



Mackenzie Valley Land and Water Board
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March 7, 2014

File: MV2013C0021

Mr. Dave R. Webb
New Discovery Mines Ltd.
1909 108 W. Cordova St.
VANCOUVER BC V6B 0G5

Email: dave@drwgcl.com

Dear Mr. Webb:

Further Study Requested – Mineral Exploration – Mon Gold Mine

The Mackenzie Valley Land and Water Board (MVLWB) held a meeting on March 7, 2014 and considered your application for the above-noted Land Use Permit. The MVLWB has determined that, pursuant to paragraph 22(2)(b) of the Mackenzie Valley Land Use Regulations, further study needs to be conducted on this Land Use Permit Application. Specifically, you are requested to undertake and provide a reclamation cost estimate, using the RECLAIM model (version 6.12 attached). This reclamation cost estimate will then undergo a public review.

Please provide your response to the MVLWB by March 20, 2014. Upon receipt of this information, the MVLWB will continue to process the application and a determination will be made by the Board.

If you have any questions or concerns regarding this letter, please contact Jen Potten at (867) 766-7468 or email jpotten@mvlwb.com.

Yours sincerely,

A handwritten signature in black ink, appearing to read "W. Hagen".

Willard Hagen
Chair

Copied to: Distribution List

Attachments: RECLAIM model version 6.12

These buttons may alter the contents of your worksheet.

Please back up your workbook before clearing all the data

Shows 2 windows; the current one and the Unit Cost Window

Prints all non-zero components

SUMMARY OF COSTS

CAPITAL COSTS

COMPONENT TYPE	COMPONENT NAME	TOTAL COST	LAND LIABILITY	WATER LIABILITY
OPEN PIT	0	\$0	\$0	\$0
UNDERGROUND MINE	0	\$0	\$0	\$0
TAILINGS	0	\$0	\$0	\$0
ROCK PILE	0	\$0	\$0	\$0
BUILDINGS AND EQUIPMENT	0	\$0	\$0	\$0
CHEMICALS AND SOIL MANAGEMENT		\$0	\$0	\$0
WATER MANAGEMENT		\$0	\$0	\$0
POST-CLOSURE MONITORING AND MAINTENANCE		\$0	\$0	\$0
SUBTOTAL		\$0	\$0	\$0
		PERCENTAGES	0%	0%
MOBILIZATION/DEMOBILIZATION		\$0	0	0
PROJECT MANAGEMENT	5%	\$0	\$0	\$0
Bonding	1%	\$0	\$0	\$0
Taxes (GST on supplies) - est.	allowance	\$0	\$0	\$0
Insurance	1%	\$0	\$0	\$0

SUMMARY OF COSTS

CAPITAL COSTS

COMPONENT TYPE	COMPONENT NAME	TOTAL COST	LAND LIABILITY	WATER LIABILITY
ENGINEERING	5%	\$0	\$0	\$0
CONTINGENCY	20%	\$0	\$0	\$0
Market Price Factor Adjustment	0%	\$0	\$0	\$0
GRAND TOTAL - CAPITAL COSTS		\$0	\$0	\$0

Open Pit Name:

Pit # 1

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
OBJECTIVE: CONTROL ACCESS							
Fence	m		#N/A	0.00	\$0	\$0	\$0
Signs	each		#N/A	0.00	\$0	\$0	\$0
Berm at crest	m3		#N/A	0.00	\$0	\$0	\$0
Block roads	m3		#N/A	0.00	\$0	\$0	\$0
Other			#N/A		\$0	\$0	\$0
OBJECTIVE: STABILIZE SLOPES			#N/A				
Off-load crest, soil A	m3		#N/A	0	\$0	\$0	\$0
Off-load crest, soil B	m3		#N/A	0	\$0	\$0	\$0
Doze/trimoverburden at crest	m3		#N/A	0	\$0	\$0	\$0
Drill & blast pit crest	m3		#N/A	0	\$0	\$0	\$0
buttress slope	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: COVER/CONTOUR SLOPES			#N/A				
Place fill, soil A	m3		#N/A	0	\$0	\$0	\$0
Place fill, soil B	m3		#N/A	0	\$0	\$0	\$0
Rip rap	m3		#N/A	0	\$0	\$0	\$0
Vegetate slopes	ha		#N/A	0	\$0	\$0	\$0
Vegetate pit floor	ha		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: SPILLWAY			#N/A				
Excavate channel, soil A	m3		#N/A	0	\$0	\$0	\$0
Excavate channel, soil B	m3		#N/A	0	\$0	\$0	\$0
Concrete	m3		#N/A	0	\$0	\$0	\$0
Rip rap	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0

Open Pit Name:

Pit # 1

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
OBJECTIVE: FLOOD PIT			#N/A				
remove stationary equipment (sump pump)	each		#N/A	0	\$0	\$0	\$0
remove power lines	each		#N/A	0	\$0	\$0	\$0
Embankment/dam - Soil A	m3		#N/A	0	\$0	\$0	\$0
Embankment/dam - Soil B	m3		#N/A	0	\$0	\$0	\$0
supply/install pump & piping system	each		#N/A	0	\$0	\$0	\$0
operate pumps to flood pit	each		#N/A	0	\$0	\$0	\$0
Lime addition, _____ kg/m3 of water	tonne		#N/A	0	\$0	\$0	\$0
Lime, purchase and shipping	tonne		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
RECLAIM QUARRIES			#N/A				
Contour slopes	m3		#N/A	0	\$0	\$0	\$0
Berm at crest	m3		#N/A	0	\$0	\$0	\$0
Place overburder	m3		#N/A	0	\$0	\$0	\$0
Vegetate	m3		#N/A	0	\$0	\$0	\$0
OTHER ITEMS			#N/A				
			#N/A	0	\$0	\$0	\$0
			#N/A	0	\$0	\$0	\$0

