

The Mackenzie Valley Pipeline

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Introduction

The Mackenzie Valley Pipeline is a CDN \$7 billion dollar natural gas pipeline project¹. This is equivalent to roughly US \$5.65 billion at an exchange rate of 0.8078. It is slated to run 1220 Km through the Northwest Territories, down to Alberta, where it would connect to existing pipeline system in north western Alberta for further distribution. It is estimated that it will have operating costs of approximately \$62 million a year in 2003 dollars (CDN)² for its first five years of operation (2010-2015). Imperial Oil of Canada will administer the pipeline on behalf of the project participants.

The companies involved in the natural gas production for this project are associated primarily with three discovered natural gas fields in the Mackenzie delta-Taglu, Parsons Lake and Niglintgak. These fields could together supply 800 million cubic feet per day of natural gas. These companies who hold the rights to the gas fields are Imperial Oil, ExxonMobil, ConocoPhillips, and Shell Canada³.

The natural gas supplying this pipeline would be sourced out of a variety of northern sources, mostly based off of the Mackenzie Delta. The pipeline would have a transmission capacity of 1.2 Bcf a day of natural gas, and a parallel line would transport gas hydrates. This number could be increased to 1.9 Bcf a day with additional compressor units⁴. This pipeline was initially proposed and granted permits in the late

¹ Lowey, Mark. Northern pipeline challenges mount, Business Edge. Vol 4, No. 41, November 18,2004.

² www.mackenziegasproject.com/theProject/regulatoryProcess/applicationSubmission/Documents/MGP_CP_CN_Vol1_Set_2_S.pdf, February 11, 2005.

³ www.mackenziegasproject.com, January 10, 2005.

⁴ Lowey, Mark. Northern pipeline challenges mount, Business Edge. Vol 4, No. 41, November 18,2004.

1970's during the energy crisis of the time. Work was never completed on the line due to changes in the market situation, but the permits are still held by TransCanada Pipelines⁵. There has been a resurgence in interest in the project based on the increasing demand for natural gas as an energy source and the declining stocks in current conventional deposits on the North American mainland. It has been estimated that between 2002-2010, there will be a 17% growth in demand for natural gas. This amounts to an 11.5 Bcf/ day increase in the market demand⁶. TransCanada Pipelines estimates that by 2012, the demand increase (versus present) will be around 15 Bcf/ day, with traditional North American production only increasing by 5 Bcf/ day⁷. The National Energy Board estimates that there is 64 Tcf of natural gas in the North which could potentially utilize the pipeline for transportation. This number includes both currently known fields as well as the expected future discoveries.

TransCanada Pipelines acquired the permits for the pipeline by taking over the Foothills Pipelines who were the original holders in the late 1970's. TransCanada Pipelines is also the holder of the permits for the Alaska pipeline through its subsidiary, the Alaskan Northwest Natural Gas Transportation Company⁸. Currently, Enbridge Pipelines has tried to mount a series of challenges to have TransCanada Pipelines' permits revoked as being out of date so that they could potentially acquire the rights if bidding were started anew for the project.

⁵ www.transcanada.com/company/position.html, January 24, 2005.

⁶ www.mackenziegasproject.com/theProject/whyNow/markets/markets.html, January 24, 2005

⁷ www.transcanada.com/news/2003_news/2003_06_10.html, February 7, 2005.

⁸ www.transcanada.com/company/position.html, January 24, 2005.

Alternatives

The Alaska Pipeline

The proposed Alaska pipeline is estimated to cost roughly CDN \$20 billion (US \$16.16 billion)⁹. This is a higher cost than the proposed Mackenzie pipeline and has a number of stumbling blocks of its own. It also has a later estimated date for possible completion, somewhere around 2014 by optimistic estimates¹⁰. It connects to a different set of deposits than the Mackenzie Valley Pipeline, as the Alaska line is intended to allow for shipment of the Prudhoe Bay gas. There have been suggestions that a smaller pipeline could be built between the Prudhoe Bay fields and the Mackenzie delta, to allow both deposits to be distributed through one pipeline. This initiative would have a number of difficulties which would have to be surmounted in its environmental impact mitigation before it would be allowed. The Alaskan natural gas reserves are calculated to be at least 35Tcf¹¹.

