THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Natural Resources

Division of Support Services
Administrative Support

550 West 7th Avenue, Suite 1230
Anchorage, Alaska 99501-3574
Main: 907.269.8663
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October 21, 2014

ATTENTION: Prospective Contractors

SUBJECT: ASP 10-15-015 Request for Support to Develop Mine Reclamation and Closure Cost Estimation Guidelines

PURPOSE

The Office of Project Management & Permitting (OPMP), Department of Natural Resources (DNR), is soliciting proposals for professional services to develop a portion of the Mine Closure and Reclamation Cost Estimation Guidelines (guidelines) using the attached DRAFT Mine Closure and Reclamation Cost Estimation Guidelines (DRAFT Guidelines) as the starting point. The guidelines will provide guidance to mining project proponents for calculating direct and indirect costs associated with the reclamation, closure and post-closure activities for mining projects in Alaska. In this solicitation we are seeking proposals to develop the portion of these DRAFT Guidelines that address Indirect Costs further, so that they are accurate, relevant to Alaska, up-to-date and concise such that they can be more formally considered by the State and distributed to mining project proponents for their use in developing reclamation and closure cost estimates.

BACKGROUND

The State developed a draft Mine Closure and Reclamation Cost Estimation Guidelines document in 2009 and has subsequently made minor revisions. The DRAFT Guidelines are a collaboration between the Departments of Natural Resources (DNR) and Environmental Conservation (DEC). The current DRAFT Guidelines document is 28 pages in length. The DRAFT Guidelines are designed to describe, in general terms, the information that is needed by the State reviewers that, if provided, would normally be sufficient for regulators to review and assure that the cost estimate is sufficient to meet the reclamation and closure requirements and perform the required activities during the mine reclamation, closure and post closure periods. The DRAFT Guidelines also describe specific assumptions that need to be incorporated into the cost estimate regarding scope, timing, availability of equipment and management of the activities. The DRAFT Guidelines provide guidance on Direct and Indirect Costs.

This Scope of Work (SOW) is designed to improve the section of the DRAFT Guidelines that address Indirect Costs, through a process that includes re-evaluating the basis for the current ranges for the Indirect costs and providing linkage to the Standardized Reclamation Cost Estimator (SRCE) model. DNR and DEC recognize the need for such a guidance in order to promote consistent, efficient, technically sound, and defensible

reviews and authorizations as well as provide a level of certainty and consistency to the regulated mining industry.

The State intends to award this work in Q4 2014 and have it completed approximately 4 months after contract award and no later than April 1, 2015.

SCOPE OF WORK

Overview

The DRAFT Guidelines are divided into Direct and Indirect cost categories. The State has recently improved Direct Cost portion of the DRAFT Guidelines and now seeks to improve the Indirect Cost portion through this contract. Specifically, the State would like to improve the guidance for the seven categories of Indirect costs (Task 2). The existing lack of clarity for Indirect costs has made the process of reviewing and approving reclamation cost estimates from project proponents difficult. In addition, the basis for the range of Indirect costs requires validation.

The Scope of Work (SOW) is divided into three separate Tasks, each with its own deliverable. Task 1 is the kickoff meeting with the Contractor-provided deliverable being the meeting notes which will be used as the basis of understanding between the Contractor and the State. Task 2 is the review and recommendations of Indirect cost analysis with the Contractor-provided deliverable being the draft and final reports with recommendations for changes to, and narratives for the Indirect Costs. Task 3 is a Contractor-facilitated Workshop, to be held in Anchorage, with State personnel to discuss the recommendations of the Contractor.

Task 1 - Kickoff Meeting

Description:

The kickoff meeting will be a teleconference and will include a discussion of the tasks described under this scope of work, the expectations and procedures for communication between the State and the successful Contractor, and timelines and milestones for completing the work.

Requirements:

Upon obtaining notice to proceed (NTP), the Contractor will participate in a kickoff meeting via teleconference to ensure a mutual understanding of the SOW and mutual expectations. In preparation for the kickoff meeting, all members of the Contractor's team should have reviewed the SOW, the DRAFT Guidelines and all the references listed in this SOW. The Contractor should be prepared in advance of the kickoff meeting including identifying issues that require further clarification to be discussed during this meeting.

Tentative Kickoff Meeting Agenda (approximately 2 hours)

a) Introductions
b) Review SOW (DNR)
c) Discussion of the SOW Deliverable (DNR/DEC & Contractor)
d) Questions & Answers (DNR/DEC & Contractor)

Deliverables:

1) Teleconference with DNR/DEC, organized by the Contractor
2) Teleconference meeting notes generated by the Contractor, delivered to DNR

Task 2 –Evaluate Indirect Costs

Description:

The DRAFT Guidelines provide ranges (calculated as a percentage of the Direct costs, or as a percentage of estimated labor costs for Liability Insurance) for seven categories of Indirect costs, including: Profit, Overhead, Performance and Payment Bonds, Liability Insurance, Contract Administration, Engineering Redesign and Contingency. The purpose of Task 2 is to evaluate the appropriateness of the ranges in the DRAFT Guidelines, develop recommendations for changes, if warranted, and develop narratives that describe the variables that affect each range. The results of this Task will be documented in a Report on Indirect Costs as described in Subtask D.

Requirements:

The Contractor will complete the following Subtasks under this Task.

Subtask A – Evaluate Indirect Cost Range Basis in DRAFT Guidelines/USFS Training Guide and Compare with Recent Projects to Make Recommendations for Changes to Ranges of Indirect Costs.

The Contractor is to review the DRAFT Guidelines (Include sections 3,4 6 and 7) and assess whether the Indirect cost categories and ranges (Section 6) are valid in terms of being current and whether they are appropriate for Alaska mining projects. The ranges (in Draft Guidelines) are modified from the Training Guide for Reclamation Bond Estimation and Administration for Mineral Plans of Operation authorized and administered under 36 CFR 228A USDA – Forest Service, APRIL 2004. The Contractor will research the basis for the USFS ranges and assess whether they are applicable and appropriate to Alaska and whether they reflect current Indirect costs. Concomitantly the Contractor will research available data on other mining or civil projects that the Contractor can justify as being analogous to Alaska mine reclamation and closure activities and determine the Indirect costs for these projects for the seven categories of Indirect costs included in the DRAFT Guidelines. The Contractor will make recommendations for changes to the ranges of Indirect costs in the DRAFT Guidelines wherever warranted by the review and assessment described above and include the assessment and any recommendations in the Report on Indirect Costs in Subtask C.

Subtask B – Evaluate Indirect (Administrative) Cost Range Basis in BLM Surface Management Handbook (H-3809-1), pages 6-9 through 6-15 and Compare with Recent Projects to Make Recommendations for Changes to Ranges of Indirect Costs.

The Contractor will review the Indirect (administrative) cost ranges in the BLM Surface Management Handbook and consider them in the overall assessment of the Indirect costs in the DRAFT Guidelines. The Contractor will research the basis for the BLM ranges and assess whether they are applicable and

appropriate to Alaska and whether they reflect current Indirect costs. The Contractor will incorporate their findings into the recommendations for changes to the ranges of Indirect costs in the DRAFT Guidelines wherever warranted by the review and assessment described above and include the assessment and any recommendations in the Report on Indirect Costs in Subtask D.

Subtask C – Develop Narratives for Each Indirect Cost Category that Describes the Variables that Affect Indirect Cost Ranges

The DRAFT Guidelines presently offer a range of acceptable values (expressed as a percentage of Direct costs for most categories) for most of the seven categories of Indirect costs. Guideline users have to select (and justify) a single value (within the range) for each category of Indirect costs when they estimate their reclamation and closure costs. In Subtask C the Contractor will develop a narrative for each category of Indirect costs that guide the user by describing the specific project variables that typically have the largest effect on each category of Indirect costs. Contractor will confirm the validity of expressing the categories as a percentage of Direct costs or as a percentage of labor costs. The narratives should be developed knowing that they will be used to provide guidance for the future Guideline users, and serve as a basis for the agency responsible for reviewing and accepting the Indirect costs proposed by project proponents. The narratives for each cost category will be included in the Report on Indirect Costs in Subtask D.

Subtask D – Prepare Final Report on Indirect Costs

The Contractor will document the research methodology, supporting data, findings and recommendations for changes to Indirect ranges or categories from Subtasks A & B, and the narratives from Subtask C into the Report on Indirect Costs.

The report will incorporate the following major headings at a minimum.

Executive Summary

Introduction

Assessment of Basis of DRAFT Guideline/USFS/BLM Indirect Cost Ranges

Indirect Costs Associated with Recent Mining Projects

Recommendations for Changes to Indirect Cost Ranges

Description and Discussion of General Variables that Affect Indirect Costs

Description and Discussion of Alaska-Specific Variables (by regions if appropriate) that Affect Indirect Costs

Recommended Narratives for Each of Seven Categories of Indirect Costs

Summary and Conclusions

Deliverables:

1) The Contractor will submit a draft Report on Indirect Costs to DNR
2) DNR will submit comments on draft Report on Indirect Costs to Contractor
3) The Contractor will consider agency comments, prepare and submit the Final Report on Indirect Costs to DNR

Task 3 – Facilitate Workshop in Alaska

Description:

The purpose of this Task is to have the Contractor facilitate a 0.5-day workshop in Anchorage focused on Indirect costs. The Workshop has the objective of having the Contractor present their findings and recommendations to the State and facilitate a forum for discussing them. The Workshop will consist of a PowerPoint presentation, followed by a discussion of the contractor's recommendations between state agencies and the contractor. Contractor is expected to be a subject expert on Indirect costs in order to effectively facilitate the discussion and respond to comments that may come from State agency personnel. Most State personnel will participate in-person (Anchorage), others via the web.

Requirements:

The Contractor will facilitate a 0.5-day workshop with State agency staff. The Workshop will be held in Anchorage but made available simultaneously via the web for state personnel that may be participating remotely.

The draft Agenda for the Workshop is as follows:

- Introductions (DNR/DEC/Contractor)
- Presentation on Task 2, Subtasks A & B and C, including final contractor recommendations regarding the categories, ranges, and variables affecting the ranges of Indirect costs in the DRAFT Guidance document (Contractor)
- Contractor-facilitated discussion of the recommendations and any alternative approaches to Indirect cost ranges, i.e. those suggested by DEC related to maturity of mine, other (DNR/DEC/Contractor)
- Closing Comments (DNR/DEC/Contractor)

Deliverables:

- Contractor will prepare handouts, develop and present PowerPoint(s) serve as subject expert on Indirect costs and otherwise facilitate Workshop
- Contractor will submit electronic copy of handouts and PowerPoint(s) to DNR 1 week prior to the Workshop
- DNR will be responsible for providing the meeting room and audio visual equipment and Internet connectivity for the Workshop and generating meeting notes

GENERAL PROJECT STIPULATIONS

Project Communication Plan: Communication and coordination is anticipated to be essential during the project. Jack DiMarchi shall be the DNR Project Manager and the point of contact for day to day communications and technical assistance. Marlys Hagen is the DNR Contract Manager. *Any conflicting technical requirements between the referenced documents and/or the statement of work will be resolved in*

negotiation with the DNR Project Manager and Contract Manager. Deviations to this Scope of Work requiring a Scope of Work Amendment will require DNR Project Manager approval prior to finalization.

Project Management shall be provided by:

Jack DiMarchi, CPG
DNR, Office of Project Management and Permitting
3700 Airport Way
Fairbanks, AK 99709
Phone: (907) 451-2806 Fax: (907) 451-2703
Email: Jack.DiMarchi@alaska.gov

Contract Management shall be provided by:

Marlys Hagen
Marlys Hagen, C.P.M., Procurement Officer
Department of Natural Resources
Support Services
550 W 7th Ave, Suite 1230
Anchorage, AK 99501
Phone: 907-269-8666
Fax: 907-269-8909
Email: marlys.hagen@alaska.gov

The following paragraphs describe the stipulations for the project.

A. *DNR will:*

- respond to Contractor questions during review and drafting of comments, and
- review the comments prepared by the Contractor and request clarifications in a timely manner.

