WORKSHOP PROCEEDINGS

ORPHANED AND ABANDONED MINES:
A WORKSHOP TO EXPLORE BEST PRACTICES

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PREPARED FOR THE:

NATIONAL ORPHANED / ABANDONED MINES INITIATIVE (NOAMI)
ADVISORY COMMITTEE

PREPARED BY:

STRATOS INC.

DECEMBER 2006

ORPHANED AND ABANDONED MINES: A WORKSHOP TO EXPLORE BEST PRACTICES

WORKSHOP REPORT

Prepared for:

The National Orphaned/Abandoned Mines Initiative Advisory Committee

Prepared by:

Stratos Inc.
1404-1 Nicholas Street
Ottawa, Ontario
K1N 7B7
tel: 613 241 1001
fax: 613 241 4758
www.stratos-sts.com

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Abstract

This report captures the proceedings of the National Orphaned/Abandoned Mines Initiative (NOAMI) workshop on best emerging and innovative practices relating to the management of orphaned and abandoned mines, held on October 26th and 27th, 2006 in Winnipeg, Manitoba. Over 100 participants attended the workshop from Aboriginal groups, non-governmental and academic organizations from Canada, the US and abroad, the mining industry, and federal and provincial governments.

The objective of the workshop was to explore and understand the best, emerging and innovative practices relating to the management of orphaned and abandoned mines. Best practices in the areas of setting priorities, public engagement and capacity building, and partnership approaches were examined through Canadian and international case studies and presentations, which were discussed in plenary. A breakout group exercise allowed participants to discuss and apply these best practices to a complex abandoned mine case study.

In addition to capturing the workshop proceedings, this report lists possible elements that may constitute a "tool kit" of best practices to address the legacy issues of orphaned/abandoned mine sites.

Résumé

Ce rapport contient les actes de l'atelier de l'Initiative nationale pour les mines orphelines/abandonnées (INMOA) qui a porté sur les meilleures pratiques émergentes et novatrices quant à la gestion des mines orphelines et abandonnées et qui a eu lieu les 26 et 27 octobre 2006, à Winnipeg, au Manitoba. Cet atelier a attiré plus de 100 participants provenant de groupes Autochtones, d'organismes non gouvernementaux et universitaires du Canada, des États-Unis et d'autres pays, de l'industrie minière, et des gouvernements fédéral et provinciaux.

L'objectif de l'atelier consistait à examiner et à définir les meilleures pratiques émergentes et novatrices qui ont trait à la gestion des mines orphelines et abandonnées. Les meilleures pratiques dans les domaines de l'établissement des priorités, de la mobilisation du public et du renforcement des capacités ainsi que des démarches axées sur des partenariats ont été examinées au moyen de présentations d'études de cas canadiennes et étrangères, qui ont fait l'objet d'une discussion en séance plénière. Répartis en de petits groupes, les participants ont analysé ces meilleures pratiques et ils les ont appliquées à l'étude d'un cas complexe de mines abandonnées.

En plus de renfermer les actes de l'atelier, ce rapport énumère les éléments d'une « boîte à outils » des meilleures pratiques qui pourrait servir à régler la problématique liée aux sites miniers orphelins et abandonnés.

Introduction

About this Report

This report captures the proceedings of the National Orphaned/Abandoned Mines Initiative (NOAMI) workshop on best emerging and innovative practices relating to the management of orphaned and abandoned mines, held on October 26th and 27th, 2006 in Winnipeg, Manitoba. The report includes a brief summary of the presentations as well as plenary and breakout group discussions, and also lists possible elements that may constitute a "tool kit" of best practices to address the legacy issues of orphaned/abandoned mine sites. A CD-ROM containing this report, the full presentations, and relevant reports, papers and information will also be published.

About NOAMI

Created in 2001 based on recommendations put forth at a multi-stakeholder workshop on abandoned mines, NOAMI is administered by an Advisory Committee that takes direction from Mines Ministers and reports back to them via the Intergovernmental Working Group on the Mineral Industry (IGWG). The NOAMI Advisory Committee's role is to assess key issues regarding orphaned and abandoned mines in Canada and put forward recommendations to Mines Ministers. NOAMI is guided by a work-plan that was endorsed by Mines Ministers in 2003, and outcomes of this workshop will assist NOAMI in identifying areas for future work and future recommendations to Mines Ministers. Additional information on NOAMI is available on the NOAMI website (www.abandoned-mines.org)

About this Workshop

The National Orphaned Abandoned Mines Initiative (NOAMI) Advisory Committee sponsored the workshop. The workshop was planned and organized through the Best Practices Workshop Organizing Team whose members included:

Elizabeth Gardiner, The Mining Association of Canada
Cindy Blancher-Smith, Ontario Ministry of Northern Development & Mines
John Fox, Manitoba - Science, Technology, Energy and Mines
Karla Heath, Stratos Inc.
Charlene Hogan, NOAMI Secretariat (NRCan)
Brennain Lloyd, Northwatch
Joan Kuyek, MiningWatch
David Markham, Mining Association of Manitoba
Barb McLean, Manitoba Science, Technology, Energy and Mines
John Robertson, Ontario Ministry of Northern Development & Mines
Adrianna Stech, Ontario Mining Association
Elaine Stevenson, Manitoba Science, Technology, Energy and Mines
Gilles Tremblay, NOAMI Secretariat (NRCan)
Michael van Aanhout, Stratos Inc.

In addition, Michael van Aanhout, Stratos Inc. provided facilitation services and Karla Heath, Stratos Inc. provided reporting services for the workshop.

Special thanks to the Manitoba logistical team of Elaine Stevenson, Barb McLean, Kelly Proutt, Diana Kircz, Kevin Liu and the break-out session recorders for their great organizational skills and creativity – and for helping to make the workshop registration and activities run so smoothly!

Workshop Introduction

Elder Flora Zaharia opened the workshop with a brief opening ceremony and prayer, which was followed by opening remarks from Jim Rondeau, Honourable Minister of Manitoba Science, Technology, Energy and Mines. Christine Kaszycki, NOAMI Chair (Ontario Ministry of Northern Development and Mines), thanked Elder Flora Zaharia and Minister Jim Rondeau for lending their support to the workshop, and proceeded to welcome participants and provide a brief overview of the work of NOAMI over the past five years. She noted that NOAMI's track record over this time exemplifies the commitment to ensure real progress on orphaned and abandoned mines (OAMs), and that NOAMI has garnered international attention as a unique approach to dealing with OAM issues in a collective and multi-stakeholder fashion.

Michael van Aanhout, Workshop Facilitator (Stratos), reviewed the workshop agenda and the workshop objective, which was to explore and understand the best, emerging and innovative practices relating to the management of orphaned and abandoned mines.

Keynote Address

Professor Paul Younger, of Newcastle University, provided an entertaining and enlightening keynote address. His presentation focused on outlining the environmental and heritage dimensions of the OAM issue and presented case studies pertaining to the three main themes of the workshop: setting priorities, community engagement, and partnership approaches.

Dimensions of the OAM Issue

Professor Younger outlined the "lethal legacy" of OAMs through long-term environmental impacts, and also discussed the less common "precious patrimony" or heritage perspective whereby OAMs may be considered something to be conserved as well as remediated. The earliest reliably-dated archaeological remains of mining keep getting ever more ancient, and many communities have developed a deep sense of identity and pride around their mining histories. OAMs may also offer unique tourist opportunities – the newest UNESCO World Heritage Site is the Cornwall and West Devon Mining Landscape.

Priority Setting

Priority setting allows costs to be spread over time, encourages the development of "know-how" through sequential experiences, and facilitates the availability of specialist contractors as requirements for their services are staggered over time. Priority setting requires an integrated technical and social evaluation and an assessment of "do-ability" – the feasibility of putting together a group of people that has enough interest and understanding to pursue the project.

Community Engagement

Community engagement needs to be pursued at all scales, from a single village through to regions, countries, and international arenas. However, defining a "community" can be a challenge - which people constitute "the community" in any given case? Who decides who belongs to it? Who is excluded? If anyone can "join", do all have equal say-so? What about divided communities? There are also questions about the sufficiency of engagement – for example, is it enough for public bodies or multi-stakeholder groups to talk with elected representatives, or is there a need or responsibility to go beyond that?

Partnership Approaches

Partnership approaches require a creative approach to regulation – relevant laws are generally not written with the peculiarities of OAMs in mind, and should avoid "dis-incentivising" voluntary actions. Effective partnerships also require learning to listen, and earning confidence and trust.

Towards Best Practices

Implementing best practices in managing OAMs requires an acknowledgement of the dependencies between climate, the type of mining, the socio-economic setting, and the legal framework. A best practice approach to managing OAMs must be scientifically sound, culturally appropriate, ecologically and hydrologically integrated, and cognisant of the full mining life cycle.

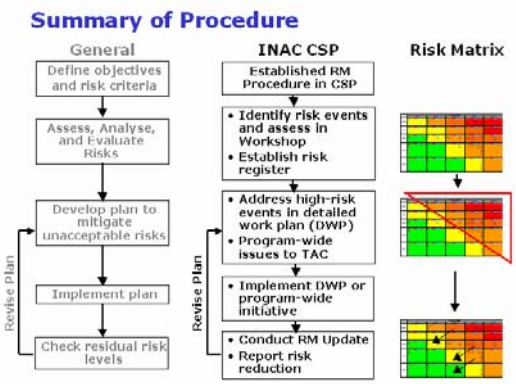
Panel Presentations: Setting Priorities

Risk Management in the Contaminated Sites Program

Mike Nahir, Indian and Northern Affairs Canada (INAC), presented on managing risk and setting priorities in INAC's Northern Contaminated Sites Program (CSP). CSP's mandate is to manage contaminated sites in a cost-effective and consistent manner, to reduce and eliminate, where possible, risk to human and environmental health and liability associated with contaminated sites. The program's current liability is approximately $997 million, with an additional potential liability of $622 million, which provide a sense of the scope of the challenge and the level of effort that is being focused on addressing these liabilities. In 2004, the Government of Canada committed $3.5 billion towards the clean up of federal contaminated sites through the Federal Contaminated Sites Action Plan (FCSAP), and a number of INAC priority sites are funded through this mechanism.

INAC developed a Risk Management Procedure to be in place for all sites by the end of 2004/2005. The objectives of the risk management program are to provide a consistent methodology for developing an inventory and evaluating the many different types of risk at contaminated sites; a process to ensure that no high risk items are "falling through the cracks"; and a basis for prioritizing risk mitigation or control activities within and among sites. INAC undertakes management, review and implementation of activities at sites based on the outcomes of the risk management process.

Mr. Nahir provided an overview of the general risk management process, discussed the application of consequence severity and likelihood ratings in the development of a risk matrix, and illustrated CSP's application of the risk management procedure and tool. The risk management process allows INAC to separate legacy and program activity risks and formulate appropriate responses to these risks. For example, INAC has responded to program risks by establishing a Technical Advisory Committee (TAC); addressing tenure issues; developing an Environment, Health & Safety Management System; and developing a procurement strategy and procedure.



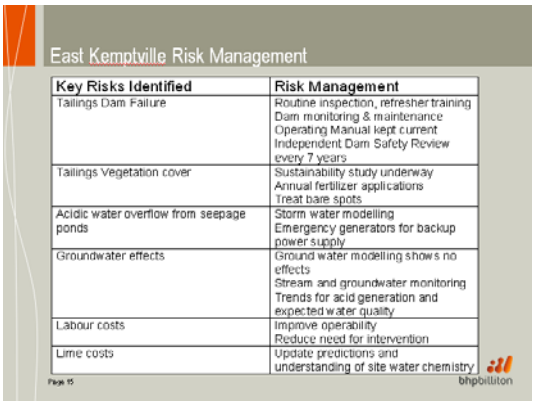
Risk Assessment at East Kemptville

Maxine Wiber, BHP Billiton, provided a case study on risk assessment at the East Kemptville mine. For public mining companies, accounting for closure liabilities has been impacted by the changes in corporate governance and disclosure rules. To best meet the intent of the new rules in the area of mine environmental restoration liabilities, BHP Billiton is aiming for greater consistency in the approach to planning and cost estimating for mine closure across the company. A Closure Standard was implemented this year, complementing BHP Billiton's Health, Safety, Environment and Community (HSEC) Management Standard that requires mine closure plans be in place at all life stages of the mine cycle, and that regular reviews be carried out throughout the mine life to test for good planning through risk assessment, technical rigour and comprehensive cost estimating.

