Mining Dialogue Backgrounder 2
A Framework for Assessing how a Mine/Mineral Project Contributes to Sustainability

1. Prologue

Task Objectives

In the summer of 2001, one stream of activities of MMSD North America set out to:

- develop a set of practical principles, criteria, and/or indicators that can be used to guide or test the exploration for, design, operation, and performance monitoring of individual, existing or proposed, operations in terms of their compatibility with concepts of sustainability;

- suggest approaches or strategies for effectively implementing such a test/guideline.

Development Process

This document provides a summary of the result to 31 October, 2001. It emerges from a phase of research and synthesis, several teleconferences and a 2-day workshop held in Tucson Arizona, October 11 – 13th, 2001. Some 25 individuals drawn from across the US and Canada and reflecting a range of interests and backgrounds have participated. In this process, no attempt was made to come to an overall consensus on the output. Rather, the current synthesis, is best considered a work in progress that will inevitably evolve significantly as additional individuals have the opportunity to reflect on its content, tone, and form.

The process began with a review of 10 pieces of work including:

Sustainability and Environmental Assessment

<www.cea.gc.ca/panels2/voisey/report/2_e.htm>

In preparation for the Workshop, a summary of each was completed to identify major characteristics, strengths, and common elements. Review of this summary prior to the workshop led to the conclusion that an overall framework could and should be attempted as a basis for workshop discussion. That step was taken and during the workshop, further development of the framework – a tool that was general in nature but could be easily refined for local application – became the main task.

Development of the Framework is following a three-step process as outlined below in Figure 1. In addition, the critical task of designing an implementation process that can effectively engage the needed communities of interest as well as deal with trade-offs that arise is being dealt with throughout.
Figure 1. Assessment Framework Development Sequence.

Framework Overview

The framework as it currently stands includes the following five high-level categories:

<table>
<thead>
<tr>
<th>Framework for Assessing How a Mine/Mineral Project Contributes to Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Process Ground Rules</td>
</tr>
<tr>
<td>2. Ecosystem Well-being</td>
</tr>
<tr>
<td>3. Human Well-being</td>
</tr>
<tr>
<td>4. Economic (market) Activities, Traditional and Non-Market Activities, and Institutional Arrangements</td>
</tr>
<tr>
<td>5. Need for the Mined/Processed Commodity and the Testing of Alternatives</td>
</tr>
</tbody>
</table>

Category 1 reflects a commitment to elevate a concern for the effectiveness of engagement between all communities of interest (company, government, indigenous peoples, labour, affected communities, non-government organizations) to a priority position. Doing so signals that the transfer of sustainability ideas from theory to practice is as much an issue of effective process as it is an issue of substantive/technical concern.
Categories 2 and 3 focus on the end results against which the success of any project ultimately must be tested. The most fundamental criteria for contributing to sustainability for any project (including the resulting products) is that over the long term, a net contribution to both ecosystem and human well being is generated, even though a given mine – minerals project has a limited life. In this overall sense, mining and minerals projects are best seen as “bridging” activities.

Category 4 encompasses the means that we have at our disposal to achieve the well-being in Categories 2 and 3. Lastly, need for a given set of commodities and the testing of alternatives to fulfilling those needs is included as a final Category.

**Context**

In developing this material, the following observations were made that reflect both the richness and complexity of this topic. Together they provide a context for the Framework.

**Focus of Interest and Application.** The focus of interest and application for this framework is that of the set of facilities and activities comprising an individual (existing or proposed): exploration program, or mining, milling, smelting, refining, or primary metals manufacturing operation.

**System of Interest and Spatial Scale.** The system of interest comprises the human and ecological system influencing, influenced by or potentially influenced by the operation, directly and indirectly. Thus, the spatial scale of analysis for any given application will be determined by the “reach” of site-specific implications as they ripple out into human society and the natural ecosystem.

**Time Horizon.** The time horizon of interest and application is that of the full facility or operation life cycle as shown below in Figure 1. Thus both short and long-term concerns come into play. Each element of this life cycle needs to be considered using the framework as a lens.

