Mining Association of Canada
Towards Sustainable Mining

20th Meeting of the
Community of Interest Advisory Panel
POST-VERIFICATION REVIEW REPORT

October 16-18, 2013
Sudbury, ON

Towards Sustainable Mining
Vers le développement minier durable

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1 Introduction

The purpose of this report is to present the summary of discussions of the MAC Community of Interest Advisory Panel (COI Panel) post-verification review of Vale and Teck Resources Limited's Fording River and Elkview Operations. Meeting presentations and briefing materials were provided to the COI Panel; content contained in meeting presentations is not duplicated in the body of this report.

For more information on the October 2013 Panel Meeting, please see the *October 2013 COI Panel Meeting Report* under separate cover.

This report is organized by the following sections:

- **Section 2:** Overview of Towards Sustainable Mining (TSM)
- **Section 3:** Overview of the TSM verification system and COI Panel post-verification review
- **Section 4:** Results and discussion of the 2013 post-verification review: Vale
- **Section 5:** Results and discussion of the 2013 post-verification review: Teck
- **Section 6:** Key reflections from the 2013 post-verification review

A list of all referenced web links is provided in **Annex 1**.

2 About the Towards Sustainable Mining (TSM) Initiative

TSM is MAC's commitment to responsible mining. It is a set of tools and indicators to drive performance and ensure that key mining risks are managed responsibly at our facilities. Adhering to the principles of TSM, our members demonstrate leadership by:

- *Engaging with communities*
- *Driving world-leading environmental practices*
- *Committing to the safety and health of employees and surrounding communities.*

Today, communities expect more of mining companies and the industry expects much more of itself. TSM helps mining companies meet society's needs for minerals, metals and energy products in the most socially, economically and environmentally responsible way. At its core, TSM is:

***Accountable:** Assessments are conducted at the facility level where mining activity takes place – the only program in the world to do this in our sector.*

***Transparent:** Members publicly report their performance against 23 indicators annually in MAC's TSM Progress Reports and results are externally verified every 3 years.*

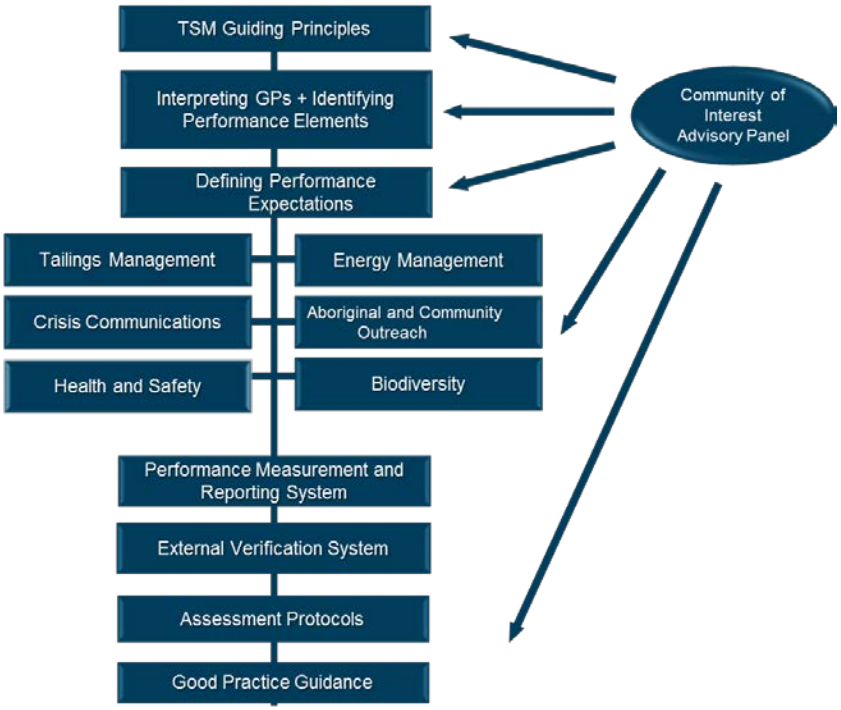
***Credible:** TSM is overseen by an independent Community of Interest (COI) Advisory Panel, which shapes the program for continual advancement.*

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 supported by specific performance indicators against which member companies must report their results.

Performance measurement protocols have been developed for key areas of operational performance as illustrated in Figure 1. MAC released its ninth TSM Progress Report in December 2013, which provides overall industry TSM results and company-specific results for the issues listed in Figure 1. For more information on TSM and industry and company results, please visit the MAC website: http://www.mining.ca/site/index.php/en/towards-sustainable-mining.html.

Figure 1: TSM Architecture



TSM is overseen by the TSM Governance Team, a sub-committee of MAC's Board of Directors. Within each member company, TSM is supported by internal representatives called Initiative Leaders. Expert 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 as shown in Table 1.

Table 1: TSM Performance Indicators

PERFORMANCE ELEMENTS						
ELEMENTS	COMMUNITIES & PEOPLE			ENVIRONMENTAL FOOTPRINT		ENERGY EFFICIENCY
INDICATORS	Aboriginal and Community Outreach	Crisis Management Planning	Safety and Health	Tailings Management	Biodiversity Conservation Management	Energy Use and Greenhouse Gas (GHG) Emissions Management
	Community of Interest (COI) Identification	Crisis Management Preparedness	Policy, Commitment and Accountability	Tailings Management Policy and Commitment	Corporate Biodiversity Conservation Policy Accountability and Communications	Energy Use and GHG management systems
	Effective COI Engagement and Dialogue	Review	Planning, Implementation and Operation	Tailings Management System	Facility-Level Biodiversity Conservation Planning and Implementation	Energy Use and GHG Emissions Reporting Systems
	COI Response Mechanism	Training	Training, Behavior and Culture	Assigned Accountability and Responsibility for Tailings Management	Biodiversity Conservation Reporting	Energy and GHG Emissions Performance Targets
	Reporting		Monitoring and Reporting	Annual Tailings Management Review		
			Performance	Operation, Maintenance and Surveillance (OMS) Manual		

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 each indicator, MAC members receive one of five scores based on the criteria they met from level C, B, A, AA, AAA 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]. The goal of MAC members is to achieve a minimum of Level A, which represents good performance, for all indicators, or 'Yes' in the case of crisis management.

