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FILE NUMBER: MV200212-0019.

DATE: Sept 17 03.

TO: Dist List

FAX NUMBER: see attached.

FROM: Laurie Cordell

Number of pages including cover: 14

Please find attached information
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Jane Howe, BHP Billiton Diamonds Inc – (F) 669-9293
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Joe Acorn, DCFN – by email
John Donihee, MVLWB – (403)282-6596

**Mackenzie Valley Land and Water Board**

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September 17, 2003

File: MV2002L2-0019

Distribution List

Dear Sir/Madame:

North American Tungsten Corporation Ltd., MV2002L2-0019
Estimates of Reclamation Cost Liability, Cantung Mine

Attached for your review and comments is the aforementioned review of the Estimates of Reclamation Liability commissioned by the Board.

Please submit your comments in writing by **September 26, 2003** quoting Water Licence MV2002L2-0019.

If you have any questions regarding the Water License, contact me at (867) 669-0506 or email mvlwbpermit@mvlwb.com.

Yours sincerely,

A handwritten signature in black ink, appearing to be "Laurie Cordell", written over a horizontal line.

Laurie Cordell
Regulatory Officer

Attachment

**MEMO**

**To Laurie Cordell, Regulatory Officer
Mackenzie Valley Land and Water Board**

From Larry Connell

Tel (604) 473-5308

File No. YX00643

Water License N3L2-0004

Fax (604) 294-4664

cc

Date 11 September 2003

Subject CanTung Mine -- Estimates of Reclamation Liability

AMEC Earth & Environmental Limited (AMEC) was asked by the Mackenzie Valley Land and Water Board (MVLWB) staff to review the previous estimates of reclamation liability for the CanTung Mine site, and to prepare a "blended estimate" that takes into consideration the wide range in proposed reclamation activities, unit rates, and quantities that were used in the preparation of these previous estimates.

The AMEC reclamation liability "blended estimate" was drawn from the various estimates previously submitted to the MVLWB, specifically the estimates prepared by North American Tungsten Corporation, Gartner Lee Limited and by Brodie Consulting. AMEC reviewed the reclamation components (line items) included in each of the estimates, the differing reclamation activities proposed, the quantities used and the differing unit rates used in each of the estimates and then used its professional judgement to prepare a revised estimate. AMEC did not do any additional field or engineering work in the preparation of this "blended estimate".

Table 1 presents, in a summary form, a comparison of the reclamation liability estimates prepared by North American Tungsten Corporation Ltd (Cantung Mine Abandonment and Restoration Plan, submitted to the MVLWB, dated July 2003), Gartner Lee Limited (Cantung Mine Site Phase I Environmental Site Assessment and Environmental Liability Assessment, prepared for the Department of Indian Affairs and Northern Development, dated February 2003) and Brodie Consulting Limited (Cantung Mine Reclamation Cost Estimate, prepared for the Department of Indian Affairs and Northern Development, dated November 2002) with the AMEC "blended estimate". The breakdown of the AMEC "blended estimate" is presented in Appendix A.

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Mackenzie Valley Land and Water Board
Review of Reclamation Cost Estimates for the Cantung Mine
Cantung Mine
September 11, 2003



Table 1: Comparison of Reclamation Liability Estimates Made for the CanTung Mine Site

