Mining Association of Canada
Towards Sustainable Mining

2010 Post-Verification Review
Final Report

14th Meeting of the
Community of Interest Advisory Panel

September 15-16, 2010
Montreal, Quebec

Towards Sustainable Mining
Vers le développement minier durable

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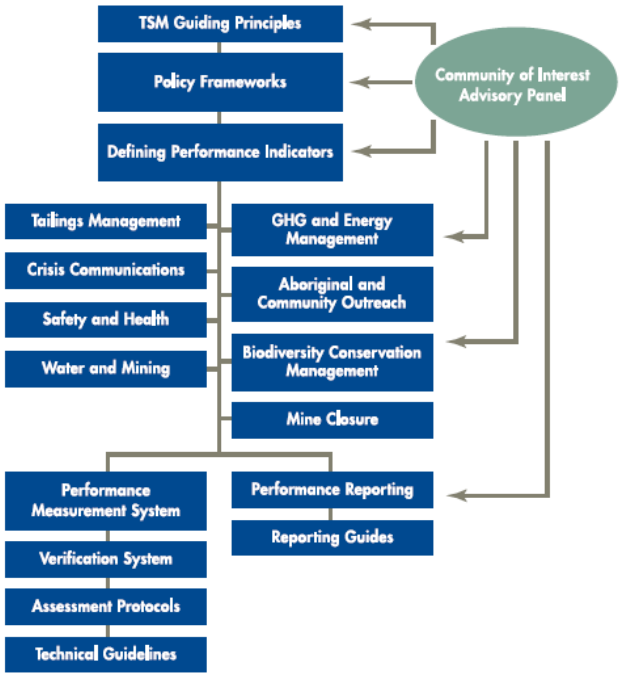
1 Introduction

This report presents the results of the MAC Community of Interest Advisory Panel (COI Panel) post-verification review of Breakwater Resources Ltd. (Myra Falls) and Teck Resources Limited (Highland Valley Copper). Section 2 of the report provides important background on MAC's TSM initiative, the TSM external verification system, and the COI Panel's role in external verification. Section 3 outlines the post-verification review process and questions agreed to by the COI Panel. Section 4 details the companies' responses to these questions, and the ensuing discussion between the COI Panel and the company. Section 5 discusses key learnings from the post-verification review. A list of all referenced web-links is provided in **Annex 1**.

2 About the Towards Sustainable Mining (TSM) Initiative

Launched in 2004, the Mining Association of Canada's (MAC) *Towards Sustainable Mining* (TSM) initiative aims to enhance the mining industry's reputation by improving its environmental, social and economic performance. Participation in TSM is a condition of membership in MAC, and requires that members subscribe to a set of guiding principles that are backed by specific performance indicators against which member companies must report. Performance measurement protocols have been developed for tailings management, energy use and greenhouse gas (GHG) emissions management, external outreach and crisis management planning. Additional performance measurement protocols addressing biodiversity and safety and health have also been developed, and the external outreach protocol has been amended to include Aboriginal relations (now referred to as Aboriginal and community outreach). Public reporting on these new protocols will begin in 2012.

Figure 1: TSM Architecture



TSM is spearheaded by the TSM Governance Team, a committee led by MAC's Board of Directors. Within each member company, TSM is supported by internal representatives called Initiative Leaders. Committees of MAC members lead the development and refinement of performance indicators and technical guidelines for implementing TSM. Also as part of the TSM initiative, MAC's Board of Directors initiated the Community of Interest Advisory Panel (COI Panel), a multi-stakeholder group whose mandate is to help MAC members and communities of interest improve the industry's performance, to foster dialogue between the industry and its communities of interest, and to help shape TSM goals. The COI Panel meets twice a year, and held its founding meeting in March 2004. The COI Panel terms of reference, a current list of COI Panel members, and meeting agendas and minutes can be found on MAC's website (see **Annex 1**).

2.1 Measurement and Reporting

Every year, MAC members self-assess their performance against a series of specific performance indicators in the areas of tailings management, energy use and GHG emissions management, external outreach, and crisis management planning:

Table 1: TSM Performance Indicators

TAILINGS MANAGEMENT	ENERGY USE AND GHG EMISSIONS MANAGEMENT	EXTERNAL OUTREACH	CRISIS MANAGEMENT PLANNING
1. Tailings management policy and commitment 2. Tailings management system 3. Assigned accountability and responsibility for tailings management 4. Annual tailings management review 5. Operation, maintenance and surveillance (OMS) manual	1. Energy use management systems 2. Energy use reporting systems 3. Energy intensity performance target 4. Greenhouse gas emissions management systems 5. Greenhouse gas emissions reporting systems 6. Greenhouse gas emissions intensity performance target	1. Community of Interest Identification 2. Effective COI engagement and dialogue 3. COI response mechanism 4. Reporting	1. Crisis management preparedness 2. Review 3. Training

Detailed assessment protocols in each of these areas provide guidance to assist companies in their self-assessments and to facilitate the consistency of self-assessments within and across companies. These protocols are available on MAC's website (see **Annex 1**).

For tailings management, energy use and GHG emissions management, and external outreach, the detailed protocols identify five levels of performance (from Level 1 to Level 5) for each indicator, and assessments are conducted for each Canadian operating facility. For crisis management planning, the assessor is required to determine whether the criteria of each indicator

are met and to provide a yes/no answer, and to assess each indicator for the company's corporate office, as well as for each of the Canadian operating facilities[1].

MAC released its sixth TSM Progress Report in September 2010, which is available online (see **Annex 1**). The report provides overall TSM performance results for the four elements outlined above, and also includes detailed company-specific performance results.

2.2 TSM External Verification System

In the first two years of TSM reporting (2004 and 2005 reports), the results published in the TSM Progress Reports were based on company self-assessments against the four sets of performance indicators. This first step allowed MAC member companies to familiarize themselves with the TSM indicators and the reporting process. Verification of TSM results was added starting with the 2006 report to assure MAC members and their communities of interest that reported results are consistent and accurate. As a result, the TSM initiative includes an external verification system to verify that MAC members' self-assessments reflect actual company performance, to assist members in developing the capacity to monitor and self-assess TSM implementation, and to ensure that MAC members and their communities of interest can rely on the reported results.

The TSM verification system involves a layered approach. Three elements combine to give MAC members and their communities of interest confidence in the integrity of reported company performance:

- Verification of company self-assessments by an external verifier;
- Letter of assurance from a CEO or authorized officer confirming the verified results (to be published on MAC's website); and
- Annual post-verification review of two or three member companies' performance by the COI Panel.

The verification system was implemented for the first time in 2007 with ten MAC members externally verifying their 2006 self-assessment results. In 2008 companies began verifying their self-assessment results on a rotating three-year basis, with one-third of members externally verifying their results each year. New MAC members have three years to fully implement the self-assessment and external verification system.

Of the companies that reported 2009 TSM performance results for the 2010 TSM Progress Report, 7 underwent external verification. See **Annex 2** for a list of companies that verified their 2006, 2007, 2008 and 2009 TSM Results.