![Figure 1. Project Life Cycle](image-url)
Practical Application for Large and Small Operations. The framework is intended to provide practical guidance throughout the entire life cycle for operations and facilities that range from very small through to very large. At the small end of this scale lie the individual and family operations found in the placer mining areas of Nevada, Alaska, and the Yukon. There is somewhat of an analogy here to the artisanal miners of other countries. At the other end of the scale lie the massive open pit mines, smelters, refineries, and primary manufacturing plants (e.g. aluminum) of the major corporations. There is an enormous gap between these two extremes. Translation of this framework for effective application across the entire spectrum will require significant follow-up work.

Addressing the Distribution of Costs, Benefits and Risks. The framework includes a requirement for identifying and addressing the distribution of costs, benefits, and risks as well as for clarifying who is responsible for undertaking this kind of analysis in any given application. Accepted techniques for undertaking this kind of analysis are not yet available. It is an area of urgent attention.

The Issue of Need and Tradeoffs. A needs assessment relative to any project can be very complex. Aspects of need which come into play here include:

- needs of the local community, now and in the future;
- needs of indigenous peoples, now and in the future;
- needs of the regional and national economy, now and in the future;
- needs of the company, their employees, shareholders, and investors, now and in the future;
- national security needs now and in the future;
- needs of broader society for the metals or minerals being mined, now and in the future; and
- needs of the ecosystem, now and in the future.

Almost inevitably, some aspects of these needs and the value sets that they reflect when perceived through the eyes of different communities of interest will result in tension and a requirement that tradeoffs be made.

Addressing Tradeoffs. In this exercise, emphasis was placed on establishing a fair, effective, and respected processes of engagement that would encourage affected parties linked to any given site to develop the means for collaborating amongst themselves in designing locally grounded ways of addressing such tradeoffs. No attempt was made to design the rules governing such tradeoffs as this was seen a task for implicated communities of interest. However, committing to a broadly –based multi-party process to drive the assessment of a project’s contribution to sustainability represents a major leap for the industry.

There are many formal and informal approaches for identifying implications, applying weights to these implications and attempting to synthesize the results. One family of such approaches is grouped under the banner of multiple accounts analyses (MAA).
Variable success in applying MAA has led to both avid supporters as well as cautious detractors.

Boxes 1, 2, and 3 provide brief case histories of examples of various approaches to address the engagement and tradeoffs issue in a systematic way.

**Box 1**: Example 1

**Box 2**: Example 2

**Box 3**: Example 3

**Addressing both “Process” and “Substantive” Concerns.** Much evidence is now available that demonstrates how critical it is to be sensitive to both the “what” or substantive content of what we do, and the “how” or process part of that activity. This duel concern lies at the heart of effective implementation of sustainability concepts. In turn, it follows that in developing a framework for assessing how a mine/mineral project contributes to sustainability, consideration is given to both.
Company Economic Viability. Maintaining company economic viability is not only a concern to internal stakeholders (employees, shareholders, investors) but also to external communities of interest who wish to be confident that commitments made will be fulfilled. This issue is a key part of the sustainability envelope but it is not the whole.

Achieving Acceptance of Sustainability Ideas Across Corporate and Government Cultures. Ultimately company and government workers must take the actions that demonstrate the commitment to the ideas of sustainability. To facilitate this transition, the kind of framework evolving in this work must be articulated in a way that respects and nourishes the progress that has been and is being made internally within companies and governments.

Security and Having a Sense of Control over One’s Future. As much as anything else, the sustainability discussion is about security and re-establishing a sense of confidence that:

- people can/will have an opportunity to participate in the decisions that affect one’s own future;
- the resources will be made available to ensure that they will have the capacity to participate effectively; and
- companies and governments will fulfill the commitments that they make regarding human (social, cultural, economic) and ecological conditions.

The above three elements are critical determinants of healthy people and healthy communities.

Focus of Attention. With the effort that they make, the risks that are taken and the discipline that they apply to succeed, it is inevitable that companies place themselves at the centre of attention. However, applying the ideas of sustainability demand a perspective that puts the broader community as the focus of analysis and sees companies as one (key) set of many players. This broader perspective demands clearer thinking about the roles and responsibilities not only of companies but also of government and the many elements of civil society.

