



Guidance for Calculating Capital Indirect Costs for Mine Reclamation and Closure Cost Estimates

The New Mexico Mining and Minerals Division (“MMD”) is providing this guidance to assist operators and regulators in calculating indirect costs as a component of financial assurance cost estimates for construction of reclamation as described in a closeout plan (§19.10.5.506 NMAC) and for post-closure operation and maintenance (“O&M”). The intent of this guidance is to provide a consistent methodology for State of New Mexico personnel, to provide the public with a more transparent approach, and provide operators with a more prescriptive approach to calculating indirect costs that are justified by the available literature and research. While this is a guidance document, it is MMD’s intent that any proposed deviations from this guidance will need to be thoroughly documented and justified.

The New Mexico Mining Act (“Act”) and New Mexico Administrative Code (“NMAC”) requires financial assurance to be provided to the State of New Mexico to ensure proper reclamation through permitting for operations subject to the Mining Act (§19.10.12.6 NMAC). It is required that an applicant’s financial assurance proposal be based upon estimates for a third-party contractor to complete reclamation work and shall be in an amount adequate to complete the proposed closeout plan (§19.10.12.1201 NMAC). There are two basic components to calculating reclamation and closure costs: direct costs and indirect costs. The methodology for calculating direct costs is fairly straightforward and uses references such as the *Caterpillar Performance Handbook* and *Heavy Construction Cost Data* by R.S. Means and/or *Equipment Watch*. In contrast, indirect costs tend to be far more subjective with a higher degree of variability and final selection of indirect cost percentages has often been the most difficult element of an agencies’ audit process (DOWL, 2015).

Construction Indirect Costs

MMD has identified several indirect cost categories as the essential categories when determining reclamation and closure cost estimates. Section §19.10.12.1205.A NMAC states that the estimated total reclamation cost should include, at a minimum, the following individual costs: contract administration; mobilization; demobilization; engineering redesign; profit and overhead; procurement costs; reclamation or closeout plan management; and contingencies. Table 1 provides a breakdown of the cost categories and establishes MMD’s recommended indirect cost percentage when creating a reclamation cost estimate.

Section §19.10.12.1205.A NMAC also states that cost estimates should reflect the probable difficulty of conducting reclamation or closure and should depend on the requirements of the approved permit, which is reflected in Table 1 as the “Complexity Modifier.”

Table 1: Construction Indirect Costs

Indirect Cost Categories	Indirect Percent – Construction
Contractor Profit and Overhead:	
\$0-1MM	20%
\$1MM-50MM	15%
>\$50MM	10%
Reclamation or Closeout Plan Management:	
\$0-1MM	4%
\$1MM-50MM	3%
>\$50MM	2%
Engineering Redesign:	
\$0-1MM	4%
\$1MM-50MM	3%
>\$50MM	2%
Contingencies:	
\$0-1MM	20%
\$1MM-50MM	15%
>\$50MM	10%
Complexity Modifier:	
<i>Above Average Complexity:</i>	<i>+2% to Contingency</i>
<i>High Complexity:</i>	<i>+3% to Contingency</i>
Procurement Costs:	
\$0-1MM	4%
\$1MM-50MM	3%
>\$50MM	2%
Mobilization and Demobilization:	
\$0-1MM	6%
\$1MM-50MM	5%
>\$50MM	4%
Contract Administration:	
3%	
Performance & Payment Bonds:	
3%	
Liability Insurance:	
1.5% of labor costs	

Notes:

- MM = millions; reflects the direct cost of reclamation construction

Potential contributing factors and features that might increase the complexity of a reclamation project include, but are not limited to:

- Topography
 - Presence of steep slopes of native ground or constructed rock piles
 - Necessity to pull-back rock piles from the top
 - Subsidence zones

- Geology
 - Necessity for blasting during reclamation or closure
 - Instability of rock piles or native ground
 - Presence or likely presence of acid mine drainage and/or metal leaching
- Surface and groundwater hydrology
 - Surface water diversions and engineered structures
 - Long-term groundwater water pumping and water treatment
 - Lined impoundments
- Revegetation potential
 - Use of non-soil cover materials
 - Poor texture, rocky cover materials
 - Poor nutrient content and nutrient cycling potential of cover materials
 - Potential for drought conditions
 - The need to use special amendments to develop non-soil cover materials
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- Waste Rock and Tailings Material
 - Use of special covers and liners
 - Construction of repositories

The available data from federal and state agencies for construction of reclamation has an average indirect cost of 35.7%. Therefore, MMD establishes 36% (plus 1.5% of the labor costs) as the minimum construction indirect cost for reclamation projects having an average complexity. The indirect costs for reclamation projects determined to have an above average or high complexity should be adjusted accordingly. Available construction indirect cost data from various state and federal agencies is presented and summarized in the Overview and Comparison of Indirect Costs section of this guidance document.