More information on the TSM external verification system, including terms of reference for verification service providers, can be found on MAC's website (see **Annex 1**).

[1] While only the application of TSM to Canadian operating facilities is mandatory for MAC members, some members have chosen to apply TSM to operating facilities outside of Canada.

3 COI Panel Post-Verification Review Process

Prior to the first post-verification review in 2007, the Panel agreed that the purpose of the review is to:

- Lend public credibility to the TSM results by improving TSM (including the verification process);
- Highlight deficiencies and best practices;
- Bring cohesiveness in the application of the self-assessment and verification;
- Drive continued performance improvements; and
- Determine whether the member companies are finding the verification process useful.

The Panel selected Breakwater Resources Ltd. and Iron Ore Company of Canada (IOC) for the 2010 post-verification review. In June of 2010, IOC requested that its post-verification review be delayed until September 2011 to allow it to reach its goal of maintaining and achieving TSM scores of 4's and 5's in all performance areas by the end of 2010. IOC was granted a delay, and Teck Resources Limited volunteered to undergo post-verification in 2010.

At its March 2009 meeting, the Panel discussed improvements to the post-verification review process that would benefit both the Panel and the companies undergoing the review by providing clearer terms for the review, more specific questions and more timely requests for information. The Panel agreed to improvements in both the content and the process (timing of steps) for the September 2009 review, including:

- Using a set of standard guidelines for companies undergoing post-verification review, including a menu of the background information for the Panel;
- Providing the guidelines and request for background information to the selected companies;
- Formulating more specific questions for the companies to use in preparing their post-verification review presentations; and
- Requesting the companies to submit their post verification presentation and supporting information in time to be included in the Panel meeting materials.

The Panel Post-Verification Review Working Group prepared guidelines for background information that were submitted to both companies for the post-verification review. This report summarizes the information provided by the companies in their post-verification reviews and provides the Panel discussion on the presented information.

4 Results of the Post-Verification Review

4.1 Breakwater Resources Ltd. (Myra Falls)

Bob Carreau, Vice President - CSR and Sustainability (Breakwater Resources), gave Myra Falls' post-verification review presentation. Breakwater's verifier, Morry Brown, MorCom Inc., was present for the presentation and answered applicable questions as they arose. A summary of the presentation and the ensuing discussion is provided below.

4.1.1 Context

Breakwater is a mid-tier Canadian mining company with about 20 people in its corporate office in Toronto and about 800 employees internationally. It has projects located in Nunavut, British Columbia, Quebec, Honduras, Chile and Tunisia. Breakwater earns its revenues by selling zinc, copper, lead, silver and gold concentrates to smelters and traders globally. Breakwater has six operational, non-operational and closed facilities.

Myra Falls Mine (operational, British Columbia)
The Myra Falls mine is located in Strathcona-Westmin Provincial Park in central Vancouver Island. The mine is linked by an asphalt road to the port of Campbell River, 90 kilometres away. Active mining has been carried out at Myra Falls since 1966. Boliden Limited acquired the Myra Falls operation in January 1998. In July 2004, Breakwater Resources Ltd. purchased all the outstanding shares of Boliden Westmin (Canada) Limited from Boliden Limited. Myra Falls produces zinc concentrate, copper concentrate, lead concentrate, gold concentrate, gold flake and silver which is trucked to Campbell River for shipment. Current production at the mine and mill is 500,000 tonnes per year. Current resources indicate the expected mine life is 15 – 20 years. NVI Mining Ltd. has no plans to expand beyond current surface footprint. Additional tailings deposition areas would be required if resources increase and the possible options include either underground or off-site.

250 people are currently employed at Myra Falls, but employment has been as high as 700 people at a time. 99% of NVI Mining Ltd. employees reside in Campbell River and commute daily via private coach to the mine site. Local Aboriginal communities include: Wei Wai Kum First Nation - Campbell River Indian Band; Cape Mudge, home to the We-Wai-Kai band of the Kwakwaka'wakw Nation, on Quadra Island; Mowachaht/Muchalaht First Nations (part of the Nuu-Chah-Nulth Tribal Council); and K'omoks First Nations.

El Mochito (operational, Honduras)
The Mochito mine is located in northwest Honduras. The closest major city is San Pedro Sula, the commercial centre of the country, approximately 88 kilometres northeast of the mine. The Mochito mine was originally discovered in 1938. In 1943, Rosario Resources Corporation purchased the property and production began in 1948. In September 1987, American Pacific Mining Corporation (AMPAC) purchased the mine and in March 1990, Breakwater acquired AMPAC. Breakwater operates and supports several socio-economic projects associated with this facility including a hospital, an agroindustrial operation (currently a coffee plantation) and a vocational institute.

El Toqui (operational, Chile)
The Toqui mine is located in Chile's Region XI, approximately 1,350 kilometres south of Santiago and 120 kilometres northeast of Coyhaique. Breakwater purchased Toqui in August 1997.

The Toqui property includes the Doña Rosa zinc/gold mine and the San Antonio and Mallin-Monica zinc/lead mines, the Estatuas mine and the Concordia deposit. Processing is carried out through a 1,500 tonne per day concentrating plant. The El Toqui mine is a self-generator of hydro power and Breakwater has recently added wind power capacity at this site (to supplement hydro).

Langlois Mine (non-operational, Quebec)
The Langlois mine is located in northwestern Quebec, approximately 48 kilometres northeast of the town of Lebel-Sur-Quévillon and 213 kilometres northeast of Val d'Or. Breakwater acquired the Langlois zinc/copper mine effective in 2000. Langlois was considered to be in commercial production effective July 1, 2007. On November 2, 2008, the Company temporarily suspended operations at the Langlois mine. The operation is being maintained on a care and maintenance basis. This decision was precipitated by the decline in the commodity prices and the general deterioration of the economic outlook globally, which mitigated the overall operational improvements in production and costs at Langlois.

Nanisivik Mine (closed, Nunavut)
The Nanisivik mine began operations in 1976 and operated successfully for 26 years. It was the first Canadian mine north of the Arctic Circle. The last tonne of ore was produced in October 2002. Mine site reclamation was completed in 2009 and approved by the Nunavut Water Board.

Bougrine (closed, Tunisia)
Breakwater purchased the Bougrine property in 1997. The site is located in a desert climate zone where water resources are scarce and therefore precious. The mine operated as a zero discharge facility. Reclamation began at the site in 2005 and is expected to be finalized in 2011.

4.1.2 Corporate Approach to Sustainability

In creating its sustainability policy, Breakwater worked with Canadian Business for Social Responsibility (CBSR) to consult with its employees on the meaning of sustainability. This process included:

- Interviewing corporate office executives in Canada;
- Delivering a sustainability primer at Myra Falls and at El Mochito; and then
- Surveying those employees on what sustainability means to them, what activities Breakwater undertakes and should undertake.