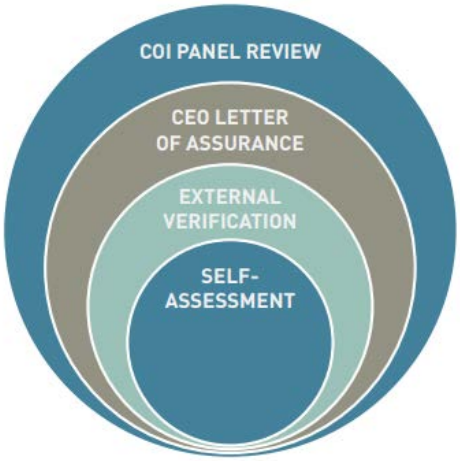
2.2 TSM External Verification System

TSM includes a number of checks and balances to ensure that reported results present an accurate picture of each facility's management systems and performance. Figure 2 identifies the different layers of assurance embedded in TSM.

This report is focused on the final layer: the COI Panel Review. Each year, the COI Panel chooses two or three companies who have gone for external self-assessment to undergo the Post-Verification Review at the October COI Panel meeting.

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

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**).



3 COI Panel Post-Verification Review Process

As agreed by the COI Panel at the March 2007 meeting, the purpose of the post-verification review is to lend public credibility to the TSM results by:

- ✓ Improving TSM (including the verification process);
- ✓ Identifying best practices and deficiencies;
- ✓ Bringing cohesiveness in the application of the self-assessment and verification processes;
- ✓ Driving continued performance improvements by identifying both opportunities and impediments to reaching the highest level of performance; and
- ✓ Determining whether the member companies are finding the verification process useful.

At the March 2013 COI Panel meeting, the Panel selected Teck's Elkview and Fording River operations and Vale from the list of companies verifying their 2012 TSM results to undergo post-verification review (PVR) in 2013.

The Panel guides the post-verification review through a number of steps as shown in the figure below.

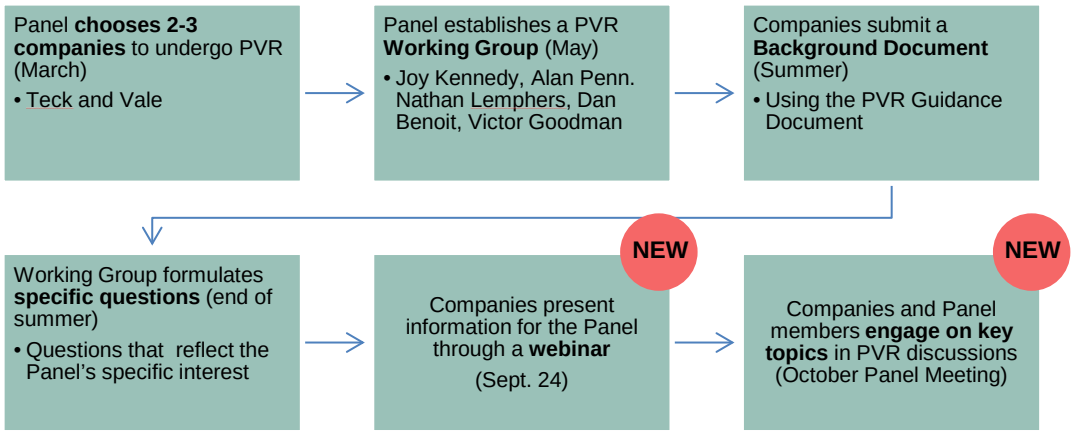


Figure 2: PVR Process 2013

Upon consulting with the PVR Working Group, a few changes were made to the PVR process this year. Firstly, companies were asked to present their materials via webinar two weeks prior to the meeting for the Panel. The purpose of the webinar was to free up time for dialogue with the PVR companies during the face-to-face meeting as well as give the Panel some time to reflect on the material. Secondly, the design of the PVR session with the companies shifted from a presentation and Q&A style to a more focused discussion based on the following topics, as selected by the Panel:

1. TSM performance
2. Discussion on key issues of interest to the Panel
    a. Energy & GHG emissions
    b. Biodiversity

   c. Community Development
3. Value of TSM to the company

In structuring the PVR session on these themes, the Panel was able to analyze the company's TSM results and also focus on improving their understanding of key sustainability issues in mining. An issue that arose during the PVR process, was that Teck made the decision not to undertake the facility-level TSM reporting on the two new protocols: the biodiversity conservation management and safety and health TSM protocols for 2012. This raised a number of questions for the PVR Working Group, and led to inclusion of a discussion on the "Value of TSM" during both the Vale and Teck PVR sessions.

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: Vale

About Vale:

- World's largest producer of iron ore and second largest producer of nickel
- Base metal business headquartered in Toronto, global headquarters in Brazil
- 4 active operations in Canada:
  - Sudbury, ON – a mining complex, mill, smelter, and refinery
  - Port Colborne, ON – a refinery
  - Thompson, MB – a mine, mill, smelter and refinery
  - Voisey's Bay, NF&L – a mine and mill operation
- 2 developing projects in Canada:
  - Long Harbour – NF&L – construction of a hydrometallurgical operation
  - Kronau, SK – seeking approval to build a solution potash mine
- Direct employment = 5,000 people in Canada (+ several thousand contractors)

See Vale's Background Document and PVR webinar slides for more information.

