



DIAVIK – THE ART OF THE POSSIBLE

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The Diavik Diamond Mine was built on a solid foundation of local and aboriginal community consultation and benefits. Through a number of “out of the box” approaches, Diavik developed innovative ways to contribute to local community capacity and enhanced community transparency. When combined with its high regard to environmental protection and excellence in engineering and technology, Diavik is meeting its own stringent sustainable development objectives.

Introduction

Let me begin with apologies to Otto von Bismarck, for modifying his famous quote in the title of my paper. Of course, the German Chancellor was quoted as saying that *politics* is the art of the possible. But, given the high level of politics that large projects like Diavik attract today, perhaps the reference is not out of line.

However, I selected this title to highlight the results of “out of the box” thinking taken by our company, Diavik Diamond Mines Inc. in developing, constructing, and now operating the Diavik Diamond Mine in Canada’s north. I particularly wish to highlight our work with local and largely aboriginal communities, where Diavik’s approach has not been the norm in the mining industry.

I would like to acknowledge our partner, Aber Diamond Corporation, who in its original form as the small Canadian junior exploration company, Aber Resources Ltd. staked the key Diavik mineral claims. Today that company is its own symbol of the “art of the possible”, having grown itself into a world class diamond company, with an innovative partnership with Tiffany & Co. and most recently having acquired the well-known international company, Harry Winston, “jeweller to the stars”.

I would also be remiss if I didn’t acknowledge the work of our neighbours, BHP Billiton Diamonds, who built Canada’s first diamond mine. They were there first, and as any northern outdoorsman knows, one is grateful to the trailbreaker.

Now, with my employment bias, let me highlight the work of our little company, with its lofty goal to build Canada’s premier diamond mine.

The Historical Context

It is helpful to the Diavik story to understand the historical context of community involvement. From this perspective, one might categorize mining’s history into three phases:

- Phase 1 – some aboriginal community involvement as newcomers seek residents’ assistance

- Phase 2 – little aboriginal community involvement as outsiders are imported
- Phase 3 – Aboriginal communities finally become active participants in mining.

Mining in the NWT began in the early 1930s, with the development of a radium deposit at Great Bear Lake. The deposit had high value, and similar to diamonds attracted much interest despite its remoteness. It was followed quickly with the discovery and development of gold deposits at the newly formed community of Yellowknife.

From a local communities perspective, this early stage of mining and exploration is marked by small numbers of newcomers working in a forbidding land, and relying on local, aboriginal residents to provide meat, cut wood and provide labour.

After World War Two, Canada began to push back its frontiers using natural resources as an engine of growth. The construction of roads, airports, hydropower and community infrastructure accelerated development. A wave of settlement by “outsiders” – many of them new immigrants – marked this stage of development. While there were some early attempts to train and employ local community residents in the mines (Rankin Nickel, Pine Point, Nanisivik), success did not come easily and Aboriginal residents received few benefits from mining.

In the early 1980s, a new practise – commuter mining – added to the local employment challenge. Companies found the economics more attractive to construct temporary mining camps and to fly workers to and from their homes on work rotations. While this spared the cost of closing mining towns when resources were depleted, the consequences to northern residents were not overly positive. Trained and experienced mine workers could simply be flown in from other jurisdictions using efficient jet aircraft. As the workers flew overhead they took their pay with them. Local economic development suffered, as did the opportunity for capacity building that mining could have provided.

It would not be until the late 1980s that the first hint of change was felt.

The proponent of a very low-grade gold mine called Colomac northwest of Yellowknife promised to hire 25% of her workforce from the Dogrib (Tli Cho) region. New jobs were an exciting proposition for many Dogrib, but unfortunately, the mine was short lived and opportunity was as quickly gone. But Colomac was the first hint of the art of the possible, the possibility that local aboriginal communities could become active participants in resource development in their own back yards.

The third stage of community participation in mining in the NWT, one in which local aboriginal communities would finally benefit significantly, would begin in earnest in the early 1990s with the new diamond mines.

Perspective of Mining Poor But Pragmatic

It is little surprise that after 50 years experience with mining companies, local communities were somewhat distrustful of mining developers. Aboriginal residents had received few benefits from them, and environmental legacies of some early developers helped confirm communities' poor opinion.

However, community leaders were also in a dilemma. For a variety of reasons, community life was changing, and for the worse.

Unemployment in the aboriginal communities was reaching crisis proportions.

Environmental groups had virtually killed the fur trade, a major source of community income and employment. Job opportunities were already limited to largely government jobs, of which there were not many, or service industry jobs of which there were fewer. And residents' reluctance to leave home to find employment elsewhere added to the problem.

