

SEASONAL OVERLAND ROAD FINANCING OPTIONS STUDY

Slave Geological Province
SC793259



Extracted from Tibbitt to Contwoyto Winter Road Joint Venture Winter Road Orientation Presentation, 2011.

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Our team, consisting of Deton' Cho Stantec (DCS) and PricewaterhouseCoopers (PwC), is pleased to offer the following response to the Request for Proposal for the Seasonal Overland Road (SOR) Financing Options Study for the Government of the Northwest Territories (GNWT), Department of Transportation. This report follows the structure outlined in the DCS and PwC May 31, 2012 proposal to the (GNWT).

The project team collectively provides the GNWT with local expertise, stakeholder community consultation, technical knowledge of facilities and infrastructure (including northern experience), financial skills and capability, and significant Public-Private Partnership (P3) experience and knowledge.

Our response to the RFP takes into account the budget and time limitations of the assignment and the Scope of Work requirements. We have tailored our response to what we understand to be the desired outcome of the study. We believe our response achieves the GNWT's objectives and expectations to move forward with the evaluation of the Seasonal Overland Road (SOR) project. Given the preliminary nature of the SOR project, this study in no way constitutes an opinion, attestation, or other form of assurance.

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EXECUTIVE SUMMARY

The Government of the Northwest Territories (GNWT) is committed to finding ways to improve reliable road access to support existing mining operations, and promote exploration and development in the Slave Geologic Province (SGP). To this end, the GNWT has retained Deton' Cho Stantec (DCS) and PricewaterhouseCoopers (PwC), to undertake a financing options study to examine the development of a 156 km Seasonal Overland Road (SOR) to replace the southern section of the Tibbitt to Contwoyto Winter Road (TCWR).

Following the Introduction (section 1) of this report, section 2 provides an overview of the proposed SOR project as well as an introduction to Public-Private-Partnership (P3) procurement. The existing 500 to 600 km TCWR connects three (3) operating diamond mines: Snap Lake (DeBeers Canada Inc.), Diavik (Rio Tinto and Harry Winston Diamond Corp.), and EKATI (BHP Billiton Diamonds Inc.). The winter road traverses numerous water bodies and is highly vulnerable to climatic conditions. Its construction is an expensive undertaking every year in order to provide land access to the remote mining and exploration sites, which are otherwise accessible only by air. The proposed SOR would be less impacted by climatic influences. It would potentially increase the length of the driving season by approximately 30 days, and provide greater stability for land access to the mineral-rich region of the SGP.

Section 3 of this report presents a top-down analytical assessment of market and economic conditions for the Northwest Territories (NWT), global mining and diamond industries, and individual mines in the SGP. Accounting for over a quarter of total economic output, the diamond mining industry is a significant economic driver in the Territory. While the NWT economy suffered from the effects of the recent global recession, a turnaround in the diamond mining and construction industries is expected to help grow the economy over the short-to-midterm.

There is a great deal of uncertainty regarding the long-term outlook for NWT's diamond mining industry. The largest mines, EKATI and Diavik account for nearly 90 percent of the current production capacity; however, these mines will end operations in 2019 and 2023, respectively. These two (2) mines accounted for over three-fourths of all winter road demand in 2011.

Excluding the proposed Gahcho Kué mine (a joint venture between De Beers Canada and Mountain Province Diamonds), which will commence operations in 2017, there are no new projects that appear to significantly impact the winter road demand during their operations. While new developments, such as MMG Ltd.'s Izok Corridor project, may use the TCWR during their construction periods, these projects are in feasibility stages of development, and their future road demands are uncertain. Furthermore, expenditures related to exploration activities, (which serves as a leading indicator of future production potential) have yet to rebound back to pre-recession levels. As a result, the long-term future of mining activity in the area and therefore, the long-term future demand for the TCWR, appears limited.



The addition of the SOR would provide a number of benefits. It will extend the winter road driving season, provide greater transportation certainty and reliability to its users, allow for greater economic development opportunities (e.g. construction, northern tourism, etc.), and potentially facilitate exploration activities in the region. However, the current uncertainty of long-term future demand for the SOR may impact on the GNWT's ability to recover revenues from users to offset its costs. In these circumstances the GNWT, as guarantor under a P3 arrangement, would effectively be required to subsidize the road over the life of the concession.

As the GNWT is currently developing a Mineral Development Strategy and an Economic Development Strategy, section 4 of this report broadly assesses how the SOR's project objectives and proposed outcomes align with the GNWT's wider strategic policies. The SOR appears to have a reasonable alignment to the GNWT's six (6) strategic goals.

To complement the study's analytical findings, section 5 summarizes key findings from the stakeholder consultation. Regulatory challenges in the region are highlighted. Because the SOR would enhance the area's infrastructure, some stakeholders suggested that it would make many smaller projects more economically viable and extend the lives of the existing operations. Another stakeholder suggested that a comprehensive regional infrastructure plan should be developed ahead of investing in a road that primarily serves the mining industry.

Section 6 of this report summarizes potential delivery methods for the project and the benefits and challenges of each delivery method. Potential delivery methods considered include a status quo option, design-bid-build, design-build and design-build-operate-finance and maintain (P3).

Building upon the review of potential delivery methods, section 7 provides a high-level assessment of whether the proposed SOR would offer potential to be delivered using a P3 procurement model. Given the challenges and complexities of building and maintaining the proposed SOR, a P3 structure may offer significant benefits for the GNWT, while at the same time transferring some key risks to the private sector. This section includes a high-level P3 suitability screening checklist, which qualitatively assesses the SOR project against the desirable characteristics for a P3 project. The P3 potential of the proposed SOR project is rated as "Medium".

Section 8 of this report outlines some project specific risk issues that need to be addressed for the SOR project and that would represent a departure from the standard market accepted risk allocation between public and private sectors on completed P3 projects to date.

Section 9 provides a very high-level indicative assessment of the impact on the capital payment of different concession lengths to demonstrate that the shorter concession lengths result in higher annual cost of the project to the GNWT. The scope of this report did not include a value-for-money analysis of the proposed SOR which will need to be carried out to determine whether a P3 delivery model can offer the GNWT value for money when compared with a traditional delivery model.



Section 10 presents key findings from the market sounding exercise, which gathered high-level opinions from potential private sector partners. All of the participants expressed a strong interest in the project during the market sounding interviews. Section 11 concludes the report by summarizing key findings as well as recommendations for additional analysis for the proposed SOR P3 project.

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1 INTRODUCTION

Improving road access to operating mines as well as for mining exploration and development in the Slave Geologic Province (SGP) has been a long standing objective of the mining industry and the Government of the Northwest Territories (GNWT)¹. As part of the GNWT's highway strategy, "new road infrastructure that is responsive to the needs of industry to create economic development" is seen as a key vision for continued northern development².

The existing Tibbitt to Contwoyto Winter Road (TCWR) which traverses numerous water bodies is highly vulnerable to climatic conditions and is an expensive undertaking every year in order to provide land access to the remote mining and exploration sites. Close to \$12 million is required to maintain the current winter road annually³. Improving access to the SGP will likely facilitate mineral exploration efforts and provide economic development opportunities (e.g. tourism operators).

In an effort to provide improved road access, the GNWT commissioned this high-level financing options study to understand the financial viability of developing a Seasonal Overland Road (SOR), which potentially would be less impacted by climatic changes and provide stability for land access to remote mining areas. The purpose of the study is to examine potential financing options for the project, to assess the economic environment and the future demands of the users, and to solicit interest from potential P3 partners.

1.1 Methodology

The DCS and PwC project team have undertaken four (4) primary tasks to complete this assignment. While each task responds to a specific requirement of the project, they are intended to be viewed in combination so as to form a meaningful analysis of primary and secondary data. Task categories follow those identified in the DCS and PwC May 31, 2012 proposal to the Government of the Northwest Territories (GNWT) and include:

¹ Government of the Northwest Territories, Seasonal Overland Road P3 Financing Options Request For Proposal, November 4, 2010.

² Government of the Northwest Territories, Investing in Roads for People and the Economy: A Highway Strategy for the Northwest Territories, November 2000.

³ 2006 Dollar Estimates, Excludes Risk, Escalation, and Financing Allowances. EBA Engineering Consultants Ltd., Evaluation of the YKDFN Route to Lockhart Lake Report, October 2007.

1. Review of existing information;
2. Market and economic analysis;
3. Engagement of stakeholders and the private sector;
4. Project financing and delivery options analysis.

1.1.1 Data Collection, Availability and Reliability

Most of the data used in this study is publicly available through existing reports. However, some of the data referenced on winter road usage by each mine was collected through confidential consultations with mining companies, industry organizations, and government agencies. Additional material was collected through the review of publicly available articles and reports.

After signing confidentiality agreements with the GNWT, members of the DCS and PwC project team reviewed the existing information provided by the GNWT. The objective of this high-level review was to obtain a general understanding of the work that has been completed to date and to assign relevant materials to DCS and PwC project team members for use in completing subsequent tasks of the project. Project team members then reviewed relevant reports. The following documents were received from the GNWT:

- GNWT Public-Private Partnership Management Framework, May 2011;
- GNWT Public-Private Partnership Policy Draft, April 2011;
- Seasonal Overland Road Project, Engineering Report, October 2008;
- Seasonal Overland Road Project, Project Description Report, October 2008;
- Seasonal Overland Road Project, Wildlife Habitat Assessment, Baseline Studies Report, October 2008;
- Seasonal Overland Road Project, Wildlife Studies, Baseline Studies Report, August 2008;
- Seasonal Overland Road Project, Archaeology, Baseline Studies Report, January 2008;
- Seasonal Overland Road Project, Consultation Report, January 2008;
- Seasonal Overland Road Project, Ecological Land Classification Mapbook, Baseline Studies Report, December 2007;

- Seasonal Overland Road Project, Ecological Land Classification Studies, Baseline Studies Report, December 2007;
- Evaluation of the YKDFN Route to Lockhart Lake Report, October 2007;
- Overview of Strategic Options to Supplement or Replace the Tibbitt to Contwoyto Winter Road, EBA Engineering Consultants, February 2007.

1.1.2 Stakeholder Consultation

Stakeholder consultation for this project was limited to stakeholders with a direct, vested interest in the development of the SOR, namely the existing and proposed mining operations near the existing TCWR, the mining industry association and regulators, and the local Aboriginal communities. The DCS project team extended invitations to all stakeholders listed in the DCS and PwC May 31, 2012 proposal to the GNWT. Interviews were conducted with the stakeholders below. These represent those companies, associations and communities that responded to the interview invitations:

- Government
 - GNWT Department of Industry, Tourism and Investment
- Industrial Association
 - NWT-Nunavut Chamber of Mines
- Mining Industry
 - Winter Road Joint Venture/Rio Tinto (Diavik Diamond Mine)
 - Tyhee Gold Corporation
 - MMG Resources
 - BHP Billiton (EKATI Mine)
 - Shear Diamonds
 - Elgin Mining
- Aboriginal Peoples
 - North Slave Métis Alliance
 - Yellow Knives Dené First Nation
 - Tli Cho First Nation

In addition to Section 5, which highlights many of the themes brought forward during the stakeholder consultation, relevant opinions of stakeholders are included throughout the report. Appendix A includes the stakeholder survey along with responses collected from responding stakeholders.

Due to the complex and preliminary nature of this project, consultation with the selected stakeholders was undertaken in a phased approach as described below:

Phase 1: Project Awareness

To initiate the project, a personalized letter was sent to each of the stakeholders identified in the study area, starting at a high-level of strategic involvement through the local industry associations such as the Chamber of Mines, the trucking and construction associations, etc. This enabled a higher level strategic focus for overall development plans and needs for the area before tightening the focus to the needs of individual road users. This also provided an opportunity for these higher level organizations to identify the most appropriate individuals to contact. The letter contained brief project information, contact information for the Stantec project team, and information on the upcoming consultation phases. The team initiated the stakeholder interview process approximately one (1) week after the letters were received by the stakeholders.

Phase 2: Initial Engagement

The DCS team undertook a telephone interview process with each stakeholder. During these interviews, the team member identified themselves to the stakeholder, asked them if they received their letter and pamphlet in the mail, and answered any questions that they had. A short survey was also provided to the stakeholders and the stakeholder responses were discussed with each participant. Each stakeholder contacted was logged on a database checklist for future mapping of responses.

Aboriginal Consultation

Supreme Court of Canada case law requires that First Nations be consulted whenever land management and resource development decisions have the potential to adversely affect First Nations' constitutionally protected rights. Rights and traditional uses include uses of public lands such as:

- Burial grounds;
- Gathering sites;
- Historic or ceremonial locations;
- Existing constitutionally protected rights to hunt, trap and fish (does not refer to proprietary interests in the land).

The Yellowknives Dené First Nation, the Tli Cho First Nation and the North Slave Métis Alliance are the major Aboriginal stakeholders in the area and were directly engaged. However, given the nature of these discussions, all three (3) parties reserved the right to have further input once discussions with their leadership and communities occurred.

2 PROJECT OVERVIEW

This section begins with a project description, which outlines a brief history leading to the conceptualization of the proposed SOR project. It also discusses some of the challenges and opportunities should the proposed SOR project proceed. Additionally, this section introduces Public-Private Partnership (P3) procurement and identifies the steps necessary to examine the project as a P3 candidate.

2.1 Background

Mining is the largest industry in the NWT. Employing over 2,500 people, the mining sector is also the main source of employment⁴. As such, improving road access to operating mines, and mining exploration and development projects in the SGP, has been a long-standing objective of the mining industry and the GWNT⁵.

Over the past 28 years, a winter road between 400km and 600km (depending on mining activities) has been constructed annually to allow NWT mine operators to truck in supplies essential for operations⁶. This Tibbitt to Contwoyto Winter Road (TCWR) begins at Tibbitt Lake at the end of Highway 4, about 60km east of Yellowknife. The road continues north and links four (4) diamond mines: Snap Lake, Diavik, EKATI, and the Lupin diamond mine (no longer in operation). Respectively, the Snap Lake, Diavik and EKATI diamond mines are owned by DeBeers Canada Inc., Diavik Diamond Mines Inc. (owned by Rio Tinto plc, and Harry Winston Diamond Corporation, .), and BHP Billiton Diamonds Inc. along with a minority private stake⁷. These companies manage the winter road through the *Tibbitt to Contwoyto Winter Road Joint Venture (WRJV)*. A map of the winter road is shown in Figure 1.

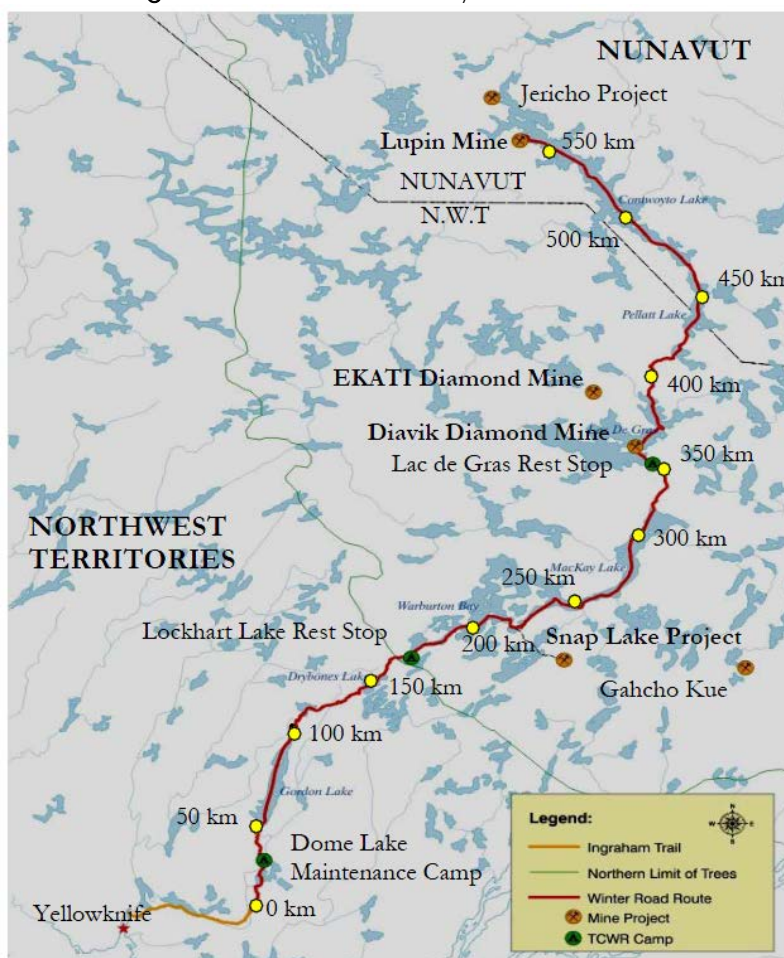
⁴ Government of the Northwest Territories, Ministry of Industry, Tourism and Investment, *Economic Review and Outlook*, January 2011.

⁵ Government of the Northwest Territories, Seasonal Overland Road P3 Financing Options Request For Proposal, November 2010.

⁶ Nuna Logistics, Tibbitt to Contwoyto Winter Road website. Accessed October 2012.

⁷ Tibbitt to Contwoyto Winter Road Joint Venture website. Accessed May 2012.

Figure 1. Tibbitt to Contwoyto Winter Road⁸



The winter road is rebuilt each year. The majority (87 percent) of the road is built over frozen lakes. It is constructed over a period of five (5) to six (6) weeks, and opens for approximately eight (8) to ten (10) weeks each year. For the remainder of the year, the mine sites are accessible only by air. Between 2000 and 2011, the winter road was open for 60 days on average. Over the same period, an average of 6,542 northbound truckloads delivered 212,506 tonnes annually. Each day, an average of 110 truckloads traveled north and 3,573 tonnes were transported on the road⁹. This is a major logistical feat given that the winter road is accessible less than 20 percent of the year.

⁸ Tibbitt to Contwoyto Winter Road Joint Venture Fact Poster, 2012.

⁹ Calculations based on aggregated annual averages. Tibbitt to Contwoyto Winter Road Joint Venture Fact Poster, 2012.

Historically, only a few years have had climate concerns that restricted shipping on the TCWR. Most years, the shipping program is completed before the ice road is unusable. The ice road does not typically present itself as a problem, but rather, the melting of the portages off and onto the ice road is usually the determining factor for closure¹⁰.

Shipping on the TCWR is led by the JV partners, who estimate their loads and tonnage for the upcoming season. Once these have been determined, any excess capacity on the road is then offered to the other users in the area. Users pay a set fee per tonne based on the price determined for each of the JV partner's loads, which is prorated from the estimate of what is actually shipped. The haul program for 2012 and third party applications for access was expected to be finalized by mid-November, 2012¹¹.

Due to significant variations in winter air temperatures and snowfall recorded in the SGP, the existing winter road is challenged each year by changing lake ice and overland section conditions. Given warmer than usual temperatures in 2006 and 2010 for example, the winter road was forced to close early.

To examine its transportation options, the WRJV commissioned "An Overview of Strategic Transportation Options to Supplement the Tibbitt to Contwoyto Winter Road" study. The study recommended that the existing ice road's southern section be replaced with a 156 kilometre Seasonal Overland Road (SOR) from Tibbitt Lake to Lockhart Lake. Among the various alternatives examined, the SOR appeared to provide greatest overall benefit to shippers and transporters delivering supplies to mines and exploration projects in the SGP. The study suggested that the SOR would encourage future investment in the area by providing greater transportation reliability.

At an estimated cost of \$200 million (in 2006 dollars), the proposed SOR demands a substantial capital investment¹². This investment, for example, would account for 88 percent of the entire infrastructure investment capital spend of the GNWT's Department of Transportation infrastructure in 2010/11¹³. While significant, the initial capital costs are small in comparison to the cost of hauling materials on the road. Improvements in transport efficiency by routing over land rather than ice will reduce cycle times. Travel time on the ice road is generally around 14 hours, though it can be as high as 18 hours for heavy loads¹⁴. Speed on the road is carefully controlled to

¹⁰ Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

¹¹ Ibid.

¹² 2006 Dollar Estimates, Excludes Risk, Escalation, and Financing Allowances. EBA Engineering Consultants Ltd., Seasonal Overland Road (SOR) Project, Engineering Report, October 2008.

¹³ 2010/11 Transportation Infrastructure Investment Spend was \$227,888. Government of the Northwest Territories, Capital Estimates, 2012-2013.

¹⁴ Diavik mine website. Accessed June 2012.

protect the integrity of the ice. Given the large number of truckloads of fuel and supplies that travel on the road, even small efficiencies can lead to large savings on a cumulative basis.

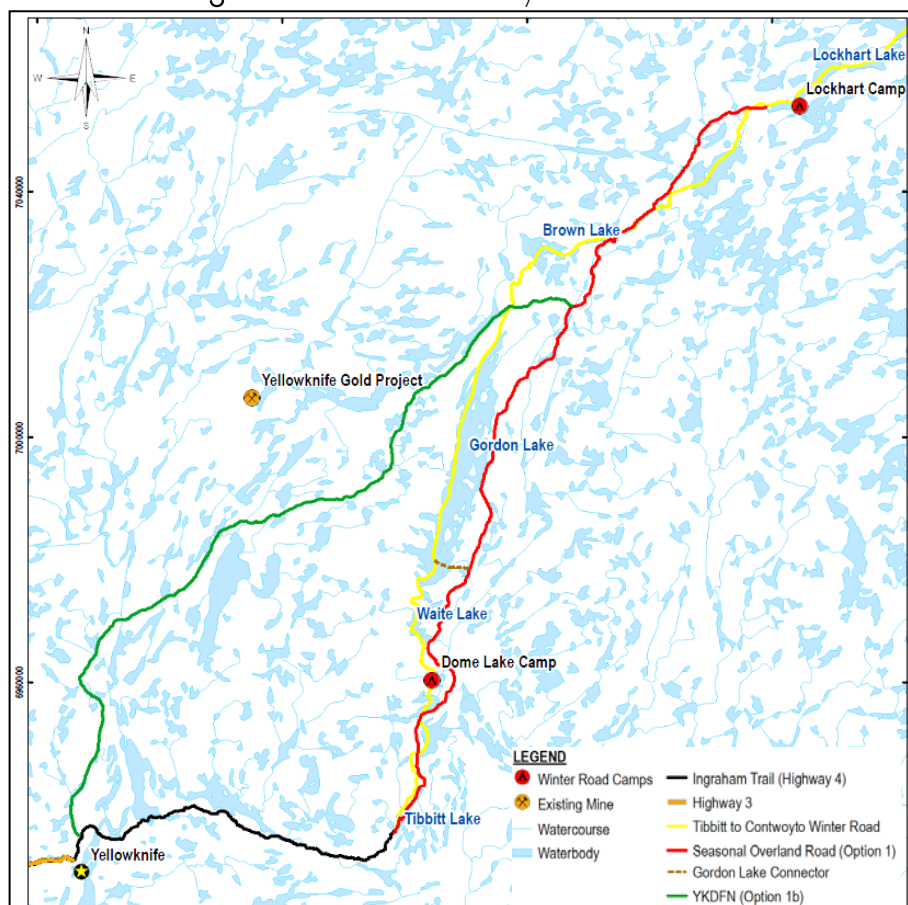
The alternate/bypass route from Lockhart Lake to Yellowknife has taken some pressure off of the southern portion of the TCWR. The section from the Ingraham Trail to Lockhart Lake is the most fragile and a determining factor in the length of the shipping season due to the shallow lakes, poor water quality for ice formation, and a high incidence of gravel/sand bars in the lakes¹⁵. The area north of Gordon Lake is significantly easier to manage, and the creation of an SOR to this point could potentially open up the shipping season for another month or more. This could ultimately spur exploration and eventually increase development of the area.

Since the proposed SOR would be less impacted by climatic changes, it would add approximately 30 days to the normal winter road operating season. The SOR would be used in conjunction with the remainder of the existing winter road. Along with the winter road, the SOR would be taken out of service to restrict access for conservation purposes during the remainder of the year.

Figure 2 illustrates the location for the proposed SOR in red. Because it would be constructed primarily over land, the path of the SOR differs from the current winter road (in yellow). As shown, the proposed 156km SOR would run from Tibbitt Lake to Lockhart Lake.

¹⁵ Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

Figure 2. Tibbitt to Contwoyto Winter Road¹⁶



The benefits attributed to the proposed SOR go beyond extending the winter road season for existing diamond mine operators. The realization of the SOR is expected to be a catalyst for future mineral exploration in the SGP. As a result, this could potentially lead to future development of new mines in the area and sustain social and economic benefits flowing to the residents of NWT¹⁷. Additionally, the construction of the SOR itself would lead to economic benefits as it is expected to be a significant undertaking. While a quantitative economic multiplier analysis is outside of the scope of this study, Table 1 below includes typical intensity ratios used for the construction industry per dollar of gross output in the NWT.

¹⁶ Tibbitt to Contwoyto Winter Road Joint Venture Fact Poster, 2012.

¹⁷ Tibbitt to Contwoyto Winter Road Joint Venture, Seasonal Overland Road Project Description Report, October 2008.

Table 1. Construction Industry Intensity Ratios¹⁸

	GDP at Basic Prices per Dollar of Output Labour	Labour Income per Dollar of Output	Jobs per \$million of Output
Construction	0.46	0.33	3.8

2.2 Description of the Financing Options Study

This study builds upon previous research on the SOR by capturing feedback from current users of the winter road and other stakeholders involved in the planning and use of the proposed SOR.

It includes an analysis of mine operators that currently use the winter road, as well as those who may use the winter road in the future. This high-level analysis examines market and economic factors that will influence future mining activity in the NWT, and specific mining activity in the SGP. The study begins with a broad analysis of the mining industry before narrowing the focus on individual mines in the SGP. This includes identifying the remaining service life of current mines as well as anticipated future mining that may take place in the area. The aim of this analysis is to gain insight into current and proposed mines that would likely form the majority of the demand for the proposed SOR.

To complement the economic analysis, the study presents feedback from stakeholders representing the GNWT, industrial associations, the mining industry and aboriginal peoples. This includes current users of the existing winter road as well as other stakeholders that would be affected by the development of the SOR.

The study also contains a high-level qualitative description of potential delivery models for the project, ranging from traditional procurement to a public private partnership (P3). A preliminary market sounding has been carried out with a selection of companies that are currently active on P3 projects to solicit market feedback on the attractiveness of the project itself and potential procurement structuring issues.

For planning purposes very high-level indicative annual costs to the GNWT have been estimated for a P3 option but these do not include costs for escalation, risk, operations and maintenance¹⁹.

¹⁸ Government of the Northwest Territories, Bureau of Statistics, NWT Economic Multipliers Overview and Results, April 2011.

¹⁹ It is therefore important to recognize that when detailed financial models are developed for the Project the actual costs to the GNWT are likely to be significantly higher than the indicative costs contained within this study.

Due to the nature of this study, it in no way constitutes an opinion, attestation, or other form of assurance. If deemed appropriate, a comprehensive viability analysis may follow this study. In order to fully determine potential for this project to proceed as a P3 additional analysis will need to be developed by the GNWT. This analysis is described in the GNWT's P3 Management Framework document (May, 2011). Further evaluation includes a detailed Feasibility Analysis and Business Case Analysis. These documents will examine whether the proposed project has sufficient potential to provide value-for-money as a P3 as compared to a traditional procurement. Additionally, these documents will study the project's feasibility in detail to determine whether the proposed SOR will meet all of its objectives.

2.3 Public-Private-Partnership (P3) Overview

According to the GNWT, a P3 is defined as "a cooperative venture between the public and private sectors, built on the expertise of each partner that best meet clearly defined public needs through the appropriate allocation of resources, risks and rewards"²⁰.

The GNWT infrastructure deficit is estimated to be \$3 billion over the next five (5) years²¹. Over the past decade, P3s have emerged as important project delivery mechanisms that governments have used to close large infrastructure gaps²². However, P3s cannot be viewed as a single form of project delivery. In fact, they are used in a broad spectrum of delivery models, ranging from Design-Build to Build-Own-Operate models where the private partner is actively involved throughout the project lifecycle as shown in Figure 3. Detailed analysis will be required to determine the most suitable P3 delivery model for the proposed SOR project that incorporates the preferred level of involvement by private partners and the GNWT.

Figure 3. Spectrum of P3 Categories²³



²⁰ Government of the Northwest Territories, Public Private Partnerships Management Framework, May, 2011.

²¹ Government of the Northwest Territories, 2012-2013 Budget Address, May, 2012.

²² Deloitte Research, Closing the Infrastructure Gap: The Role of Public-Private Partnerships, 2006. Original source: National Council for Public Private Partnerships.

²³ Ibid.

Compared to traditional procurement models (e.g. Design-Bid-Build), the private sector assumes a greater role in the planning, financing, design, construction, operation, and maintenance of public infrastructure with P3s. While P3s have a number of benefits, they also bring a number of challenges for a project owner. Table 2 lists common positive attributes and pitfalls associated with P3 projects.