4.1 Vale Presentation

Several Vale employees were present for the PVR session and answered applicable questions as they arose. The Vale team included:

- Mark Travers, MAC Board Member, Member of COI Panel, Executive VP Legal
- Mitch Medina, General Manager for Sustainability, HR, Environment and Health and Safety
- John Mullally, Manager of Corporate Affairs, Base Metals
- Chantal Clement, TSM Initiative Lead
- Angie Robson, Manager of Corporate Affairs
- Lisa Lanteigne, Environment Manager
- Danica Pagnutti, Corporate Affairs Officer

Mark Travers welcomed the members of the COI Panel and provided some context on the global nickel market. Intense cost pressures and poor nickel prices have made it increasingly difficult for Vale to make current and planned investments. Nevertheless, he pointed out that Vale cannot lose focus of its vision of sustainability and

noted that TSM helps the company improve sustainability performance and communicate these achievements to its stakeholders.

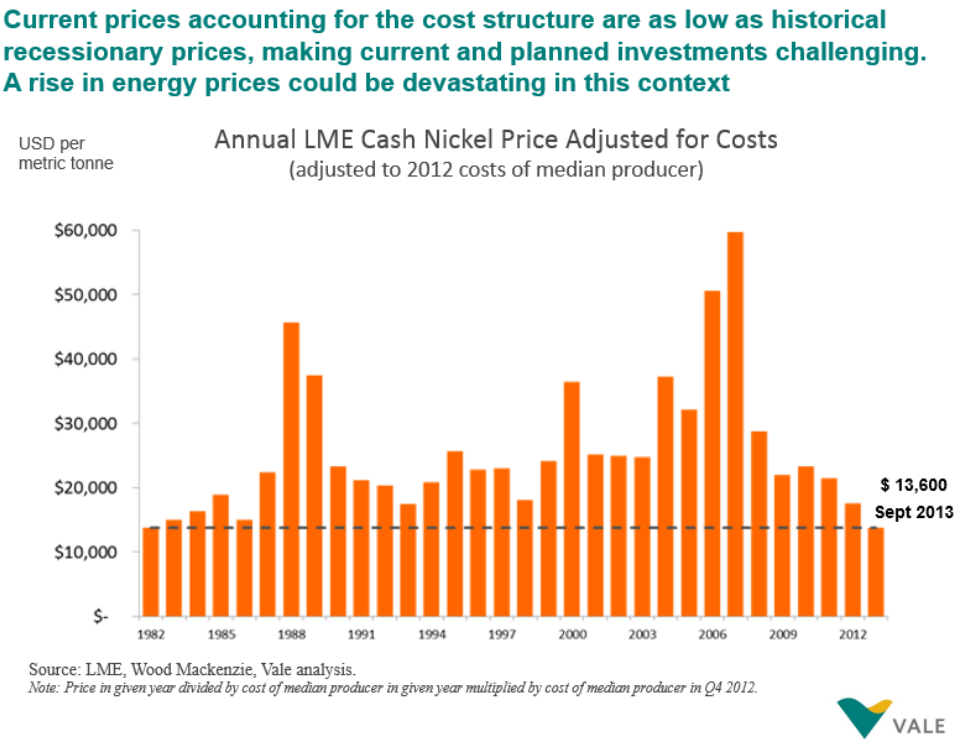


Figure 3: The Global Nickel Market (Source: Vale's PVR Webinar slide)

Considering Vale was in a unique situation to showcase its operations in the community where the COI Panel was meeting, several of Vale's team members shared information on sustainability at Sudbury's operations. Specifically, their presentation touched on:

- Vale's contribution to the Sudbury community through employment, procurement, and community investments
- Opening of the new Totten Mine
- Vale's Clean Atmospheric Emissions Reduction (AER) Project (a $1 billion investment to reduce atmospheric emissions in Greater Sudbury)
- Dealing with the 100+ year legacy through several, globally known, re-greening efforts (i.e. slag re-greening, annual aerial seeding program, growing seedlings, raising fish, etc.)
- Community outreach programs

4.2 General Questions and Commentary from the Panel

Panel members had the following comments and questions regarding Vale's presentation:

Community engagement

- Vale's operations are large and situated in the heart of the city and its surrounding communities. As such, Vale has worked hard to be open and transparent. Angie mentioned that TSM has helped to systematize the company's community engagement efforts. For instance, meetings and committees meet at regular intervals with meeting records. Just recently, Vale published an annual report targeted for the Sudbury community and launched a new sustainability website for Sudbury that provides up-to-date information on sulfur dioxide (SO_2) emissions.
- One Panel member wondered how Vale handles critical stakeholders – those who bring dissenting points of view. Angie Robson noted that all stakeholders seem relatively comfortable with bringing up

concerns. For example, the community recently campaigned against Vale to protect the Willisville Mountain on Manitoulin Island. Although Vale owned the lands with the mountain, Vale amended their license to prove that they would never mine on that specific location.

Labour relations

- Vale's year-long strike in Sudbury was noted in Vale's presentation as a very difficult period and that Vale is looking forward to improving labour relations. One Panel member wondered about the culture of the mines and if there were generational differences at mines with newer miners going to new mines and older miners going to old mines. Vale responded that this was not the case and that often miners associate their work with a specific mine, not the company.

Understanding how Vale's Sudbury facilities compare to Thompson and Voisey's Bay

- Thompson, MB → Creating a sustainable future in Thompson remains a challenge. Founded in the 1950's, the town was built around the mining industry and was even named after the Chairman of Inco, John F. Thompson. Due to increased cost pressures, Vale recently announced that it was exploring strategic partnerships for its Thompson nickel mine and that it would close the smelter and refinery in the near future. As the two mines in Thompson were underperforming, Vale worked closely with the city and the union to identify $100 million in reductions (through fixed costs, not headcount) to attract more suitable investors. In addition, Vale provided funding and project management for the Thompson Economic Diversification Working Group ("TEDWG"). This process represented a $2.5 million direct investment in the development and diversification of the region.