BHP Billiton's process for risk assessment in closure planning and cost estimating includes the following steps:

- Select the risk assessment team.
- Conduct a site-specific risk assessment of the closure plan:
    - Identify risks for each major component of the plan; and
    - Identify residual risks expected to remain after execution. For these, identify likelihood, possible outcomes, and costs.
- Develop or update closure plan(s) and costs:
    - Identify activities and costs to mitigate key risks to a tolerable level;
    - Compliance with applicable State/Province and Federal regulations; and
    - Compliance with BHP Billiton HSEC/EWRM Standards/Charter.
- Model the data to generate an "expected" cost estimate – including costs associated with known risks and uncertainty in the revised plan.

This process was implemented at the East Kemptville site, and identified a number of key risks to which appropriate risk management activities could be applied. The risk management process in mine closure provides a rigorous planning tool for future site closure and reclamation, allows for risk-informed decision making and a strong technical basis for plans and costs, provides documentation for review and audit purposes, and results in early identification of emerging trends and real risk reduction.



Uncertainty and Risk in Reclamation Bonds – An Alaskan Example

Dave Chambers, Center for Science in Public Participation, discussed a detailed review of direct and indirect reclamation costs at six large mines in Alaska, as estimated by the respective company or State/Federal Regulatory Agencies. The study determined that while direct reclamation costs were well estimated, a number of critical factors were not integrated into indirect reclamation costs, resulting in significant underestimation of these costs. These factors include:

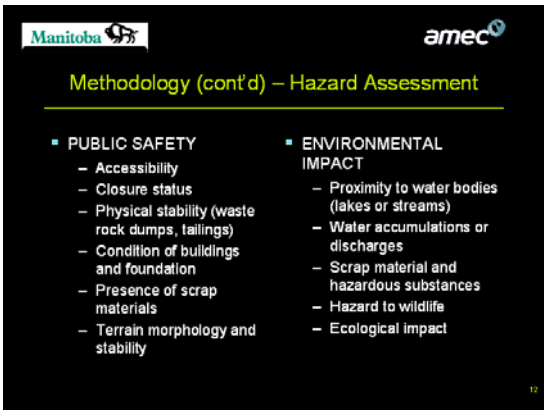
- Mobilization/demobilization;
- Engineering redesign;
- Engineering, procurement, and construction management;
- Contractor overhead;
- Contractor profit;
- Agency administration;
- Inflation; and
- Contingency.

The study concluded that reclamation sureties for Alaska large mines have been significantly underestimated by both State and Federal Regulatory Agencies, and recommended that the Alaska Department of Natural Resource (DNR) should set a high threshold for a company to qualify for the corporate guarantee. In addition, with the availability of a corporate guarantee, Alaska DNR should not be reluctant to calculate a conservative estimate for the reclamation surety, and should hire a professional consulting firm to calculate mine reclamation sureties. Ultimately, the public is at risk for either the cost of mine closure, or the cost of the impacts if the mine is not properly closed.

Condition and Hazard Evaluation of Crown Owned Inactive Mine Sites in Manitoba

Caius Priscu, AMEC Earth and Environmental, discussed the results of a screening-level project initiated in 2005 by Manitoba Science, Technology, Energy and Mines to inspect Crown-owned abandoned mine sites in Manitoba in order to review and asses their condition, evaluate hazards and liabilities, evaluate the approximate costs for rehabilitation, and prepare a database of these sites to integrate with existing federal and provincial databases.

There are currently 140-150 Crown-owned abandoned mine sites in Manitoba, and the location, size, condition and liabilities of many of these sites were unknown when the study began. The project methodology included reviewing existing documentation for information as well as conducting onsite evaluations according to hazard assessment criteria for public safety and environmental impact. The criteria used in such evaluations could be subjective in nature, and based on knowledge and experience specific to Manitoba sites and conditions. In order to minimize biases in the evaluation process, a point-based assessment was instead prepared for each mine site in each category (safety and environment) that allowed for ranking and prioritization.



Only openings deeper than 1.5 metres are considered in the evaluation, and any mine openings left uncapped automatically triggered a high hazard rating. Proximity to public settings also triggered an increase in assigned points. Onsite analytical testing of water quality was also conducted where water bodies were present.

Dr. Priscu's presentation included three examples of sites that were inspected in the project. To date, about 10 to 15 sites have been designated as high hazards, 20 to 30 as moderate hazards, and over 100 as low hazards. The final report on the study is expected by December 2006. More than 75% of the high hazard sites are classified as such due to public safety concerns.

Plenary Discussion

A participant asked whether INAC's liability estimates account for long-term site maintenance. Mr. Nahir responded that care and maintenance is factored into liability assessments, yearly work programs, and project budgeting. Depending on the nature of the site, activities can be planned for over 100 years. Another participant noted that Treasury Board has released updated guidance on accounting for liabilities.

A participant asked Mr. Chambers to comment on the risk of accepting mine assets for financial security. Mr. Chambers noted that this practice includes a significant amount of risk and can pose a number of problems. Mr. Chambers was also asked whether his study looked at single-mine companies vs. multi-mine companies as a possible risk factor in bond viability. Mr. Chambers noted that all of the mines were held by multi-mine companies, but the study looked at only the amount of the bond, not the viability.

There was some discussion among participants on the appropriate amount of surety to require from a mining company, and whether it is more appropriate to adjust the bond amount every two-three years depending on the stage of the mine rather than requiring a single large amount. One participant referenced a recent CIM seminar held in May 2006 where a participant presented a graph demonstrating

the life of a mine versus bond amounts. The bond amount would be reviewed every two-three years and adjusted if necessary. Mr. Chambers pointed out some of the risks associated with partial bonding with corporate guarantee (e.g. if you grant a corporate guarantee, what you will do five-ten years from now if the company no longer meets its financial test criteria?) Another participant noted that this approach is similar to the way B.C. collects bonding for mines. The risk is represented by the gap between the liability and the security that is held. For long-term liabilities like water treatment, the question is when do you start collecting security for that potential risk in the future. The system works best when the regulator reviews that security to ensure that it is adequate. Another participant expressed that, from an industry point of view, there is support for the idea of "negotiating" that number. For strong companies, it is fair to say that there can be a gap between the full costs of closure and the financial guarantee, and it is also fair for the government to decide on an acceptable level of risk.

A participant asked Ms. Wiber how the various monitoring programs underway at East Kemptville are being implemented with a staff of only four people. Ms. Wiber noted that a number of consultants also participate in the monitoring activities, and that full monitoring studies are not done every year. Decisions regarding the frequency of monitoring activities are based on trends observed at the site. There was also specific discussion on wildlife monitoring. One participant noted that many Aboriginal communities are dealing with the legacy impacts of OAMs on wildlife (e.g. contaminated populations resulting in hunting and fishing bans), and questioned what types of baseline studies have been done to determine the impacts of OAM contamination on wildlife. Ms. Wiber noted that the type of wildlife monitoring depends on the physical circumstances at the site. At East Kemptville, the main concern was fish, and BHP Billiton conducted a baseline study and follow-up work on the issue. Much of the current work pertaining to wildlife at the East Kemptville site is on wildlife sightings and tracking as a matter of interest. Mr. Nahir also noted that INAC works with interested First Nations communities on wildlife issues, such as shaping a site to have the least possible impact on caribou migration routes.

A participant commented that it is important to take an ecosystem approach on remediation design and to consider the best available option according to economic, environmental and social factors, including consideration of heritage issues and wildlife populations.

Panel Presentations: Public Engagement and Capacity Building

Community-Based Decisions and Setting Priorities in Abandoned Mine Remediation

Sue Moodie, CCSG Associates, discussed challenges in community-based monitoring and decision processes. The harmful impact of mining on the health of the environment and communities does not cease when the mine stops operating. Many factors that change community health have generally fallen outside the boundaries of the way mine clean-up decisions are currently made, but there is a responsibility to consider health in its broadest terms when determining remediation criteria.

Mining developments affect all levels of individual and community health. Standard risk assessments do not account for psycho-social health influences such as stress, violence, addiction or poverty. Risk assessments may not paint a complete and accurate picture of the threats to ecosystems, and local and traditional knowledge of how health has changed is not a component of typical risk assessment processes. The state of health that is described by risk assessments is consequently a physiological representation lacking the broader health context. Standard risk assessment approaches have not been effective at efficiently targeting means to improve community health, and there is a need for new precautionary approaches that aim for higher health goals.

Research related to mining contaminant exposures has generally focused on workplace health and safety, while the health of the diverse range of individuals found within a community, of women, elderly, children or people with sensitivities, are only accounted for with safety factors that have generally not been ground-truthed with real data. Community experiences with long-term exposures to low concentrations and complex mixtures of contaminants are also not well characterized. Because of these considerations, risk assessments are an imprecise and potentially misleading tool for predicting the long-term impact to the health of a community. Ms. Moodie suggested that a new approach for choosing remedial options based on community health priorities is needed to increase community confidence in these decisions.

Communities increasingly require accessible methods to analyze and address critical community health issues. Practical methods for a hazard-based community health analysis aimed at improving health need to be developed. A range of qualitative and quantitative information can be used together to get a full picture of individual and community health and the health of those at greatest risk can be more adequately assessed. In this way, compelling links between cause and effect provide not only information on health effects but also a focused analysis that gives direction to choose appropriate remediation options and improve the health of mining-affected communities.

Remediation and maintenance of mine sites is expensive, and sound decisions for remedial options must be made based on community priorities. Priorities should be set with both a short and a long-term view. The short term should include a critical assessment of what key remediation choices will have the greatest impact to immediately improve human and environmental health. In the long term, decisions should be made based on consideration of ecological health, site stability and financial analysis that are not based in engineering timelines.

Communities often have divided opinions on the benefits and impacts from the local mining operation. However, one of the galvanizing issues can be concern for the health of their family, community and future generations. The role of communities to decide their own health futures must be clearly mandated to set criteria for making decisions at abandoned mines that are based on community priorities.

Deloro Minesite Cleanup - Community Involvement and the Role of the Media

Louise Livingstone, The Community Press, discussed the role of the community and the media in the Deloro Minesite cleanup. She provided a history of the project and of public involvement, reviewed the role of the media in reporting, telling stories, communicating, and acting as a watchdog, and provided advice on working with the media.

The history of the site has been tumultuous and stressful for local residents. The national press has written dramatic articles about the "valley of death" – ironically, "Deloro" means "valley of gold". The Ontario Ministry of the Environment assumed responsibility for the Deloro Minesite in 1979 when the site owner failed to comply with ministry orders to stop pollution. Between 1979 and 2004, the Ministry conducted a number of activities to deal with the onsite contamination and also conducted two offsite studies of Deloro village and of the Moira River system. Public consultation on the long-awaited final cleanup plan was completed in January 2005 and the Deloro Cleanup is now in the middle of a federal environmental assessment. The Canadian Nuclear Safety Commission has to license the site as a low-level radioactive waste site. The federal environmental assessment should be finished in the spring of 2007.

As a contributor to The Community Press, a local weekly newspaper that is distributed to nearly 60,000 homes in the area, Ms. Livingstone has been writing about the Deloro Mine for ten years. Her initial involvement began with an invitation to the press launch of the current cleanup in 1997, and continued with writing general articles as well as reporting on the meetings of the Deloro Public Liaison Committee (PLC), which was established by the Ministry in 1997. As well as reporting on meetings, Ms. Livingstone has told people's stories as a way of commemorating what had happened at Deloro and also getting local anecdotal evidence to the table. She followed this up with some investigative journalism to find documentary evidence to back up what people were saying. Ms. Livingstone notes that the PLC is finally working well together and there is a much higher level of trust and mutual respect than there was at the beginning. Local members have made important contributions, including emergency preparedness planning, upgrading the arsenic treatment plant and downstream monitoring.