Linking to International Perspectives. Even though this work is drawn from North American experience and inevitably reflects Canadian and American culture, it is essential that effort is made to try to build a tool that is sensitive to cultures and conditions found elsewhere. The mining minerals industry is so global in nature now that anything put into practice in one country will influence and be influenced by, practices in other countries. In short, an isolated perspective on assessing a project’s contribution to sustainability is no longer possible.
The Tension between Practice and Theory; the Need for Incremental Change Strategies. There is a significant gap between the language and perspectives of theoreticians and that of mining/mineral practitioners. This gap results in an ongoing tension which in turn leads to the need for incremental change strategies the evolve from back and forth interaction in which each influences the other.

Need for Real Action on the Ground. There is a desperate need for action, not just talk. Outside industry, there is real cynicism that industry is serious about making and substantive change at all.

The Issue of Dependency. There is significant concern centered on the economic and social dependencies that can be created by a short term mine. This issue lies at the base of the need to put in place mechanisms that will create a reasonable degree of confidence for all communities of interest that acceptable post closure outcomes will be achieved.

Relationship Building Starts During Exploration. Exploration marks the start of any mine/minerals project and the nature of the relationship that is established between the exploration team and affected communities of interest sets the tone of relationship from then forward. As a result, significant responsibility rests with the exploration team.

The Need for Simplicity and Clear Thresholds. Translating “deep/important” ideas to a simple form on paper remains a major challenge in bringing sustainability ideas to implementation. An effective framework for assessing a project’s contribution to sustainability will be simple and will include clear thresholds for its application.

Linking Sustainability and Business Objectives. Establishing the “business case” remains a significant challenge but is essential for establishing a workable approach for applying the concept of sustainability within companies who exist to make a profit. Part of this challenge is learning a way to articulate sustainability concepts in language that speaks to those in business.

Design-for-Post-Closure. Concepts of “design-for-closure” have been in place for over 30 years. Concepts of sustainability now demand “design-for-post-closure”: past the moment when a proponent can walk away with dignity. This is a significant shift and requires involvement of those affected by post closure conditions from the earliest phases of any project. In short, “succeeding custodians” need to be at the table. It is only with their presence that it is possible that their values can be factored in project implementation.
Assessment and Reporting as a Catalyst for Change. Undertaking an assessment of a project’s contribution to sustainability and periodically repeating that assessment as a mechanism to track progress serves as an effective catalyst for change both within a company and across other implicated communities of interest. It’s important in initiating such process to NOT spell it out in detail but let participating employees and others build the assessment process to maximize both the learning and the sense of accomplishment. Recognizing success is a key part of that catalytic role.

Applying the Framework in an Approvals Process. An approvals process will ultimately lead to an overall subjective decision to go or not to go. Such decisions will rarely, if ever, depend on a single factor. In guiding such a process, the Framework including the assessment criteria should reflect the ideal, highest, target. Failure to meet any one component within the framework should not be considered a “show-stopper”. Taking this approach is the only way to ensure that the thresholds and tradeoffs that are ultimately applied in practice are seen in context. Over time as society’s values evolve, the assessment criteria will also change.

Variations in Standards. Standards of performance will be higher in ecologically and culturally sensitive areas.


2. The Framework in Greater Detail

In the following material, each of the five high-level categories that comprise the framework is further described through the description of sub-components. In building any assessment approach, this kind of hierarchical system inevitably emerges with general categories underlain by progressively more detailed sub-categories until specific metrics are reached.

In practical application, the identification of the quantitative and qualitative information (including specific indicators and metrics) needed to address each element of the framework will be governed by site-specific conditions.

Figure 3 provides an overall schematic of the framework as it currently stands. A listing of five “fundamental questions” that attach to the high-level categories follows this. In turn, the sub-categories are listed and also described in terms of the question that each addresses.

As this work proceeds through additional iterations, it will be pushed to greater practical detail which in turn, may lead to refinements of both the sub-categories and the five high level categories.

The format of this material is dominated by articulating specific questions that require an answer. This format has been chosen because:

1. it lends itself to clarity in terms of understanding exactly what is required;
2. articulating an “ideal” answer to the question immediately sets a foundation for design of the assessment criteria that will be required; and
3. experience in evaluation and auditing supports this approach as being the most effective.
Figure 3. Draft Framework for Assessing a Projects Contribution to Sustainability
Table 1. Assessment Framework Fundamental Questions

Process

1. Are processes of engagement committed to, designed, and implemented that ensure all affected communities of interest are participating in the decisions that influence their own future in a way that they are satisfied with?