- Voisey's Bay, NF&L → Building successful partnerships with the province and local communities has been instrumental to the success of setting up the Voisey's Bay mine. The strength of the partnership with Newfoundland is an example of shared benefits on traditional territory. During the construction phase, approximately 80% of the services bought by Vale were provided by local aboriginal companies, which will subsequently help to build up the skills required by the mine for the operations. Vale is studying the feasibility of building an underground mine with a construction start date of 2015, to be operational in 2019.

Closure planning and mining legacies

- As mining is such an integral aspect of the economy in Sudbury, one Panel member asked Vale what their plans are for the community when the mines close. Angie noted that Inco, and now Vale have long been aware of the challenge that the community could become reliant on mining and so the companies have focused on diversifying the economy through community investments in initiatives such as Science North and the Vale Living with Lakes Centre. One Panel member wondered what the community would want to physically preserve of the landscape, explaining that there may be cultural elements that are important to the community that should be considered during closure. For instance, several Sudbury stakeholders are already wondering "What to do with the stack?" Several Panel members and participants noted that the heritage and cultural aspects of mining are becoming an increasingly important issue.

4.3 Key issues & Panel Discussions

As per the revised PVR process described in section 3, the scope of the conversation was not limited to the protocols. While several questions touched on the scores related to protocols, Panel members were invited to probe on these key issues as it relates to sustainable mining in general.

Energy Use and GHG Emissions Management

A summary of the conversation on energy use and GHG emissions management is provided below:

- *Why are Vale's scores lower for GHG emissions indicators than for the energy use indicators? What are the inhibitors for reducing energy use and GHG emissions at the facility level?*
    - Vale's GHG emissions indicators were lower mainly because the company's energy management system includes aspects of GHG emissions but there is no separate GHG emissions management system. MAC has made an amendment to this protocol to combine the energy use and GHG emissions indicators. A Vale representative noted that there is room for improvement on this protocol and they expect their scores to improve in the future.

- *How is Vale responding to the threat of climate change? How was the GHG target set for Vale?*
    - Globally, Vale has made a commitment to reduce its projected 2020 GHG emissions by 5%. This target was selected as a global target across all of Vale's global operations, which are at different phases of the mining life cycle in very different geographical settings. Regional targets were not provided.
    - In addition, Vale is focused on re-greening efforts, identifying potential avenues for transforming the company's energy matrix to include more renewable and sustainable options, and developing research projects related to climate change and energy.

- *Why are GHG emissions higher in Sudbury compared to Vale's other operations?*
    - While the answer is complex, Sudbury's emissions are the highest because it is the largest complex with the greatest production. The carbon footprint for electrical power in Ontario is significantly different from the footprint in Manitoba and different technologies are used at the mines and surface plants.

- *What are the differences between national and provincial approaches for supporting GHG emissions policies and regulations? What else could the government do to support GHG emissions reductions in mining?*
    - Vale's Thompson operations have benefitted from Manitoba's hydro power and have been particularly successful in capturing waste heat to heat the premises of its Nickel Refinery. Vale's Ontario operations have experienced significant savings by taking advantage of the Ontario government's 5CP program that offers large industrial electricity consumers substantial incentives to reduce energy consumption.
    - Different provinces and jurisdictions have different carbon footprints. While some mines have access to clean energy, several remote mines do not have access to the grid and are forced to use diesel. Government can support GHG emissions reductions by supporting infrastructure development that can address these issues.
    - The federal government has a role to play in supporting the policy and regulatory side of energy use and GHG emissions reductions, which in turn, will help industry make informed investment decisions. One Panel member wondered what the implications were of not having a national energy strategy for Canada.
    - One observer noted that the rest of the provinces could learn from British Columbia's regulation on requiring mines to have a dedicated professional energy manager. This has helped mines in B.C. drive performance improvements in energy use and should be shared broadly.

- *Understanding the context of GHG emissions in mining*
    - A few Panel members commented on how the mining industry is best understood from a site-specific perspective and the PVR process helps to shed light on these details. Understanding how energy use changes over time, in various geographic settings, and using different processes is important for having an educated discussion on sustainability in mining.
    - One industry member noted that there is also a balance between implementing GHG controls and the contaminant emissions reduction objectives (such as sulfur dioxide) because reducing contaminant emissions may increase GHG emissions. The industry and government need to

take a holistic perspective on contaminant and GHG emissions reductions objectives to achieve a balance that results in a net environmental performance improvement.

Biodiversity

A summary of the conversation on biodiversity is provided below:

- *What does biodiversity mean? How is biodiversity defined?*
    - Biodiversity is a vast subject area and MAC and its members have found it challenging to define and manage. Similar to the discussion around understanding the context of energy use, biodiversity is site-specific. To assist framing the conversation, one MAC member suggested that biodiversity be considered as a "basket" of significant aspects that can be managed appropriately (e.g., endangered species, land use, etc.)
- *What does biodiversity mean across Vale's facilities?*
    - In general, each facility understands and interprets biodiversity differently – which is one of the major challenges in working with this new protocol. It is difficult to have a consistent message and capture this information in a management system. While Vale has done a lot of work, there is still a lot of work to be done. It will take time.
    - A summary of the biodiversity issues across Vale's operations is presented below:
        - Voisey's Bay
            - This mine went through the environmental assessment process in the 1990s, which enabled several success factors. The mine was able to develop targets, set conservation projections and have a supportive regulatory framework. There are lessons to be learned from this project.
        - Thompson
            - Vale's Manitoba operations have been operating since 1959 and as such, no baseline information is available. While Vale has been active in addressing biodiversity and cooperating with stakeholders (e.g., Vale personnel working on the caribou monitoring project), key questions remain such as how can Vale have a more systematic approach to managing biodiversity?
        - Sudbury
            - Sudbury's operations have been active for over 100 years and the focus is on restoration and re-vegetation. The opportunity is to understand how to apply the TSM biodiversity protocol at a very mature operation.
        - Port Colborne
            - Vale was asked how Port Colborne received a "B" for the corporate biodiversity, conservation policy, accountability and communications indicator, when all of Vale's other operations received a "C". The result was achieved because Port Colborne has communicated the Vale Global biodiversity policy to employees during the implementation of the Vale Environmental Management System.