Subtotal	\$0	0%	\$0	\$0
	Pct Land	Total Land	Total Water	

Underground Mine Name

UG Mine # 1

ACTIVITY/MATERIAL	Unit	Qty	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
OBJECTIVE: CONTROL ACCESS							
Fence	m		#N/A	0	\$0	\$0	\$0
Signs	each		#N/A	0	\$0	\$0	\$0
Ditch, mat'l A	m3		#N/A	0	\$0	\$0	\$0
, mat'l B	m3		#N/A	0	\$0	\$0	\$0
Berm	m3		#N/A	0	\$0	\$0	\$0
concrete wall in 2 portals	m3		#N/A		\$0	\$0	\$0
backfill portal #1	m3		#N/A	0	\$0	\$0	\$0
backfill portal #2	m3		#N/A	0	\$0	\$0	\$0
cap 5 raises	m3		#N/A	0	\$0	\$0	\$0
cap raise #2	m3		#N/A	0	\$0	\$0	\$0
cap shaft #1	m3		#N/A	0	\$0	\$0	\$0
cap shaft #2	m3		#N/A	0	\$0	\$0	\$0
backfill audits	m3		#N/A	0	\$0	\$0	\$0
backfill open stope	m3		#N/A	0	\$0	\$0	\$0
concrete cap over open stope	m3		#N/A	0	\$0	\$0	\$0
other			#N/A	0	\$0	\$0	\$0
	m3		#N/A	0	\$0	\$0	\$0
OBJECTIVE: FLOOD MINE							
Bulkheads to control water flow	each		#N/A	0	\$0	\$0	\$0
supply/install pump & piping system	each		#N/A	0	\$0	\$0	\$0
operate pumps to flood workings	m3		#N/A	0	\$0	\$0	\$0
	m3		#N/A	0	\$0	\$0	\$0
other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: HAZARDOUS MATERIALS							
remove hazardous materials, U/G labor			#N/A		\$0	\$0	\$0
and days			#N/A				
off-site disposal costs on Chemicals sheet			#N/A				

Underground Mine Name

UG Mine # 1

ACTIVITY/MATERIAL	Unit	Qty	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
remove/decontam. stationary & elect. eq	days		#N/A		\$0		\$0
remove/decontam. mobile equipment	each		#N/A	0	\$0		\$0
Remove misc. haz. mat & explosives	kg		#N/A	0	\$0		\$0
Other			#N/A	0	\$0		\$0
SPECIALIZED ITEMS			#N/A				
install water quality monitoring pipes	each		#N/A	0	\$0		\$0
intall permanent pumping system	each		#N/A	0	\$0		\$0
other			#N/A	0	\$0		\$0
				Subtotal	\$0	0%	\$0
						Pct Land Total Land	Total Water

COMMENTS:

Tailings Impoundment Name:

Pond # 1

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost
OBJECTIVE: CONTROL ACCESS							
Fence	m		#N/A	0	\$0	\$0	\$0
Signs	each		#N/A	0	\$0	\$0	\$0
Ditch, mat'l A	m3		#N/A	0	\$0	\$0	\$0
, mat'l B	m3		#N/A	0	\$0	\$0	\$0
Berm	m3		#N/A	0	\$0	\$0	\$0
Block roads	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: STABILIZE EMBANKMENT			#N/A				
toe buttress, drainage layer	m3		#N/A	0	\$0	\$0	\$0
toe buttress, bulk fill	m3		#N/A	0	\$0	\$0	\$0
Rip rap	m3		#N/A	0	\$0	\$0	\$0
Vegetate	ha		#N/A	0	\$0	\$0	\$0
Raise crest	m3		#N/A	0	\$0	\$0	\$0
Flatten slopes	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: COVER TAILINGS			#N/A				
quarry soil cover mat'l - north pile	m3		#N/A	0.00	\$0	\$0	\$0
Soil cover - starter cell	m3		#N/A	0.00	\$0	\$0	\$0
geofabric cost and install 30% area - starter cell	m2		#N/A	0.00	\$0	\$0	\$0
Soil cover - east cell	m2		#N/A	0.00	\$0	\$0	\$0
geofabric cost and install 60% area - east cell	m2		#N/A	0.00	0	\$0	\$0
Soil cover - west cell	m3		#N/A	0.00	\$0	\$0	\$0
geofabric cost and install - west cell	m2		#N/A	0.00	0	\$0	\$0
Vegetate	m2		#N/A	0.00	\$0	\$0	\$0
cover shortfall - processing cost only	m3		#N/A	0.00	\$0	\$0	\$0
OBJECTIVE: BURY PAG ROCK			#N/A				

Tailings Impoundment Name:

