

**APPENDIX A**  
**SUMMARY OF MAJOR COST ITEMS FOR**  
**MINE AREA CLOSURE PLAN**



# Summary of Major Cost Items for Mine Area Closure Plan

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## Opinions of Probable Construction Cost

In providing opinions of probable cost, MOE understands that CH2M HILL has no control over the cost or availability of labour, equipment or materials, or over market conditions or the potential Contractor's method of pricing. CH2M HILL makes no warranty, express or implied, that the bids or the negotiated cost of the Work will not vary from the opinion of probable construction cost.

CH2M HILL has made efforts to acquire area specific rates for materials, labour, and equipment whenever possible. The suitability of said materials to the intended purposes were not verified and will need to be determined prior to any construction activities. Where a local source or supplier could not be identified, industry budgetary tools such as the R.S. Means Company Inc. costing guide were used to assign a typical value. Appropriate regional coefficients were applied where necessary to adjust the typical costs to address regional conditions.

Each specific area of interest has been examined as an independent project. Any possible synergies associated with co-execution of various areas were ignored. Prices provided include the federal Goods and Services Tax (GST).

Volumes and areas were determined using existing available information. No additional investigations were performed to confirm or refute the estimates. Some estimates such as potential water volumes were based on engineering experience from other similar projects. Probable construction costs were based on typical weather conditions and may require adjustments due to extreme conditions.

Certain construction costs such as overhead, insurance, and various construction bonds will vary based on the potential Contractor. Financial strength, experience, and previous history all play a role in determining the rates that will be applied to a particular Contractor. These sums were determined as a percentage of the total costs based on industry averages.

Several of the site remediation options involved additional pumping to the arsenic treatment plant located in the Industrial Area. The application of a varied number of options over the four main areas will result in increases and decreases of the total treated water volume. At this conceptual stage it is difficult to determine whether there will be a net increase or decrease to the volume of water to be treated. Therefore, the operation and maintenance of the arsenic treatment plant has only been considered in the Industrial Area Closure Plan. Actual operation and maintenance costs over the last decade were used to develop a weighted-average and one standard deviation was added to this value in an effort to create a conservative estimate. Wastewater treatment considerations for all other areas were limited to collection and transmission to the equalization pond (i.e. equalization/storage basin).

Finally, a 15 percent contingency was added to the final capital cost (before taxes, overhead, insurance, and bonds) and a 5 percent contingency was added to the final OMM costs (before taxes).

The net present value costs presented in the following cost breakdown are the sum of the capital cost and the net present value of the OMM costs. The annual OMM costs have been transformed to a net present value assuming an effective interest rate of 5 percent and a planning horizon of 20 years. The effective interest rate includes inflationary effects. It should be noted that OMM effort and costs will be required beyond the 20-year horizon. The 20-year period was selected based on the assumption that it is a reasonable period for budgetary planning purposes.

Cost opinions were developed based on information available at the time this report was prepared and are expected to have an accuracy on the order of +/- 25 percent. Use of this information for project budgeting purposes should include a factor for escalation if the contract will not proceed in the same calendar year.