In the Deloro case, the media helped keep the public up to date with what is happening, acted as a watchdog or neutral observer, kept the project in the political spotlight, and acted as a sounding board. Working with the local media was a good way of getting people involved in a mine cleanup. Around 72% of Canadians read their community newspaper, and sources such as these can be a good place to publish brief press releases about coming events or events that have happened. Inviting reporters out to events and giving them all the information they need can go a long way to dispelling rumours and help build mutual trust. Letters to the editor are also a good way of stimulating debate locally. There is also great potential with e-journalism.

Ms. Livingstone made some suggestions based on observing the Deloro cleanup process for ten years:

- Don't forget the small things. The PLC was told Deloro had a state-of-the-art arsenic treatment plant only to find out the chemical analysis equipment had to be replaced because it was 20 years old;
- Set achievable goals with firm deadlines and meet them. Consider having incremental projects rather than striving for the final perfect cleanup some time in the future;
- Improve communication between the province and the federal governments and between ministries and departments;
- There needs to be a balance between alarming people and taking necessary precautions to protect people; and

- The results of environmental and health risk assessments at one site cannot be applied to another site. Each site is unique.

Public Engagement in the Mt. Washington Mine Remediation

Father Charles Brandt, Tsolum River Restoration Society (TRRS), presented on public engagement in the Mt. Washington Mine Remediation. After the Mt. Washington Mine was abandoned in 1967, the Tsolum River, a critical coho and steelhead habitat, was decimated due to acid mine drainage and toxic levels of copper contamination. The overall mission of the TRRS is to restore the Tsolum River to its historic levels of health and productivity, and specific concern regarding fish populations has driven much of the reclamation activity so far.

Father Brandt discussed the history of the contamination in the Tsolum River and mentioned a number of previous attempts made to remediate the Mt. Washington Mine going back to 1988. It all started in 1982 when pink fry were introduced into Tsolum Creek, and in two years not a single salmon returned. Monitoring studies found 90 micrograms/litre of copper – the lethal limit for fish is 20 micrograms/litre. Public concern and outrage spurred government involvement, but after a series of remediation activities from 1988 - 1995, the mine reclamation was deemed a failure. However, in 1999, it was discovered that there was a 50% reduction in copper loadings in the river, and the TRRS, with the help of the Department of Fisheries and Oceans (DFO), Ministry of Environment and local volunteers, began to restore the Pink Salmon run.

In 2003, Pyrrhotite Creek, which transports the copper loading from the mine site to the Tsolum River, was detoured through wetlands, which further reduced copper levels by another 50%. Now, for most of the year, copper levels are less than 7 micrograms/litres, which is capable of supporting pink and chum salmon.

A mine engineering study is now underway to help develop a remediation plan for the Mt. Washington Mine. Partners in the project include the Ministry of Environment, the Tsolum River Restoration Society (TRRS), the Pacific Salmon Foundation, Timber West, Fisheries and Oceans Canada and the Ministry of Mines. The Mining Association of B.C. continues their support in an advisory position.

Community Capacity: Best Practices and Pitfalls from Northern Canada

Chris Paci, Deep Consulting, outlined best practices and pitfalls regarding community capacity in northern Canada. OAMs are often the cause for division and anxiety in the general public, confusion over what will be cleaned up (by whom and to what extent), and who is responsible for costly remediation. The effective remediation of a site depends a great deal on the capacity of the various communities involved, and communities require human resource development to effectively participate in cleanup and development. Indices of capacity include a governing First Nation, culturally appropriate economic development, and other levels of support (e.g. complimentary governance).

Best practices and pitfalls regarding community capacity in northern Canada include:

BEST PRACTICES

- Taking responsibility for OAMs
- National accounting of OAM costs and risks
- Definition around full and meaningful consultations
- Clean up to agreed upon "independent" standard
- Engagement in capacity building so First Nations can participate in all levels of clean up
- Land use planning to avoid the mess

PITFALLS

- Poor grasp of public risk perceptions
- Alienation of the public (e.g. only those directly impacted are consulted)
- Remediation isolated from economic development
- Poor communications
- Underestimate of the capacity needs
- Poor project management
- Lack of effective evaluation and accounting

Dr. Paci noted that it is important to learn from and talk about both successes and failures of project management. He also pointed out that while Canada has seen considerable public investments to clean up OAMs, there are also a number of other prioritized projects underway that require critical attention. Independent review (effectiveness evaluation and accounting) is required, and the public must be engaged in all aspects of remediation.

Historical Overview of Community Involvement in Abandoned Mines

Joan Kuyek, MiningWatch Canada, provided a short history of community involvement in the issue of mines abandoned in Canada. In the 1980's, many single industry towns were faced with mine closures. At this time, Queen's university undertook a major study on mine economics in mining communities, and highlighted the social issues of mine closures, including the need for new economic opportunities, industrial adjustment packages, and retraining. In addition to these social issues, a growing list of environmental concerns and increasing public awareness of the issue of OAMs in the 1990's left many communities worried, and at the same time dealing with the impacts of OAMs. Communities began to mobilize to draw attention to the issue of mine abandonment and to demand action at sites such as Britannia Mine, Mt. Washington Mine, Colomac Mine, Giant Mine, Port Radium, Deloro Mine, Hollinger Mine, and Kam Kotia. Internationally, communities were also demanding change.

Community organizes for Britannia Clean-up

The Canadian government began to respond to these concerns. In 1993, the Canadian Council of Ministry of the Environment issued a report on contaminated sites, and in 1996 the Auditor General released a report on contaminated sites. In 1998, the Canada–Wide Accord on Environmental Harmonization affirmed "polluter pays" principle, and in 2002 the Auditor General issued another report on Abandoned Mines in the North, putting the price tag of remediation at $565 million. In June 2001, NOAMI was formed, and in 2003 the federal government budget allocated $175 million to address contaminated sites, which was increased to $4 billion in 2004.

Communities act as catalysts to advocate the clean up of sites that affect them and their families. Without community pressure, there is no political will to act. It is in everyone's interests to clean-up

abandoned mines and to prevent new ones from occurring, and to build citizen capacity to play this important role.

The principles of community involvement include representativeness and inclusivity; holding meetings in affected communities; providing resources so communities can participate (e.g. childcare expenses); providing financial resources for technical help; and integrating the full spectrum of concerns into discussions and solutions (e.g. health, social, environmental, economic, cultural). Closure and post-closure activities should allow for community monitoring with financial support for technicians/experts; health and risk assessments; opportunities for community employment; development of skills and education for environmental industries, including worker health and safety concerns; and relocation if required.

Faro Mine Closure - A Community Perspective

Kathlene Suza, Closure Planning Coordinator for the Ross River Dena Council, Ellie Marcotte, Closure Planning Coordinator for the Selkirk First Nation, and Stephen Mead, Yukon Government, presented a community perspective on the Faro Mine closure.

The Faro Mine is 250 kilometres northeast of Whitehorse. Officially opened in 1969, the Faro Mine quickly became the largest private sector employer in the Yukon Territory. It represented over a third of the economy of Yukon, and by the mid 1970's was the largest lead/zinc mine in Canada. After 29 years of intermittent operations, the last owner was placed into receivership in 1998. Current conditions onsite include significant acid mine drainage issues; concerns regarding the stability and capacity of dams and diversions; uncovered waste material; and land use issues, as the mine is in traditional Dena territory.

The Town of Faro, established to service the Faro Mine, is now home to 400 people. Pelly Crossing, home to the Selkirk First Nation (SFN), is directly downstream of the mine site, and Ross River, home to the Ross River Dena Council (RRDC) and part of the Kaska Nation, is upstream of the mine site.

The Faro Mine is moving towards closure, and the process encourages community input. The Selkirk First Nation and Ross River Dena Council have a role on the Oversight Committee, and have community offices and project coordinators. They are funded by the government to coordinate community input into planning process, to acquire technical advice to support informed involvement and input in development of a closure plan, and to coordinate community meetings and information sessions. The Town of Faro's Community Liaison Officer is funded by the government to coordinate community input into the planning process, to seek technical advice from the Closure Office and Government departments, and to participate in community meetings and workshops.

However, the closure process is not without its challenges for the Ross River Dena Council, the Selkirk First Nation, and the town of Faro, as illustrated below:

Community Challenges		
Ross River Dena Council Ross River	**Selkirk First Nation Pelly Crossing**	**Town of Faro**
Time – community and "closure process" often works with a different understanding of time. **Complexity of Project** – difficult for many people to understand basics of the project and makes it hard to keep up. **Lack of Continuity** – engagement with community comes in flurries; challenging to maintain and build on knowledge in "downtimes". **Levels of knowledge** ▪ How to achieve balance between traditional and scientific knowledge. ▪ How to balance what the community "knows" against what the community is being "told".	Lack of **public attendance** at planning meetings. Lack of **capacity / training**. **Scheduling issues** - It is always a task to try and get everyone's schedule together. Ensuring people of the **quality of water** in the Pelly River. People don't speak up at meetings due to the fact that this **project is very complex** - not sure if everyone fully understands. If the federal and/or territorial government is in favor of a completely different option than the First Nations, it will be a challenge explaining how the **FN decision was measured**.	**Maintenance costs** for the Town's Infrastructure: created for a community of 2,500+, now funded by a population of 400. **Quality of well water** supplying Town of Faro, specifically Vangorda Creek. **Cleanup** of mine-related contaminated sites in the town. **Future use** of the Town for purposes related to Mine Closure, where such use could be tied to closure operation. Examples are: ▪ Educational opportunities ▪ Training facilities ▪ Tourism potential **Monitoring and tracking of health issues** for those working at the mine before shut down, during current phase, and during reclamation process

Plenary Discussion

Participants discussed the level of communication with the communities around Giant Mine. One participant noted that while the Giant Mine is a complicated site and a unanimous decision regarding its remediation will likely never be reached, there has been considerable effort by INAC to engage the Yellowknives Dene First Nations and the community of Yellowknife. Another participant remarked that according to a Yellowknives Dene First Nation Chief, the remediation approach being taken at Giant does not satisfy the Yellowknives Dene First Nations, and thought that sound or effective communication should result in some form of consensus. A third participant noted that there is a difference between a lack of understanding and an actual difference in what people want to have happen, and the real issue isn't about better communications but about resolving serious differences of opinion about what needs to be done.

With regard to community capacity building, a participant referred to good work being done by the uranium industry in Saskatchewan, which has worked with communities on education and community vitality as it pertains to uranium mining in northern Saskatchewan.

A participant questioned why OAMs are still being created, and why the government takes responsibility for these sites so easily. A participant responded that proper reclamation bonding and responsible and careful opening of mines would avoid the OAM problem. Another participant noted that policies have

changed over time, and what was acceptable a short time ago may now be considered unacceptable or insufficient. Faro is an example of where problems were compounded because of decisions made by regulators according to the policies of the time.

A participant made a number of observations about Aboriginal involvement and engagement in managing OAMs. Communication with Aboriginal people must use culturally appropriate methods – many Aboriginal communities do not have access to the Internet, but may have local radio or TV stations. There are also issues around language and terminology, and many Aboriginal languages may not have the equivalent words to translate complex mining terms. Even with the right language, the general public is not going to understand mine closures because it is not part of their daily lives. Industry must strive to understand Aboriginal communities and their unique communication needs, and take the time to communicate properly and effectively.

There was some discussion around the role of third parties (e.g. NGOs) in offering technical assistance and advice to communities. One participant commented that it can be challenging for third parties such as NGOs to play this role if communities see them to be "carrying baggage", imposing their own view, or championing a particular cause that is not in line with the community's cause, and the community may reject them even if this perception is misled. It is important for people engaged in communicating with communities to take the time to learn about the community and earn their trust.

Panel Presentations: Partnership Approaches

Rehabilitating Abandoned Mines in Canada: A Toolkit of Funding Options

Dick Cowan, Cowan Minerals Ltd., presented the results of a study conducted for NOAMI that examined five funding approaches to OAM rehabilitation as well as several related case studies. The five approaches reviewed were:

1. Direct government funding from general revenues;
2. Government funding through tapping existing revenue streams generated by mining (e.g. mining tax/royalties);
3. Government funding through the imposition of a levy on current and future mineral production;
4. Federal and provincial cost sharing arrangements from general revenues; and
5. Government-industry partnerships.