The following priorities were developed through this consultation process and are included in Breakwater's sustainability policy:

- Grow a vibrant and profitable enterprise;
- Provide meaningful and rewarding employment within a culture that values above all else the health and safety of our employees;
- Contribute to the vitality of the communities that we are a part of - today and into the future; and
- Minimize our impact on our natural surroundings.

Breakwater believes that success is achieved when sustainability is embedded into all its operations, and its decisions and actions are guided by the following commitments:

- **Integrity and fairness:** We will conduct our business with integrity, fairness and honesty, and we expect the same from our stakeholders.
- **Accountability:** We will work actively and transparently with our host communities.

- **Fiscal responsibility:** We will manage our business with fiscal responsibility to ensure strong financial performance.
- **Environmental stewardship:** We will operate in a manner that protects and preserves our natural environment.
- **Our reputation:** We will conduct ourselves in a manner that earns trust and respect.

Panel Discussion

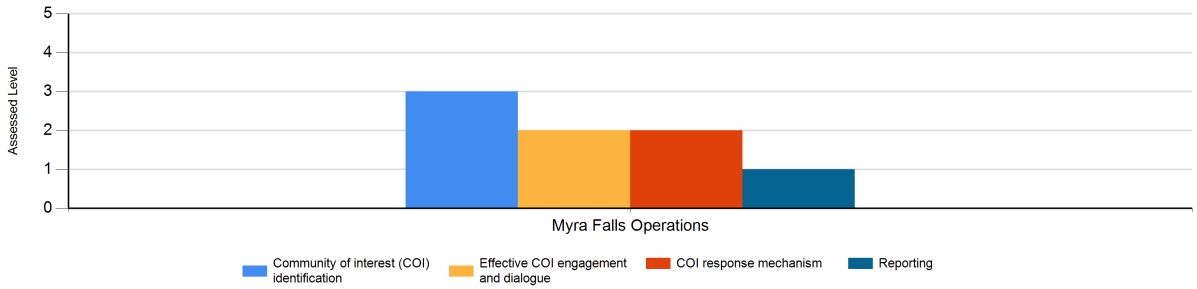
In response to Bob Carreau's opening remarks, the Panel had a number of questions for Breakwater:

- *For your international facilities, how long have you been there and how long do you expect to be there?* Breakwater purchased El Mochito in 1990 and El Toqui in 1997. Historically, these operations have been successful at replacing the reserves as they mine (through exploration). Currently El Mochito has reserves for another 7 years (but will probably continue to run much longer) and El Toqui has published 15 years of reserves.
- *What is the breakdown of your employees (local vs. expatriate) at your international facilities?* Approximately 98% of the employees at El Mochito and El Toqui are local (27 expatriates at Mochito and 2 at El Toqui).
- *What is the payback on your wind farm at El Toqui?* The payback on the wind farm is about six years, as the wind power is replacing diesel power (not hydro power).
- *What is the nature of the arrangement with the community regarding the hospital at El Mochito?* The relationship is ad hoc – as a long time member of the community, Breakwater hasn't completed a formal needs assessment related to its socio-economic projects or established many formal partnerships. Breakwater has partnered with the TechnoServe (via the Devonshire Initiative) to improve the sustainability of certain projects as part of the consideration of what will happen in the community when Breakwater leaves. The company has a community liaison and undertakes continuous community consultation.
- W*hat are the prospects of the Langlois Mine becoming operational?* The cost of operation is higher than our other operations, so we are watching the market in order to have the facility ready when the market is steady.
- *It seems like you've been applying TSM principles outside of Canada. Have you been using general principles or principles in specific countries?* For development in other countries, there is a disconnect between what is needed in a country and what outside organizations or governments think is needed in a country. On-the-ground, Canadian representation is needed in other countries to work effectively on development, and miners can be a part of this solution by applying TSM principles.

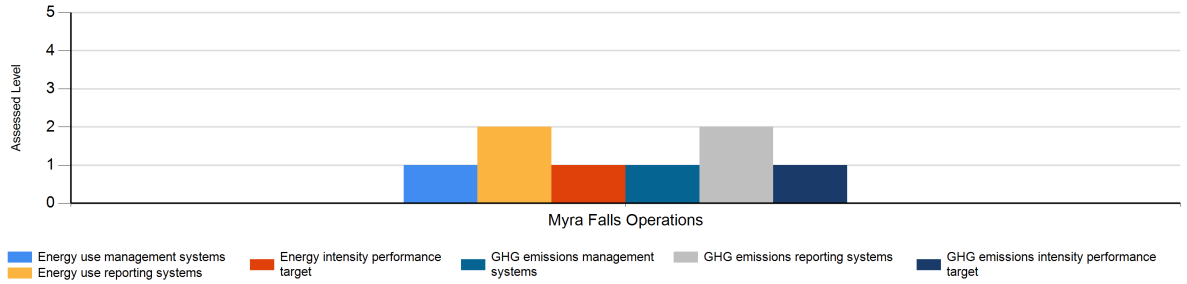
4.1.3 TSM Results and Lessons Learned

Breakwater's verified 2009 TSM results (as presented in the 2010 TSM Progress Report) and associated commentary are provided below. Note that the indicators for external outreach, energy use and GHG emissions management and tailings management are assessed on a scale of "Level 1" (lowest) to "Level 5" (highest), and crisis management planning assessments are based on "yes/no" responses.

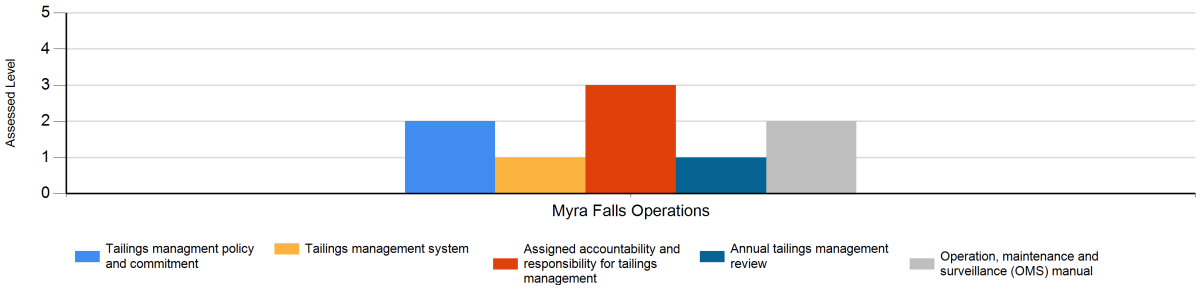
External Outreach



Energy Use and GHG Emissions Management



Tailings Management



Crisis Management Planning

Crisis Management Preparedness	Review	Training
N	**N**	**N**

Bob Carreau noted that the TSM results for Myra Falls are not excellent and that Breakwater will be making improvements. However, he noted that in some cases, Breakwater is not far away from achieving higher scores and that the difference in achieving a higher score is a matter of improved administration and documentation of processes.

One panel member raised two questions about the verification process itself in terms of whether the verifier visited the mine site and the qualifications of the verifier. Breakwater confirmed that

the verifier visited both the mine site and the corporate office – speaking to employees and seeing the facility is deemed critical for verification. Breakwater's verifier, Morry Brown, MorCom Inc., described his qualifications including: verifier training with MAC, mining company work experience, expertise in conducting TSM verifications and partnerships with technical partners.