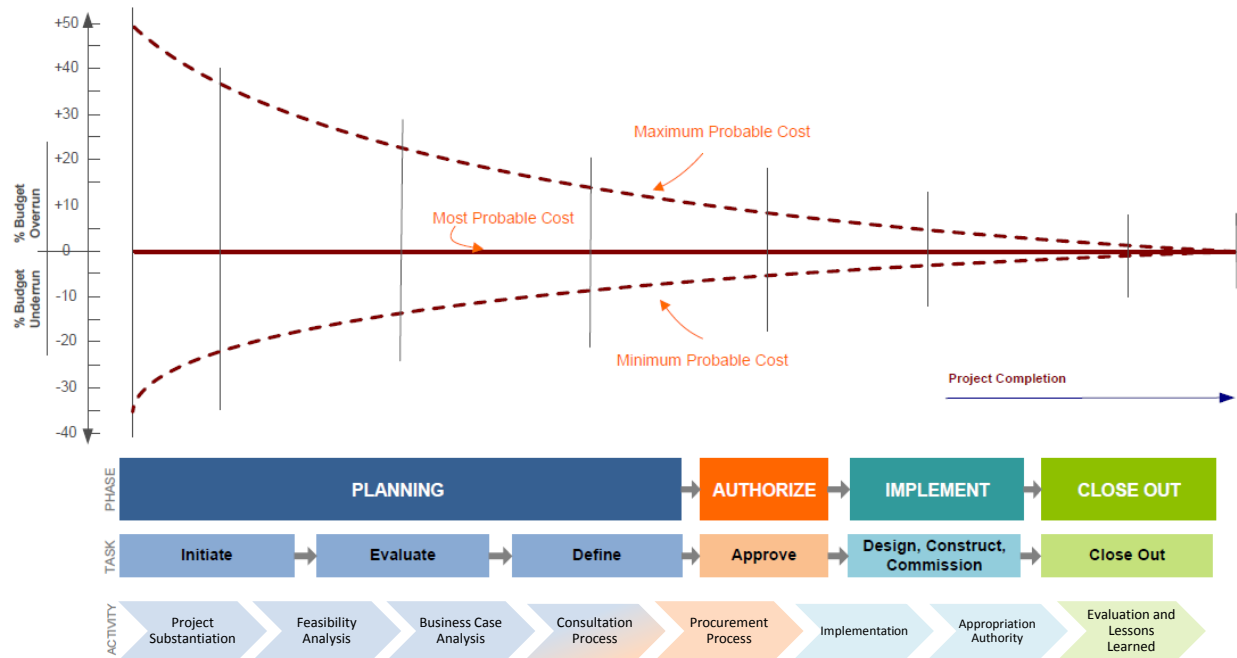
Table 2. Common Benefits and Pitfalls of P3 Projects

Benefits	Pitfalls
<ul style="list-style-type: none"> • Brings construction forward. • On-time & on-budget delivery. • Shifting construction and maintenance risk to private sector. • Cost savings. • Strong customer service orientation. • Public sector can focus more on outcomes and core business. 	<ul style="list-style-type: none"> • Poor setup & inadequate planning. • Lack of clear project objectives. • Too much focus on transaction. • Inappropriate risk model applied to project. • Lack of internal capacity. • Failure to realize value for money.

Because the proposed SOR project is in the pre-feasibility stage of its project lifecycle, a definitive timeframe for its implementation is unknown at this juncture. A variety of internal and external factors will affect its time to implementation.

Figure 4 illustrates the assessment path required for typical capital investment. The “activities” identified at the base of the graphic are extracted from the GNWT’s P3 Management Framework document (May, 2011).

Figure 4. Project Assessment Stages²⁴



²⁴ Activities taken from: Government of the Northwest Territories, Public Private Partnerships Management Framework, May, 2011.

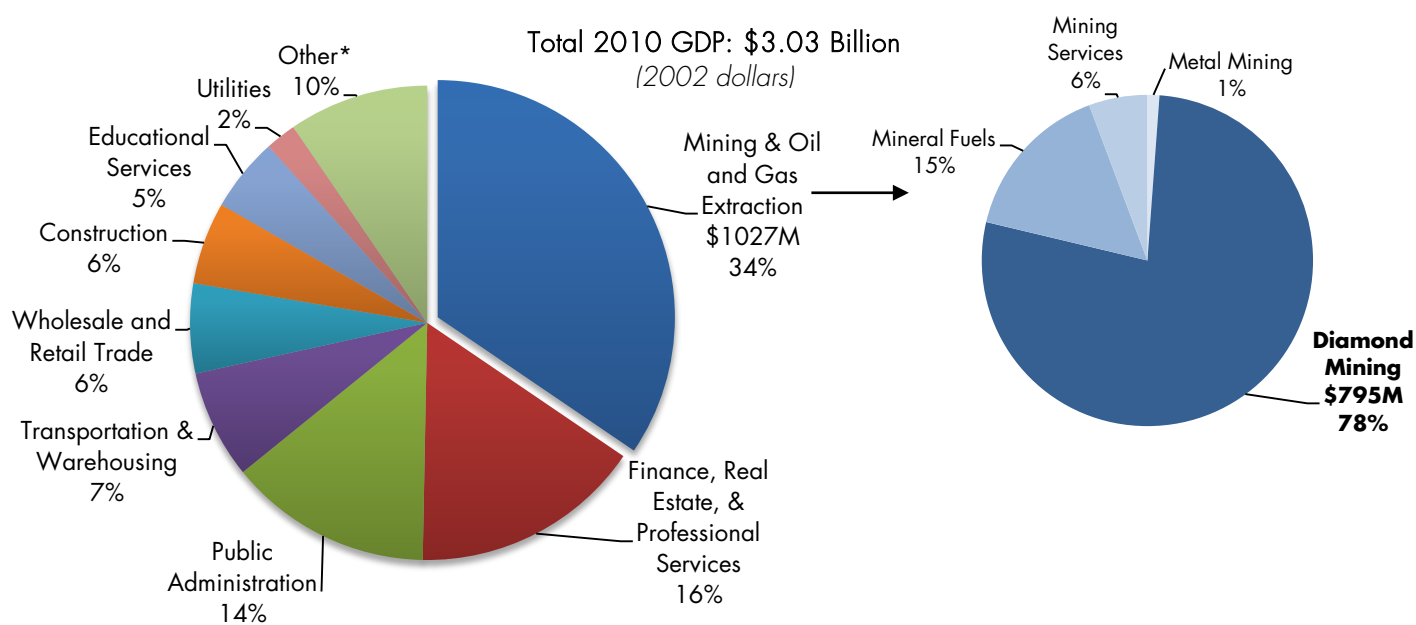
3 MARKET AND ECONOMIC ANALYSIS

Current and anticipated changes to the market and economic climate will affect the viability of the proposed SOR as well as the most appropriate financial option. The analysis presented in this section uses a *top-down* analytical approach, beginning first with the macroeconomic environment, narrowing the focus to mining in the NWT, and finally, examining individual mines in the SGP.

3.1 NWT Economic Outlook

The NWT economy is highly resource-dependent, with a particularly large reliance on diamond mining. The diamond mining sector directly accounts for more than a quarter (26 percent in 2010) of total economic output in the Territory. Moreover, diamond mining activity comprises over three-quarters (78 percent in 2010) of all mining, and oil and gas extraction economic output in the NWT. Mining's influence on the economy is much larger than its direct contribution when factoring in the indirect effects on other sectors, such as construction and the service sector. Figure 5 illustrates the NWT's Gross Domestic Product (GDP) breakdown by industry for 2010.

Figure 5. NWT Economic Structure²⁵



²⁵ Conference Board of Canada, *Territorial Outlook: Economic Forecast, Winter 2012*.

Government of the Northwest Territories, Bureau of Statistics, *Gross Domestic Product, 2010*. Accessed May, 2012.

*Other industries include: Accommodation and food services; arts, entertainment and recreation; administrative and support, waste management, etc.; information and cultural industries; manufacturing; agriculture, forestry, fishing and hunting; and, other services.

Like other Canadian regions, the NWT economy suffered from the effects of the global recession in 2009. Its GDP contracted by 11 percent and employment dropped by 6 percent. Mining, the territory's largest industry, led the decline due to falling diamond and mineral prices, weaker global demand, and tighter financing conditions²⁶.

A turnaround in diamond mining and construction helped lift the NWT economy by nearly 6 percent in 2010. Still, the rebound was not strong enough to offset 2009 declines, as output and employment remain well below pre-recession levels.

The NWT is finding it challenging to regain its economic footing relative other Canadian provinces and territories. According to the Conference Board of Canada, the NWT suffered from another contraction in economic activity in 2011 due primarily to declining diamond production and weaker construction spending. In contrast, Canada as a whole experienced economic growth of 3.4 percent in 2010 and 2.6 percent in 2011. In 2011, real (inflation adjusted) GDP by industry increased in every province and territory except the Northwest Territories²⁷.

As a major component of the GDP, capital expenditures provide an indication of market conditions in the overall economy and in particular industries. As shown in Figure 6, the reduction in NWT's recent capital spending comes after an eight-year period of robust growth, fuelled primarily by the construction of Rio Tinto and Harry Winston Diamond Corporation's Diavik diamond mine (2000-2002)²⁸, and De Beers Canada's Snap Lake diamond mine (2005-2007)²⁹. Between 2008 and 2009, the NWT mining industry's capital expenditures fell 85 percent. To counteract the decrease in private investment, capital expenditures related to public administration grew over two times from \$78 million in 2009 to \$251 million in 2010.

While there are several projects in the works, most are not advanced enough to have a significant impact on NWT's economy over the next two (2) years. As a result, capital spending by industry is expected to decline as illustrated in Figure 6. Couple this with the decline in capital investment by the GNWT from \$377 million in 2011/12 to \$124 million in 2012/13³⁰, and the NWT economy appears to be constrained by declining capital investment by both the public and private sectors.

²⁶ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

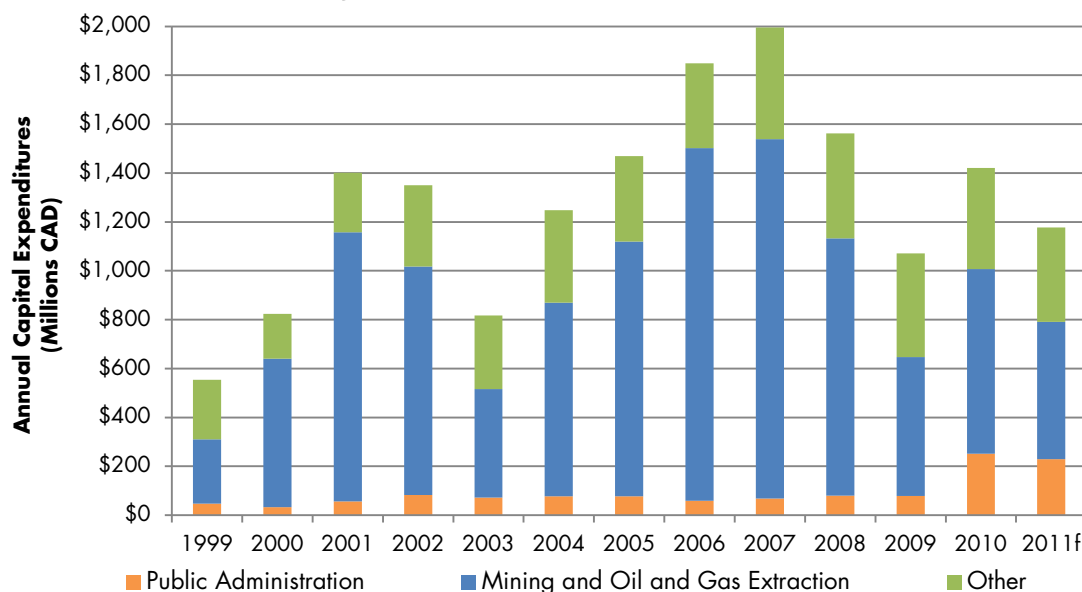
²⁷ Statistics Canada, *Gross domestic product by industry: Provinces and territories, 2011*, April, 2012.

²⁸ Diavik mine website. Accessed June 2012.

²⁹ De Beers Canada website. Accessed June 2012.

³⁰ Government of the Northwest Territories, *Budget Address 2012-2013*, May 2012.

Figure 6. NWT Capital Expenditures³¹



Looking beyond 2011, the Conference Board of Canada expects economic activity to grow in 2012 (+5.9 percent) as output in the mining sector improves from its decline in activity in 2011. Economic growth of 7.6 percent is anticipated in 2013 with moderate growth thereafter (an average annual rate of 2.2 percent from 2014 to 2016³²).

In 2017, the NWT economy is expected to receive an economic boost from anticipated production from the Gahcho Kué diamond mine project, a joint venture between De Beers Canada and Mountain Province Diamonds. Pending final approval, the Gahcho Kué mine will be constructed from 2014 to 2016, with production coming on stream by 2017. The Gahcho Kué mine has an estimated 11-year operating life, with three (3) open pits mined in sequence. On average, approximately 4.5 million carats of diamonds will be extracted from three (3) million tonnes of kimberlite annually³³.

While the Gahcho Kué project is likely to proceed, it is still subject to a final decision by the joint venture partners and the outcome of an environmental review. The total cost of constructing the mine is \$650-\$750 million. A 120 km winter road that follows the route established during exploration of the site would be built to the site each year, connecting to the Tibbitt-Contwoyto

³¹ Capital expenditures by Public Administration do not represent all expenditures by the Public Sector. Government of the Northwest Territories, Bureau of Statistics, Capital Expenditures by Industry, 2011.

³² Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

³³ De Beers Canada website. Accessed June 2012.

winter road near the top end of MacKay Lake³⁴. As a result, the construction and operation of the Gahcho Kué mine would impact the demand for the winter road. However, it should be noted that the Gahcho Kué mine is relatively small in size. In comparison, the capital cost of the Diavik Diamond mine was \$1.3 billion³⁵. In 2012, Diavik expects its mine to produce 8.3 million carats (approximately double in cost and production compared to the proposed Gahcho Kué mine)³⁶.

Another proposed project is the Mackenzie Gas Project (MGP), a 1,196 Km natural gas pipeline that would run through the NWT's Mackenzie Valley. The MGP would run southwest of the Slave Geological Province, from Inuvik through Norman Wells, Wrigley, and Fort Simpson. It would connect to existing lines in Alberta that serve southern markets. The total estimated cost of the MGP is \$16 billion. While the MGP holds promise, it is not certain to go ahead. It received approvals from the National Energy Board (NEB) in March 2011, and is now in the hands of the funding partners. The NEB requires the construction of the pipeline to begin before the end of 2015 for its approval to remain valid, which would put operation of the pipeline at 2018-2019 at the earliest. According to the Conference Board of Canada's most recent *Winter 2012 Territorial Outlook*, the MGP is not expected to proceed in its economic forecast. While the MGP would provide a significant boost to the NWT economy, its location west of the SGP means that it would not have an impact on demand for the winter road.

Figure 7 illustrates economic growth forecasts for NWT. The green time-series line represents year-over-year GDP changes of the entire NWT economy. The global economic recession negatively impacted NWT's economic growth rate over 2008-09, reducing the size of its economic output by almost 20 percent. The recovery in 2010 was due in part to increase in government spending. However, as public infrastructure expenditures retreated, business spending eased, and real output in the construction industry dropped, the real GDP by industry fell 5.5 percent in 2012³⁷. Over the mid-to-long-term, NWT's economy is forecast to benefit from an increase in private investment with annual GDP growth rates ranging from 2.0 to 7.6 percent.

³⁴ De Beers Canada website. Accessed June 2012.

³⁵ Nuna Logistics website. Accessed June 2012.

³⁶ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

³⁷ Statistics Canada, *Gross domestic product by industry: Provinces and territories, 2011*, April 2012.

Figure 7. NWT Economic Growth, Mining vs. Total³⁸



3.2 Global Mining Outlook

The global mining sector is highly influenced by fluctuations in global economic conditions, which dictate both demand and supply for minerals. This section provides a brief overview of global economic developments, their impact on the mining sector, and concludes with an outlook for NWT's most important mineral: diamonds.

The global economy is recovering from the worst downturn since the Great Depression. However, the road to recovery has been bumpy, and met with a number of obstacles along the way. In 2011, some of the problems have been transitory: a devastating earthquake in Japan and social uprisings in the Middle East. But the main issue, record government debt, is longer term and much more difficult to fix. Concerns over high debt levels in the Euro zone and the U.S. continue to cloud the economic outlook, raising uncertainty and causing turbulence in financial markets.

Economic growth has been highly uneven during the recovery, with the emerging economies (e.g. China) continuing to offset persistent weakness in advanced countries. In particular, the job situation remains weak in many advanced countries, preventing a much needed jolt in consumer spending just as fiscal stimulus measures unwind. The International Monetary Fund (IMF) has revised down its forecast for global growth to 3.3 percent in 2012 and in 3.9 percent 2013,

³⁸ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.



down from September estimates of 4.0 percent and 4.5 percent, respectively³⁹. Risks continue to be prevalent in the IMF forecast. Debt concerns in Europe and the possibility of a double dip recession in the U.S. have led to renewed financial market turbulence and heightened uncertainty.

The global mining industry has bounced back briskly from the recession, supported by higher mineral prices, improved financing constraints and stronger global demand. While mining prices have been volatile, they remain well above recessionary lows.

The good news is that balance sheets of mining companies remain healthy. This partly reflects improved mineral prices and the effects of economies of scale due to recent consolidation in the industry as a number of mergers and acquisitions (M&A) took place in 2011⁴⁰.

However, given current economic uncertainty, mining companies are placing a greater focus on enhancing productivity and lowering costs. These companies are expanding production closer to growth markets, such as China and India, and are avoiding locations deemed too costly or risky to invest⁴¹.

3.3 Focus on Diamonds

As previously noted, mining in the NWT is heavily focused on diamonds. This section provides a high-level outlook for the diamond mining sector.

Diamond prices have improved from recessionary lows, reaching their highest level on record in early 2011. While growing economic uncertainty and financial market turbulence resulted in about a 20 percent drop in diamond prices in the third quarter of 2011, most analysts believe that prices are likely remain strong moving forward⁴². However, in the near term, diamond prices are expected to remain stagnant for the remainder of 2012 as the Euro-zone debt crisis saps demand⁴³.

Diamond demand is primarily driven by two main drivers: fine jewellery and industrial applications⁴⁴. Global demand should outpace supply in the mid-to-long term, thanks largely to consumers in East and South Asia. While economic troubles in Japan may temper conditions somewhat, these risks should be offset by growing demand in China, which has surpassed Japan

³⁹ International Monetary Fund, World Economic Outlook, January 2012.

⁴⁰ PricewaterhouseCoopers, *Global Mining 2011 Deals Review & 2012 Outlook*, March 2012.

⁴¹ Ibid.

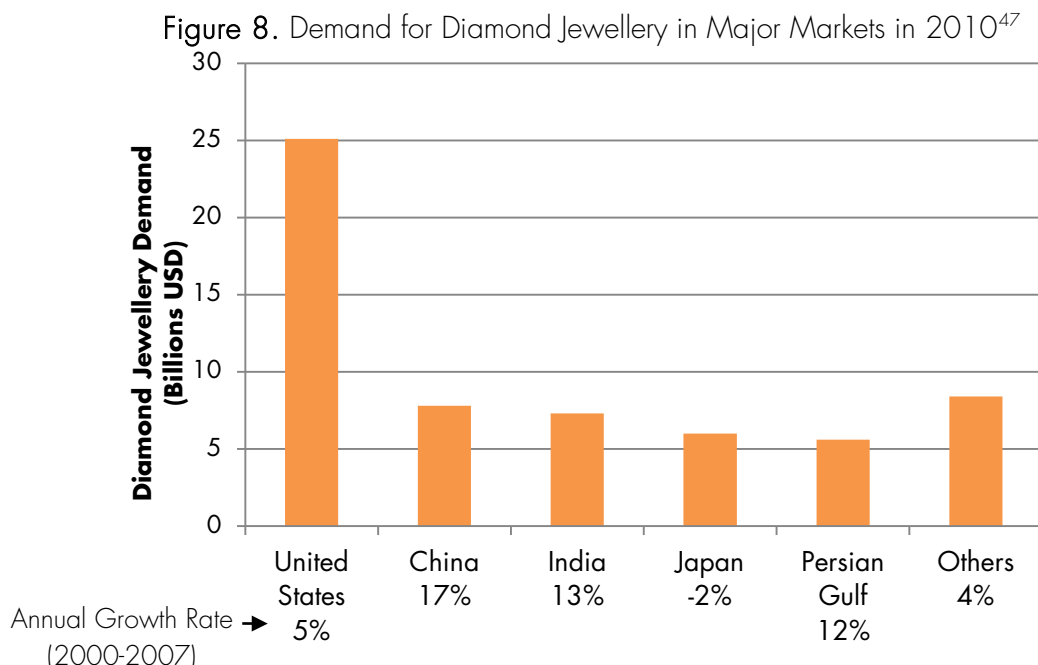
⁴² The Guardian, *Firestone says diamond prices are down 15-20% in six weeks*, September 2011.

⁴³ Biesheuvel, Thomas, *Diamond Prices to Stagnate in 2012 on Euro Crisis*, BMO Forecasts, Bloomberg, June 2012.

⁴⁴ Bain and Company, *The Global Diamond Industry*, 2011.



to become the world's second-largest diamond consumer market next to the United States⁴⁵. Industry experts see huge potential demand among the emerging middle classes in India and China. As illustrated in Figure 8, some experts believe that Asian markets hold the key to future growth in the global diamond jewellery business⁴⁶.



There are a number of supply constraints to diamond production expected over the next five (5) years. Many of the world's diamond mines have passed their peak open-pit production capabilities, and are moving underground, where it is more costly to extract deposits. Meanwhile, demand for diamonds will continue to rise, as growing numbers enter the middle class in emerging economies, such as China and India⁴⁸.

Canadian based WWW International Diamond Consultants expects that global production will remain relatively flat while demand continues to increase up until 2020⁴⁹. The resulting supply-demand imbalance is expected to support elevated diamond prices in the future. Diamond prices could also benefit from on-going economic uncertainty, as many investors view diamonds as a reserve asset, like gold or silver. This positive impact however, is likely insignificant given less

⁴⁵ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

⁴⁶ Bain and Company, *The Global Diamond Industry*, 2011.

⁴⁷ Ibid.

⁴⁸ PricewaterhouseCoopers, *Global Mining 2011 Deals Review & 2012 Outlook*, March 2012.

⁴⁹ WWW International Diamond Consultants, Presentation, September 2010.

liquidity present in diamond markets. As a result, should global economic uncertainty prevail in the short-term, diamond prices will be negatively impacted. Some mining companies have reported to be pessimistic about diamond prices⁵⁰. In fact, Rio Tinto and BHP Billiton, both major diamond operators in the NWT, are examining strategic alternatives to divest their diamond mine business⁵¹. Nonetheless, according to Bank of Montreal forecasts, diamond prices will gain three (3) percent in 2013, and rise five (5) percent to seven (7) percent in the following years⁵².

3.4 Prospects for the NWT Mining Industry

The NWT is the third largest producer of diamonds by value in the world after Botswana and Russia⁵³. As the world's top producing country by value, Botswana produced 22 million carats valued at \$2.6 billion in 2010. Russia was the top producer by volume at 35 million carats worth \$2.4 billion. Canada was the third largest producer of diamonds by value in 2010 at \$2.3 billion, and the fifth large largest by weight with 11.8 million carats produced. Preliminary estimates indicate that Canada's 2011 diamond production reached 11.1 million carats valued at \$2.5 billion⁵⁴. This is due in large part to the diamond mining within the NWT⁵⁵. In 2010, the NWT accounted for close to 90 percent of all Canadian diamonds produced.

NWT diamond production fell sharply in 2008-2009 due to the global recession, but experienced a rebound in 2010 and 2011. In 2011, the territory produced \$2.1 billion worth of diamonds⁵⁶, accounting for nearly 15 percent of global production⁵⁷.

Figure 9 illustrates the value of diamond production between 1999 and 2011 in the NWT. Figure 10 shows the annual weight of diamond production for the NWT and other areas in Canada over the same time period. From 2003 to 2011, 110 million carats of diamonds were mined resulting in a value of approximately \$16 billion. Based on the annual value and weight of the NWT's diamond production, Figure 11 displays a timeline of the value per carat of diamond produced in the territory. On average, one diamond carat produced in the NWT was worth \$151 between 2003 and 2011.

⁵⁰ Fraser Institute, Survey of Mining Companies, 2011/12.

⁵¹ Reuters, Diamonds not Forever, Rio Tinto May Sell Business, March 2012.

⁵² Biesheuvel, Thomas, Diamond Prices to Stagnate in 2012 on Euro Crisis, BMO Forecasts, Bloomberg, June 2012.

⁵³ Bain and Company, The Global Diamond Industry, 2011.

⁵⁴ Perron, Louise, Senior Policy Advisor – Diamonds, Government of Canada.

⁵⁵ NWT & Nunavut Chamber of Mines, Northern Mining News, August 2012.

⁵⁶ Government of the Northwest Territories, Budget Address 2012-2013, May 2012.

⁵⁷ Ramsay, David, NWT Minister of Industry, Tourism and Investment, CBC Canada, March 2012.

Figure 9. Diamond Production in NWT by Value⁵⁸

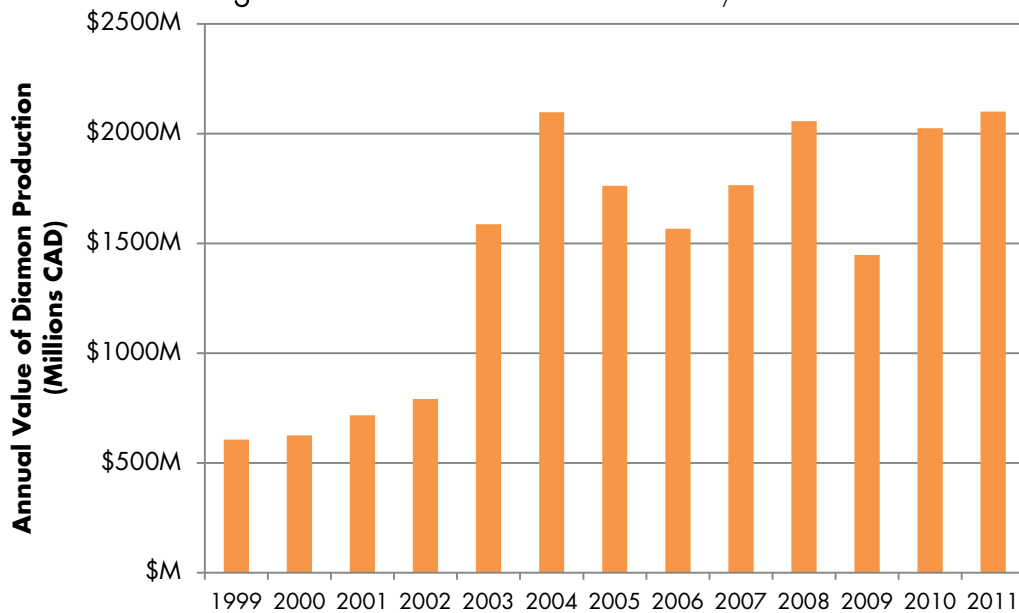
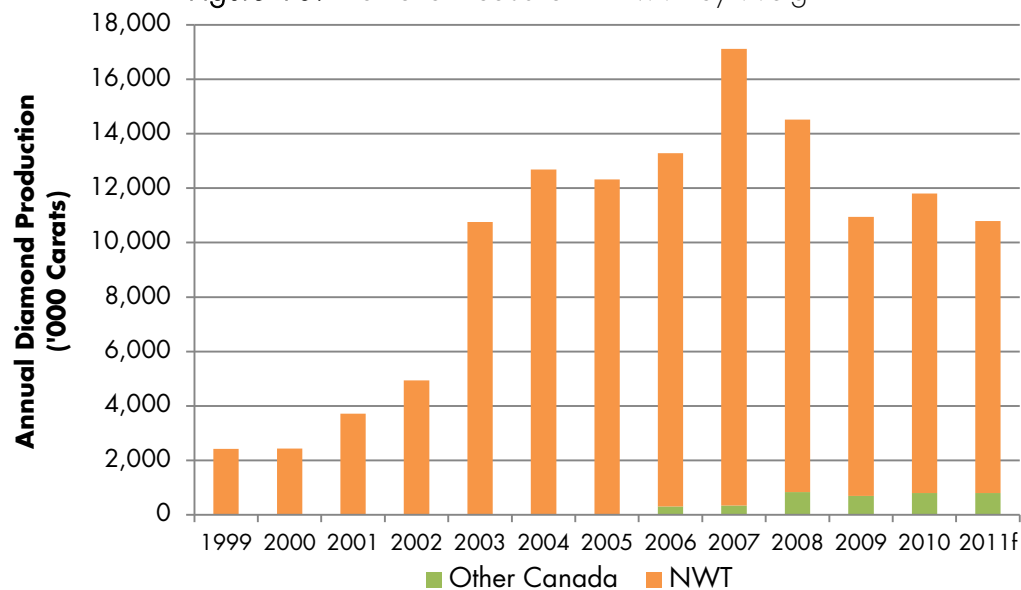


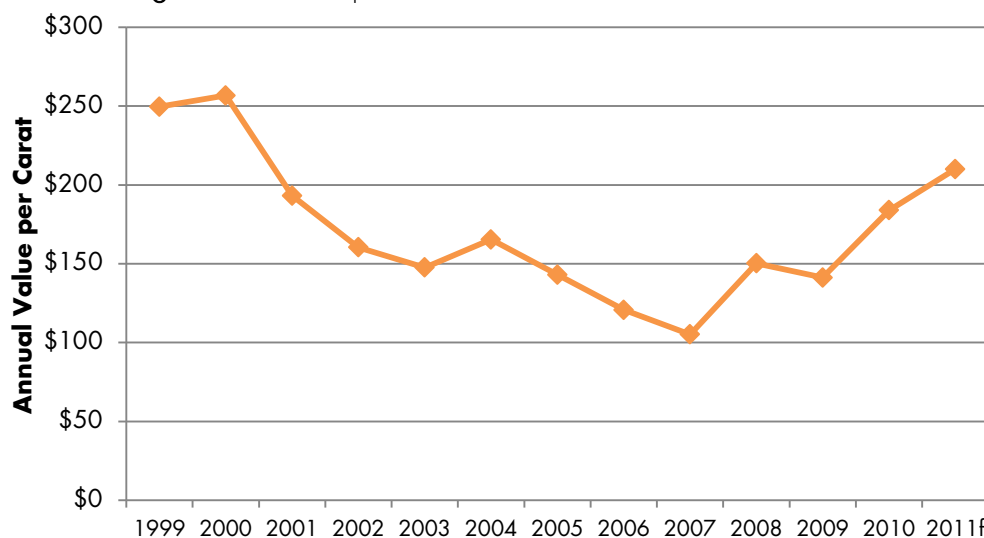
Figure 10. Diamond Production in NWT by Weight⁵⁹



⁵⁸ Government of the Northwest Territories, Bureau of Statistics, Annual Value of Mineral Production by Commodity, 1999 to 2011. Opportunities North News, Mining, June 2011.