Liquid Natural Gas

Liquid natural gas has discussed as a potential solution to America's natural gas situation. This system uses tanker ships to transport liquefied natural gas under pressure and at low temperatures from the point of production to a delivery terminal. This allows for transportation from any area of the world, with less need for pipelines, which would only be needed to deliver the gas to the shipment point, and for distribution from the terminal. This allows for transportation from areas of the world which is not normally able to transport natural gas to the American market. This means that transportation from areas like Russia would be feasible, as well as potential to transport resources from the

⁹ Lowey, Mark. Northern pipeline challenges mount, Business Edge. Vol 4, No. 41, November 18, 2004.

¹⁰ Ibid.

¹¹ www.ngsa.org/docs/NGSA_position_on_Alaska_and_LNG2.pdf, January 15, 2005.

Arctic fields. Much of the downside associated with this technology is the volatility of the compound and the danger to public safety which could be associated with transportation and storage of the compound.

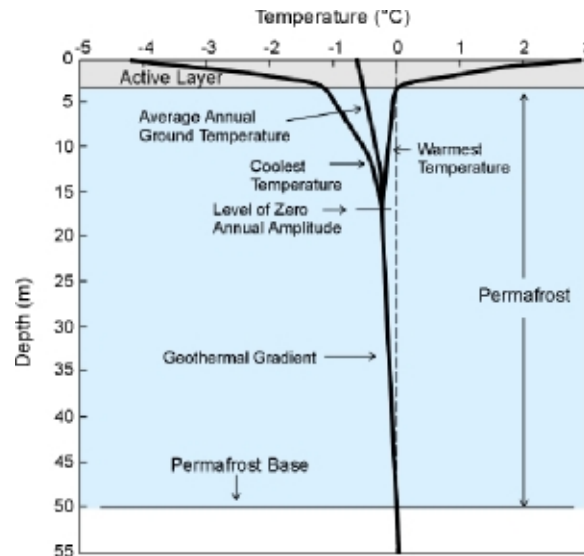
Issues

There are a variety of issues which must be considered when examining the Mackenzie Valley Pipeline. They fall largely into three broad categories. There are technical issues and considerations. These are technological and environmental challenges relating to the unique conditions of the region and potential solutions to them. There are socio-economic considerations. These relate to the economic benefits of the projects and the potential social impacts on communities. Finally, there are a variety of legal issues. These issues take a variety of forms. There are issues of regulation and jurisdiction. First Nations considerations play a large role in the future of the project. And there are potential environmental challenges which must be addressed as well.

Environmental and Technological

In the Arctic, projects are often characterized by the manner in which they deal with environmental challenges. There are many environmental considerations which must be made in association with the pipeline, both environmental impacts and challenges associated with a variety of conditions. These issues are considered most fully in the environmental impact assessments which companies must complete before moving forward with a project. These analyses will be quite comprehensive in looking at environmental phenomenon (e.g. permafrost, discussed below), and potential impacts of flora and fauna in the region.

One of the challenges associated with working in the northern areas of Canada is permafrost. Permafrost is a condition where ground remains permanently frozen year round below an active layer¹². We will discuss this in detail, as it will be less familiar to most people than discussions of environmental impacts on plants and animals.



<http://sts.gsc.nrcan.gc.ca/permafrost/whatis.html>, January 28, 2005.

This phenomenon is highly susceptible to impact from activities which would be associated with the pipeline. Should the pipe radiate heat, there would damage to the permafrost, which would become an issue of stability for the terrain, and the pipeline. Frost heave is an issue for pipelines¹³. The melting and refreezing of ice causes shifting in the ground. While the actual distances involved are not large, the effects on a pipeline can lead to breakages. The effects are worse if the pipeline has been anchored in place.

There are technological counters to many of the problems associated with the unique environmental aspects of the northern environment. The counters are often made using a variety of materials and designs for construction of the pipeline. These

¹² <http://sts.gsc.nrcan.gc.ca/permafrost/whatis.html>, January 28, 2005.