External Outreach

There are several communities within driving distance of Myra Falls including:

- Campbell River, with a population of 33,000, is 92 km to the east of Myra Falls.
- Gold River, with a population of 1,400, is north of Myra Falls at the end of Highway 28 and 89 km west of Campbell River.
- Comox Valley, with a population of 64,000, is 45 km south of Campbell River.

99% of NVI Mining Ltd. employees reside in Campbell River and commute daily via private coach to the mine site.

Local Aboriginal communities include:

- Wei Wai Kum First Nation - Campbell River Indian Band;
- Cape Mudge, home to the We-Wai-Kai band of the Kwakwaka'wakw Nation, on Quadra Island;
- Mowachaht/Muchalaht First Nations (part of the Nuu-Chah-Nulth Tribal Council); and
- K'omoks First Nations.

NVI Mining has a lease agreement with Wei Wai Kum First Nation for use of the ship loading facility located on their traditional lands at Campbell River. NVI Mining representatives communicate with the First Nation Council on an informal basis as necessary. Transfer of concentrate from the enclosed transport haulage vehicles to the cargo hold in the ships is via a contained process, thereby avoiding any spillage or leakage on the land or water.

Myra Falls contributes to local economic development, with a payroll of $25 million per year and indirect contributions estimated to be $100 million per year. NVI Mining representatives are involved in and supportive of local economic development initiatives including: providing a Director for the Chamber of Commerce representing heavy industry; and participating in community development initiatives.

Breakwater noted the following verification discrepancies between its 2009 self-assessed and verified scores:

- ***Community of Interest Identification*** - Although a stakeholder mapping exercise was completed through CBSR, the system did not meet TSM criteria which includes COIs whose interest in the operations may be indirect and issue-based (e.g., provincial and national NGOs).
- ***Reporting*** – The Facility does not report on its community engagement and dialogue activities beyond regulated requirements.

Panel Discussion

The Panel had a number of questions related to External Outreach at Myra Falls:

- *Does NVI Mining have any agreements with local Aboriginal groups?* Aside from the agreement with Wei Wai Kum First Nation for use of the ship loading facility, NVI Mining doesn't have any agreements; however, open offers exist.
- *Has NVI Mining asked whether Aboriginal groups would like any training? The onus is on company to make the offer, whether communities express interest or not.* Training programs exist and are open to all community members, not just Aboriginal groups. Engagement has been ad hoc.
- *Do any service agreements exist?* Other than the agreement with Wei Wai Kum, nothing formal is in place.
- *Has the practice of negotiation been used?* Because Myra Falls is in a level "B" provincial park, its footprint is restricted. NVI Mining has done some consultations about further exploration.
- *What ideas did you get about different aboriginal groups through the stakeholder mapping exercise with CBSR?* Breakwater brought in managers, some communities, and surveyed some community members. A classification of different groups was conducted and identification of broad interests (not specific group interests).

One panel member observed that Breakwater's outreach is seemingly more comprehensive outside of Canada than within Canada. Consequently, Bob Carreau offered some additional context to shed light on the application of TSM and the verification process at Myra Falls.

The metal market crash in 2008 resulted in a very difficult year for Breakwater. As such, the company was occupied with different sustainability priorities during that year; however, it knows that it needs to improve its TSM results. As mentioned throughout Breakwater's presentation, absence of documented results doesn't necessarily mean that activities are not taking place. The first year that NVI Mining completed its self-assessment, its environmental group looked after the reporting (i.e., TSM was owned by a department); however, the person who was responsible for facility level reporting left the company. Since then, NVI has been regaining this knowledge and has attended self-assessment and verifier training by provided by MAC.

Breakwater believes that it is doing equally well within and outside of Canada. At Myra Falls it is part of the Strathcona Park Public Advisory Committee. In 2010, NVI sponsored and participated in an expedition to re-enact the Park's discovery. It also participates in a school curriculum course that talks to students about what the mining industry does. Breakwater is not deficient in engagement, but deficient in administration. MAC indicated that Breakwater's results are similar to other companies, and that companies need to go through the verification process to learn about how to do self-assessment properly.

One panel member asked what learnings resulted from the verification process, whether the verification process was useful and what Breakwater will do differently next year. Bob Carreau indicated that verification has been helpful and has provided a different viewpoint. Over the next year, Breakwater plans to formalize and document items where necessary to improve TSM scores. Morry Brown (Breakwater's verifier) reiterated that Breakwater has conducted many meetings, but hasn't engaged in follow-up communication and doesn't have documented, formal processes about how to handle further engagement in a timely fashion. One panel member recommended that Breakwater conduct stakeholder mapping exercise with greater depth to understand the diversity of interests within Aboriginal groups. Panel members cited a few different characteristics where Breakwater might find different interests within communities including: age, gender, and authority structures and indicated that it is important to understand the functioning of specific communities.

Energy Use and GHG Emissions Management

Myra Falls relies on its own power generation, as there are no hydro lines into the facility through the provincial park. Electricity is generated via hydro and diesel. Breakwater has two hydro facilities with 10 megawatts of capacity which currently generate 90% of the power requirements. More capacity would be needed to reach 100% hydro ("clean power"), so Breakwater is working with the Strathcona advisory committee to consider the tradeoffs between supplementing existing dams vs. using diesel.

Starting in January 2009, NVI Myra Falls implemented a 24-hour energy efficiency strategy. Peak periods of power consumption were avoided by scheduling the major power consumers (milling, crushing, paste plant and ore hoisting) through the Mill Control Room Operator who continuously monitored and adjusted power generation and power consumption to maximize the efficient use of energy. Breakwater's power consumption has dropped steadily from 2007 to 2009 and it reduced its GHG emissions over the same time period (even though hydropower is supplemented with diesel).

Table 2: Myra Falls Energy Use and GHG Emissions (2007-2009)

	2007	2008	2009
Electricity produced/consumed (Gwh/yr)	85.15	73.14	62.58
GHG Emissions* (Kt of CO2e/yr)	13,736	15,151	7,446

**Excludes GHG emissions from vehicles on site.*

Breakwater noted the following verification discrepancy between its 2009 self-assessed and verified scores:

- ***GHG Emissions Management Systems*** – The facility did not meet Level 2 because the draft commitment is not a formal approved document.

Panel Discussion

Panel members congratulated Breakwater on undertaking a very innovative approach to managing energy use at its site. They were impressed with both the implementation of the strategy to manage energy use and balance resources and the associated reductions in energy use through effective management.

Bob Carreau stated that TSM scores would improve for this indicator if Breakwater were to improve its documentation practices. The panel facilitator commented that process standards (like the TSM indicators) do not necessarily tell the story about performance (i.e. lower scores do not necessarily mean an absence of company activity). The TSM indicators were set up as process standards with reason, but it is important to be careful about the conclusions that are drawn. An industry representative recapped that TSM is about "saying what you do, doing what you say and demonstrating that you did it".