The intent of the project was to provide a plain language guidance document for politicians, bureaucrats, municipal officials and other interested but non-technical persons or agencies. The study assessed the pros and cons of each funding options, and also assessed the funding mechanisms for four site-specific case studies and four federal-provincial case studies. The following recommendations were made on the basis of these assessments:

1. With some exceptions, each jurisdiction is responsible for its' own abandoned mines. Before funding can be addressed in a meaningful way the problem must be defined and quantified through site assessment; creation of an inventory; risk analysis; cost analysis, and prioritization;
2. Valuation of the liability is important in that auditors must be able to see the liability diminish as funds are expended – use a sufficient contingency (e.g. 30%). The valuation of the cost to rehabilitate must not be viewed as static;
3. Before redirecting existing mineral related revenue streams, jurisdictions must determine whether sufficient revenues can be generated to support sustainable funding;
4. Jurisdictions considering imposition of a new levy on minerals production must determine whether the levy could generate sufficient revenue to support the required funding level; determine the impact on producers and consumers; and consider the overall fairness of the levy, i.e. who is really responsible;
5. Jurisdictions should be entrepreneurial and take risks in entering partnerships with industry on a site-specific basis so that each party gets something;
6. Jurisdictions contemplating partnership agreements must develop policies on indemnification against future liability so that the rules are clear;
7. As part of the policy discussion, "Good Samaritan" legislation should be reviewed for appropriateness;
8. Where jurisdictions introduce rehabilitation programs, adequate staff resources and management must be put in place to ensure proper planning and inspection, value for money and emergency planning; and
9. The funding mechanism should be legislated to provide greater certainty. However, seeking legislation can cut both ways.

The study also highlighted a number of best practices regarding funding options:

- Evaluate liabilities – physical, chemical, financial, and legal;
- Evaluate sites for responsible parties;

- Complete risk assessments and prioritize;
- Develop a long-term plan and realistic cost schedule to complete the work;
- Review funding options for viability and efficacy;
- Select workable funding option(s);
- Sell the option(s) to financial managers and ministry; and
- Be persistent and opportunistic.

Jurisdictional Updates

Five presenters from various jurisdictions in Canada gave presentations on the legislative or policy advances to address OAMs in their jurisdiction (e.g. funding issues, innovative partnership approaches).

Gregg Stewart, British Columbia Ministry of Agriculture and Lands

Gregg Stewart provided a jurisdictional update from B.C. regarding addressing OAMs. B.C. has a relatively long history of mining and a significant OAM issue. However, the province has made significant progress in addressing this issue over the past three years based on establishing a dedicated program with a significant operating budget.

The mandate of the B.C. Ministry of Agriculture and Lands (MAL) is to manage provincial Crown lands, which make up 94% of the provincial land base. MAL's Crown Contaminated Sites Branch (CCSB), established in 2003, addresses a broad range of contaminated sites, of which OAMs form a large subset. An inter-agency committee of resource and central agency ministries assists CCSB's work.

CCSB's remediation of OAMs is subject to the provisions under the Environmental Management Act and Contaminated Sites Regulation, which is based on a polluter pay principle and lays out a prescriptive process for addressing and managing contamination based on the source-pathway-receptor model. The legislation also prescribes the assignment of liability. Therefore, the government of B.C. will only expense public funds on those sites where no responsible person can be found and the site in many instances has escheated to the Crown. Since 2001, the B.C. government has committed $180 million for the management of the province's contaminated sites. An additional $47.2 million has been allocated to the program for 2007-2009. The source of these funds is direct government funding from general revenue. However, there are currently no partnership funding programs in B.C. with the mining industry, and no "Good Samaritan" programs, but the work of NOAMI provides a starting point to advancing these key policy areas. The program reports financial expenditures and liabilities on an annual basis and program accomplishments in a Biennial Report. The program's performance targets are to investigate 10 new sites on an annual basis, which presently happen to all be mines sites, with appropriate follow up from field investigations and analytical results.

CCSB has developed a prioritization process specific to mines sites whereby sites are ranked based on potential impacts to human health and the environment. The B.C. Historic Mines Sites Atlas, a joint effort between the province of B.C. and Environment Canada, ranks sites based on specified criteria. CCSB is currently refining the prioritization process and has negotiated a contract with a B.C.-based consulting firm to undertake a review of risks and develop a science-based site ranking methodology for high-risk sites. B.C. has also developed a Crown Contaminated Sites database. Significant program successes have been achieved at the Britannia mine, the Yankee Girl mine tailings site, and the Pitt River landfill.

Ernest Armitt, Manitoba Science, Technology, Energy and Mines

Ernie Armitt presented on the Manitoba Orphaned and Abandoned Mine Sites Program. In the late 1990's it was brought to the attention of the Manitoba Mines Branch that there were five sites in Manitoba that were of serious environmental and safety concern. In 1999, Manitoba Mines Branch developed a strategy document on OAMs that addressed environmental degradation and public safety, and were given an initial $1 million to carry out environmental and health risk assessments at the five critical sites as well as an additional $1 million to correct identified safety issues and high-risk environmental concerns. Liabilities, expenditures, and the future budget for activities at these sites are highlighted at the right.

Critical Sites:

Site	Liability	Expended 2001-05	Expended 2006	Budget 2006-2016
Sherridon (1931-1953)	open glory holes; tailings	$93.6	$650,000	$21.0 M
Gods Lake (1935-43)	shafts, mill, buildings, power lines; environmental issue	$259.0	Nil	$6.0 M
Baker Patton (1950)	acidic waste rock; acid mine drainage	$202.0	Nil	$0.05 M

Site	Liability	Expended 2001-05	Expended 2006	Budget 2006-2016
Snow Lake (NorAcme 1949-1958)	arsenopyrite pile (contains $43 M gold); emergency tailings area; lined leach pad	$55,000	Nil	$2.0 M
Lynn Lake (1953-1976)	550 acres of tailings; 25M tonnes	Nil	$1.12 M	$30.0 M (province) $30 M Viridian
Other mine sites	+/- 144 sites safety; environmental	$350,000	$250,000	$2.0 M

Under the *Mines and Minerals Act*, the proponent is required to file a mine closure plan 60 days before mining commences in accordance with the Regulation. A mine closure plan should be submitted for all mines; non-aggregate quarries; private non-aggregate quarry; and advanced exploration. Manitoba collects $0.10/tonne as a rehabilitation levy on private and Crown aggregate quarries. The closure plan must address in detail the specific objectives of mine rehabilitation: protect public health and safety, alleviate or eliminate environmental damage, and allow productive use of the land similar to its original use or an acceptable alternative.

Manitoba has an aggressive schedule to move forward on addressing OAMs, and has also established a $70 million environmental liability account. Financial assurance guidelines that were published a number of years ago are currently under review.

Cindy Blanchard-Smith, Ontario Ministry of Northern Development and Mines

Cindy Blanchard-Smith presented on the rehabilitation of Ontario's abandoned mines. There are approximately 16,400 mine features or hazards located on more than 5,600 known abandoned mine sites within Ontario. Approximately 4,000 of these sites could potentially be hazardous to public health and safety or to the environment. Thirty-forty percent of these sites have reverted to the provincial Crown. Hazards range from sites containing a single unprotected, low rehabilitation cost mine shaft to large sites that have greatly impacted on the surrounding area with acid mine drainage, metal leachates, etc. that can cost millions of dollars to rehabilitate.

Ontario's *Mining Act* requires that before any advanced exploration or mine production project may proceed in Ontario, a certified closure plan must be filed, including sufficient financial assurance to rehabilitate the site. All owners of abandoned mine sites are required to "take all reasonable steps to progressively rehabilitate a site". Owners of an abandoned mine site may also be ordered by the Director to conduct rehabilitation on, or submit a closure plan for, their site.

It is currently estimated that it will cost about $500 million to rehabilitate all abandoned mine sites in Ontario. Of this amount, it is estimated that it will cost $200 million or more to rehabilitate the Crown held sites. Ontario's Abandoned Mine Rehabilitation Program was established in 1999 as a four year, $27 million fund to rehabilitate Crown-held abandoned mine sites. The fund was extended in 2003 for another four years, with an additional $41 million. In March 2006, the Ontario Government's budget announced a further $60 million (i.e. $10 million per year), and the fund will now run until at least 2012.

To date, more than $60 million has been spent on rehabilitating 75 of the highest priority sites, mainly Crown-held, abandoned mine sites. This includes more than $38 million that has been spent to date on the rehabilitation of the Kam Kotia Mine (KKM) site. A further $12.3 million for the next phase of rehabilitation on KKM was recently awarded and will be completed by the winter of 2007-2008. It is now expected that it will cost approximately $58 million to completely rehabilitate the KKM site.

The Ontario Ministry of Northern Development and Mines (MNDM) has two partnership agreements in place that share the funding of certain rehabilitation under the fund:

1. **MNDM and the Ontario Mining Association**: This Agreement allows for each party to equally share the cost of rehabilitation of various agreed to projects. One project has been completed to date. Both parties have recently agreed to conduct their next project at the Kam Kotia Mine site during the winter of 2006-2007.
2. **MNDM and PJV (formerly Kinross)**: This Agreement limits MNDM's rehabilitation responsibilities to a maximum of $12.5 million on the former Hollinger and MacIntyre Mine sites.

New legislation provisions are currently being considered to allow "Good Samaritan" companies and individuals to conduct abandoned mine rehabilitation on Crown-held mining-rights lands. Proposed changes would allow companies to conduct the rehabilitation of abandoned mine hazards without incurring any historical responsibility under the Province's environmental legislation, as long as all of the rehabilitative measures have been conducted according to the Mine Rehabilitation Code of Ontario.

Louis Bienvenu, Ministère des Ressources naturelles et de la Faune, Québec

Louis Bienvenu discussed case studies of five categories of partnerships in Quebec on rehabilitating closed mines:

- **Partnership between ministries**: The Sullivan Mine was retroceded to the government in 1978. At the beginning of the process, Ministère des Ressources naturelles et de la Faune (MRNF) and Ministère de du Développement durable, de l'Environnement et Parcs (MDDEP) signed a cooperative agreement to facilitate reclamation and permitting. The 2001 site restoration plan included measures to restore the site's natural environment and to encourage the development of wildlife habitats at the cost of $1.5 million.

- **Partnership with mining industry**: The government established a partnership with Barrick Gold whereby Barrick rehabilitated government-owned tailings from the Malartic Goldfield Mine at the same time it rehabilitated its own tailings from the Terrains Aurifères tailings site. This arrangement saved the government $500,000.

- **Partnership with the forest industry**: The East Sullivan rehabilitation plan proposed putting a dyke around the tailings as well as covering the tailings to stop the acid mine drainage problem. Since wood waste is an adequate cover and the forest industry needed a place to stock its wood waste products, the tailings were covered with two metres of wood waste from the forest industry (in addition to a six kilometre impervious dam). Without this cooperation, remediation of the East Sullivan site would have cost the government $30 million. Instead, the project cost $9.5 million.

- **Partnership with local organizations**: The Albert Mine is owned by a non-profit organization that wanted to develop the site as an historic, education and recreation area. A partnership was struck between this organization, the paper industry (which needed somewhere to stock residues) and the compost industry (which also needed somewhere to dispose of its products). The site was rehabilitated for a total cost of $1.3 million, $450,000 of which came from the government. This partnership saved the government $850,000.

- **Partnership with native peoples**: Blue Lake mineral exploration site is an abandoned exploration site 70 kilometres north of Schefferville. A local Cree community conducted rehabilitation work with support from MRNF. The Cree are now involved in an ongoing inventory of all abandoned exploration sites with Environment Canada financial support.

MRNF recognizes the importance of including Aboriginal people as partners for sustainable development, and has established two partnership agreements with the Cree and the Inuit. Partnerships of all kinds are key in the success of rehabilitating closed mines, and it is critical to involve partners early in the process.