- *Biodiversity from a social perspective*
    - One Panel member made note that biodiversity should also be considered from a social perspective. Biodiversity includes understanding how livelihoods are impacted. Developing strong partnerships with the affected communities is important for gaining this perspective.

- *Comments on the biodiversity and conservation management protocol*
    - Vale has achieved several successes through its programs and initiatives related to biodiversity but these are not accounted for in TSM as the protocol is based on management system processes. It would be beneficial to Vale if these programs could be recognized somehow within TSM.
    - The protocol is quite prescriptive. For instance, communicating the biodiversity policy to all employees may mean, quite literally, *all* employees.

- *Do Glencore and Vale collaborate on biodiversity initiatives?*
    - Yes, the two companies work together on establishing baselines and sharing best practices. The companies also sit on several local environmental groups together.

- *What are the lessons learned that can be shared with others?*
    - As biodiversity is site-specific, it is important for each operation to have an operational definition.
    - All employees need to have an understanding of what biodiversity means for their organization. Change starts with the culture. Companies need to increase awareness and develop capacity to support performance improvements.

4.4 Value of TSM & Panel Discussion

- *TSM Implementation*
    - The TSM protocols that are based on technical issues such as tailings management, crisis management planning and safety and health are easier to implement than the protocols that are harder to define such as the biodiversity and conservation management protocol. How should MAC deal with these discrepancies? What are the barriers of making successful initiatives and projects into full-fledged systems?
    - Vale explained how new protocols take considerable effort to implement and that it is important to keep priorities clear to be successful in implementation. A few Panel members commented that, after hearing Vale's presentation, they have an increased appreciation for how difficult it is to implement management systems across large companies.
- *Sharing best practices*
    - Several agreed that more TSM case studies would be useful to share best practices across the protocols.
- *Value of TSM*
    - Overall, TSM has driven Vale to be a more disciplined organization, having more rigour around implementing their policies and procedures. Panel members agreed that TSM exists to raise the bar.
- *Feedback on the PVR process*
    - Several Vale representatives thought that the PVR process was a unique opportunity to share successes and challenges in a safe and respectful space, although, at least one Vale representative noted that he wanted to have more time to hear from the Panel.
    - From the Panel's perspective, the PVR process helps to ground the Panel's understanding of the industry and provide context on geographical, temporal and cultural factors.

4.5 Vale's 2012 TSM Performance Results

Vale's verified 2012 TSM results (as presented in the 2013 TSM Progress Report) are provided below.

Crisis Management Planning	Crisis Management Preparedness	Review	Training
Corporate	Y	N	Y
Manitoba Operations	Y	N	Y
Ontario Operations - Port Colborne Refinery	Y	Y	Y
Ontario Operations - Sudbury	Y	Y	Y
VNL Labrador Operations	Y	N	Y

Energy Use and GHG Emissions Management	Energy Use Management Systems	Energy Use Reporting Systems	Energy Intensity Performance Target	GHG Emissions Management System	GHG Emissions Reporting Systems	GHG Intensity Performance Target
Manitoba Operations	AA	A	A	C	B	C
Ontario Operations - Port Colborne Refinery	AA	A	A	C	B	C
Ontario Operations – Sudbury	AA	A	B	C	B	C
VINL Labrador Operations	AA	A	B	C	B	C

Biodiversity Conservation Management	Corporate biodiversity conservation policy, accountability and communications	Facility-level biodiversity conservation planning and implementation	Biodiversity conservation reporting
Manitoba Operations	C	C	B
Ontario Operations - Port Colborne Refinery	B	C	B
Ontario Operations - Sudbury	C	C	B
VNL Labrador Operations	C	AA	AA

Safety and Health	Policy	Planning	Training, Behaviour, Safety Culture	Monitoring and Reporting	Performance
Manitoba Operations	A	AA	AAA	AA	AA
Ontario Operations - Port Colborne Refinery	A	AAA	AAA	AAA	AAA
Ontario Operations - Sudbury	A	AAA	AAA	AAA	B
VNL Labrador Operations	A	AAA	AAA	AAA	AA

Aboriginal and Community Outreach	Community of interest (COI) identification	Effective COI engagement and dialogue	COI response mechanism	Reporting
Manitoba Operations	AAA	AAA	AAA	AAA
Ontario Operations - Port Colborne Refinery	AAA	AAA	AAA	A
Ontario Operations – Sudbury	AAA	AAA	AAA	A
VINL Labrador Operations	AAA	AAA	AAA	AAA

Tailings Management Reporting Assessment	Tailings management policy and commitment	Tailings management system	Assigned accountability and responsibility for tailings management	Annual tailings management review	Operation, maintenance and surveillance (OMS) manual
Manitoba Operations	A	A	A	A	AA
Ontario Operations - Sudbury	AA	AA	AA	AA	AA
VINL Labrador Operations	AA	A	A	A	A

5 Results of the Post-Verification Review: Teck (Elkview and Fording River)

About Teck:

- Headquartered in Vancouver
- Second largest exporter of seaborne steelmaking coal in the world
- Owns, or has interest in, 13 mines in Canada, the USA, Chile and Peru, and one metallurgical complex in Canada
- This PVR is focused on two of its Elk Valley coal operations in southeastern British Columbia, located in the Rocky Mountain trench:
    - Fording River Operations (FRO) – largest of its open pit mines; primarily mining steelmaking coal; 1,175 employees
    - Elkview Operations (EVO) – second largest of its open pit mines; mainly produces high-quality mid-volatile hard coking coal; 1,085 employees
    - Note: FRO and EVO are two of five coal mines adjacent to one another that share the same watershed.