One panel member also asked a few questions specifically about Breakwater's hydropower facilities:

- *Is Breakwater's hydro production useful for users in area?* This is a controversial issue, because in order to share power, a hydro line would have to be constructed in the park.

- *Is Breakwater's hydropower run of river?* Breakwater's facilities are essentially run of river. They have small retention dams with some storage capacity; however there is a lot of spill.
- *Could or would Breakwater add an additional penstock to its hydropower facilities?* Breakwater is considering the addition of a penstock, but acknowledges that riparian areas could be impacted.

Tailings Management

Myra Falls has two tailings impoundments. The older tailings disposal facility is nearing capacity; the impoundment has been upgraded to meet current seismic design criteria (1/1000 year seismic event). The newer facility has been designed to utilize the footprint of the previously mined open pit (Lynx Pit Facility). Approximately 60% of the tailings produced are pumped back underground as a coarse fraction backfill. The remainder is deposited on surface as "paste". AMEC is used for tailings engineering. The Mill Superintendent is responsible for day-to-day operations and reports to the General Manager.

Breakwater noted the following verification discrepancies between its 2009 self-assessed and verified scores:

- ***Assigned accountability and responsibility for tailings management*** – Not formally delegated to operations and /or corporate personnel (i.e., no documentation).
- ***Annual tailings management review –*** Although annual reviews are completed by AMEC and submitted and approved to the BC government, the format and content do not meet the TSM requirements.

Panel Discussion

One panel member asked two questions:

- *Is Breakwater required to spend significant resources treating wastewater?* The Pacific Rim is a wet area with lots of runoff, so significant resources are used to treat wastewater.
- *Has Breakwater received any complaints from downstream users?* No; however, due to downstream water uses (e.g., Campbell River water supply, salmon runs, etc.), diligent management is required.

Crisis Management Planning

The Crisis Management Plan was triggered on January 12, 2010 after a seasonal storm that had several consecutive days of unseasonal heavy rains. Although there were direct flood impacts from the rains, a secondary source of flooding came from melting of the snow pack. Flash flooding brought an estimated 20 million litres of water into the Lynx Open Pit facility. The concern was the potential for this volume of water to inundate the mine through the walls and floor of the pit; an in-rush of water into the adjacent mine could have jeopardized the safety of employees and the mine infrastructure.

Mine personnel were evacuated and production was halted. Provincial Authorities were notified and Breakwater's corporate office issued a national press release. Coordinated efforts between the site and corporate office outlined a mitigation plan including the engineering of two supplementary pumping systems (capacity of 20,000 GPM) and bulkhead pressure indicators to track the level of flooding underground. The crisis ended on January15, 2010 with no injuries to personnel and no damage to the facility.

Although Myra Fall's Crisis Management Plan has been successfully activated, documentation, training, review and follow-up processes do not meet TSM standards.

4.1.4 Challenges, Successes and Looking Ahead

As a result of conducting TSM self-assessments, Breakwater has learned that there are too few people involved in TSM across the operation (i.e., having one department "own" TSM) is not enough for effective implementation. Undergoing verification has increased Breakwater's understanding of what's required to move to the next level. To achieve performance improvements site personnel are viewing TSM as a management system, not an environmental function. Functional Managers now recognize that they must take responsibility for the implementation, monitoring and ongoing assessment of the key indicators and integrate TSM into day-to-day operations.

In spite of the benefits of TSM, Breakwater does not think TSM is driving performance improvement; however, TSM is being used as a measuring stick to make improvements in some areas. Facility capacity constraints, including operating with a reduced workforce make it difficult to fully integrate TSM initiatives, reporting and tracking. NVI Mining estimates that one man year is required to implement the deficient TSM criteria as well as conduct the self-assessments and verification.

Breakwater will achieve performance improvements in the four TSM indicators by improving communications with employees, Communities of Interest, media and the public about the company's monitoring, tracking and reporting to safeguard the environment and community while operating a mining and processing facility in full compliance with Park Policies. The resulting value to the company of achieving TSM indicators ensures the continued operation and sustainability of a significant employer in the area and a safe environment for future generations.

Breakwater's longer term objective is to introduce TSM practices, self-assessments and external verifications at its international operations.

Panel Discussion

Panel members commented that they were pleased with Breakwater's presentation. One panel member noted that it was interesting that Breakwater doesn't think TSM is driving performance improvements. Another member stated that other companies have indicated that TSM is driving performance improvements at their facilities. It was agreed that there are several drivers of performance improvement (including regulatory requirements), but that this difference in opinion might be a good topic to return to in future discussions.

4.2 Teck Resources Limited (Highland Valley Copper)

Mark Freberg, Superintendent - Environment & Community Affairs (Teck Highland Valley Copper Partnership) and Carmen Turner, Leader - Sustainability and Community Engagement (Teck Resources), gave Highland Valley Copper's post-verification review presentation. Teck's verifier was unable to attend the meeting. A summary of the presentation and the ensuing discussion is provided below.

4.2.1 Context

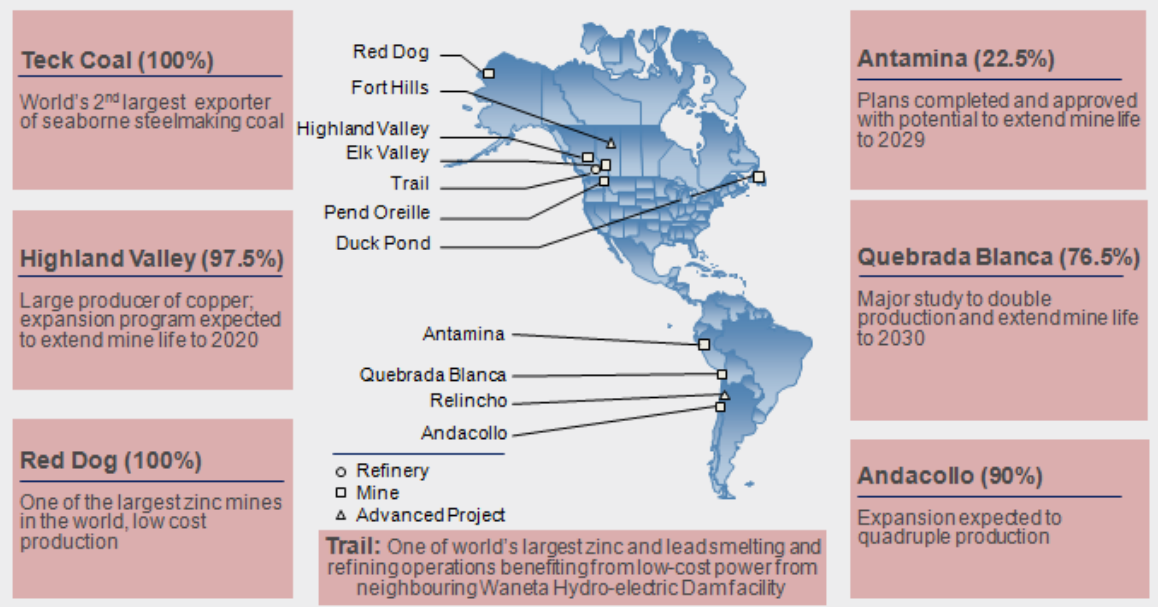
Teck Resources Limited is a diversified resource company committed to responsible mining and mineral development. Headquartered in Vancouver, Canada, Teck is a significant producer of copper, the second largest exporter of seaborne steelmaking coal and the third largest producer of zinc concentrate. Teck is also a producer of molybdenum and specialty metals, with interests in several oil sands development assets.