O&M Indirect Costs

For O&M indirect costs, the cost categories of mobilization and demobilization, contingencies, contractor profit and overhead and project management apply. Table 2 summarizes MMD's guidance for calculating the indirect cost percentage for post-closure O&M. An indirect cost of 24% (plus 1.5% of labor costs) should be used for post-closure O&M for projects where the direct cost is calculated to be greater than \$2MM. For projects less than \$2MM in direct costs, an indirect cost of 30% (plus 1.5% of labor costs) should be used.

Table 2: O&M Indirect Costs

Indirect Cost Categories		Indirect Percent – O&M
Contractor Profit and Overhead:		
	\$0-2MM	10%
	>\$2MM	8%
Project Management:		
	\$0-2MM	3%
	>\$2MM	2%
Contingencies:		
	\$0-2MM	10%
	>\$2MM	8%
Mobilization and Demobilization:		
	\$0-2MM	3%
	>\$2MM	2%
Contract Administration:		1%
Performance & Payment Bonds:		3%
Liability Insurance:		1.5% of labor costs

Notes:

- MM = millions; reflects the direct costs of reclamation construction

Overview and Comparison of Indirect Costs

This section of MMD's guidance document briefly summarizes existing reclamation and closure guidance documents from various State and Federal agencies and presents the justification for the indirect costs that MMD proposes for the development of future financial assurance cost estimates.

Indirect costs are generally defined as costs that are not directly accountable to a cost object. There is a limited amount of data available regarding indirect costs for large-scale mine reclamation projects, although a recent study by DOWL (2015) for the State of Alaska provides a relative wealth of information. MMD has identified categories of indirect costs in various guidance documents which include, but are not limited to: mobilization and demobilization of equipment; contractor profit and overhead; performance and payment bonds; liability insurance; contract administration; reclamation or closeout plan management; main office expenses; engineering redesign; contingencies (sometimes divided-up as scope contingencies and bid contingencies); and agency administration.

Accurate calculation of indirect costs for a mine reclamation project are often complicated by conflicting independent variables. DOWL (2015) provides an excellent summary of project effects on indirect cost variables. As an example, indirect costs tend to increase with smaller projects and decrease with larger projects due to economy of scale. However, in contrast, larger reclamation projects increase the risk of encountering unknowns due to complexities resulting from more specialized or challenging tasks (DOWL, 2015).

Table 3 compares available indirect costs used by various Federal and State agencies. The table is based on data from DOWL (2015) and includes the USACE/EPA Guide (2000) and information available from the states of New Mexico, Montana, Utah and Colorado. It should be noted that several of these references are quite old and are considered by MMD to be outdated. However, due to the scarcity of public information available regarding indirect costs for mine reclamation projects, these guidelines or handbooks were reviewed and summarized for this guidance document. There are commonalities in the approaches to indirect costs apparent in Table 3, including several cost categories and ranges of values. For instance, older guidelines or handbooks tend to include mobilization and demobilization while more recent guidance documents include contractor profit and overhead, performance and payment bonds, liability insurance, contract administration, engineering redesign, and contingencies. Table 4 compares the minimum and maximum values of indirect costs for each guidance document as well as statistical analysis of the indirect costs.

TABLE 3: Comparison of Indirect Cost Categories		Federal Guidelines										State Guidelines						3rd Party Contractor Recommendations for Alaska DNR
		USACE/EPA (2000)	OSM Handbook (Apr 2000)	USFS Guide (2004)	BLM Handbook H-3809-1 (Sep 2012)	US DOE (June 2014)	BLM Alaska Guide (Sep 2014)	New Mexico Guidelines (1996)	Montana DEQ (1997)	Utah (Bonding Worksheets)	Nevada (SRCE)	Colorado DNR (Rule 6.3.4.2.C)	Alaska DNR Guidelines (2014 draft)	DOWL (2015)				
Reclamation & Closure Work: Indirect Costs	Contractor Profit	8 - 10%			10%	--	10%	Required, but percentage not specified	--	10%	10%	10 - 20%	6 - 10%					
	Contractor Overhead	5 - 25%			--	--				--	--	5 - 10%	4 - 8%					
Performance/Payment Bonds		--	15 - 30%	15 - 35%	3%	1%	--	Percentage not specified;	3%	--	--	3%	2.5 - 3.5%					
	Liability Insurance	--			1.5% of labor	--	--	included in mob/demob	1.5% of labor	1.5% of labor	--	1.5% of labor	1.5% of labor					
Contract Administration (aka "Reclamation Management" (MMD); "Main Office Expense" (Utah); "Project Management" (USACE/EPA/US DOE))		5 - 10%	2 - 7%	2 - 7%	6 - 10%	15%	6 - 10%	Required, but percentage not specified	6 - 10%	--	--	2 - 7%	5 - 9%					
	Engineering Redesign ("Remedial Design" (USACE/EPA); "Studies, Design, Permits, Procurement" (US DOE))	6 - 20%	2.5 - 6%	2 - 10%	4 - 8%	10 - 25%	4 - 8%	Required, but percentage not specified	4 - 8%	4 - 8%	--	3 - 6%	3 - 7%					
Contingency	To Scope	10 - 25%	3 - 5%	4 - 30%	4 - 10%	20%	15%	2 - 10%	--	4 - 10%	--	6 - 20%	6 - 11%					
	To Bid	10 - 20%		10 - 20%								10 - 20%	4 - 9%					
Indirect Costs (BLM)		--	--	--	21% of Contract Admin	--	21% of Contract Admin	--	21% of Contract Admin	up to 18.5%	--	--	--					
	Mobilization & Demobilization	Applied as a direct/capital cost	10%	1 - 10%	--	--	--	10% including insurance, performance bonds	--	--	--	--	--					
Agency Administration ("Project Management" (Utah); "Construction Management" (USACE/EPA); "General and Administrative" (US DOE))		6 - 15%	--	2 - 7%	--	23%	--	--	--	5%	--	--	--					
	Inflation	--	--	5 - 20%	--	--	--	--	--	--	--	--	--					
Indirect Category Percentage Totals (Overall Ranges)	Min.	50%	32.5%	36%	29%	69%	41%	--	29%	--	--	39.5%	31%					
	Max.	125%	58%	139%	43.5%	84%	49%	26.8%	43.5%	23.5%	87%	58%						