⁵⁹ Natural Resources Canada, Mineral Production Statistics, 1999 to 2011f.

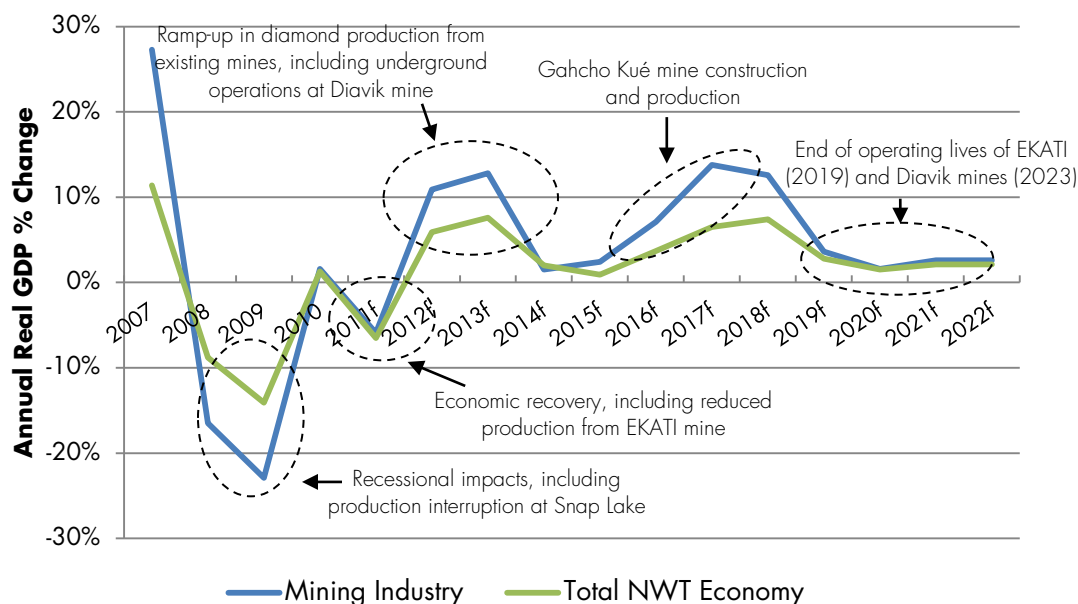
Figure 11. Value per Carat of Diamond Produced in NWT⁶⁰



The diamond mining industry will continue to be the main driver of NWT's economy. Figure 12 illustrates total economic growth forecasts for NWT, accompanied with growth forecasts for NWT's mining industry. The green time-series line represents year-over-year GDP changes of the entire NWT economy, while the blue line denotes growth changes associated with NWT's mining industry. Given the mining industry's significant contribution to the NWT's overall economy, changes to the mining industry growth forecasts are highly correlated to changes in NWT's broader economy. Figure 12 highlights significant past and anticipated events that impact year-over-year growth.

⁶⁰ Government of the Northwest Territories, Bureau of Statistics, Annual Value of Mineral Production by Commodity, 1999 to 2011. Opportunities North News, Mining, June 2011. Natural Resources Canada, Mineral Production Statistics, 1999 to 2011f.

Figure 12. NWT Economic Growth, Mining vs. Total⁶¹



Between 2013 and 2018, NWT's mining industry is forecast to grow, due in large part to a ramp-up in operations from the existing mines. The Diavik mine is transitioning its open pit mines to underground operations. Full underground production is expected by 2013. In addition, the Misery open-pit project at the EKATI diamond mine (owned by BHP Billiton) is expected to produce from 2015 to mid-2017⁶².

From 2019 onwards, the forecast projects a decline in economic activity from the mining sector. This is due in large part to the anticipated closure of the EKATI (2019) and Diavik diamond mines (2023). As these large mines terminate operations and reclaim the lands, the demand to resupply their operations via the winter road would significantly decrease. Moreover, the Snap Lake (owned by De Beers Canada Inc.) and Gahcho Kué mines are expected to approach the end of their lives in 2028. This will have a significant impact on the demand for the winter road and proposed SOR.

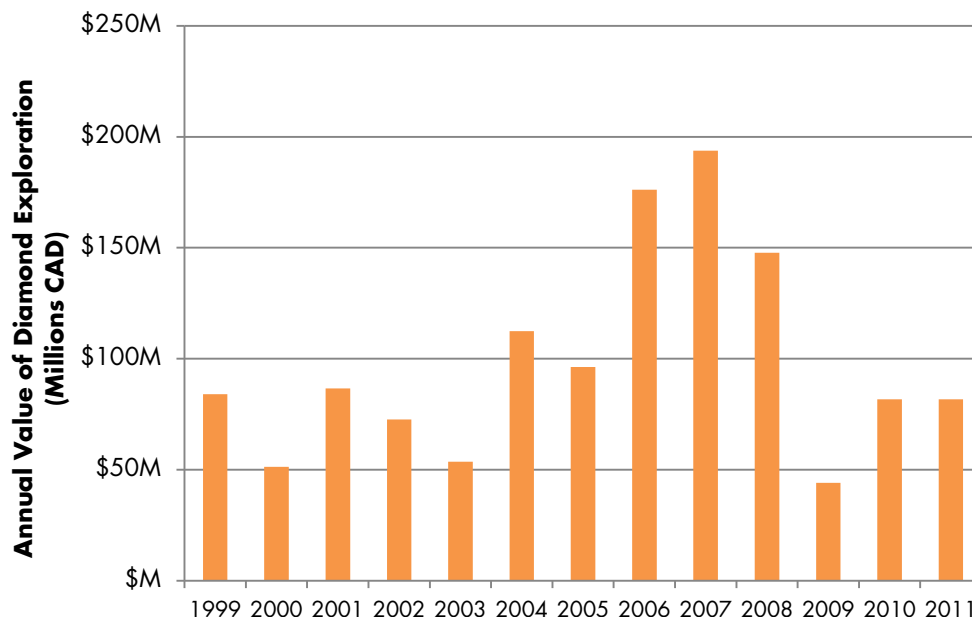
Exploration is critical to the discovery and development of mineral deposits. Expenditures related to exploration activities serves as a leading indicator of future production potential. There has been a sharp decline in diamond exploration activity since 2007. Part of this was due to the recession in 2008-09. Yet, even as prices and production improved, exploration remained weak.

⁶¹ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

⁶² Ibid.

In fact, diamond exploration expenditures totalled just \$24 million in 2011, one-fifth of its 2007 level as illustrated in Figure 13. On a relative basis, the NWT is lagging behind the Yukon and Nunavut Territories, which are witnessing significant exploration growth⁶³.

Figure 13. Value of Diamond Exploration and Deposit Appraisal Activity in NWT⁶⁴



The decline in exploration activity in the NWT is occurring at the same time other regions in Canada (e.g. BC) are seeing a large rebound. The NWT's share of Canada's exploration expenditures has declined from nine (9) percent in 2006 to less than three (3) percent expected for 2011 and 2012⁶⁵. It can take up to 13 years to begin production once a diamond deposit discovery is made. Given that no major discoveries have been made recently and the relatively low levels of exploration expenditures in the NWT, weaker production gains over the next five (5) to ten (10) years than those experienced in the 2000s is expected.

Consultations with various stakeholders indicate that the decline in exploration expenditures is most likely due to perceived regulatory barriers among investors, including land claim issues. This finding is confirmed in the recent 2011/12 Survey of Mining companies, conducted annually by

⁶³ NWT & Nunavut Chamber of Mines, Mining in the NWT, August 2011.

⁶⁴ Government of the Northwest Territories, Bureau of Statistics, Value of Mineral Exploration and Deposit Appraisal Activity, 1999 to 2011.

⁶⁵ Natural Resources Canada, Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures, June 2012.

the Fraser Institute. The majority (69 percent) of surveyed mining executives suggested that the uncertainty concerning disputed land claims were a mild to strong deterrent from pursuing investment in the NWT. In fact, 12 percent of all respondents would not pursue investment in the NWT due to this uncertainty. This was the highest percentage of all of Canadian provinces and territories⁶⁶. The GNWT is working to respond to these issues. In 2012/13, it will invest over \$1 million to develop a Mineral Development Strategy to address unfavourable industry perceptions of the NWT's regulatory regime⁶⁷.

While just 29 percent of respondents believed that the current regulations and land use restrictions encourages investment given the NWT's mineral potential, three-quarters (75 percent) of respondents indicated that NWT's mineral potential alone would encourage investment if the territory had no land use restrictions in place. It appears that the nature of mineral potential in NWT has a positive perception among mining executives, although regulatory barriers and land use restrictions are limiting investments. According to two mining executives:

In the Northwest Territories, the regulatory review process is cumbersome and time consuming. Too many small projects (that have no impact on the environment) are being referred to environmental assessment. These referrals generally come from the aboriginal community where land claims remain unsettled...Until this is solved, the NWT will remain an area known as one "not to go to."

—Exploration company, Vice-president, Fraser Institute 2011/12 Mining Survey.

We were granted simple NWT land use permits after 8-10 month delays, then had those permits subjected to court challenge by third parties on the basis of "duty to consult"—you want stability and perceived transparency. This is not the way to get it in Canada...

—Exploration company, Vice-president, Fraser Institute 2011/12 Mining Survey.

The NWT also ranked relatively low in terms of infrastructure. Over four (4) of every five (5) respondents indicated that the quality of NWT's infrastructure was a mild or strong deterrent to mining investment. This sentiment ranks only second to Nunavut. At this time however, it is unclear how the addition of the SOR would impact the perception of NWT's infrastructure to encourage investment.

Overall, the NWT ranks 48 of 93 mining jurisdictions in terms of policy potential: the effects of government policy (regulations, native land claims, infrastructure, security, etc.) on exploration

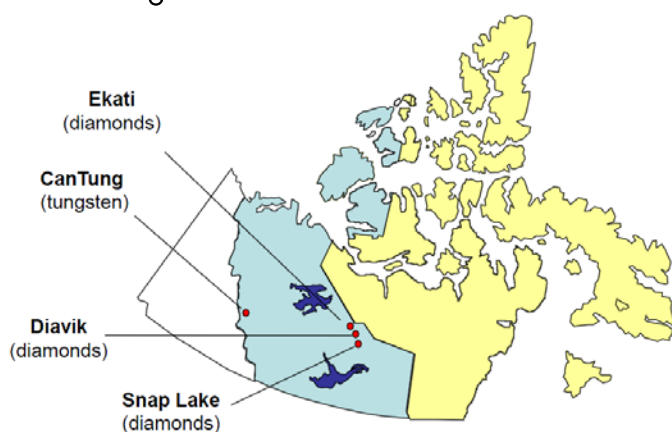
⁶⁶ Fraser Institute, Survey of Mining Companies, 2011/12.

⁶⁷ NWT & Nunavut Chamber of Mines, Northern Mining News, May 2012.

activities. The NWT's overall ranking has fallen in recent years: in 2007/08 it placed 37th out of 68 jurisdictions⁶⁸.

Beyond diamond mining, the NWT is a small producer of base and precious metals. There is one metal mine in the territory, the Cantung tungsten mine, which resumed mining in October 2010 and is expected to continue producing until 2014. Another metal mine, the Fortune Mineral's NICO project, is slated to begin production of cobalt, bismuth and gold in 2014 and has a life of 15 to 18 years. However, even with both these mines operating, they are only expected to account for a small percentage of the NWT's mining output over the coming years. As shown in Figure 14, these mines are located west of the TCWR and therefore are not expected to have an impact on the winter road's usage.

Figure 14. Active Mines in NWT⁶⁹



3.5 Mining Outlook for the SGP

All three (3) of NWT's diamond mines are located in the Slave Geological Province (SGP) and are active users of the existing winter road. This section profiles each of the mines (Diavik, Snap Lake and EKATI) and discusses their current and future production and development plans.

3.5.1 Operating Mines

The largest of the three (3) mines is the Diavik mine, which has been operational since 2003 and in 2011 produced about 6.7 million carats⁷⁰. It took approximately nine (9) years to begin

⁶⁸ Fraser Institute, Survey of Mining Companies, 2007/08.

⁶⁹ NWT & Nunavut Chamber of Mines, Mining in the NWT, August 2011.

⁷⁰ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

production at Diavik since its deposit was discovered⁷¹. The Diavik mine is jointly owned by Rio Tinto and Harry Winston Diamond Corporation. At this time, however, Rio Tinto is conducting a review of its diamonds business that may result in the potential sale of Diavik. In its 2012 half-year reporting, Rio Tinto wrote down the value of its diamond business by \$344 million⁷².

The existing open-pit operations are expected to wrap up by mid-2012, at that time Diavik will become an all underground mine. Underground production at the mine commenced in March of 2010, after a capital investment of approximately \$800 million. The recent developments at Diavik are part of the original mine plan in which commercial production is expected to cease in about 2022. The transition to underground mine production will intensify Diavik's energy needs, as this mining method requires underground water pumping, mobile fleet operations, heating and ventilation.

In 2012, Diavik trucked 3,160 loads (89,000 tonnes) of fuel, cement, explosives, equipment, wind turbine components, and other materials, over the winter road⁷³. In 2013, diesel consumption at Diavik is expected to increase by approximately 15 percent compared to the consumption recorded in 2011, which will likely result in increased truckloads of diesel to the mine⁷⁴.

A small portion (2 percent) of the Diavik loads, were to supply parts for its wind farm, currently under construction. Custom-designed trailers were required to transport 33-metre turbine blades over the winter road. Diavik's wind farm, expected to be operational later in 2012, is projected to reduce its annual ice road fuel haul by approximately 100 loads, or over four million litres of fuel per year⁷⁵.

The second largest mine, the EKATI diamond mine, was Canada's first underground and surface diamond mine and is the Territory's oldest in operation. Operations began in 1997, seven (7) years after EKATI's deposit was discovered⁷⁶. Rough diamonds at EKATI are worth \$262 per carat, which is the highest value among the largest diamond mines in the world⁷⁷. The EKATI mine comprises a Core Zone and a Buffer Zone. The Core Zone has both open-pit and underground mining, while production at the Buffer Zone only occurs through open-pit mining. The combined production capacity of the mine is 4.5 million carats a year; however, production in 2011 was just 2.5 million carats representing a decline of 18 percent from 2010 levels. During

⁷¹ Bain and Company, The Global Diamond Industry, 2011.

⁷² Bloomberg, Harry Winston, KKR, Apollo Said to Consider Bids for BHP, March, 2012.

⁷³ Diavik mine website. Accessed June 2012.

⁷⁴ Tibbitt to Contwoyto Winter Road Joint Venture

⁷⁵ Diavik mine website. Accessed June 2012.

⁷⁶ Bain and Company, The Global Diamond Industry, 2011.

⁷⁷ Ibid.



the first two (2) quarters of 2012, production from Ekati was just 481,000 carats, a year-over-year decline of 29 percent⁷⁸.

EKATI's owners, BHP Billiton and its partners, are currently working on a project to reopen the Misery open-pit, which was mined between 2001 and 2005. The total capital expenditure to rehabilitate Misery is estimated at USD\$323 million, with a two-year production life targeted to commence in late 2015⁷⁹. Production at EKATI is expected to end in June of 2018. Similar to Rio Tinto, BHP Billiton is conducting a review of its diamonds business, which may include the potential sale of EKATI. If a suitable buyer is not found however, BHP Billiton would retain its stake in EKATI. Potential buyers such as De Beers, Canadian diamond miner and jewelry retailer Harry Winston Diamond, diamond exploration company Stornoway Diamond Corp, and U.S. private equity firm KKR, have opted not to submit a binding offer⁸⁰.

The newest mine, the Snap Lake Project, was De Beers' first diamond mine outside of Africa. Production capacity is estimated at between 1.4 million carats per year⁸¹, with the mine life extending to 2028⁸². Commercial production at Snap Lake began in January 2008, after three (3) years of mine development and construction and \$975 million in construction expenditure. Commercial development of Snap Lake, was interrupted in 2009 due to unfavourable market conditions⁸³. In 2010 diamond production was 926,000 carats, more than doubling the 440,000 produced in 2009. Production slowed in 2011 as 882,000 carats were produced. It is expected that production will ramp up in 2012, will reach a plateau shortly after, and will end in 2028⁸⁴.

⁷⁸ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

⁷⁹ Ibid.

⁸⁰ Reuters, De Beers Won't Bid for BHP's Stake in EKATI, June 2012.

⁸¹ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

⁸² De Beers Canada website. Accessed June 2012.

⁸³ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

⁸⁴ De Beers Canada, Snap Lake Quarterly Newsletter, Spring 2012.



Table 3. Existing Mines




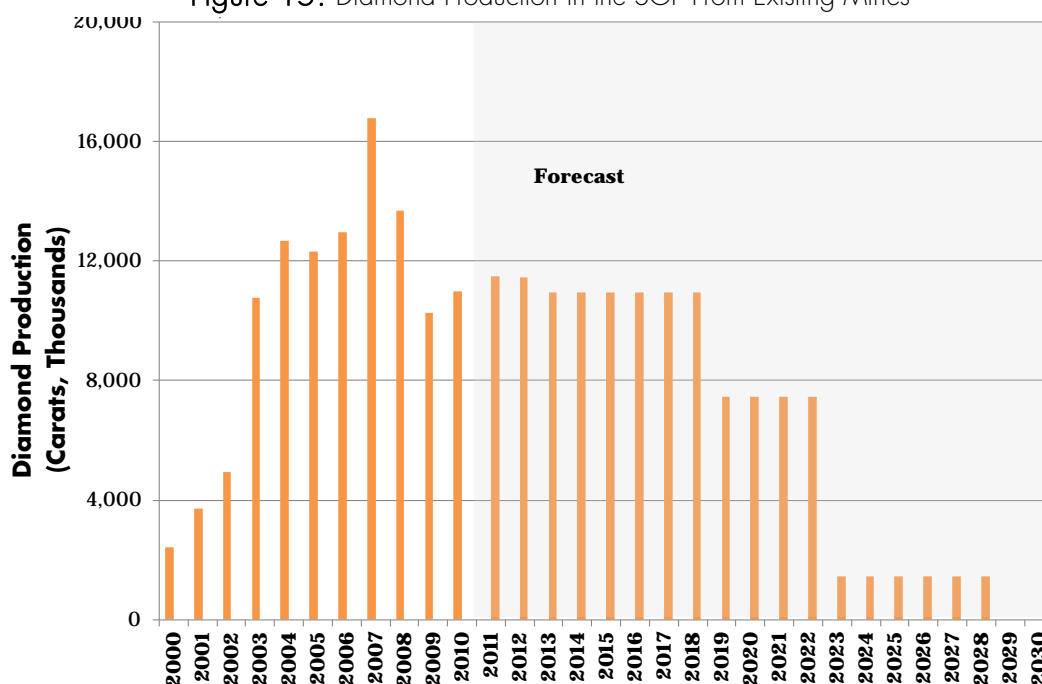
Site Name		Company	Type of Operation	Ore Reserves	Const Start Date	Prod Start Date	Prod End Date	Annual Prod Capacity
Diavik Diamond Mine		Rio Tinto (60%) and Harry Winston Diamond Corporation (40%)	Open-pit and underground mining, processing plant	19.7 M tonnes at 3 carats/tonne	2000	2003	2022	6.9 million carats
EKATI Diamond Mine		BHP Billiton (80% in the Core Zone and 58.8% in the Buffer Zone). The remaining interest is held by two individuals.	Open-pit and underground mining, processing plant	Core Zone: 53 M tonnes at 0.8 carats/tonne underground and 35 M tonnes at 0.5 carats / tonne open pit Buffer Zone: 47 M tonnes at 2.0 carats per tonne open pit.	1994	1997	2018	4.5 million carats
Snap Lake Project Diamond Operations		De Beers Canada Inc.	Underground mining, processing plant	25 M tonnes at 1.2 carats per tonne	2005	2008	2028	1.4 million carats

Figure 15 provides a forecast of diamond production between 2011 to 2030 for the existing mines. For 2011, forecasts are based on company projections. For 2012 and beyond, the following assumptions have been included:

1. EKATI continues to operate below its capacity due to depletion of higher ore grade reserves. It is assumed that EKATI produces 3.5 million carats a year between 2012 and 2018, up from 3.13 million in 2011, but still below its original 4.5 million carat production capacity.
2. Diavik is in the process of shifting to underground mining operations by 2013. It is expected that underground operations will reduce annual production to about 6 million carats a year, down from 6.9 million in 2011.
3. Snap Lake is assumed to produce 1.45 million carats a year, the mid-point of De Beers 1.4-1.5 million carats annual capacity estimate over the life of the mine.

Figure 15. Diamond Production in the SGP From Existing Mines⁸⁵



3.5.2 Proposed Mines

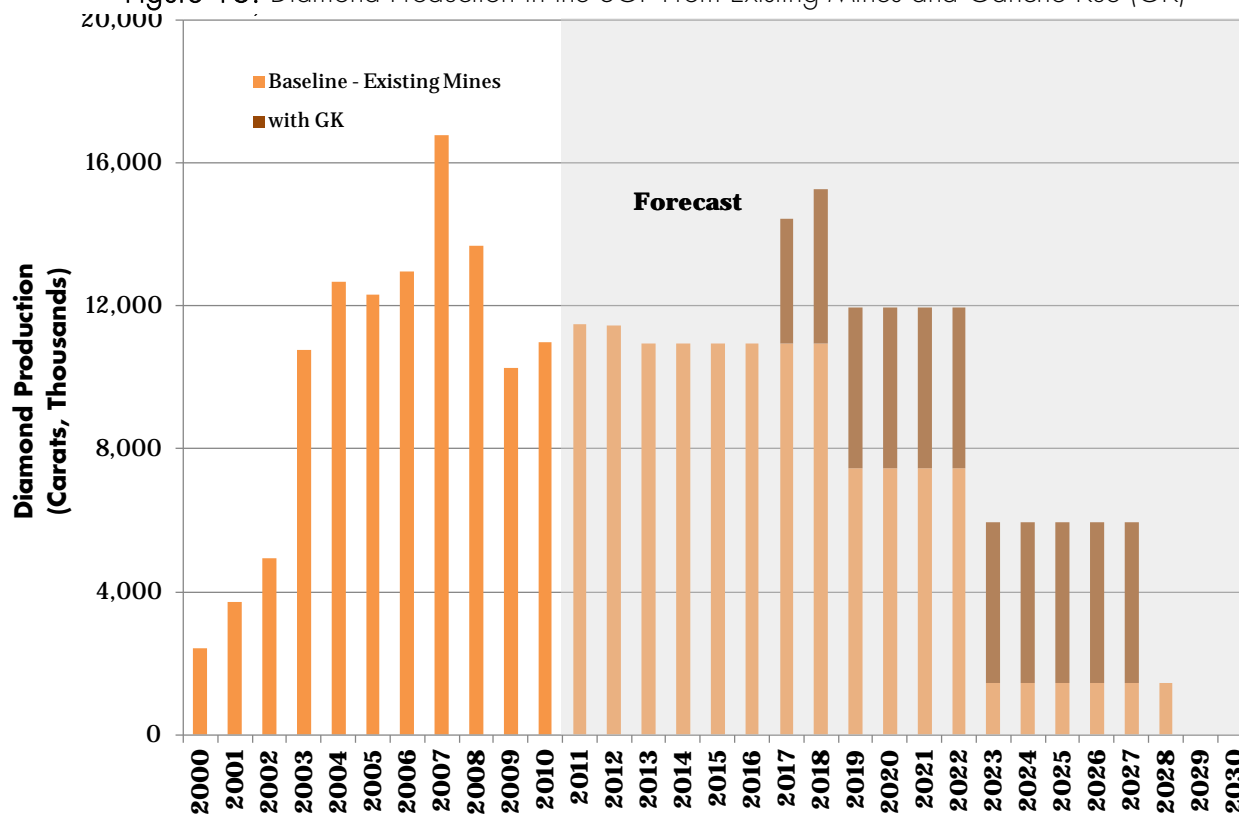
In addition to the existing diamond mines, there are some new mines proposed for development in the SGP. The mine most likely to proceed is De Beers and Mountain Province Diamonds' Gahcho Kué project, formerly known as the Kennady Project. De Beers and its partners submitted an Environmental Impact Study (EIS) to the Mackenzie Valley Environmental Impact Review Board

⁸⁵ Natural Resources Canada, PwC forecast based on assumptions.

(MVEIRB) in December 2010. In July 2011, the Gahcho Kué Environmental Impact Review Panel issued a conformity statement for the EIS and set the work plan for the Environmental Impact Review (EIR). De Beers and its partners expect the panel to make a decision by July 2013. The mine is estimated to cost between \$600 million and \$650 million including construction, working and sustaining capital⁸⁶. Construction is expected to occur over two (2) years with the mine beginning commercial production in 2016⁸⁷.

In the most likely scenario that the Gahcho Kué project proceeds, the mine is expected to produce 4.5 million carats annually during its 11 year life. Figure 16 forecasts diamond production in the SGP with the addition of the Gahcho Kué project.

Figure 16. Diamond Production in the SGP From Existing Mines and Gahcho Kué (GK)⁸⁸



⁸⁶ De Beers Canada, Gahcho Kué.

⁸⁷ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

⁸⁸ Natural Resources Canada, PwC forecast based on assumptions.

The Gahcho Kué mine will make use of the existing Tibbitt-Contwoyto winter road to ship supplies during the winter season. However, given the mine's distance to the road, De Beers plans to construct a 120 km extension winter road each year, connecting to the existing winter road near the top end of MacKay Lake as shown in Figure 17⁸⁹.

Figure 17. Proposed Gahcho Kué Mine Site⁹⁰



Table 4. Proposed Diamond Mine – Likely to Proceed

Site Name	Company	Type of Operation	Reserves	Const. Start Date	Prod Start Date	Prod End Date	Annual Prod Capacity
Gahcho Kué	De Beers Canada Inc. (51%) and Mountain Province Diamonds (49%)	Open Pit Mine, Plant	32 M tonnes at 1.57 carats per tonne	2014	2016	2027	4.5 million carats

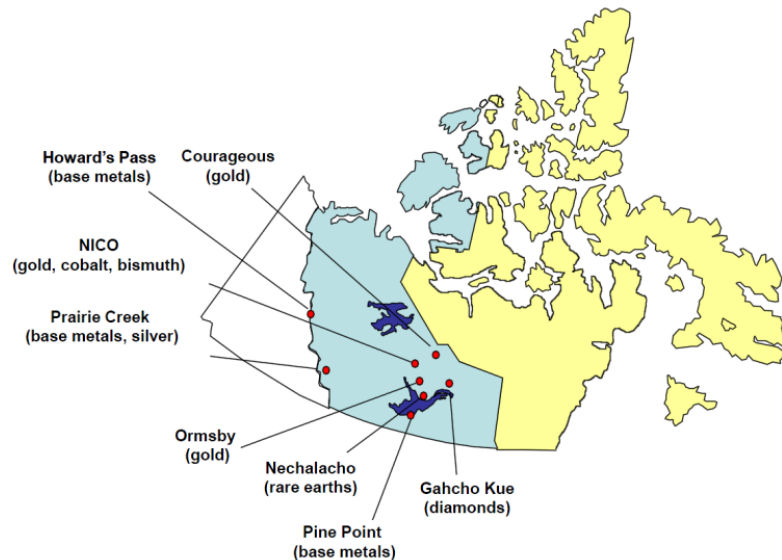


⁸⁹ De Beers Canada website. Accessed June 2012.

⁹⁰ Natural Resources Canada, PwC forecast based on assumptions.

Other proposed mining projects in the NWT, as illustrated in Figure 18, remain highly uncertain at this stage. Nonetheless, excluding the Gahcho Kué mine project, other proposed mines will have limited impacts on the Tibbitt-Contwoyto winter road due to their locations.