Component	Estimated Reclamation Liability for the CanTung Mine Site				Component Applicable to Brodie Estimate
	AMEG Blended Estimate	NATL 2003 Estimate	GL 2003 Estimate	Brodie 2003 Estimate	
1 Flat River Tailings	\$40,000	\$23,250	\$119,250	\$102,500	Open Pit
2 Tailings Pond No. 1 & 2	\$53,250	\$87,630	\$59,500	\$34,906	Underground Mine
3 Old Lagoon	\$19,240	\$0	\$19,240	\$4,296,543	Tailings
4 Tailings Pond #3	\$611,200	\$188,396	\$833,950	\$113,264	Rock Piles
5 Tailings Pond #4	\$177,420	\$12,350	\$240,420	\$1,587,580	Buildings and Equipment
6 Tailings Pond #5	\$107,000	\$53,940	\$0	\$372,091	Chemicals and Soil Management
7 Old Landfill	\$10,000	\$28,500	\$18,500	\$1,500,000	Water Management
8 Active Landfill	\$30,000	\$28,970	\$49,500		
9 New (Demolition) Landfill	\$35,000	\$28,970	\$36,000		
10 Upper Scrap Yard	\$67,250	\$0	\$72,500		
11 PCB's	\$20,000	\$20,000	\$145,000		
12 Reagents/Chemicals/Batteries	\$25,000	\$1,000	\$100,000		
13 Used Oil	\$25,000	\$5,000	\$50,000		
14 Industrial Buildings	\$1,250,000	\$280,000	\$1,875,000		
15 Hydrocarbon Tanks and Pipelines	\$100,000	\$100,000	\$100,000		
16 Housing in Townsite (75 Buildings)	\$1,485,000	\$120,000	\$475,000		
17 Roadways and Powerlines	\$68,535	\$23,535	\$11,250		
18 Hydrocarbon Contaminated Soil	\$240,000	\$50,000	\$670,000		
19 Metal Contaminated Soil	\$85,000	\$60,000	\$160,000		
20 Underground Mine	\$55,000	\$51,000	\$70,000		
21 Open Pit	\$11,500	\$10,000	\$122,500		
22 Waste Rock and Ore Piles	\$15,000	\$13,485	\$15,000		
23 Land Reclamation and Revegetation	\$100,000	\$59,000	\$160,000		
24 EEM Program	\$75,000	\$100,000	\$75,000		
25 ESA/E&HHRA	\$75,000	\$0	\$110,000		
26 CDA Failure Effects Analysis	\$55,000	\$50,000	\$85,000		
27 Env. Monitoring/Reclamation Mitigation	\$200,000	\$140,000	\$200,000		
Estimated Direct Reclamation Costs	\$5,015,395	\$1,513,026	\$5,872,610	\$8,006,884	
28 Management during Reclamation Period	\$200,000	Mgmt, Travel, Mob, Camp Combined	\$600,000	\$789,570	Project Management - 3%
Travel during Red Period (2 Yrs)	\$100,000		\$100,000	\$1,390,238	Mobilization/Demobilization
Mobilization/Camp Costs (2 Yrs)	\$300,000	\$400,000	\$300,000		
Engineering Allowance	\$250,770	\$0	\$880,892	\$789,570	Engineering - 3%
Contingency Allowance	\$752,309	\$0	\$1,174,522	\$6,579,754	Contingency Allowance - 25%
Estimated Reclamation O/H Costs	\$1,603,079	\$400,000	\$3,055,414	\$9,549,132	
Total Estimated Reclamation Cost	\$6,618,474	\$1,913,026	\$8,928,024	\$17,556,016	
Post Closure Monitoring & Maintenance (10 yrs)	\$1,325,000	\$0	\$1,325,000	\$16,921,894	Post Closure Monitoring, Maintenance & Water Treatment (200 Years)
Total Estimated Reclamation Liability	\$7,943,474	\$1,913,026	\$10,253,024	\$34,477,910	

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As seen in Table 1 the four estimates vary between \$1.9 million and \$34.5 million (Gartner Lee had prepared liability estimates for three levels of reclamation. The highest estimate was \$49.3 million, which was based on full restoration of the site to pre-mining conditions and included activities such as picking up all tailings and returning them into the U/G mine. The \$10.3 million Gartner Lee estimate used in this assessment was predicated on reclamation of the site to provide long-term environmental protection.).

The AMEC estimate includes estimated direct reclamation costs of \$5.0 million plus indirect or overhead costs of \$1.6 million for a total reclamation cost of \$6.6 million. Post closure environmental monitoring and maintenance costs add an additional \$1.3 million for a total reclamation liability estimate of \$7.9 million.

This is based on the assumption that reclamation will be completed within a two-year time frame following the final cessation of mining and that environmental monitoring and maintenance will continue for a further 10-year period.