¹³

www.mackenziegasproject.com/theProject/regulatoryProcess/applicationSubmission/Documents/MGP_CP_CN_Vol1_Set_2_S.pdf, February 11, 2005.

techniques are used to attempt to minimize the environmental impacts and ensure reliable operations continue. There are always questions of environmental impacts, and those are currently handled through a succession of assessments made by the companies involved, in association with environmental boards and groups in the affected regions.

Logistical Challenges

Another factor which must be understood is the logistical issues involved with constructing the pipeline. Construction of major projects in northern areas of Canada is usually undertaken during the winter. This is due primarily to transportation requirements. Winter roads are the normal format for many northern areas. These roads are solid while frozen, and vehicles and equipment can be moved in regular fashion. But as temperatures increase, the road will become softer, and transportation of heavier equipment and materials will become untenable. This gives only a limited time scale in a year in which work can be most efficiently carried out. As a result, there would be a smaller working window during any given year, and there would be significant amounts of work done during those times. This would have the effect of condensing the time of construction of the project. In doing so, the construction would be more likely to use a higher proportion of workers who do not live in the area, and would not provide year round employment for many of the people who live in the area. Training for those who were employed would be valuable, and could lead to later opportunities within the industry. The remoteness of the terrain would also be challenging since the population centers are neither extensive nor concentrated. As a consequence of this, the majority of workers would be based out of work camps, with the supply chain being mostly a

function of bringing in goods and people from further south in Canada instead of being able to use local sources.

Economic

One point which must be made when discussing natural resource deposits is the difference in resource in place and recoverable resource. The amount of the resource in place is always greater than the level of the resource which can be recovered with today's methods and technologies. The amount of the resource which is deemed to be recoverable forms the basis of the reserves estimate for a site.

Gas which is shipped from the north will have a variety of potential end destinations. The pipeline linkages in Alberta provide access to the transportation systems necessary to move the gas anywhere in North America. There are a variety of different spot prices which could be used to calculate gas prices depending on the HUB that the gas was intended for, although it will more likely be based off of a standard, such as the Henry HUB.

There has also been some comment regarding the amount of the gas flowing from the pipeline which may be utilized by Alberta's growing tar sands developments¹⁴. If the pipeline were completed, it has been estimated that it would spur the development of \$60 billion in oil sands projects¹⁵. Natural gas is used in both mining and in situ recovery of oil from the tar sands. For in situ recovery, natural gas is the most common fuel used to generate the steam which is used in almost all projects. Mining operations utilize the gas both as fuel, but also as a source of hydrogen in newer operations for the formation of synthetic oil. While these concerns are certainly valid as to the level of natural gas which

¹⁴ www.eia.doe.gov/emeu/perfpro/ch4sec4.html, January 17, 2005.

¹⁵ Lowey, Mark. Northern pipeline challenges mount, Business Edge. Vol 4, No. 41, November 18, 2004.

would be available to the US, there would likely be more than if no pipeline was built at all. Also, the production from tar sands operations would likely be flowing to the US as well, so the gas would still be being used for a product which is beneficial to the US.

Financial

Each group with an interest in the pipeline is expected to provide its share of project expenses. These groups will each use their own capital structures to finance the project. There is no overall project financing¹⁶. For example, the Aboriginal Pipeline Group is being loaned \$80 million dollars by TransCanada Pipelines to enable their buy in on the project. This loan is expected to be repaid through the revenues generated by operation of the pipeline. The Aboriginal Pipeline Group was created to represent the interests of the First Nations in the Northwest Territories in the Mackenzie Valley Pipeline¹⁷.

Table 1 Participants and their Pre-Development Interest

Owner	Pre-Development Participating Interest (%)
Imperial Oil Ltd.	34.2
Mackenzie Valley Aboriginal Pipeline Limited Partnership	33.3
Conoco-Phillips Canada (North) Limited	16
Shell Canada Limited	11.2
ExxonMobil Canada Properties	5.3

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www.mackenziegasproject.com/theProject/regulatoryProcess/applicationSubmission/Documents/MGP_CP_CN_Vol2_Section_3_S.pdf, February 11, 2005.

¹⁷ www.aboriginalpipeline.ca, February 12, 2005.