Teck engages in a full range of mining activities including exploration, development, smelting, refining, safety, environmental protection, product stewardship, recycling and research. Teck owns or has interests in 13 mines in Canada, the USA, Chile and Peru, as well as one metallurgical complex in Canada.

Teck holds a 97.5% interest in Highland Valley Copper (HVC), located in south central British Columbia near the City of Kamloops. HVC produces copper concentrates and is also a significant producer of molybdenum. The mine is an open-pit truck-and-shovel operation employing conventional drill and blast mining methods. The processing plant uses semi-autogenous grinding and flotation to produce metal in concentrate from the ore.

Mining in the Highland Valley first occurred in 1899, however it wasn't until 1962 that a high volume open pit mine was established there, by Bethlehem Copper. HVC was created over the years through the amalgamation of four different mining properties in the Highland Valley. The first mine site, Bethlehem Copper, was purchased by Cominco in December 1981. Mining began in 1970 at the second ore body, which was owned by Lornex. HVC was born from the amalgamation of Lornex with Cominco's Valley Mine in 1986. Cominco merged with Teck Resources Limited in 2001, which brought HVC into the Teck family of operations. Currently the mine is expected to operate until 2021, however engineering and financial studies are underway to determine the feasibility of further extending the mine life.

Figure 2: Teck Resources' Assets



As of June 2010, HVC employed 1,225 people. The operation's employees live primarily in five nearby communities. The majority of the employees live in Kamloops, 80 kilometres northeast of the mine. The closest community to the operation is Logan Lake, 15 kilometres to the east. The mine site located within the traditional territory of the Nlaka'pamux First Nation which includes: 6,000 people; 15 Bands; and 3 geopolitical groupings. The mine site is also within the traditional territory of the Skeetchestn Band of the Secwepemc First Nation. The operation is currently negotiating Participation Agreements with the Nlaka'pamux Nation which will contain provisions on employment, business opportunities and environmental and cultural protection.

4.2.2 Corporate Approach to Sustainability

On September 14, 2010, Teck Resources Limited was named to the Dow Jones Sustainability World Index (DJSI), indicating that Teck's sustainability practices rank in the top 10 percent of companies in the resource industry worldwide. Teck is guided by a set of principles related to business ethics, environment, safety, health and community that govern its operating practices and that are outlined in its *Charter of Corporate Responsibility*. To assist the company in implementing its Charter, Teck has a *Code of Sustainable Conduct* that outlines 15 key business practices, including conducting regular to audits to ensure compliance with the Code. Teck has Environment, Health, Safety and Community Management Standards that are broadly compatible with the ISO 14001:2004 international standard for Environmental Management Systems (EMS) and the OHSAS 18001:2007 specifications for occupational health and safety management. The Standards also incorporate additional requirements based on the Code and on elements described by the U.S. EPA's National Enforcement Investigations Center (NEIC) for compliance-focused EMS. Protocols and tools also exist to support the management standards.

Panel Discussion

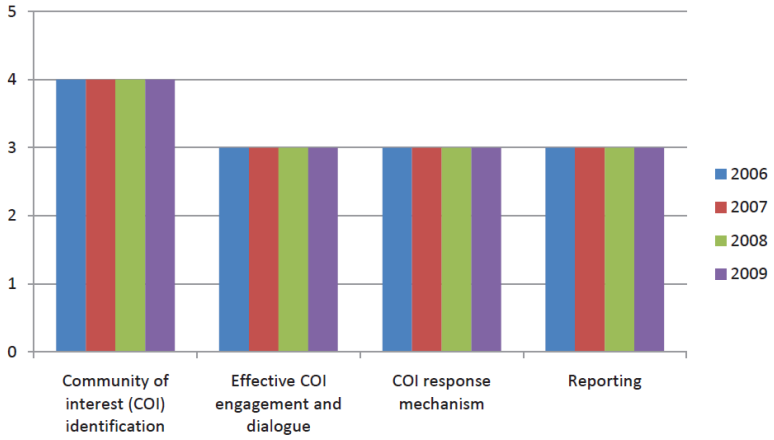
One Panel member asked one question in response to Teck's opening remarks:

- *Does regular testing of contaminants migration through soils occur at HVC?* Regular testing does occur. HVC has low sulphide levels (i.e., no acid rock drainage issues) and selenium is not a problem. Molybdenum poses a concern for long-term water management; HVC is well within its regulatory limits, but molybdenum can affect ungulates. Sulphate levels are increasing in groundwater supplies (downstream of the mine site), so HVC is undertaking research to understand this issue and consider options.

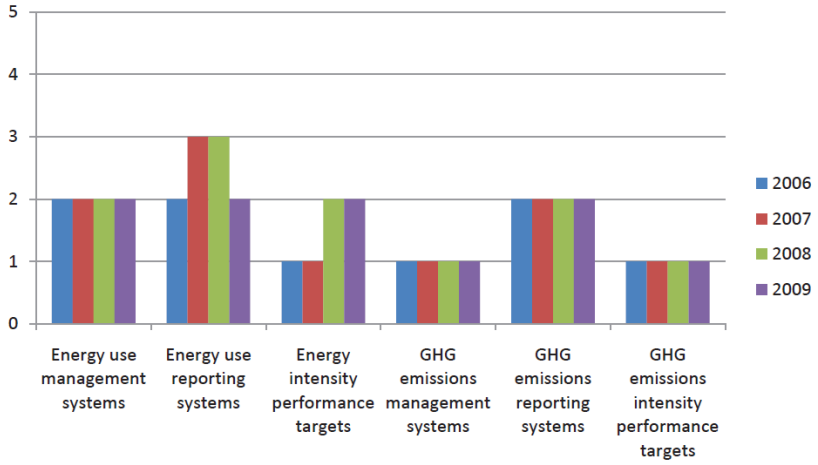
4.2.3 TSM Results and Lessons Learned

Highland Valley Copper's verified 2009 TSM results (as presented in the 2010 TSM Progress Report) and associated commentary are provided below. Note that the indicators for external outreach, energy use and GHG emissions management and tailings management are assessed on a scale of "Level 1" (lowest) to "Level 5" (highest), and crisis management planning assessments are based on "yes/no" responses.