Table 4: Summary of Indirect Totals / Statistical Analysis

Guidance Document	Minimum	Maximum
BLM H-3809-1 (2012)	29.0%	43.5%
US DOE (2014)	69.0%	84.0%
BLM Alaska (2014)	41.0%	49.0%
USFS Guide (2004)	36.0%	139.0%
OSM Handbook (2000)	32.5%	58.0%
USACE/EPA (2000)	50.0%	125.0%
Montana DEQ (1997) ^a	21.0%	21.0%
Utah ^a	26.8%	26.8%
Nevada SRCE	29.0%	43.5%
Colorado DNR ^b	23.5%	23.5%
Alaska DNR (2014)	39.5%	87.0%
DOWL (2015)	31.0%	58.0%
Statistical Analysis	Minimum	Maximum
Minimum	21.0%	21.0%
Maximum	69.0%	139.0%
Average	35.7%	63.2%
Standard Deviation	12.7%	36.8%
Average - 1 Standard Deviation	23.0%	26.4%
Average + 1 Standard Deviation	48.3%	100.0%

Notes:

^a Montana DEQ and Utah have fixed indirect costs

^b Colorado DNR does not provide a low indirect value; 23.5% is used in lieu of a reported value

Conclusions

Based on the available data, the minimum indirect average cost is 35.7% and the maximum indirect average cost is 63.2%. Setting a minimum indirect value lower than the average seems imprudent as it could expose the State of New Mexico to financial liability. In contrast, setting a minimum indirect value significantly higher than the average seems unreasonable. A common indirect cost category in more modern guidance documents is the inclusion of liability insurance, which is commonly 1.5% of the estimated labor costs. Inclusion of this cost category seems prudent to protect the State's liability upon injury of a contractor. As such, MMD establishes 36% plus 1.5% of the estimate labor costs as the minimum indirect cost for reclamation construction projects, which is reasonable and justifiable based on the data.

References

Alaska, *Mine Closure and Reclamation Cost Estimation Guidelines (Draft)*, State of Alaska, Department of Natural Resources and Department of Environmental Conservation, April 2015.

BLM, *H-3809-1 Surface Management Handbook*, Department of Interior Bureau of Land Management, Rel. 3-336, September 2012.

BLM, *BLM Alaska Mining Reclamation Bonding Guide*, U.S. Department of Interior, Bureau of Land Management, Alaska State Office, Branch of Energy and Minerals, September 2014.

Colorado, *Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations*, January 2015.

DOWL, *Mine Closure and Reclamation Cost Estimation Guidelines: Indirect Cost Categories*, prepared for Alaska Department of Natural Resources and Alaska Department of Environmental Conservation, April 2015.

Montana, *Review of Hard Rock Mining Reclamation Bond Requirements*, Legislative Request #98L-36, Legislative Audit Division, December 1997.

Nevada, *Standardized Reclamation Cost Estimator*, <http://www.nvbond.org>.

New Mexico, *Closeout Plan Guidelines for Existing Mines, Attachment #4 Financial Assurance Calculation Hand Book*, Mining Act Reclamation Bureau, Mining and Minerals Division, New Mexico Energy, Minerals and Natural Resources Department, April 1996.

Office of Surface Mining (OSM), *Handbook for Calculation of Reclamation Bond Amounts*, Directive TSR-1, Department of Interior Office of Surface Mining and Enforcement, Revised April 2000.

USACE/EPA, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study (FS)*, EPA 540-R-00-002, OSWER 9355.0-75, July 2000.

USDOE, *Defense-Related Uranium Mines Cost and Feasibility Topic Report – Final*, U.S. Department of Energy LMS/S10859, June 2014.

USFS, *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.

Utah, *Bonding Total Worksheet*, http://linux3.ogm.utah.gov/WebStuff/wwwroot/minerals/bonding_worksheets.html