Pond # 1

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost
Relocate PAG rock	m2		#N/A	0.00	\$0	\$0	\$0
place cover over PAG rock	m3		#N/A	0.00	\$0	\$0	\$0
Raise crest	m2		#N/A	0	\$0	\$0	\$0
Other	m3		#N/A	0	\$0	\$0	\$0
OBJECTIVE: FLOOD TAILINGS			#N/A				
Ditch, mat'l A	m3		#N/A	0	\$0	\$0	\$0
, mat'l B	m3		#N/A	0	\$0	\$0	\$0
Doze Tailings to final contour	m3		#N/A	0	\$0	\$0	\$0
Raise crest of dam	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: TREAT SUPERNATANT			#N/A				
Pump water	m3		#N/A	0	\$0	\$0	\$0
Supply reagents	tonne		#N/A	0	\$0	\$0	\$0
Operate treatment plant	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: UPGRADE SPILLWAY			#N/A				
Excavate channel, rock	m3		#N/A	0	\$0	\$0	\$0
excavate channel, soil	m3		#N/A	0	\$0	\$0	\$0
Concrete	m3		#N/A	0	\$0	\$0	\$0
Rip rap	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: STABILIZE DECANT SYSTEM			#N/A				
excavate and replace	m3		#N/A	0	\$0	\$0	\$0
Plug/backfill with concrete or clay	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: REMOVE TAILINGS DISCHARGE			#N/A				

Tailings Impoundment Name:

Pond # 1

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost	
Cyclones	m3		#N/A	0	\$0	\$0	\$0	
Pipe	m3		#N/A	0.00	\$0	\$0	\$0	
Remove reclaim barge	each		#N/A	0	\$0	\$0	\$0	
SPECIALIZED ITEMS			#N/A					
install permanent instrumentation, supply & technican	each		#N/A	0	\$0	\$0	\$0	
install permanent instrumentation, drilling	each		#N/A	0	\$0	\$0	\$0	
Subtotal					\$0	0%	\$0	\$0
						Pct	Total	
						Land Total Land	Water	

Rock Pile Name:**Rock Pile #: 1**

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
OBJECTIVE: STABILIZE SLOPES							
Flatten slopes with dozer	m3		#N/A	0	\$0	\$0	\$0
Flatten "bubble dump" areas	m3		#N/A		\$0	\$0	\$0
Divert runoff, ditch mat'l A	m3		#N/A	0	\$0	\$0	\$0
, ditch mat'l B	m3		#N/A	0	\$0	\$0	\$0
Toe buttress, drain mat'l	m3		#N/A	0	\$0	\$0	\$0
, fill mat'l A	m3		#N/A	0	\$0	\$0	\$0
, fill mat'l B	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: COVER DUMP			#N/A				
Mat'l A	m3		#N/A	0	\$0	\$0	\$0
Mat'l B	m3		#N/A	0	\$0	\$0	\$0
Rip rap	m3		#N/A	0	\$0	\$0	\$0
Vegetate	ha		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
VERY LOW PERMEABILITY COVER			#N/A				
supply geomembrane, HDPE, ES3, GCL	m2		#N/A	0	\$0	\$0	\$0
upper and lower bedding layers	m3		#N/A	0	\$0	\$0	\$0
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	\$0	\$0	\$0
erosion protection layer	m3		#N/A	0	\$0	\$0	\$0
vegetate	ha		#N/A	0	\$0	\$0	\$0
install infiltration/seepage instrumentation	allow		#N/A	0	\$0	\$0	\$0
OBJECTIVE: RELOCATE DUMPS			#N/A				
Load, haul, dump or doze	m3		#N/A	0	\$0	\$0	\$0
Add lime	tonne		#N/A	0	\$0	\$0	\$0
Contour reclaimed area	ha		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0

Rock Pile Name:

Rock Pile #: 1

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost	
SPECIALIZED ITEMS			#N/A					
install permanent instrumentation			#N/A	0	\$0	\$0	\$0	
install permanent instrumentation, drilling			#N/A		\$0	\$0	\$0	
other			#N/A	0	\$0	\$0	\$0	
Subtotal					\$0	0%	\$0	\$0
					%	Total	Total	
					Land	Land	Water	

Building / Equip Name:**Bldg / Equip #: 1**

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost % Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT							
Decontaminate and ship off-site	each		#N/A	0	\$0	\$0	\$0
Decontaminate, dispose on-site	each		#N/A	0	\$0	\$0	\$0
Other	each		#N/A	0	\$0	\$0	\$0
OBJECTIVE: BUILDING DECONTAMINATION & HAZ. MATERIAL REMOVAL			#N/A				
Decontaminate, oil, fuel and glycol systems	mandays		#N/A	660	\$0	\$0	\$0
Decontaminate, general mechanical	mandays		#N/A	660	\$0	\$0	\$0
Electrical	mandays		#N/A	660	\$0	\$0	\$0
Decontaminate maintenance shop	each		#N/A	0	\$0	\$0	\$0
Decontaminate power plant	each		#N/A	0	\$0	\$0	\$0
Decontaminate bulk fuel storage	each		#N/A	0	\$0	\$0	\$0
Decontaminate ANFO plant	each		#N/A	0	\$0	\$0	\$0
Deontaminate offices/warehouse/accom	each		#N/A	0	\$0	\$0	\$0
Removal of asbestos siding on buildings	each		#N/A	0	\$0	\$0	\$0
Removal of friable asbestos on equipment	each		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: REMOVE BUILDINGS - ALL BUILDING AREAS SCALED TO ACCOU			#N/A				
Building 1- Accom. Complex	m2		#N/A	0.00	\$0	\$0	\$0
Building 2 -Process Facilities	m2		#N/A	0.00	\$0	\$0	\$0
Building 3 -Offices, Repair, Lab, Warehouse	m2		#N/A	0.00	\$0	\$0	\$0
Building 4 -Storage Facilites	m2		#N/A	0.00	\$0	\$0	\$0
Building 5 -Water and Wastewater Treatment Facilities	m2		#N/A	0.00	\$0	\$0	\$0
Building 6 -U/G Heating Plant	m2		#N/A	0.00	\$0	\$0	\$0
Building 7 - Emulsion Plant	m2		#N/A	0.00	\$0	\$0	\$0
Building 8 -AN Storage Facility	m2		#N/A	0.00	\$0	\$0	\$0
Building 9 -Warehouse, Shops and Other	m2		#N/A	0.00	\$0	\$0	\$0