The wide disparity in the estimates presented in Table 1 arise from the following factors:

- The July 2003 A&R Plan for the CanTung Mine site is conceptual in nature and does not contain sufficient information to allow the potential areas of uncertainty to be adequately addressed. Specifically, there remains uncertainty in the area of understanding the long-term potential for acid rock generation and metal leaching from wall rock in the post closure open pit and underground workings, waste rock dumps and from the tailings facilities. Additional data is needed to fully eliminate the risks associated with this potential liability;
- There is insufficient information available to know what will happen to water quality draining from the mine and tailings impoundments over the long-term and, consequently, it is difficult to assess the need for post closure water treatment or to quantify the cost of post closure water treatment; and
- The amount of effort required for post closure environmental monitoring and maintenance is difficult to assess, predict and cost without understanding the long term acid generating and metal leaching potential and the resultant long-term water quality issues at this site.

The Cantung Mine first entered operation as an open pit mine in 1962. Mining activity moved underground in 1974 and continued through 1986. All mining operations were suspended between 1986 and 2002 due to depressed tungsten commodity prices. During this shut down period, the mine was maintained on a "care and maintenance" basis that included ongoing environmental monitoring. Consequently, we have water quality data from the Cantung Mine for approximately 40 years that indicates that water quality draining from the open pit, U/G mine workings and tailings impoundments has not yet triggered any need for water treatment nor is there any indication of an impending adverse trend in water quality. While this observation

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cannot rule out all of the risk that water treatment may be required at some point in the future, it does suggest that there is a good possibility that water treatment may not be required at this site.

The key assumptions drawn by AMEC in coming up with this blended estimate are as follows:

- The tailings that are currently stored on the Flat River floodplain will not have to be relocated. Additional rock armouring will be provided along the shoreline to protect these deposits from erosion during possible flood conditions;
- The tailings in Pond 1 and 2 will not have to be relocated. The existing soil cover will be upgraded and reseeded. Additional armouring will be placed along the toe to protect from erosion by the Flat River;
- The tailings in Pond 3 will not have to be relocated. A soil cover will be placed on top of the tailings once they are drained. An armoured spillway will be constructed to carry away surface runoff and the embankment will be buttressed where needed to provide slope stability;
- All site buildings will be demolished and the debris disposed of in a landfill on-site;
- No treatment of pit drainage or mine water will be required; and
- Post closure environmental monitoring and maintenance will continue for ten years after reclamation has been completed.

There are significant differences in some of the key unit rates used by North American Tungsten Corporation (NATL), Gartner Lee (GL) and Brodie Consulting (RECLAIM Model) in the preparation of their relative reclamation cost estimates. The key differences are captured in Table 2.

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Table 2: Comparison of Unit Rates Used by North American Tungsten, Gartner Lee and Brodie Consulting in estimating Reclamation Liability at the CanTung Mine Site

Activity	Unit	NATL	GL	RECLAIM Model	
				Low	High
Riprap existing channel	/m ³	\$5	\$30	\$9.95	\$14.85
Riprap runoff ditch	/m ³	\$10	\$30	\$10.10	\$15.40
Additional toe armour	/m ³	\$5	\$15		
Buttress Embankment	/m ³		\$15		
Excavate Soil	/m ³	\$5	\$5	\$2.91	\$4.40
Excavate and haul soil	/m ³		\$15	\$3.61	\$5.43
Placement of soil cover	/m ³	\$5	\$15	\$4.05	\$8.14
Light contouring	/ha	\$470			
Medium contouring	/ha	\$950			
Contouring	/ha		\$2,000		
Dozing - rock pile	/m ³			\$0.77	\$1.77
Ripping pavement	/ha	\$345			
Haulage and disposal of pavement	/m ³	\$5			
Excavate and haul pavement	/m ³		\$15		
Relocate Scrap	/m ³		\$30		
Tear down industrial buildings	/m ²		\$100	\$32.00	\$48.00
Tear down housing	/m ²		\$25	\$19.50	\$30.00
Seeding	/ha	\$500	\$2,000	\$1,450	
Maintenance fertilizer	/ha	\$500	\$500		
Seal openings to UG Mine	each	\$10,000	\$10,000		
Block Pit Adits	each	\$3,000	\$5,000		
Shaft & Raise Closures	/m ²			\$480	\$1,590
Portals	/m ³				\$185
Landfill water samples	/sample	\$250	\$4		
Excavate and haul rock from dump	/m ³		\$15	\$3.82	\$5.25

The impact of using these different unit rates on the overall reclamation liability estimate is presented in Table 3.

