October 23, 2012

Mark Cliffe-Phillips
Executive Director
Wek’eezhii Land and Water Board
#1 – 4905 48th Street
YELLOWKNIFE NT X1A 3S3

Dear Mr. Cliffe-Phillips,

On August 21, 2012, the Wek’eezhii Land and Water board (the Board) requested that Aboriginal Affairs and Northern Development Canada (AANDC) provide additional information and documentation on the RECLAIM Model with respect to:

1. Project management percentage: Please describe what is included in the RECLAIM estimate, and any significant exclusions.
2. Engineering percentage: Please describe what is included in the RECLAIM estimate, and any significant exclusions. For conceptual and interim closure plans, does the estimate include the costs of final engineering, specifications, and drawings?
3. Contingency percentage: Please provide guidance on how to estimate costs for contingencies. While each site will need to be considered individually, basic principles and guidelines for estimating the contingency percentage should be documented. Also, please clarify whether the contingency costs typically include those incurred when site conditions or project configuration are different at closure than those assumed in the closure plan.
4. Mobilization/demobilization: Please document relevant AANDC policies or principles (e.g., assumptions related to fuel mobilization).
5. Monitoring and maintenance: Please describe what is included in the RECLAIM estimate, and any significant exclusions.
6. Other: Any closure and reclamation costs excluded from RECLAIM not already mentioned above. For example, does RECLAIM cover the costs of an initial site assessment, completion of the closure plan, regulatory approvals, compliance with other instruments, consultation with communities and other parties, etc.? Are costs incurred by the Crown that would not normally apply to private companies included in the estimate?
7. Unit costs: Please provide any available documentation supporting the unit costs in the mine component spreadsheets, including any generic unit cost calculators with supporting documentation.
AANDC retained Brodie Consulting Limited (BCL) to provide, where possible, answers to the Board’s questions on RECLAIM. Please see attached. Complementary to these responses, the Department offers the following points:

- The Board is correct in stipulating that many of the closure cost estimates and assumptions for a particular mine site are specific to that project and cannot be stated generically. AANDC maintains that project specific considerations and assumptions have been and will continue to be addressed during project specific security review processes.
- RECLAIM estimates provided to regional Land and Water Boards are intended to assist the Boards in exercising their authority for the setting of security within water licences and land use permits. An operation may also have reclamation security obligations with AANDC through a land lease and/or an Environmental Agreement. Duplication of security amongst instruments is avoided. However, it cannot be assumed that AANDC estimates provided to the Land and Water Boards will satisfy all reclamation security obligations under other instruments. Additional security will be held by the Crown to meet these obligations, if necessary.
- Unit costs utilized within the RECLAIM model represent third party costs, and have been developed utilizing independent contractor rates and, where possible, costs experienced at sites where reclamation has been undertaken by the Crown.
- The RECLAIM model is structured into a series of mining components. Within each component, a number of line items detail the reclamation work and associated costs. The overall total for the component is the sum of the line items. If an aspect of reclamation is not included within the line items, it is not included within the estimate. This may be associated with the avoidance of duplication amongst instruments, or, necessary additions and updates to the estimate may be required.

The Department appreciates the opportunity to respond to the Board’s request. If you have any questions, please feel free to contact Mr. Nathen Richea at 867-669-2657 or Nathen.Richea@aandc-aadnc.gc.ca

Sincerely,

[Signature]

Robert Jenkins
A/Director
Renewable Resources and Environment
Aboriginal Affairs and Northern Development Canada - NWT Region
Mr. Nathen Richea,
AANDC Water Resources Division, NWT

By email: Nathen.Richea@aandc-aadnc.gc.ca

RE: RECLAIM QUESTIONS FROM WEEKEEZII WATER BOARD

Dear Nathen,
The Wekeezhii Water Board submitted to AANDC a number of questions concerning use of the RECLAIM Model for reclamation cost estimating. This letter presents answers to those questions.

General Comment
The RECLAIM model was first developed in 1992. Since that time it has undergone 5 major modifications and numerous updates to the unit cost data base.

