NI 43-101 in Perspective for Investors

BMO Global Metals and Mining Conference

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Agenda

• Value of NI 43-101 technical report
  • Summarizes all material information in a standardized format

• NI 43-101 as a “brand”

• Basics of a NI 43-101 technical report
  • What is a NI 43-101 technical report
  • What are the triggers for filing a technical report
  • When does regulator review the reports

• What should investors look for
  • Relevant experience of QP
  • Mineral resource vs mineral reserve
  • Economic assumptions and estimates
  • Legal right to mine
Value of NI 43-101 Technical Report

• Material information about a project is captured in one document.

• Ability to compare projects at a similar stage of development.

• Easily accessible as filed on SEDAR.

• Enables investors to make informed investment decisions.
NI 43-101 as a “brand”

• If a company says:
  
  • “We have a NI 43-101 compliant estimate”, or
  
  • “We have a NI 43-101 compliant technical report”

• Then investors may have certain expectations:
  
  • Prepared according to NI 43-101
  
  • Contains all the important information
  
  • Signed-off by a qualified person
  
  • It must be correct … right?
What “NI 43-101 compliant estimate” really means

• The company has to comply with the **disclosure rules** in NI 43-101 – that’s what being “compliant” really means.

• The term “**NI 43-101 compliant estimate**” refers to the manner of the reporting, not the quality or the accuracy of the estimate.

• Describing a resource/reserve estimate as being a “**NI 43-101 compliant estimate**” is potentially misleading. The correct reference is to the governing code, i.e. CIM or JORC.

• This refers not just to resources and reserves but to cost estimates as well.

“**NI 43-101 compliant estimate**” should be interpreted to mean:

*An estimate determined by a Qualified Person and reported in accordance with NI 43-101*
Mission Mining & the “NI 43-101 Report” brand

Nov. 12, 2013 - LAS VEGAS -- Mission Mining Company (OTC: MISM)

Mission Mining Company NI 43-101 Report Confirms $25.5 Billion in Measured Gold, Silver Resources

The NI 43-101 Report confirms total Measured mineral resources of 17.2 million ounces of gold and 148.3 million ounces of silver located in the top 30 feet of surface material across the six Gold Star Mine claims. - $MISM

Nov. 28, 2013

The BCSC recommends that investors in B.C. exercise extreme caution when dealing with any company that purports to release a NI 43-101 technical report, but does not file the report with a securities regulator in Canada. Any technical report that a publicly traded company files with a securities regulator in Canada under NI 43-101 is available to the public on SEDAR.
Technical Report Basics –
Canadian National Instrument 43-101
What are the core principles of NI 43-101?

Objective of NI 43-101 is to ensure that disclosure is based on reliable information, reflecting professional opinions, based on industry best practices and using standardized terms.
Technical report

Supports a mining company’s most important asset: its material mineral properties and the resources and reserves they contain

Filed on SEDAR
Prepared by Qualified Person(s)
5 Ws (and 1 H) of technical reports

Who  Prepared by QPs, often independent of the company and the property.

What  Current summary of material technical information on a material property.

When  Triggered by milestone events and filed within a specific timeframe.

Where  Filed publicly on SEDAR.

Why  Supports a company’s technical disclosure and assists investor’s decisions.

How  Must follow prescribed Form 43-101F1 and requirements of NI 43-101.
“Milestones” trigger technical reports

**Property Milestones**

1st time disclosure of:

- Mineral resources
- Mineral reserves
- Preliminary economic assessment (PEA)

Material change of the above

“Success or revision driven triggers”

**Company Milestones**

1st time reporting in Canada

Filing of any of the following documents:
(where the material technical information is not already supported by a technical report)

- Preliminary (long form) prospectus
- Preliminary short form prospectus
- Information or proxy circular
- Offering memorandum
- Rights offering circular
- Annual information form
- Valuation
- TSX Venture offering document
- Take-over bid circular

“Event driven triggers”
Technical reports filed per year (2007 – 2013)

Review of Reports:
- Long-Form or Short-Form Prospectus
- Continuous Disclosure Review