See Teck's Background Document and PVR webinar slides for more information.

TSM is one of many external standards Teck subscribes to, including: the International Council on Mining and Metals (ICMM), the Global Compact, Global Reporting Initiative (GRI), Dow Jones Sustainability Index, and the International Finance Corporation's (IFC) Performance Standards. In order to align their TSM verification requirements with assurance requirements for other standards, Teck undertakes verification of a subset of their facilities each year, unlike other MAC members who verify all sites every three years.

Given the diversity of various requirements, Teck noted in their Background Document to the Panel that they are looking to consolidate and streamline their improvement efforts. As part of this process, Teck made the decision not to undertake the facility-level TSM reporting on the two new protocols: biodiversity conservation management and the safety and health TSM protocols for 2012. This raised a number of questions for the PVR Working Group and the panel as a whole, and lead to a substantive discussion on the "Value of TSM" during both the Vale and Teck PVR sessions.

As a result of this decision not to report, the TSM Governance Team (GT) working group met on September 5th to discuss TSM as a condition of membership, the governance structure of the initiative and to find opportunities to ease the burden of TSM without compromising its integrity.

The proposed changes to TSM are included below. This was described in detail in the TSM Governance Briefing Note and TSM 2.0 Briefing Note and discussed with the Panel on Friday, October 18.

1. Changes to TSM governance
    a. Implement a formalized dispute resolution process to address issues with member non-conformance
    b. Add an element to the current condition of members to require members to demonstrate continuous improvements over time.
2. Evolving TSM
    a. Reduced reporting for facilities that are consistently assessed at a level A or better
    b. Alignment of TSM requirements with other standards and frameworks

5.1 Teck Presentation

Mark Edwards (Vice President, Community and Government Relations) and Ed Kniel (Manager, Environmental Assurance), were present for the PVR session and answered applicable questions as they arose. Laura Bevan-Griffin, Superintendent of Environment, was invited but could not attend.

To help ground the discussions on TSM's successes and challenges, Ed and Mark provided background information on Teck's additional programs to highlight how sustainability is being integrated into Teck's internal strategy and operations.

Teck developed its Sustainability Strategy as a way to shift the company towards a common vision and a shared set of values and goals. Six focus areas help drive the company towards improved performance around sustainability issues, as shown in the figure to the right.

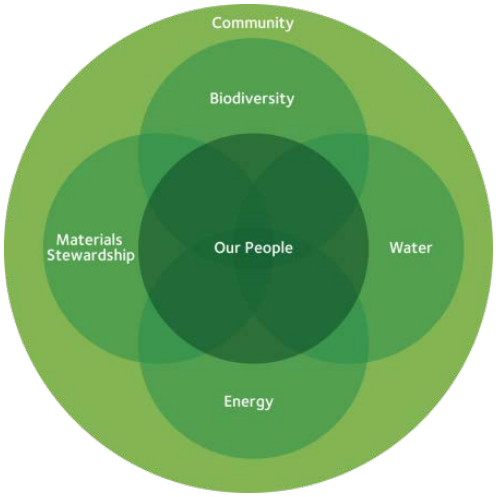


Figure 4: Focus areas of Teck's Sustainability Strategy

Mark and Ed touched on several key sustainability issues in their presentation, including:

- *Health and safety* - focusing on Teck's Safety Vision and the balance required between the cultural (i.e. leadership) and technical elements (i.e. standards and procedures) of a safety system
- *Community strategy* - including Teck's *SMART Toolkit* which provides process and phase-specific tools to help the company reach its community-related goals
- *Biodiversity* – achieving a net-positive impact on biodiversity and the Biodiversity Management Plan required by select Teck operations by 2015
- *Energy* – focusing on efficient energy use and sourcing clean energy supply

The last part of Teck's presentation focused on TSM's successes and challenges, which are discussed below in section 5.3 under the Value of TSM.

5.2 General Discussion

The majority of the discussion time was related to the topic of the "Value of TSM". Specific comments related to Teck's performance are included below:

- *Teck's approach to health and safety*
  - Teck shared how health and safety has been a major focus at Teck for the past three years, and has now become a huge part in how the company defines itself. The Courageous Safety Leadership (CSL) initiative is a key vehicle for improving Teck's safety performance. In response to the presentation on Teck's "Courageous Safety Leadership" approach, one Panel member noted that randomly testing workers for drugs and alcohol is not supported by the labour unions, and suggested that the emphasis of health and safety on the individual also has challenges as it suggests that the person is at fault, not the organization. Teck noted that these are concerns that Teck, like other companies, are trying to work through.

- *Tailings management*
  - The Panel was keen to know how Teck achieved AAAs in this protocol for Highland Valley Copper and Elkview in 2012. While Teck had the practices in place, the company spent a great deal of time re-building the management system manuals / OMSs to align with TSM. Although

beneficial to have all of the information in one place, Ed explained that the people at Teck are wondering if it was worth it in the end considering the amount of time spent.

- *Energy*
  - Teck indicated that Highland Valley Copper requires intensive energy use to extract the low grade ore. TSM has been influential in helping Teck improve performance on energy use.