B. The contractor will:

- use experienced staff that has accumulated the expertise necessary to complete the objectives of this SOW,
- guarantee by submission of their proposal that the experts indicated in the proposal will be committed to the project for the duration of the project, including the Indirect cost subject expert who will be facilitating the Workshop in Anchorage in person (Task 3).

C. The Kickoff Meeting will be held via teleconference and the Workshop will be held in Anchorage with web-based connectivity available for State agency staff participating remotely.

D. All invoices must be received by the project end date of this SOW. Final invoice(s) must be received by the Project Manager no later than thirty (30) days following contract expiration.

DELIVERABLES

All deliverables for this project will be in Microsoft Office 2013 Word, Excel or PowerPoint electronic format. All deliverables will coordinated with or be submitted to the DNR Project Manager.

PROJECT SCHEDULE

The project schedule is shown in the table below. Dates are subject to change subject to the actual issuance date of the Notice to Proceed. Other deadlines may be adjusted (earlier or later) according to the duration necessary to complete the next step. Adjustments will be coordinated and approved with the DNR Project Manager.

Project Component	**Completion Date**
RFP Issuance	10/21/2014
Technical proposal/cost estimate submitted	11/10/2014
Notice To Proceed (NTP) Issued (estimated)	11/17/2014
Task 1 - Kickoff Meeting (KO)	
Deliverable 1 – Meet with DNR (teleconference)	NTP + 7 days
Deliverable 2 – Meeting notes	KO Meeting + 3 days
Task 2 – Indirect Cost Guideline Development	
Deliverable 1 – DRAFT Report on Indirect Costs	KO Meeting + 6 weeks
Deliverable 2 – DNR comments on DRAFT Report on Indirect Costs	KO Meeting + 9 weeks
Deliverable 3 – FINAL Report on Indirect Costs	KO Meeting + 12 weeks
Task 3 - Workshop on Indirect Costs	
Deliverable 1 – Handouts and PowerPoints(s) for Workshop	KO Meeting + 14 weeks
Deliverable 2 – Facilitate Workshop in Alaska	KO Meeting + 15 weeks

Project Component	Completion Date
Deliverable 3 – Workshop Meeting Notes	KO Meeting + 16 weeks
Project End	April 1, 2015

PROPOSAL FORMAT

Proposals must include the following information:

1. A cover letter containing your complete name and address, your Alaska business license number, and a statement regarding qualifications as an *Alaskan Bidder*, if appropriate.

2. AS 36.30.170 describes an *Alaska Bidder* as one who:

    a. Holds a current Alaska business license,
    b. Submits a proposal for services under the name as appearing on the current Alaska business license,
    c. Has maintained a place of business within the state staffed by the Offeror or an employee of the Offerors for a period of six months immediately preceding the date of the RFP,
    d. Is incorporated or qualified to do business under the laws of the state, is a sole proprietorship and the proprietor is a resident of the state, or is a partnership and all partners are residents of the state, and,
    e. If a joint venture is composed entirely of ventures that qualify under (a) through(d) of this subsection.

3. A statement regarding whether the Offeror qualifies for the Alaska Veterans' Preference. The preference will be given to Offerors who qualify as Alaska Bidders and are:

    a. sole proprietorship owned by an Alaska veteran;
    b. partnership under AS 32.06 or AS 32.11 if a majority of the partners are Alaska veterans;
    c. limited liability company organized under AS 10.50 if a majority of the members are Alaska veterans; or
    d. corporation that is wholly owned by individuals and a majority of the individuals are Alaska veterans.

4. Discussion of your understanding of the work requested and methods you propose to accomplish the tasks defined in this RFP. At a minimum the proposal shall:

    a. Include a statement of understanding describing the Offeror's understanding of each of the 7 tasks described under Scope of Work in this RFP;
    b. Include a work schedule and timeline;
    c. Discuss the level of involvement you anticipate for DNR personnel;
    d. Describe potential problems with performing this project;

5. Provide a brief description of your firm and resumes for key participants showing experience and qualifications in areas similar to those requested in this RFP. Please describe the key participant(s)': experience with: (1) Developing or reviewing Reclamation & Closure Cost Guidelines for other States, public agencies or mining companies, (2) experience working with the SRCE model (3) Managing or implementing closure or remedial activities at mining sites in Alaska or other northern locations, (4) previous experience developing or using the Training Guide for Reclamation Bond Estimation and Administration for Mineral Plans of Operation authorized and administered under 36 CFR 228A USDA – Forest Service , APRIL 2004. Also please provide a statement that the key participants are available and committed to performing the work as outlined in the proposal.

6. Provide a cost proposal with a detailed breakdown of hours and costs for each task as proposed in your offer and the fixed, not to exceed amount, for the contract including travel expenses. Be prepared to discuss any other issues that may impact costs or actions the Offeror would take to assure the project is completed within the available funds for this project. **The State will provide the Workshop room**. The Contractor will provide Workshop materials in electronic format, and one hardcopy for each participant. If cost is based on number of participants please give proposals based on 12 participants and identify cost per additional participant.

EVALUATION CRITERIA

Proposals will be evaluated based on the applicant's qualifications and experience (40%), understanding of the project and proposed methodology (10%), cost (40%) and Alaska Offeror Preference (10%). State staff will evaluate the proposals. Fixed cost rates and schedule may be subject to negotiation

PROPOSAL DUE DATE

Proposals must be received not later than **4:00 p.m. Alaska Standard Time, November 10, 2014.** Proposals may be sent by mail, fax, or email to the address below.

Please direct proposals and questions on submittal process to:

Marlys Hagen, C.P.M., Procurement Officer
Department of Natural Resources
Support Services
550 W 7th Ave, Suite 1230
Anchorage, AK 99501
Phone: 907-269-8666
Fax: 907-269-8909
Email: marlys.hagen@alaska.gov

Sincerely,

Marlys Hagen, C.P.M., CPPB, CPPO

Marlys Hagen, C.P.M., CPPB, CPPO
Procurement Officer

Encl: Attachment A – Standard Agreement Form/Appendices A and B

Attachment A

STANDARD AGREEMENT FORM FOR PROFESSIONAL SERVICES

1. Agency Contract Number	2. ASPS Number	3. Financial Coding	4. Agency Assigned Encumbrance Number
5. Vendor Number	6. Project/Case Number	7. Alaska Business License Number	

This contract is between the State of Alaska,

8. Department of	Division	hereafter the State, and

9. Contractor

hereafter the Contractor

Mailing Address	Street or P.O. Box	City	State	ZIP+4

10.

ARTICLE 1. Appendices: Appendices referred to in this contract and attached to it are considered part of it.

ARTICLE 2. Performance of Service:

2.1 Appendix A (General Provisions), Articles 1 through 14, governs the performance of services under this contract.
2.2 Appendix B sets forth the liability and insurance provisions of this contract.
2.3 Appendix C sets forth the services to be performed by the contractor.

ARTICLE 3. Period of Performance: The period of performance for this contract begins _____, and ends _____.

ARTICLE 4. Considerations:

4.1 In full consideration of the contractor's performance under this contract, the State shall pay the contractor a sum not to exceed $_____ in accordance with the provisions of Appendix D.
4.2 When billing the State, the contractor shall refer to the Authority Number or the Agency Contract Number and send the billing to:

11. Department of	Attention: Division of
Mailing Address	Attention:

12. CONTRACTOR		14. **CERTIFICATION:** I certify that the facts herein and on supporting documents are correct, that this voucher constitutes a legal charge against funds and appropriations cited, that sufficient funds are encumbered to pay this obligation, or that there is a sufficient balance in the appropriation cited to cover this obligation. I am aware that to knowingly make or allow false entries or alterations on a public record, or knowingly destroy, mutilate, suppress, conceal, remove or otherwise impair the verity, legibility or availability of a public record constitutes tampering with public records punishable under AS 11.56.815-.820. Other disciplinary action may be taken up to and including dismissal.
Name of Firm		
Signature of Authorized Representative	Date	
Typed or Printed Name of Authorized Representative		
Title		
13. CONTRACTING AGENCY		Signature of Head of Contracting Agency or Designee / Date
Department/Division	Date	
Signature of Project Director		Typed or Printed Name
Typed or Printed Name of Project Director		Title
Title		

NOTICE: This contract has no effect until signed by the head of contracting agency or designee.

APPENDIX A
GENERAL PROVISIONS

Article 1. Definitions.

1.1 In this contract and appendices, "Project Director" or "Agency Head" or "Procurement Officer" means the person who signs this contract on behalf of the Requesting Agency and includes a successor or authorized representative.

1.2 "State Contracting Agency" means the department for which this contract is to be performed and for which the Commissioner or Authorized Designee acted in a signing this contract.

Article 2. Inspection and Reports.

2.1 The department may inspect, in the manner and at reasonable times it considers appropriate, all the contractor's facilities and activities under this contract.

2.2 The contractor shall make progress and other reports in the manner and at the times the department reasonably requires.

Article 3. Disputes.

3.1 Any dispute concerning a question of fact arising under this contract which is not disposed of by mutual agreement shall be decided in accordance with AS 36.30.620-632.

Article 4. Equal Employment Opportunity.

4.1 The contractor may not discriminate against any employee or applicant for employment because of race, religion, color, national origin, or because of age, disability, sex, marital status, changes in marital status, pregnancy or parenthood when the reasonable demands of the position(s) do not require distinction on the basis of age, disability, sex, marital status, changes in marital status, pregnancy, or parenthood. The contractor shall take affirmative action to insure that the applicants are considered for employment and that employees are treated during employment without unlawful regard to their race, color, religion, national origin, ancestry, disability, age, sex, marital status, changes in marital status, changes in marital status, pregnancy or parenthood. This action must include, but need not be limited to, the following: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training including apprenticeship. The contractor shall post in conspicuous places, available to employees and applicants for employment, notices setting out the provisions of this paragraph.

4.2 The contractor shall state, in all solicitations or advertisements for employees to work on State of Alaska contract jobs, that it is an equal opportunity employer and that all qualified applicants will receive consideration for employment without regard to race, religion, color, national origin, age, disability, sex, marital status, changes in marital status, pregnancy or parenthood.

4.3 The contractor shall send to each labor union or representative of workers with which the contractor has a collective bargaining agreement or other contract or understanding a notice advising the labor union or workers' compensation representative of the contractor's commitments under this article and post copies of the notice in conspicuous places available to all employees and applicants for employment.

4.4 The contractor shall include the provisions of this article in every contract, and shall require the inclusion of these provisions in every contract entered into by any of its subcontractors, so that those provisions will be binding upon each subcontractor. For the purpose of including those provisions in any contract or subcontract, as required by this contract, "contractor" and "subcontractor" may be changed to reflect appropriately the name or designation of the parties of the contract or subcontract.

4.5 The contractor shall cooperate fully with State efforts which seek to deal with the problem of unlawful discrimination, and with all other State efforts to guarantee fair employment practices under this contract, and promptly comply with all requests and directions from the State Commission for Human Rights or any of its officers or agents relating to prevention of discriminatory employment practices.

4.6 Full cooperation in paragraph 4.5 includes, but is not limited to, being a witness in any proceeding involving questions of unlawful discrimination if that is requested by any official or agency of the State of Alaska; permitting employees of the contractor to be witnesses or complainants in any proceeding involving questions of unlawful discrimination, if that is requested by any official or agency of the State of Alaska; participating in meetings; submitting periodic reports on the equal employment aspects of present and future employment; assisting inspection of the contractor's facilities; and promptly complying with all State directives considered essential by any office or agency of the State of Alaska to insure compliance with all federal and State laws, regulations, and policies pertaining to the prevention of discriminatory employment practices.

4.7 Failure to perform under this article constitutes a material breach of the contract.

Article 5. Termination.
The Project Director, by written notice, may terminate this contract, in whole or in part, when it is in the best interest of the State. The State is liable only for payment in accordance with the payment provisions of this contract for services rendered before the effective date of termination.

Article 6. No Assignment or Delegation.
The contractor may not assign or delegate this contract, or any part of it, or any right to any of the money to be paid under it, except with the written consent of the Project Director and the Agency Head.

Article 7. No Additional Work or Material.
No claim for additional services, not specifically provided in this contract, performed or furnished by the contractor, will be allowed, nor may the contractor do any work or furnish any material not covered by the contract unless the work or material is ordered in writing by the Project Director and approved by the Agency Head.

