The Types, Uses and Methods of Mine Closure Cost Estimates

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Outline

- Cost Estimate Terminology
- Case Study of Financial Assurance Regulatory Program (Nevada, USA)
Avoiding confusion when discussing mine closure cost estimates.

COST ESTIMATE TYPES
Common Terminology

- Mine Closure Cost (MCC)
- Financial Assurance Cost Estimate
- Life-of-Mine Closure Cost (LOM)
- Asset Retirement Obligation (ARO)

- International Financial Reporting Standards (IFRS)
- US Generally Accepted Accounting Principles (USGAAP)
Mine Closure Cost

- Generic term often applied to any number of more specific types of mine closure cost estimates including:
  - Financial Security Cost Estimates
  - Life-of-Mine (LOM) Closure Cost Estimates
  - Asset Retirement Obligation (ARO) Estimate
- Without clarification or context, can be confusing or potentially misleading
Financial Assurance Cost

- Estimated cost for responsible regulatory agency to perform all of the actions required to fulfill an approved reclamation/closure plan
- Usually used to determine the amount of financial security required under governing regulations
  - Typically assumes third-party costs
  - May be subject to govt. contracting laws
  - Current or maximum near-term cost
**Life-of-Mine (LOM) Cost**

- Estimated cost for mine operator to perform all of the actions required to fulfill an approved reclamation/closure plan in the context of operations
- Usually used for planning, budgeting and cost tracking
  - Prefeasibility/feasibility
  - Due diligence
  - Accrual allocation
- Includes all planned development
- Cash flow basis
Asset Retirement Obligation (ARO)

- Fair value of abandonment liabilities associated with mining and mineral processing operations for financial reporting.
- Amount company would pay a third party to assume responsibility (including a profit margin).
- Includes both Legal (and Constructive) Obligations.
- Only includes liability existing in reporting year.
- Cash flow basis.

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Legal Obligations (US GAAP)

“an obligation that a party is required to settle as a result of an existing or enacted law, statute, ordinance, or written or oral contract, or by legal construction of a contract under the doctrine of promissory estoppel.”

Source: FASB Statement 143
Legal Obligations (IFRS)

A legal obligation is an obligation that derives from:

(a) a contract (through its explicit or implicit terms);

(b) legislation; or

(c) other operation of law.

Source: Extracted from IAS 37
A constructive obligation is an obligation that derives from an entity's actions where:

• (a) by an established pattern of past practice, published policies or a sufficiently specific current statement, the entity has indicated to other parties that it will accept particular responsibilities; and

• (b) as a result, the entity has created a valid expectation in those parties that they can reasonably rely on it to discharge those responsibilities.

Source: IASB Meeting Minutes, May 2004
## Closure Cost Types

<table>
<thead>
<tr>
<th>Use(s)</th>
<th>Financial Security</th>
<th>LOM</th>
<th>ARO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Financial security</td>
<td>Planning (DD, prefeas, feas), budgeting, etc.</td>
<td>Financial Reporting, IPOs</td>
</tr>
<tr>
<td>Rate Basis</td>
<td>Third-party</td>
<td>Operator &amp; Third-party</td>
<td>Third-party</td>
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<tr>
<td>Included Development</td>
<td>Maximum (near-term)</td>
<td>All Planned</td>
<td>Current Financial Year</td>
</tr>
<tr>
<td>Govt. Contracting Rules</td>
<td>Maybe</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Cost Basis</td>
<td>Current Cash</td>
<td>Cash Flow</td>
<td>Cash Flow</td>
</tr>
<tr>
<td>Salvage Value</td>
<td>No (varies)</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
What when wrong with our financial assurance regulations?

NEVADA CASE STUDY
More than 20 mines abandoned
Financial Assurance generally less than 50% of actual costs
Two sites bonded under corporate guarantee
Many sites were an imminent risk to the environmental
What was missing?

- Proper closure plans
- Site-specific costs estimates
- Process fluid management costs
- Additional permitting costs
- Long-term maintenance and monitoring
- Mobilization/Demob
What was insufficient?

- Costs based on average conditions
- Unrealistic equipment fleets
- Intentionally inflated productivities
- Unrealistic labor and equipment costs
- Short-term funds for fluid management
Heap Closure - Griffon

- Abandoned in 2000
- US Forest Service assumes control
- Active cyanide heap leaching operation
- ±4-day upset time
- All assets removed from site during bankruptcy
- Required 9 months of management before closure

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Griffon Mine Closure

- Financial assurance = $.77M
- Estimate to complete closure plan = $3.0M
- Actual spent by Forest Service = $1.5
Yerington Mine

- Open pit copper mine
- Abandoned 2001
- Active copper leach operation (100L/s)
- <8-hour upset time for heap solutions
Yerington Mine Closure

- Financial Assurance as Corporate Guarantee = $0
- Estimate to close site properly +$30M
- Emergency water management = $2.5M
- Site still not closed
- USEPA now involved
Lessons Learned

- Large gap between theory and implementation
- Regulators did not have adequate for reviews
- Operators attempted to keep estimates low
- Corporate guarantees aren’t worth much in a actual bankruptcy
SRCE Development

- Accurate & defensible
- Standard unit rates
- Easy to use
- Standardized format
- Free – public domain

- Broad range of input alternatives
- Easy to update or modify
- Ability to use other cost bases
The SRCE Model

Cost Data File

- Labor
- Equipment
- Materials
- Productivity Data
- User Data
- Reclamation Schedule
- Financial Assurance
- SRCE MODEL
- Completion Plan
- ARO

Available at: www.nvbond.org
How financial modeling and reporting changed how we estimate closure costs

LOMs and AROs
Life-of-Mine Estimates

- Feasibility studies
- Due diligence audits
- Lender requirements
- Annual budget cycles
AROs

- High-level management sign-off
- Updated annually
- Must be auditable
- Often include risk analysis
- Must consider obligations that may not be in a FACE
Improving Cost Estimates

- Require better closure plans
- More complete estimates
- Auditable data sources/calculations
- Annual updates
- Better internal review
- External audits
What does the future hold?

CONCLUSIONS
Where are things heading?

- New laws and regulations
- Evolving financial assurance requirements
- Heightened expectations by investors/banks/corp. accounting
- Increased scrutiny by NGOs
- The numbers will get bigger