Average = 95/month
Technical reports filed in 2013 by jurisdiction

- BC: 516 reports (59%)
- ON: 234 reports (27%)
- QC: 72 reports (8%)
- AB: 37 reports (4%)
- SK: 6 reports
- NS: 9 reports
- MB: 3 reports
- Other: 0 reports

Total technical reports filed in 2013: 877
What Investors Should Look For
Investors Checklist

• All material information should be in the summary of the Technical Report.
• Check relevant experience of the QP in Certificate.
• Was there a site visit, if not, why not?
• Exploration target vs resources.
• Mineral Resources/Mineral Reserves.
  • Are the assumptions and parameters described?
  • Cut-off grades – reasonable for open pit or underground projects?
  • Metal prices – similar to peers or similar projects?
• What level of study is this? PEA, PFS or FS.
• Other Issues with Advanced Projects – metallurgy, environmental and social, permitting.
• Are the risks as well as opportunities disclosed.
The Risk Stages of a Mining Project

Develop
- Project Acquisition
- Exploration
- Pre-Scoping
- Advanced Exploration

Study & Definition
- Scoping
- Pre-Feasibility
- Feasibility

Financing

Construction
- Startup

Operation
- Closure

ENVIRONMENT AND PERMITTING AT ALL STAGES
Review the summary which is a key part of any technical report.

Summarize the “key findings” relative to the property’s stage of development.

- Property description and ownership.
- Exploration and drilling status.
- Data verification and site visit.
- Mineral resource and reserve estimates (if applicable).
- Mining studies and economic analysis (if applicable).
- QP’s conclusions and recommendations.
Relevant Experience of Qualified Person

- Does the QP have experience in this deposit type.
- Longevity in the mining industry does not necessarily guarantee quality.
What is an exploration target?

- Statement of the exploration potential of mineralization in a defined geological setting.

- Relates to mineralization where there is insufficient exploration to estimate a mineral resource.

- Must be a basis for determining the target which may include information such as:
  - Exploration results.
  - Historical estimate.
  - Foreign estimate.

- Further exploration should be able to test the validity of the exploration target.
Disclosing an exploration target

s. 2.3(2)

May disclose the potential tonnes and grade, expressed as ranges, of a target for further exploration only if the disclosure states with equal prominence:

- Potential quantity and grade is conceptual in nature.
- Insufficient exploration to define a mineral resource.
- Uncertain if a mineral resource estimate will be delineated.
- Basis on which exploration target has been determined.

Exploration target disclosure checklist:

- ✔ Range of tonnes & grade.
- ✔ Cautionary statement – next to the disclosed target ranges.
- ✔ Reasonable basis for target ranges.
Exploration target

June 29, 2012


• No disclosure of tons and grade.
• No explanation of basis for this estimate.
• No cautionary language.


• CTO remained in place until the Company filed a NI 43-101 technical report addressing all technical comments from the BCSC.
Definition of a mineral resource

• A concentration or occurrence in or on the Earth’s crust of:
  • Natural solid inorganic material including base and precious metals, diamonds and industrial minerals, or
  • Natural solid fossilized organic material including coal.

• Location, quantity, grade, geological characteristics and continuity are:
  • Known, estimated or interpreted from specific evidence and knowledge.

• Has “reasonable prospects for economic extraction”.

CIM DEFINITION STANDARDS - For Mineral Resources and Mineral Reserves

Prepared by the CIM Standing Committee on Reserve Definitions
Adopted by CIM Council on November 27, 2010
A Mineral Reserve is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study.

This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.
CIM Definition Standards for Mineral Resources and Mineral Reserves (2010)

- Exploration Results
  - Mineral Resources
    - Inferred
    - Indicated
    - Measured
  - Mineral Reserves
    - Probable
    - Proved

Increasing level of geological knowledge and confidence

Consideration of mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors (the "Modifying Factors")
Disclosing mineral resources and reserves

s. 3.4

When disclosing mineral resources or reserves include:

- **Effective date** of each estimate.

- **Quantity and grade** of each category.

- Key **assumptions, parameters, and methods** used.

- **Any known risks** that could materially affect potential development.

- Statement that “mineral resources that are not mineral reserves and do not have demonstrated economic viability” if results of an economic analysis of resources is disclosed (such as in a PEA).
Examples: assumptions, parameters & methods

- Assumptions
  - Cut-off grade and basis for determination.
  - Mining and processing method.
  - Metallurgical recovery.
  - Metal prices.