Article 8. Independent Contractor.
The contractor and any agents and employees of the contractor act in an independent capacity and are not officers or employees or agents of the State in the performance of this contract.

Article 9. Payment of Taxes.
As a condition of performance of this contract, the contractor shall pay all federal, State, and local taxes incurred by the contractor and shall require their payment by any Subcontractor or any other persons in the performance of this contract. Satisfactory performance of this paragraph is a condition precedent to payment by the State under this contract.

Article 10. Ownership of Documents.
All designs, drawings, specifications, notes, artwork, and other work developed in the performance of this agreement are produced for hire and remain the sole property of the State of Alaska and may be used by the State for any other purpose without additional compensation to the contractor. The contractor agrees not to assert any rights and not to establish any claim under the design patent or copyright laws. The contractor, for a period of three years after final payment under this contract, agrees to furnish and provide access to all retained materials at the request of the Project Director. Unless otherwise directed by the Project Director, the contractor may retain copies of all the materials.

Article 11. Governing Law.
This contract is governed by the laws of the State of Alaska. All actions concerning this contract shall be brought in the Superior Court of the State of Alaska.

Article 12. Conflicting Provisions.
Unless specifically amended and approved by the Department of Law the General Provisions of this contract supersede any provisions in other appendices.

Article 13. Officials Not to Benefit.
Contractor must comply with all applicable federal or State laws regulating ethical conduct of public officers and employees.

Article14. Covenant Against Contingent Fees.
The contractor warrants that no person or agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee except employees or agencies maintained by the contractor for the purpose of securing business. For the breach or violation of this warranty, the State my terminate this contract without liability or in its discretion deduct from the contract price or consideration the full amount of the commission, percentage, brokerage or contingent fee.

APPENDIX B[1]
INDEMNITY AND INSURANCE

Article 1. Indemnification

The Contractor shall indemnify, hold harmless, and defend the contracting agency from and against any claim of, or liability for error, omission or negligent act of the Contractor under this agreement. The Contractor shall not be required to indemnify the contracting agency for a claim of, or liability for, the independent negligence of the contracting agency. If there is a claim of, or liability for, the joint negligent error or omission of the Contractor and the independent negligence of the Contracting agency, the indemnification and hold harmless obligation shall be apportioned on a comparative fault basis. “Contractor” and “Contracting agency”, as used within this and the following article, include the employees, agents and other contractors who are directly responsible, respectively, to each. The term “independent negligence” is negligence other than in the Contracting agency’s selection, administration, monitoring, or controlling of the Contractor and in approving or accepting the Contractor’s work.

Article 2. Insurance

Without limiting Contractor's indemnification, it is agreed that Contractor shall purchase at its own expense and maintain in force at all times during the performance of services under this agreement the following policies of insurance. Where specific limits are shown, it is understood that they shall be the minimum acceptable limits. If the Contractor's policy contains higher limits, the state shall be entitled to coverage to the extent of such higher limits. Certificates of Insurance must be furnished to the Contracting Officer prior to beginning work and must provide for a 30-day prior notice of cancellation, nonrenewal or material change of conditions. Failure to furnish satisfactory evidence of insurance or lapse of the policy is a material breach of this contract and shall be grounds for termination of the Contractor's services. All insurance policies shall comply with, and be issued by insurers licensed to transact the business of insurance under AS 21.

2.1 Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees engaged in work under this contract, coverage as required by AS 23.30.045, and; where applicable, any other statutory obligations including but not limited to Federal U.S.L. & H. and Jones Act requirements. The policy must waive subrogation against the State.

2.2 Commercial General Liability Insurance: covering all business premises and operations used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000.00 combined single limit per occurrence.

2.3 Commercial Automobile Liability Insurance: covering all vehicles used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000.00 combined single limit per occurrence.

ATTACHMENTS

1. DRAFT Reclamation and Closure Cost Guidelines Aug'14 for Indirect Cost IRFP
2. Table of Indirect Costs at existing Alaska mines and in guidance

REFERENCES

USDA, 2004, Training Guide for Reclamation Bond Estimation and Administration for Mineral Plans of Operation authorized and administered under 36 CFR 228A USDA – Forest Service, APRIL 2004. http://www.fs.fed.us/geology/bond_guide_042004.pdf

The Handbook for Calculation of Reclamation Bond Amounts, U.S. Department of the Interior, Office of Surface Mining, 2000 http://www.osmre.gov/mwg-internal/de5fs23hu73ds/progress?id=aRYXBS/kXH

Surface Management Handbook BLM Handbook H3809-1
http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/ib_attachments/2012.Par.98133.File.dat/3809%20Handbook.pdf

Alaska Statutes that apply to mine closure and reclamation
Title 27, Chapter 19 Reclamation
Title 46, Chapter 3 100 Waste Management and Disposal Discharge Authorization
Title 46, Chapter 3 100 (f) Water pollution control and waste disposal
Title 46.17 - Alaska Dam Safety Act

Alaska Regulations that apply to mine closure and reclamation
11 AAC 97.200 - .450
18 AAC 60.455 and .265
18 AAC 15.090(3)

State of Alaska
Department of Natural Resources &
Department of Environmental Conservation

Mine Closure and Reclamation Cost Estimation Guidelines

August 2014

Disclaimer

These DRAFT Mine Closure and Cost Estimation Guidelines have been developed by technical review staff at the Division of Mining, Land & Water and the Department of Environmental Conservation.

These guidelines have not been adopted as official policy.

We welcome your comments, but will not be able to directly respond to every comment as these guidelines are not currently out for public notice.

Please send comments to:

Jack DiMarchi
State of Alaska
Department of Natural Resources
Office of Project Management and Permitting
jack.dimarchi@alaska.gov

Contents

List of Tables

1 Preface

The purpose of these guidelines is to provide a consistent methodology for mining companies to use when estimating the amount of financial assurance required for the closure of a mine and the regulatory agencies to use when reviewing the closure cost estimates. In these guidelines, the terms "bond," "financial assurance" and "proof of financial responsibility" are considered interchangeable and are not meant to suggest the requirement for a specific financial instrument used to satisfy the regulatory requirements. The mention of trade names of commercial equipment products is for illustrative purposes only and does not constitute endorsement or recommendation by the State of Alaska. This is meant to be a broad list of provisions that might apply at mines; all provisions are not meant to apply to all mines.

2 Acknowledgements

The information in these guidelines is derived in part from:

- *The Handbook for Calculation of Reclamation Bond Amounts*, U.S. Department of the Interior, Office of Surface Mining 2000 (USDI-OSM 2000), web link: http://www.osmre.gov/lrg/docs/directive882.pdf
- *The Training Guide for Reclamation Bond Estimation and Administration*, U.S. Department of Agriculture – Forest Service, April, 2004 (USDA-FS 2004), web link: http://www.fs.fed.us/geology/bond_guide_042004.pdf
- *Surface Management Handbook*, U.S. Department of Interior, Bureau of Land Management, September 2012 (H-3809-1 – Surface Management, Release 3-336), web link: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.9375.File.dat/3809%20Handbook.pdf
- *Nevada Standardized Reclamation Cost Estimator Model (SRCE)*, Nevada Cost Data File Version 1.4.1 Build 17, August 1, 2012, web link: Standardized Reclamation Cost Estimator - NVbond.org
- *SRCE User Manual, Public Domain Version, 1.12*, prepared with support from Barrick and SRK Consulting, September 2009, web link: http://www.nvbond.org/downloads/SRCE_User_Manual_1_3.pdf
- *Planning for Integrated Mine Closure: Tool Kit, International Council on Mining and Metals, 2008* (ICMM 2008), web link: http://www.icmm.com/document/310

3 Introduction

3.1 Background and Purpose

Mine closure and reclamation, on all lands in Alaska is regulated by the State of Alaska. The Department of Natural Resources (ADNR) regulates reclamation and the Alaska Department of Environmental Conservation (ADEC) regulates mine facility closure under the State of Alaska Reclamation Act and the Solid Waste and Water Quality Regulations. Federal land management agencies also regulate the reclamation of mines located on federal land.

An important shared goal of the State agencies is to ensure the adequate closure and reclamation of all areas disturbed by mining operations. Mining operations are required to provide financial assurance sufficient for the site to be reclaimed in a stable condition (AS 27.19.020) and to manage and close the mine site in a manner that will control or minimize the risk of the release of unauthorized levels of pollutants from the facility (AS 46.03.100(f)). The financial assurance serves as a guarantee that facility closure and reclamation will be completed, waters will be protected, and in the event of bond forfeiture, that funds will be available for the regulatory agencies to contract for the necessary mine closure work.

The method presented here uses generally accepted engineering cost-estimating procedures to develop site-specific costs for each mine closure activity. Bond estimates calculated in this manner will automatically account for differences in mine site conditions and post-mining land uses. This method should provide a rational and defensible approach to the estimation of closure costs for the facility that will be acceptable to the State and consistent with state and federal laws.

3.2 Alaska Regulatory Setting

Alaska Statutes (AS) and Alaska Administrative Code (AAC) drive the requirements for financial assurance for mining projects in Alaska. Specifically, AS 27.19 focuses on reclamation, AS 27.21 applies to coal mines, AS 46.03 focuses on waste management, disposal, and discharge and AS 46.17 addresses dam and reservoir safety. Natural resources are addressed under AAC Title 11 addresses while AAC Title 18 covers environmental conservation. The following bullets provide a partial reference to the AS and ACC as they apply to financial assurance; readers seeking more detail are referred to the most current versions of these documents, available through the State of Alaska Legislature's website.

- AS 27.19.020 calls for contemporaneous reclamation as practicable and leaving a site in stable condition
- AS 27.19.030 establishes the requirement for an approved reclamation plan prior to mining
- AS 27.19.040(a) establishes ADNR authority to require financial assurance requirements and states that the assurance amount of $750 per acre does not apply to a lode mine.
- AS 27.21.160 establishes performance bond requirements for conducting coal mining and reclamation operations
- AS27.21.210 discusses environmental performance standards consistency with the Surface Mining Control and Reclamation act of 1977 for coal mines
- AS 37.14.800 establishes a mine reclamation trust fund
- AS 46.03.100(f) Establishes ADEC authority to require financial assurance. Establishes requirement for financial assurance for a mining waste disposal facility, for an operation that chemically processes ores, or has the potential to generate acid.
- 11 AAC 90.083 establishes reclamation plan general requirements for surface coal mines
- 11 AAC 90.201 establishes requirements for bond requirements for surface coal mines
- 11 AAC 93 establishes assurance for state jurisdictional dams
- 11 AAC 97.200 establishes land reclamation performance standards
- 11 AAC Article 4 (97.400) – Reclamation bonding

18 AAC 15.090 enables the State to attach terms and conditions to a permit or approval including operating, monitoring sampling and reporting and posting of a performance (or surety) bond.