Joanna Ankersmit, Indian and Northern Affairs Canada

Joanna Ankersmit provided an overview of the Federal Contaminated Sites Action Plan and INAC's relationship to that program. INAC got involved in the abandoned mines issue in 1998-1999 when some of the larger mines – Giant, Faro, Colomac and others went bankrupt. In 2002-2003, the Auditor General's report was critical of the lack of a federal inventory or path forward on contaminated sites, and specifically highlighted northern abandoned mines. This attention allowed INAC to push the issue of contaminated sites forward, and in 2003 the federal government budget allocated $175 million to address contaminated sites, which in 2004 was rolled into a $3.5 billion commitment to address contaminated sites over 15 years (to 2020). The fund, called the Federal Contaminated Sites Action Plan (FCSAP), is available to federal government departments and crown corporations to implement the polluter pays principle with the objective to reduce overall federal liability and address human health and environmental risk through the application of risk management and remediation. The fund is managed by an interdepartmental Assistant Deputy Minister Committee and the FCSAP Secretariat (co-chair by Environment Canada and the Treasury Board Secretariat). An interdepartmental Contaminated Sites Working Group provides advice and support to FCSAP secretariat.

INAC has received a considerable amount of funding from FCSAP, and their expenditures have increased from $12 million in 1999 to a current budget of $85-$100 million. Priorities are dictated by FCSAP, driven largely by human health and environmental risks, as well as the engineering risks of inaction. Based on those priorities, INAC uses a number of tools (e.g. internal risk management tool) to ensure investments are optimized and prioritized.

INAC faces a number of challenges in its work on contaminated sites. The pace of work on contaminated sites must be as aggressive as possible while still allowing for effective community engagement. There are also a number of constraints that limit the pace of work, such as weather, short seasons, and other logistical challenges (e.g. winter roads). Remediation also has to be paced to take into consideration the capacity of Northerners and Aboriginals to participate in those projects.

INAC's goal is to have 15 sites in active remediation by 2010. Success is contingent on the ability to move forward in a way that recognizes the capacity issues in the northern environment, with a significant emphasis on good project and program management. The program must achieve good value for money with this considerable investment as well as be transparent, inclusive and deliver results.

United Keno Hill Mine Closure – A Partnership Approach

Hugh Copland, Yukon Government, discussed the partnership between government and industry in the closure of the United Keno Hill Mine (UKHM). UKHM is located 60 kilometres northeast of the town of Mayo, and has a long history of production dating back to the turn of the century. The site is 15,000 hectares and is on the traditional land of the Nacho Nyak Dun First Nation. When UKHM went bankrupt in 2001, there were still three-four years of reserves remaining on the site; however, there were also a number of environmental and human health hazards, and site liabilities were estimated to be $40-75 million.

A decision had to be made to either close or sell the site. Two previous attempts to sell the site failed, and though there was good exploration potential remaining, the site liabilities outweighed the known economic potential. Nevertheless, industry had expressed interest in the site, and the Yukon was interested in economic development in the area. The federal government decided it was willing to give indemnity on historic environmental liabilities if it would promote a sale and possibly reduce their costs.

Nine purchase offers were received by the deadline of April 13, 2005 and were evaluated according to strict criteria, including history and experience; management team; financial capacity; exploration and mining plans; reclamation and environmental expertise; First Nation and local opportunities; historic reclamation contribution; and care and maintenance contribution. The winning bid from Alexco Resources included:

- $410,000 cash for secured creditors;
- $10 Million into a qualified environmental trust;
- 1.5% net smelter royalty on production into a reclamation securities trust with a $4 million cap;
- Assume care and maintenance for site under a fixed price eventually reducing to zero;
- Option for a guaranteed remediation program (GRiP) with Arcadis G&M Inc.;
- Obtain a care and maintenance water licence in three-four years of initial close;
- Commitment of at least $5.6 million in exploration on the site over three years; and
- Development of an impact benefit agreement with Nacho Nyak Dun First Nation.

Elsa Reclamation and Development Company Ltd. (ERDC – the company set up by Alexco to do work on the site) took over the care and maintenance contract for fixed price on June 2006 and is developing site work plans for closure research and site improvements. Governments and ERDC are cost-sharing the development of a baseline environmental survey (to be completed and agreed to by March 31, 2007) and are jointly developing a closure plan on a cost share basis (closure planning process to be completed by late 2008). ERDC is conducting exploration on site prior to full ownership being granted, and will be 100% responsible for remediating any new areas brought into production. Federal funding approvals will be conducted through the Treasury Board. The site will also have to undergo an environmental assessment through the *Yukon Environmental and Socio-Economic Assessment Act*, and ERDC will have to obtain all necessary water licences and other authorizations. Implementation of the closure plan is expected around 2013-2014.

The Churchill Copper Partnership

Garry Davies, Teck Cominco, presented on the Churchill Copper Partnership between Teck Cominco, the B.C. Ministry of Sustainable Resource Development, and the Muskwa Kechika Program. Teck Cominco's Churchill Copper Mine was shut down in 1972. The original decommissioning and infrastructure was the responsibility of the Churchill Copper Mine, but because of the "Roads to Riches" program, it was decided that the transportation infrastructure belonged to the public, and the mine was not permitted to remove road or bridges. However, nobody was given responsibilities for maintaining this infrastructure.

The Muskwa Kechika Special Management Area was created in 1998 and includes the former Churchill Copper Mine. In 1999, it was decided by Teck Corporation Limited after consultation with the B.C. Ministry of Energy and Mines that further remediation was required at the former Mine to meet the requirements of the Muskwa Kechika Act, to address safety concerns, reclaim to current standards, and rehabilitate the transportation corridor that had fallen into disrepair. However, Teck Cominco had no right to enter the special management area with mechanized or heavy equipment and no right to perform the work because they did not have tenure on the land. In 1999, a multi-agency committee was formed between the Ministry of Environment (MOE), Land and Water B.C., the Ministry of Sustainable Resources, the Ministry of Energy and Mines (MEM), and the Department of Fisheries and Oceans (DFO) in order to obtain the permits necessary to further rehabilitate the site:

- MEM Reclamation permit to allow work on Crown land;
- MOE and Land Water B.C. approval to allow landfills on Crown land;
- MEM landfills permit from Water and Air B.C./MOE;
- MOE permission to enter MK Special Management Area (Wildlife Act, Access Management Area Regulations); and
- DFO approval to allow for fording river and creeks with heavy equipment and to remove bridge pilings.

In 2004, the Muskwa Kechika Program and Teck Cominco approved a joint work plan and a 50/50 trust fund. The plan included the removal of safety hazards and improvements to the Wokkpash Corridor road and trails while making the smallest reclamation footprint possible. Activities undertaken at the site included relocating a landfill, moving tailings from the north tailings pond to an area above the river flood plain, and reclaiming the mill site area. Four adits were in-filled for public safety, and bridges and piers were removed at the three river and creek crossings of the access road. Local and regional contractors were employed to conduct the work, and local businesses were used for re-supply.

Tourism – A Viable Option for Abandoned Mines?

Peter Whitbread-Abrutat, the Post-Mining Alliance (www.postmining.org) and the Eden Project (www.edenproject.com), discussed tourism as a viable option for OAMs. The vision of the Post-Mining Alliance is to be a world leader in brokering solutions to catalyse action on mining legacies and in promoting integrated mine closure good practice. Tourism is a common option for the sustainable regeneration of mined lands and communities. Many mining regions have a strong cultural identity and existing infrastructure to support tourism, which provides clean and safe employment. However, there is a difference between maintaining cultural identity and trying to use that identity on a larger scale to regenerate an entire economy.

Categories of mining tourism include heritage, non-heritage, mixed (on-site), or integrated (beyond the site), although these are not mutually exclusive:

- **Heritage Tourism**: typically includes a mining museum and a trip underground. While heritage tourism is important for maintaining cultural identity, it is often economically unsustainable in that it has a small regeneration impact and must compete with other, higher priority public funding areas. However, heritage is a growing tourism market and provides opportunities for cohesion, education and skills development, and branding. Examples include the Geevor Tin Mine and the Cornwall and West Devon Mining Landscape World Heritage Site, both in the UK.

- **Non-Heritage Tourism**: uses mining infrastructure, communities and landscapes to create novel tourism opportunities. Both heritage and non-heritage attractions can benefit one another. Non-heritage tourism in particular requires innovation and investment, and may attract transient funding. Examples include the Eden Project in the UK.

- **Mixed Tourism**: combines heritage and non-heritage tourism elements on the same multi-purpose site. While this approach broadens visitor appeal, there are trade-offs between attracting revenue and maintaining cultural authenticity. Examples include the Wieliczka Salt Mine in Poland.

- **Integrated Tourism**: maximizes regeneration opportunities by integrating tourism more fully into the local economy via policies on local sourcing and local employment; attracting external capital funds; strengthening links to the education sector; joint marketing initiatives; branding; and the media.

Whichever options are chosen, it must be recognized that tourism has both positive and negative impacts, and that it is critical to maximize tourism's regeneration potential:

- Choose local solutions according to local circumstances;
- Maximize funding options;
- Use creative partnership approaches and look beyond the usual actors;
- Include critical and meaningful community involvement;
- Create a high quality, unique venue with long-lasting visitor appeal. Use the site for different purposes to broaden its appeal, or change regularly to attract return visitors (e.g. events, performances);
- Implement policies to maximize the sustainable development footprint (e.g. local employment, local sourcing);
- Staff training could include transferable skills and personal development;
- Integrate with other tourism (and non-tourism) opportunities;
- Communicate broadly and often of the work and its positive impacts; and
- Consider branding and marketing – understand the media, link to wider tourism strategies.

Co-operating on the Giant Mine Closure

Bill Mitchell, Giant Mine, presented on the co-operation in the Giant Mine closure. When Royal Oak Mines was assigned into receivership in 1999, the Giant Mine, located on the north shore of Great Slave Lake, become an orphaned site. From 1999-2005, INAC had an agreement with Miramar Giant Mine Ltd to provide care and maintenance at the Giant Mine. Miramar provided personnel skilled in maintaining mine in environmental compliance including operating mine water management system and effluent treatment plant, and operated the mine on a reduced scale. This agreement allowed INAC and a Technical Advisor to assess liabilities and develop options with public input for the management of the underground arsenic trioxide.

In 2005, the former lease of the mine reverted to the Government of the Northwest Territories (GNWT). The remediation of the Giant Mine requires both surface and underground components. Since GNWT has administrative authority for the surface of the mine and INAC has administrative authority for the subsurface, a Cooperation Agreement was needed to allow GNWT and INAC to cooperate and coordinate the care and maintenance of the site, and finalize and implement an integrated Remediation Plan. Under the Agreement, the parties agree to:

- Implement an effective care and maintenance plan;
- Finalize, approve and implement a remediation plan (after appropriate regulatory approval);
- Protect human health, public safety and environment;
- Maximize northern economic opportunities; and
- Cooperate to achieve a timely and efficient regulatory review process.

The main components of the Agreement address care and maintenance, an integrated remediation plan (surface and underground), administration of the project, and financial cost sharing:

Care and Maintenance	Integrated Remediation Plan	Administration	Financial Cost Sharing
Interim office responsible for managing care and maintenance to maintain the mine in environmental compliance and provide site security. Cost shared between GNWT and INAC. In 2005 after a competitive bid process, Public Works and Government Services Canada awarded a contract for care and maintenance to Deton'Cho Nuna, an Aboriginal and northern company joint venture.	Parties agree to finalize a remediation plan integrating surface and subsurface components for submission to regulatory agencies. The plan will include the former town site. Parties agree that in situ freezing of arsenic trioxide dust is the preferred option for addressing the underground arsenic trioxide at the site. Parties agree to cooperate in all aspects of regulatory filings and environmental assessment. Remediate surface of the site to GNWT Industrial Standards.	Parties will establish an Oversight Committee with equal federal and territorial representation to administer the Agreement and Interim Project Office – decisions by consensus. Parties will jointly establish an Interim Office to ensure care and maintenance is carried out, finalize an integrated Remediation Plan and submit the Plan on behalf of both Parties to the regulatory authorities. Parties will jointly establish a project management structure to implement the Approved Remediation Plan.	GNWT to contribute $23m over 10 years towards care and maintenance and remediation of the surface. Canada acknowledges long-term responsibility of arsenic trioxide dust stored underground. GNWT to provide right of access and possession by appropriate land tenure instrument at no cost to Canada. GNWT will contribute up to $250,000 annually towards the cost of the interim office. GNWT will make best efforts to provide other in-kind services.

The next steps at the Giant Mine are the application for a water license; continued care and maintenance, risk mitigation and air, water and effluent monitoring; and continued communications and information activities.