The operation of the pipeline would bring the natural gas resources of the north into production for the benefit of the North American market. The producers of the gas will earn their profits through the sale of the gas directly, or for integrated producers, through the sale of the products which can be produced from the gas. The owners/operators of the pipeline will earn their money through tolls paid for the transportation of the resources through the pipeline¹⁸. These fees will often be negotiated with producers in advance. A certain shipping charge for a certain minimum level of product shipped. Excess production could be shipped at a spot rate depending on volume and capacity, but most of the early deals will be fairly long term to try to ensure that the pipeline begins to return a profit in short order. The shipping charges are an important factor to consider, as high shipping charges may decrease the appeal of gas production in the north if the prices decrease significantly in the long term.

Social

The size of the project means that there are a number of potential impacts that it could have on the regions where it will pass through. There are numerous potential benefits to the region. There will be added infrastructure in some areas to allow for greater ease in supplying the building and maintenance of the pipeline. This infrastructure could be a substantial boon to communities living in the region. Such infrastructure is often outside the budgetary constraints of small communities in the north.

It is also important to notice the difference between the man years of work the project requires, and the time it will take to build to project. Roughly 11,000 man years of labour are expected to be required to build the pipeline. It is expected that the pipeline

¹⁸ Ibid.

will create around 2600 jobs at its peak¹⁹. The pipeline is expected to come online in 2010. Due to the low density of population throughout the region, much of the labour and expertise will be brought in from elsewhere. While there will still be opportunities for local residents, the end of construction will mean that many of the regional inhabitants will have to seek out work elsewhere, in the new fields they have acquired expertise in, or revert to their previous employment. Some full time jobs will be generated by the need to monitor and maintain the pipeline, and these will be beneficial to the communities beyond the construction phase.

Legal

The proposed project would require several permits and approvals to be able to start the project. The regulatory process would require cooperation from the various regulatory agencies in order to speed up this process and make it more effective and efficient. Only after obtaining these approvals and analyzing the conditions imposed on them can the proponents of the project decide whether to proceed with project or not. The Mackenzie Gas Project requires approvals from federal, territorial, provincial and settlement area regulatory authorities responsible for assessing and regulating energy developments in the area. This is because of the fact the proposed pipeline project encompasses several territorial regions and jurisdictions during its course. The main regulatory agencies include National Energy Board, Mackenzie Valley Environmental Impact Review Board, Northwest Territories Water Board, Indian and North Affairs

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www.mackenziegasproject.com/theProject/regulatoryProcess/applicationSubmission/Documents/MGP_CP_CN_Vol1_Set_2_S.pdf, February 11, 2005.

Canada, Inuvialuit Region Environmental Screening and Reviews Board and Canadian Environmental Assessment Agency.

In October 2004, the project proponents filed applications for the construction of gas and natural-gas liquids gathering system pipeline, application for a Certificate of Public Convenience and Necessity for Mackenzie Valley pipeline, and three development plan applications for the anchor fields with the NEB. These applications were also supported by an Environmental Impact Statement (EIS)²⁰, which assess the potential socio-economic and environmental impacts of all components of the proposed development.

The joint review panel for the Mackenzie Gas Project has identified some serious gaps in the EIS submitted by the proponents. In their letter²¹ to the proponents the panel has asked to submit the detailed EIS as requested by the interveners, without which the panel would not be able to proceed with the hearing. This could potentially increase the time required to complete the review process and thus affect the project timeline.

The Environmental and Regulatory Review Process

The environmental and regulatory review process as explained above will be carried out by various regulatory boards and agencies.

A joint review panel hearing is currently underway. The Panel was appointed on August 18, 2004 by the Minister of the Environment, in agreement with the Chairs of both the Mackenzie Valley Environmental Impact Review Board and the Inuvialuit Game

²⁰ The EIS is a detailed report that explains how scientists, northern people and communities think the Mackenzie Gas Project might affect the people and land of the Mackenzie Delta and Valley. The information is intended to help regulatory agencies decide if the Project should go ahead, and if so, under what conditions.

²¹ http://www.ngps.nt.ca/Upload/Joint%20Review%20Panel/JRP_to_Martin_Feb_3_2005.PDF, February 12, 2005.