There were few role models, and with little optimism of employment, young people saw little reason to stay in school, adding to already low community education levels.

Community culture was also changing with the tradition of land-based activities like trapping dying, and with newly introduced television exposing young people to a very different, material outside world.

Reliance on government social assistance grew, and so did the social problems.

Clearly a catalyst for training, job creation and business opportunities was needed. Community leaders throughout the north began to recognize that non-renewable resource development, and specifically mining for many, might be that catalyst.

Given the few benefits received from development, they felt that legislation was required to ensure they received benefits from resource development. Aboriginal leaders also began to understand "the art of the possible".

Aboriginal Participation Legislated

Over the last century, aboriginal groups felt they were less equal than other Canadians. Action to change this gathered momentum in the 1970s, as aboriginal groups began to fight for constitutional recognition.

While government had signed two treaties with northern aboriginal groups in 1899 and 1921, no land had been

transferred with them. This was righted in 1984 with the first modern land claim settlement in the Mackenzie Delta region of the NWT. By 1993, three more similarly structured land claims had been settled.

The land claims provided Aboriginal groups with a mix of surface and subsurface land rights. Recognizing that resources are important to their future, the Aboriginal groups often selected lands with high mineral potential.

As important as land ownership, government gave the Aboriginal groups the right to co-manage resource development on all Crown lands too, through the creation of boards of public government. The Mackenzie Valley Resource Management Act (MVRMA) of 1998, created the Mackenzie Valley Environmental Impact Review Board, and the Mackenzie Valley Land & Water Board, both comprising 50% Aboriginal and 50% government appointees.

To further strengthen the issue of benefits, the MVRMA also requires a proponent to describe how its project will benefit local communities, making it somewhat unique environmental assessment legislation.

Clearly, Aboriginal groups in the NWT have won an important right to influence their participation in resource-based projects.

The Discovery of Diamonds

For the minerals industry, 1991 was a year of epic proportions in Canada. In fact, the discovery of diamonds by Fipke & Blusson at Lac de Gras resonated around the world. Canada had entered the rarefied air of the diamond world.

For Canada's junior exploration companies¹, diamonds were seen as a life preserver, for their industry was dying, due in no small part to reduced Federal Government tax incentives. Tens if not hundreds of junior companies rushed to stake claims in what became perhaps the largest claim staking rush in the world.

Exploration for diamonds is a time consuming and costly proposition, and under northern mining legislation, exploration must be conducted to maintain the claims – use it or lose it. It quickly became apparent to the junior companies that despite having staked mineral claims, their work had just begun.

Partnerships were sought with the large, better-resourced mining companies. It was the world's largest companies that entered the risky diamond business, and BHP, Rio Tinto and De Beers signed up to provide the bulk of the financial horsepower.

Success in the largely under-explored region came quickly and by the mid-1990s three projects emerged that would become diamond mines – the Ekati deposits of BHP and partners, the Diavik deposits of Rio Tinto and Aber, and the Snap Lake deposit of De Beers.

¹ A "junior" exploration company has no producing mine for income, rather must rely on funds raised from investors.

Challenges for Mining Diamonds

The challenges facing the diamond developers were daunting.

Physical Challenges

The discovery area was remote, 300 kilometres by air from Yellowknife in the region known as the tundra, or the barren lands. A vestige of the last ice age, permafrost underlies the land creating construction challenges. Winters are cold with temperatures often reaching -50C.

No power lines traverse the diamond fields, and no all weather roads. The only sign of human presence was a unique thread of ice road – a seasonal lifeline linking the remote Lupin gold mine to Yellowknife some 500 kilometres to the south.

The diamond ore bodies are difficult to find and can fit within a football field. The last ice age also did a magnificent job of obscuring them, often with tens of metres of glacial clay, sands and gravels, and very often topped with a lake.

At Diavik, the lake challenge was even greater as the diamond ore bodies are all located under the water of the very large lake called Lac de Gras. To get to them would be no easy matter of draining small lakes as was the case at the neighbouring Ekati mine. It would require a new engineering recipe never before contemplated in Canada.

Environmental Challenges

Environmental challenges were also somewhat unique.

The Lac de Gras region is visited twice annually by migrating caribou herds, an important staple in aboriginal people's diets. It was important that the caribou would be protected from harm.

While water is always of consideration, at Diavik the surrounding lake is essentially as pure as distilled. Any work to access the diamonds under the lake would require special attention to protect that water ... and also the fish within it.