Building / Equip Name:**Bldg / Equip #: 1**

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost % Land	Land Cost	Water Cost
Building 10 -Storage Facility at Laydown/Airstrip	m2		#N/A	0.00	\$0	\$0	\$0
Building 15 -Fuel tanks	m2		#N/A	0.00	\$0	\$0	\$0
Building 16 -Fuel Tanks	m2		#N/A	0.00	\$0	\$0	\$0
Building 23 -Freshwater intake	m2		#N/A	0.00	\$0	\$0	\$0
Building 26 Reclaim pumps	m2		#N/A	0.00	\$0	\$0	\$0
Building 27outfall &diffuser	m2		#N/A	0.00	\$0	\$0	\$0
Airstrip lighting, navigation, electrician	mandays		#N/A	660	\$0	\$0	\$0
Airstrip lighting, navigation, mechanical	mandays		#N/A	660	\$0	\$0	\$0
consolidate & dump boneyard debris	m3		#N/A	0	\$0	\$0	\$0
other	m2		#N/A	0	\$0	\$0	\$0
OBJECTIVE: BREAK BASEMENT SLABS			#N/A				
Building 1- Accom. Complex	m2		#N/A	0	\$0	\$0	\$0
Building 2 -Process Facilities	m2		#N/A	0	\$0	\$0	\$0
Building 3 -Offices, Repair, Lab, Warehouse	m2		#N/A	0	\$0	\$0	\$0
Building 4 -Storage Facilites	m2		#N/A	0	\$0	\$0	\$0
Building 5 -Water and Wastewater Treatment Facilities	m2		#N/A	0	\$0	\$0	\$0
Building 6 -U/G Heating Plant	m2		#N/A	0	\$0	\$0	\$0
Building 7 - Emulsion Plant	m2		#N/A	0	\$0	\$0	\$0
Building 8 -Warehouse, Shops and Other	m2		#N/A	0	\$0	\$0	\$0
	m2		#N/A	0	\$0	\$0	
	m2		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE			#N/A				
Place soil cover	m3		#N/A	0.00	\$0	\$0	\$0
Vegetate	ha		#N/A	0	\$0	\$0	\$0
Landfill disposal fee	tonne		#N/A	0	\$0	\$0	\$0
OBJECTIVE: GRADE AND CONTOUR			#N/A				

Building / Equip Name:

Bldg / Equip #: 1

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost % Land	Land Cost	Water Cost	
Building 1- Accom. Complex	ha		#N/A	0	\$0	\$0	\$0	
Building 2 -Process Facilities	ha		#N/A	0	\$0	\$0	\$0	
Building 3 -Offices, Repair, Lab, Warehouse	ha		#N/A	0	\$0	\$0	\$0	
Building 4 -Storage Facilites	ha		#N/A	0	\$0	\$0	\$0	
Building 5 -Water and Wastewater Treatment Facilities	ha		#N/A	0	\$0	\$0	\$0	
Building 6 -U/G Heating Plant	ha		#N/A	0	\$0	\$0	\$0	
Building 7 - Emulsion Plant	ha		#N/A	0	\$0	\$0	\$0	
Building 8 -Warehouse, Shops and Other	ha		#N/A	0	\$0	\$0	\$0	
place rock cover	m3		#N/A	0	\$0	\$0	\$0	
Vegetate	ha		#N/A	0	\$0	\$0	\$0	
other	m3		#N/A	0	\$0	\$0	\$0	
OBJECTIVE: LINED SUMPS			#N/A					
puncture liner and place soil cover	m3		#N/A	0.00	\$0	\$0	\$0	
OBJECTIVE: RECLAIM ROADS			#N/A					
Remove culverts	each		#N/A	0	\$0	\$0	\$0	
Remove bridges	each		#N/A	0	\$0	\$0	\$0	
Scarify and install water breaks	ha		#N/A	0	\$0	\$0	\$0	
scarify airstriip	ha		#N/A	0	\$0	\$0	\$0	
scarify laydown areas	ha		#N/A	0	\$0	\$0	\$0	
Vegetate	ha		#N/A	0	\$0	\$0	\$0	
other			#N/A	0	\$0	\$0	\$0	
SPECIALIZED ITEMS			#N/A					
Dispose of misc. debris and laydown area refuse	m3		#N/A	0	\$0	\$0	\$0	
Subtotal					\$0	0%	\$0	\$0
					Pct Land	Total Land	Total Water	