Council, the parties with legislated environmental assessment responsibilities along the proposed project route. The Panel will work to fulfill the environmental impact assessment responsibilities of the land claims agreements, as well as federal legislation.

The following shows the four main steps of the regulatory process for the Mackenzie Gas Project. The first two steps have already been completed.

Step One: Preparation (Completed)	Step Two: Preliminary Information Package (PIP) and Trigger Applications (Completed)	Step Three: A Joint Review Panel Hearing and Coordinated Regulatory Panel Hearings	Step Four: Completion of the Regulatory Process
2001-2003	2003	2004-2005	
Regulatory agencies develop a common understanding and approach to evaluate proposals to build a pipeline. The regulatory Cooperation Plan is developed.	Regulatory agencies review the PIP and trigger applications. All agencies evaluate the proposed project and determine a potential exists for environmental impact or public concern. As a result, the project is referred to the Joint Review Panel for an environmental impact assessment.	Major regulatory applications for most parts of the project are submitted by the proponents in October 2004 Public hearings are held to listen to the views of the public about the possible impacts of the project. The public has an opportunity to voice any concerns and to influence the project.	If regulatory approvals are given for the pipeline project, licences and permits will be issued that outline the conditions to be met. Project proponents will make a decision whether to proceed with construction.

Source: <http://www.mackenziegasproject.com>

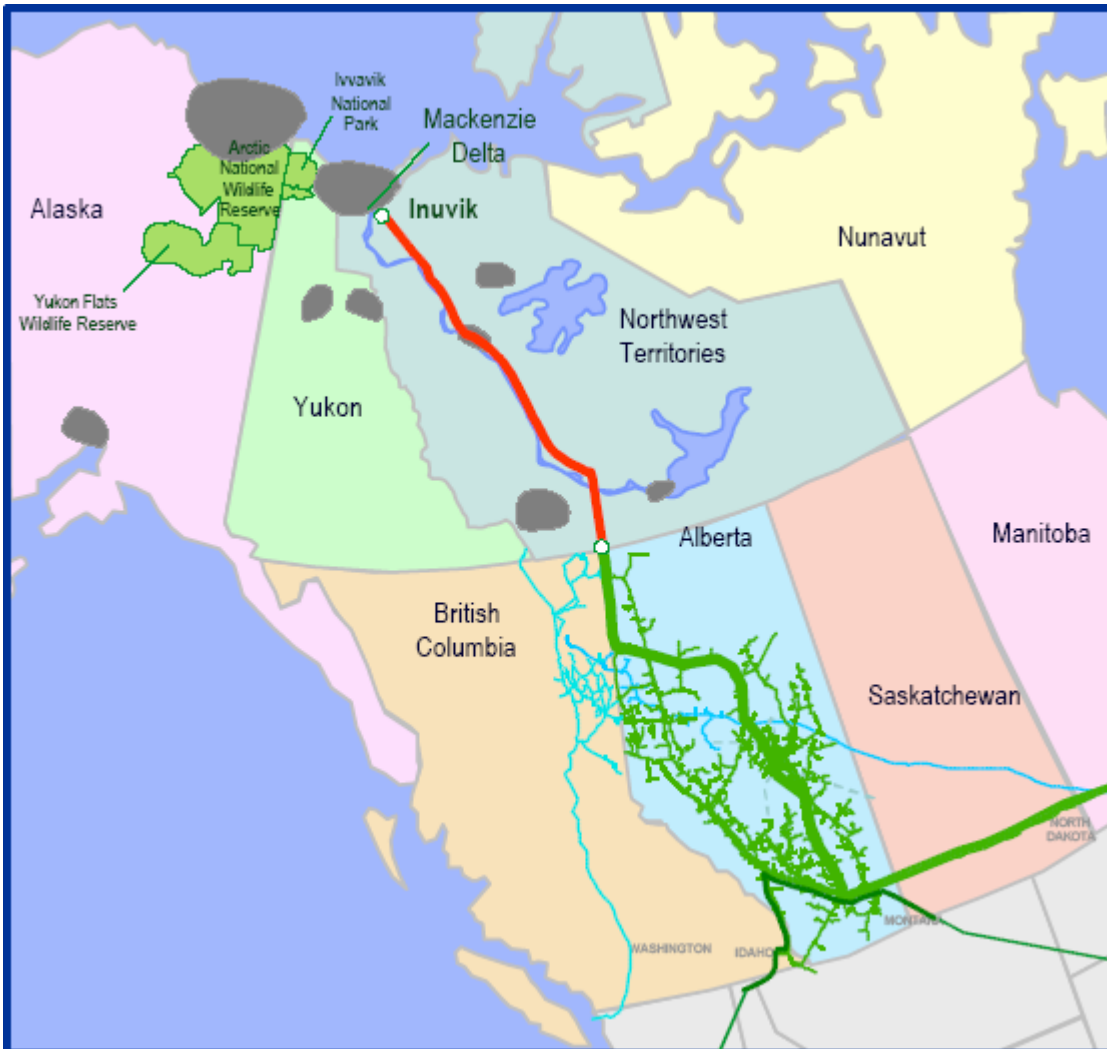


Figure 1 Mackenzie Pipeline Project

<http://www.pnwr.org/meetings/Winter2003/Presentations/tonypalmerpanel4.pdf>, February 5, 2005. (There are lot of other figures in here)

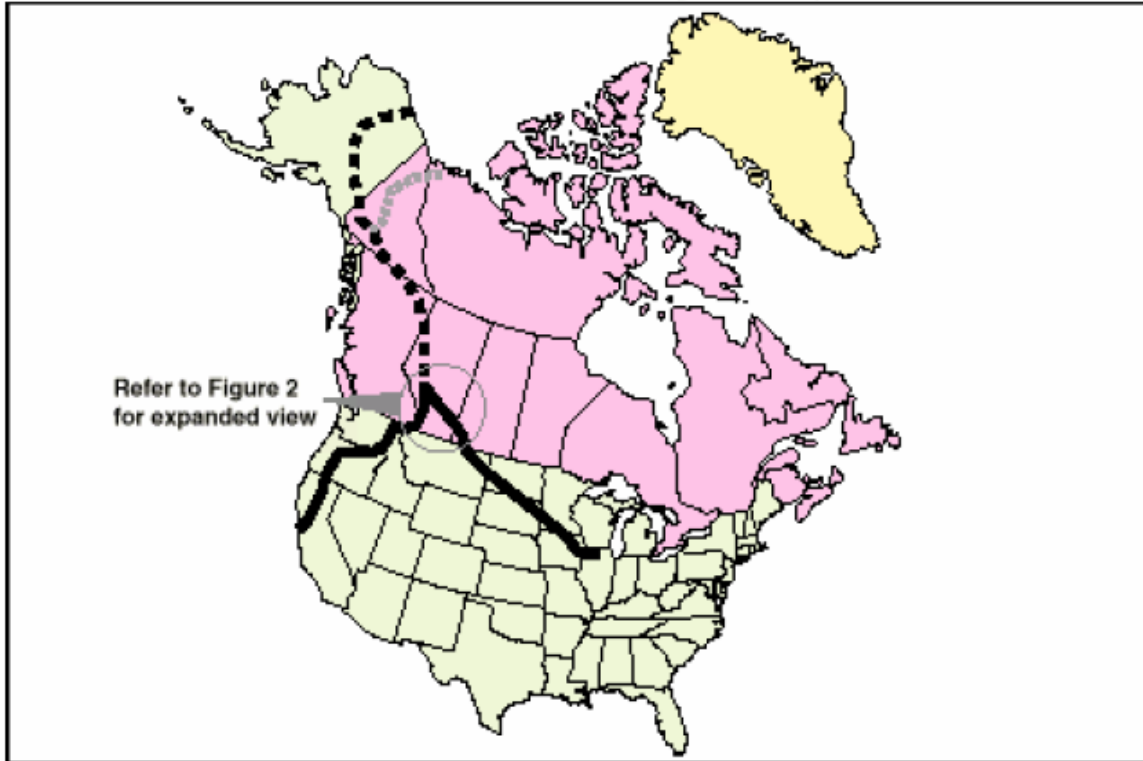


Figure 2 The Alaska Natural Gas Transportation System

NPA

In 1977, following extensive regulatory hearings in both countries, the Governments of Canada and the USA executed an "Agreement on Principles Applicable to a Northern Natural Gas Pipeline." This agreement provided the framework for the construction and operation of the ANGTS (Alaska Natural Gas Transportation System), a pipeline mega-project capable of transporting Alaskan and northern Canadian natural gas to southern markets in the United States and Canada.