Figure 18. Proposed Mines in NWT⁹¹



The Jericho diamond property is an open-pit mine located in the territory of Nunavut, approximately 500 km north of Yellowknife and accessible through the Tibbitt to Contwoyto winter road as shown in Figure 19.

⁹¹ NWT & Nunavut Chamber of Mines, Mining in the NWT, August 2011.

Figure 19. Jericho Diamond Mine Location⁹²



The Jericho mine commenced commercial production in January, 2006, but operations ceased in early 2008 when Tahera Diamond Corporation, the former mine owner and operator, filed for bankruptcy. The original mine design comprised an open-pit and a processing plant, with a process capacity of around 7 million tonnes of ore per year. During the two (2) years that the Jericho mine was in operation, the plant processed 1.3 million tonnes of kimberlite and recovered around 780,000 carats. According to Shear Diamond, who bought the property in 2010, Jericho has approximately 1.9 and 1.1 million carats in indicated and inferred reserves respectively, with an expected recovery rate of between 1.2 and 1.3 carats per tonne.

The diamond valuation at Jericho was scheduled for May 2012. Shear believes that significant exploration potential exists at Jericho and in the region surrounding Jericho⁹³. The production start date is uncertain but it is intended to initiate operations no sooner than 2013. Once operational, the mine will operate at a slower pace than that taken by previous owners and will likely remain in production for 10 to 12 years. Since the majority of the mine is already built, loads on the SOR and TCWR would likely only involve initial and resupply shipping. Because the Jericho mine

⁹² Rio Tinto, Diavik Diamond Mine Fact Book, January 2009.

⁹³ Shear Diamonds website. Accessed June 2012.

remains in an exploratory phase however, it is not forecast to make use of the winter road over the short-to-mid-term.

The former Lupin gold mine is located at the end of the Tibbitt to Contwoyto winter road, approximately 400 km north of Yellowknife. The property produced around 3.7 million ounces of gold between 1982 and 2005 at an average grade of 0.259 ounces per tonne. In July 2011, MMG Resources sold the property to Elgin Mining Inc. (Elgin) for \$4.8 million and 3.8 million common shares. A detailed ground magnetic survey was then completed in late August 2011 with additional mapping of these zones and, Elgin planned to drill test exploration targets from late 2011 into 2012. While the Tibbitt-Contwoyto winter road was extended to Lupin during its operations, Elgin is not using the winter road for its current exploration and development operations. However, it does note that it would have the ability to gain access on this transportation mode if sufficient resources are identified that warrant restarting operations⁹⁴.

Initial estimates indicate that production at the Lupin mine would not start for three (3) to four (4) years at the earliest, and would likely follow a similar pace and process to the nearby Jericho mine. Because the Lupin mine remains in an exploratory phase with little communication around anticipated production, Elgin is not forecast to make use of the winter road over the short-to-mid-term.

In addition to Lupin, Elgin owns the Ulu deposit, which is located 155 km north of the Lupin gold mine. The company recently announced that according to the results of a NI 43-101 commissioned early in 2011, Ulu has indicated mineral resources of 751,000 tonnes grading 11.37 grams per tonne, and inferred mineral resources of 418,000 tonnes grading 10.6 grams per tonne⁹⁵. Similar to the Lupin mine however, activity at the Ulu mine is exploratory in nature and will likely not affect demand for the winter road.

Yellowknife Gold, a Tyhee Gold Corp. (Tyhee) venture is located northeast of Yellowknife near the winter road alternate route (Option 1b)⁹⁶. Tyhee planned to file its Environmental Impact responses at the end of the first quarter 2012. Following their review, the regulatory committee will circulate the Developers Assessment Report for review by other interested parties, which will lead to additional responses being provided by Tyhee. The company has several gold zones under consideration. They have completed a preliminary feasibility study and are now undertaking a bankable feasibility study, which is scheduled for completion in mid-2012⁹⁷.

⁹⁴ Elgin Mining Inc. website. Accessed June 2012.

⁹⁵ Ibid.

⁹⁶ EBA Engineering Consultants Ltd., Seasonal Overland Road (SOR) Project, Engineering Report, October, 2008.

⁹⁷ Tyhee Gold Corp. website. Accessed June 2012.

Courageous Lake, a Seabridge Resources gold project is located northwest of the Snap Lake mine. The project is currently undertaking a \$16 million program to generate data required to complete a preliminary feasibility study. A preliminary economic assessment (PEA), released June 2011, predicts a 16 year mine life with average annual gold production of 383,000 ounces⁹⁸.

Any mines further north than the Jericho Project will likely be serviced by river barge south from the Arctic Ocean, but there is also the potential to use the TCWR to increase their shipping season. This includes MMG Resources' exploration development projects located in the Slave Geological Province in Nunavut (Izok Corridor Project), which do not have plans to use the TCWR during operations⁹⁹. Rather, they are planning to develop an all-weather road running east from the Izok Lake project to near the northern end of Contwoyto Lake, and head nearly directly northward past their project at High Lake and the Elgin Mining project at Ulu on its way to Grays Bay on the Arctic Ocean. The bay would be developed to include a large deep water wharf, a new port with the capacity to ship 650,000 tonnes of concentrate per year, and extensive storage facilities, especially for diesel. If this road is developed, it is likely that the economics of the Shear Diamond's Jericho Project and Elgin Mining's Lupin Mine could be sufficiently altered to advance their reopening or extend their lifespan.

MMG's analysis of southern transportation routes indicates that they are not economically viable for their projects when in operation. However, two temporary winter roads would be used during the construction phase of the proposed Izok Corridor Project – one of which would link the Izok mine to the TCWR¹⁰⁰. This would likely increase the quantity of loads on the TCWR during the two-year construction period, which can begin as early as 2016¹⁰¹.

Shear Diamonds has indicated they do not anticipate that a northern resupply route would be of any benefit as their entire operation would likely be completed before the northern route is secured¹⁰². As such, they are currently planning on using the TCWR for their shipping needs. Elgin Mining has not explored a northern resupply route and is planning to use the TCWR/SOR for their resupply needs.

Of the three proposed projects, Gahcho Kué is the nearest to approval and could potentially begin construction within the next five years, as the expectation is that De Beers will start this project as soon as it has received the necessary approvals from the government. Yellowknife Gold is next in terms of likelihood to proceed, as they are nearly at the same stage of approvals as the

⁹⁸ Seabridge Gold Inc. website. Accessed June 2012.

⁹⁹ MMG Resources Consultations, October 2011.

¹⁰⁰ MMG Resources, Izok Corridor Project, Application for Crown Land for the Grays Bay Port, August 20, 2012.

¹⁰¹ George, Jane, Nunatsiaq News, MMG Promises Jobs Galore for Western Nunavut, October 1, 2012.

¹⁰² Shear Diamond Consultations, October 2011.

Gahcho Kué project. MMG Resource's Izok Corridor Project is next, as it has completed its per-
fesiability study, and is now conducting a \$50 million feasibility study set to complete within two
years¹⁰³. Seabridge Resources' Courageous Lake is the least likely to proceed as the mine has
just begun the approval/feasibility process and will process a high volume, low grade ore,
making it the most expensive of the potential mines to operate.

Table 5. Proposed Mines – Uncertain

Site Name	Company	Type of Operation	Likelihood of Proceeding	Reserves*	Const Start Date	Prod Start Date	Prod End Date	Annual Prod Capacity
Jericho Diamond Mine	Shear Diamond LTD (100%)	Open-pit and underground mining.	Most likely of "uncertain" mines given that the mine is already built and infrastructure is in place.	1.88 million carats indicated and 1.13 million inferred.	The original mine was built in 2006	2013-14	Unknown	Unknown
Lupin Mine and Ulu Deposit	Elgin Mining Inc. (100%)	Open pit mining and processing plant	Likely if gold prices remain strong.	Indicated: 751,000 tonnes grading 11.37 grams per tonne; inferred: 418,000 tonnes grading 10.61 grams per tonne.	The Lupin mine was built in the early 1980s	Unknown	Unknown	Unknown
Courageous Lake Mine	Seabridge Gold		Have not yet conducted a pre-feasibility study (most uncertain of mines).	Indicated: 77,582,000 tonnes grading 2.31 grams per tonne; inferred: 63,053,000 tonnes grading 2.24 grams per tonne.	Unknown	Unknown	Unknown	6.4 million tonnes (383,000 ounces of gold) each year over 16 years.
Ormsby and Nicholas Lake Mine (Yellowknife Gold Project)	Tyhee Gold	Open-pit and underground mining.	Pre-feasibility phase (highly uncertain).	Indicated: 9,382,000 tonnes grading 3.3-3.4 grams per tonne; inferred: 1,178,000 tonnes grading 3-4 grams per tonne.	Unknown	Unknown	Unknown	1-1.1 M tonnes
Izok Lake and High Lake (Izok Corridor Project)	MMG LTD (Chinese-controlled)	Open-pit and underground mining.	Pre-feasibility phase complete, feasibility study start in 2012.		2016	2018-2019	2030	180,000 tonnes of zinc 50,000 copper

¹⁰³ George, Jane, Nunatsiaq News, MMG Promises Jobs Galore for Western Nunavut, October 1, 2012.

3.6 Implications for Winter Road Demand

This section translates our 'top-down' research into demand estimates for the Tibbitt to Contwoyto Winter Road. With an understanding of the mines that currently use the road as well as those mines that will likely use the road in the future, a forecast of winter road demand over the next decade is presented in this section.

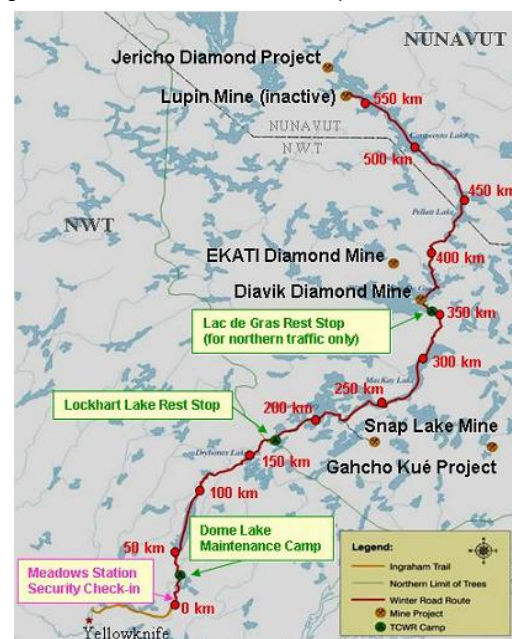
3.6.1 Current Winter Road Usage

The winter road is almost exclusively used by the three (3) existing mines. The Winter Road Joint Venture Partnerships (JV), consisting of the Snap Lake, Diavik and EKATI mines, accounted for 96 percent of truckloads during the 2011 winter season. Over half the truckloads were transported to the Diavik mine.

Table 6. 2011 TCWR Truckload Allocation¹⁰⁴

	2011 Total Truckloads	% of Total
Diavik	3,863	51.3%
EKATI	1,967	26.1%
Snap Lake	1,373	18.2%
Other	333	4.4%
Total	7,536	100%

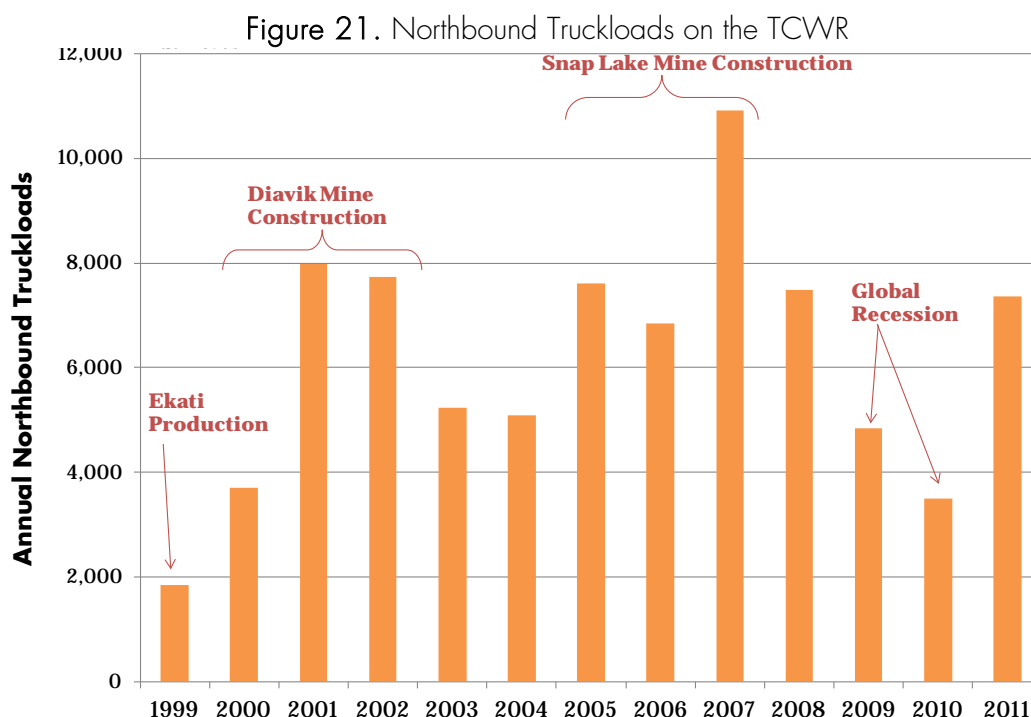
Figure 20. Tibbitt to Contwoyto Winter Road



Of the remaining 4 percent of the loads in 2011, Aboriginal Engineering accounted for 159 loads, or 2 percent of the total. The other 174 loads were either third party loads or shipments for Nuna Logistics used directly in the maintenance of the road or associated supplies.

¹⁰⁴ Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

Annual changes in traffic volumes are heavily impacted by road usage for the three (3) operating mines. As shown in Figure 21 large changes in volumes are directly associated with periods of construction and periods of new production coming on stream. In 2008 to 2009, truck volumes declined in response to the global recession, as lower diamond prices and tighter financing conditions resulted in a pullback in production and exploration activities.



3.6.2 Future Winter Road Usage

The future demand for the winter road is highly uncertain. Actual road usage will depend on future production activity which is highly influenced by market conditions, government policy (e.g. regulatory requirements), and land claims issues. While exploration activities will also impact demand, the impacts would be significantly less than demand influenced by actual mine construction and operating mines which use the winter road to resupply operations. Additionally, weather conditions will determine the length of the driving season. Given higher than usual temperatures in 2006 and 2010 for example, the winter road was forced to close early. With warmer and increasingly volatile temperatures, the future reliability of the winter road across the entire winter operating season may be in question.

The highest level of certainty comes from the three (3) existing diamond mines as well as the proposed Gahcho Kué project. As discussed in the previous sections, these mines are expected to be producing over the next seven (7) to fifteen (15) years. Figure 22 illustrates the annual capacity of these mines (as represented by bubble sizes), the mines' ages, as well as the anticipated number of years of service life remaining. Figure 23 shows the same mines with actual 2011 production and shows that the two (2) largest mines, Diavik and EKATI are in the maturity phase of their lives. Moreover, both Rio Tinto (Diavik) and BHP Billiton (EKATI) are examining the potential divestment of their diamond mining interests. As a result, it appears that the long-term

future of winter demand use is contingent upon new exploration and construction activities near the winter road.

Figure 22. Annual Production Capacity, Age and Service Life Years Remaining

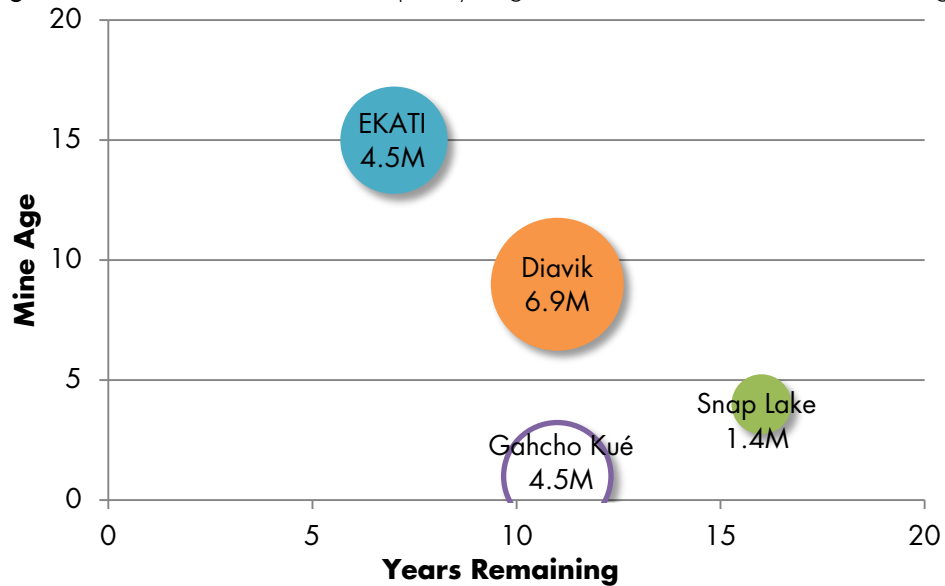
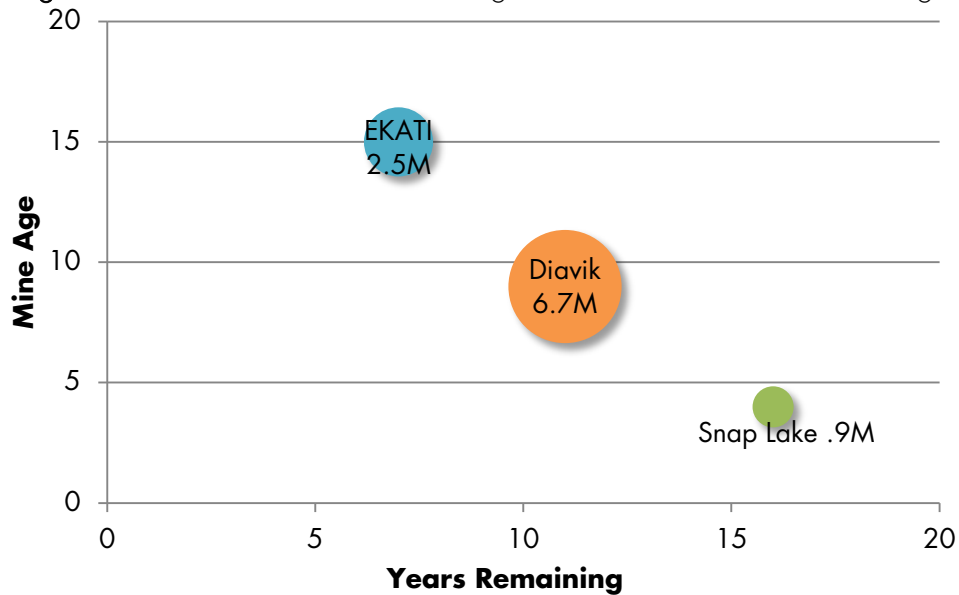


Figure 23. 2011 Actual Production, Age and Service Life Years Remaining



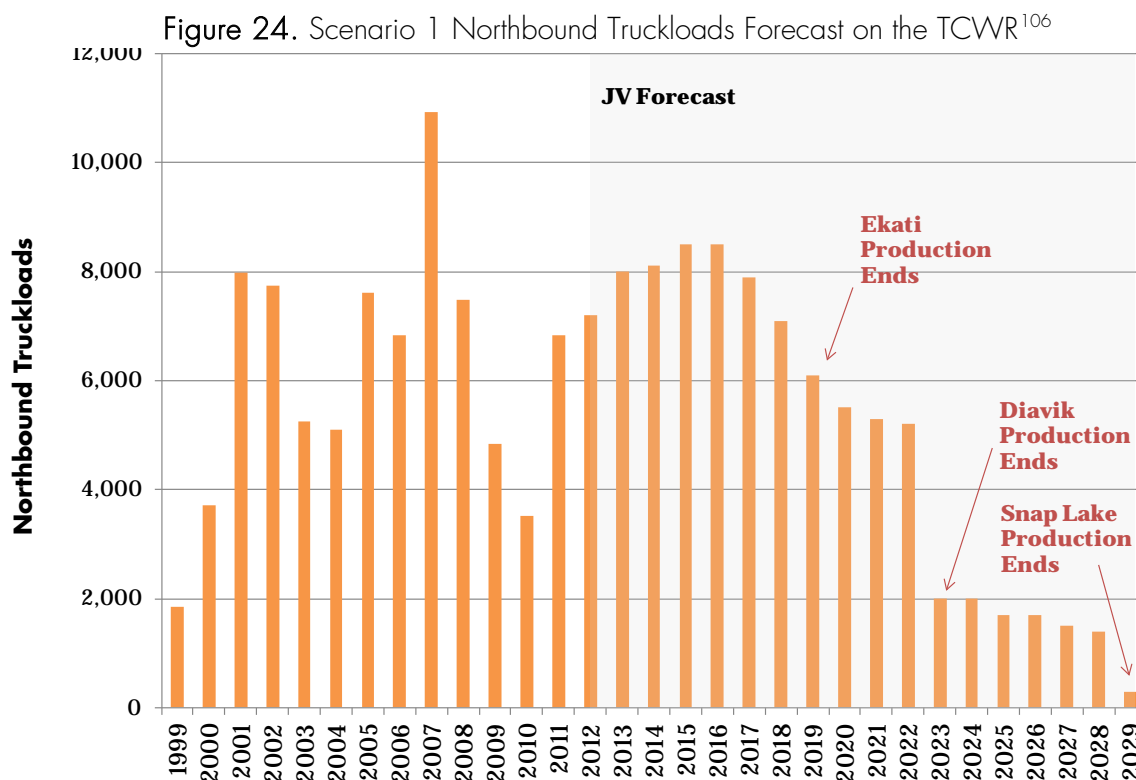
Demand for third party loads has been steady over the previous years, with expectations that these levels will only increase in the coming years as Gahcho Kué and other projects begin construction or more intensive exploratory work. The overall capacity of the road is around 11,000 loads, with a maximum shipping frequency of approximately 175 to 200 loads a day¹⁰⁵. This may be a critical factor, as Gahcho Kué alone will require approximately 3,500 loads during the construction phase. The reopening of the Lupin and Jericho projects would potentially add a significant number of loads as well, both initially for reopening and supplying, as well as in the future for yearly resupply. The current joint venture agreement is set up specifically to deal with loads to the De Beers Snap Lake mine and does not have any provisions for their proposed Gahcho Kué project. The agreement must therefore be revised to include this new mine under the De Beers entity, or included as a separate entity.

The following three (3) forecast scenarios illustrate potential future demand for the winter road.

The **first scenario**, the baseline, assumes that only the existing three (3) mines will remain in operation for the remainder of their useful lives. In October 2011, the VRJV provided a forecast of the number of northbound truckloads to each of these mines from 2012 to 2028 based on the current plans of each of the three (3) existing diamond mines. Certain highlights from the JV's forecasts include:

1. Truckloads will range between 7,000 to 8,500 until 2018 when EKATI production ends. Much of the increase after 2012 is due to the shift to underground mining for the Diavik mine and the development of the EKATI's Misery open pit project between 2011 and 2015. These projects will result in increased diesel and equipment requirements.
2. From 2019 to 2022, the VRJV forecasts that there will be on average 2,000 fewer truckloads per year relative to 2018 due to the closure of the EKATI mine.
3. In 2023 to 2028, the VRJV predicts that there will be a further significant drop in truckloads of about 3,000 per year due to the closure of the Diavik mine.
4. In 2029 and beyond, the VRJV forecasts that truckloads will fall close to zero as the final mine, Snap Lake, closes.

¹⁰⁵ Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.



The **second scenario** is the baseline plus the addition of the Gahcho Kué project. If it proceeds, construction at the Gahcho Kué mine will likely begin construction in 2014 with production coming on stream by 2017¹⁰⁷.

The Gahcho Kué mine will likely put some additional pressure on the winter road between 2014 to 2016 as it will be constructed while the other three (3) existing diamond mines are in operation. At this time, it is unclear as to how much construction of Gahcho Kué will increase road demand. During the consultations, one stakeholder suggested this number could be 3,500 truckloads annually over three (3) years¹⁰⁸. In the years of the construction of the Diavik mine, truckloads increased by about 2,000 to 6,000 per year, although Diavik is a much larger mine than Gahcho Kué. Overall, it is reasonable to assume that truckloads could increase 1,000 to 2,000 per year over the 2014 to 2016 period. This would bring annual northbound truckloads

¹⁰⁶ Includes small allowance of 300 truckloads a year for non-JV use. Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

¹⁰⁷ De Beers Canada website. Accessed June 2012.

¹⁰⁸ Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

to around the 8,000 to 10,000 range over this period. Some major assumptions associated with scenario two include:

1. In 2017 and 2018, Gahcho Kué production will be ramping up just as EKATI production is winding down. Over this period, annual truckloads would likely fall back to 7,000 to 9,000 loads annually.
2. From 2019 to 2022, the WRJV forecasts that there will be on average about 2,000 fewer truckloads per year relative to 2018 due to the closure of the EKATI mine. However, this amount will likely be offset by Gahcho Kué production, leading to no significant change in truckloads.
3. From 2023 to 2028, the WRJV anticipates that there will be a further significant drop in truckloads of about 3,000 per year due to the closure of the Diavik mine.
4. In 2028, when Gahcho Kué is expected to stop producing, there will be a further drop in truckloads of 1,500 to 3,000 per year.
5. In 2029 and beyond, truckloads will fall close to zero as the final mine, Snap Lake, closes.

A **third scenario** is that the remaining other proposed mines, labelled “uncertain”, proceed in addition to Gahcho Kué. Developing projections for these mines is difficult, since the timing, production, and potential road use is unknown. Moreover, incremental impact of these mines would be negligible. Based on our consultations with stakeholders and preliminary market analysis, it does not appear that the “uncertain” mines will lead to significant constraints on the existing winter road even if they proceed, for the following reasons:

1. Discussions with MMG Resources (that is exploring base metal deposits in Izok Lake), indicate that it would receive supplies exclusively from the north via ship during operations¹⁰⁹. During construction of its proposed Izok Corridor Project however, it would develop a temporary winter road to link to the TCWR¹¹⁰. Additionally, there is the possibility that MMG’s planned winter road to Grays Bay could be shared with the Elgin Mining’s Lupin mine. The winter road may, however, serve as a contingency in case of interruptions or constraints on the northern routes.

¹⁰⁹ MMG Resources Consultations, October 2011.

¹¹⁰ MMG Resources, Izok Corridor Project, Application for Crown Land for the Grays Bay Port, August 20, 2012.

Because the Izok Corridor Project is in its feasibility stage of development, there has not been any quantified forecast for TCWR demand during the project’s construction period.

2. Elgin Mining suggests that it would have the ability to gain access on to the winter road for its Lupin mine if sufficient resources are identified that warrant restarting operations. However, a time period has not been provided as to when operations may restart¹¹¹.
3. The Jericho mine owned by Shear Diamonds would likely use the winter road during its anticipated operations. Since the majority of the mine is already built, loads on the SOR and TCWR would likely only involve initial and resupply shipping. Shear Diamonds does not anticipate that northern resupply would be possible as its operations would finish before the northern route's construction is complete¹¹².
4. The Yellowknife Gold Project at Ormsby and Nicholas Lake is located west of the existing road, closer to the alternate route. Therefore, it would not use the existing winter road or the proposed SOR. Rather, it would only benefit from a SOR that runs west of the proposed route (Option 1b). If Option 1b is selected as the preferred route for the SOR, it would require about 50KM of extension to the winter road to service the site.
5. The "uncertain" mine that would rely most heavily on the existing winter road is the Courageous Lake Mine by Seabridge Gold, although a 35KM extension winter road is still required to service the site. This mine is in the prefeasibility stages and will take several years to proceed, if at all. Given its early stage of development, the Courageous Lake Mine would be constructed well after Gahcho Kue is built by 2016. Therefore, the mine will not put additional pressure on road usage in 2015-2016, the years of anticipated road demand caused by the construction of Gahcho Kue.

¹¹¹ Elgin Mining Inc. website. Accessed June 2012.

¹¹² Shear Diamond Consultations, October 2011.

Table 7. Impact of Mines on Existing Winter Road

Diamond Mine	Use of Existing Winter Road/ proposed SOR	Timing of Road Use (Start to End Date)	Road Extensions Required
Existing Mines			
Diavik	Yes	2000 to 2022	No
Ekati	Yes	1994 to 2018	No
Snap Lake	Yes	2005 to 2028	No
Mines Likely to Proceed			
Gahcho Kue	Yes	2013/2014 to 2026	Yes. 120 km extension winter road connecting at top end of MacKay Lake.
Uncertain Mines			
Courageous Lake Mine	Yes	Unknown (16 year mine life)	Yes. A 35 km extension winter road
Ormsby and Nicholas Lake Mine (Yellowknife Gold Project)	No. Requires Option 1b, west of existing winter road.	Unknown	Yes. Approx. 50 km extension winter road from Option 1b
Jericho Diamond Mine	Yes	2014 to 2025	No
Lupin Mine and Ulu Deposit	Uncertain.	Unknown	No

4 STRATEGIC AND REGULATORY CONTEXT

The proposed SOR will improve access to Northern resources and is a key component to Canada's and GNWT's drive for economic development. In contemplating projects such as the SOR, it is necessary to establish that the project supports the GNWT's strategic objectives. To enhance its strategic objectives the GNWT is investing over \$1 million to develop a Mineral Development Strategy and an Economic Development Strategy to guide its economic policies, programs and services in 2012/13. These territory-wide strategies for the NWT will celebrate the successes as a result of mining, but it will also address the challenges¹¹³. This section examines how the SOR's project objectives and proposed outcomes align with the GNWT's wider strategic policy.