Case Study Breakout Group Discussions

Workshop participants were divided into three breakout groups to discuss and apply best practices in setting priorities, public engagement and capacity-building, and partnership approaches to a complex abandoned mine case study.

The best practices highlighted through these discussions are summarized below:

SETTING PRIORITIES	PUBLIC ENGAGEMENT AND CAPACITY-BUILDING	PARTNERSHIP APPROACHES
Discuss and recommend a plan incorporating best practice approaches to setting priorities at the Maycavin mine site. Include consideration of site assessment; risk/hazard assessment; reclamation; and monitoring. Consider community involvement and Partnership Approaches in developing the plan.	*Discuss and recommend a plan to incorporate best practice approaches to community involvement at the Maycavin mine site. Include consideration of Community and Aboriginal involvement in the full life cycle of the project including consultation, monitoring and decision-making.*	*Discuss and recommend best practice partnership approaches for the Maycavin mine site. Include consideration of best available funding options; regulatory structures; and opportunities for collaboration.*
▪ Determine whether the site is actually abandoned; ▪ Establish liability, determine possibility of going after the original owner; ▪ Hold multi-stakeholder meetings to identify and scope issues, determine expectations, establish objectives; ▪ Set priorities (public safety, ecological and human health assessments) and take swift action on key items; ▪ Establish partnerships; ▪ Manage expectations; and ▪ Adaptive management – continuous loop of review, stakeholder communication/ consultation, re-evaluation of priorities, post-construction evaluation, etc.	▪ Identify stakeholders - but don't assume you know who all the stakeholders are; ▪ Delineate responsibility for communicating, and be transparent and consistent in messaging to build trust; ▪ Acknowledge the need for different strategies to work with different stakeholders, and that different stakeholders will have different concerns; ▪ Conduct bilateral discussions first, and identify health and environmental issues; ▪ Recognize the importance of good information (strive to fill information gaps; learn about the site and the community); ▪ Have acceptable timelines for information transfer; ▪ Implement a two-way communication plan and establish clarity in information needs on both sides. Consider involving the media in this plan; ▪ Use appropriate communication mechanisms – establish a toolbox of approaches. Recognize and respect that each group or community has its own distinct way of communicating; ▪ Involve the community in setting priorities and setting	▪ Explore whether any residual liabilities. Affected departments would go through regulatory structure to see if they can provide more information on existing liabilities; ▪ Explore different types of partnership arrangements: - Collaborate with local academics from local universities and community colleges; - Engage a "good neighbour" mining company and explore possibility for indemnification; - Group interested in maintaining the heritage aspects of the site; and - Various levels of government. ▪ Conduct a review of different communities/jurisdictions to learn how other communities have dealt with similar situations; ▪ Divide partnerships into different types and then draw linkages between parties involved in the partnerships: - Partnerships that deal with government; - Partnerships that deal

SETTING PRIORITIES	PUBLIC ENGAGEMENT AND CAPACITY-BUILDING	PARTNERSHIP APPROACHES
	short and long-term goals; ▪ Bring different groups together; ▪ Recognize the need for capacity building (e.g. technical capacity, language/terminology); ▪ Establish realistic timelines; and ▪ Take an adaptive management approach to getting communities involved.	with businesses; and - Partnerships that deal with communities ▪ Each partnership will have different timeframes for dealing with the various issues that they face; ▪ Identify what types of partnerships are better for getting certain jobs done (i.e. smaller partnerships may be better for smaller, more short-term problems.); ▪ Explore relationships that exists between parties involved; ▪ Explore idea of having a consultation company involved for communications between parties; ▪ Define what permits/licenses are required for the process; and ▪ Explore in-kind funding opportunities (i.e. that government can provide academic institutions/ communities, vice versa).

Closing Remarks

Elizabeth Gardiner, Chair of the Workshop Organizing Committee, wrapped up the workshop with closing remarks and thanked all of the participants for their contributions to what she considered a very successful workshop. Ms. Gardiner noted that the work of NOAMI has begun to coalesce and must now move from theory to practice. Commitment from the Mines Ministers remains strong, and NOAMI has been a driver in pushing the OAM issue at all levels. Ms. Gardiner stressed the importance of developing a strategy for keeping OAMs on the national agenda, since NOAMI won't be around forever, and highlighted a number of potential work areas for 2007-2008, including:

- Taking the research on jurisdictional reviews and the funding options toolkit to create a template or model that jurisdictions can use to generate their own pieces of OAM legislation (recognizing that all jurisdictional are different);
- Using the OAM inventory and national database to inform each jurisdiction about what they're contending with in their own backyard, and to put that information to good use in developing a legislative framework
- Putting together a communications strategy and tool to inform people about NOAMI and to heighten awareness of legacy issues on a national basis.
- Discussing risk assessment and setting priorities with a real focus on risk assessment for OAMs.

Many workshop participants commented that they do not want to see an end to NOAMI, and spoke positively about NOAMI's strong contribution to addressing the issue of OAMs in Canada.

APPENDIX A: AGENDA

Orphaned and Abandoned Mines: A Workshop to Explore Best Practices

October 26 – 27, 2006
Viscount Gort Hotel
Winnipeg, Manitoba

AGENDA

OBJECTIVE:

- To explore and understand the best, emerging and innovative practices relating to the management of orphaned and abandoned mines.

ANTICIPATED OUTPUT:

- Report of workshop proceedings capturing presentations and resulting discussions, as well as a listing of possible elements that may constitute a "tool kit" of best practices to address the legacy issues of orphaned/abandoned mine sites.

TARGET AUDIENCE:

Approximately 100 individuals dealing with orphaned and abandoned mines including:

- Provincial, Territorial and Federal Government officials;
- Communities of interest;
- Aboriginal peoples;
- NGOs;
- Academics;
- Consultants;
- Scientists;
- Mining industry representatives; and
- Public engagement practitioners.

BACKGROUND MATERIAL:

- NOAMI backgrounder

	OCTOBER 26
07:30 – 08:30	Registration and Continental Breakfast (Muffins, Danishes and Juice)
08:30 – 09:00	WORKSHOP INTRODUCTION
8:30 – 8:35	**Opening Ceremony** Elder Flora Zaharia
8:35 – 8:40	**Minister's Remarks** Jim Rondeau, Honourable Minister of Manitoba Science, Technology, Energy and Mines
8:40 – 8:50	**Welcoming Remarks and NOAMI Background** Christine Kaszycki, NOAMI Chair, Ontario Ministry of Northern Development and Mines
8:50 – 8:55	**The Mining Association of Canada's Remarks** Gordon Peeling, President and CEO
8:55 – 9:00	**Objectives and Approach of Workshop** Michael van Aanhout, Facilitator, Stratos Inc.
9:00 – 9:45	Keynote Speaker Professor Paul Younger, Newcastle University
9:45 – 10:00	**Health and Coffee Break**
10:00 – 12:30	**SETTING PRIORITIES** **Site assessment, risk/hazard assessment, monitoring, reclamation**
10:00 – 10:25	Mike Nahir, Department of Indian and Northern Affairs ***Risk Management in the Contaminated Sites Program***
10:25 – 10:50	Maxine Wiber, BHP Billiton ***Risk Assessment at East Kemptville***
10:50 – 11:15	Caius Priscu, AMEC Earth and Environmental ***Condition and Hazard Evaluation of Crown Owned Inactive Mine Sites in Manitoba***
11:15 – 11:40	David Chambers, Center for Science in Public Participation ***Uncertainty and Risk in Reclamation Bonds – An Alaskan Example***
11:40 – 12:30	Plenary Discussion
12:30 – 13:30	**LUNCH**
13:30 – 16:30	**PUBLIC ENGAGEMENT AND CAPACITY BUILDING** **Community and Aboriginal involvement, including consultation, monitoring and decision-making**
13:30 – 13:50	Sue Moodie ***Community-Based Decisions and Setting Priorities in Abandoned Mine Remediation***
13:50 – 14:10	Louise Livingstone, The Community Press/Deloro Minesite ***Deloro Minesite Cleanup - Community Involvement and the Role of the Media***
14:10 – 14:30	Father Charles Brandt, Tsolum River Restoration Society ***Public Engagement in the Mt. Washington Mine Remediation***

14:30 – 14:50	Chris Paci, Deep Consulting ***Orphaned and Abandoned Mines and Community Capacity: Best Practices and Pitfalls from Northern Canada***
14:50 – 15:00	**Health and Coffee Break**
15:00 – 15:20	Joan Kuyek, MiningWatch Canada ***Historical Overview of Community Involvement in Abandoned Mines***
15:20 – 15:40	Kathlene Suza, Closure Planning Coordinator for the Ross River Dena Council Ellie Marcotte, Closure Planning Coordinator for the Selkirk First Nation Stephen Mead, Yukon Territorial Government ***Faro Mine Closure - A Community Perspective***
15:40 – 16:30	Plenary Discussion
16:30	**Close of Day 1** Michael van Aanhout
16:45 – 18:30	**Informal Reception and Showcasing the Inventory of Orphaned/Abandoned Mines**

	OCTOBER 27
08:00 – 08:30	**Continental Breakfast (Muffins, Danishes and Juice)**
08:30 – 12:40	**PARTNERSHIP APPROACHES** **Funding options, regulatory structures, opportunities for collaboration**
8:30 – 8:40	Welcome and review of the agenda
8:40 – 9:00	Dick Cowan, Cowan Minerals Ltd. ***Rehabilitating Abandoned Mines in Canada: A Toolkit of Funding Options***
9:00 – 10:00	Panel Presentation – Jurisdictional Updates: ▪ Gregg Stewart, British Columbia Ministry of Agriculture and Lands ▪ Ernest Armitt, Manitoba Science, Technology, Energy and Mines ▪ Cindy Blanchard-Smith, Ontario Ministry of Northern Development and Mines ▪ Louis Bienvenu, Ministère des Ressources naturelles et de la Faune, Québec ▪ Joanna Ankersmit, Indian and Northern Affairs Canada
10:00 – 10:20	Hugh Copland, Yukon Territorial Government ***United Keno Hill Mine Closure – A Partnership Approach***
10:20 – 10:30	Health and Coffee Break
10:30 – 10:50	Garry Davies, Teck Cominco ***The Churchill Copper Partnership***
10:50 – 11:10	Peter Whitbread-Abrutat, The Eden Project ***Tourism – A Viable Option for Abandoned Mines?***
11:10 - 11:30	Bill Mitchell, Giant Mine ***Co-operating on the Giant Mine Closure***
11:30 – 11:50	Dirk van Zyl, University of Nevada, Reno ***Including Sustainable Development Thinking in Resource Management Planning***
11:50 – 12:40	Plenary Discussion

12:40 – 12:45	Planning for the Afternoon Session **Michael van Aanhout**
12:45 – 13:30	LUNCH
13:30 – 16:00 13:30 – 15:00 15:00 – 16:00	**APPLYING BEST PRACTICES** **Bringing it all together!** Case Study Breakout Group Discussions *Breakout Group 1: Setting Priorities* *Breakout Group 2: Public Engagement and Capacity Building* *Breakout Group 3: Partnership Approaches* Report to Plenary
16:00 – 16:15	**Next Steps** Christine Kaszycki
16:15 - 16:30	**Wrap Up and Closing Remarks** Michael van Aanhout

APPENDIX B: CASE STUDY

Orphaned and Abandoned Mines: A Workshop to Explore Best Practices
October 26 – 27, 2006
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Winnipeg, Manitoba

CASE STUDY

Maycavin Mine – Nimbyville, Ontario

The Maycavin Mine is located in Nimbyville, Ontario, about 600km north of Toronto. Originally owned by Maycavin Mining Inc. (MMI), extensive underground gold mining occurred at the site from 1912 until 1953. The mine was subsequently acquired by AnotherKickattheCan (AKATC) Mining Company in 1966. In 1980, FinalKickattheCan (FIKATC) Mining acquired the site and, after a failed attempt to revitalize the old mine in the early 1980s, eventually abandoned the mine in 1983.

Presently, a number of dwellings, mostly portable housing trailers, are on the site. Other structures include the Maycavin head frame and service buildings of the mine, which have been deemed historical features by the Town of Nimbyville. Railway tracks, a community college, a gas pipeline easement and recreation trails are located in the broader property area.