In 1978, the Canadian Parliament enacted the *Northern Pipeline Act* to give effect to the agreement as well as to establish the Northern Pipeline Agency to oversee the planning and construction of the Canadian portion of the project by Foothills Pipe Lines Ltd. Under the Act a CPCN was issued to Foothills Pipe Lines (Alta.) Ltd which is

currently owned by Trans Canada. However, unfavorable economics lead to an indefinite delay in the completion of the project.

With recent high gas prices both ANGTS as well as Mackenzie projects have become economically feasible. As a result, TransCanada in a recent announcement expressed its intention to build at least the Canadian portion of the line, using the right of way and environmental permits in obtained under the 25 year old NPA.

However, the Alaska producers group, which includes BP, Exxon Mobil and Conoco-Philips, do not favor proceeding with the pipeline under the NPA. They fear that this could open up the project for legal challenges as it has substantially changed during the last 25 years and may lead to more complex regulatory processes.

The big question now facing this project is that whether the market or the 25 year old legislation should decide who builds the pipeline and through which regulatory course.

First Nation Issue

The Deh Cho First Nation is a tribal council representing 13 Dene and Metis communities in the North West Territories, with lands comprising roughly 40 per cent of the land the proposed Mackenzie Valley pipeline would cross. They are one of the several aboriginal groups living in the valley but the community still does not have a comprehensive lands claim agreement with the federal government.

The Deh Cho First Nations are unhappy for not been represented in the cooperative plan and review process. The Deh Cho are also unhappy that the Sahtu, Gwich'in and Inuvialuit of the Mackenzie Delta were able to pick their own representatives on the panel because they have land claim settlements dating back to the 1980s.

The Deh Cho's are now asking the court to issue a permanent injunction to stop the joint review panel from reviewing the pipeline applications. Talks for an out of court of settlement have been stalled as they want to have a new permitting agency with their group having the final control over the development. The Deh Cho doesn't want to be governed by the Mackenzie Valley Land and Water Board, as they want the final say on any development on their claimed land²².

This is the second legal action filed by the Deh Cho and it's more specific than their statement of claim made earlier. This was done just a week before the application for regulatory approvals was to be filed. In the process, the Deh Cho also alleged that some of the seven members on the review panel have publicly expressed their support for the pipeline, thus undermining the panel's supposed impartiality.

These issues if not resolved soon could drag the process of getting the approvals for the project longer than expected, during which time the window of opportunity might be lost.

Conclusions

Based on the information presented in the paper, it can be seen that the Mackenzie Gas Pipeline is a project which has many detailed aspects which are unconventional in nature as opposed to most gas pipelines. These issues include the unique area which the pipeline will pass through. This area requires engineering innovations, and environmental sensitivity as well as a unique legal and social understanding to be reached with the residents of the region.

²² Weber, Bob. Land Claim may kill Arctic gas pipeline. Edmonton Journal, February 10, 2005

But the rewards of the project are now visible to all participants in the process. The scale of the available resource in Canada's Arctic, combined with the growing demand for natural gas has made the project potentially beneficial to all involved.

A Brief Project Timeline

1974-1978 - Energy crisis

- Search for alternate fuel sources
- Original applications and permits for Mackenzie Valley Pipeline
- Crisis Ends, Pipeline not economically feasible

1980's & 90's – TransCanada maintained interest in project, and updated plans with time

-Increasing gas prices and decreasing conventional resources lead to renewed interest in the project and in northern gas

2001 - Cooperative planning begins

2001-2003 - Information and impact assessment generated

2004 - Application filed on October 7

2005 - Estimated completion of joint review panel

2006 - Estimated commencement of construction

2009 - Estimated completion of construction

2010 - Estimated commencement of operations