4.1 GNWT Strategic Alignment

As discussed in Section 3, the diamond mining industry is the economic engine of the NWT, accounting for a third of the Territory's economic output. On an annual basis the industry creates over 2,600 direct jobs and has an annual economic impact of over \$750 million¹¹⁴. Given the magnitude of the investment, the proposed SOR certainly has linkages to the vision, goals and priorities of the GNWT. The vision of the GNWT is:

*Strong individuals, families and communities sharing the benefits and responsibilities of a unified, environmentally sustainable and prosperous Northwest Territories*¹¹⁵.

With an aim to attract private investment to the area, the SOR's objective seeks to bring further prosperity to the Northwest Territories. Additionally, the process used for the proposed SOR assessment is aligned with the vision of the GNWT. Environmental, social and high-level economic analyses have been conducted to explore alternatives and determine the best means to secure a reliable transportation source to mines in the SGP. For example, after receiving feedback from the Yellowknives Dene First Nation (YKDFN) that the proposed south segment SOR route (as well as the current TCVR) interferes with traditional hunting trails, an analysis of an alternative route proposed by the YKDFN was undertaken. While this alternative route (also referred to Option 1b) would be surrounded by less wildlife and would follow areas that have already been contaminated in the past, it would have higher capital and maintenance costs¹¹⁶.

¹¹³ NWT & Nunavut Chamber of Mines, Northern Mining News, May 2012.

¹¹⁴ Government of the Northwest Territories, Mineral Development Strategy, June 2012.

¹¹⁵ Government of the Northwest Territories, Vision, June 2012.

¹¹⁶ EBA Engineering Consultants Ltd., Evaluation of the YKDFN Route to Lockhart Lake Report, October 2007.

The GNWT has translated its vision into further refined goals. We have assessed each of goals with respect to the proposed SOR objectives and outcomes. Descriptions of the project's strategic alignment to GNWT's goals are as follows:

Goal 1: A strong and independent north built on partnerships.

Building upon the partnerships created over the last 28 years with the annual creation of the TCWR, the addition of the SOR will require strong partnerships among current mine operators, exploration companies, engineering and construction companies, financiers, First Nation communities and other residents, as well as the GNWT. With a large number of stakeholders involved, however, significant coordination efforts will be needed particularly if the SOR is implemented as a P3. The proposed SOR may bring greater independence to the North by improving the reliability of transportation for current and potential mine operations.

Goal 2: An environment that will sustain present and future generations.

Given that the proposed SOR traverses across land, it will likely have negative incremental environmental impacts. In fact, the YKDFN suggested that the proposed SOR route may impact the natural habitat for wildlife in the area. Traditional hunting activities would also be affected because of the route's proximity to the Ingraham Trail. The proposed SOR is likely to encourage additional mining exploration activity in the region. However, due to the inherent uncertainty of mineral exploration and the long lead time for mining development to begin, it is unclear as to whether the SOR would produce sustained economic activity in the region. For example, Elgin mining, the owners of the Lupin gold mine, identified air access as its primary transportation source for its exploration activities¹¹⁷.

Goal 3: Healthy, educated people free from poverty.

The proposed SOR could create employment opportunities both during its construction (and the operations and maintenance period in the case of a P3). The GNWT may mandate that a certain percentage of the workforce used to construct the SOR to be residents of the Territory. Additionally, the GNWT may receive limited tax revenues that it could reinvest into healthcare or schools in the Territory. However, it is unknown as to whether the SOR would negatively impact on current northern employment used for the annual creation of the TCWR. If the SOR attracts additional private investment in the area, a greater number of jobs are likely to be made available to NWT residents. From the year 2000 onwards, Diavik's construction and operations has yielded contracts worth \$3.5 billion with northern companies, including over \$2 billion with

¹¹⁷ Elgin Mining Inc. website. Accessed June 2012.

Aboriginal companies. Additionally, most mine operators in the area invest in northern and First Nation communities as part of their community investment programs¹¹⁸.

Goal 4: A diversified economy that provides all communities and regions with opportunities and choices.

While the proposed SOR would add transportation focused construction activities to the area, its main objective (to attract greater private mining investment in the area), seeks to build the mining industry in the area. The mining industry already accounts for over a third of NWT's entire economic output¹¹⁹. As a result, the SOR would be unlikely to significantly diversify the economy.

In making reference to the 137km Inuvik to Tuktoyaktuk all-weather road, the GNWT suggests that lowering the cost of living and diversifying the economy, is not only achieved through road access but also through access to lower cost power generated from hydro or other alternative energy initiatives. Development of renewable energy sources is seen as a priority of the GNWT. It believes that NWT residents will benefit from new technology that will lower costs, diversify the economy, and reduce its greenhouse gas emissions¹²⁰.

Goal 5: Sustainable, vibrant, safe communities.

With an aim to encourage additional private investment in the region, the proposed SOR may bring sustainable economic development opportunities to the SGP. However, the effects on the surrounding communities are unclear. Impact Benefit Agreements (IBA) are socio-economic agreements negotiated between the company and the aboriginal government whose traditional territory is under mineral exploration or development. Success of the IBAs however depends on how well they are negotiated and enforced by the First Nations or aboriginal group signing onto them. While mines typically have little direct affects on daily community life, there are environmental impacts on a community's traditional lands and watersheds. Communities still use and eat food harvested from the land¹²¹. Additionally, maintaining a consistent family life is difficult for those community members employed by mine operations. Typically, one parent is usually on a schedule of two weeks on, two weeks off.

Goal 6: Effective and efficient government.

According to principles set forth by the GNWT's Department of Industry, Tourism and Investment, the "territorial economy should be developed by private sector ownership and employment where

¹¹⁸ Diavik mine website. Accessed June 2012.

¹¹⁹ Conference Board of Canada, *Territorial Outlook: Economic Forecast*, Winter 2012.

¹²⁰ Government of the Northwest Territories, Budget Address 2012-2013, May 2012.

¹²¹ Impact and Benefit Agreement Research Network, *Diamond Mining Impact on People, Wildlife in NWT of Canada*, February 2009.

possible and, through public sector ownership and employment when necessary or appropriate.”¹²² As a result, the GNWT advocates that the private sector is the primary catalyst to drive the Territory’s economy. Given the creation and successful use of the TCWR over the past two decades, the GNWT’s ownership of the SOR project may not be necessary (industry’s solution seems to be working). There needs further examination of potential delivery options to determine the appropriate ownership structure and level of control by the GNWT for the SOR project.

4.1.1 Fiscal Strategy Alignment

The GNWT is committed to make fiscal decisions within the guidelines and limits contained in its Fiscal Responsibility Policy. It is also committed to report on how well it is managing its fiscal affairs¹²³. The GNWT has an Aa1 credit rating. This is the second-highest rating obtainable from Moody’s Investors Service with only Alberta and British Columbia receiving higher ratings in Canada. Its debt servicing costs are approximately one percent of revenues, which is one of the lowest debt to GDP ratios in the country¹²⁴.

The proposed SOR may impact on the GNWT’s debt capacity and its ability to borrow funds. Even as a P3, the SOR may be carried as a liability on the GNWT’s balance sheet. Moreover, it is assumed at this time that GNWT would serve as a guarantor to secure the payment streams to the P3 partners. This may result in a reassessment of the GNWT debt capacity and its credit rating (please refer to Appendix D for a high-level summary of the typical accounting implications for an ‘availability based’ P3 structure).

¹²² Government of the Northwest Territories, Department of Industry, Tourism and Investment, Establishment Policy, March 2005.

¹²³ Government of the Northwest Territories, Fiscal Responsibility Policy, May 2011.

¹²⁴ Government of the Northwest Territories, Budget Address 2012-2013, May 2012.

5 STAKEHOLDER CONSULTATION

This section summarizes key stakeholder consultation findings. This primary research complements the analytical findings presented in previous sections of this study. Appendix A includes the stakeholder survey along with responses collected from responding stakeholders.

5.1 Key findings

Key stakeholder findings are presented in the categories shown below. Where possible, linkages have been made amongst stakeholder responses to represent common opinions.

5.1.1 Exploration and Development

Exploration and investment in the SGP has been flat or declining due to uncertain global economics and concerns about the regulatory process in the region¹²⁵. Outstanding land claims by several First Nations have made some exploration costs high, and the perception is that the uncertainty and costs are not worth the exploration even with record high gold prices¹²⁶. Land withdrawals for the new national park and other projects also mean that there is little land left to explore and claim for projects¹²⁷.

Many respondents felt that a cheap source of power would also spur exploration and development faster than the SOR, as it would reduce the need for loads of diesel fuel on the road¹²⁸. Winter road costs account for 6 to 8 percent of the annual operational budget for BHP Billiton's EKATI mine, while diesel and its associated shipping costs account for 20 to 25 percent of its annual operational budget, and make up approximately 75 percent of the loads on the TCWR annually¹²⁹. The EKATI mine hauls 1,200 to 1,300 loads of diesel per year, which is expected to increase to about 1,700 loads per year in 2017 with the full operation of the Misery project¹³⁰. However, some stakeholders indicated that the need for a dependable power source and reliable access go hand-in-hand¹³¹. A SOR would allow for dependable access to the sites for supplies and hopefully reduce costs. New power sources can reduce costs but would not affect access to the mine. In an attempt to reduce the reliance on diesel fuel for power and the associated shipping requirements, wind turbines were transported to the Diavik mine during the

¹²⁵ BHP Billiton, NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹²⁶ NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹²⁷ Government of the Northwest Territories, Department of Industry, Tourism and Investment, Consultations, October 2011.

¹²⁸ NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹²⁹ BHP Billiton, Consultations, October 2011.

¹³⁰ Ibid.

¹³¹ BHP Billiton, NWT & Nunavut Chamber of Mines, Consultations, October 2011.

2011 winter road season¹³². The turbines are expected to address a proportion of their power requirements once they are constructed and operational.

The current advantage of the TCWR over other shipping methods (barging, etc.) is that materials can be shipped directly to site during the shipping season; there is no double handling, no need for additional security or storage, etc. For this reason, staging of more materials in locations like Yellowknife or the Lockhart Lake camp is not necessary. Storage capacity at Hay River and Yellowknife for diesel fuel has increased substantially over the past few years and is no longer an issue¹³³.

There was some concern expressed that while this road would improve the certainty for existing mines, it would not do much to spur further development of the SGP and would not leave much of a "legacy" for the region as the SOR would not be located near any existing or proposed communities and proposed projects. In fact, it was suggested that the GNWT work with stakeholders to develop a comprehensive regional infrastructure plan¹³⁴. MMG Resources proposed an alternative road, which was deemed to offer more potential and would also help to strengthen northern sovereignty and economic diversity, as well as drive more trade between the interior and the coast. With the projected increase in ice-free days on the Arctic Ocean in the coming years, this could potentially have significant implications.

Furthermore, access to the ice road may become an issue in the coming years due to the addition of the Gahcho Kué project loads, which will push the winter road nearly to capacity and restrict further users, regardless of the addition of the SOR¹³⁵. Additionally, beginning as early as 2016, MMG may possibly use the TCWR to transport construction material for the development of its Izok Corridor Project. While these additional loads would only occur during the project's two-year construction period, they will place pressures on the availability of the winter road¹³⁶.

5.1.2 Potential Implications of SOR

Some stakeholders suggested that the SOR would enhance the area's infrastructure and thereby make many smaller projects more economically viable¹³⁷. Additionally the SOR may extend the lives of the existing operations as well¹³⁸.

¹³² Diavik mine website. Accessed June 2012.

¹³³ Government of the Northwest Territories, Department of Industry, Tourism and Investment, Consultations, October 2011.

¹³⁴ North Slave Métis Alliance Consultations, October 2011.

¹³⁵ Government of the Northwest Territories, Department of Industry, Tourism and Investment, Consultations, Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

¹³⁶ George, Jane, Nunatsiaq News, MMG Promises Jobs Galore for Western Nunavut, October 1, 2012.

¹³⁷ NWT & Nunavut Chamber of Mines, Consultations, October 2011.

Restrictions on winter road shipping forces existing and proposed operations to carry a lot of inventory, which costs money both for the actual materials as well as for the security and storage to ensure that they can be used when needed¹³⁹. An extended shipping season, either through the addition of the SOR or from increased barge traffic southwards from the Arctic Ocean, could ease these economic pressures¹⁴⁰.

Access to good transportation routes with long shipping seasons is more important for metals, rare earth, precious metals, etc. mining than for diamonds, due to the higher weight and volume of product produced¹⁴¹. There is some potential for diversification of the mining portfolio along the TCWR, but currently most projects are diamonds and gold, which may or may not be stable based on global economics. There is the potential that high volume products (e.g., base metals) operations could bring in supplies up the TCWR and send the finished, concentrated product northwards to the Arctic Ocean coast for shipping rather than bringing it back down the TCWR¹⁴².

5.1.3 Aboriginal Issues

The alternative SOR route proposed by the YKDFN (Option 1b) has several positive factors including:

- The removal of truck traffic on the Ingraham Trail (a safety issue, as there is public access to this stretch of road);
- It ties into the only proposed operation between Yellowknife and Lockhart Lake (Tyhee Resources gold project) thus bringing in another partner for potential cost sharing;
- It alleviates concerns of YKDFN regarding proximity of the road to their traditional hunting areas;
- It provides operational flexibility¹⁴³;
- Its proximity to the proposed Bluefish Hydroelectric facility¹⁴⁴.

¹³⁸ Government of the Northwest Territories, Department of Industry, Tourism and Investment, NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹³⁹ Government of the Northwest Territories, Department of Industry, Tourism and Investment, NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹⁴⁰ Government of the Northwest Territories, Department of Industry, Tourism and Investment, Consultations, October 2011.

¹⁴¹ Ibid.

¹⁴² NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹⁴³ Government of the Northwest Territories, Department of Industry, Tourism and Investment, Consultations, October 2011.



However, this option also has some flaws, since it has more river/water crossings and potentially more gradient¹⁴⁵.

Tourism, hunting, and fishing pressure on the TCWR is non-existent. Most of these activities only extend to the Ingraham Trail terminus and the ban on caribou hunting has meant that most outfitters do not venture that far north¹⁴⁶.

Inclusion of the Aboriginal peoples of the north in the planning, construction, and maintenance of any future infrastructure projects will be a key factor in ongoing development of the SGP. Linkages between communities and spin-off economic benefits may help to ease regulatory uncertainty around land claims in the region. The biggest concern is that development in the north is primarily unplanned and reactionary to sporadic industrial interests, rather than responsive to long term planning for sustainable development guided by those with traditional knowledge and a long term commitment to the land. Major developments such as roads should never be built in the absence of comprehensive long term land use planning that adequately consults the Aboriginal peoples and engages all potentially affected communities¹⁴⁷. In the interest of sustainable development, the long term needs of permanent NWT residents and indigenous aboriginal communities should take precedence over the short term interests of industry.

There was some concern that increased/improved access north and east of Yellowknife could potentially increase the amount of illegal habitation on Crown land. Currently, there are already a number of illegal "squatter" cabins constructed on various lakes in the area that have led to increased tension between the local Aboriginal peoples and the owners of these structures, as they have been built within or near traditional territories. This increased access and disturbance has also impacted the traditional hunting areas and potentially changed migration patterns of prey animals, as has the TCWR, but more input from the government scientists on this front would be welcome to clarify these effects¹⁴⁸.

¹⁴⁴ Tyhee Gold Corp., Consultations, October 2011.

¹⁴⁵ Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

¹⁴⁶ Government of the Northwest Territories, Department of Industry, Tourism and Investment, NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹⁴⁷ Tli Cho First Nation Staff Consultations, October 2011.

¹⁴⁸ Yellow Knives Dené First Nation Staff Consultations, October 2011.

6 DELIVERY OPTIONS FOR THE SOR PROJECT

This section describes different potential delivery options that may be suitable for the SOR project including the status quo, traditional procurement and potential P3 delivery options and it includes some relevant illustrative case studies.

It is recommended that a full delivery options analysis is carried out before identifying a preferred delivery option as detailed in Appendix B to this report. Additionally, case studies are presented in Appendix C to provide practical examples of best practices and lessons learned in other projects.

6.1 Status Quo

In 1999 BHP Billiton, Diavik Diamond Mines (a subsidiary of Rio Tinto) and De Beers Canada formed a joint venture to operate and maintain the Tibbitt to Contwoyto Winter Road (TCWR). The TCWR, which provides access to NWT's three diamond mines currently in operation, starts around 70 km north of Yellowknife and covers a total distance of between 400 km to 600 km, depending on the level of mining and exploration activity occurring each year.

Since the TCWR is a seasonal road, it has to be engineered and constructed every January. The construction and road testing process takes approximately six (6) weeks. Historically, the road has only been operational during February and March, with an average of 67 days of service per year. The main products hauled through the TCWR are diesel fuel, mining equipment and construction materials, including cement, aggregate, tires and other industrial supplies.

The costs to operate and maintain the TCWR are paid for almost entirely by the JV partners. For instance, in 2011 the JV partners accounted for approximately 96 percent of the total truck loads during the year. In order to recover the cost associated with the TCWR each year, the JV partners developed a financing structure that is based on a "Shipping Rate", which is determined at the beginning of each year. The process to calculate the Shipping Rate is as follows:

1. Each JV estimates the number of total loads and total tonnage each JV partner will be hauling;
2. The JV partners determine a cost per tonne / km rate, which is to be applied to each of their loads;
3. Multiplying the cost per tonne / km rate by the distance hauled and the tonnage of the load gives a distinct cost for each load.

Thus, while EKATI is the farthest mine from Yellowknife, it doesn't necessarily have to pay the majority of the costs if its tonnage is lower than the tonnage for the other JV partners. Additionally, the rate charged to non JV partners is similar to the cost per tonne / km applicable to JV partners.

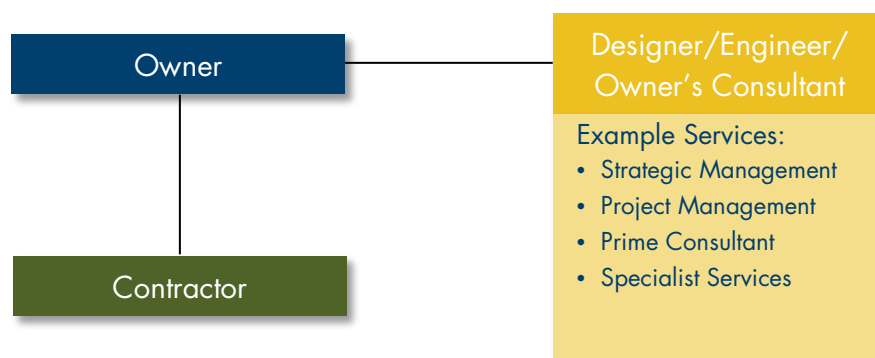
Based on an economic analysis undertaken by EBA Engineering Consultants in 2007, the total cost to build, maintain and operate the SOR for the next 20 years would be only about one (1) percent higher than the cost of building and maintaining the current TCWR in present value dollars¹⁴⁹.

6.2 Traditional Procurement – Design Bid Build (DBB)

DBB procurement is the most common delivery method for infrastructure procurement used by the public sector and is often referred to as 'traditional procurement'. In the value for money analysis for a public-private partnership, the public sector comparator (PSC) is often based on a DBB procurement.

As shown in Figure 25, there are typically three (3) parties involved in DBB procurement: the owner, the designer/engineer/owner's consultant and the contractor. The owner (i.e. the government) would enter into separate contracts with the designer and with the contractor. With DBB procurement, it is likely that the GNWT would enter into multiple contracts (i.e. multiple work packages) for each component of the project.

Figure 25. Conventional DBB Project Delivery Structure



As owner of the infrastructure, the GNWT would set the scope, the standards, and the terms for the project then later contract various work packages for each of the key activities. The designer/engineer would prepare detailed designs in accordance with the GNWT's

¹⁴⁹ EBA Engineering Consultants Ltd., Evaluation of the YKDFN Route to Lockhart Lake Report, October 2007.

specifications and would administer the contract documents. Bids are then invited from qualified bidders for the construction component. The bids are evaluated and the contract is awarded to the highest scoring bidder. The winning bidder then constructs, tests, and commissions the project after which the asset is transferred to the GNWT which would assume operation and maintenance responsibilities.

Potential benefits of DBB typically include:

- The Public Sector has exclusive control;
- By separating the design and construction roles, the owner creates a system of checks and balances as each party effectively carries out a form of due diligence role on the other. As most contracts require any errors to be reported directly to the owner, the owner is able to monitor and control the quality of activities;
- Easy to manage and universally understood¹⁵⁰;
- Bid unit rate / lump sum pricing offers a degree of price (cost) certainty;
- Consultants and/or contractors selected on assessment of past performance.

DBB Potential Challenges typically include:

- Typically DBB is used in public sector projects where a detailed design needs to be completed prior to commencement of construction. This can lead to extended project timelines when compared to other delivery methods which can also lead to risk of increased costs due to inflation;
- The public sector bears most of the construction and schedule risk and is exposed to interface risks between the designer and contractor;
- Significant resources required by the Public Sector to manage the process;
- Potential for adversarial relationships between the contractors and the designers as the separation of design and construction responsibilities can result in higher claims for additional cost due to design and construction conflicts as well as disputes over the level of risk and liabilities attributable to the different contracts;

¹⁵⁰ Fazilat, Saher, Design-Build vs. Design-Bid-Build Owner's Perspective, March 2011.

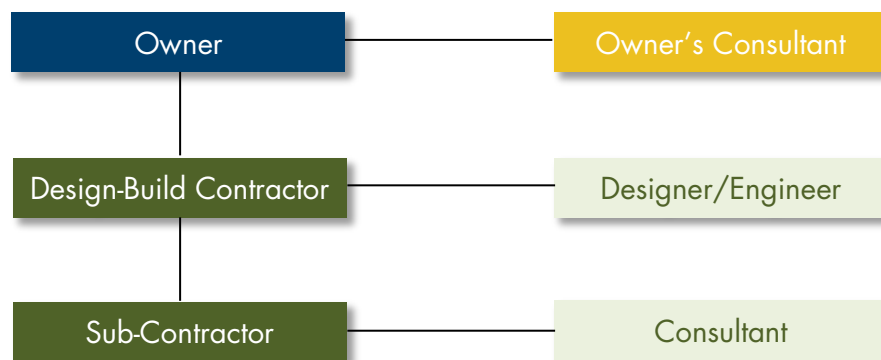
- Limited design innovation as there is no direct relationship between the designer and constructor and there may also be a limited focus on whole-of-life outcomes;
- Costly change orders may occur due to the indirect relationship between designers and contractors;
- No direct investment from any of the non-owner parties means they have less focus on satisfactory outcomes for the project.

6.2.1 Design Build (DB)

The primary benefit of a DB (also referred to as Engineering-Procure-Construct) delivery method is the simplicity of having only one (1) party responsible for the detailed design and construction of a project.

Before a DB project is undertaken, the owner typically works with a consultant to conduct extensive up-front project scoping including carrying out risk assessments and the development of project performance specifications. In order to mitigate risk, the owner typically completes in the order of 30 percent of the design (preliminary engineering) before it issues a request for proposals. The typical DB project structure is illustrated in Figure 26.

Figure 26. DB Project Delivery Structure



It is particularly important to have sufficient design performed in advance of awarding the contract as the owner will ultimately be responsible for operations and maintenance once the construction is completed. DB agreements generally specify a fixed lump sum amount for delivery of the project within a specified timeline. Since the contractor is responsible for design as well as construction the ability to run design and construction activities concurrently may result in a shorter project timeline. Once a DB contract has been entered into between the owner and the contractor, the owner's role in the project is limited to monitoring.

Potential benefits of DB typically include:

- Potential cost efficiencies may be achieved through encouraging innovation in design and construction and using appropriate contract management arrangements;
- Early knowledge of firm costs (greater cost certainty)¹⁵¹;
- Once an initial template DB contract has been developed by an organization the documents can be used on future projects which will save time and cost.

Potential challenges of DB typically include:

- Requires the owner to relinquish control of the development of the project;
- Contracts can take 9 to 18 months to develop depending on the complexity of the project;
- Potentially a lack of incentive to consider the whole life cost of a project as the owner is responsible for long-term operations and maintenance;
- Innovation during construction may give rise to increased operations and maintenance risk for the project.

6.2.2 Design, Build, Finance, Operate and Maintain (DBFOM)

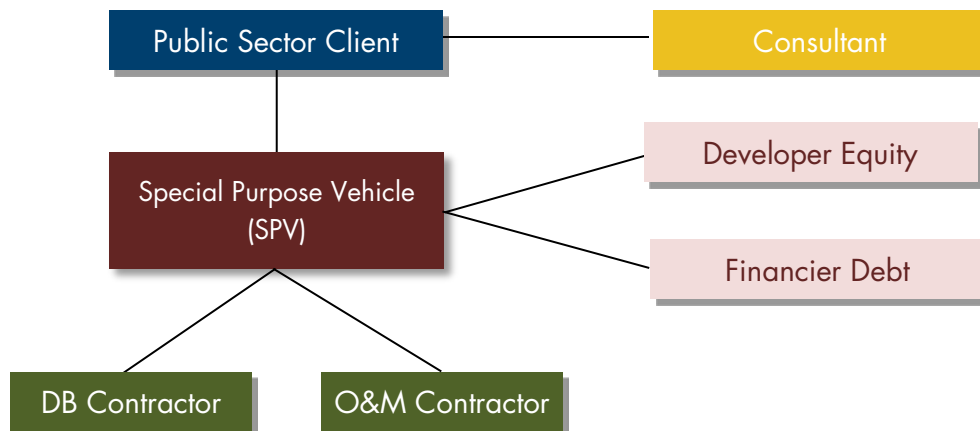
DBFOM is a P3 delivery method where the public sector would contract with a single private entity created solely for the purpose of delivering the Project. The private entity or 'Special Purpose Vehicle' (SPV) is responsible for the design, construction, operations maintenance and lifecycle, as well as providing a component of the finance necessary to fund the Project.

¹⁵¹ Design-Build Institute of America (DBIA) annual conference, 2010.

Fazilat, Saher, *Design-Build vs. Design-Bid-Build Owner's Perspective*, March 2011.

Mortenson Construction, *The State of Design-Build*, December 2010: Survey of 70 attendees at 2010.

Figure 27. P3 Project Delivery Structure



Key features of this arrangement typically include:

- The private sector can be penalized for late delivery thereby providing it with significant incentive to deliver the infrastructure on time or early;
- Once the infrastructure is available, and open to the public, the government makes periodic payments to the partner over a long term period (approximately 25 to 30 years, depending on the length of the concession term). The payment is based on the infrastructure meeting certain specified availability and performance criteria;
- The public sector may make milestone payments during construction to reduce future periodic payments to the private sector. The private sector will be required to provide some financing to the project to preserve the risk transfer;
- The higher cost of private sector financing will be offset by savings achieved through economies of scale, efficient risk transfer, private sector innovation and consideration of the whole life cost (i.e. the balance between investing in up-front capital costs to potentially reduce long-term operations and maintenance costs).

The Sierra Yoyo Desan (SYD) Resource Road Project in northeast British Columbia was delivered using a DBFOM type structure (see Appendix C) and is one of the most relevant case studies for the proposed SOR Project.

Potential benefits of DBFOM typically include:

- A single point of accountability for integration of the design, build, finance, operations and maintenance;

- Potential for private sector innovation;
- Takes account of whole-life cost;
- Long term warranty (e.g. payments can be based upon actual performance);
- Risk transfer to the private sector;
- Schedule and cost certainty through payment and performance mechanism, private finance at risk and long term responsibility of the private sector partner;
- Competitive process to secure the best combination of technical solution and price;
- There may be reduced public sector resource requirements as compared with traditional forms of procurement.

Potential challenges of DBFOM typically include:

- Under the current option the JV partners are covering the cost of the road whereas under a DBFOM GNWT would be responsible (GNWT would guarantee the payment¹⁵²);
- More complex procurement process (for both the public sector and the private sector) that requires detailed documentation and significant up-front involvement from the public sector in defining its requirements;
- Post contract award, changes can be more costly and difficult to achieve (as the negotiation process involves more parties i.e. lenders, equity providers, and operators).

6.2.3 Other Potential Delivery Options

There are other potential delivery options that could be considered such as a Design-Build-Finance (DBF) approach which has not been reviewed in detail in this report. Further consideration would need to be given as to whether this type of structure would qualify for P3 Canada funding.

The South Fraser Perimeter Road (SFPR) project (see Appendix C) illustrates some examples in which the size of the project, risk optimization, innovation and market interest play an important role in helping achieve value for money savings on a complex road project.

¹⁵² Government of the Northwest Territories, Department of Transportation: for the purposes of this study, the GNWT will serve as guarantor for the proposed SOR project, June 2012.

7 P3 SCREENING/QUALITATIVE ANALYSIS

Given the challenges and complexities of building and maintaining a SOR in the SGP, a DBFOM structure may offer significant benefits for the GNWT, while at the same time transferring some key risks to the private sector.