Ecosystem Well-being

2. Will the project lead to at least the maintenance of ecosystem well-being, preferably an improvement?

Human Well-being

3. Will the project lead to at least the maintenance of human well-being, preferably an improvement?

Economic Activities, Traditional and Non-Market Activities, Institutional Arrangements

4A. Will the project lead to at least the maintenance of, preferably an augmentation of desirable economic activity at the project level, in the implicated community and region, for the government and broader society?

4B. Will the project lead to at least the maintenance of, preferably an augmentation of desirable traditional and non-market activities in the implicated community and region?

4C. Is implementation based on waste minimization and the most efficient use of materials and energy?

4D. Are the institutional arrangements in place to provide a reasonable degree of confidence that the capacity to address project consequences will continue to exist through the full life cycle including post closure?

Needs Analysis

5. Has the need for the project and the produced commodity been demonstrated taking into consideration:
   - needs of the local community, now and in the future;
   - needs of indigenous peoples, now and in the future;
   - needs of the regional and national economy, now and in the future;
   - needs of the company, their employees, shareholders, and investors, now and in the future;
   - national security needs now and in the future;
   - needs of broader society for the metals or minerals being mined, now and in the future; and
   - needs of the ecosystem, now and in the future
   - alternatives for providing the same benefits to be achieved from the project or product
1. Process Ground Rules

1.1 **Commitment to Engage.** Has a process been created and implemented that is understood, agreed upon, consistent with the legal institutional, and cultural environment of the project, and that serves as a mechanism for:

- Engaging with all affected communities of interest (including the full range of diverse community components, particularly disadvantaged or vulnerable sub-populations) through the full life cycle beginning with early exploration and extending through post-closure?

- Collaboratively Identifying:
  - desired objectives addressing the concerns of all communities of interest?
  - the best approach to gathering evidence in support of achieving objectives including quantitative and qualitative indicators?
  - assessment criteria (including levels of “acceptability”) for detailed elements of as well as the overall assessment?

- overseeing the application of the framework for each phase of the project life cycle from exploration through post-closures?

  *reflects the fundamental concern about the effectiveness and fairness of engagement processes*

1.2 **Consent from those Affected.** Has the informed and voluntary (democratic?) consent by those most affected by the project (proposed or operating) been given?

*is not intended to imply a veto. The right to proceed or not lies with government acting on behalf of society as a whole. However, in the absence of support by affected communities, the possibility of any project contributing to sustainability is greatly reduced and in some cases negated completely*

1.3 **Dispute Resolution.** Has a dispute resolution mechanism been established, acceptable to all affected communities of interest and have resources been ear-marked for its application should the need arise.

*Such a mechanism is critical for providing a sense to all communities of interest that their concerns will be heard and considered through a fair and open process*

1.4 **Community Capacity.** Have appropriate measures been taken to ensure that community capacity is adequate to make informed decisions and participate as required throughout the project life cycle?

*addresses the need to ensure that the community has the capacity to effectively participate throughout the project life cycle*

1.5 **Reporting and Verification.** Are mechanisms for ongoing proactive, and accessible reporting and verification understood and in place?

*addresses the need for ongoing reporting and verification if continuous learning for the company, community, and others is to be facilitated*
1.6 **Testing the Effectiveness of the Framework applied in any Given Application**: Has the framework effectively addressed:

- **Ethical Practices** -- have the ethics of the project been considered including whether or not transactions for compensation are open, honest, and transparent?
  
  *addresses the particular concern about honesty and bribery*

- **Both Substance and Process** -- have criteria been established for testing both the substantive nature of the project as well as the effectiveness of processes used in engaging all the affected communities of interest?
  
  *addresses the need for the test/guideline to be concerned with both substance-and process-related concerns*

- **Both Broad Context and Specific Detail**. Does the test/guideline have the capacity to assume a range of perspectives from local to global?
  