18 AAC 60.265 requires proof of financial responsibility for closing a landfill under the solid waste program

3.3 Terminology and Definitions

Terminology used in reclamation and closure can be inconsistent and open to interpretation based on the source and context (e.g. the term reclamation, an activity that is a subset of the mine closure process, is sometimes used interchangeably with the term closure).These guidelines use the following terminology and definitions developed from a variety of sources including AS 46.03.100 (f), AS 27.19:

- Closure– A process that extends over the mine life cycle and that typically culminates in site relinquishment once all legal closure obligations are completed. The level of detail of a closure plan will evolve for a mine site from conceptual design during permitting, to actual design and as-built specifications during operations, to when closure execution is eminent. The term closure alone is sometimes used to indicate the point at which operations cease, infrastructure is removed and management of the site is largely limited to monitoring.
- Closure and Reclamation Plan – for the purposes of this guideline, a closure and reclamation Plan refers to the plan(s) to close and reclaim the mine site. While AS 27.19.030 establishes the requirement for an approved reclamation plan prior to mining, a mine must have a plan covering both closure (overseen by ADEC) and reclamation (overseen by ADNR) to provide the basis of the closure cost estimate and subsequent financial assurance. A closure plan and a reclamation plan may be prepared separately, however, it is frequently preferable for a mine to submit a combined closure and reclamation Plan for agency approval to provide the basis of the cost estimate that includes all aspects of the mine closure period including (but not limited to) the following:
  - Holding Period Care and Maintenance – The State of Alaska refers to a holding period, which is a minimum 2-year interim care and maintenance period following the cessation of mine operations. Costs for the holding period are estimated to allow for the scenario where the state is required to obtain control of property from the mine operator (due to default by the mining company). The length of the holding period would allow time for the State of Alaska to complete legal proceedings and finalize closure plans and cost estimates.
  - Decommissioning – The process that begins near or at the cessation of mineral production and ends with the removal of all unwanted infrastructure and services.
  - Reclamation- The process of returning disturbed land to a stable and productive condition including regrading, recontouring, cover, and revegetation of mine waste stockpiles.
  - Care and maintenance – Activities required to maintain the site facilities necessary during closure execution and/or post-closure including long-term water treatment, maintenance of access (e.g. roads, airstrips) required for long-term care, maintenance or monitoring, ditch or settling basin sediment removal and repair excessive damage from erosion and settlement.
  - Post-closure monitoring – A mine is considered to enter the post-closure monitoring period when all physical reclamation is complete, reclamation

performance standards are achieved, active water treatment is no longer required, and any water released from the facility consistently meets all State Water Quality Standards. If the approved closure and reclamation plan requires passive water treatment (such as constructed wetland), the post-closure monitoring period starts after the use of passive water treatment has been demonstrated to be successful in achieving State Water Quality Standards at the point of discharge from the passive treatment system for two consecutive years. Post-closure monitoring may include such activities as water monitoring, vegetation monitoring, tailings and waste pile stability monitoring, subsidence monitoring, dam safety inspections and monitoring and cover performance monitoring.

- Closure and Reclamation Cost – The amount reasonably necessary to ensure performance of the approved closure and reclamation plan, including all of the aspects described in the definition of "closure" above. A basic premise of the closure and reclamation cost estimate for the purpose of this guideline is that the operator is not available to complete the closure work and the applicable government agency would need to perform the closure work. The closure cost is based upon the details of the work outlined in the approved closure and reclamation plan with updates based on site conditions at closure. The closure cost is an estimate of both the direct and indirect costs to reclaim the mineral operation described as the following:
  - Direct costs – costs estimates of materials, labor and expenses related to the execution of the closure and reclamation plan.
  - Indirect Costs – costs related to fees and charges over and above the direct closure costs. Such costs may be related to the planning, design, contracting, administration or actual performance of reclamation work. Either the overseeing agency or its contractor incurs these costs.
- Financial Assurance – Financial assurance for mine closure is based on the closure cost calculation tied to the approved closure and reclamation plan. The State of Alaska requires financial assurance for mine operations according to AS 46.03.100 (f)): " A person who applies for an authorization to operate a solid waste disposal facility that accepts hazardous waste or a mining waste disposal facility for an operation that chemically processes ores or has the potential to generate acid shall furnish to the department proof of financial responsibility to manage and close the facility in a manner that the department finds will control or minimize the risk of the release of unauthorized levels of pollutants from the facility to waters." The State of Alaska also requires financial assurance for reclamation under AS 27.19.040(b): "The commissioner shall require an individual financial assurance in an amount not to exceed an amount reasonably necessary to ensure the faithful performance of the requirements of the approved reclamation plan. The commissioner shall establish the amount of the financial assurance to reflect the reasonable and probable costs of reclamation. The assurance amount may not exceed $750 for each acre of mined area, except that the $750 an acre limitation does not apply to the assurance amount required for a lode mine." Financial assurance in the State of Alaska is referenced in other statutes and regulations, including those noted above in Section 3.2.

3.4 Closure and Reclamation Cost Assumptions

Fundamental assumptions inherent in calculating the mine closure and reclamation cost include:

- The cost estimate includes cost of decommissioning of facilities, reclamation, care and maintenance, long-term care and maintenance, and long-term post-closure costs.

- Closure and reclamation activities are being performed by a third-party contractor hired by the State of Alaska. Third-party contractor rates are used to estimate equipment, material and labor.
- Costs are based on rental equipment rates and the cost estimate must include mobilization and demobilization of equipment. It is assumed that no owner equipment is available at the time of mine closure.
- Costs are based on the mine site conditions anticipated to represent the point of maximum closure costs for the current 5-year permit term. Costs calculated in this manner support financial assurance ensuring that adequate funds are available regardless of the timing of bond forfeiture. For most large hard rock mines, this period will correspond to the point of maximum surface disturbance, which may occur at the end of the current permit term.
- Costs are based on a reasonable and probable mine closure scenario (not worst case) of the maximum disturbance during the 5-year permit term and any long-term care costs associated with that disturbance.
- Costs are based on generally acceptable industry cost-estimating procedures for determining earthmoving, construction, demolition, monitoring, storm water management and erosion / sediment control, water treatment, and other closure costs for the site-specific mine operation.
- The permit applicant or mine operator, is responsible for providing all information necessary to validate and support the closure cost estimates.
- The regulatory agencies may utilize other sources of information to validate cost estimates provided by the applicant.
- The cost estimate is based on the mine operator adhering to the approved closure and reclamation plan, and Waste Management Permit performance standards.
- Salvage values are not considered as a credit in closure cost estimates.
- To interest-proof a bond, add 5 years of compounded interest based on the average over the last 5 years of Anchorage's CPI.
- All material costs should be regular consumer price, i.e. assume no discounts and must include associated costs for shipment to the site.

3.5 List of Acceptable Sources of Information

References and data sources used in the estimation of the closure cost estimate should be specifically cited in the appropriate section of the closure cost estimate. Acceptable sources for the mine closure cost estimate typically include, but are not limited to, the most current editions of the guidelines listed in Section 2 Acknowledgements and the following:

- The ADNR-approved Plan of Operations, ADNR-approved reclamation plan, ADEC – approved closure plan, and the ADEC – approved Waste Management Permit, and "as-built" surveys. The closure and reclamation plan and the Waste Management Permit contain essential information to determine details on facility demolition and disposal, earthmoving, construction of engineered covers, collection and treatment of process and contact water, monitoring, and other closure requirements. Once the mine is developed, "as-built" surveys provide essential data with respect to material relocation costs.

- Commercial equipment manufacturer handbooks and computer software for the estimation of equipment productivity. Most equipment manufacturers publish handbooks that contain performance and cost data for their equipment lines such as:
  - Caterpillar Performance Handbook, the "Caterpillar Performance Handbook" is one of the most complete handbooks. In addition to containing data on the types of equipment typically used on reclamation projects, it also contains other useful information such as methods for estimating site-specific equipment production rates and cost estimates, web link: http://www.wheelercat.com/resources/cat-performance-handbook-44;
  - Dataquest Cost Reference Guide for Construction Equipment, "InfoMine - Mine and Mill Equipment Costs," or "Equipment Watch Cost Reference Guide" for hourly operating costs for equipment, web link: http://www.equipmentwatch.com/marketing/product/413/cost-reference-guide;
  - The "R.S. Means Building, Mechanical, and Heavy Construction Cost Data" handbooks for estimation of construction and demolition costs. This reference is updated on an annual basis and can be useful for estimating material acquisition and structure demolition costs. Care must be taken when using this type of guidebook to ensure that profit and overhead are not incorporated into the costs, as these will be considered under indirect costs, web link: http://rsmeans.reedconstructiondata.com/
- State of Alaska, Department of Labor and Workforce Development, Wage & Hour Administration – Laborers' & Mechanics' Minimum Rates of Pay for estimation of labor rates. Labor rates for equipment operators should be obtained from the most current issue of "Pamphlet No. 600 Laborers' and Mechanics' Minimum Rates of Pay" published twice per year by State of Alaska, Department of Labor and Workforce Development – Wage and Hour Administration (Pamphlet 600). These labor rates should be compared to 'industry standard wage rates' and the higher rate should be utilized in the reclamation cost estimate. Web link: http://labor.alaska.gov/lss/pamp600.htm
- United States Department of Interior, Bureau of Land Management, Washington D.C., Guidelines for Reviewing Reclamation Cost Estimates. http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2006.Par.8378.File.dat/im2006-135attach1.pdf
- CostMine, a branch of the commercial site InfoMine that provides industry standard estimation models for costs including equipment, labor, mine development, and supplies.Web link: http://costs.infomine.com/
- Project specific vendor and third-party contractor quotes for equipment, fuel, labor, materials, and/or services

Table 3-1 below provides additional information on closure cost estimating information sources.

Table 3-1 Data Needs and Sources

Data Need Note: all costs must be based on third-party contractor performing the work	Data Source

Table 3-1 Data Needs and Sources

Data Need Note: all costs must be based on third-party contractor performing the work	Data Source
Material handling requirements (volumes, cross-sections, material handling plans, swell factor, material properties, handle factor, and other requirements specific to project)	Plan of Operations, Reclamation Plan, Waste Management Permit and then "as-built" surveys
Site-specific physical information (haul distance, grades, etc…)	Plan of Operations, Reclamation Plan, Waste Management Permit and then "as-built" surveys
Disturbed acreage and acreage to be reclaimed	Plan of Operations, Reclamation Plan, Waste Management Permit and then "as-built" surveys
Description of post mining use and list of facilities to be removed or left on site	Plan of Operations, Reclamation Plan and Waste Management Permit
Typical costs for structure demolition or removal	Plan of Operations, Reclamation Plan, R.S. Means Building, Mechanical, and Heavy Construction Cost Data Handbooks, and site specific demolition contractor quotes. [1]
Revegetation requirements	Reclamation Plan
Equipment types and production capabilities for activities such as regrading slopes or hauling topsoil	Manufacturer equipment productivity handbooks
Equipment ownership and operating costs	Manufacturer equipment productivity handbooks and Dataquest Cost Reference Guide for Construction Equipment [2]
Labor rates	Pamphlet 600 "Laborers' and Mechanics' Minimum Rates of Pay" – State of Alaska, Department of Labor and Workforce Development – Wage and Hour Administration or 'industry standard wage rates' [3]
Fuel and materials	Project specific vendor quotes
Logistical support costs	Camp and worker transportation costs for remote sites are not considered typical contractor overhead costs and should be estimated on a site-specific basis [4]
Monitoring costs, closure of any monitoring wells, and post closure water treatment and monitoring	Reclamation Plan and Waste Management Permit [5]

[1] Demolition costs are highly variable depending not only upon the size of the structure but also the type of construction. Simple estimates that are based only upon the size of the building may significantly underestimate the costs for building demolition. Care must be taken to include the "other costs" associated with structure removal, such as: costs for recycling material or equipment; snow removal; electrical power supply; and the draining, removing, cleaning and disposal of all fluids, lubricants, fuel, chemicals, minerals, and hazardous materials from all equipment, vessels, tanks and piping. It is recommended that operators obtain site-specific quotes for the demolition of structures from a contractor that has mine / mill demolition experience in the arctic and sub-arctic.

[2] Hourly operating costs are based on average fuel, lubrication and wear items, and maintenance costs. These costs must be adjusted to account for higher costs in Alaska and particularly at remote sites. Fuel costs should be inclusive of all costs associated with the handling and shipment of the fuel from the point of purchase to the final point of use.

[3] Labor estimates for remote sites should include an appropriate adjustment for anticipated overtime charges based upon the anticipated work schedules.

[4] Logistical Support Costs: where transportation may require the maintenance of off-site access roads, airstrips, or ports, these costs also

Table 3-1 Data Needs and Sources

Data Need Note: all costs must be based on third-party contractor performing the work	Data Source

must be included in the total closure cost estimate for the duration of the time period where they will be required for active site reclamation and post-closure active water treatment. The use of historic 'long-term' contract costs that the mining company has with camp support contractors may not be appropriate for a smaller workforce and / or shorter duration project typical of mine reclamation.

[5] At sites where long-term water treatment is not anticipated, post-closure monitoring is typically required in years 1,2,5,10,15,20, and 30 over a 30-year period. Monitoring, analysis, and well closure costs must be adjusted for inflation over the 30-year period. At sites where long-term water treatment or other remediation is required for more than 30 years, post-closure monitoring would be postponed accordingly.