1 Chemicals and Soil Contamination:

ACTIVITY/MATERIAL	Units Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost
Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.						
HAZARDOUS MATERIALS AUDIT						
Phase 1 audit	each	#N/A	50000	\$0	100%	\$0 \$0
Phase 2 audit	each	#N/A	25000	\$0	100%	\$0 \$0
HAZARDOUS MATERIALS TO BE CONSOLIDATED FOR REMOVAL						
Waste oils	litre	#N/A	0.00	\$0		\$0 \$0
Fuel - Type 1, eg diesel dregs	litre	#N/A	0	\$0		\$0 \$0
Fuel - Type 1, eg gasoline dregs	litre	#N/A	0	\$0		\$0 \$0
waste batteries	kg	#N/A	0	\$0		\$0 \$0
assay & environmental lab reagents	pallet	#N/A	0	\$0		\$0 \$0
machine shop, paints, solvents etc	litre	#N/A	0.9	\$0		\$0 \$0
contaminated soils - hydrocarbon	m3	#N/A	0	\$0		\$0 \$0
metal contam. soil at conc. load-out	m3	#N/A	0	\$0		\$0 \$0
glycol	litre	#N/A	1.15	\$0		\$0 \$0
HAZARDOUS MATERIALS						
Transportation to disposal facility	allow	#N/A	0	\$0		\$0 \$0
Disposal fees	allow	#N/A	0	\$0		\$0 \$0
other		#N/A	0	\$0		\$0 \$0
CONTAMINATED SOILS						
Contam. soil investigation - technical	each	#N/A	0	\$0		\$0 \$0
Contam. soil investigation - drilling & samplin	each	#N/A	0	\$0		\$0 \$0

1 Chemicals and Soil Contamination:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost	
CONTAMINATED SOIL REMOVAL	m3		#N/A		\$0	\$0	\$0	
contaminated soils - hydrocarbon	m2		#N/A	0	\$0	\$0	\$0	
metal contam. soil at conc. load-out	m3		#N/A	0	\$0	\$0	\$0	
Load, haul, dump or doze	m3		#N/A	0	\$0	\$0	\$0	
Reagents/stabilizing agent	m2		#N/A	0	\$0	\$0	\$0	
Contour reclaimed area	m3		#N/A	0	\$0	\$0	\$0	
Type 2, heavy fuel and oil	drums		#N/A	155	\$0	\$0	\$0	
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER			#N/A					
supply geomembrane, HDPE, ES3, GCL	m2		#N/A	0	\$0	\$0	\$0	
upper and lower bedding layers	m3		#N/A	0	\$0	\$0	\$0	
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	\$0	\$0	\$0	
erosion protection layer	m3		#N/A	0	\$0	\$0	\$0	
vegetate	m2		#N/A	0	\$0	\$0	\$0	
install infiltration/seepage instrumentation	allow		#N/A	0	\$0	\$0	\$0	
other			#N/A	0	\$0	\$0	\$0	
OTHER			#N/A					
			#N/A	0	\$0	\$0	\$0	
Subtotal					\$0	0%	\$0	\$0
					Pct		Total	
					Land	Total Land	Water	

1 Water Management :

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost
A OBJECTIVE: WATER SUPPLY EMBANKMENT							
Toe buttress, drain mat'l	m3		#N/A	0	\$0	\$0	\$0
, fill mat'l A	m3		#N/A	0	\$0	\$0	\$0
, fill mat'l B	m3		#N/A	0	\$0	\$0	\$0
Rip rap	m3		#N/A	0	\$0	\$0	\$0
Vegetate	ha		#N/A	0	\$0	\$0	\$0
Breach dam	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
B OBJECTIVE: UPGRADE SPILLWAY							
Excavate channel, mat'l A	m3		#N/A	0	\$0	\$0	\$0
, mat'l B	m3		#N/A	0	\$0	\$0	\$0
Concrete	m3		#N/A	0	\$0	\$0	\$0
Rip rap	m3		#N/A	0	\$0	\$0	\$0
Other			#N/A	0	\$0	\$0	\$0
OBJECTIVE: BREACH EMBANKMENT							
remove fill	m3		#N/A	0	\$0	\$0	\$0
contour water intake area	m3		#N/A	0	\$0	\$0	\$0
E OBJECTIVE: STABILIZE SEDIMENT PONDS							
place soil cover	m3		#N/A	0.00	\$0	\$0	\$0
doze & spread excavated material	m3		#N/A	0	\$0	\$0	\$0
Vegetate, spread material	ha		#N/A	0	\$0	\$0	\$0
Rip rap in channel base	each		#N/A		\$0	\$0	\$0
F OBJECTIVE: BREACH DITCHES							
Excavate breaches	m3		#N/A	0	\$0	\$0	\$0
backfill/recontour	m3		#N/A	0	\$0	\$0	\$0
install flow dissipation	m3		#N/A	0	\$0	\$0	\$0
vegetate remainder of ditch	m2		#N/A	0	\$0	\$0	\$0

1 **Water Management :**

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost	
G OBJECTIVE: REMOVE PIPELINES			#N/A					
Remove pipes	m		#N/A	0	\$0	\$0	\$0	
Concrete plug deep pipes	m3		#N/A	0	\$0	\$0	\$0	
Other			#N/A	0	\$0	\$0	\$0	
H Groundwater Collection - Long-term Collection System			#N/A					
excavate/install sumps	m2		#N/A	0	\$0	\$0	\$0	
install pumping wells	m3		#N/A	0	\$0	\$0	\$0	
install pumps/pipelines/power supply			#N/A	0	\$0	\$0	\$0	
I OBJECTIVE: COLLECT DRAINAGE FOR TREATMENT			#N/A					
Excavate channel	m3		#N/A	0	\$0	\$0	\$0	
doze & spread excavated material	m3		#N/A	0	\$0	\$0	\$0	
Vegetate, spread material	ha		#N/A	0	\$0	\$0	\$0	
Rip rap in channel base	each		#N/A	0	\$0	\$0	\$0	
Construct contaminated water storage pond			#N/A					
Excavation	m3		#N/A	0	\$0	\$0	\$0	
supply geomembrane, HDPE, ES3, GCL	m2		#N/A	0	\$0	\$0	\$0	
upper and lower bedding layers	m3		#N/A	0	\$0	\$0	\$0	
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	\$0	\$0	\$0	
erosion protection layer	m3		#N/A	0	\$0	\$0	\$0	
J OBJECTIVE: TREAT DRAINAGE (see "ONGOING			#N/A					
Build treatment plant	LS		#N/A	0	\$0	\$0	\$0	
build sludge containment facility	LS		#N/A	0	\$0	\$0	\$0	
Subtotal					\$0	0%	\$0	\$0
						Pct Land	Total Land	Total Water