**Appendix A**  
**Breakdown of Capital Costs for Work Packages and Operations, Maintenance, and Monitoring Costs**

	Cost	Insurance	Overhead	Performance Bond	Labour and Material Bond	Remote Area Cost	Final Costs*
<b>MMA-WP#1(a): Excavate Highly Leachable Wastes, Low-Level Radioactive Slag, and Infill/Vegetate and Reconstruct Riverbank (if required)</b>							
Set-up	\$35,107	\$569	\$1,369	\$527	\$527	\$351	\$38,450
Access Routes	\$27,259	\$442	\$1,063	\$409	\$409	\$273	\$29,854
Silt Fencing along Moira River Bank (west side)	\$1,438	\$23	\$56	\$22	\$22	\$14	\$1,575
Watercourse Rerouting North of Gatling Shaft	\$146,890	\$2,380	\$5,729	\$2,203	\$2,203	\$1,469	\$160,874
Washpad	\$16,687	\$270	\$651	\$250	\$250	\$167	\$18,276
Mobilization of Equipment	\$2,190	\$35	\$85	\$33	\$33	\$22	\$2,398
Excavation and Removal of Arsenic Dump Material, Highly Leachable Soil, and Low-Level Radioactive Slag (includes infilling and grading)	\$589,793	\$9,555	\$23,002	\$8,847	\$8,847	\$5,898	\$645,941
Daily Surface Water Quality Sampling	\$3,449	\$56	\$134	\$52	\$52	\$34	\$3,777
Moira River Bank Materials Excavation (if required), Consolidation, and Restoration	\$115,553	\$1,872	\$4,507	\$1,733	\$1,733	\$1,156	\$126,554
Revegetation	\$30,668	\$497	\$1,196	\$460	\$460	\$307	\$33,588
Consolidation of Wastes in Industrial Area (highly leachable wastes and radioactive slag)	\$30,668	\$497	\$1,196	\$460	\$460	\$307	\$33,588
<b>Total</b>	<b>\$999,702</b>	<b>\$16,195</b>	<b>\$38,988</b>	<b>\$14,996</b>	<b>\$14,996</b>	<b>\$9,997</b>	<b>\$1,095,000</b>
<b>RMA-WP#1(b): Excavate Impacted Soils and Infill/Vegetate</b>							
Access Routes	\$107,746	\$1,745	\$4,202	\$1,616	\$1,616	\$1,077	\$118,003
Excavation and Removal of Impacted Soil (includes infilling, grading, and revegetation)	\$210,063	\$3,403	\$8,192	\$3,151	\$3,151	\$2,101	\$230,061
Consolidation of Impacted Soils in Industrial Area	\$10,674	\$173	\$416	\$160	\$160	\$107	\$11,690
<b>Total</b>	<b>\$328,483</b>	<b>\$5,321</b>	<b>\$12,811</b>	<b>\$4,927</b>	<b>\$4,927</b>	<b>\$3,285</b>	<b>\$360,000</b>
<b>MMA-WP#2(a): Cover Waste Rock and Marginally Leachable Soil, and Vegetate</b>							
Grading and Covering of Waste Rock	\$243,765	\$3,949	\$9,507	\$3,656	\$3,656	\$2,438	\$266,972
Simple Earth (Clay) Caps over Marginally Leachable Soils	\$224,652	\$3,639	\$8,761	\$3,370	\$3,370	\$2,247	\$246,038
Revegetation of Waste Rock and Simple Earth (Clay) Caps	\$16,118	\$261	\$629	\$242	\$242	\$161	\$17,653
<b>Total</b>	<b>\$484,535</b>	<b>\$7,849</b>	<b>\$18,897</b>	<b>\$7,268</b>	<b>\$7,268</b>	<b>\$4,845</b>	<b>\$531,000</b>
<b>RMA-WP#2(b): Cover Waste Rock and Vegetate</b>							
Grading and Covering of Waste Rock	\$117,581	\$1,905	\$4,586	\$1,764	\$1,764	\$1,176	\$128,775
Revegetation	\$5,050	\$82	\$197	\$76	\$76	\$50	\$5,531
<b>Total</b>	<b>\$122,631</b>	<b>\$1,987</b>	<b>\$4,783</b>	<b>\$1,839</b>	<b>\$1,839</b>	<b>\$1,226</b>	<b>\$134,000</b>
<b>MMA-WP#3: Upgrade Tuttle Shaft Pumping System Installation and Install Overland Piping to Industrial Area</b>							
Install Pump and Overland Piping	\$66,359	\$1,075	\$2,588	\$995	\$995	\$664	\$72,676
<b>Total</b>	<b>\$66,359</b>	<b>\$1,075</b>	<b>\$2,588</b>	<b>\$995</b>	<b>\$995</b>	<b>\$664</b>	<b>\$73,000</b>
<b>Total Capital Cost</b>							<b>\$2,193,000</b>
<b>Operation, Maintenance, and Monitoring (for 20 years, present investment at 5%)</b>							
Collection system requirements	\$22,916	\$0	\$894	NA	NA	\$229	\$24,039
Collection system maintenance	\$67,035	\$0	\$2,614	NA	NA	\$670	\$70,320
Cap Maintenance	\$163,501	\$0	\$6,377	NA	NA	\$1,635	\$171,513
	(\$19,369)**						
Monitoring program includes physical stability, fence inspection, surface and groundwater quality, pumping and conveyance inspections, and biomonitoring	\$786,727	\$0	\$30,682	NA	NA	\$7,867	\$825,277
	(\$47,061)**						
<b>Total Operation, Maintenance, and Monitoring Costs</b>	<b>\$1,040,180</b>	<b>\$0</b>	<b>\$40,567</b>	<b>\$0</b>	<b>\$0</b>	<b>\$10,402</b>	<b>\$1,091,000</b>
<b>Grand Total</b>	<b>\$3,041,890</b>	<b>\$32,428</b>	<b>\$118,634</b>	<b>\$30,026</b>	<b>\$30,026</b>	<b>\$30,419</b>	<b>\$3,284,000</b>

All capital costs include GST and a 15% contingency (before taxes, overhead, insurance, and bonds).

All OMM costs include GST and a 5% contingency (before taxes).

\*Rounded to nearest \$1,000. All costs have been developed using 2004 pricing and do not include an escalation factor.

\*\*Annual (Weighted) OMM Costs (before overhead and remote area costs).

\*\*\*Total Annual (Weighted) OMM Costs (before overhead and remote area costs) includes all three costs for collection system requirements, collection system maintenance, and cap maintenance.