5.3 Value of TSM

A good portion of the meeting was spent discussing Teck's successes and challenges of working with TSM. To kick off the discussion, Teck presented the following points:

TSM Successes	TSM Challenges

• 2012 TSM results place Teck at the forefront of Canadian mining companies
• Continued improvement during 2012
• Elkview Leadership Award
• TSM protocols that have been particularly useful are:
  o Tailings management
  o Aboriginal and Community Outreach
  o Energy and GHG
	• Rigidity – 'one size fits all', regardless of facility or organizational context
	• Inability to substitute / credit alternative approaches (i.e., 'equivalency' – which is why H&S and Biodiversity were not assessed at Teck)
	• Detailed programmatic aspects (e.g., system for grading / ranking performance; variety of interpretations in protocol content ⇔ Verification)
	• Inability to selectively apply protocols or substitute with other mechanisms creates facility-level: duplication of effort, confusion as to precedent, questions regarding the value proposition
	• Conflicts between TSM as a performance driver and TSM as a reporting obligation
	• 'All-or-nothing' performance rating no recognition for what is in place
	• External verification has highlighted a variety of content issues within TSM protocols and related documentation (an ongoing work-in-progress) (e.g., meaning / variety of possible interpretations; 'met' or 'not met')

Teck noted that they recognize and value TSM as a program but are trying to rationalize TSM with their internal strategy and better understand how to integrate and embed TSM within their strategy. They made note that they may report on the two protocols in the future but, at the present time, they are unsure about what they mean to the company.

Panel Questions and Commentary

- *Teck's choice to not report on all protocols*
  - Panel members appreciated Teck sharing their perspectives on the successes and challenges of TSM and of their decision to not report on all protocols. As one Panel member cautioned, chipping away at the edges of TSM will not serve the program in the long run. Another Panel member wondered why Teck was breaking from the rest of its peers as their challenges were seemingly not unique. Panel members were supportive of MAC's recommendations on TSM as a condition of membership. (The Panel elaborated on the discussion the following day during the TSM Update session).

- *Embedding TSM into companies' internal sustainability strategies*
    - Several Panel members discussed the concept of embedding TSM as part of a company's sustainability strategy. One Panel member felt that TSM was lacking a common language or set of terms which seemed to make it difficult for companies to move forward. While specific terminology may vary within and between companies, an industry member added that from her perspective, what matters most is that the facilities follow and demonstrate the good management practices contained in the TSM protocols to drive continuous improvement.
    - The "devil is in the details" was a commonly used phrase throughout the meeting as the difficult questions lie with the interpretative elements of the protocols.
    - Teck has used incentive plans to drive TSM performance in the past. However, it was driving performance in a different way than was intended and so moving forward they will tie their incentives to the Teck sustainability strategy.

- *TSM reporting requirements*
    - Ed and Mark expressed concern over the audit overload and logistics of facility-based reporting. This is why Teck is focused on verifying 3 operations at a time. Ed explained how Teck does not have one person solely dedicated to TSM and Ben responded that that is often the case within companies as TSM is generally embedded in the organization with several people involved in the process. The Panel noted that the concerns over reporting fatigue were important and finding the balance between effective and efficient reporting is necessary for TSM.
    - For the PVR sessions in particular, there were some concerns regarding the Panel members desire to have more detailed information. One industry member explained how there will need to be balance between what information the Panel would like and how much time and resources the companies have to prepare the material.

- *Value of TSM to broader industry*
    - TSM cannot be "all things to all companies" as the value is different for each company. However, several industry members agreed that part of the value of TSM is for the industry as a collective. As one industry member pointed out, the industry is often only as strong as its weakest link – and having TSM as an industry-wide standard is important for raising the bar for everyone. TSM helps companies hold each other accountable.

- *Value of TSM to the communities*
    - One Panel member remarked that there is a lot of damage that has been done in northern communities from junior mining companies in the past, and noted that if a community member wanted to quickly look up a new company that is interested in the area, it is hard to compare and really understand what type of company it is based on their corporate sustainability report. TSM gives some weight in terms of how companies can be compared. Suspicions may be raised if a company is not reporting.
    - On a separate note, one Panel member wondered if there would be value in inviting local COI into the TSM reporting process. Having a more collaborative approach to reporting may help build relationships and trust.

- *TSM 2.0 – What's next for TSM?*
    - Considering TSM is in its tenth year, several Panel members felt that the program's current challenges were aspects of its success. TSM needs to evolve and be flexible to remain valuable. To put it in perspective, when the program was started 10 years ago, the architecture was based on management systems as that was where the industry could have the most impact on performance. However, as performance continues to improve and systems become more sophisticated, the focus shifts to the softer side - which deals with aspects such as culture and leadership. Large operating companies who have strong management systems already in place are now beginning to experience this shift, although medium and small companies still require the technical support that TSM brings to help build their operations.

- As TSM is not designed around specific outcomes, one Panel member felt that communities would want to know why MAC chose the management system approach and what the limitations are in choosing this approach. Ben responded that the management system approach works well at the facility level as all operations vary widely. However, he offered that the combination of TSM, GRI and ICMM helps bring it all together as TSM focuses on the facility level, GRI focuses on outcomes and ICMM focuses on the corporate policy level.