1

Mobilization:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost % Land	Land Cost	Water Cost
A MOBILIZE HEAVY EQUIPMENT							
Equipment to regional centre							
. Excavators	each		#N/A	150000	\$0	\$0	\$0
. Dump trucks	each		#N/A	50000	\$0	\$0	\$0
Dozers	each		#N/A	150000	\$0	\$0	\$0
Demolition shears	each		#N/A	200000	\$0	\$0	\$0
Crane	each		#N/A	0	\$0	\$0	\$0
Light duty vehicles	each		#N/A	0	\$0	\$0	\$0
. loader	each		#N/A	150000	\$0	\$0	\$0
. Other	each		#N/A	0	\$0	\$0	\$0
Equipment, regional centre to site							
. Excavators	km		#N/A	0.00	\$0	\$0	\$0
. Dump trucks	km		#N/A	0	\$0	\$0	\$0
Dozers	km		#N/A	0	\$0	\$0	\$0
Demolition shears	km		#N/A	0	\$0	\$0	\$0
Crane	km		#N/A	0	\$0	\$0	\$0
Light duty vehicles	km		#N/A	0	\$0	\$0	\$0
. loader	km		#N/A	0	\$0	\$0	\$0
. Other	km		#N/A	0	\$0	\$0	\$0
B MOBILIZE CAMP							
. allow			#N/A	100000	\$0	\$0	\$0
C MOBILIZE WORKERS							
crew travel time	andays		#N/A	600	\$0	\$0	\$0
. crew transportation	each		#N/A	0	\$0	\$0	\$0
D MOBILIZE MISC. SUPPLIES							
. Fuel	litre		#N/A	0.6	\$0	\$0	\$0

1

Mobilization:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost % Land	Land Cost	Water Cost	
Minor tools and equipment	allow		#N/A	100000	\$0	\$0	\$0	
Truck tires	allow		#N/A	50000	\$0	\$0	\$0	
Delivery	truck loads		#N/A	6033	\$0	\$0	\$0	
E WORKER ACCOMODATIONS			#N/A					
	manmths		#N/A	0	\$0	\$0	\$0	
F WINTER ROAD			#N/A			\$0	\$0	
3 year, const & operate section into Sna	km		#N/A	0	\$0	\$0	\$0	
Limited winter use	km		#N/A	0	\$0	\$0	\$0	
Winter road tariff, 20,000T x 222 km	km		#N/A	0.11	\$0	\$0	\$0	
G INTERIM CARE & MAINTENANCE			#N/A					
on-site caretaker	annual		#N/A	95000	\$0			
spring extra personnel	months		#N/A	23750	\$0			
fuel and misc. supplies	litre		#N/A	0.6	\$0			
electrician	each		#N/A	3300	\$0			
mechnaic	each		#N/A	3300	\$0			
pick-up truck	each		#N/A	15000	\$0			
small dozer	allow		#N/A	25000	\$0			
small excavator	allow		#N/A	0	\$0			
snow machine	allow		#N/A	3000	\$0			
communications	allow		#N/A	25000	\$0			
Water licence sampling & reporting	each		#N/A	450000	\$0			
Geotechnical assessment	each		#N/A	10000	\$0			
Other	each		#N/A	0	\$0			
			#N/A	&M cost	\$0			
Total C&M cost	years		#N/A	5	\$0	\$0	\$0	
Subtotal					\$0	0%	\$0	\$0

1

Mobilization:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land	Land Cost	Water Cost
						Pct Land	Total Land	Total Water

1 Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost
A OBJECTIVE: MONITORING & INSPECTIONS							
Annual geotechnical insp.	each		#N/A	\$0	\$0	\$0	\$0
Survey inspection	each		#N/A	\$0	\$0	\$0	\$0
Surface water sampling	each		#N/A	\$0	\$0	\$0	\$0
Groundwater Sampling	each		#N/A	\$0	\$0	\$0	\$0
Receiving/downstream water sampling	each		#N/A	\$0	\$0	\$0	\$0
Monitoring program as per plan	each		#N/A		\$0	\$0	\$0
on-site transportation	each		#N/A	\$0	\$0	\$0	\$0
transportation to site	each		#N/A	\$0	\$0	\$0	\$0
Other			#N/A	\$0	\$0	\$0	\$0
B OBJECTIVE: COVER MAINTENANCE			#N/A				
Repair erosion - infill gullies	allow		#N/A	\$0	\$0	\$0	\$0
Repair erosion - upgrade diversion ditch	allow		#N/A	\$0	\$0	\$0	\$0
Remove problem vegetation	allow		#N/A	\$0	\$0	\$0	\$0
Repair animal damage	allow		#N/A	\$0	\$0	\$0	\$0
Repair/upgrade access controls	allow		#N/A	\$0	\$0	\$0	\$0
Other			#N/A	\$0	\$0	\$0	\$0
C SPILLWAY MAINTENANCE			#N/A				
Repair erosion	m3		#N/A	\$0	\$0	\$0	\$0
Clear spillway	each		#N/A	\$0	\$0	\$0	\$0
Other			#N/A	\$0	\$0	\$0	\$0
D POST-CLOSURE WATER TREATMENT			#N/A				
Annual water treatment cost, from Ongoing water			#N/A		\$0	\$0	\$0
Subtotal, Annual post-closure costs					\$0	\$0	\$0