4 Closure Cost Estimation Methodology

4.1 Standardized Reclamation Cost Estimator

The Standardized Reclamation Cost Estimator (SRCE) software is available as a public resource on the web at http://www.nvbond.org/. SRCE was developed during the implementation of the Nevada Standardized Unit Cost Project, a cooperative effort between the Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation (NDEP), the U.S. Department of Interior, Bureau of Land Management (BLM) and the Nevada Mining Association to facilitate accuracy, completeness and consistency in the calculation of costs for mine site reclamation.

The SRCE model provides a set of established, standardized procedures, guidelines and tools. The State of Alaska encourages the use of the SRCE model with the intention of improving the accuracy and consistency of mine closure cost estimating. The SRCE model was not developed specifically for Alaska projects and Alaska mines will need to supplement SRCE with additional information and spreadsheets to support the reclamation and closure cost estimate.

4.2 Cross-Referenced Spreadsheets

Direct reclamation cost estimate spreadsheets should be developed for reclamation activities at each mine facility. For example, for cost estimation procedures, the mill, water treatment plants, open pit, waste rock stockpiles, tailing impoundment, roads, heap leach pads, etc. should each be considered a separate facility. The spreadsheet should include each closure task associated with the specific facility. All spreadsheets should be linked to additional spreadsheets that include equipment productivity estimates and the material handling requirements for each facility and to the base case assumptions regarding fuel, labor, and material costs. If spreadsheets are properly linked, any changes made in the equipment productivity labor, equipment ownership and operation, fuel, or other supplies and materials will automatically update the estimated costs for each reclamation task for every facility and the overall total closure cost summary. All assumptions used in every spreadsheet should be clearly identified; i.e. using inserted comments or another easily referenced manner.

The SRCE model provides a set of cross-referenced spreadsheets and is therefore encouraged by the State of Alaska, while not strictly required.

4.3 Basis of Estimate Report

The mine operator will provide a narrative Basis of Estimate Report that that demonstrates a clear understanding of what is included in the closure and reclamation cost. The Basis of Estimate Report should provide agencies with a 'bridge' between the reclamation and closure plan and the cost estimate spreadsheets and explains how the cost estimate model was developed. The Basis of Estimate Report explains all the costs including the minimum 2-year site holding period, closure costs during the period of active closure plan execution (including reclamation), and any post-closure costs associated with term water treatment, dam monitoring and maintenance, and site management and monitoring requirements. The Basis of Estimate Report is intended to expedite agency review of the closure cost estimate. Basis of Estimate Report should include (but not be limited to) the following:

- Scope of the estimate
  - Estimate structure (see Section 4.2 Cross Referenced Spreadsheets)
  - Mine area reclamation activities
  - Tailings area reclamation activities
  - Water treatment activities
  - Infrastructure demolition and reclamation Activities
- Quantities
- Unit costs
  - Equipment rates
  - Fuel
  - Labor rates
  - Material costs
- Relocation costs
- Camp costs
- Shipping costs
- Task unit rates
- Mobilization & demobilization costs
- Indirect costs

4.4 Closure Cost Estimate Units of Measure

To assure consistency and assist in the State of Alaska in the timely review of closure plans and closure cost estimates, closure cost estimates should be based on consistent, standard units of measure that are clearly documented. The units of measure of the closure cost estimate must be clearly tied to all relevant documents (e.g. approved mine plan of operations, approved Closure and Reclamation Plan, Waste Management Plan, annual reports, closure cost Basis of Estimate documents).

Factors used for converting mass and volume (e.g., tons, cubic yards) will be provided as needed to audit the closure cost estimate. The following units of measure should be used for all closure cost estimate calculations:

- Imperial standard units (non- metric) (e.g. tons = short tons/2000 lbs., cubic yards, cubic feet per second, gallons) (SRCE allows the use of either metric or imperial units; the State of Alaska requires imperial units)
- United States Dollars (USD)

4.5 Maximum Closure Cost Requirements

In order set the backdrop for the closure cost estimate, the first step in the estimation process is to define the boundary, scope, and conditions at the mine site during which the likely closure costs (including decommissioning, reclamation and post-closure costs) will be at their highest during the 5-year permit period. This is one of the most critical steps in the cost estimation procedure. Typically, the greatest estimated closure costs will happen when mine closure and reclamation occurs simultaneously with one or more of the following conditions:

- The greatest surface area is disturbed that requires recontouring, topsoil replacement and revegetation;
- The largest volume of material must be graded to establish suitable post-mining land use;
- The longest haul distance between material handling areas and the location of final placement;
- The greatest amount of material that must be handled to cover waste disposal sites;
- The need for special long-term / post-closure activities, such as handling of ARD / ML, handling of topsoil, closure of underground openings, long-term water treatment; or
- Working with difficult topographic conditions.

Typically, for large open-pit hard rock mines with a long mine life, the maximum reclamation requirements will occur at the close of the current permit term (5 years). However, a site specific evaluation will need to be done based on the 5-year permit for each mine.

5 Direct Closure Cost Approach

Closure cost estimates are to be based on the current approved closure and reclamation plan, and ADEC Waste Management Permit.

The SRCE model provides a generally accepted standardized approach for estimating direct closure costs. As previously stated, the State of Alaska strongly recommends use of the SRCE resources. The publically available model includes guidelines for developing specific direct costs for common mine facilities and closure activities. The SRCE process has been standardized to the extent possible. However, the model also allows flexibility for site specific needs.

Land reclamation cost estimates should be based upon the type of disturbance and the proposed post-mine land use. Standard practices used in the construction and mining industries should be used when estimating the costs of earth moving related activities, demolition of constructed mine facilities and water management / treatment. Any assumptions used in the cost estimation should be clearly identified. Sources of equipment rates, labor rates, and material costs should be identified.

The following sections discuss typical approaches to estimating closure costs for selected common facilities and closure aspects and are not intended to be all inclusive. Additional information on developing direct costs to close mine facilities in included in the SRCE guidance and other resources listed in Section 2 Acknowledgements.

5.1 Holding Period Care and Maintenance Costs

To assure an appropriate level of conservatism in the closure cost estimate, the costs for a minimum 2-year holding period is included in the closure cost estimate. In the case where a mine defaults at the time of closure there would generally be a delay between the time the State of Alaska assumes responsibility for a site and the time when actual site closure can begin. This delay may be due to litigation, disputes regarding ownership of equipment and facilities, additional data gathering or engineering studies and design, and/or seasonal climatic restrictions. During this holding period, the State of Alaska may need to contract for the continued active water treatment, care and maintenance, and monitoring of the site. Costs associated with this holding period must be included in the closure cost estimate.

5.2 Closure and Reclamation Plan Execution Period Care and Maintenance Costs

Costs to perform continued site management, care and maintenance, active water treatment, and monitoring of the site, during the time that active closure is occurring are included in the closure cost estimate as a direct cost. The active closure execution period begins at the end of the minimum 2-year holding period and continues until the start of the post-closure period (e.g. after active water treatment is no longer necessary, as discussed in Section 5.17 Other Direct Costs).

5.3 Monitoring During Holding Period and Closure Execution

Water, soil and vegetation monitoring are typical closure requirements. Additional monitoring may be required, such as land subsidence monitoring at some underground operations. Costs associated with monitoring required by agencies during the holding period and closure execution period must be included in the closure cost estimate. Monitoring through these phases of the closure process may be similar to the monitoring required while the mine site was in operation, with adjustment for closure execution activities. Consideration will need to be given to workforce presence and site accessibility, which will change as the closure plan is executed. Post-closure monitoring is discussed in Section 5.9, Other Direct Costs.

5.4 Equipment Operating Costs

Equipment hourly operating costs are based on average fuel, lubrication and wear items, and maintenance costs. These costs must be adjusted to account for higher costs in Alaska and particularly at remote sites. Fuel costs should be inclusive of all costs associated with the handling and shipment of the fuel from the point of purchase to the final point of use.

The SRCE cost estimating software contains an equipment cost reference sheet, titled Equipment Costs, where applicable Alaska specific equipment rates may be identified for use within the cost estimates.

5.5 Mobilization / Demobilization

In the event of a default on reclamation obligations the State of Alaska assumes that none of the equipment on-site will be available for closure activities; this is likely due to liens, equipment ownership, and other bankruptcy issues. This cost is an allowance for the cost of

mobilizing equipment to the site for reclamation and demobilizing equipment from the site after the closure activities have been completed.

State considers mobilization / demobilization to be a direct cost of the mine closure. When estimating the mobilization and demobilization costs, consider whether a single mobilization / demobilization will allow for the accomplishment of all closure activities or whether multiple / seasonal mobilization / demobilization may be required.

Mobilization / demobilization costs are influenced by the type and quantity of the equipment used in reclamation, site access, duration of reclamation, and the sequencing of reclamation tasks. Unusual time constraints, a need for special equipment, or a remote location should be considered in this aspect of the cost estimate.

5.6 Logistical Support Costs

Transportation of work crews to the mine site must be included in the cost estimate. Where transportation requires the maintenance of off-site access roads, airstrips, or ports, these costs also must be included in the total cost estimate for the duration of the time period where they will be required (including the holding period, closure execution period, active site reclamation, active water treatment and post-closure period). The use of historic 'long-term' contract costs that the mining company has with camp support contractors during mine operations may not be appropriate for a smaller workforce and/or shorter duration project typical of mine closure and reclamation phase due to economies of scale. For contractors in remote locations, any camp operations supported through a third-party vendor should have a quote submitted based upon the expected number of contract workers for the different tasks and seasons.

5.7 Labor and Wage Estimation

Labor is an integral component of, and contributes a significant portion to most of the direct cost categories. Labor also factors into indirect costs in the form of overhead (i.e. benefits) and liability insurance. The cost estimate should incorporate guidelines provided in current the State of Alaska Pamphlet 600-Laborer's and Mechanics' Minimum Rates of Pay including information on wages, accommodation provisions, per diem, fringe benefits, and special rates.

~~The Base Hourly Wage included in the State of Alaska Pamphlet 600 of pay should be increased for the assumed overtime schedule based on the following formula:~~

$$Overtime\ Factor = \frac{40 + ((7x - 40) \times 1.5)}{7x} - 1$$

~~Where x = Hours per shift~~

~~Overtime Factor Amount = Base Hourly Wage * Overtime Factor~~

~~The sum of the Base Hourly Wage and the Overtime Factor Amount should then be increased by a 21% burden to account for Social Security, Medicaid, Unemployment, Liability, and Workers Compensation Insurance. This burden rate assumes that benefits are provided by the contractor and are not subject to taxation.~~

~~The Total Hourly Rate should then be calculated according to the following formula:~~

- Pamphlet 600 doesn't explicitly address how to calculate Overtime (only wages).Consider providing references to AK standard or SRCE rather than detailed equation
- Reference for the 21% Burden Amount: BLM Surface Management Handbook H-3809-1 (p.6-12)
- Check that burden and benefits are captured but not duplicative benefits under "Overhead" in the Indirect Category
- Consider if this section could be deleted completely, Pamphlet 600 is referred to in the section above under acceptable sources.

~~Total Hourly Rate = Base Hourly Wage + Overtime Factor Amount + Burden + Benefits~~

Attention should be given to labor estimates for remote sites that must include an appropriate adjustment for anticipated overtime charges based upon the anticipated work schedules that tend to be longer than those at sites closer to established towns.

The SRCE cost estimating software contains a labor cost reference sheet, titled Labor Rates, where applicable Alaska specific labor wages may be identified for use within the cost estimates. Individual worksheets for the various direct cost components include a labor component which is linked to the Labor Rate worksheet.

5.8 Direct Closure Aspects for Typical Mine Facilities

Direct closure aspects effecting closure cost estimates for typical, selected facilities are discussed in the following sections.

5.8.1 Waste Rock Dumps

Waste rock dump closure costs may include: storm water-erosion-sediment control best management practices (BMPs), recontouring to final reclaimed grade; construction of an engineered cover if necessary; replacement of topsoil; seedbed preparation seeding, fertilization, mulching, and weed control. Dependent upon the geochemistry of the waste dump material, closure costs also may include the costs for the collection, treatment, and disposal of runoff and seepage from the waste rock facility, and long-term monitoring as discussed under Section 5.9 Other Direct Costs.