The Diavik ore bodies are offshore, with the nearest land an island, albeit a 20 square kilometre one. Could a mine be built within that footprint? And once built, could runoff from the island be collected to further protect the surrounding lake?

Financial challenge

It became clear that meeting the many challenges would be an expensive proposition – Diavik alone would require a start up investment of C\$1.3 billion.

Social Challenge

There were challenges at the community level too, with potential workforces having low education levels, limited work experiences, and high social problems.

While there was also distrust of mining companies borne from experience, given the high unemployment, people's expectations of benefits were also very high.

Political Challenges

The political pressures were also complex.

Land claims were unsettled and four Dene and Metis groups and one Inuit group claimed an interest in the diamond mining region.

Two governments have jurisdiction: the Federal Government over the environment and non-renewable resources, and the Territorial Government over the social envelope, including education & employment, health and social services, and for public infrastructure including transportation, and public works.

Diavik – Meeting the Challenges

Diavik met the challenges facing it head on.

Overcoming the Physical & Engineering

Over three seasons, in a significant logistical project in itself, Diavik safely trucked over 8,000 truckloads of construction materials, fuel and equipment to the site over the narrow two-month annual ice road shipping windows.

A variety of physical plant was constructed to create a modern, state of the art facility in the middle of the tundra.

A diesel powered generating station was built that not only generates electricity, but collects exhaust and engine heat which is used to heat mine buildings, raising efficiency.

Aboveground arctic corridors carry this heat along with power and water to various buildings, and allow workers safe and warm access to work areas in the coldest and stormiest of winter days.

A state of the art process plant, using top of the line computerized processing controls, ensures a high recovery rate for the valuable diamonds.

The latest mining equipment – large to reduce mining costs – was transported to the mine site in pieces where it was re-assembled for the mining process.

A facility to rival a resort was built to provide first class meals and accommodations to the workforce.

And Diavik built a facility to treat water prior to returning it to the lake, as well as one of only two sewage treatment plants in the NWT.

In perhaps its most innovative construction, Diavik invented a new dike design to access the four ore bodies discovered under Lac de Gras. Through short summer seasons, Diavik safely placed four million tonnes of rock into the lake, made the structure watertight, and then removed the water to allow mining to begin. The lower than expected inflow of water has proven the soundness of the design. So innovative was the dike that it received the Canadian Council of Professional Engineers top national achievement award.

Protecting the Environment

Diavik worked at protecting the environment throughout construction. While four million tonnes of rock were placed into Lac de Gras to build the dike, a silt curtain protected the lake water with turbidity levels even below our expectations.

Many fish were even returned to Lac de Gras prior to dewatering.

The dike was designed as fish habitat on the outside and new habitat is being created for the future within the dike.

And Diavik treated 10 billion litres of water in a state of the art treatment facility before releasing it back to Lac de Gras.

Caribou visited the site on a regular basis, and were given right of way, in order to protect the visitors.

And Diavik put up what is perhaps the largest reclamation security ever to add assurances to their reclamation plans.

Meeting the Social Challenges

Meeting social challenges is quite a different arena than the well-developed disciplines of engineering and construction. Mining's history of providing community benefits has not been strong in the north, and there are no established recipes for success.

Through the support of parent company, Rio Tinto, and through the support of senior management within Diavik, the "art of the possible" flourished, and Diavik was able to create new approaches to:

- early and meaningful community consultation
- Aboriginal participation agreements
- community based training
- significant enhancements to community transparency
- job creation, and
- building of local business capacity.

Rio Tinto's Community Perspective

Diavik Diamond Mines Inc.'s parent company is Rio Tinto, a mining company with significant global mining experience. Recognizing that stronger community relationships held promise of creating more successful projects, in the mid-1990s Rio Tinto created a communities policy requiring member companies, amongst other things, to "...build enduring relationships with our neighbours that are characterized by mutual respect, active partnership, and long term commitment".

Diavik's timing was right, and as a "clean slate" was in an excellent position to develop a new and innovative communities approach.

Under a seasoned Rio Tinto employee, Rod Davy, a new company was created manage the project. Symbolic of the goal to work closely with local communities, Diavik Diamond Mines Inc. would have its headquarters in the north, at Yellowknife.

With leadership from the top, this new northern company proceeded to hire a cadre of experienced northerners who knew the neighbourhood to build the communities plan.

Intensive Community Consultation

Five aboriginal groups emerged with an interest in the Diavik project area: the Dogrib, Yellowknives and Lutsel K'e Dene, the North Slave Metis, and the Inuit of the West Kitikmeot region of Nunavut.