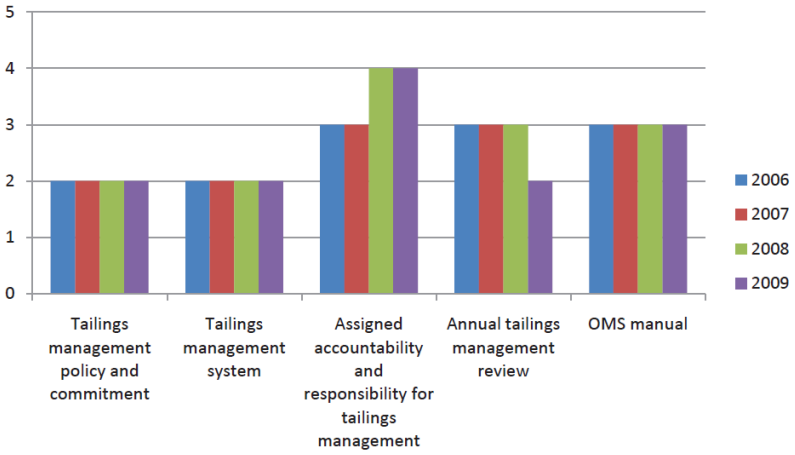
External Outreach



Energy Use and GHG Emissions Management



Tailings Management



Crisis Management Planning

Year	Indicator 1: Crisis management preparedness	Indicator 2: Review	Indicator 3: Training
	Assessment (Yes/No)	Assessment (Yes/No)	Assessment (Yes/No)
2006	No	No	No
2007	No	No	Yes
2008	No	Yes	Yes
2009	Yes	Yes	No

External Outreach

Highland Valley Copper is committed to positive and sustainable relationships with all of the communities surrounding the mine. Not only is the operation a significant employer in the region, but it contributes a great deal to the local economy through procurement and tax payments. HVC gives priority to buying goods and services from local vendors. In 2009, $94 million in goods and services were purchased from 467 local vendors.

HVC is within the traditional territory of the Nlaka'pamux First Nation (NFN). The NFN is made up of 15 Bands many of whom have Reserves in the river valleys that border the Thompson Plateau. The mine site is also within the traditional territory of the Skeetchestn Band of the Secwepemc First Nation. The operation is currently negotiating Participation Agreements with the Nlaka'pamux Nation which will contain provisions on employment, business opportunities and environmental and cultural protection.

The Cook's Ferry Band had four Reserves in the valley that were purchased by one of Teck's predecessor companies in the 1970's. The Band retains the right to repurchase one of the Reserves in 2073. There are currently approximately 65 aboriginal employees at the mine. The operation has been actively trying to increase the number of Nlaka'pamux employees and over twenty people have been hired in the last 10 months. Many of HVC's contractors have local aboriginal employees, although to date no attempts have been made to capture or track this information.

Highland Valley Copper is one of the founding partners of the British Columbia Aboriginal Mine Training Association which has the mandate to help interested First Nations be successful in obtaining employment in the mining industry.

The operation is active in all of the surrounding communities and works hard to maintain a good relationship with the different community Councils and keep them up to date on what is happening at the mine and on future plans, which enables us to engage them early on issues and involve them in the solutions. HVC consistently engages communities through the following methods:

- Its annual Open House, which takes place on the BC Day holiday and is attended by more than 2,000 participants;
- Daily public tours during the summer;
- Over 25 school and speciality tours;
- A quarterly employee newsletter; and
- Annual community events on Trojan pond, a former tailings facility that has now been reclaimed.

Panel Discussion

During the post-verification review presentation, Mark Freberg stated that external outreach is not an area that HVC is currently looking to improve. This comment raised a question from one of the panel members about what would motivate companies to move beyond a level 3 in TSM more broadly. Industry representatives noted that companies have set monetary resources and capacity and that training can take years, particularly as a company acquires new facilities. The same panel member asked whether this is simply a question of financial resources, and industry representatives noted that it's not just about financials, but about developing management systems and balancing the number of different sustainability commitments that companies support (which in some cases overlap with TSM). The law of diminishing returns was noted, as companies may see greater value up to level 3, but not above. In addition, the drivers of going beyond a 3 might be very different for each company. MAC noted that TSM is about managing social and environmental risks, and the first priority is to get all companies to a level 3, which hasn't occurred yet. However the industry's view of what a level 3 means now may change in the future, encouraging further performance improvements.

One panel member asked what has lead HVC to negotiate with one First Nation, but not with another. HVC responded that it has a good relationship with the Nlaka'pamux First Nation and it was the right thing to do (if the agreement is in place, it will make permitting easier). Other First Nations agree that HVC is on the fringe of their territories, so there hasn't been a need to negotiate.

Energy Use and GHG Emissions Management

Energy is the single largest consumable cost at the operation (outside of labour), which consequently drives energy management practices. However, even in the absence of economic drivers, HVC has undertaken some measures in order to reduce GHG emissions.

There is considerable variation from year to year in the relative quantities of ore and waste rock mined, and in the distance that the material must be hauled. This means that there are significant variations each year in any intensity data related to materials movement. While detailed energy budgets and intensity targets are developed annually, HVC has found little value in comparing these on a year over year basis.

Identifying and capturing opportunities to save energy is an ongoing process. Examples of recent projects range from installing automated light switches in offices to a new initiative that will eliminate the drying of the copper concentrates. The installation of pressure filters will reduce natural gas consumption on the property by 40 per cent and lower the operation's overall GHG emissions by approximately 3 percent.

With the exception of large projects such as the replacement of the copper dryers, energy savings from the smaller projects, while real and significant, are masked by the magnitude of the two main energy components: electricity in the grinding circuits and diesel in the haulage fleet. (In the mill, the grinding circuit consumes over 85 percent of the energy used in the milling process.) This makes the value of broad intensity targets questionable. HVC indicated that more clarity on this area from MAC would be valuable.

HVC also noted that MAC's GHG Guidance Document doesn't cover what an acceptable energy management system looks like.

Panel Discussion

One panel member asked where HVC obtains its power. Mark Freberg indicated that HVC uses electricity from BC Hydro for operations and uses diesel in all of its hauling equipment.

Mark Freberg noted that it's hard to improve intensity targets at open pit mines, without a step change, such as a technology substitution, because there is too much variability. One panel member asked whether it would be helpful to look at a different time period (e.g., looking over 3 years); however, HVC thought it would be more helpful to look at an intensity target within a given year, rather than from year-to-year. Another panel member suggested the introduction of a coefficient to account for hauling; however, the point was raised that complex mathematical equations do not build public confidence.

MAC indicated that it has been working on energy since the 1970s and that the Board used to set reduction targets (roughly 1% per annum), which is okay if it is being measured for the global industry, rather than at a facility basis. In BC, the bigger consumers of energy will pay, and a step change of going to electrification would only work if a company had confidence that a mine site would be operating over next 30 years (which HVC hasn't had).