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Table 3: Estimate of Reclamation Liability at the CanTung Mine Site

Component	Estimated Reclamation Liability for the CanTung Mine Site			
	Using NATL Unit Rates	Using GL Unit Rates	Using Reclaim Unit Rates	AMEC Blended Estimate
1 Flat River Tailings	\$10,000	\$60,000	\$30,000	\$40,000
2 Tailings Pond No. 1 & 2	\$20,500	\$55,500	\$41,175	\$53,250
3 Old Lagoon	\$9,880	\$19,240	\$18,970	\$19,240
4 Tailings Pond #3	\$282,650	\$833,950	\$521,950	\$611,200
5 Tailings Pond #4	\$85,640	\$249,420	\$142,560	\$177,420
6 Tailings Pond #5	\$53,940	\$158,000	\$86,900	\$107,000
7 Old Landfill	\$5,500	\$13,500	\$8,900	\$10,000
8 Active Landfill	\$15,500	\$43,500	\$22,290	\$30,000
9 New (Demolition) Landfill	\$20,500	\$36,000	\$29,900	\$35,000
10 Upper Scrap Yard	\$64,750	\$68,500	\$67,125	\$67,250
11 PCB's	\$20,000	\$20,000	\$20,000	\$20,000
12 Reagents/Chemicals/Batteries	\$1,000	\$25,000	\$25,000	\$25,000
13 Used Oil	\$5,000	\$25,000	\$25,000	\$25,000
14 Industrial Buildings	\$310,250	\$1,650,000	\$845,000	\$1,250,000
15 Hydrocarbon Tanks and Pipelines	\$100,000	\$100,000	\$100,000	\$100,000
16 Housing in Townsite (75 Buildings)	\$125,000	\$2,625,000	\$1,466,000	\$1,465,000
17 Roadways and Powerlines	\$68,535	\$68,535	\$68,535	\$68,535
18 Hydrocarbon Contaminated Soil	\$125,000	\$370,000	\$200,000	\$240,000
19 Metal Contaminated Soil	\$47,500	\$122,500	\$70,000	\$85,000
20 Underground Mine	\$51,000	\$55,000	\$55,000	\$55,000
21 Open Pit	\$11,500	\$11,500	\$11,500	\$11,500
22 Waste Rock and Ore Piles	\$15,000	\$15,000	\$5,250	\$15,000
23 Land Reclamation and Revegetation	\$59,000	\$110,000	\$99,000	\$100,000
24 EEM Program	\$75,000	\$75,000	\$75,000	\$75,000
25 ESA/E&HHRA	\$75,000	\$75,000	\$75,000	\$75,000
26 CDA Failure Effects Analysis	\$55,000	\$85,000	\$55,000	\$55,000
27 Env. Monitoring/Reclamation Mitigation	\$200,000	\$200,000	\$200,000	\$200,000
Estimated Direct Reclamation Costs	\$1,912,645	\$7,170,145	\$4,365,055	\$5,015,395
28 Management during Reclamation Period	\$150,000	\$600,000	\$130,952	\$200,000
Travel during Recl Period (2 Yrs)	\$50,000	\$100,000	\$100,000	\$100,000
Mobilization/Camp Costs (2 Yrs)	\$200,000	\$300,000	\$300,000	\$300,000
Engineering Allowance (5%)	\$95,632	\$358,507	\$218,253	\$250,770
Contingency Allowance (15%)	\$286,897	\$1,075,522	\$654,758	\$752,309
Estimated Reclamation O/H Costs	\$782,529	\$2,434,029	\$1,403,963	\$1,603,079
Total Estimated Reclamation Cost	\$2,695,174	\$9,604,174	\$5,769,018	\$6,618,474
Post Closure Monitoring & Maintenance (10 yrs)	\$1,325,000	\$1,325,000	\$1,325,000	\$1,325,000
Total Estimated Reclamation Liability	\$4,020,174	\$10,929,174	\$7,094,018	\$7,943,474

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For the four estimates presented in Table 3, similar reclamation components, reclamation activities, quantities, engineering allowance rates and contingency allowance rates were assumed with the only difference being the unit cost rates applied. For example, for Component 1 (Flat River Tailings), the reclamation activity is placement of 2,000 cubic metres of additional armour rock along the riverbank berm separating these tailings from the Flat River. NATCL applied a unit rate of \$5/m³, GL applied a unit rate of \$30/m³ and the Reclaim Model suggests a unit rate of \$15/m³. The blended estimate applied a unit rate of \$20/m³.