  *reflects a need to not only consider detail on the ground, but also the larger context of a project*
2. Ecosystem Well-being

2.1 Ecosystem Function and Resilience. Will the project result in ecosystem function and resilience being maintained or enhanced?

addresses the ecosystem conditions that (will) result from the project

2.2 Ecological Entitlement. Will the capacity of project-effected renewable resources to meet the needs of present and future generations be maintained or enhanced?

2.3 Ecosystem Costs, Benefits, and Risks. Have the full costs, benefits, and risks to the ecosystem been identified and factored into project-related decision-making (as it applies throughout the full project life cycle) by the project proponent, government, and other communities of interest?

establishes the need to test the adequacy of the assessment itself in terms of ecological implications

2.4 Responsibility and Accountability. Have responsibilities and accountabilities for ensuring both short and long term ecosystem well-being been fully and fairly assigned and accepted? addresses the need to clearly identify responsibilities for addressing environmental concerns (be those responsibilities attach to company, community, government or non-government organization) to ensure development of confidence that commitments made will be fulfilled
3. Human Well-being

3.1 Health and Safety. Will/does the project protect the health and safety of the people who come in direct contact with the operation (e.g. surrounding communities, workers)?

*reflects the health and safety concern of community, labor, company, and government*

3.2 Contribution to Human Well-being and Community Empowerment. Will the project maintain (as a minimum) or enhance human well being, not only on the short term and during the life of the project, but also over the long term?

*addresses the human conditions that result from the project*

3.3 Distribution of Costs, Benefits and Risks. Has a mechanism been created for identifying and publicly reporting on the distribution of costs, benefits, and risks between affected communities of interest including company indigenous peoples, community, government and broader society

3.4 Project Effects on People. Have direct, indirect, and diffuse effects of the project on human well-being been considered and fully addressed?

*reflects a need to test the adequacy of the assessment in terms of its coverage of direct, indirect, and diffuse effects*

3.5 Social and Cultural Costs, Benefits and Risks. Have full social and cultural costs, risks, and benefits been identified and factored into project-related decision-making by the project proponent, government, and other communities of interest?

*establishes the need to test the adequacy of the assessment itself in terms of human implications and their integration into decision-making processes*

3.6 Responsibilities and Sureties. Have responsibilities and sureties for ensuring both short and long term human well-being been fully and fairly assigned and accepted?

*addresses the need to clearly identify responsibilities for addressing human concerns (be those responsibilities attach to company, community, government or non-government organization) to ensure development of confidence that commitments made will be fulfilled*
4. Economic (Market) Activities, Traditional and Non-market Activities, and Institutional Arrangements

(Projec, Company, Community, Government, Broader Society)

4.1 Traditional and Non-market Activities. Will desired, traditional and non-market activities be maintained or augmented?

Addresses indigenous communities' concerns for maintaining the desired aspects of their traditional life style.

4.2 Economic (Market) Activities. Will desired economic (market) activities be maintained or augmented:

- For the project (including the economic well-being of the company, shareholders, and investors)?
- For the directly implicated community and region?
- For governments and broader society?

Addresses the company's, communities' and governments' concern for maintaining or enhancing economic well-being and ensuring that the resources are in place to address project implications through the full life-cycle.

4.3 Efficiency. Are the mine project and related infrastructure and programs contributed by others, being undertaken in a manner which maximizes efficiencies for all materials and energy use and minimizes waste?

4.4 Institutional Arrangements. Have institutional arrangement been designed and put in place to provide a reasonable degree of confidence that the capacity to address project consequences will continue to exist through the full project life cycle?

Addresses the need for strong institutional arrangements (could be legislated rules, voluntary programs, or financial incentives) to ensure development of confidence that commitments made will be fulfilled.
5. Need for the Mined Commodity and Testing of Project Alternatives

5.1 Need for the Mined Commodities. Has the need for the mined commodity been fully assessed and established?

intended to supplement, not replace, other aspects of the need issue such as needs of the community, needs of the regional and national economy, needs of the company, security needs, and needs of the ecosystem that are covered above in section 2 – 4.

5.2 Project Alternatives. Have all relevant project alternatives have been considered:

- From the perspective of the company;
- From the perspective of the community;
- From the perspective of governments and broader society?

A critical part of assessing need relates to assessment of alternatives.