In a continuum of meetings mounting to the hundreds, the Diavik team began gathering information on the communities' needs. This was incorporated into the evolving mine model, and again shared with communities. This iterative approach helped Diavik to build community rapport, understand their expectations, and share with them the company's own needs.

Communities were placed as a high priority in the entire planning process, and community input helped establish the mine plan. Brainstorming was encouraged to find ways of meeting community needs. The art of the possible was very much alive at Diavik.

By early 1999, Diavik's team had developed a mine plan that was now quite familiar to the communities, and that was ready to be tabled with the government to initiate the environmental assessment process.

The Diavik Communities Plan Emerges

Within the overall Diavik mine plan was an aggressive communities plan that envisaged Diavik using best efforts to:

- employ at least 40% northern workers during construction;
- spend 38% of its construction costs with northern companies;
- employ at least 66% northern and 40% aboriginal workers during operations;
- carry a complement of up to 18 trades apprentices;
- work closely with northern communities to increase business capacity;
- spend 70% annually to purchase goods and services from northern firms; and
- set new levels of transparency through the creation of community advisory boards.

Diavik realized that they could not do this alone, and success would be enhanced with the active participation of communities and government. This was reinforced in three styles of agreements:

- Aboriginal Participation Agreements;
- a Socio-Economic Monitoring Agreement; and
- an Environmental Agreement.

Aboriginal Participation Agreements

To help reinforce its partnership approach, Diavik proposed a new type of community agreement which it called a *Participation Agreement (PA)* rather than the more typical but biased term *impact benefit agreement*.

With each of the five local aboriginal groups, Diavik negotiated individual PAs that addressed training, employment and business opportunities.

To help facilitate the agreements, four of the agreements call for the creation of PA Implementation Committees that meet on a regular basis to measure progress and to iron out issues.

Also built into these agreements are annual cash payments as requested by the Aboriginal groups, and some firm commitments by Diavik to outsource business to them.

Socio-Economic Monitoring Agreement

Diavik's communities plan envisioned high levels of community participation in training, jobs and business through all phases of the project, from construction through operations to closure.

So committed was Diavik to these goals, that the company agreed "to put its money where its mouth was" and write them into a Socio-Economic Monitoring Agreement (SEMA) with the NWT Government, and further endorsed by the five Aboriginal groups.

Within the SEMA, Diavik formalized its Diavik Communities Advisory Board (DCAB), another unique vehicle designed to help create community transparency and social success. The DCAB would comprise representatives from each of the 9 aboriginal communities as well as Territorial Government and Diavik representatives. With these key partners at the table, it was felt that the necessary powers were there to deal with virtually any issue.

Environmental Agreement

To address environmental concerns not covered in legislation, such as reclamation security and caribou protection, Diavik signed an Environmental Agreement with the Federal and Territorial Governments and the five Aboriginal groups.

Again, to support transparency, Diavik also proposed the creation of an Environmental Monitoring Agreement Board (EMAB), comprising representatives of all of the signatories and largely funded by Diavik.

Implementing the Diavik Communities Plan

Upon receiving the various approvals needed to construct the mine, in late 2000 Diavik began implementing its plans.

Matching Workers to Contractors

To enhance northern employment during construction, Diavik visited communities to interview potential workers and document their skills and experience in a Communities Skills Database.

The database was used to match experienced candidates with appropriate contractors building the mine. Many of the contractors were not that familiar with the smaller communities. Diavik's work to identify experienced community workers helped them find jobs.

The Communities Skills Database was also used to help find candidates for Diavik's unique community based training.

Community-Based Training

To enhance hireability, Diavik staff created an innovative training partnership, dubbed Community-Based Training. Conducted right in their home communities, the training comprised an equal mix of classroom and hands-on training. The communities identified real projects, and examples included the erection of a storage building in Rae-Edzo, the completion of the community centre in Wekweti, the construction of a road in Lutsel K'e, and the installation of concrete and reinforcing steel in the Kugluktuk arena. Often one of Diavik's contractors supervised the training. And significant financial support was provided by the Federal and

Territorial governments. Over 230 students completed this training, and the vast majority went to work constructing the Diavik mine, or with other employers.

Diavik also initiated training partnerships with Aurora College for process plant training, and for instrumentation technicians. Jobs were guaranteed at completion.

Education levels in the North are generally below the Canadian average. To help workers increase their basic skills, Diavik opened an Adult Learning Centre during construction. Today, an adult educator assists workers in career planning, and then in selecting and taking on-line training programs to help them advance their careers.