Tailings Management

There are four tailings ponds at HVC. Three of these ponds are inactive and in the process of being decommissioned. The main tailings pond will continue to be used until the end of mine life. The active Highland Pond (one of the largest constructed structures in the world) is located along the north end of the Highland Valley and has two containment dams; one at either end of the pond, 9.6 km apart. The surface of the pond rises an average of two metres each year. The pond has a design capacity of 1.8 billion tonnes and at the end of current mine life in 2021will contain 1.3 billion tonnes of tailings. There are signs of some impacts to groundwater, which HVC will need to manage.

Klohn Crippen Berger reviewed the geotechnical design of the three inactive ponds in 1996 and the Province of British Columbia has indicated that they meet geotechnical-decommissioning standards. Each of the associated dams will withstand a Maximum Credible Earthquake, i.e.: a 1 in 10,000-year earthquake. Decommissioning spillways have been designed and constructed to handle a Probable Maximum Flood (1 in 10,000 year) from each of these three ponds. At two of its inactive tailings ponds, HVC is undertaking native species reclamation and trialling canola and soya bean growth for biofuels.

HVC noted the following points in relation to its TSM scores:

- HVC has not conducted final discussions with its communities of interest;
- Its score on annual tailings management review dropped because the corporate visit to mine was delayed; and
- Although HVC has tailings management policy and commitments and it has talked to several stakeholders, it hasn't engaged with Spences Bridge (the community that would be impacted if the tailings dam failed – an unlikely scenario).

Panel Discussion

One panel member asked how far away from the tailings pond base HVC samples. Mark Freberg indicated that HVC samples 10 km downstream from the lake and it hasn't identified any problems. The same member asked how HVC keeps birds off its tailings ponds; it was noted that this is not an issue for HVC.

Crisis Management Planning

Highland Valley Copper's crisis management plan was triggered in May, 2010 in response to the discovery of a discharge of process water to the Thompson River. The discharge resulted from the failure of multiple valves in a complicated piping system which has since been reconfigured to completely prevent any future incidents.

The crisis management plan was triggered at 7pm on May 21. All required senior staff returned to the mine site and worked through the protocol. Initial reporting of the incident to the British Columbia Provincial Emergency Program was done as soon as the discharge was discovered. The crisis management team coordinated additional reporting to the corporate office in Vancouver, handled follow up inquiries from regulatory agencies and ensured that all steps were taken to gather and preserve evidence that would be needed during the subsequent investigation into the causes of the incident.

HVC noted the following point in relation to its TSM scores:

- The shortfall for the training indicator was due to the lack of a documented detailed crisis simulation in 2009. However, a detailed simulation involving the failure of the tailings system was completed early in 2010 and fully documented.

4.2.4 Challenges, Successes and Looking Ahead

Progress at HVC has not been as rapid as Teck would like. As with other companies, Teck is involved in many different initiatives. Early in 2010, HVC achieved its ISO 14001 Certification. HVC is now looking to integrate tailings and energy management systems into its main EMS; however, a better understanding around what an acceptable energy management system looks like is still needed.

The verification process is considered essential to maintain the integrity of TSM. Through external verification, HVC has learned that:

- Onsite verification is better than a desktop exercise – ratings aren't affected, but it helps to shape future plans at the facility;
- A long-term relationship with the verifier is important; and
- Discussion around expectations for next steps is an important component of the process.

TSM is part of the picture, but it doesn't set Teck's commitment to sustainability. TSM encouraged Teck to create a sustainability vision and targets (Teck developed a cross-functional working group to come up with a sustainability vision and strategy), and TSM helps Teck stay focused on some key issues.

Panel Discussion

In response to Teck's closing comments, discussion around the verification process ensued. HVC stated that ISO 14001 is less is open to interpretation than TSM, and that it would like to have a long-time relationship with its verifier to know what they are looking for because different verifiers apply different degrees of rigour. One panel member raised a question about whether using the same verifier is effective at getting companies to improve. Another panel member stated that this type of relationship has worked effectively with another MAC member. MAC noted that Stratos is reviewing all verification reports from 2009 to check for consistency, but that it's the Initiative Leader's responsibility to raise these types of issues with MAC. External verifiers also request additional guidance from MAC as needed. Another panel member raised the question about how confident the industry is in the verifiers and another panel member noted that TSM verifiers are not required to have any knowledge or background in mining. One industry representative suggested that because the verification process is a systems audit, a mining engineering background is not necessary.

In addition, the panel posed some final questions to HVC:

- *How has HVC's administrative commitment been affected as a result of both its TSM and ISO commitments?* HVC's systems are now in place for TSM self-assessment and verification, making them quicker to complete. HVC reports twice a year to management on TSM progress.
- *Does TSM drive any performance improvements?* TSM drives performance in some areas (i.e., external outreach and crisis management planning), but not in others (i.e., tailings management and energy use and greenhouse gas emissions management). In the early years of TSM, TSM helped companies learn what to do (before these issues were corporate priorities).
- *What is the one learning that Teck can take from the HVC verification process and apply to other operations?* In order to implement TSM effectively, companies need leaders and they

need to budget resources. In addition, even if a facility is meeting the process requirements of a TSM protocol, it still may not be able to assess how *effectively* it's implementing those requirements.

- *How does sustainability affect the financials of companies (i.e., are they higher or lower)?* What a company does in an area, will influence its license to operate (in other areas). There are lots of good business reasons to be sustainable, beyond being the right thing to do (i.e., banks won't finance new operations for companies with a bad reputation).

Annex 1: Weblinks

COI Panel Information:
www.mining.ca/www/Towards_Sustaining_Mining/Community_of_Interest_Panel/Community_of_Interest_Panel.php

Detailed Assessment Protocols:
www.mining.ca/www/Towards_Sustaining_Mining/Performance_Indicators/index.php

2010 TSM Progress Report:
www.mining.ca/www/Towards_Sustaining_Mining/index.php

TSM External Verification System Information:
www.mining.ca/www/Towards_Sustaining_Mining/External_Verification/Introduction.php

Annex 2: List of Companies That Verified Their TSM Results

2006 Results

Albian Sands Energy Inc.
BHP Billiton Diamonds Inc.
Breakwater Resources Ltd.
CVRD Inco Limited[1]
Diavik Diamond Mines Inc.
HudBay Minerals Inc.
Inmet Mining Corporation
Iron Ore Company of Canada
Suncor Energy Inc.
Syncrude Canada Ltd.
Teck Cominco Limited

[1] *Verified results do not include Voisey's Bay Nickel, a new reporter within CVRD Inco*

2007 Results

ArcelorMittal Mines Canada
Barrick Gold Corporation (partial)
Syncrude Canada Ltd.
Teck Cominco Limited (partial)
Xstrata Copper Canada
Xstrata Nickel
Xstrata Zinc Canada

Note: Barrick Gold and Teck Cominco had a sample of their facilities verified.

2008 Results

BHP Billiton Diamonds Inc. – EKATI Diamond Mine
IAMGOLD
Inmet Mining Corporation

2009 Results

Shell Canada Energy – Shell Albian Sands
Vale
Breakwater Resources Ltd.
HudBay Minerals Inc.
Iron Ore Company of Canada
Suncor Energy Inc.
Teck Resources Limited – Highland Valley Copper