1 Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Water Cost	
Discount rate for calculation of net present value of post-closure			0.00%					
Number of years of post-closure activity			5 years					
Present Value of payment stream					\$0	\$0	\$0	
						Pct Land	Total Land	Total Water

A Unit Cost Estimator

Equipment Productivity Figures and Graphs have been reproduced from Caterpillar Performance Handbook - Edition 32

http://www.spec-check.com/kome

A10 EXCAVATION		
A11	PRODUCTIVITY	Cat 345 B
A12	bucket capacity	m3 2.4
A13	fill factor	% 75%
A14	cycle time	seconds 45
A15	operator skill	% 75%
A16	machine availability	% 83%
A17	Altitude adjustment	% 100%
A18	Hourly productivity	m3/hr 89.64
A19		
A20		
A21		
A22		
A23		
B OPERATING COSTS		
B10	use contractor supplied cost or insert cost components	
B11	Hourly rate - contractor supplied	\$150.00
B12	Excavation cost	1.67 \$/m3
B13		
B14		
B15	Cost of:	
B16	ownership, daily	\$/day
B17	maintenance	\$/hr
B18	fuel	\$/hr
B19	consumables (cutters, tires)	\$/hr
B20	operator	\$/hr
B21	total hourly cost	0 \$/hr
B22	Excavation cost	0.00 \$/m3

C Haul and Dumping		
C10	PRODUCTIVITY	769 rock truck
C11	Truck capacity	m3 24
C12		0
C13	Cycle time	
C14	load time	min. 6.0
C15	haul distance	km 1.5
C16	average velocity	km/hr 20.0
C17	haul time + return time	min. 9.0
C18	wait time	min. 0.5
C19	dump time	min. 1.0
C20	machine availability	% 83%
C21	Altitude adjustment	% 100%
C22		0 e. min/cycle 16.33
C23	Hourly productivity	m3/hr 88.2
D OPERATING COSTS		
D10	use contractor supplied cost or insert cost components	
D11	Hourly rate - contractor supplied	\$140.00
D12	Excavation cost	1.59 \$/m3
D13		
D14		
D15	Cost of:	
D16	ownership, daily	\$/day
D17	maintenance	\$/hr
D18	fuel	\$/hr
D19	consumables (cutters, tires)	\$/hr
D20	operator	\$/hr
D21	total hourly Cost	0 \$/hr
D22	Excavation cost	0.00 \$/m3

E Spreading - Dozing		
E10	PRODUCTIVITY	Cat D8
E11	Estimate production using example curves below or	m3/hr 600
E12	equivalent from other supplier	
E13	operator skill	0.75
E14	material type, see table	0.80
E15	slot dozing	1.00
E16	side by side dozing	1.00
E17	visibility	1.00
E18	job efficiency	0.83
E19	Altitude adjustment	1.00
E20	slope adjustment	1.00
E21		
E22		
E23	Hourly productivity	m3/hr 298.8
F OPERATING COSTS		
F10	use contractor supplied cost or insert cost components	
F11	Hourly rate - contractor supplied	\$190.00
F12	Excavation cost	0.64 \$/m3
F13		
F14		
F15	Cost of:	
F16	ownership, daily	\$/day
F17	maintenance	\$/hr
F18	fuel	\$/hr
F19	consumables (cutters, tires)	\$/hr
F20	operator	\$/hr
F21	total hourly Cost	0 \$/hr
F22	Excavation cost	0.00 \$/m3

Sum of costs for excavate load haul dump rock cover on tailings
 ripping in excavation area
 testing

3.90
 0.25
 0.2
 \$4.35 /m3

WATER TREATMENT COSTS

ANNUAL VOLUME OF WATER (m3) _____

Reagent addition rates

Reagent	kg reagent/m3 water	cost in \$/kg, FOB site	Annual reagent cost
H2O2	kg/m3		\$0
lime	kg/m3		\$0
ferric sulphate	kg/m3		\$0
ferrous sulphate	kg/m3		\$0
flocculents	kg/m3		\$0
TOTAL			\$0

Supplies and Labour

power, kW-hr	rate, \$/kW-hr	\$0
misc. supplies, hoses, tools		
sampling equip.		\$0
equip. maintenance and parts		\$0
water analysis reporting		\$0
truck rental		
air support		
communications		
road maintenace & snow plowing		\$0
electrician/mechanic for treatment plant & power supply		
Annual cost		\$0
labor, hourly rate	\$55.00	
men per day for water treatment work on site, days per year		0
		0

WATER TREATMENT COSTS

ANNUAL VOLUME OF WATER (m3)

spring/fall maintenance, extra work	
hours worked per year	0
annual labor cost	\$0
<hr/>	
Total, labour and supplies	\$0
<hr/>	
TOTAL ANNUAL COSTS, reagents + labour + supplies + site access	\$0
Average treatment cost, \$/m3	\$0.00

Water analyses	
samples per month	0
analysis cost/sample	110
shipping	220
Total Water Sampling	220