The site presents various noteworthy technical and environmental aspects. Recent studies at the abandoned mine have found mine workings beneath the town infrastructure. It would appear that this infrastructure was built on top of existing mine workings without regard for stability of the underlying crown pillars.

Geotechnical studies have identified a potentially unstable crown pillar located beneath three housing trailers on the former Maycavin Mine site. The trailer park was originally part of a housing area for mine workers but gradually became a small residential pocket. None of the owners have title, as the mining and surface rights belong to the Crown, and the occupants of the trailers are effectively “squatting” on the land.

Additionally, there is a possible threat to the integrity of the rail bed that runs through the site, which is constructed on a thick layer of tailings that are subject to flow and possible disruption should an adjacent crown pillar fail. Two trains use the track daily, one northbound train carrying concentrate to a nearby smelter, and one southbound carrying sulfuric acid.

Several openings to the surface have been identified as representing public safety hazards, including an open shaft that is a major bat hibernaculum, and the mine head frame, which is of interest as a tourist attraction and located near a community college walking path.

There are also environmental concerns associated with the site. While there are tailings onsite, they are not an immediate concern. Of more direct concern is the potential for acid rock drainage and surface water contamination.

There are multiple stakeholders involved with the Maycavin Mine site. Stakeholders include:

- Ontario Ministry of Northern Development and Mines (MNDM)
- Ontario Ministry of Natural Resources (MNR)
- XYZ Engineering Consulting Firm
- Trailer residents
- Railway
- Nimbyville Community College
- Algonquin Aboriginal community
- Town of Nimbyville

The Ministry of Northern Development and Mines (MNDM) and Ministry of Natural Resources (MNR) have been working cooperatively to ensure the safety of the people and environment at the Maycavin Mine site. MNDM is responsible for commissioning engineering and geotechnical studies at the former Maycavin Mine site, providing government funding for mine hazard abatement, holding community meetings and issuing press releases, and developing the remedial action plan. The MNR is leading on the Crown land occupation/ownership issues.

XYZ Consulting is responsible for carrying out engineering and geotechnical studies, providing recommendations to the MNDM on remediation options, as well as installing, monitoring and maintaining monitoring equipment.

The residents occupying the trailers on the mine site are doing so illegally on Crown land and currently have no legal tenure. XYZ Consulting has informally notified the residents that they will have to relocate. Residents are complaining of informal and inconsistent communication that has resulted in conflicting information. The government, taking into consideration that these people are effectively squatters on Crown land, has initiated discussions on the issue of paying for relocation costs.

The Town of Nimbyville is interested in reaching a solution to the property tenure issue and recovering municipal taxes due.

There is an ongoing Aboriginal land claim that affects the Maycavin Mine site. The Algonquin land claim against the Crown includes the mine site and covers more than 1.12 million acres within northern Ontario. The large size of the claim territory and the nature of the claim indicate that a number of different ministries and agencies could potentially be involved.

The draft closure plan on file for the Maycavin Mine site has a closure cost estimate of approximately $30 million. In 1990, Global Mining Inc. (GMI) acquired AKATC Mining. GMI is an international gold development and mineral exploration company traded on the NYSE.

The Good Neighbour Mining Company operating on an adjacent mineral lease has offered to provide technical support and equipment if they can be provided with an indemnification.

APPENDIX C: LIST OF DELEGATES

Dina Aloi
Hatch
2800 Speakman Drive
Sheridan Science & Technology Park
Mississauga, ON
L5K 2R7
E-mail: daloi@hatch.ca
Tel: (905) 403-4123

Joanna Ankersmit
Indian and Northern Affairs Canada
25 Eddy
Gatineau, QC
K1A 0H4
E-mail: ankersmitj@inac.gc.ca
Tel: (819) 997-7247

Ernest Armitt
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: earmitt@gov.mb.ca
Tel: (204) 945-6505

Brian Bailey
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: bbailey@gov.mb.ca
Tel: (204) 945-6516

Susan Baldwin
Chemical and Biological Eng.
2360 East Mall
Vancouver, BC
V6T 1Z3
E-mail: sbaldwin@interchange.ubc.ca
Tel: (604) 822-1973

Karen Baltgailis
Yukon Conservation Society
302 Hawkins Steet
Whitehorse, YT
Y1A 1X6
E-mail: ycsforest@ycs.yk.ca
Tel: (867) 668-5678

Louis Bienvenu
Ministere des Ressources naturelles (Quebec)
880 Chemin Ste-Foy Bureau 3.00,
Quebec, QC
G1S 4X4
E-mail: louis.bienvenu@mrnf.gouv.qc.ca
Tel: (418) 627-6365 ext:5606

Eric Blais
UMA Engineering Ltd.
1479 Buffalo Place
Winnipeg, MB
R3T 1L7
E-mail: eric.blais@uma.aecom.com
Tel: (204) 284-0580

Cindy Blancher-Smith
Ontario Ministry of Northern Development & Mines
933 Ramsay Lake Road,
Sudbury, ON
P3E 6B5
E-mail: cindy.blancher-smith@ontario.ca
Tel: (705) 670-5784

Bill Botsforn
Montana Deq Aml Program
1100 N. Last Chance Gulch
Helena, MT
59601
E-mail: wbotsforn@mt.gov
Tel: (406) 841-5000

Philip Bousquet
Prospectors & Developers Association of Canada
9th Floor, 34 King Street E.
Toronto, ON
M5C 2X8
E-mail: pbousquet@pdac.ca
Tel: (416) 362-1969

Norman Brandson
Agrium
302 Scotswood Drive South,
Winnipeg, MB
R3R 3H3
E-mail: N2b@shaw.ca
Tel: (204) 837-9590

Charles Brandt
Tsolum River Restoration Society
2364 Catherwood Road
Black Creek, BC
V9J 1J3
E-mail: cbrandt@mars.ark.com
Tel: (250) 337-8525

Jared Buchko
PWGSC Environmental Services
10025 Jasper Avenue
Edmonton, AB
T5J 1S6
E-mail: jared.buchko@pwgsc.gc.ca
Tel: (780) 497-3886

Jim Cassie
BGC Engineering Inc.
Ste. 1170-840 7th Ave. S.W.
Calgary, AB
T2P 3G2
E-mail: jcassie@bgcengineering.ca
Tel: (403) 250-5185 ext:103

David Chambers
Center for Science in Public Participation
224 North Church Avenue
Bozeman,
59715
E-mail: dchambers@csp2.org
Tel: (406) 585-9854

Michele Coleman
NB Coal Limited
12 Tower Road
Minto, NB
E4B 3V1
E-mail: mcoleman@nbpower.com
Tel: (506) 327-2228

Ed Collins
KGS Group
3rd Floor-865 Waverly St.
Winnipeg, MB
R3T 5P4
E-mail: ecollins@kgsgroup.com
Tel: (204) 896-1209

Hugh Copland
Government of Yukon
P.O. Box 2703 Energy, Mines and Resources - Abandoned Mines,
Whitehorse, YT
Y1A 2C6
E-mail: hugh.copland@gov.yk.ca
Tel: (867) 667-3208

David Courtois
Mushkegowuk Environmental Research Centre
36 Birch St. South,
Timmins, ON
P4N 2A5
E-mail: dcourtois@merc.ontera.net
Tel: (705) 268-1123

Gerry Couture
Yukon Conservation Society
302 Hawkins Street
Whitehorse, YT
Y1A 1X6
E-mail: glc@northwestel.net
Tel: (867) 668-5678

Richard Cowan
Cowan Minerals Ltd.
3978 Orange Road
Sudbury, ON
P3G 1H6
E-mail: dick.cowan@sympatico.ca
Tel: (705) 522-6002

Marilyn Crawford
Bedford Mining Alert
223 Crawford Lane, RR2
Godfrey, ON
K0H 1T0
E-mail: marilync@rideau.net
Tel: (613) 273-4511

Amy Crook
Center for Science in Public Participation
4436 Torquay Drive
Victoria, BC
V8N 3L4
E-mail: acrook@csp2.org
Tel: (250) 721-3627

Sarah Crowe
Canadian Envrionmental Network
Suite 300, 945 Wellington St. West
Ottawa, ON
K1Y 2X5
E-mail: scrowe@cen-rce.org
Tel: (613) 728-9810

Claudia David
Indian and Northern Affairs Canada
25 Eddy
Gatineau, QC
K1A 0H4
E-mail: davidc@ainc-inac.gc.ca
Tel: (819) 994-7469

Garry Davies
Teck Cominco Limited
P.O. Box 4000 Trans Canada Highway
Kamloops, BC
V1S 2A9
E-mail: gdavies@attglobal.net
Tel: (250) 372-0032

John Davis
Department of Mines & Energy (Newfoundland)
Natural Resources Building 50 Elizabeth Ave.
St. John's, NL
A1B 4J6
E-mail: johnddavis@gov.nl.ca
Tel: (709) 729-6449

Bonnie De Moissac
Manitoba Trade and Investment
1100-259 Portage Avenue,
Winnipeg, MB
R3B 3P4
E-mail: bdemoissac@gov.mb.ca
Tel: (204) 945-6584

Allyson Desgroseilliers
AMEC Earth & Environmental Limited
440 Dovercourt Drive
Winnipeg, MB
R3Y 1N4
E-mail: allyson.desgroseilliers@amec.com
Tel: (204) 488-2997 x. 230

Kaci Djaffar
French Radio

Eileen Doody
Iskut First Nation
P.O. Box 47
Iskut, BC
V0J 1K0
E-mail: tahltangirl@hotmail.com
Tel: (250) 234-3145

Charles Dumaresq
Environment Canada
12 Floor 351 St. Joseph Blvd.
Gatineau, QC
K1A 0H3
E-mail: charles.dumaresq@ec.gc.ca
Tel: (819) 953-8459

Michelle Edwards
DIAND, Yukon Region
415C 300 Main Street
Whitehorse, YT
Y1A 2B5
E-mail: edwardsm@inac.gc.ca
Tel: (867) 393-7934

Jared Etcheverry
University of Manitoba
125 Dysart Road
Winnipeg, MB
R3T 2N2
E-mail: umetchev@cc.umanitoba.ca

Randy Fleming
Inter Church Uranium Committee Educational Cooperative
P.O. Box 1101
Saskatoon, SK
S7K 3N2
E-mail: icuc_ec@canada.com
Tel: (306) 244-8438

John Fox
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue,Winnipeg,R3G 3P2
Winnipeg, MB
R3G 3P2
E-mail: jfox@gov.mb.ca

Elizabeth Gardiner
Mining Association of Canada
1105-350 Sparks Street
OttawaK1R 7S8, ON
R3G 3P2
E-mail: egardiner@mining.ca
Tel: (613) 233-9392 ext:328

Ann Garibaldi
CE Jones and Associates Ltd.
Suite 104, 645 Fort Street
Victoria, BC
V8W 1G1
E-mail: agaribaldi@jonesassoc.com
Tel: (250) 383-8375 ext:11

Tom Gates
Canadian Nuclear Safety Commission
101-22nd Street East, Suite 520
Saskatoon, SK
S7K 0E1
E-mail: gatest@cnsc-ccsn.gc.ca
Tel: (306) 975-6362

Michael Grant
Ontario Ministry of Northern Development & Mines
435 James Street S. Suite B002
Thunder Bay, ON
P7E 6S7
E-mail: mike.grant@ndm.gov.on.ca
Tel: (807) 475-1746

Denis Hache
Fisheries & Oceans Canada
343 Universite Avenue P.O. Box 5030
Moncton, NB
E1C 9B6
E-mail: HacheD@dfo-mpo.gc.ca
Tel: (506) 851-6252

Ramli Halim
Acres Manitoba Limited
6th Floor 500 Portage Ave
Winnipeg, MB
R3C 3Y8
E-mail: rhalim@hatchacres.com
Tel: (204) 786-8751

Murray Hampton
Town of Faro
200 Campbell Street Box 580
Faro, YT
Y0B 1K0
E-mail: info@faroyukon.ca
Tel: (867) 994-2728

Karla Heath
Stratos Inc.
1404-1 Nicholas Street
Ottawa, ON
K1N 7B7
E-mail: kheath@stratos-sts.com
Tel: (613) 241-1001 ext:232