5.4 Teck's 2012 TSM Performance

Crisis Management Planning	Crisis management preparedness	Review	Training
Highland Valley Copper	Y	N	Y
Elkview Operations	Y	Y	Y
Fording River Operations	Y	N	N

Energy Use and GHG Emissions Management	Energy use management systems	Energy use reporting systems	Energy intensity performance target	GHG emissions management systems	GHG emissions reporting systems	GHG emissions intensity performance target
Highland Valley Copper	AAA	AAA	A	AAA	AAA	A
Elkview Operations	A	AAA	A	A	AAA	A
Fording River Operations	AA	AAA	A	AA	AAA	A

Aboriginal and Community Outreach	COI identification	Effective COI engagement and dialogue	COI response mechanism	Reporting
Highland Valley Copper	AA	AAA	AAA	AA
Teck Coal - Elkview Operations	AAA	AAA	AAA	AAA
Teck Coal - Fording River Operations	AAA	AAA	AAA	AAA

Tailings Management Reporting	Tailings management policy and commitment	Tailings management system	Assigned accountability and responsibility for tailings management	Annual tailings management review	Operation, maintenance and surveillance (OMS) manual
Highland Valley Copper	AAA	AAA	AAA	AAA	AAA
Elkview Operations	AAA	AAA	AAA	AAA	AAA
Fording River Operations	B	B	A	A	A

6 Summary of 2013 Post-Verification Review

A number of themes emerged during the post-verification reviews that overlapped with themes discussed during other meeting agenda items. These themes include:

- *Challenges with the current global mining market conditions*
  - Mining companies are facing intense cost pressures and poor market conditions. Companies do not want to lose focus of their sustainability goals but it is a challenging time to be operating in the mineral sector.
- *Government's role in supporting sustainability*
  - The provincial and federal governments have a role to play in supporting energy and climate change by investing in infrastructure and developing supportive policy and regulations. This would help industry make informed investment decisions and have more regulatory certainty.
- *Understanding sustainability at the site-specific level*
  - The mining industry is best understood from a site-specific perspective – particularly for hard to define issues such as biodiversity and energy use. The PVR process helps to ground the Panel's understanding of the industry and provide context on geographical, temporal and cultural factors.
- *Sharing lessons learned and building knowledge*
  - There are several opportunities to share best practices and lessons learned through case studies.
  - Additional research and discussions could also be spent on analyzing the Panel's site visit experiences over the last three years as they have important common elements (e.g., sophisticated mining operations, support substantial human settlements, etc.)
- *Value of TSM*
  - TSM exists to raise the bar and the program has driven companies to improve performance and be more disciplined in how they manage key sustainability issues. However, there are challenges with the program. From a corporate perspective, these may include: the rigidity of the program, interpretations of the protocols at the verification stage, and reporting requirements. From a community of interest perspective, the value of process-related performance is different from outcome-based performance and questions remain about how effective TSM is at addressing these concerns at the community level.
  - Part of the value of TSM comes from its value to the industry as a collective. Having TSM as an industry-wide standard is important for raising the bar for everyone. TSM helps companies hold each other accountable. TSM also provides value at the community level as it provides basis for looking at company performance at a facility level.
- *What's next for TSM*
  - TSM needs to continue to evolve and be flexible to remain valuable. While the management system approach is still the foundation of TSM, companies who are succeeding at this level are placing greater emphasis and focus on embedding sustainability within the corporate culture and leadership practices.
  - One participant suggested that moving forward, MAC may wish to consider how to further encourage and enable companies to embed sustainability into their leadership practices and corporate culture.
- *Feedback on the revised Post-Verification Review process, including the webinar:*
  - Most participants felt that the additional PVR webinar held prior to the meeting was beneficial. One noted that it was an excellent tool to start the discussion. A few people mentioned that they were not able to or did not watch the webinar. One participant felt that the Panel was not given sufficient opportunity to question Teck during their PVR as too much time was spent on the presentation from Teck. From the PVR company perspective, one person commented that the objectives and process for the PVR were not clear from the beginning. One participant suggested that in the future, a more sophisticated company selection process should be put in

place and there should be a balance between what Panel members would like to know and what the companies are able to provide.

Annex 1: Web Links

COI Panel Information:
http://www.mining.ca/site/index.php/en/towards-sustainable-mining/community-of-interest-advisory-panel.html

Detailed Assessment Protocols:
http://www.mining.ca/site/index.php/en/towards-sustainable-mining/performance-measures-a-protocols.html

2013 TSM Progress Report:
http://www.mining.ca/www/media_lib/MAC_Documents/Publications/2013/TSM_Progress_Report/TSM-2013-english.pdf

TSM External Verification System Information:
http://www.mining.ca/site/index.php/en/towards-sustainable-mining/verification-service-providers.html

Annex 2: List of Companies That Verified Their TSM Results

2007 Review (2006 Results)
Albian Sands Energy Inc.
BHP Billiton Diamonds Inc.
Breakwater Resources Ltd.
CVRD Inco Ltd. (excluding Voisey's Bay Nickel)
Diavik Diamond Mines Inc.
HudBay Minerals Inc.
Inmet Mining Corporation
Iron Ore Company of Canada
Suncor Energy Inc.
Syncrude Canada Ltd.
Teck Cominco Limited

2008 Review (2007 Results)
ArcelorMittal Mines Canada
Barrick Gold Corporation (a sample of facilities)
Syncrude Canada Ltd.
Teck Cominco Limited (a sample of facilities)
Xstrata Copper Canada
Xstrata Nickel
Xstrata Zinc Canada

2009 Review (2008 Results)
BHP Billiton Diamonds Inc. – EKATI Diamond Mine
IAMGOLD
Inmet Mining Corporation

2010 Review (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

2011 Review (2010 Results)
ArcelorMittal Mines Canada
Barrick Gold Corporation
De Beers Canada Inc.
Diavik Diamond Mines Inc.
Iron Ore Company of Canada
Syncrude Canada Ltd.
Xstrata Copper Canada
Xstrata Nickel
Xstrata Zinc Canada

2012 Review (2011 Results)
Vale
HudBay
Shell
Teck (select facilities)
Nyrstar

Note: *Suncor Energy Inc. and Inmet Mining Corporation participated in a pilot post-verification review process (i.e., a "pre-verification review") in 2006.*

Underlining denotes which companies completed post-verification reviews in each year.