The model is intended to be simple and transparent. Although the use of Unit Cost Codes has given the model an aspect which is not seen as simple, the model only does simple multiplication and addition (except for the use of the formula for calculation of Net Present Value, NPV). The Unit Cost Codes serve only to aid an estimator or reviewer in describing/understanding the assumed level of effort or difficulty in completing a reclamation task.

The RECLAIM model does not do reclamation planning, although it can be used as a checklist to ensure that a given closure plan includes all necessary tasks.

Question 1  Project management percentage: What is included in the RECLAIM estimate, and any significant exclusions.
Project management provision is to cover the costs of: general project coordination, accounting & project control, engineering for QA/QC, change orders and as-built report. Project management does not include cost of bonding (bid bond or performance bond) or any insurance provisions.

Project management has been assumed to be 5% of direct project costs. It is unlikely to be less than this. However, it could be higher on complicated reclamation projects.

**Question 2**  
*Engineering percentage: Describe what is included in the RECLAIM estimate, and any significant exclusions. For conceptual and interim closure plans, does the estimate include the cost of final engineering, specifications, and drawings?*

Engineering provision is to cover the costs of prepared “issued for construction (IFC)” drawings and specifications for the reclamation work. The 5% provision is believed to be appropriate to accomplish this, starting from an approved closure plan and a site condition which is substantially as expected at the time of mine closure. Any significant departures from the expected mine development will necessitate a site assessment and preparation of a new closure plan (to be submitted for approval) before IFC’s can be prepared. In such a case, the 5% provision would be inadequate.

**Question 3**  
*Contingency Percentage: Provide guidance on how to estimate costs for contingencies. Also, clarify whether the contingency cost typically include those incurred when site conditions or project configuration are different at closure than those assume in the closure plan.*

The determination of appropriate contingency is a subjective and project specific task that relies heavily on judgment of the estimator. The following table provides some guidance.
<table>
<thead>
<tr>
<th>Estimate Type</th>
<th>Description</th>
<th>Accuracy or appropriate contingency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed or Project Control</td>
<td>Based upon detailed engineering take-offs and written quotes</td>
<td>+/- 5 %</td>
</tr>
<tr>
<td>Definitive or construction drawing phase</td>
<td>Engineering mostly complete, some written quotes</td>
<td>+/- 10 %</td>
</tr>
<tr>
<td>Preliminary or budget level</td>
<td>Little detailed engineering and costs based upon verbal quotes</td>
<td>+/- 15 %</td>
</tr>
<tr>
<td>Feasibility or advanced conceptual</td>
<td>Engineering may be 10% complete and costs based upon typical unit costs</td>
<td>+/- 20 %</td>
</tr>
<tr>
<td>Pre-feasibility, conceptual or trade-off study</td>
<td>Very basic engineering only and costs based upon typical unit costs</td>
<td>+/- 25 %</td>
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</tbody>
</table>

In the experience of Brodie Consulting, virtually all mine closure plans and associated cost estimates are at the “feasibility or advanced conceptual” level until the final year of mine operation, at the earliest. This is due to lack of detailed engineering and uncertain quantities of work. Generally, the effort to complete the reclamation work and performance of the reclamation measures is understood at a general level only, until IFC’s are prepared.

Contingency costs included in RECLAIM do not provide for addressing substantial changes in the mine plan or closure strategy. Contingency costs do not provide for “worst case” scenarios.

**Question 4**  
*Mobilization/Demobilization: Document relevant AANDC policies or principles (e.g. assumptions related fuel mobilization).*

AANDC does not have a policy or stated principle concerning the strategy/assumptions for mobilization. That said, the RECLAIM model is to determine the potential reclamation cost to be set in security provisions, should it become necessary for the government to conduct the reclamation work. In this regard, the government would only do so in the event of a site becoming abandoned by the owner. A site would only become “abandoned” if the owner was insolvent. Therefore, it is generally assumed that the equipment and infrastructure at a site has deteriorated to an advanced state of disrepair (no material value). For this scenario, it is appropriate to assume that a contractor would have to mobilize all equipment and infrastructure to the site in order to carry out the reclamation work.
Mobilization of personnel, equipment and fuel is assumed to necessary for every site. Depending upon the assumed scope of the reclamation work, additional mobilization effort could be required, such as reagents for water treatment, power plant for electricity, or camp facilities for workers. In the case of remote sites, mobilization of workers at the beginning/end of each work rotation is included.