This section contains a high-level consideration of the applicability of a P3 option, assuming a DBFOM model based upon a number of P3 screening tools used in Canada, Australia and the UK.

We have assigned a High (H), Medium (M) or Low (L) suitability rating against each P3 screening criteria as identified in Table 8.

Table 8. P3 Suitability Checklist

Project Characteristics		Assessment	P3 Potential
Financial Threshold	Will the capital cost of the project exceed \$50 million?	We understand that the total estimated capital cost for the SOR is in the region of \$200m ¹⁵³ . Raising finance for a project of this size should be relatively straightforward (assuming the Project is structured appropriately) and the overall procurement costs should not be disproportionate to the size of the project.	H
Duration and future demand	Is the duration of the project likely to exceed 20 years? Is likely demand for the project expected to change over the project term?	The long-term demand for the SOR is highly uncertain at this time. Of the mines currently in operation, EKATI is expected to cease commercial operations in 2018, while Diavik and Snap Lake are expected to shut down production in 2025 and 2028 respectively. Gahcho Kué, is likely to commence production in 2017 and is expected to only have a 10 year life.	L
Performance Based Contract	Is it likely that Key Performance Indicators could be determined for service delivery?	It is likely that elements of the SOR project could be measured through Key Performance Indicators (KPIs). Similar performance based regimes are in place in other Canadian P3 road projects. However, the ability of the private sector partner to guarantee long-term performance might be limited by factors	M

¹⁵³ 2006 Dollar Estimates, Excludes Risk, Escalation, and Financing Allowances. EBA Engineering Consultants Ltd., Seasonal Overland Road (SOR) Project, Engineering Report, October 2008.

Project Characteristics		Assessment	P3 Potential
		outside its control, such as extreme weather conditions.	
Bundling of Contracts	Will the project involve a number of individual service contracts?	All of the contracts associated with designing building, operating and maintaining the infrastructure could be bundled together.	H
	Will the project involve an asset provision contract?	Yes the project is expected to deliver a new asset which could be procured under a single P3 asset provision contract.	H
Project characteristics	Is this project new construction, refurbishment, or both?	The SOR project would be new construction. There is a possibility that the existing TCWR may need to be maintained during the construction phase but consideration should be given to whether this could be done independently of the new infrastructure.	M
Ownership and Management Synergies	Is there potential for ownership and management synergies?	Based on other similar projects there is likely to be an opportunity to transfer operations and maintenance responsibility to a single service provider (potentially a provider that has significant experience in road P3 projects) which may offer potential ownership and management synergies.	H
Risk Transfer	Is there potential to achieve value for money through the transfer of the costs of certain project risks to a private sector party?	Under a DBFOM delivery model there is significant potential for risks to be transferred to the private sector. However, the specific complexities faced by this project, such as building in the north and extended exposure to extreme weather conditions, could present some challenges in achieving a standard P3 risk allocation (please refer to the following section for further discussion). A detailed VFM analysis will need to be conducted to quantify the potential value for money savings that could be achieved by delivering the project using a DBFOM delivery model.	M-H
Third Party Revenue	Is there potential for the asset to earn additional revenue, by charging users a fee for using the infrastructure?	Given that the SOR would primarily be used by mining companies conducting exploration and production activities in the SGP, it is unlikely to generate additional revenue from other third party users. However, it may be possible to include toll	L-M

Project Characteristics		Assessment	P3 Potential
		charges for use of the SOR.	
Innovation	Does the project lend itself to clearly definable and measurable output specifications?	Similar to existing road P3 projects, the SOR project requirements could be translated into detailed output specifications and measurable key performance indicators could be developed.	H
	Is the project likely to involve a high degree of complexity?	The SOR project is likely to involve a high degree of complexity, given the challenging conditions of building and maintaining an infrastructure asset in the north and therefore there are potential opportunities for the private sector to provide innovative solutions.	H
	Is there significant scope for innovation (including the use of new technologies) in the delivery of this project?	There may be scope for the private sector to bring innovation through efficient work practices or use new technologies in the delivery of the SOR project.	M
Market Appetite	Is there likely to be private sector demand for involvement in this project?	From a size perspective the project will be attractive to bidders but given the remote location market interest from non-northern companies will be likely be affected by the number and nature of other projects in the wider market at the same time ¹⁵⁴ .	L-M
	If the project were a P3 would it be a real business opportunity that would be likely to attract a number of competent bidders?	From a size perspective the project will be attractive to bidders but given the remote location market interest from non-northern companies will be likely be affected by the number and nature of other projects in the wider market at the same time ¹⁵⁵ .	L- M

Under our initial high-level screening exercise the SOR project has been rated as "Medium" from the perspective of its suitability for delivery under a DBFOM delivery model.

¹⁵⁴ The high-level market sounding exercise will solicit private sector interest in the proposed SOR project.

¹⁵⁵ Ibid.

8 OTHER RISK ISSUES

This section outlines some project specific issues that could affect the risk allocation between the parties and the ability to transfer certain risks to the private sector. This is a preliminary, high-level assessment. Should the GNWT wish to consider the project further the suggested next steps would be:

- To undertake a comprehensive exercise to identify the project risks;
- To define the risk tolerance level of GNWT;
- To identify mitigation and control measures to reduce the likelihood or impact of risks which are unacceptable to GNWT.

Table 9. Preliminary Risk Identification

Risk Category	Project Specific Risk
Construction Risks	<ul style="list-style-type: none"> • Limited seasonal access to the site may increase risks of delay especially if additional materials are required. • Inflation on labour and materials due to potentially limited local supply and which could be significantly higher if other mining construction projects are underway at the same time. • Impact of extreme weather conditions which may cause delays in construction. • Ground conditions may be worse than anticipated given the remote location. • Third party claims may arise if construction causes interference to other businesses (e.g. mines). • The remote location and the specific challenges of the project may make cost and schedule certainty difficult to achieve under any procurement model.
General Maintenance and Lifecycle Risk	<ul style="list-style-type: none"> • Seasonal usage, unexpected weather, additional demand and overweight vehicles may all contribute to unexpected degradation of the road, resulting in higher-than-expected maintenance and lifecycle costs. • Response times to events may be longer due to remote location. • Limited local supply of labour and materials may give rise to additional inflation. • Limited availability of labour and materials may affect the contractor's ability to carry out lifecycle maintenance on a timely basis.
Whole-life Cost	<ul style="list-style-type: none"> • The remote location and the specific challenges of the project will

Risk Category	Project Specific Risk
	make whole life outcomes difficult to predict and/or achieve.
Demand Risk	<ul style="list-style-type: none"> In the case of the NWT SOR, historical data on traffic counts may not be a good predictor of future traffic. Given the uncertainty around future mine developments and in particular the predicted lifespan of future projects it is unlikely that transferring demand risk would provide a value for money outcome for the project.
Relief and Compensation Events	<ul style="list-style-type: none"> The unpredictable conditions in which the SOR will be built and operated such as extreme weather conditions and seasonal transit patterns, may require a broader range of supervening events than would be present in other contracts. This would affect upon the overall level of risk transfer as well as the value for money analysis.

9 HIGH-LEVEL QUANTITATIVE ANALYSIS AND CONTRACT TERM

This section provides a very high-level indicative assessment of the impact on the capital payment of different concession lengths to demonstrate that the shorter the concession length the higher the annual cost of the Project.

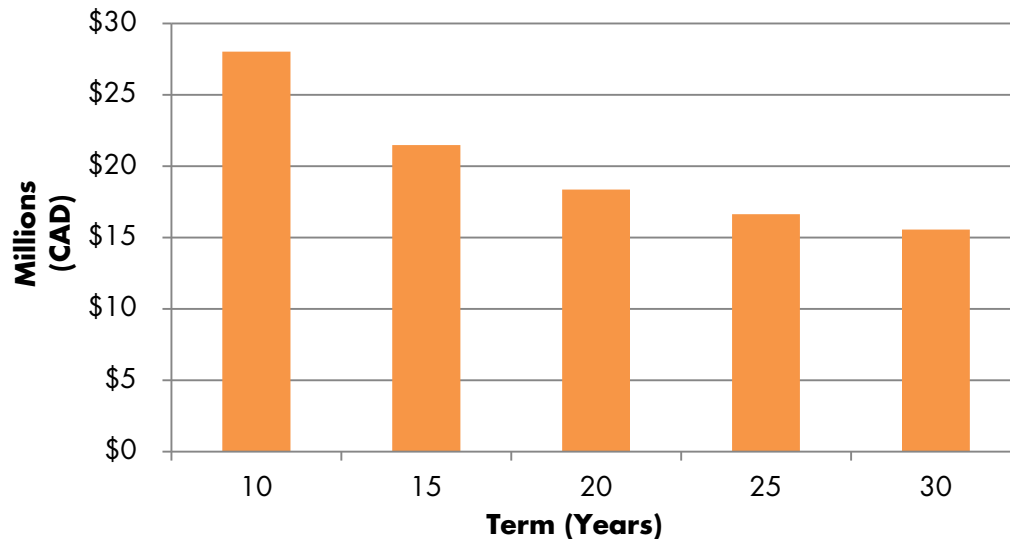
9.1 High-level Quantitative Analysis of the NWT SOR

In developing the high-level analysis we have made the following key assumptions:

- The total capital cost for the project is \$200M (i.e., this is exclusive of risk and interest costs during construction and does not provide for escalation between 2006 and 2012. Detailed financial models based on actual project costs and including appropriate escalation and risk estimates will need to be developed in order for the project to progress to the next stage);
- Annual operating and maintenance costs are not included in this example;
- The GNWT would pay the SPV based upon availability of the road and the extent to which the SPV meets the key performance indicators. Under this structure a typical Debt: Equity ratio is 90:10;
- The estimated cost of debt is 6 percent and the estimated cost of equity is 12.5 percent. The Weighted Average Cost of Capital (WACC) is assumed to be 6.65 percent.

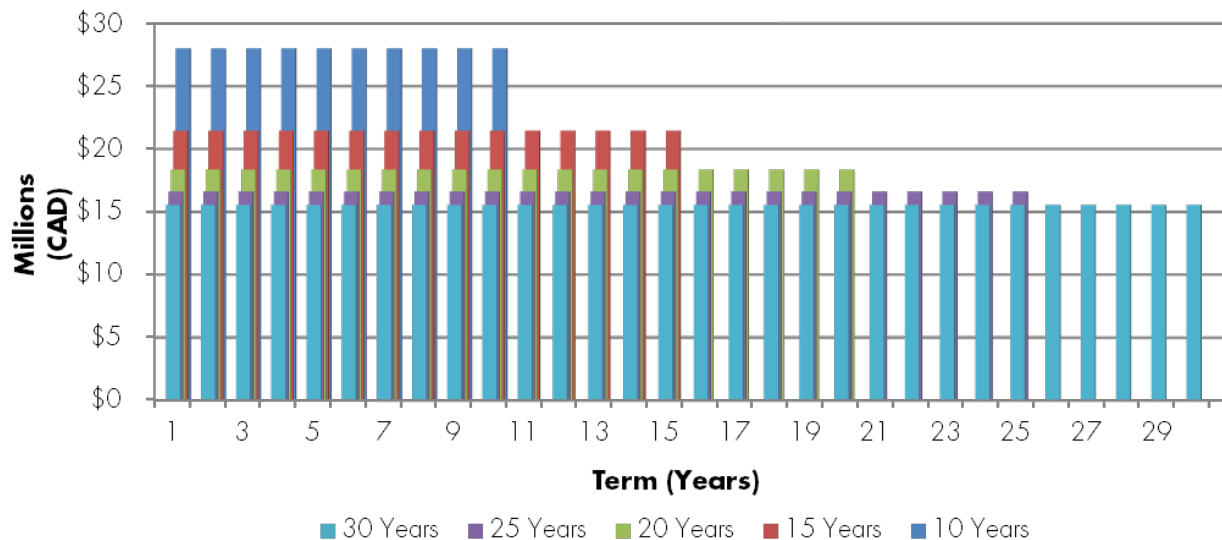
Using a simple PMT function in Microsoft Excel we calculated the annual revenue requirement that the private sector would require under varying concession lengths.

Figure 28. Annual Capital Payment (\$200 million CAPEX)



The graph above illustrates that the annual capital payment (based on a \$200M capital project) would increase significantly as the contract term is shortened, however as illustrated in the graph below the higher payments occur over a shorter period.

Figure 29. Annual Capital Payment for an Availability-Based Scenario (\$200M CAPEX)



It is important to note that the quantitative analysis included in this report is purely for illustrative purposes. The payment estimates are based upon an assumed \$200M project (excluding financing, operating, maintenance and lifecycle costs). Significant additional work, including risk analysis and detailed financial modelling (including the development of a public sector comparator and a shadow bid financial model), would be required to determine the estimated cost of the project and to determine whether the project is likely to deliver value for money to the GNWT.

9.2 Contract Term

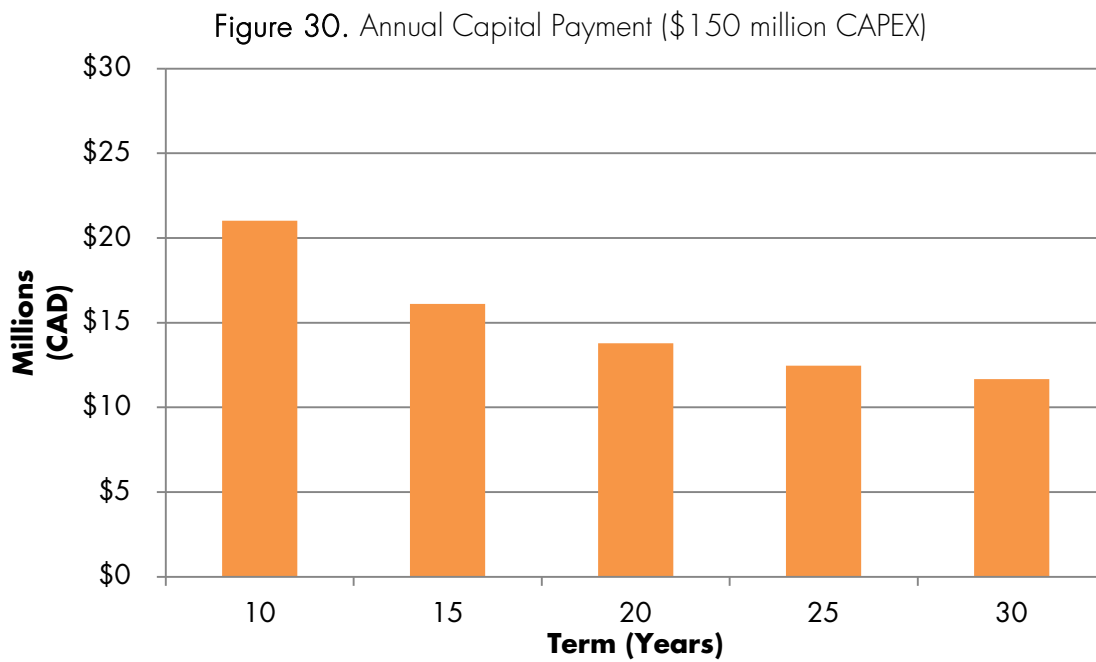
The actual contract term established for a project will depend on a number of factors including the length of the construction period, the expected life of the asset, the economics and affordability of the project, and the length of debt service.

Generally, the approximate term for P3 road projects has been between 20 to 30 years of operations (post construction completion). However, given the high level of uncertainty regarding future exploration activity and mineral production in the SGP, a shorter contract term may appear more appropriate for this project. In the event that potential future mining projects do not materialize and current operating mines cease commercial operation by 2028, there would be a high probability that the GNWT would have to continue to pay for the SOR should the concession term extend beyond 2028.

However, while a shorter contract term may appear to be more appropriate, it will inevitably increase the size of the availability payments that the GNWT has to make to the private partner during the project life as illustrated in Figure 29 above.

9.3 P3 Canada funding

We understand that the GNWT has had initial discussions with P3 Canada with respect to it providing funding support for the Project. This section updates Figure 28 based on an assumed capital requirement of \$150 million (i.e. assuming a 25 percent funding contribution from PPP Canada). This chart illustrates the difference in the annual capital payment for project with a capital requirement of \$150 million as compared with a project with a \$200 million capital requirement. This chart is a proxy for the impact that receipt of a capital contribution of 25 percent of capital costs from PPP Canada may have on the annual capital payment.



It is important to note that an application has not yet been made to PPP Canada for funding support. As a result, it is not clear whether:

- The Project will actually meet the criteria for funding support as set out in the PPP Canada Application Guide;
- The entire \$200 million would constitute eligible capital costs;
- Whether funding will be forthcoming from PPP Canada in the future and whether it would contribute 25 percent of eligible costs; or
- Whether the funding from PPP Canada would be repayable.

In order to meet PPP Canada's requirements for funding approval, the GNWT would need to develop a business case that meets PPP Canada's criteria. This would include carrying out detailed financial modelling, and risk identification and quantification in order to develop a Value for Money analysis that meets the requirements of PPP Canada as described in its P3 Business Case Development Guide. The Round four (4) fund closed on June 15th 2012 and Round five (5) is expected in Spring 2013.

10 MARKET SOUNDING

The market sounding process is an opportunity to inform prospective private sector partners about the project, in particular, the sponsor's requirements and objectives and formally gather feedback on the proposed project structure. Given the preliminary nature of the project, the purpose of the market sounding exercise is to gather high-level opinions from potential private sector partners.

The market sounding was carried out by PwC during July and August 2012. The participants included a range of companies that have experience in public-private-partnerships as well as companies that have specific experience of construction in the North. All of the participants expressed a strong interest in the project during the market sounding interviews. Key findings from the market sounding exercise are:

- The project is sufficiently large at over \$200 million to attract a field of competition;
- No difficulties in raising the required level of private finance are anticipated;
- The likely debt:equity model is 90:10 but the equity requirements may be a little higher on this project (15%);
- The preferred procurement model would be a Design-Build-Finance-Operate and Maintain (DBFOM);
- As this would be the first PPP project for the GNWT it should consider using a procurement agency such as Partnerships BC to lend credibility to the procurement process from a bidding perspective and to access market-accepted template project documentation (this would also be a likely condition to receiving PPP Canada funding support);
- Market sounding participants had differing levels of experience of similar projects and working with northern contractors; and
- An honorarium would be needed to enhance the attractiveness of the project; a broad range of values were suggested as the project is in its very early stages.

The conclusions from the market sounding as well as the market sounding paper that describes the project to assist with the discussions with private sector entities can be found in Appendix E.

11 CONCLUSION

The planning, design, delivery, operations and maintenance of northern infrastructure is increasingly complex. The introduction of a 156 km Seasonal Overland Road (SOR) to replace the southern section of the Tibbitt to Contwoyto Winter Road (TCWR) is no different. The conclusions of the demand and economic analysis are:

- Between 2012 and 2014, current diamond mine operators are expected to react favourably to the anticipated economic recovery by increasing diamond production levels;
- Coming online in 2017, the Gahcho Kué mine is expected to add 4.5 million carats of annual production capacity. However, the number of mines that will make use of the winter road after 2023 is quite limited;
- There is little indication as to whether private exploration investment (which remains well below pre-recession levels) will result in new mine development that may make use of the winter road. In addition, it can take up to 13 years to start production after a mineral deposit is discovered¹⁵⁶;
- As the long-term future of mining activity in the area is uncertain, the long-term future demand for the TCWR, appears limited. Under a P3 arrangement, the GNWT, as guarantor under a P3 arrangement, may be required to subsidize the road over the life of the concession should revenues from users be insufficient to offset costs.

The stakeholder consultation revealed:

- There is a general perception that the NWT has onerous regulatory barriers and lengthy land claim issues¹⁵⁷;
- The SOR may enhance the area's infrastructure, and thereby make many smaller projects more economically viable¹⁵⁸ and extend the lives of the existing operations¹⁵⁹;

¹⁵⁶ Bain and Company, The Global Diamond Industry, 2011.

¹⁵⁷ Fraser Institute, Survey of Mining Companies, 2011/12.

NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹⁵⁸ NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹⁵⁹ Government of the Northwest Territories, Department of Industry, Tourism and Investment, NWT & Nunavut Chamber of Mines, Consultations, October 2011.

- An affordable source of power may also spur exploration and development, as it would reduce the need for loads of diesel fuel on the road¹⁶⁰;
- A comprehensive regional infrastructure plan should be developed ahead of specific investments¹⁶¹;
- While the alternative SOR route proposed by the YKDFN (Option 1b) has several positive factors, such as removal of truck traffic on the Ingraham Trail, it has some weaknesses, since it has more river/water crossings and potentially more gradient¹⁶².

The high-level delivery options analysis contained within the report provides:

- An analysis of several potential delivery models for the project ranging from traditional procurement through to a P3 option (Design-Build-Finance-Operate and Maintain);
- A high-level P3 screening assessment that concludes the project has a “Medium” potential for a P3 procurement;
- An indicative annual cost to the GNWT of an assumed \$200 million project based on differing concession lengths in order to illustrate the impact on the cost to GNWT of a shorter concession period.

In order to determine whether this project should be pursued as a P3, additional analysis and review would be required as described below:

- A more detailed consideration of the likely future demand and the long-term need for the road given the predicted lifespan of the relevant mines;
- Development of a public sector comparator (PSC) financial model, a shadow bid financial model, and a value for money analysis (including a detailed risk identification and quantification exercise);
- Review of the overall affordability of the project to the GNWT;
- A detailed consideration of the accounting impact that a P3 arrangement would have on the GNWT;

¹⁶⁰ NWT & Nunavut Chamber of Mines, Consultations, October 2011.

¹⁶¹ North Slave Métis Alliance Consultations, October 2011.

¹⁶² Tibbitt to Contwoyto Winter Road Joint Venture, Operations Staff Consultations, October 2011.

-
- Consideration of the extent to which the GNWT could recover some of the costs associated with developing the SOR from user fees (thereby potentially offsetting some, or all, of the cost of building, operating, and maintaining the SOR);
 - Further discussions would be required with PPP Canada and a funding application would be required for funding support of up to 25 percent of eligible capital costs (followed by a more detailed business case).

APPENDIX A: STAKEHOLDER SURVEY QUESTIONS & RESPONSES

Use of Existing Road

1. Please indicate where your current activities (or the activities of the industry you represent) are located along the TCWR.

See attached map of road distance intervals.

Distance Interval	Yes	No
Km 0 - Km 150 (incl. Dome Lake Maintenance Camp)	<input type="checkbox"/>	<input type="checkbox"/>
Km 151 - Km 250 (incl. Lockhart Lake Rest Stop)	<input type="checkbox"/>	<input type="checkbox"/>
Km 251 – Km 350 (incl. Lac de Gras Rest Stop)	<input type="checkbox"/>	<input type="checkbox"/>
Km 351 – Km 450	<input type="checkbox"/>	<input type="checkbox"/>
Km 451 to Terminus	<input type="checkbox"/>	<input type="checkbox"/>

2. In which of these distance intervals do most of your transportation activities take place? (ranking 1-6, with 1 being highest levels)

Distance Interval	1	2	3	4	5	6
Km 0 - Km 150 (incl. Dome Lake Maintenance Camp)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Km 151 - Km 250 (incl. Lockhart Lake Rest Stop)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Km 251 – Km 350 (incl. Lac de Gras Rest Stop)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Km 351 – Km 450	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Km 451 to Terminus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Future Needs of Road

3. Can you discuss any projects for future development/expansion of your organization around the SOR (or the industry you represent)?

- i) E&D (L/M/H), comments
- ii) Production (L/M/H), comments
- ii) Other (L/M/H), comments

4. How will this activity impact traffic volume on the SOR? (where available, include an estimate of the number of trips per day this activity will generate)

- i) E&D (L/M/H), comments
- ii) Production (L/M/H), comments
- ii) Other (L/M/H), comments

5. For each industry and overall, how do you think the demands on the **existing roadway** will change over the next 5-10 and 10-20 years?

5-10 years

Please select one box per row.

Industry	Significantly increase	Slightly increase	Stay about the Same	Significantly decrease	Slightly decrease	Unsure
Oil and Gas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Highway Demand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

10-20 years

Please select one box per row.

Industry	Significantly increase	Slightly increase	Stay about the Same	Significantly decrease	Slightly decrease	Unsure
Oil and Gas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Highway Demand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments

6. What are the challenges associated with transportation on the existing TCWR?

7. What would be the preferred option of the two proposed routes and why?

SOR Stakeholder Contact Database

Date of Contact	Stakeholder Group	Contact Name	Title	Phone Number	Email	Comments	Attendees
9/20/2011	NWT Chamber of Mines	Tom Hoefer	Executive Director	867-873-5281	executivedirector@miningnorth.com	<p>projects in the pipeline - 3 projects that will need road shipping - Gahcho Kue, Seabridge, Tyee. Tyee and Gahcho are in approval process now, which is feasibility and EIA together. Gahcho is a diamond project lead by DeBeers, Seabridge and Tyee are juniors with no known partners. Seabridge is low grade ore with high extraction costs, but may still work out. Existing mines may be able to extend their lifespan with adding in more pipes that would be now economical with higher prices. Diavik has been looking at this. If this happens, would mean more supplies on the TCWR. Is some potential with the other mines as well. Exploration and investment has been flat or declining due to current economics. Shear Diamonds @ Jericho is still trying to get this back online so may be successful as this mine closed prematurely due to some uneconomical management. Jericho that has a lot of diamonds that are in very hard rock that has not been processed, has some room for more exploration, and there are some pipes that they know are there but were deemed uneconomical in the past. Lupin Mine has been sold to Elgin Mining who may be planning to reopen the mine, if only to process base metals ore from a neighbouring mine that is potentially starting from MMG. Neumont is servicing their mine via ship and will not use the road. there are several land claims active in the NWT which are causing a lot of regulatory uncertainty in the region, as well as the activity of the existing boards that has been unstable in the past. There is one FN that has a land claim for about half of the SGP and have been playing very hard with proponents, as well as forcing several exploration projects into EIA. Chamber has signed an MOU with Deh Cho in June regarding exploration and development in the region, which will hopefully improve the investment climate in the area. Fraser Institute survey of mineral potential index ranks the area as #8 in the world from a geological perspective, but drops due to regulatory issues. Only a federal EIA under the Mackenzie Valley Resource Management Act, but the NWT can have effects on wildlife, etc. Costs for grassroots exploration have partially been due to the FN needs for engagement. SGP is known for good gold deposits but record high prices haven't really changed that. There has been some movement in this tough stance from the Deh Cho to be more flexible but this has not been broadcast widely and the stigma is still that the prices for exploration are still prohibitively high. Two new companies are looking at lands around Diavik/Ekati but won't make a difference to them which route goes ahead.</p> <p>Declining roads/loads on the existing TCWR are not really due to poor weather but more due to a several factors - addition of alternate route, easing of pinch points that stalled traffic in 2006 which aided high numbers in 2007. Since then, cold winters with little snow have helped to keep the loads flowing - road has been closing because there hasn't been need for more loads, not because of weather or melting. Have other strategies as well - strip the snow off earlier to make the ice start strengthening earlier and do more flooding earlier. Problem in the spring is that the portages start to melt before the lakes and forces them to night driving and eventual closure. Roads are used to haul diesel for power generation, food/parts the mines, fertilizer for explosives, and cement for the mines, as well as steel, mining equipment, etc. Organization on the road is exceptional and is not a factor. Storage capacity for diesel in Hay River and Yellowknife used to be an issue but RTL has added four new huge tanks in YK to abate this. Ferry crossing over the Mackenzie is starting to be an issue in the fall due to low water levels. New bridge over the Mackenzie is designed to handle these loads, and will be forced to pay a toll for commercial loads.</p> <p>How many loads will Gahcho Kue need if they go, and then add in Seabridge and Tyhee - have to figure out how big they are going to be and how many loads they will need.</p> <p>Don Haly from EBA has a lot of info on their work up there. Need to talk to Erik Madsen at Baffinland, Ron Near is his replacement and he will know if EBA is still on the job.</p> <p>Production forecasts from the existing mines are available. Courageous Lake - 15 year life, 1.2 billion dollar cap, example.</p> <p>SOR study in 2007 was to look for all of the alternatives possible - option 1b was thrown in late by the YKDFN as they were not happy with the fact that the existing TCWR follows their traditional hunting trails. Their feeling was that the 1b option was already disturbed. This option has some flaws - more river/water crossings and potentially more gradient. Ask Erik about this. There are high potentials in this area, however, due to the high incidents of greenstone belts in the alternate route area, which would decrease the cost of exploration in an area with higher potential for success. Avalon Rare Metals SE of YK are in EIA, check on newsletter from Chamber.</p> <p>Need more political/marketing work to spur developmetn or exploration - infrastructure is not really an issue. What will happen with the existing mines will drive a lot of short term need for SOR, and medium term will need more exploration to drive more investment. Hard to predict any farther than about 5-10 years away.</p> <p>Would the other potential roads northwards have any effect - most likely base metals north will head north to the coast rather than south. Jericho is pretty much the northern boundary for the road as past there it becomes more economical to come south from the coast. Some push federally for more infrastructure in the NWT. Nunavut side will likely steal more of this federal money. Several projects in that area have been on the books for years but are in need of this infrastructure. Hackett River is getting bought by something ZINC who will likely look for a Bathhurst link to a port. Nunavut Resources Corp is trying to make a bridge between good ventures that need infrastructure and provide funding similar to how AIDA has worked on the Red Dog Mine in Alaska. Goal is to take some of this burden of smaller projects to make them more economical. Hope Bay is already starting, and potentially more at Bathhurst Inlet and Graves Bay. Basically, opening on the Arctic Ocean year round could drive a lot of this investment.</p>	Barry, Diego, Mark, Jonathan, Tom
250-767-9033, dhaley@eba.ca							