The SRCE cost estimating software contains an estimating sub-task, titled Waste Rock Dumps. The sub-task generates the estimated labor, equipment and material cost associated with grading, cover replacement, topsoil replacement, ripping / scarifying, and revegetation costs of applicable waste rock dump facilities.

5.8.2 Tailings Impoundments

Cost for the closure of tailings impoundments are estimated in a manner similar to waste rock dumps, however additional costs may be incurred for: dewatering; water treatment and disposal; filling; and spillway construction. If the tailings facility will be maintained in a manner that impounds water to the extent that the tailings dam represents a “jurisdictional dam” per state law, long-term dam operating, monitoring and maintenance costs should be included in the closure cost estimate as discussed under Section 5.9 Other Direct Costs.

The SRCE cost estimating software contains an estimating sub-task, titled Tailings that generates the estimated labor, equipment and material cost associated with embankment regarding, tailings surface grading, cover replacement, topsoil replacement, ripping / scarifying, and revegetation costs of applicable tailings impoundments.

5.8.3 Material Sites or Borrow Areas

Reclamation costs must be estimated for reclaiming any material sites associated with the mining operation and any material sites developed to produce capping materials used during reclamation of the mine site.

The SRCE cost estimating software contains an estimating sub-task, titled Quarries & Borrow Pits that generates the estimated labor, equipment and material cost associated with grading,

cover replacement, topsoil replacement, ripping / scarifying, safety berm construction and revegetation costs of applicable borrow areas.

5.8.4 Open Pits

The reclamation costs for open pits are controlled by the requirements of the closure plan. Costs may include: post-mining stability analysis; stabilization of pit high walls; pit dewatering; pit water treatment; bench and pit floor reclamation; partial or complete backfilling; and the construction of warning berms or fencing and signage near the pit high walls. If pit backfilling is necessary to protect ground and surface waters, the closure cost assumption is that the pit is abandoned at the maximum build-out during the permit period. If long-term water treatment is required, the cost must be estimated as discussed under Section 5.9 Other Direct Costs.

The SRCE cost estimating software contains an estimating sub-task, titled Pits that generates the estimated labor, equipment and material cost associated with safety berm construction and revegetation costs of applicable pit areas.

5.8.5 Underground Development

Adits and shafts shall be plugged per the terms of the approved closure plan. The costs for the collection and treatment of mine seepage, and disposal of underground waste permitted in the Waste Management Permit is included. If long-term water treatment is required, the cost must be estimated as discussed under Section 5.9 Other Direct Costs.

The SRCE cost estimating software contains an estimating sub-task, titled Underground Openings that generates the estimated labor, equipment and material cost associated with the reclamation of adits, portals, declines, shaft backfill/cover, and shaft capping costs of applicable underground development areas.

5.8.6 Support Facilities

Mine support facilities include: roads; airstrips; fresh-water reservoirs; buildings; power lines; monitoring wells; permanent diversions or drainage channels; and equipment. The disposition of all of these must be included in the closure cost estimate unless specifically approved for post-mining land use. Hauling and/or disposal costs for materials to be removed from the site need to be included in the closure cost estimate.

The SRCE cost estimating software contains estimating sub-tasks, titled Roads, Sediment & Drainage Control, Process Ponds, and Misc. Costs that generates the estimated labor, equipment and material cost associated with support facility reclamation activities.

5.8.7 Reclamation: Recontouring, Regrading, Engineered Covers, and Topsoil Placement

All costs associated with creating a sustainable, stable land form protective of the environment must be included as a direct cost. The State Reclamation Act sets the minimum standards for reclamation of mining operations in Alaska regardless of the land status. The reclamation objectives and the proposed post-mining land use for mining operations located on private lands require approval from the underlying landowner. Nothing in the Reclamation Act prevents private landowners from requiring closure standards that exceed the requirements of the Act.

Recontouring and regrading serves to establish an acceptable post-mining topography in the mined area ensure a stable surface for topsoil replacement and revegetation. Closure cost estimation should consider these steps usually involve the handling of large amounts of material and other earthworks to regrade mine waste dumps from of an "angle-of-repose" to the desired reclaimed grade, establishing erosion control features and re-establish drainage features. Standard equipment performance and cost-estimating guidebooks and contractor estimates should be used to estimate and document material handling costs.

The following aspects of reclamation should be considered in the cost estimate:

- Regrading waste rock dumps from "angle-of-repose" to a more stable slope (typically 2.5 – 3.0H: 1V) must be included in cost estimate. The cost of regrading is affected by the angle of repose, the grade of the final reclaimed slope, the underlying slope of the original topography, and the bench height.
- The swell factor is defined as the percentage increase in volume of material from the "bank" state to the "loose" state. Swell factors must be considered appropriately when estimating equipment productivity and estimating the closure cost.
- Haul Distance Estimates: The haul distance is one of the primary factors affecting the efficiency and cost of material handling and therefore, must be determined for each area where recontouring, construction of engineered covers, or topsoil replacement will occur. The haul distances can be determined initially from the mine Plan of Operations and Reclamation Plan; however, once the mine is constructed, haul routes and distances should be determined from as-built surveys. The approximate centroid of each source and destination should be identified so that the centroid-to-centroid haul distance can be determined. Note that the centroid-to-centroid haul distance can be significantly greater than the straight-line distance between centroids when viewed on a plan map. In some instances, additional haul roads may need to be constructed to increase the efficiency of the reclamation activities.
- Grade Estimates: The grade of the haul road segments must be evaluated to allow for equipment selection and to estimate the equipment's productivity.
- Rolling Resistance Estimates: The surface conditions of the haul road must be evaluated to determine rolling resistance for each haul-route segment in order to estimate the equipment's productivity.
- Equipment Selection: Care should be exercised to not base earthmoving costs on specialized pieces of mine equipment, such as large mine haul trucks, which may not be available for the reclamation of the site due to litigation associated with bankruptcy and bond forfeiture. The initial selection of equipment type is based primarily on the reclamation plan, equipment manufacturer performance handbooks and experience. Final selection for the size and type of equipment will be based upon the information developed in the Materials Handling Plan and possibly site access restrictions. Equipment selection for sites that are air-access only, may be limited air freight size and weight limits.
- Final Grading: The final grading task prepares the disturbed areas for receiving topsoil and involves the final shaping of the ground surface to allow for proper drainage. Typically, the final graded surface should be left slightly rough to assist in the bonding between the recontoured fill and the topsoil. In some cases, ripping may be required to eliminate compaction; however, in other cases where there is the desire to minimize infiltration of precipitation, ripping should be avoided if possible.
- Construction of Engineered Covers: Where the geochemistry of the recontoured material is such that ARD / ML is a concern, there may be the need for construction of

an engineered cover between the recontoured waste material and the topsoil layer. These must be specifically designed for site conditions and climate at the mine site, may require the construction of "pilot-plant scale" covers for evaluation, and may add significantly to the cost of reclamation.

- Topsoil Handling: The cost of topsoil handling procedures must be included in the estimate of overall direct reclamation costs. Equipment selection should consider the haul distance and the volume of material to be moved. Spreading topsoil generally requires more operator proficiency than standard recontouring operations and you should anticipate lower dozer productivity when spreading topsoil. The State requires that dozer rehandle of topsoil material be considered in the closure and reclamation cost estimate.

The appropriate methods for estimating equipment productivity (and costs) should be selected based upon site conditions and the recommendations found in the equipment manufacturer's performance handbooks. Generally, the productivity of a piece of equipment is expressed in cubic yards per hour. Factors that affect equipment productivity include capacity, cycle time, site conditions, material characteristics, and operator proficiency. For each piece of equipment identified in the Materials Handling Plan, the method used to estimate productivity should be identified for each facility. The same piece of equipment may have different productivity for different facilities at the mine site, even when performing similar functions, due to differing material characteristics or topography. Job condition correction factors should be appropriately applied to each piece of equipment for each individual job function at each specific facility. Typical job condition correction factors that should be considered include: operator proficiency, material characteristics, visibility, job efficiency, grade resistance / assistance, and rolling resistance. The SRCE cost estimating sub-tasks incorporate recontouring, regrading, engineered covers, and topsoil placement within each individual activity. The SRCE software summarizes the total estimated costs for these activities on a summary sheet, titled Reclamation Quantities.

5.8.8 Revegetation

Revegetation tasks generally consist of seedbed preparation, seeding, planting, and fertilization. Costs for revegetation should be based on the approved closure and reclamation plan with consideration of details including (but not limited to) depth of topsoil replacement, use of bonded fiber matrix on steep slopes, seed type and application rates, and fertilizer application rate.

The SRCE cost estimating sub-tasks incorporate revegetation activities within each individual activity. The SRCE software summarizes the total estimated costs for revegetation on a summary sheet, titled Reclamation Quantities.

5.8.9 Decommissioning / Structure Demolition and Removal

This reclamation activity includes the demolition and removal or disposal of buildings, crushers, tanks, storage bunkers, conveyor systems, foundations, and other similar structures that are identified for removal in the approved closure plan. The R.S. Means Building, Mechanical, and Heavy Construction Cost Data handbooks are a valuable resource that can be used to estimate building demolition costs.

Miscellaneous structures, such as bridges, conveyors, power lines, and equipment and material "bone-yards" must be removed unless part of an approved post-mining land use. Removal and/or demolition and disposal costs for these miscellaneous structures must be incorporated into the overall estimate of direct reclamation costs. The previously referenced construction cost handbooks may be used to estimate the costs for reclaiming these

miscellaneous structures; however, care must be taken to modify these cost guidelines appropriately for conditions found in Alaska (i.e., short construction season, lower efficiency for winter work, etc.).

In order to estimate the demolition costs, data describing the physical characteristics of all structures present at the project site must be obtained. The types of building material, the size of the structure, and the type of foundation, primarily affect the cost of demolition; site access and whether or not the debris can be disposed of on-site also must be considered. When using the R.S. Means reference handbook, the estimator should not include overhead and profit. These are included in Indirect Costs.

Demolition costs are highly variable. Estimates that are based solely upon the size of the building may significantly underestimate the costs for building demolition. Care must be taken to include costs for removing material or equipment; snow removal; electrical power supply; and the draining, removing, cleaning and disposal of all fluids, lubricants, fuel, chemicals, minerals, and hazardous materials from all equipment, vessels, tanks and piping. It is recommended that operators obtain site-specific quotes for the demolition of structures from a contractor that has construction and demolition experience in cold regions.

The SRCE cost estimating software contains an estimating sub-task, titled Foundations & Buildings, that generates the estimated labor, equipment and material cost associated with decommissioning and/or structure demolition and removal costs of applicable facilities.

5.8.10 Decommissioning / Road and Ditch Removal

Paved road surfaces may have to be separated from the road sub-base and removed. Ripping with a dozer and loading with a front-end loader for trucking and disposal typically accomplish this activity. Non-contaminated loose road surfacing can be mixed with the sub-base or fill without any special disposal measures. In this circumstance, the road surface will be simply ripped to promote revegetation. All culverts will need to be removed and channels created for run-off. In some circumstances where side-cuts exist in steep topography, the "fill" may be required to be placed in the "cut" using an excavator. The estimated costs for removing road-surfacing materials can be found in the referenced cost-estimation handbooks. The Caterpillar Performance Handbook can be used to estimate the ripping capacity of dozers.

The SRCE cost estimating software contains an estimating sub-task, titled Roads, that generates the estimated labor, equipment and material cost associated with support facility reclamation activities.

5.8.11 Water Management

Water management such as process solution management and short-term water treatment may add significantly to short-term closure costs (long-term water treatment is discussed in a separate section below). Water management costs estimates must be developed and include all capital and operating costs for the defined closure period.

The SRCE cost estimating software contains a module for water (solution) management that provides options for calculating costs for selected activities. Options include tables and guidelines for calculating and documenting pumping, forced evaporation and decontamination. Costs associated with highly site specific activities such as water treatment, draindown times, water management labor and water balance management are developed externally and are then added into the overall SRCE module for inclusion in the total closure cost.

All approved reclamation and closure plans include requirements to conduct final engineering during the 2-year holding term and before the actual work begins. The cost of performing the engineering by a third-party contractor must be included in the closure cost estimate.