Further to the assumption about the condition of the site upon abandonment, it is unlikely that IFC’s would exist at the time of abandonment. Therefore, a period of time would be needed to confirm the condition of the site, prepare and tender the reclamation work, before mobilizing to do the work. In the mobilization section, an allowance for care and maintenance is typically included in the estimate.

With respect to the mobilization of fuel, the cost of fuel consumed in equipment is included in the unit cost for the reclamation activity. However, there is a significant additional cost to transport fuel to remote sites (above the cost of buying the fuel). This cost is included in the mobilization part of RECLAIM.

**Question 5** Monitoring & maintenance: Describe what is included in the RECLAIM estimate, and any significant exclusions.

Monitoring and maintenance are post-closure activities. These include long-term assessment of critical structures such as dams, and long-term water quality monitoring (typically on a declining schedule of effort and frequency). Maintenance could be included for periodic minor repairs to spillways, dams or covers on mine waste.

Monitoring and maintenance is determined on a site-specific basis and the amount and type of monitoring may change over the course of the project to include additional items. The monitoring provision applies only to AANDC mandate for land and water aspects of a project. Activities such as wildlife or air quality assessments are not included in monitoring.

**Question 6** Other Closure & Reclamation Costs
Unless specifically identified in a given RECLAIM estimate, costs are not included for any of the following: initial site assessment (other than minor effort in the engineering task to verify conditions are as per the approved closure plan), completion of the closure plan, regulatory approvals, compliance with other instruments, consultation with communities and other parties.

RECLAIM estimates do not normally include costs that may be incurred by the Crown that would not normally apply to private companies. Should these costs be included, they would be specifically identified.

**Question 7  Unit Costs:** Provide documentation supporting the unit costs in the mine component spreadsheets, including any generic unit cost calculators.

All of the unit costs in the RECLAIM unit cost table are independent third-party costs. These have been obtained from review of northern reclamation projects, conducted by contractors. All of these costs are undocumented unit costs so as to protect the pricing/bidding of contractors. Unless specifically noted, all unit costs are inclusive of equipment, labor, maintenance, fuel, consumables, field supervisor, and contractor’s profit.

RECLAIM includes an “Estimator” worksheet. This estimator is to check the cost of critical or significant reclamation activities from first principles, versus the costs in the unit cost table. The estimator is based upon the costing methodology as presented in the Caterpillar Performance Handbook (http://www.cashmanequipment.com/blog/tag/caterpillar-performance-handbook-42/). Ideal productivity and adjustment factors are included. It is still necessary to separately obtain hourly cost of operation for select equipment in order to develop unit costs with this method.

**Additional Items**

Further to the response to Question 3 on contingency, is the inclusion of “additional reclamation activities”. For some mine developments, there are outstanding questions about closure plan. These may be due to a mine plan which is optimistic in the potential to avoid/mitigate adverse effects, and/or probable departures from the mine plan, and/or optimistic predictions about the implementation and/or performance of the closure measures. In such cases, two options could be used in RECLAIM: a very large contingency or additional reclamation measures.
Use of a very large contingency is not desirable, because it results in a single line item the estimate which is larger than all other element in the estimate, and it is subjective. The inclusion of additional reclamation measures allows the estimator to quantify the potential significance of the item of concern and diminish the subjective element of the estimate. It should be noted that the inclusion of an additional reclamation activity, does not constitute a “design” for that element of concern (nor is it a “recommended” strategy). Therefore, the contingency that is applied to the whole site estimate also applies to the additional reclamation activity.

I trust that these responses fully address your questions.

Yours truly,
Brodie Consulting Ltd.

M. J. Brodie, P. Eng.