SOR Stakeholder Contact Database

Date of Contact	Stakeholder Group	Contact Name	Title	Phone Number	Email	Comments	Attendees
9/21/2011	ITI	Erik Madsen	Head, Nuna Logistics	416-814-3980	erik.madsen@baffinlan	BHP past president had been workign on doubling his mine life, and lowering costs may help with this as it will make previously uneconomical pipes more valuable. Need to ask them specifically if the addition of the SOR would drop their costs enough to help them along for a few more years. Cheap power may also be a good driver. Seabridge will need a lot of power as well and so a better way to send power north may be a huge driver. Need to look at the road addition as a part of a bigger picture - power, manpower, etc. Winter road access has other mitigating factors - have to carry more inventory due to only be able to ship 2 months a year, need more storage,e tc. if power was cheaper, could then offset these costs and make more of the marginal deposits more feasible. need to protect the existing mines and keep them there as long as possible. All of the projected mines together are only equal to Ekati in terms of manpower - need to keep them going and then add more mines instead.	
		John Zigarlick		604-682-4667		Tourism potential is pretty low, mostly for hunting and fishing, but ban on caribou hunting has hampered this. Could be lodges built north of Yellowknife as there is no cottages allowed due to all of the land claims. Addition of the SOR may add more demadn for this.	
		Pietro De Bastiani				Gahcho Kue is on the horizon, have heard that there may be capacity issues already with the other mines already online, Tyhee could also add pressure, Seabridge west of Diavik would also add. West of Diavik there is some early stage exploration in the greenstone belt for gold, base metals and platinum - Platinum Group Metals is getting active. East of Lupin is Xtra Zinc, Sabine and MMG are operating in the area as well in the Izok and Goose Lake areas, Lupin was bought by Elgin Mining and they are looking like they are going to resurrect the mine. diavik is doing more drilling and BHP is looking at at couple of other areas as well, some other players like harry Winston are also getting interested in the area. South of Diavik - junior partner would mine and haul a concentrated ore up to Diavik for final processing or to Ekati. in the 10-20 year timeframe, Gahcho Kue is the only real deal in 5-10 years, incremental expansion in the existing mines potential but need diamond prices to increase or be long term stable to change this. Seabridge looks good but needs a lot of power and would definitely need the road to bring in extraction reagents like lime to extract the gold from the ore. Barging in equipment from the south is also being looked at but has its own issues. Would companies look at paying an upfront premium into their business cases to guarantee this type of infrastructure - existing players get priority on the road. most of the problems with the TCWR are in the southern part of the road - north of Lockhart Lake the problems decrease a lot. Tyhee would definitely benefit from the option 1b. Ormsby Lake area is where the most attractive ore is, which is along this route. There is a greenstone belt to the east of the existing TCWR as well as one to the west of the alternate route - latter has been quite explored, less so in the former. Higher near term potential in the latter as well. Last year the load numbers were down but still got everything through - 2006 was the only year that they didn't finish hauling. Road shuts down when all loads are through, hasn't been a problem so far. Heavy usage of the road happens during capital development phases - standard operations don't require a lot of loads. 2006 was due to Snap Lake opening, Diavik expansion, and a bad winter. more money being spent on the road recently for better engineering, etc. to keep quality high and safety as well. Southern portion is more prone to high snowfall, thinner ice, poorer water that forms ice slowly, and shallower lakes that cause under ice erosion. Alternate route was put back in to keep more backhauls off the road as much as possible. has the same issues but has mostly unloaded trucks so less issues overall. More monitoring on both roads in the past few years to better understand this. Exploration decline in the past few years - mostly due to unsettled land claims for the keh Cho which causes regulatory uncertainty. Exploration has been going where the work is easier to get permitted. Land withdrawals have also happened as well - new national park, etc. Not a lot of real estate left to stake a claim on. Sotheastern par tof the SGP is the worst for this. With gold prices so high there should have been more exploration or more expansions but land withdrawals tend to stymie this. Companies prefer not to do anything instead. Fraser institute points to the lack of road access as an issue - less for diamonds, but base metals need a stable year round road to handle their products. JV members pool their loads and figure out their need for shipping, then ask the rest of the area and have found that there have been fewer and fewer others that need to use this service. Interesting to see if activities in Nunavut could drive demand to stage	
		Deborah Archibald					
		John Ketchum					
		Malcolm Robb - INAC					
		minerals					

SOR Stakeholder Contact Database

Date of Contact	Stakeholder Group	Contact Name	Title	Phone Number	Email	Comments	Attendees
9/28/2011	JV/Rio Tinto (Diavik)	Ron Near	Director, Winter Road Operations	867 669 6561	ron.near@riotinto.com	<p>Ron is the director for the entire winter road but his role is cost shared between the three members of the JV. Reports to all three presidents and oversees the operation, construction, regulatory and the partnerships that make up the winter road. Funding is split based on number of loads and the total tonnage - everyone supplies estimates of their proposed loads and then this total is prorated based on what is actually used. Third parties are then charged the same amount based on this prorated amount. Fee is set per tonnage for everyone. Usage of the road has varied over the past ten years - usually opens and closes at approximately the same time. Last year should be similar to this year - third party loads included. Diavik had 3863 loads last year, 57% of total loads. Ekati had 1967 loads, 30% of loads. Snap Lake had 1373 loads, 12% of loads. Aboriginal Engineering had 159 loads, 1.3% of loads. This year looks like it will be very similar in breakdown. JV users are using over 95% of the loads now but all are on a similar lifespan so will start decreasing in the future. Gahcho Kue will start bringing in loads in the near future as well as Seabridge and will start transitioning to the bigger players. Unless the big three find more deposits, Ekati closes in 8-10 years, Diavik in about 15 years, DeBeers in around 15 years as well. Gahcho Kue would be approximately 30 years from the date it opens. Are expecting the statistics to stay pretty similar for the next few years. Demand for third party loads has been pretty steady, construction of GK could add 3500 loads alone in a year. Reopening of Jericho mine or addition of Seabridge would only add to this. Concern of the JV members is the upper capacity of the road and the additional risk of the JV partners ensuring that they can get their loads into their mines. Last year there were 7389 loads - different from two years previous due to the economic slowdown. Nonbillable loads bring total to 7536 - these are loads from Nuna Logistics to work on the road, supplies, etc. Road was open 63 days last year. Thaw cycles have a huge impact on the number of loads - late in the season the road starts to break down so they may go to night time travel only to save the portages. 2006 the ice started to erode as well. Main concern is the area from Tibbitt lake to Gordon Lake as the portages don't hold up. Past that it gets better. Lakes in the south are shallower - there are several problem lakes that are shallow and have reefs/sandbars as well as currents and poor water for making ice, are the weak link in the road. SOR would make for a more predictable portion of the south road, takes the risk out for the JV parnters especially but would influence future growth as well. Servicing mines in the NWT is the critical portion of the operations - solid infrastructure that would reduce risk would be beneficial. The advantage of the route 1b is that uses less of the Ingraham trail so it would be less of a safety issue. Both routes would work equally well otherwise. YKDFN would prefer the 1b route because it is on less of their traditional hunting areas. Alternate route has only been made a few years, started in 2007 to take backhaul pressure of the main road, did it again last year. 11,000 loads in 2007 was probably near capacity - early loads are not full and work up to full capacity. 175-200 loads a day would be maximum. Some years they haven't even had to go night time travel only, but most years they do.</p> <p>There is a general plan in place for the diavik mine for the rest of its lifespan - Ron to see if it can be shared. Addition of new mines will probably have more effect on the SOR than the existing mines - upper end of the road could stay open for likely another month but the southern portion falls apart so early that it is the limiting factor. North of Gordon Lake - if SOR came to here the north part would be opened up more considerably. Jericho and Lupin would really benefit from this. ASsembling loads up to Lockhart Lake doesn't make much sense - double handling and would have to add security at the staging area. Length of the winter road season is the main constraint - extension of the amount of time it was open would add a lot of potential days of hauling, which would drive load costs down. Could add over a month to the shipping season, after which the mines must fly equipment/supplies in. Cost of building the winter road is spread nearly evenly across its length, with some lakes needing more attention and engineering. Meeting of the JV partners will happen in mid October - Mark and Jonathan to send questions to Ron. Load applications for 2012 should all be in by mid NOvember, Ron to share. Addition of Jericho and Lupin would add some loads but likely in the 1700 range each. Diesel loads are the main shipment right now as it is used for power generation and for making explosives.</p>	Mark, Jonathan, Ron

SOR Stakeholder Contact Database

Date of Contact	Stakeholder Group	Contact Name	Title	Phone Number	Email	Comments	Attendees
10/7/2011	MMG Minerals	Sahba Safavi		604-417-5589	Sahba Safavi <Sahba.Safavi@mmg.com>	currently are not planning to use the TCWR at all - were planning to bring everything south via a new road from the Arctic Ocean coast. Will have more value for Diavik and Ekati, but may be valuable for MMG during construction as it will add more time that they can wait to haul equipment up for construction. Would have to ship stuff up in February for construction in August, would cut a month off storage time. have looked at shortcuts to the ice road to their operations but have not found anything that was viable or more viable than coming down from the north. are needing to service their High Lake property as well farther north so have to build a road that far at least from the coast. gold is not a focus for MMG - it is produced as a byproduct of their base metals operations, which is why they sold Lupin. Also some environmental issues at Lupin that they didn't want to look at. are looking at a road from Izok to Shear then straight north through Ulu to High Lake and then to the coast. This would be about 350 km. would likely only look at the TCWR if their High Lake project did not go. more economical to send their metal concentrates to the north onto boats at the coast and then send to Europe. South means hauling to a rail terminal and then offloading to send to somewhere like Cominco for processing. Have done multiple analyses of the routes south and they were not economical. One of the routes they looked at was an all weather road straight north from Lockhart Lake to Izok Lake. Port on the coast would be at Grays Bay straight north of High Lake property. Would build a wharf just for their use, would only operate for two months a year or so. Downside is that they could only ship two months a year so would limit revenues but even so the road still does not make it economical as it would involve an extra 850 KM of driving just to get out of the territories. Likely this project does not have any benefit for MMG as the economics are just not there. have looked at the ice road in their analysis of their projects and the extra transportation costs are not worth it for the extra shipping cost. Question for the NWT is could they do something similar north to the coast instead of spending money on this project. Fuel costs will be high but will use a tanker to the coast to haul for them, have storage on site and will be much cheaper than hauling it by truck. This may be an economical move for the existing and proposed mines as it is closer to haul fuel from the coast south than up north from Edmonton.	
10/14/2011	BHP Billiton/Ekati	Ben Coutts	Manager - Production	867-446-3167	Coutts, Ben P <Ben.P.Coutts@bhpbilliton.com>	mine production closure is planned for 2019, with several years of reclamation afterwards, which would have some significant backhaul requirements for the SOR. Process plants, the camp materials, vehicles, etc. would all need to be hauled out. Need for the road would drop off rapidly though. Winter road costs are a huge factor of their budget - 6-8% of total operations. SOR would have a positive impact but wouldn't be a game changer. Cheaper power would be the biggest change - 20-25% of their total cost. Haul in 1200-1300 loads of diesel per year, will peak at about 1700 in 2017 but will tail off quickly due to closure in 2019. climate change is a big concern - if the winter road ever failed and mines had to reduce or halt production, the costs of this lost production would easily pay for the road. It's all about mitigation of the risk around operations. Have a lot of knowledge about the road - as long as the temp gets below zero, they can build an ice road likely. Timing is a key factor as well - they are nearing end of mine life as is Diavik and it's hard to justify large capital infrastructure at this stage of the game. A road south from the coast would have a lot of attraction for them - again, not a game changer because of economics of transportation but would give them more certainty. This road would likely have more potential - infrastructure is the key bottleneck in development of the north. Part of their corporate vision is to leave a lasting legacy from their projects, and would support infrastructure projects as much as possible in the north as long as they make economic sense. Costs \$15-20 million a years for winter road for them, so a smaller cost as tolls would be likely supported. Primary economic driver is the price of diamonds, which is driven by the world economy. Diamond prices are strong but also more volatile than gold due to fear of another recession. Could potentially operate for 20 more years but would need guaranteed supply lines and would also need cost certainty for the product. If a secure SOR was in place when the prices did jump, they would be ahead of the game. Fuel and labor are their two biggest production costs by far. Majority of fuel is used for power generation, with most of the rest used for mine vehicle operations. Would prefer the route that mirrors the existing winter road, but if there was good reason to build the other one, they would be definitely be willing to listen. The secondary route adds a lot of operational flexibilitiy, and can see the benefits of adding in Tyhee as a user of the road by building the western route instead of the eastern route.	

SOR Stakeholder Contact Database

Date of Contact	Stakeholder Group	Contact Name	Title	Phone Number	Email	Comments	Attendees
10/14/2011	North Slave Metis Alliance	Sheryl Grieve	Environment Manager	(867) 445-6658	Environment Manager <enviromgr@nsma.net>	wondering if the option up through Wekwhati through Snare Lake by Discovery Mine which would make a circular route around the region - this is the Road to Riches proposed by Diefenbaker. NSMA businesses would like to be part of the road construction phase and would like to participate in the building of the road. Would not be happy if they could not get economic benefits of the road and then had to pay tolls on the road as well. NSMA would like to make sure that the economic benefits of the road and the area are spread across all of the peoples. Best idea would be to build roads that link communities and potential projects as well as the existing mines. Need to do a regional infrastructure plan instead of just investing in a road that only services the mines. Bathhurst Inlet port and road seems like the best option but does not seem to have a lot of support. Need to have more trade inland from teh coast to support sovereignty and economic diversity. much more recreation opportunities along the Ingraham Trail and the NSMA is frustrated with the level of development and traffic on the trail right now. There are people commuting along this road every day. Good memories of Discovery Mine had a community right there, some economic benefits and the road was well used and had good services. Would prefer this type of a methodology as opposed to the current fly in and fly out camp schedule that is being used on most projects. NSMA would like to participate in any road planning that would affect their communities such as Whati, Gameti, etc. Road development in any direction would likely spur development but NSMA would like to be part of the planning process to ensure that it serves the best interests of everyone and that there is more monitoring of the existing agreements on environment, socioeconomics, etc. that are not being honoured. There needs to be more consultation on this type of projects before they proceed any further. Need to be more than just a survey and see what the real costs and routes would be. Environmental considerations are huge too - need to build them where they do the least damage, both from the road and the subsequent development that follows it. Any road that is built will be a threat to caribou. should look at old planning reports to see if there are any good ideas. GNWT should do more consultation with NSMA in depth to get more details - can only give a superficial answer with superficial details. NSMA is generally pretty pro-development, but biggest challenge is getting a fair share of the benefits as it is their territory as well as the FNs and other stakeholders. Rail and hydro capacity should also be looked at for the region - maybe could build them both together to make a larger benefit than building a road.	
14/10/2011		Ron Near				JV agreement is set up specifically to deal with Snap lake, not GK. Agreement would have to be rewritten to include this new mine under De Beers or added in as a separate entity. Tonnage times distance is the way that the rate is made for each of the partners. Total loads are divided to create a tonnes per load travelled, and then multiplied by the distance. Cost per tonne/km is created at the beginning of each year and then that rate is applied to each load. Third party loads pay a very similar rate albeit without any sort of non member premium.	
18/10/2011	Elgin Mining	Karyn Lewis				Just bought mine in July, just getting land use permits and water permits as well as other regulatory requirements. Drill is out at the mine site but hasn't started sampling yet. Some geotech work has been done. Accommodations and offices are still there, some upgrades have been done, plant is still there but will need some upgrades and repairs to get back to operational status. Drilling needs to be done first to determine if the mine is even worth reopening. Hard to know how much gold is still there and how much production there will be. Most permits have been received. Would likely be 3-4 years before they would be able to get back into production. Have 12 staff on site right now, unknown how many would be required - would depend on production. Person to contact would likely be Jacques 905-399-3511 - he might have better info on load levels, etc. No idea yet what production levels could be like or what would be needed for loads coming in to get started and operate. Right now, most of the mine infrastructure is still there from the previous owners. This is an underground mine. Have not investigated the possibility of a northern resupply route yet.	
28/10/2011	Shear Diamonds	Pamela Strand				Still reassessing Jericho, so not really sure where they are at. Ideally would be start using the mine again in 2013 and then operate for 10-12 years - would process at a slower rate than previously. Mine is already built so only would need to bring in fuel, etc. Definitely would see the benefit of the longer shipping season from an SOR. Would like the western route better as it has FN support and would have more operations benefiting, which would share the costs and would also extend its useful life. Are planning to have some coordination talks with Elgin and MMG to try and find synergies in their hauling and operations, will meet at the upcoming Geoscience Forum. Even though there is more cost for western route, still seems like the best idea. NOrthern resupply likely won't help them as their operation will likely be finished before the northern route has been constructed.	
14/11/2011	Yellow Knives Dené First Nation	Randy Freeman	Director, Lands Management	(867)766-3496	Randy Freeman <rffreeman@ykdene.com>	can see the benefit of the western route to take truck traffic off the Ingraham Trail. YKDFN have a big problem with squatters on the land in their area - road proposed to the east of YK to clean up the seven old mine sites but there was some significant opposition because of the fact that there would be many people building squatter cabins on the lakes farther east. Many illegal cabins already on Prosperous Lake, etc. Federal gov't has been working with the YKDFN on this issue on the Crown lands. There has not been a lot of action on these cabins in the past.Has been years since there has been any significant action of the caribou around Gordon Lake - herd tends to split and head more towards McKay Lake.	
14/11/2011	Tli Cho First Nation	Kerri Garner	Acting Lands Director	867-392-6381 x 305	Kerri Garner <kerrigarner@tlicheo.com>	Access to hunting areas is a huge issue for the Tli Cho and so the TCWR in general traverses some of their prime caribou hunting areas. In general, they have found that increased access tends to impact their traditional way of life and the cumulative effects of the lands in the area.	



APPENDIX B: DELIVERY OPTION ANALYSIS

APPENDIX B: DELIVERY METHOD ANALYSIS

This section is for illustrative purposes only. The purpose of a delivery method analysis is to evaluate each potential delivery method against specific qualitative assessment criteria to determine the extent to which each delivery method meets the GNWT's objectives.

This section describes a potential approach to the delivery method analysis.

The table below identifies and defines potential delivery method assessment criteria.

Delivery Method Assessment Criteria	
Criteria	Description
1) Whole of life outcomes	Ability of the delivery method to achieve an efficient whole of life outcome. (i.e. to achieve the optimal combination of up-front capital costs and ongoing operations and maintenance costs).
2) Innovation	Ability of the delivery method to encourage efficient work practices, apply new technologies, exploit private sector management skills and systems and deliver innovative solutions to address the challenges associated with the project.
3) Performance based outcomes	Ability of the delivery method to be structured in a performance based manner, such that the contractor and/or the operator achieves both short term and long term performance standards (performance goals aligned with the public interest).
4) Risk optimization	Optimal allocation of risk over the life of the project between the public and private sectors – the risk is allocated to the party best able to manage it.
5) Schedule certainty	Provides a high-degree of confidence that the project can be delivered on time.
6) TCWR operations during construction of SOR	Delivery method offers the potential to maintain the existing traffic volume during the construction of the project.
7) Market interest / Competition	Ability to attract sufficient bidders with the necessary expertise to deliver a project of this size and complexity to provide robust competition in order to meet the value for money objective.
8) Fair, open and transparent process	Ability to provide a fair, open and transparent process.

Delivery Method Assessment Criteria	
Criteria	Description
9) Stakeholder considerations	Ability to address stakeholder issues and concerns on an ongoing basis. Stakeholder groups include all levels of Government and general public.
10) Procurement complexity and precedents	Management of the procurement process including contractual arrangements, contractual interfaces in a multiple-contract environment and procurement precedents.
11) Cost certainty	Ability to achieve cost certainty.

Each delivery method is then assessed by each criterion in accordance with the following scale to indicate how effective the delivery method is in satisfying the relevant criterion:

✓✓✓	Extremely effective
✓✓	Substantially effective
✓	Partially effective
✗	Ineffective



APPENDIX C: CASE STUDIES

APPENDIX C: CASE STUDIES

Case Study 1: Turcot Interchange in Montreal - DB

The Turcot Interchange is the most important transportation crossroad in the Montreal region. In addition to connecting Highways 15, 20 and 720 and the Champlain Bridge, it links Pierre Elliott Trudeau International Airport and downtown Montreal. Every day, this major traffic artery (for both people and merchandise) is used by approximately 290,000 vehicles and 50 trains. Encompassing the Turcot, De la Vérendrye, Angrignon and Montreal-West Interchanges, in addition to sections of Highways 15, 20 and 720, the Turcot project extends over a length of approximately 10 km, centred on the Turcot Interchange.

As project owner, the Ministère des Transports du Québec (Quebec Ministry of Transportation/MTQ) is seeking to rebuild the Turcot Interchange and the adjacent infrastructure due to their state of deterioration. The Project also provides the MTQ with an opportunity to rectify the outdated geometry of certain structures while revitalizing the site occupied by the former Turcot rail yard and upgrading the entire south-western sector of Montreal. The MTQ has developed a technical solution referenced in two (2) Government of Quebec decrees (889-2010 and 890-2010) authorizing the project.

The Project must be carried out bearing in mind two (2) major challenges:

1. *Compliance with the project schedule:* Due to the current structures' age and level of deterioration, the MTQ has a target date of 2018 for demolition; and
2. *Maintaining traffic flows:* Due to the Project's role as a hub for several major highways in the Montreal region and due to the importance of the rail lines, it is expected that road and rail traffic flows will need to be maintained during construction (which may span a period of up to six (6) years), using either existing or temporary infrastructure.

The Turcot Interchange is approaching the end of its useful life. The MTQ studied several options ranging from renovation to the selected solution of completely rebuilding the Interchange. The technical elements of the project are not complex but the goals set by the MTQ, as described above, present some challenges.

With the preliminary technical studies on the verge of completion, Infrastructure Québec ("IQ") and the MTQ decided to prepare an initial business case in 2008 to select the most appropriate delivery method for the project. The project was delayed and the MTQ decided to prepare a new business case in 2010 which was required to be completed within four (4) months due to concerns about safety of the existing infrastructure.

After several studies that considered options to build and finance this \$3.0 billion project, the MTQ concluded that a design- build (DB) model would offer most benefits when compared to other delivery models while still meeting the required quality and safety standards.

Case Study 2: Sierra Yoyo Desan Resource Road – DBFOM

The SYD road is a 180 km resource route that provides access to a large oil and gas region in British Columbia. The road starts near the city of Fort Nelson, about 15 km from the Alaska Highway, and extends to the South Helmet Airstrip in the northeast corner of the Province¹⁶³.

Before 1998 the SYD road consisted of several fragments owned and controlled by a number of different companies. During this time the road was often inaccessible due to the lack of appropriate maintenance work, frequent exposure to adverse weather conditions, and constant transit of heavy vehicles.

The BC government decided to take ownership of the entire road in 1998, and started to charge fees and levies to the road's users to finance the required upgrades and maintenance work. However, the government soon realized that the SYD road needed a major upgrade to realize the full potential of BC's oil and gas sector.

By promoting all-season oil and gas activity, the upgrade of the SYD road became an integral part of the Province's Oil and Gas Development Strategy announced in 2003. The project objectives included the following:

- A new, 22-kilometre-long bypass and a new major bridge across the Fort Nelson River; widening and surface improvements; replacement and/or upgrades to some of the existing bridges;
- Ongoing operation and maintenance to specified standards;
- Safety enhancements including improved sightlines and improved road surface.

After analyzing different public and private sector delivery alternatives, the Government of BC decided to structure the project as a P3. The P3 option was selected because it allowed for the work to be completed at no direct cost to taxpayers, while offering advantages in areas such as risk transfer, ensuring public access to the road and securing private investment.

¹⁶³ Project Report: Achieving Value for Money for the Sierra Yoyo Desan Resource Road (Partnerships BC, November 2004)
http://www.partnershipsbcc.ca/pdf/SYD_VFM_Nov_4_04.pdf

In June of 2004, the Ministry of Energy, Mines and Petroleum Resources entered into a P3 with Ledcor Group, a construction company selected to design, construct, finance, operate, and maintain the SYD road for a term of 16 years. The selection of the private sector partner was a fair, competitive process in which more than 20 private companies participated. Below are some of the main features of the partnership agreement:

- Ledcor invested \$40 million in the first two years to upgrade and improve the road (these works were completed three months ahead of schedule), and is scheduled to spend an estimated \$2.5 million per annum to maintain the road for another 14 years;
- The road remains a public highway, owned by the Province and leased to Ledcor for the term of the agreement;
- Ledcor assumed the risks on design, construction costs and environmental permitting.
- The contract included incentives for early completion of the upgrades and improvements to the SYD Road, and for Ledcor to provide for a well-maintained road over the long term. However, penalties are imposed if the road is not available or is not maintained to specified standards;
- Ledcor is receiving two types of payment: an availability payment for providing a good, usable road of a prescribed standard of construction; and a separate payment for operations and maintenance.

To avoid direct costs to taxpayers, the Province financed the project through (1) fees and levies paid by industrial road users, most of which are in the oil and gas sector; and (2) a royalty rebate program equal to 50 per cent of the fees and levies. However, since the upgraded road is expected to promote further growth in oil and gas activity, the Province expects to realize a significant net increase in royalty revenues in future.

Case Study 3: South Fraser Perimeter Road - DBFO

The South Fraser Perimeter Road (SFPR) project involves the construction of a new four-lane route, approximately 40 km long, on the south side of the Fraser River in Vancouver¹⁶⁴. The SFPR is a key element of the Gateway Program, which was established by the Government of BC in 2003 to complete the network of major roads in Metro Vancouver. The project objectives are to:

¹⁶⁴ Project Report: South Fraser Perimeter Road (Partnerships BC, June 2011) <http://www.partnershipsbcc.ca/files-4/project-sfpr-schedules/SFPR-ProjectReportFINAL.pdf>

- Improve the movement of people and goods through the region by providing improved connections to the Provincial highway network;
- Reduce east-west travel times, particularly for heavy trucks, by providing a continuous highway along the south side of the Fraser River;
- Improve access to major trade gateways and industrial areas as well as facilitate development in designated industrial areas along the south side of the Fraser River;
- Improve safety and reliability;
- Restore municipal roads as community connectors by reducing truck traffic on municipal road networks.

The SFPR project, which has a total capital budget of \$1.26 billion, is being completed in two (2) phases. In the first phase, the Province is conducting site preparation work to help address certain project risks. In the second phase, the work is being delivered using a DBFO model. In July 2010, the Province entered into a performance-based, fixed price agreement with Fraser Transportation Group Partnership (FTG) to deliver the DBFO phase of the project. The term of the agreement includes the construction period plus 20 years of operation. The capital costs associated with the DBFO portion of the project are \$666 million.

The procurement decision to use a DBFO delivery model was based on a thorough qualitative and quantitative analysis of available delivery options, including both traditional and P3 delivery methods. The value for money analysis indicated that the project objectives could best be achieved by delivering the project through a DBFO model, which is expected to yield approximately \$34 million (in net present value) in savings to taxpayers.

Important factors that will contribute realizing the potential value for money include efficiencies from the integration of the design, build, finance, and operations through effective risk transfer to the party best able to manage the risks. Other factors include a number of benefits from the private partner such as:

- Significant initial investment (approximately \$200 million) in the design and construction of the road and associated structures, resulting in lower long-term operating and maintenance costs, and an efficient lifecycle replacement strategy over the 20-year operating period;
- Standardized design elements and construction methods for structures;

- Optimized use of materials to reduce risk and provide significantly greater schedule certainty;
- Design innovation through the competitive process whereby proponents are encouraged to develop the best possible design, reflecting the best-in-class from around the world.

During the construction of the road, FTG will receive performance payments after achieving identified milestones. Once the SFPR is built, FTG will receive annual payments over the 20 year operating period for operations, maintenance and lifecycle replacement of the highway. The Government of Canada has agreed to provide a funding contribution of \$365 million through its Asia Pacific Gateway Corridor Initiative.



APPENDIX D: ACCOUNTING TREATMENT

APPENDIX D: ACCOUNTING TREATMENT

Accounting Considerations

The Public Sector Accounting Board (PSAB) of the Canadian Institute of Chartered Accountants does not directly address the topic of P3s. Accordingly one must review other relevant accounting guidance such as PS 3150 Tangible Capital Assets and PSG-2, Leased Tangible Capital Assets.

Under a typical P3 arrangement, and assuming an availability based regime, the GNWT would enter into a long term contractual arrangement with a private sector entity to deliver priority infrastructure and, some or all, related services. The private partner will be responsible for designing, building, operating and maintaining the infrastructure. The private partner will also provide a component of private financing. Generally, there are three (3) key components to a P3 contract:

- Capital;
- Ongoing operating and routine maintenance; and
- Lifecycle renewals.

Each of the above will be discussed in turn.