The SRCE software contains a Closure Planning module for including costs for studies, reports, engineering and permitting for final closure. The closure planning costs are entered as lump sums based on quotes from contractors or other relevant information.

5.8.12 Waste Disposal and Landfill Closure

Direct costs associated with disposal of wastes during closure must be included in the closure cost estimate. Typical wastes encountered during closure include demolition debris, excess explosives, processing chemicals, and welding supplies.

The SRCE software includes a module titled Landfills that provides a method for calculating the cost of reclaiming landfills associated with non-hazardous solid waste disposal, including construction debris. The module titled Yards can be used to calculate the cost of disturbed areas such as hydrocarbon contaminated soil treatment areas, as well as ready lines, laydown yards and parking areas.

The SRCE software also includes a Waste Disposal module for calculating the cost of disposal of solid waste, hazardous waste and hydrocarbon contaminated soils. Solid waste disposal costs can be calculated either for on-site disposal in landfills or disposal at off-site facilities. Any waste that requires special handling, transportation, or disposal is considered hazardous waste for the purposes of the SRCE module. Hazardous waste disposal costs are calculated with the assumption that they are removed from the site and thus include both off-site haulage and disposal costs. Methods for disposal of hydrocarbon contaminated soils could include either on-site or off-site disposal as defined in the approved closure and reclamation plan.

5.9 Other Direct Costs / Long-term Costs

Other direct costs include long-term costs. These costs require special attention due to the sometimes extensive period of time over which they are forecasted and incurred. Long-term costs, which may be perpetual care costs in some cases, are typically expressed in terms of an annual cost and then translated to a NPV using a reasonable real rate of return. Inflation estimates are used to account for inflationary increases in costs and to “inflation proof” the required reclamation bond

The SRCE cost estimating software contains an estimating sub-task, titled Monitoring that generates the estimated labor, equipment and material cost associated with long-term reclamation activities, including water treatment, jurisdictional dam monitoring and maintenance, and reclamation maintenance.

5.9.1 Long-term Water Treatment

For projects where long-term water treatment is part of the approved reclamation and closure plan or the Waste Management Permit, the cost estimate for long-term water capture, treatment, and monitoring should include the following:

- Capital costs for construction and replacement of water diversion, collection, and treatment facilities assuming existing water treatment facility is at end of its useful life at cessation of mine operations. Capital costs for construction and replacement of facilities should include appropriate indirect costs :

- Profit
- Overhead
- Performance and Payment Bond
- Insurance (On-Site Liability)
- Contract Administration
- Engineering Redesign
- Scope Contingency
- Bid Contingency

- Operating costs for water treatment and maintenance on an annualized basis, including
  - Labor
  - Power
  - Reagents
  - Sludge handling and disposal
  - Monitoring and analysis
  - Administrative costs
  - Camp costs
  - Transportation costs (Note: where transportation may require the maintenance of off-site access roads, airstrips, or ports, these costs also must be included in the long-term water treatment cost estimate.)
  - Profit (Assuming that the operation and maintenance of the facilities is conducted by a corporation other than the mining company.)
  - Overhead (Assuming that the operation and maintenance of the facilities is conducted by a corporation other than the mining company.)
  - Construction Management - if this is not included in labor costs
  - Agency Administration
  - Scope Contingency
  - Bid Contingency

SRCE does not have an effective place to identify/quantify long-term water treatment costs

5.9.2 Long-term Dam Monitoring and Maintenance

The cost estimate must include the inspection, operating and maintenance costs for all jurisdictional dams for as long as the dams will remain jurisdictional. The ADNR document entitled Guidelines for Cooperation with the Alaska Dam Safety Program provides information on the closure of both jurisdictional water dams and tailings dams that should be considered in the closure design and cost estimate preparation (see http://dnr.alaska.gov/mlw/water/dams/AK_Dam_Safety_Guidelines062005.pdf).

5.9.3 Reclamation Maintenance

The closure cost estimate must include costs associated with performing maintenance on the closed and reclaimed facilities that may be required after active closure is complete and before the post-closure monitoring period begins. The duration of reclamation maintenance period will be very site specific and could include such things as regrading and revegetation due to settling or erosion.

The SRCE Monitoring module contains a reclamation maintenance section that assists in calculating cost by providing information on total surface area and topsoil volumes and cost of placement (based on previous input from other modules). The user inputs the percent of surface area and topsoil that is estimated to require maintenance and the model calculates the estimated reclamation maintenance cost.

5.9.4 Post-Closure Monitoring

The duration and scope of long-term, post-closure monitoring must be carefully evaluated on a case by case basis. All costs for post- closure monitoring should be included in the closure cost estimate including 3rd party contractor field work, site access costs, laboratory costs, data validation and reporting to agencies.

A mine is considered to enter the post-closure monitoring period when all physical reclamation is complete, revegetation performance standards are achieved, active water treatment is no longer required, and any water released from the facility consistently meets all State Water Quality Standards. The post-closure monitoring period starts after the use of passive water treatment; such as constructed wetlands; has been demonstrated to be successful in achieving State Water Quality Standards at the point of discharge from the passive treatment system for two consecutive years.

Post-closure monitoring is typically required for a 30-year period. Post-closure monitoring requirements will be specified in the approved monitoring plan that is incorporated into both the ADNR - Reclamation Plan Approval and/or the ADEC – Waste Management Permit. Typically post-closure water quality monitoring events occur in years 1, 2, 5, 10, 15, 20, and 30 after closure.

Monitoring wells must be closed, per Alaska Department of Environmental Conservation requirements, upon completion of post-closure monitoring. The costs for this closure must be adjusted for inflation.

The SRCE cost estimating software contains an estimating sub-task, titled Monitoring and Well Abandonment, that generates the estimated labor, equipment and material cost associated with post-closure and well abandonment activities.

6 Indirect Closure Cost Approach (Note no changes were made to the remainder of this document by AECOM)

Indirect costs are added to the direct cost sub-total. These indirect costs are usually expressed as a percentage of the direct cost sub-total. SRCE estimates indirect costs either as a percentage of direct costs, or as a variable rate based on the magnitude of the direct costs. See SRCE guidance document Indirect Costs Table (page 4-6):

1. Profit
2. Overhead
3. Performance and Payment Bond
4. Liability Insurance
5. Contractor Administration
6. Engineering Redesign
7. Contingency

Indirect costs are added to the direct cost sub-total. These indirect costs are usually expressed as a percentage of the direct cost sub-total.

6.1.1 Profit

The State of Alaska will contract with a third party contractor to perform the reclamation work. It is therefore necessary to add an amount for contractor's profit and overhead because these costs are not included in the estimate of direct reclamation costs.

The profit portion of the cost estimate will be calculated based on a percentage of the estimated total direct costs. The State of Alaska assumes that a reasonable profit margin ranges from 10% of the total direct costs for large reclamation projects to 20% for small reclamation projects.

6.1.2 Overhead

Overhead costs include: field support staff and services; labor benefits; costs for temporary facilities or company offices; office equipment and utilities; security; storage; insurance; taxes; contractor performance bonding; permits; and company vehicles. Reclamation projects vary in size, remoteness and complexity. Overhead costs will have a significant variance depending on the assets, operating techniques, and business structure of the individual contractor. However, all reclamation contractors will have overhead costs in addition to the costs for equipment, labor and materials that were included in the estimation of the direct reclamation costs. The State of Alaska assumes that reasonable overhead costs range from 5% of the total direct costs for large reclamation projects to 10% for small reclamation projects.

6.1.3 Performance and Payment Bond

State of Alaska statutes (AS 36.25.010) require both a performance bond and a payment bond for construction of projects administered by the State of Alaska. The cost of each of these bonds is estimated at 1.5% of the total direct costs, for a total of 3% of direct costs.

6.1.4 Liability Insurance

An allowance for contractor liability insurance premium should be included at 1.5% of the total of the estimated labor costs for the project.

6.1.5 Contract Administration

This indirect cost is to pay for the cost of hiring a project management firm to inspect and supervise the work performed by the reclamation contractor and also the costs incurred by the State to forfeit the bond, administer reclamation / construction contracts, verify sampling and analyses, conduct site inspections, and other activities associated with the administration of the closure project.

These contract administration costs are calculated as a percentage of the total direct costs and may range from 2% to 7% of total direct costs. The contract administration amount accepted by the State of Alaska will be based upon the size of the overall bond, the level of complexity of the closure projects, and the anticipated duration of the active reclamation phase of the project closure

6.1.6 Engineering Redesign

The approved reclamation and closure plans may not adequately reflect site conditions at the time of bond forfeiture, and the projected quantities and quality of water to be treated may not be accurate or complete. In addition, the existing Reclamation Plan or proposed water treatment may not be sufficiently detailed to serve as contract plans and specifications. Therefore, an updated or more detailed design will likely need to be developed as part of the reclamation process. In some cases the degree of engineering redesign may decrease as a mine matures and as more recent generations of the reclamation and closure plan are more detailed.

Activities associated with Engineering Redesign may include the following:

Prepare maps and plans to show the extent of the required reclamation.

Survey waste rock dumps and other facilities to determine the amount of material handling requirements.

Characterize waste rock dumps, and other facilities, to determine if special closure requirements are necessary to minimize ARD / ML.

Evaluate proposed engineering covers for waste rock dumps and other facilities.

Perform column, pilot plant or other engineering studies to evaluate designs and performance of proposed wastewater treatment facilities.

Survey and analyze topsoil and overburden stockpiles to determine the amount of material available and whether special handling is required.

Evaluate structures to assess the difficulty of demolition and disposal or removal.

Evaluate impoundments to determine any special reclamation requirements or post-closure care and maintenance needs.

Contract for the completion of a hazardous materials survey.

- Prepare reclamation / demolition / construction contract documents.

Engineering redesign costs are calculated as a percentage of the total direct costs and may range from 3% to 6% of total direct costs. The engineering redesign “percentage multiplier” accepted by the State of Alaska will be based upon the level of detail in the current Reclamation Plan and detailed closure cost estimate, the number and nature of unknowns or assumptions incorporated into the plans, the complexity of the closure project, and the size of the overall bond.

6.1.7 Contingency

The financial assurance for the closure of the project must include a contingency allowance to account for uncertainties in the cost estimation process.

Contingency costs are separated into “scope” and “bid” contingencies. Scope contingency addresses the uncertainty inherent in producing a closure design. Bid contingency addresses

the cost uncertainty inherent in actual construction or implementation of the reclamation plan or closure plan.

Scope contingency will likely vary over the life of a project. Some of the variables that affect the scope contingency include the amount and quality of engineering and environmental data that is used to support the reclamation plan and/or issuance of an ADEC Waste Management Permit for a new mining project including data associated with ground and surface water characterization, waste rock characterization, pit lake water geochemistry, geotechnical factors associated with permafrost, slope stability etc. Scope contingency can range from 6 to 20% of direct costs, depending on these variables. In general terms there is acceptance of the concept that scope contingency could be reduce over the life of mine under the assumption that the reclamation and closure plan cost estimate is supported by more and more detailed information as the mine matures. But this must be demonstrated as iterations of the cost estimate are reviewed over the life of mine

Even during active reclamation, there will always be some uncertainty associated with the project, so some scope contingency will be retained.

Bid contingency accounts for construction costs that are unforeseeable at the time of the bond estimate but that become known as actual reclamation and closure work is conducted. Bid contingency is sometimes referred to as "construction" contingency for this reason. These costs result from changes in site conditions or work required which necessitate additional costs and contract modifications, change orders and/or claims. Bid contingency for closure cost estimation will range from 10% to 20% of direct costs depending upon the complexity, scope and overall size of the reclamation project and the amount of data available for the site.

7 Total Closure Financial Assurance

The estimate for the total project closure financial assurance represents the sum of all direct, indirect and other costs.

An example cost estimate Summary Table is shown below to illustrate the relationships between direct and various indirect costs.