The resulting estimates of total reclamation liability varied from a low of \$4.0 million (applying the NATCL unit rates) to a high of \$10.9 million (applying GL unit rates). AMEC used its own costing experience to apply appropriate unit rates in coming up with the "blended estimate".

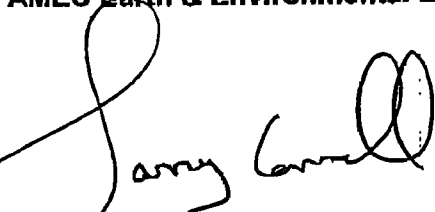
In summary, AMEC has reviewed the various cost estimates of reclamation liability for the Cantung Mine and feels that the "Blended Estimate" of \$7.9 million (\$6.6 million in direct and indirect reclamation cost, plus \$1.3 million for Post Closure monitoring and maintenance) represents a reasonable estimate of reclamation liability at this site, based on current information. This estimate does contain risk. Based on the current information available, it cannot be ruled out that at some point in the future, metal leaching or acid rock drainage may become a problem resulting in additional liability for remediation or treatment. There is, however, no evidence that such an event will occur. Additional site-specific metal leaching/ARD studies are required to reduce or eliminate such risk.

This letter has been prepared for the exclusive use of the MVLWB for specific application to the subject described herein. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. AMEC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. It has been prepared in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.

Respectfully Submitted,

AMEC Earth & Environmental Limited

Reviewed by:



Larry Connell, P.Eng.
Senior Mining Environmental Consultant



Peter C. Lighthall, P.Eng.
Vice President, Mining

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Appendix A

Reclamation Cost Estimate for the Cantung Mine

Objectives: Long Term Environmental Protection, Safety and Security

Prepared by: AMEC Earth & Environmental (Based on a Blend of Unit Rates and Quantities from Other Estimates), September 2003

Component	Task	Unit Cost \$	Quantity	Years	Individual Costs \$	Component Costs \$
1 Flat River Tailings	Additional armouring to protect falls from erosion	\$20/m ³	2,000	1	\$40,000	\$40,000
	sub-total					
2 Tailings Pond No. 1 & 2	Upgrade soil cover	\$10/m ³	1,250	1	\$12,500	\$53,250
	Seeding	\$1,500/ha	4	1	\$6,000	
	Maintenance fertilizer	\$500/ha	4	2	\$4,000	
	Butress Embankment	\$20/m ³	1,200	1	\$24,000	
	Riprap ditch	\$30/m ³	225	1	\$6,750	
sub-total						
3 Old Lagoon	Upgrade existing overflow	\$5,000 LS	1	1	\$5,000	\$19,240
	Butress embankment	\$15/m ³	900	1	\$13,500	
	Excavate swale (soil)	\$5/m ³	40	1	\$200	
	Riprap swale	\$30/m ³	18	1	\$540	
sub-total						
4 Tailings Pond #3	Butress embankment	\$15/m ³	10,000	1	\$150,000	\$611,200
	Soil cover	\$10/m ³	43,750	1	\$437,500	
	Seeding	\$1,500/ha	8	1	\$12,000	
	Maintenance fertilizer	\$500/ha	8	2	\$8,000	
	Excavate spillway (soil)	\$5/m ³	200	1	\$1,000	
	Riprap spillway	\$30/m ³	90	1	\$2,700	
sub-total						
5 Tailings Pond #4 (polishing pond)	Soil cover	\$10/m ³	15,000	1	\$150,000	\$177,420
	Butress Embankment	\$20/m ³	900	1	\$18,000	
	Excavate swale	\$5/m ³	300	1	\$1,500	
	Riprap swale	\$30/m ³	14	1	\$420	
	Seeding	\$1,500/ha	3	1	\$4,500	
	Maintenance fertilizer	\$500/ha	3	2	\$3,000	
sub-total						
6 Tailings Pond #5	Light contour	\$1,000/ha	2	1	\$2,000	\$107,000
	Soil cover	\$10/m ³	10,000	1	\$100,000	
	Seeding	\$1,500/ha	2	1	\$3,000	
	Maintenance fertilizer	\$500/ha	2	2	\$2,000	
	Excavate spillway (soil)	\$5/m ³	300	1	\$1,500	
	Riprap spillway	\$30/m ³	100	1	\$3,000	
sub-total						
7 Old Landfill	Upgrade soil cover	\$10/m ³	500	1	\$5,000	\$10,000
	Seeding	\$1,500/ha	2	1	\$3,000	
	Maintenance fertilizer	\$500/ha	2	2	\$2,000	
sub-total						
8 Active Landfill	Soil cover	\$10/m ³	2,500	1	\$25,000	\$30,000
	Seeding	\$1,500/ha	2	1	\$3,000	
	Maintenance fertilizer	\$500/ha	2	2	\$2,000	
sub-total						