In no small part due to Diavik's training efforts and its work to identify and match communities' skills with its contractors, Diavik surpassed its own construction job commitments. Northern construction employment had reached a satisfying 44%, exceeding Diavik's 40% goal, about half of the workforce had been aboriginal, matching the north's demographics.

When the smaller operations workforce was struck, Diavik was able to keep a significant number of its northern construction workers on the job. In addition, several of them advanced into trades apprenticeships. Diavik currently supports 17 apprentices – the majority Aboriginal – several of whom began their career in the community based training program.

Today, Diavik's workforce approximates 700, of which over 70% are northern. As with the NWT's demographics, the northern jobs are nearly equally split between Aboriginal and non-Aboriginal workers.

Bettering Business Targets

Annually, mines purchase a variety of goods and services from explosives to groceries to air travel. To help support local business, Diavik set its goal to purchase at least 38% of its construction needs with northern firms, and 70% of its operations spending.

To help ensure success, Diavik again took an "out of the box" approach. The company hired a Business Development Manager, a position not normally part of a mining operation. His job would be to formalize a Diavik Business Policy, and then to help the company identify contracting opportunities and the northern companies to take advantage of them.

Diavik also elected to use an innovative outsourcing approach to help build local community business capacity. Rather than do the work with an entirely Diavik workforce, local contractors would supply their own. The intent was to support local and aboriginal business, and to share with them Diavik's northern commitments.

An easy first choice was the Yellowknives Dene company for catering and camp supply, for Diavik had already been using them for some years during exploration.

A second choice was more innovative, for it involved identifying work the project has in common with a northern community. Called site services, this includes road and airport maintenance, freight handling, and power and water plant operations. Diavik helped support the creation of a new Dogrib company that continues to do this work today.

Further outsourcing would be provided by an Inuit company for security, and in time a Lutsel K'e Dene partnership for explosives.

On top of this, Diavik hired a variety of existing northern suppliers for such things as air transportation, trucking, and fuel supply.

At nearly \$900 million, Diavik's northern business expenditures during construction were nearly double the company's projections. This success was due not only to Diavik's efforts to support local business, but to Aboriginal groups becoming very aggressive in partnering with seasoned contractors to break into the business.

Again, construction set the stage for operations, and Diavik continues to use many of the same northern and Aboriginal firms today. As a result, in the first year of mining, 80% of Diavik's capital and operations expenditures were with northern firms, again exceeding its expectations.

Additional Community Initiatives

Diavik's work with communities is not limited to training, jobs and business benefits.

Diavik also supports the more typical community investment in donations and sponsorships. Since construction began, Diavik has also provided over half a million dollars in scholarships.

Diavik is also a supporter of the Aboriginal Skills Employment Program, a partnership between industry, government and Aboriginal groups to inject approximately \$40 million into Aboriginal training for the mining industry over the next 4 years.

Most recently, Diavik volunteered to take over project management of a new arena complex in Yellowknife. Diavik recently completed the Project weeks ahead of its own accelerated schedule and budget, and several years and millions of dollars ahead of the City's original plan.

Diavik – Where to from here?

Diavik has been able to meet and even exceed most of its own high expectations through innovation at the top, and through partnership with government, Aboriginal communities and contractors. Diavik's approach can certainly be framed as "the art of the possible".

But to remain an industry leader will continue to require innovation and hard work. To this end, Diavik will seek to:

- ◆ Enhance Aboriginal employment through increased jobs and by helping grow aboriginal workers into more complex jobs. As would be expected from the lower education levels, most of the Aboriginal workforce is biased towards entry level and semi-skilled jobs. Diavik's long-term goal is to raise Aboriginal distribution in the workforce.
- ◆ Enhance northern business by measuring actual performance of individual contractors in meeting all of our northern commitments.

There will be challenges though. Currently, the NWT is Canada's fastest growing jurisdiction. A number of projects are in the works, including two new diamond mines, a gold mine, and a pipeline.

Diavik itself is moving into another construction phase, as work begins to construct its next dike and to prepare for underground mining several years hence. Several hundred additional workers will be required.

There will be intense competition for labour and northern business.

Learnings & Parting thoughts

Success requires clear goals and commitment to them by all. The goals in the Diavik Socio-Economic Monitoring Agreement are clear and understood by all.

Establishing partnerships to bring everyone "onto the same page" multiplies your chances of success. The Diavik Communities Based Training Partnership is a good example, as are Diavik's outsourced Aboriginal contracts.

Success need not carry a high price tag. What might appear to be a higher cost initially can prove to be an investment in the longer term. Other funding can be leveraged.

Cultivating "the art of the possible" in your workforce can bring powerful and interesting forces of change to bear.