SUMMARY OF ESTIMATED RECLAMATION AND CLOSURE COSTS - EXAMPLE

	% of Subtotal	1-Year Holding Cost	Initial Reclamation & Demolition	Active Water Treatment	Reclamation & Demolition After Termination of Active Water Treatment	Post-Closure Monitoring & Maintenance	Total
Direct Cost		$2,000,000	$10,000,000	$6,000,000	$3,500,000	$150,000	$21,650,000
Site Management Cost		$1,000,000	$2,275,000	$16,000,000	$2,000,000	$0	$21,275,000
Mobilization/Demobilization		$0	$500,000	$0	$250,000	$0	$750,000
Subtotal Direct Cost		$3,000,000	$12,775,000	$22,000,000	$5,750,000	$150,000	$43,675,000
Indirect Costs							
Contractor Overhead and Profit	15.0%	$450,000	$1,916,250	$3,300,000	$862,500	$22,500	$6,551,250
Subtotal		$3,450,000	$14,691,250	$25,300,000	$6,612,500	$172,500	$50,226,250
Performance Bond	3.0%	$103,500	$440,738	$759,000	$198,375	$5,175	$1,506,788
Insurance	1.5%	$51,750	$220,369	$379,500	$99,188	$2,588	$753,394
Subtotal		$3,605,250	$15,352,356	$26,438,500	$6,910,063	$180,263	$52,486,431
Contract Administration	4.0%	$144,210	$614,094	$1,057,540	$276,403	$7,211	$2,099,457
Engineering Re-Design	3.0%	$0	$460,571	$793,155	$0	$0	$1,253,726
Contingency	15.0%	$540,788	$2,302,853	$3,965,775	$1,036,509	$27,039	$7,872,965
Total Indirects		$1,290,248	$5,954,875	$10,254,970	$2,472,974	$64,512	$20,037,579
Total (prior to inflation)		$4,290,248	$18,729,875	$32,254,970	$8,222,974	$214,512	$63,712,579
					Inflation (Anchorage CPI averaged for previous 3-years)	3.33%	$2,121,629
						Total Closure Costs	$65,834,208

Comment [DJJ(2]: Let's leave this table and consider adding one for red dog as an example of calculating long term financial assurance when there is perpetual water treatment

Subject to revision pending Task 3 results

Comment [jjd3]: May want to replace this table. It shows one year of inflation proofing – should it be 5? In any case it should not conflict with narrative.

AECOM RESPONSE: If narrative above is removed from above, the "inflation factor" goes away.

Comment [DJJ(4]: Let leave some flexibility in the inflation proofing language.

Basis for Ratio of Indirect to Direct Costs

Indirect Cost Category	SMCRA	Fort Knox (2013)	Greens Creek (2014)	Kensington (2013)	Nixon Fork (2012)	Pogo (2012)	Red Dog (2009)	Rock Creek (2012)	State Draft Guidance (incl BLM/USFS	DEC Suggestions (for Workshop discussion)		
										New Facilities (operating <10 yrs)	Intermediate Facilities (operating <15 yrs)	Mature Facilities (operating 15 or more yrs)
Contractor Profit	15 - 30	15	15	10	10	7.5	10% x labor/equip costs	15	10 - 20	12.5	12.5	12.5
Contractor Overhead				5	4	7.5	10% x labor		5 - 10	6.25	6.25	6.25
Performance Bond		3	1.5	0	1.5	3	1.5	1.5	1.5	1.5	1.5	1.5
Payment Bond		0	1.5	0	1.5	0	1.5	1.5	1.5	1.5	1.5	1.5
Liability Insurance		1.5% x labor	1.5% x labor	0	1.5	1.5% x direct	1.6% x labor/equip costs	1.6% x equip. cost	1.5% x labor cost	0.5	0.5	0.5
Contract Administration	2 - 7	8	7	7	9.4 (BLM) 1.5 (state)	4	1	1	2 - 7	5	5	5
Engineering Redesign	2.5 - 6	4	2.75	5	6	3	3	3	3 - 6	5.75	3.75	2.75
Scope Contingency	3 - 5	10	6.5	12	6	7.5	10	12 (10% x direct + indirect) 0	10 – 20 6 – 10 4 - 7	8.5	7	5
Bid Contingency			6.5	5	6	7.5	10		10 - 20	8.5	7	5
Other	10% (Mob/ Demob)			$695K long term dam inspection & maintenance		5% (Mob/ Demob)	12% x materials (freight transport)					
Other (road maintenance)							$300,000/ yr					
Inflation			2.31% over 5 years	3.5 over 5 more yrs ($4.43 M)	2.67	2.66						
Direct Costs ($M)		68.559	68.431	16.0	4.003	29.008		9.952				
Indirect Cost ($M)		27.609	28.227	7.6	1.873	14.271		3.454				
Direct + Indirect ($M)		96.168	96.659	23.6	5.876	43.280		13.405				
Indirect/Direct	0.325 – 0.58	0.40 (3rd permit)	0.41 (2nd permit)	0.475 (1st or 2nd permit)	0.47 (2nd permit)	0.49 (2nd permit)	(1st permit)	0.35 (2nd permit)		0.5	0.45	0.4

DIRECT COSTS	
Waste Rock Dumps	$6,526,000
Heap Leach	$2,509,000
Building Demo	$861,000
Roads & Laydown Yards	$633,000
North Wetlands Complex and Spillway	$2,773,000
Growth Media Stockpiles	$51,000
Pit Safety Berm	$123,000
Water Management	$42,418,000
TSF Earthwork	$4,137,000
Closure Studies and Reports	$1,177,000
Pipeline & Powerline Removal	$1,424,000
Fence Removal	$12,000
Well Closure	$526,000
Post Closure Monitoring	$616,000
Road Maintenance	$539,000
Pit Water Treatment	$2,060,000
Tailings Storage Facility Maintenance	$1,053,000
Water Supply Reservoir Maintenance	$519,000
Pit Rim Warning Signs and Maintenance	$241,000
Dam Security Gate Installation	$11,000
Mobilization & Demobilization	$350,000

DIRECT COSTS SUBTOTAL $68,559,000

INDIRECT COSTS (% x direct costs subtotal)		
Engineering & Redesign	4%	$2,742,000
Contractor Profit & Overhead	15%	$10,284,000
Performance Bond	3%	$2,057,000
Contract Administration	8%	$5,485,000
Contingencies	10%	$6,856,000
Insurance Premiums (labor = $12,193,000)	labor x 1.5%	$185,000

INDIRECT COSTS SUBTOTAL $27,609,000

TOTAL FINANCIAL RESPONSIBILITY **$96,168,000**

CLOSURE & MAINTENANCE ITEM		FINANCIAL RESPONSIBILITY		
Direct Costs				
Equipment Capital Costs		$947,234		
Equipment Operation & Maintenance Costs		$310,491		
Revegetation		$109,949		
Manpower		$1,137,390		
Manpower Support		$324,974		
Materials, Supplies, Other		$379,458		
Post-Closure Monitoring		$242,507		
One Year Holding Period			$551,379	
Direct Costs Subtotal*		$3,452,000	$551,000	**$4,003,000**
Indirect Costs	Percent	No Holding Period	One Year Holding Period	
Contractor Profit	10%	$345,000	$55,000	
Contractor Overhead	4%	$138,000	$22,000	
indirect + direct subtotals[1]		$3,935,000	$628,000	
Performance and Payment Bond	3%	$118,000	$19,000	
Liability Insurance	1.5%	$17,000	$3,000	
indirect + direct subtotals		$4,070,000	$650,000	
BLM Contract Administration	9.4%	$324,000	$52,000	
Engineering Redesign Plan	6%	$207,000	$33,000	
Contingency	12%	$414,000	$66,000	
State Agency Oversight	1.5%	$52,000	$8,000	
indirect + direct subtotals		$5,067,000	$809,000	
Indirect Costs Subtotal		$1,615,000	$258,000	**$1,873,000**
Direct + Indirect Total				$5,876,000
Inflation (one year at 2.67%)				$157,000
			TOTAL	**$6,033,000[2]**

[1] All subtotals and totals rounded to the nearest $1,000

[2] The financial responsibility will be reevaluated and adjusted as allowed in section 1.10.2.

POGO MINE

CLOSURE MAINTENANCE ITEM	FINANCIAL RESPONSIBILITY
Direct Costs	
1 Year Holding Cost	$1,952,300
Phase II: Reclamation Concurrent with Mining	$797,400
Phase III: Reclamation and Closure of Mine Site	$10,622,300
Phase IV: Continued Water Treatment	$10,639,328
Phase IV: Continued Reclamation	$4,892,300
Phase V: Post Closure Monitoring	$104,800
Direct Cost Subtotal	**$29,008,428**
Indirect Costs	
Mobilization/Demobilization (5%)	$820,840
Contractor Profit and Overhead (15%)	$4,474,390
Performance Bond (3%)	$1,029,110
Insurance (1.5%)	$514,555
Contract Administration (4%)	$1,433,893
Engineering Redesign (3%)	$621,460
Contingency (15%)	$5,377,098
Indirect Cost Subtotal	**$14,271,346**
Direct + Indirect Total	$43,279,773
Inflation (2.66%)	$1,150,099
TOTAL	**$44,430,000**[1]

[1] The financial responsibility will be reevaluated and adjusted as allowed in section 1.11.2 or as requested by the permittee.

Premature Closure Scenario

Years	Suspension	Closure Earthwork and other Reclamation	Closure Water Treatment	Post-Closure	Cash Flows	Net Present Value
(after suspension of mining)	*(site maintenance & ongoing water treatment)*			*(perpetual annual water treatment)*		*(at a 4.3% estimated real rate of return)*
1	$13,290,000				$13,290,000	$305,150,000
2	$13,290,000				$13,290,000	
3	$13,290,000				$13,290,000	
4	$13,290,000				$13,290,000	
5	$13,290,000				$13,290,000	
6		$25,900,000	$7,850,000		$33,750,000	
7		$25,900,000	$7,850,000		$33,750,000	
8				$10,540,000	$255,656,279	
9 and thereafter				$10,540,000	$10,540,000	

Cash flow for year 8 equals the present value of an account that earns $10,540,000 annually in perpetuity plus first year post-closure expenses of $10,540,000.

Phase 2 Rock Creek Reclamation and Bond Estimate Summary

Cost Element	Total	
Direct Costs		
Area 1: Plant Site	$	936,124
Area 2: Main & Walsh Pits	$	2,447,036
Area 3: Tailings Storage Facility & DC #3	$	1,540,006
Area 4: Injection Well Fields & DC #2	$	455,273
Area 5: Explosive Storage Area & West Pit	$	487,089
Area 6: Diversion Channel #1	$	362,760
Area 7 Roads & Rock Creek Causeway	$	621,159
Standby Adjustment	$	89,055
Long Term Monitoring	$	92,000
Water Treatment	$	144,567
Mobilization	$	449,968
Demobilization	$	299,979
Freight costs (12% of material cost)	$	79,400
Haul Road Maintenance	$	206,907
Man Camp @ 152.40/man-day	$	624,992
Field Support Labor	$	1,040,961
Administrative Cost	$	74,230
Direct Subtotal	**$**	**9,951,506**
Indirect Costs		
Insurance (1.6% of equipment cost)	$	43,582
Contractor overhead and profit (15%)	$	1,405,514
Engineering Re-Design (3%)	$	323,268
Performance & Payment Bond (3%)	$	342,018
State Management and Oversight (1%)	$	120,659
Indirect Subtotal	**$**	**2,235,041**
Contingency (Direct + Indirect)*10%	**$**	**1,218,655**
Phase 2 Project Estimate	**$**	**13,405,202**

KENSINGTON MINE

	Percentage	Amount	Subtotal	Total
Direct & Post-Closure Cost Subtotal			$16,001,492	
Indirect Cost Category				
Contractor Profit	10.00%	$1,600,149		
Contractor Overhead	5.00%	$800,075		
Performance Bond	1.50%	$240,022		
Payment Bond	1.50%	$240,022		
Liability Insurance	1.50%	$240,022		
Contract Administration	7.00%	$1,120,104		
Engineering Redesign	5.00%	$800,075		
Scope Contingency	12.00%	$1,920,179		
Bid Contingency	4.00%	$640,060		
Indirect Cost Subtotal			$7,600,709	
Other (inflation compounded over 5 more years)	3.50%		$4,429,810	
Other (long term dam inspections and maintenance)			$695,000	
Total				$28,727,011

Direct Costs ($Million)		$16.00
Indirect Cost ($Million)		$7.60
Indirect/Direct		0.475