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Component	Task	Unit Cost	Quantity	Years	Individual Costs \$	Component Costs \$
9 New (Demolition) Landfill	Design	\$5,000 LS	1	1	\$5,000	
	Soil cover	\$10/m ³	2,500	1	\$25,000	
	Seeding	\$1,500/ha	2	1	\$3,000	
	Maintenance fertilizer	\$500/ha	2	2	\$2,000	
	sub-total					\$35,000
10 Upper Scrap Yard	Drain	\$1,000 LS	1	1	\$1,000	
	Relocate scrap	\$30/m ³	2,000	1	\$60,000	
	Seeding	\$1,500/ha	2.5	1	\$3,750	
	Maintenance fertilizer	\$500/ha	2.5	2	\$2,500	
	sub-total					\$67,250
11 PCB's	Offsite disposal	\$20,000 LS	1	1	\$20,000	\$20,000
12 Reagents/Chemicals/Batteries	Offsite disposal	\$25,000 LS	1	1	\$25,000	\$25,000
13 Used Oil	Offsite disposal	\$25,000 LS	1	1	\$25,000	\$25,000
14 Industrial Buildings	Removal & disposal of hazardous materials	\$25,000 LS	1	1	\$25,000	
	Removal & disposal of equipment & building contents	\$100,000 LS	1	1	\$100,000	
	Demolish buildings and dispose of debris on-site	\$75/m ²	15,000	1	\$1,125,000	
	Soil cover over concrete building slabs	\$10/m ²	6,000	1	\$60,000	
	sub-total					\$1,250,000
15 Hydrocarbon Tanks and Pipelines	Clean and landfill (surface)	\$100,000 LS	1	1	\$100,000	\$100,000
16 Housing in Townsite (75 Buildings)	Demolish wood structures and dispose of debris	\$35/m ²	13,000	1	\$455,000	
	Demolish metal frame buildings and dispose of debris	\$45/m ²	22,000	1	\$990,000	
	Disposal of hazardous materials	\$20,000 LS	1	1	\$20,000	
	sub-total					\$1,465,000
17 Roadways and Powerlines	Excavate and landfill pavement from townsite roads	\$23,535 LS	1	1	\$23,535	
	Removal of powerlines and poles	\$20,000 LS	1	1	\$20,000	
	Scarification of mine site roadways	\$10,000 LS	1	1	\$10,000	
	Restoration of drainage (removal of culverts & bridges)	\$15,000 LS	1	1	\$15,000	
	sub-total					\$68,535
18 Hydrocarbon Contaminated Soil	Construct biocells	\$10,000 LS	1	1	\$10,000	
	Excavate soil and place in biocell	\$10/m ³	20,000	1	\$200,000	
	Operate biocells	\$5,000/year	1	5	\$25,000	
	Close biocells	\$5,000 LS	1	1	\$5,000	
	sub-total					\$240,000

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Wackaritz Valley Land and Water Board
 Review of Reclamation Cost Estimates for the Cantung Mine
 Cantung Mine
 September 11, 2003