Capital Component

The accounting treatment is based on the commercial structure of the project. Once the Project's commercial structure is fully developed the GNWT would need to confirm the appropriate accounting treatment with its auditor.

In a typical availability project (i.e. a project that does not transfer significant demand risk to the private sector) the asset would be recorded as an Asset Under Construction (AUC) as costs are incurred by the GNWT, the GNWT owns the land and any improvements to it and the GNWT is obligated to compensate the private partner for the services rendered.

The value of the assets and associated liabilities are recorded at the Net Present Cost of payments related to the capital component under the terms of the P3 contract. The GNWT will discount the capital component payments using the GNWT's borrowing rate.

When construction is complete and annual or monthly payments commence each payment is broken down into principal and interest portions. Payments would be recorded as a reduction in the liability for the principal portion with the balance being recorded as an interest expense.



Costs incurred to determine the preferred delivery method including the preparation of the business case and project concept development (including conceptual design) will be considered an operating expense and expensed as incurred.

Procurement costs incurred by the GNWT relating to the Request for Qualification, Request for Proposal, contract negotiations, associated consulting services, fairness advisor fees and any honorarium payments to the unsuccessful proponents will be considered direct costs of the project and therefore will be capitalized.

If financial close cannot be achieved using the P3 delivery method, or the GNWT does not enter into a contract for any other reason, the GNWT may pursue traditional delivery methods to deliver the project. In that case, associated procurement costs to date will be expensed in the period the decision to terminate the P3 process is made.

Preliminary and detailed design and construction would begin after the project and delivery method have been approved. Generally a portion of these costs are financed by the private sector and paid by the GNWT over the term of the contract. The GNWT may choose to finance the remaining portion of the upfront capital costs in order to reduce the overall cost of the project. The accounting transaction would be based on the nature of the GNWT's contribution (e.g. land vs. cash) and would be recorded as an Asset Under Construction (AUC). The GNWT does not recognize the interest expense incurred during construction as a capital cost in accordance with the Tangible Capital Cost Directive. At completion of construction, the capital cost, including land, will be fully recognized as an asset with corresponding liabilities. Assets put into service would be capitalized in the appropriate asset category and depreciated in accordance with the TCA directive. Capital construction costs to be depreciated include procurement, design, land servicing, and construction.

P3 associated liabilities are considered long term debt and therefore will be disclosed in the notes to the financial statements in accordance with the PSAB requirement PS 3230 Long-term Debt.

Ongoing Operating & Maintenance Costs

All ongoing annual or monthly service payments related to the operating and maintenance costs are expensed as associated services are rendered.

These contractual agreements are long term and should be disclosed in the notes to the GNWT's annual financial statements.



Lifecycle Renewal Costs

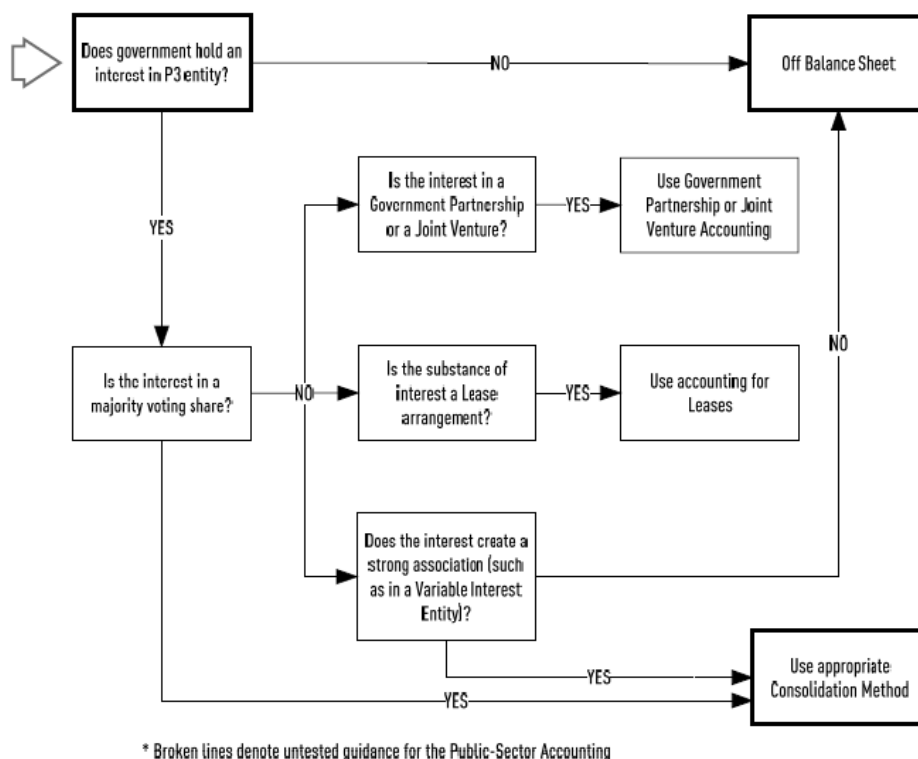
Any amounts owing to the P3 consortium are to be recorded when they become due based on the contractual terms. The nature of the renewal costs would be determined as capital or operating based on the nature of the transaction in accordance with the TCA Directive.

Commitments related to lifecycle costs would be included in the notes to the financial statements.

Debt Limit Impact

Under the P3 arrangements, the capital component of the availability charge is likely to count towards the GNWT's debt limit. The flow chart below illustrates the path to determine whether a P3 should be recorded as an off balance sheet item or within the financial statements of the public participant.

Figure i. An Overview of Accounting for P3s Based on Canadian GAAP¹⁶⁵



¹⁶⁵ Canadian Council for Public-Private Partnerships, *Public Sector Accounting for Public-Private Partnership Transactions in Canada*, July 2008.



APPENDIX E: MARKET SOUNDING RESULTS & PAPER



SOR – Financing Options Study – Slave Geological Province

Market Sounding Summary of Findings

September 2012



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1. Purpose of Market Sounding

PwC/Deton' Cho Stantec has been engaged by Government of North West Territories (GNWT) to develop a Financing Options Study for a Seasonal Overland Road in the Slave Geological Province. Part of the scope of this assignment involved carrying out an initial high-level market sounding for the SOR Project to assess market interest and obtain feedback regarding project specific issues, potential procurement models and overall project attractiveness. The feedback from this exercise will assist GNWT with determining next steps for the project.

2. Key Findings

The market soundings were carried out by PwC during July and August 2012. The participants included a range of companies that have experience in public-private-partnerships as well as companies that have specific experience of construction in the North. All of the participants expressed a strong interest in the project during the market sounding interviews. Key findings from the market sounding exercise are:

- The project is sufficiently large at \$200 million + to attract a field of competition.
- No difficulties in raising the required level of private finance are anticipated.
- The likely debt:equity model is 90:10 but the equity requirements may be a little higher on this project (15%).
- The preferred procurement model would be a Design-Build-Finance-Operate and Maintain (DBFOM).
- As this would be the first PPP project for the GNWT it should consider using a procurement agency such as Partnerships BC to lend credibility to the procurement process from a bidding perspective and to access market-accepted template project documentation. (This would also be a likely condition to receiving PPP Canada funding support).
- Market sounding participants had differing levels of experience of similar projects and working with northern contractors.
- An honorarium would be needed to enhance the attractiveness of the project. A broad range of values were suggested as the project is in its very early stages.

3. Process Undertaken

A range of companies were selected that included companies with public-private –partnership experience along with companies that have specific experience of Northern construction and of working in partnership with First Nations. A long-list of selected companies were contacted and asked to participate in a telephone or in-person interview. Prior to the interview the participants were sent an information package (attached in Appendix A). Interviews were carried out with 9 participants based on the availability of the invitees.

During July and August 2012 PwC carried out a series of interviews. Meeting notes were taken of each interview, and were summarized for inclusion in this report.

4. Market Sounding Participants

The following participants were interviewed as part of the market sounding exercise.

Sponsors
<ul style="list-style-type: none">• Acciona
<ul style="list-style-type: none">• Laing
<ul style="list-style-type: none">• Macquarie
<ul style="list-style-type: none">• SNC Lavalin

Contractors
<ul style="list-style-type: none">• Kiewit
<ul style="list-style-type: none">• Ledcor
<ul style="list-style-type: none">• NCC Dowland
<ul style="list-style-type: none">• Nuna Logistics
<ul style="list-style-type: none">• RTL

5. Detailed Findings

5.1 Experience of Similar Projects

Some of the Sponsors interviewed have Northern roads construction experience in NWT and other territories (Yukon) and where Sponsors did not have this experience they suggested that they would team up with a local partner. Some Sponsors and Contractors have experience of setting up JV's in the North whereas others indicated that they would be bringing the balance sheet strength and experience of managing large projects and would team up with local partners.

The contractors interviewed had a wide range of Northern construction experience. Some of the Northern contractors have ice roads and smaller roads experience but nothing of this scale so they would propose to partner up with other entities to deliver the project. Others have more experience in the mining sector than roads but have relevant experience of construction in similar climates.

5.2 Key Risks and Issues of the Project

The key project issues highlighted by participants were:

Construction Issues

- Ability to source and team up with suitable local contractors.
- Geotechnical risk is significant as it's a long linear project with permafrost issues.
- Supply of aggregates is key for the success of the Project and this was mentioned by several participants as it will impact on the project schedule. The quality and proximity of the source is important as well as the ownership and royalties that may be payable.
- Due to the remote location it may be difficult to accurately assess construction related risks and any construction issues would have an exponential impact on the schedule due largely to weather and limited construction windows.
- Due to the short construction window, schedule could be an issue and therefore it is important to ensure the overall project has an adequate schedule.
- The logistics of getting materials on time will require a proper risk analysis to be carried out and for the contractor to be very organized with a back-up plan for when things go wrong.
- There are fewer contractors and they are smaller so it is more challenging to get a fixed price.
- One participant thought the largest risk is that engineers design something that is not practical especially with regards to earthworks. Good quality control and communication will be key to the success of the project.

Labour Issues

- Finding the right people to go and manage a project in such a remote location may be a challenge. On some Northern projects it has been difficult to find people with appropriate project management experience that are able and willing to relocate for the duration of the project.

- Sourcing labour could be an issue but this could be resolved by involving local people and therefore it would be important to ensure that contractors with local knowledge were involved in the delivery of the project.
- Work hours for Northern people will need to be flexible.

Lifecycle Issues

- It will be important to have local involvement and understanding for the maintenance and on-going care to be successful.
- Getting an operator that would be willing to take risk on rehabilitation over a long-term period could be an issue. A Sponsor said this was proving to be an issue for them on the Iqaluit airport project. However, it is possible that this risk can be retained by the Project Company providing an operator can be found but it does create an issue for equity investors.
- Getting long-term cost certainty on the operations and maintenance would be an issue. There is a perceived challenge of assessing what wear and tear would occur and therefore being able to accurately estimate lifecycle requirements.

Route

- Two contractors suggested other routes are viable and should be considered as they may offer other attributes to communities. They also raised concerns over the viability of the particular road and whether the problems with the existing road would warrant this level of expenditure.

5.3 Experience Working with Northern Contractors

Experience of participants has typically been on engineering, procurement and construction models in the roads sector. Some of the contractors highlighted their training programs and strong relationships with First Nations.

From a Sponsor perspective the experience to date has been limited to responding to the Iqaluit RFQ. However, none of the Sponsor participants viewed this as an issue provided that they could find the right local partner with northern construction experience.

5.4 Working with First Nations and Aboriginal People

Sponsors would set up partnerships with First Nations (and have experience of doing this in other sectors such as transmission and mining). There could be an issue for competition if there is a mandatory requirement for First Nations involvement as there are a limited number of groups to team up with and some of them are inter-related so it can be a challenge to establish whether companies should be exclusive to a particular team or a shared resource.

On the Iqaluit project, participants thought that it would not be possible to get short-listed without having First Nations representation. GNWT would need to consider whether this is an essential requirement and if it is, what impact this may have on levels of competition.

Contractors on the whole have more experience than Sponsors in working and partnering with First Nations groups and would be able to offer long-term opportunities and continuity through the lifecycle on a P3 project.

The First Nations culture needs to be taken into account when determining their involvement in the project. First Nations will want time off for subsistence living activities and this will likely be at the same time as construction is taking place which will make the construction window even shorter.

5.5 Schedule

Some Sponsors felt that they did not know enough about the Project to provide an estimate of the schedule and it would also be somewhat dependent on what has been done to prepare the route. They would need to be able to evaluate contractor and materials resources available to optimize the schedule. Those who specified a likely schedule suggested 2-2.5 years or a 2-3 season job (3-4 years from start of procurement to commencement of operations).

5.6 Procurement Model

If the GNWT wants a road at a specific time for a specific price than a performance related specification in a DBFOM style is beneficial. While it is challenging for contractors it is the best option for the government as it is time and cost certain.

A DBFOM model is considered preferable by the Sponsors as long as the length of the contract term makes sense in the light of the mining operations. However, it may be difficult to establish performance standards given that the long-term usage of the road may not be certain. An availability style project was preferred. This would mean the Territory would have to set out things such as axle loads, types of traffic and volumes of traffic so the bidders can better understand the traffic volumes.

Other options that were considered feasible included a design-bid-build and, provided the risks could be sorted out, a design build may be an option.

One of the northern contractors thought a construction management approach would be best and a DB would also be possible as it is less litigious. A DBB would be very expensive due to the large number of change orders. A P3 was thought to be more expensive than other options as there would be a significant risk premium added in, especially for earthworks.

One Sponsor thought that some revenue sharing risk may be possible (as long as there was a guaranteed minimum). One of the contractors however, felt that there would be no value achieved from trying to transfer any revenue risk to the private sector.

5.7 Length of Contract Term

For a P3, a longer term (ranging from 25-40 years) was considered to be better but the actual length of the term would need to be linked to the lifecycle and financing. However, the length of the term should also be weighed up against the need for flexibility in the future. If there are likely to be changes needed to accommodate future mines or other developments (or changes resulting from a contraction in usage) then a shorter-term may be more appropriate although a shorter-term will be more expensive.

One Contractor suggested a shorter operations period, of no more than 10 years, would make more sense given the likely lifecycle of the road. If a longer life is required the road will cost a lot more to build upfront. A longer term

would mean more political risk of the mines were to close within the life of the project, especially if the GNWT is guaranteeing the payment to the private sector.

5.8 Role in a P3

The table below shows the roles that each participant would have in a P3 project.

Company	Role
Acciona	Equity provider and construction (and possibly operating)
Kiewit	Contractor and equity provider
Laing	Consortium Lead and equity provider
Ledcor	Contractor (and possibly equity provider)
Macquarie	Consortium lead and equity provider
NCC Downland	Construction - supplying equipment, labour, camps and ancillary services (and sometimes equity provider)
Nuna Logistics	Contractor (and possibly equity provider)
RTL	Equity provider, operations, maintenance and lifecycle
SNC Lavalin	All roles including construction, finance, equity provider, operations and maintenance

5.9 Capital Value

A project of \$200M was thought by some Sponsors to be the minimum size required to generate interest in the project. For remote projects larger was considered to be better.

One of the Sponsors suggested that if milestone payments are going to be made then they should not be too large in order to achieve risk transfer to the private sector.

5.10 Honorarium

The timing of the project will determine whether an honorarium is required and the level at which it should be set. Generally participants were of the view that the honorarium would need to be at, or above, market rates to make the project attractive. However, if procurement were to be conducted from a central location then a smaller honorarium may be acceptable. The range of honoraria suggested was \$300k-\$1M. This range is very broad as the project is still at the very early stages.

By the time this project gets to the next stage the Iqaluit airport PPP project will have set a market precedent for the size of the honorarium on a northern PPP project and if GNWT is using a similar external procurement advisor it should be able to provide a similar level of honorarium.

5.11 Private Financing

Raising sufficient private finance was not considered to be an issue by any of the participants especially as the G NWT has a rating.

5.12 Provision of Equity

The required debt:equity ratio will depend on the risk allocation, typically it is 90:10 in P3 projects but this project may require more equity than a standard P3 project (up to 15%).

5.13 Project Attractiveness

Generally the project was considered to be attractive and large enough but participants made the following suggestions to increase project attractiveness:

- Have reasonable risk sharing and do not try to load too much risk on to the developer as the project is small and there are lots of unknowns.
- Carry out local investigations including a geo-technical study. If developers are able to rely on this type of information it will make the project more attractive and less risky for bidders. The owner may need to retain some geotechnical risk particularly permafrost and muskeg.
- Allow greater flexibility around relief events in the contract as there are certain risks that the private sector will not be able to manage and there are limited construction windows.
- Allow sufficient time plus an adequate contingency and develop the project with as much collaboration as possible.
- Ask teams to have local partners but do not make this mandatory as there may be a limited number of firms that have the required experience to team up with.
- Provide a larger honorarium than would be typical to reflect the complexities associated with the location.
- Consider periodic benchmarking and risk sharing for large unanticipated changes.
- Consider some form of bundling with other projects to get critical mass and make the procurement more efficient. The project one Sponsor referred to as offering potential for bundling is MacKenzie Valley Fibre Link.
- Minimize the on-going operations and maintenance requirements so that it will not require too much management time and become too resource intensive.
- Have as many approvals in place as possible from the mines, industry and government and do upfront work on permitting and getting adequate rights of way in place.
- Do not be too prescriptive in order that the competition is fair. If certain JV's are already in place then they may preclude some competition. Select a proponent based upon qualifications and economic bid price.
- The project is considered to be relatively small in overall value terms (when compared to other P3 projects) and given the number of challenges there would be with the project location. The timing of bringing this

project to market is important in order to maximize interest from bidders. If there are other projects in the market at the same time as this one, the SOR would be less attractive given its relatively small size and the remote location. Several participants noted that there are parallels with the Iqaluit airport project which is currently at the Request for Qualification stage. However, despite the reservations of the participants the Iqaluit airport project has attracted significant interest from the P3 market (8 well qualified teams at Request for Qualification stage).

- This would be a new form of procurement for the Territory so having support of an already established procurement agency would ensure better competition and more interest in the project. Use precedent documents that have already been developed and are market accepted.

SOR – Financing Options Study – Slave Geological Province

July 2012

Market Sounding Paper



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Appendices

Appendix A - Questions for Contractors/Sponsors

1. Background and Purpose

1.1 Background to the Project

Deton' Cho Stantec (DCS) and PricewaterhouseCoopers (PwC) LLP have been retained by the Government of the Northwest Territories (GNWT) to provide a high-level report on potential financing options for the construction of a Seasonal Overland Road (SOR) in the Northwest Territories which would include the consideration of potential Public-Private-Partnership (P3) procurement models.

1.2 Purpose of the Market Sounding

The purpose of this market sounding exercise is to:

- communicate at a high-level (given the early stage of the process that the project is at) the needs and requirements of the project to potential contractors and sponsors;
- solicit feedback on what the market may be able to deliver; and
- offer potential market participants the opportunity to provide comments to the GNWT that are relevant to the method of procurement and that can be used to inform the development of any future business case in respect of the project.

1.3 The Market Sounding Process

This paper provides background information to the project. The market soundings are proposed to be carried out by PricewaterhouseCoopers by way of a 30 minute teleconference call per participant.

The proposed questions for the participants are listed in Appendix A to this paper.

Responses to the market sounding provided by participants will be provided to GNWT in a report format and responses will not be attributed to specific participants.

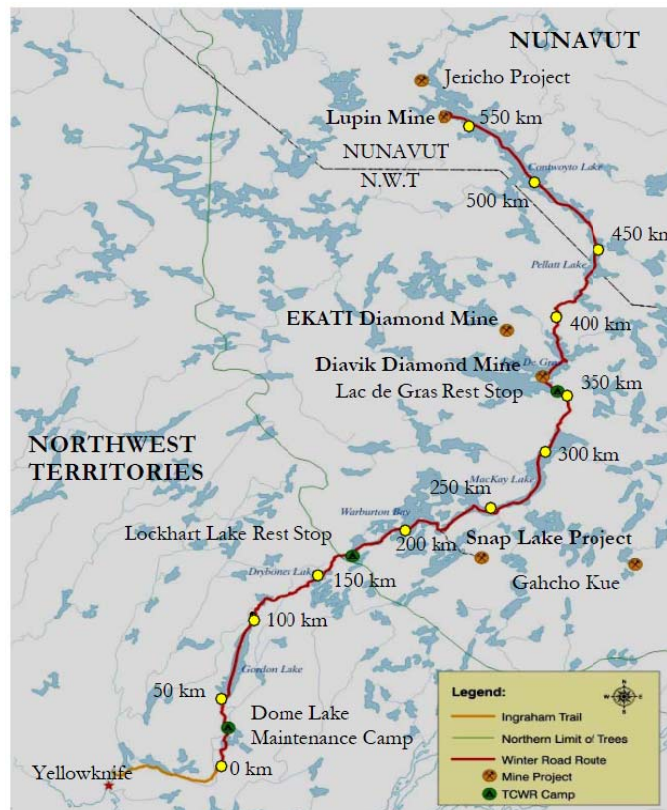
2. Project Background

2.1 Background to the Project

Improving road access to operating mines, mining exploration, and development of the Slave Geological Province (SGP) has been a long standing objective of the mining industry and the GNWT. Enhancing access to the SGP will assist and encourage mineral exploration efforts and provide economic development opportunities for tourism operators and other developments. In an effort to provide this improved road access, the GNWT is undertaking a high-level financing options study to understand the economic viability of a Seasonal Overland Road (SOR) to the SGP in order to determine next steps for the project.

Over the past 28 years, a 600km winter road has been constructed annually to allow the NWT mine operators to truck in supplies essential for operations. This Tibbitt to Contwoyto winter road (TCWR) begins at Tibbitt Lake at the end of Highway 4 about 60 kilometres (36 miles) east of Yellowknife. The road continues north and links three (3) operating diamond mines. It is managed by the Tibbitt to Contwoyto Winter Road Joint Venture (WRJV), a consortium representing BHP Billiton Diamonds Inc., Diavik Diamond Mines Inc. and DeBeers Canada Inc.

2.2 Current Location map for Tibbitt to Contwoyto Winter Road¹

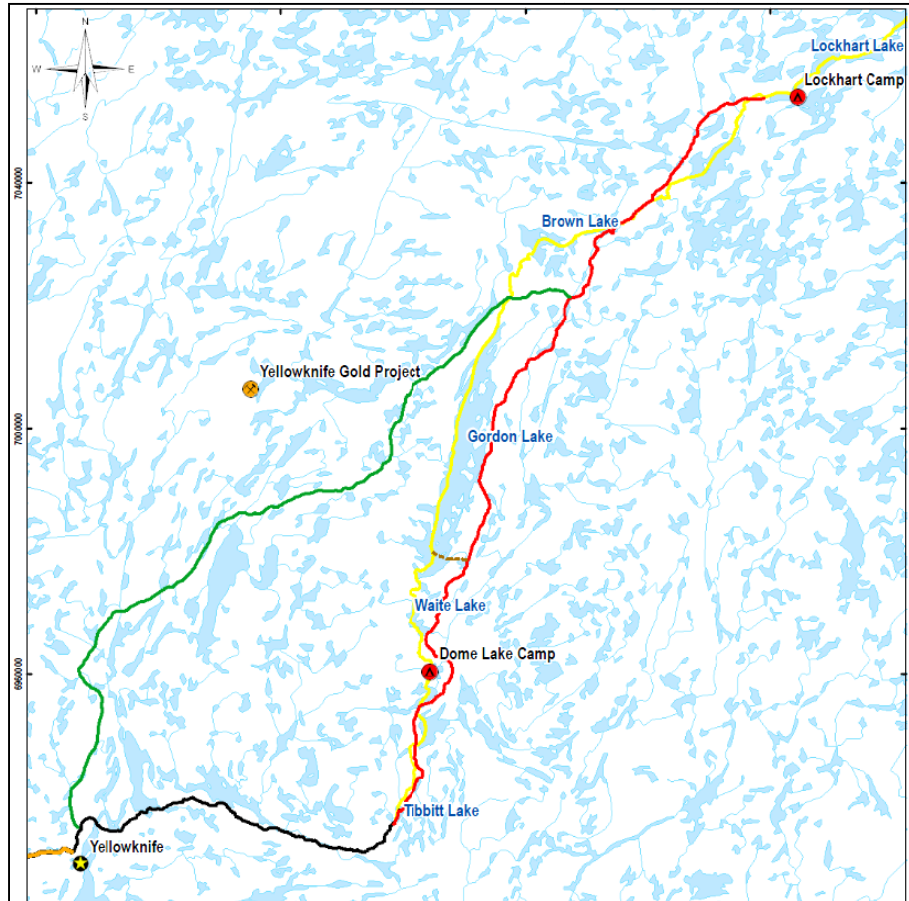


¹ Tibbitt to Contwoyto Winter Road Joint Venture Fact Poster, 2012.

2.3 Project Scope

2.3.1 Proposed Location²

The map below illustrates the location for the proposed SOR in red. Because it would be constructed primarily over land, the path of the SOR differs from the current winter road (in yellow). As shown, the proposed 156km SOR would run from Tibbitt Lake to Lockhart Lake.



2.3.2 Project Summary

- *Proposed project:* The proposed project currently being considered by GNWT is a 156 kilometre Seasonal Overland Road (SOR) from Tibbitt Lake to Lockhart Lake.
- *Estimated capital costs:* The estimated capital cost is \$200 million (in 2006 \$). This estimate was provided by EBA Engineering Consultants Ltd. This estimate does not include any allowance for risk, for escalation from the original cost estimates in 2006 or any financing costs.
- *Project Scope:* The private sector will be responsible for the design, construction, operations, maintenance and rehabilitation and partial finance of the road (a DBFOM procurement model).

² Tibbitt to Contwoyto Winter Road Joint Venture Fact Poster, 2012.

- *Funding of the Project:* GNWT has had initial discussions with PPP Canada with respect to potential funding support and may make an application to PPP Canada in future funding rounds (Round 5 or later).
- *Funding Guarantee:* It is intended that the GNWT would be the entity that would enter into a contract directly with the selected proponent and would therefore be acting as guarantor for the availability payment for the term of the Concession.
- *Revenue risk:* Tolls may be levied on users but it is not intended that this risk would be passed to proponents. GNWT would retain the responsibility for setting and collecting toll revenues.

2.3.3 Potential Users and Stakeholders

This section lists the potential users and stakeholders for the proposed road.

Current Users

- Rio Tinto – Diavik Mine
- BHP Billiton – Ekati Mine
- DeBeers Canada, Snap Lake Mine, Gacho Kue proposed mine (in regulatory process)

Prospective Users

- MMG Resources – Izok Lake Mine
- Seabridge Gold – Courageous Lake Project
- Tyhee Resources – Yellowknife Gold Project
- Shear Diamonds – Jericho Project

Others

- NWT-Nunavut Chamber of Mines
- NWT Motor Transport Association
- Nuna Logistics
- RTL
- Yellowknives Dene First Nation
- North Slave Metis Alliance
- Tlicho Landtran
- NorthwesTel
- Northwest Territories Power Corporation
- NWT Construction Association
- Tibbitt to Contwoyto Winter Road Joint Venture (WRJV)

2.3.4 Considerations for the Project

- Remote location
 - Short construction window
 - Difficulty of scheduling construction
 - Logistics and cost of transporting materials (getting materials to site)
 - Limited availability of labour
 - Limited housing capacity
 - Limited storage capacity
 - Complex construction methods
 - Flexibility to incorporate changing requirements for space usage
 - Need to incorporate new technologies for energy efficiency
- Need to be green, minimize environmental footprint and O&M as much as possible
- Integrate facility with the community, ensure positive relationship with community

2.3.5 Market Sounding Contact

PricewaterhouseCoopers

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Appendix A

Questions for Contractors/Sponsors

Project Specific Issues

1. What is your experience, if any, of building similar projects in the NWT?
2. Given some of the considerations for the projects listed on page 5, what do you see are the key issues/risks with this project? How could these risks be mitigated?
3. How would you propose to maximize Northern and First Nation participation (e.g. local involvement initiatives) in the project both during the construction phase and the long-term operations, maintenance and rehabilitation phase?
4. What is your previous experience of working with Northern contractors?
5. Given your understanding of the project, approximately how long would it take to construct?

Procurement Model

1. What procurement model(s) do you think is applicable for this project and why (DB, DBB, DBFO, DBFOM etc)?
2. What would you consider to be the optimal length of the contract term and why?
3. What role would you play if this project were procured as a P3 e.g. subcontractor/equity provider/other?
4. What capital value does the project need to be to make it viable for consideration under an alternative procurement model (e.g. DBFOM)?
5. Would an honorarium make this project more attractive? If so, how much would the honorarium need to be?
6. Do you anticipate any difficulties in raising sufficient private finance to undertake the project?
7. What degree of private finance do you anticipate will be needed in the form of equity?

Project Attractiveness

1. Is this project sufficiently attractive to bid in terms of a P3 delivery model with respect to :
 - a. Project size
 - b. Remote location
 - c. Length of time to complete/ approvals, required construction method
2. Given your preliminary understanding of the proposed SOR how attractive would this opportunity be compared with other competing projects that may be in the market at the same time?
3. What can GNWT do to increase the attractiveness of the project for bidders using a public-private-partnership procurement model (Example: are there any risks specific to the location that may impact on the project's attractiveness as a P3 and that the GNWT should consider retaining, additional relief events needed for weather, larger honorarium to reflect higher bidding costs etc)?