- Parameters
  - Appropriate geological model for the deposit type.
  - Cutting factors and specific gravity.
  - Search distances and minimum samples per block.
  - Interpolation distances and directions.

- Methods
  - Polygonal, cross-sectional, etc.
  - Geostatistical.

How were “reasonable prospects of economic extraction” determined?
What are “reasonable prospects of economic extraction”? 

• Judgement by the QP about the realistic and justifiable technical and economic factors likely to influence the prospect of economic extraction.

• Use of mine planning tools, such as open pit design algorithms, to limit the extent of mineralization is valid for advanced mineral resource statements (i.e. M+I) but may not be appropriate, or required, for earlier stage mineral resource statements (i.e. Inferred).

• For early stage assessments the QP may choose to demonstrate “reasonable prospects for economic extraction” by comparing the deposit’s attributes to analogous mine operations.
Estimating mineral resources – common issues

- Ignoring key geological controls.
- Smearing grades into barren units.
- Excluding unsampled intervals from composites.
- Using unreasonable grade-capping levels.
- Using inappropriate cut-off grades (metal prices).
- Not validating sectional interpretations in plan.
- Not having your work peer reviewed.
Example: Ignoring key geological controls

Aurcana Corp. (December 12, 2013)

• Previous model supporting the mineral resource estimate was an inconsistent predictor of tons and grade.

• Updated geological model will result in a **significant reduction** in the mineral resource estimate.

• A significant portion of the reduction can be attributed to the utilization of **geological and structural controls absent in the prior mineral resource estimate.**
Example: Smearing grades into barren units

Canada Lithium Corp. (May 16, 2011)

- Independent consultant identified certain issues with regard to the mineral resource estimate previously announced on October 28, 2010.

- Some mineralized envelopes did not conform to the pegmatite dyke boundaries and included waste.

- Some unsampled intervals within the pegmatitic dykes were not assigned a zero grade.

  - Consequently, some of the resource blocks should have been classified as waste rather than having Li₂O grades assigned to them.
    - +37% overestimation for measured and indicated resources.
    - +64% overestimation for inferred resources.
Assessing Reasonable Prospects for Economic Extraction.

To assess reasonable prospects for economic extraction, an optimized pit shell was prepared using general technical and economic assumptions listed below to constrain the estimated resource blocks.

Technical and economic parameters for assessing reasonable prospects:

- Gold Price
- Silver Price
- Gold Recovery
- Silver Recovery
- Exchange Rate
- Mining Cost
- Processing Cost
- G&A Cost
- Pit Slope
What is a reasonable metal price?

- CIM guidance on metal price assumptions.
  - Consider the stage of development (resource vs. reserve vs. production).
  - Long term average.
  - Industry/peer consensus.
  - Margin over world cash cost curve.
  - Contract price.

- SEC requirement.
  - Lesser of the 3-year trailing average or current spot price.
# Types of technical and economic studies

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Technical &amp; Economic Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study</td>
<td>Preliminary Economic Assessment (PEA)</td>
</tr>
<tr>
<td></td>
<td>Prefeasibility Study (PFS)</td>
</tr>
<tr>
<td></td>
<td>Feasibility Study (FS)</td>
</tr>
<tr>
<td>Objective</td>
<td>Early stage conceptual assessment of the potential economic viability of mineral resources</td>
</tr>
<tr>
<td>Mineral Estimate Inputs</td>
<td>Inferred/Indicated/Measured Resources</td>
</tr>
<tr>
<td>Mineral Estimate Outputs</td>
<td>Inferred/Indicated/Measured Resources</td>
</tr>
</tbody>
</table>
Technical and Economic Studies

CIM Definition Standards for a pre-feasibility and feasibility study are incorporated by reference into NI 43-101.

- Allows for future definition changes in order to harmonize with international definitions through the assistance of CRIRSCO.