Component	Task	Unit Cost	Quantity	Years	Individual Costs \$	Component Costs \$
19 Metal Contaminated Soil	Geochemical assessment	\$10,000 LS	1	1	\$10,000	
	Excavate soil & haul soil to Tailings	\$10/m ³	7,500	1	\$75,000	
	sub-total					\$85,000
20 Underground Mine	U.G Berms	\$5,000 LS	1	1	\$5,000	
	Seal openings to mine	\$10,000 each	4	1	\$40,000	
	Block pit adits	\$5,000 LS	2	1	\$10,000	
sub-total					\$55,000	
21 Open Pit	Upgrade Ditching	\$10,000 LS	1	1	\$10,000	
	Block Access	\$1,500 LS	1	1	\$1,500	
sub-total					\$11,500	
22 Waste Rock and Ore Piles	Relocate rock	\$15/m ³	1,000	1	\$15,000	
sub-total						\$15,000
23 Land Reclamation and Revegetation	Design	\$10,000 LS	1	1	\$10,000	
	Contouring	\$2,000 /ha	20	1	\$40,000	
	Seeding	\$1,500 /ha	20	1	\$30,000	
	Maintenance Fertilizer	\$500 /ha	20	2	\$20,000	
sub-total					\$100,000	
24 EEM Program	Data review/design	\$5,000 LS	1	1	\$5,000	
	Field Studies	\$40,000 LS	1	1	\$40,000	
	Analytical	\$20,000 LS	1	1	\$20,000	
	Interpretation report	\$10,000 LS	1	1	\$10,000	
sub-total					\$75,000	
25 ESA/E&HHRA	ESA field studies	\$30,000 LS	1	1	\$30,000	
	ESA analytical	\$15,000 LS	1	1	\$15,000	
	ESA interpretation report	\$10,000 LS	1	1	\$10,000	
	E&HHRA	\$20,000 LS	1	1	\$20,000	
sub-total					\$75,000	
26 CDA Failure Effects Analysis	Tailings Pond 1, 2 & 3 - Drill Investigations	\$30,000 LS	1	1	\$30,000	
	Tailings Pond 1 & 2 - CDA Failure Effects	\$5,000 LS	1	1	\$5,000	
	Tailings Pond # 3 - CDA Failure Effects	\$5,000 LS	1	1	\$5,000	
	Tailings Pond 1,2 & 3 - Stability Analysis	\$15,000 LS	1	1	\$15,000	
sub-total					\$55,000	
27 Environmental Monitoring/Reclamation Mitigation	Technician	\$50,000 /yr	1	2	\$100,000	
	Analytical	\$20,000 /yr	1	2	\$40,000	
	Mitigation	\$30,000 /yr	1	2	\$60,000	
sub-total					\$200,000	
Sub Total Reclamation Activities pre-Management, Engineering and Contingency						\$5,015,395

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Mackenzie Valley Land and Water Board
 Review of Reclamation Cost Estimates for the Cantung Mine
 Cantung Mine
 September 11, 2003



Component	Task	Unit Cost	Quantity	Years	Individual Costs	Component Costs
28 Management, Engineering, Contingency	Management	\$100,000 /yr	1	2	\$200,000	
	Travel	\$50,000 LS	1	2	\$100,000	
	Mobilization/camp	\$150,000 LS	1	2	\$300,000	
	Engineering Allowance	5% LS	5,015,395	1	\$250,770	
	Contingency Allowance	15% LS	5,015,395	1	\$752,309	
	sub-total					
Total Reclamation Activities						\$6,618,474
On-Going EEM and Site Maintenance	Water analytical (year 1-5)	\$250 /sample	80	5	\$100,000	
	Water analytical (year 5-10)	\$250 /sample	40	5	\$50,000	
	Geotech Inspection (year 1-5)	\$20,000 /year	1	5	\$100,000	
	Geotech Inspection (year 5-10)	\$10,000 /year	1	5	\$50,000	
	Maintenance (year 1-5)	\$2,000 /day	15	5	\$150,000	
	Maintenance (year 5-10)	\$2,000 /day	7.5	5	\$75,000	
	Travel (year 1-5)	\$10,000 /trip	4	5	\$200,000	
	Travel (year 5-10)	\$10,000 /trip	2	5	\$100,000	
	Management	\$25,000 /year	1	10	\$250,000	
	Reporting	\$25,000 /year	1	10	\$250,000	
	sub-total					
Subtotal On-going EEM and Site Maintenance per year for Years 1 thru 5		\$160,000 /year				
Subtotal On-going EEM and Site Maintenance per year for Years 6 thru 10		\$105,000 /year				
Total On-Going EEM and Site Maintenance for 10 Years Post-Closure						\$1,325,000
Total Reclamation Liability						\$7,943,474

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