Eric Hinton
Golder Associates
#6 - 5 Scurfield Blvd.
Winnipeg, MB
R3Y 1G3
E-mail: ehinton@golder.com
Tel: (204) 489-9600

Charlene Hogan
Natural Resources Canada – NOAMI SECRETARIAT
555 Booth Street, Mining & Mineral Sciences Laboratories
Ottawa, ON
K1A 0G1
E-mail: chogan@nrcan.gc.ca
Tel: (613) 996-7855

D. Jean Hutchinson
Queen's University, Geological Engineering Dept.
Miller 228
Kingston, ON
K7L 3N6
E-mail: jhutchin@geol.queensu.ca
Tel: (613) 533-6183

Ian Judd-Henrey
Saskatchewan Research Council
125-15 Innovation Blvd.
Saskatoon, SK
S7N 2X8
E-mail: juddhenrey@src.sk.ca
Tel: (306) 933-6711

Collins Kamunde
Institute of Island Studies
University of Prince Edward Island,
550 University Avenue
Charlottetown, PE
C1A 4P3
E-mail: ckmunde@upei.ca
Tel: (902) 566-0944

Christine Kaszycki
Ontario Ministry of Northern Development & Mines
933 Ramsay Lake Road
Sudbury, ON
P3E 6B5
E-mail: christine.kaszycki@ontario.ca
Tel: (705) 670-5877

Diana Kircz
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: dkircz@gov.mb.ca
Tel: (204) 945-6558

Corrina Kropf
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: ckropf@gov.mb.ca
Tel: (204) 945-6503

Nick Kulyk
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: nkulyk@gov.mb.ca

Joan Kuyek
Mining Watch Canada
508 - 250 City Centre Avenue
Ottawa, ON
K1R 6K7
E-mail: joan@miningwatch.ca
Tel: (613) 569-3439

Lise-Aurore Lapalme
Natural Resources Canada
580 Booth Street
Ottawa, ON
K1A 0E4
E-mail: lapalme@nrcan.gc.ca
Tel: (613) 995-9065

David Laverdiere
Environmental Protection Operations Division
4905 Dufferin St.
Toronto, ON
M3H 5T4
E-mail: David.Laverdiere@ec.gc.ca
Tel: (416) 739-5872

Derek Leschasin
Uniter - Student Newspaper
University of Winnipeg

Mark Liskowich
SRK Consulting
Suite 99A, 2366 Avenue C. North
Saskatoon, SK
S7L 5X5
E-mail: mliskowich@srk.com
Tel: (306) 955-4778

Kevin Liu
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: kliu@gov.mb.ca
Tel: (204) 945-8558

Louise Livingstone
The Community Press
251 Goods Road
Stirling, ON
K0K 3E0
E-mail: louise@tubb.ca
Tel: (613) 395-4388

Ellie Marcotte
Selkirk First Nation
Box 40
Pelly Crossing, YT
Y0B 1P0
E-mail: marcottee@selkirkfn.com
Tel: (867) 537-3331 ext:286

David Markham
Mining Association of Manitoba
700-305 Broadway Avenue
Winnipeg, MB
R3C 3J7
E-mail: dmarkham@mines.ca
Tel: (204) 989-1890

Allan Mattes
Nature Works Remediation Corporation
1737 West River Road,
Cambridge, ON
N1R 5S5
E-mail: almattes@rogers.com
Tel: (619) 620-9798

Barb McLean
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: BaMclean@gov.mb.ca
Tel: (204) 945-4961

Stephen Mead
Yukon Territorial Government
419 Range Road
Whitehorse, YT
Y1A 2C6
E-mail: stephen.mead@gov.yk.ca
Tel: (867) 393-6904

Hermann Minderlein
Town of Faro
200 Campbell Street Box 580
Faro, YT
Y0B 1K0
E-mail: cao@faroyukon.ca
Tel: (867) 994-2728

Bill Mitchell
INAC
P.O. Box 1500
Yellowknife, NT
X1A 2R3
E-mail: mitchellb@inac.gc.ca
Tel: (867) 669-2434

Sue Moodie
CCSG Associates
Box 34026
Whitehorse, YT
Y1A 7A3
E-mail: smoodie@polarcom.com
Tel: (867) 333-1135

F. Martin Murphy
EBA Consulting Engineers & Scientists
9th Floor, Ocean Plaza 1066 West Hasting Street,
New Westminster, BC
V6E 3X2
E-mail: mmurphy@eba.ca
Tel: (604) 685-0275

Michael Nahir
Indian and Northern Affairs Canada
25 Eddy
Gatineau, QC
K1A 0H4
E-mail: nahirM@inac.gc.ca
Tel: (819) 997-8413

Glen Nolan
Missanabie Cree First Nation
174 B Hwy 17 East
Garden River, ON
P6A 6Z1
E-mail: gnolan@missanabiecree.com
Tel: (705) 254-2702

Gerry O'Hara
Golder Associates
#500-4260 Still Creek Drive
Burnaby, BC
V5C 6C6
E-mail: gohara@golder.com
Tel: (604) 296-4216

Tanya Oakes
Manitoba Conservation
Box 28-59 Elizabeth Drive
Thompson, MB
R8N 1X4
E-mail: toakes@gov.mb.ca
Tel: (204) 677-6703

Bill Olsen
Saskatchewan Research Council
125 - 15 Innovation Blvd
Saskatoon, SK
S7N 2X8
E-mail: olsen@src.sk.ca
Tel: (306) 933-5477

Peter Ormond
Conserver Society of Hamilton
56 Ferrie St. West
Hamilton, ON
L8L 1C7
E-mail: ormondpm@yahoo.ca
Tel: (905) 526-6458

Gary Ostry
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue,
Winnipeg, MB
R3G 3P2
E-mail: gostry@gov.mb.ca
Tel: (204) 945-6564

Chris Paci
Deep Consulting Inc.
5215, 51st Street
Yellowknife, NT
X1A 1S9
E-mail: drcpaci@gmail.com
Tel: (867) 445-7339

Alan Penn
Grand Council of the Crees
277 Duke St. Suite 100
Montreal, QC
H3C 2M2
E-mail: apenn@gcc.ca
Tel: (514) 861-5837

Caius Priscu
AMEC Earth & Environmental Limited
440 Dovercourt Drive
Winnipeg, MB
R3Y 1N4
E-mail: caius.priscu@amec.com
Tel: (204) 488-2997

Kelly Proutt
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue,
Winnipeg, MB
R3G 3P2
E-mail: kproutt@gov.mb.ca
Tel: (204) 945-6500

Philip Reeves
Saskatchewan Mining Association Inc.
#1500 - 2002 Victoria Avenue,
Regina, SK
S4P 0R7
E-mail: phil.sma@sasktel.net
Tel: (306) 757-9505

Honourable Jim Rondeau
Science, Technology, Energy and Mines (Manitoba)
Winnipeg, MB

Sheryl Rosenberg
Thompson Dorfman
2200 - 201 Portage Ave.
Winnipeg, MB
R3B 3L3
E-mail: sar@tdslaw.com
Tel: (204) 934-2312

Bob Sales
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: rsales@gov.mb.ca
Tel: (204) 945-6588

Joe Seguin
Ministry of Energy and Mines (BC)
162 Oriole Road Mining & Minerals Division
Kamloops, BC
V2C 4N7
E-mail: joe.seguin@gov.bc.ca
Tel: (250) 371-6051

Barbara L. Sherriff
University of Manitoba
240 Wallace Bldg
Winnipeg, MB
R3T 2N2
E-mail: BL_Sherriff@Umanitoba.ca
Tel: (204) 474-9786

Gord Siebert
KGS Group
3rd Floor-865 Waverly St.
Winnipeg, MB
R3T 5P4
E-mail: gsiebert@kgsgroup.com
Tel: (204) 896-1209

Stephanie Simpson
University of Manitoba
43 Highcastle Crescent,
Winnipeg, MB
R2N 3V7
E-mail: gemgirrrl@yahoo.com
Tel: (204) 253-1553

Carrie Slanina
Canadian Parks & Wilderness Society of BC
#410 - 698 Seymour St.
Vancouver, BC
V6B 3K6
E-mail: carries@cpawsbc.org
Tel: (604) 685-7445

Lindsay Smith
Health Canada
510 Lagimodiere Blvd.
Winnipeg, MB
R2J 3Y1
E-mail: lindsay_j_smith@hc-sc.gc.ca
Tel: (204) 983-5690

Clint Smyth
EBA Engineering Consultants Ltd.
115, 200 Rivercrest Drive SE
Calgary, AB
T2C 2X5
E-mail: csmyth@eba.ca
Tel: (403) 723-6855

Angela Wandering Spirit
Department of Culture & Heritage
Legislative Building - 450 Broadway
Winnipeg, MB
R3C 0V8
Tel: (204) 943-2274

Elaine Stevenson
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue,
Winnipeg, MB
R3G 3P2
E-mail: estevenson@gov.mb.ca
Tel: (204) 945-6584

Gregg Stewart
Ministry of Agriculture and Lands (British Columbia)
4th Floor, 780 Blanshard St.
Victoria, BC
V8W 9M3
E-mail: gregg.stewart@gov.bc.ca
Tel: (250) 387-1528

Michael Sudbury
Michael P. Sudbury Consulting Services Inc.
284 Woodland Drive
Oakville, ON
L6J 4W5
E-mail: msudbury@cogeco.ca
Tel: (905) 339-2733

Kathlene Suza
Ross River Dena Council, YT
Contact: Stephen Mead

Ric Syme
Science, Technology, Energy and Mines (Manitoba)
#360-1395 Ellice Avenue
Winnipeg, MB
R3G 3P2
E-mail: rsyme@gov.mb.ca
Tel: (204) 945-6556

Brad Thompson
PWGSC Environmental Services
10025 Jasper Avenue
Edmonton, AB
T5J 1S6
E-mail: brad.thompson@pwgsc.gc.ca
Tel: (780) 497-3862

Mark Tinholt
Morrow/SNC-Lavalin
B85D Baker Street
Nelson, BC
V1L 4H6
E-mail: mark.tinholt@snclavalin.com
Tel: (250) 354-1664

Dan Tolgyesi
Association miniere du Quebec
Place de la Cite - Tour Belle cour 2590, boulevard laurier, 7 etage, bureau 720,
Quebec, QC
G1V 4M6
E-mail: dtolgyesi@amq-inc.com
Tel: (418) 657-2016

Gilles Tremblay
Natural Resources Canada – NOAMI SECRETARIAT
555 Booth Street, Mining & Mineral Sciences Laboratories
Ottawa, ON
K1A 0G1
E-mail: gtrembla@nrcan.gc.ca
Tel: (613) 992-0968

Michael van Aanhout
Stratos Inc.
1404-1 Nicholas Street
Ottawa, ON
K1N 7B7
E-mail: michael.vanaanhout@stratos-sts.com
Tel: (613) 241-1001 ext:243

Jill Watkins
Indian and Northern Affairs Canada
25 Eddy
Gatineau, QC
K1A 0H4
E-mail: WatkinsJ@inac.gc.ca
Tel: (819) 934-9396

Jared Whelan
Manitoba Wildlands
1000-191 Lombard Ave.
Winnipeg, MB
R3B 0X1
E-mail: info@manitobawildlands.org
Tel: (204) 944-9593

Peter Whitbread-Abrutat
Eden Project - Post - Mining Alliance
Bodelva,St.
Austell,
PL242SG
E-mail: pabrutat@edenproject.com
Tel: 44-1726811983

Maxine Wiber
BHP Billiton
10 Glen Oak Drive
Toronto, ON
M4E 1Y5
E-mail: maxine.wiber@BHPBilliton.com
Tel: (416) 691-2656

Margaret Yole
Health Canada
510 Lagimodiere Blvd.
Winnipeg, MB
R2J 3Y1
E-mail: margaret_yole@hc-sc.gc.ca
Tel: (204) 983-5691

Paul Younger
University of Newcastle upon Tyne
Devonshire Building (3rd floor) Devonshire Terrace,
Newcastle-Upon-Tyne, UK
NE1 7RU
E-mail: paul.younger@ncl.ac.uk
Tel: 0191-2464868

Elder Flora Zaharia
1008-880 Cambridge Street
Winnipeg, MB
R3M 3H6
Tel: (204) 837-4296