- PEA is defined only in NI 43-101, not in CIM
  - Allows regulators to restrict use of inferred resources in economic analyses.
  - Means a study, other than a pre-feasibility or feasibility study, that includes an economic analysis of the potential viability of mineral resources.
  - Also known as a scoping study.
  - Requires cautionary language.
## Study Accuracy

<table>
<thead>
<tr>
<th>Level of Study</th>
<th>Class</th>
<th>Accuracy</th>
<th>Contingency</th>
<th>Engineering Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEA (Scoping)</td>
<td>I</td>
<td>+30-40%</td>
<td>±20-25%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-10-15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-feasibility</td>
<td>II</td>
<td>±20-25%</td>
<td>±15-20%</td>
<td>1% - 4%</td>
</tr>
<tr>
<td>Feasibility</td>
<td>III</td>
<td>±10-15%</td>
<td>±10-15%</td>
<td>5% - 20%</td>
</tr>
<tr>
<td>Definitive Estimate</td>
<td>IV</td>
<td>±5-10%</td>
<td>±5-10%</td>
<td>20% - 40%</td>
</tr>
</tbody>
</table>
PEA (Scoping)

- Accuracy is +30% to 40%; -10% to 15%.
- A scoping study will have order-of-magnitude cost data based on recent historic data or factoring.
- Scale from other operations.
- From cost service graphs, annual reports, company public information, personal experience, experience from similar mines.
- This is the time to consider all manner of opportunities and options.
- Road map for planning and strategic decision making.
- Assessing project risks and opportunities.
- Public disclosure to raise capital for advanced studies.
- Preparing for a pre-feasibility study.
Prefeasibility Study

- Accuracy +/- 20% to 25%.
- Some scaling of cost estimates.
- Some budget quotations.
- Information from other operations.
- Split by departments with detail for each.
- Do not forget administration, warehouse, shipping, energy.
- Trade off studies of different choices are applicable at this stage to guide the feasibility study.
- First level of study where reserves can be reported.
Prefeasibility Study

• A pre-feasibility study will have estimates from vendor quotes based on equipment sizing and materials volumes for major equipment and supplies, as well as historical factors and percentages.

• This estimate will be prepared by a team of people over a study period of several months.

• There may be trade off studies before the PFS options are selected to evaluate options under consideration – these trade off studies have a more limited scope to compare several choices before moving ahead with one alternative.
Prefeasibility Study OPEX

- Manpower levels will be defined.
- Wage and salary rates will be determined complete with all fringes and mandatory payroll taxes.
- Mining costs will be built up from first principles with quotations for some key consumables.
- Process costs will be based on reagent, grinding steel and power consumption from testwork and quotations or recent experience on material prices.
- Administration costs will be detailed.
Feasibility Study

- Accuracy +/- 10% to 15%.
- Little scaling of costs – mainly take offs and quotations.
- Quotations for all major items.
- Labour studies for area wages/salaries.
- Details of labour loading, OT, bonuses, vacations, benefits, EI, CPP.
- Taxes, fees.
- By department with details for all cost centers, by unit for mechanized equipment.
- Prepared by major company groups or consultants.
Where Do Things Go Wrong?

- Capital Costs
- Head Grade
- Productivity
- Metallurgy
- People, Technology
- External Pressures
Clarification Press Releases

• Orbite Files Revised Preliminary Economic Assessment Technical Report (PEA) Confirming Economic Results
  Press Release: Orbite Aluminai Inc. – Thursday, May 2012, 9:08 AM EDT

• Banks Island Gold Ltd. Clarifies Technical Disclosure
  Press Release: Banks Island Gold Ltd. – Wednesday, February 6, 2013 6:41 PM EST

• Tahoe to Clarify PEA Disclosure
  Press Release: July 18, 2013, 9:06 a.m. EDT

• Timberline Clarifies Technical Disclosures for Canadian NI 43-101 Compliance
  Press Release: March 28, 2013, 8:01 p.m. EDT
I want a complete Ore Reserve Study, and I want it from an optimistic point of view.
About RPA

• Advice to the mining industry for more than 30 years.

• *The specialty firm of choice for resource and reserve work.*

• All stages:
  • exploration and resource evaluation
  • scoping, prefeasibility and feasibility studies
  • financing, permitting, construction, operation, closure and rehabilitation.

• Clients are financial institutions, governments, major mining companies, exploration and development firms, law firms, individual investors, and private equity ventures.

• Offices in Canada, United States and United Kingdom.

• Head office in Toronto.

• 100% employee owned.