Site Access	
road	\$0
air	\$0
winter road	\$0
annual site access cost	\$0

Unit Cost Table

this version updated

May-11 2% added to all costs for inflation

for additional construction cost data check the associations below, or use the Estimator Worksheet

Alberta Road Builders & Heavy
Construction Association
BC Road Builders Blue Book
at : www.roadbuilders.bc.ca

ITEM	Detail	COST CODE	UNITS	LOW \$	HIGH \$	SPECIFIED \$	COMMENTS
excavate Rock, Bulk							
	drill, blast, load						
	short haul (<500m) Dump	RB1	m3	10.51	15.73	#N/A	quarry operations for bulk fill
	RB1 + long haul, up to 1500 m	RB2	m3	11.12	16.41	#N/A	
	RB1 + spread and compact	RB3	m3	11.12	16.41	#N/A	
	RB1 + long haul + spread and compact	RB4	m3	11.74	28.37	#N/A	
	RB1 + Specified activity	RBS	m3	12.0865	#N/A	#N/A	use low and add 10% premium for work done in winter
excavate Rock, Controlled							
	drill, blast, load						
	short haul (<500m) Dump	RC1	m3	26.01	37.08	#N/A	low - foundation excavation, high - spillway excavation
	RC1 + long haul, up to 1500 m	RC2	m3	11.74	16.97	#N/A	
	RC1 + spread and compact	RC3	m3	11.12	16.41	#N/A	
	RC1 + long haul + spread and compact	RC4	m3	12.47	17.67	#N/A	
	RC1 + Specified activity	RCS	m3	#N/A	#N/A	159.73	\$145/M3-drift excavation
excavate Soil, Bulk							
	clear & grub	SBC	m2	3.12	0.00		
	excavate, load						
	short haul (<500m) dump	SB1	m3	3.96	5.45	#N/A	LOW cost: excavation of loose soil, high volume
	SB1 + long haul, up to 1500 m	SB2	m3	4.47	6.71	#N/A	LOW cost: excavation of loose soil, 1.5 km haul, high volume
	SB1 + spread and compact	SB3	m3	4.16	5.97	#N/A	
	SB1 + long haul + spread and compact	SB4	m3	5.06	10.06	#N/A	LOW cost: excavation of loose soil, 1.5 km haul, high volume, const. of simple soil cover
	SB1 + Specified activity	SBS	m3	2.60	7.17	12.06	LOW cost: rehandle waste rock dump into pit, >500,000 m3, 2 km haul
	other			0.00	0.00	0.00	SPECIFIED cost: rehandle waste rock, haul 3 km, place & compact on dam
	Soil, tailings	SBT	m3	1.25	3.40	14.28	LOW cost: doze frost heaves HIGH cost: contour - wet or frozen, Specialized - haul/place wet infill
excavate Soil, Controlled							
	excavate, load						
	short haul (<500 m), dump	SC1	m3	6.30	8.60	#N/A	
	SC1 + long haul, up to 1500 m	SC2	m3	7.81	10.83	#N/A	
	SC1 + spread and compact	SC3	m3	6.30	13.10	#N/A	HIGH cost: for simple soil covers
	SC1 + long haul + spread and compact	SC4	m3	7.08	21.41	#N/A	HIGH cost: for complex covers & dam construction, spillway repair, LOW volume

Unit Cost Table

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May-11 2% added to all costs for inflation

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Alberta Road Builders & Heavy Construction Association

SC1 + Specified activity	SCS	m3	#N/A	22.89	17.35		SPECIFIED cost: backfill adit with waste rock, High - sand bedding layer for liners
Geo-synthetics							
geotextile, filter cloth	GST	M2	1.11	3.12	#N/A		high - FOB Yellowknife
geogrid	GSG	M2	5.31	0.00	#N/A		
liner, HDPE	GSHDPEM2		6.62	0.00	#N/A		
liner, ES3	GSES3	m2	18.62	0.00			low, FOB Yellowknife
liner, PVC	GSPVC	M2	0.00	0.00	#N/A		
geosynthetic installation	GSI	m2	0.93	13.01	#N/A		low, geotextile, high - ES3 or HDPE
bentonite soil ammendment	GSBA	tonne	284.28	321.36	#N/A		FOB Edmonton, add shipping & mixing
Shaft, Raise & Portal Closures							
Shaft & Raises	SR	m2	595.52	1966.36	#N/A		LOW cost: pre-cast concrete slabs, little site prep. HIGH cost: for hand construction, remote site
Portals	POR	m3	0.00	230.34	1101.60		HIGH cost: for excavate & backfill collapsed portal SPECIFIED cost: installed pressure plug
Concrete work							
Small pour, no forms	CS	m3	333.72	668.56	#N/A		
Large pour, no forms	CL	m3	264.05	393.27	#N/A		
Small pour, Formed	CSF	m3	393.27	1966.36	#N/A		
Large pour, Formed	CLF	m3	325.85	460.69	#N/A		
Vegetation							
Hydroseed, Flat	VHF	ha	1792.19	5561.98	#N/A		
Hydroseed, Sloped	VHS	ha	2076.47	6241.78	#N/A		
veg. Blanket/erosion mat	VB	ha	12359.95	14831.94	#N/A		
Tree planting	VT	ha	12359.95	14831.94	#N/A		
Wetland species	VW	ha	61799.76	92699.64	#N/A		
Pumps							
Small, <	PS	each	3370.90	6741.79	#N/A		
Large, >	PL	each	5618.16	112363.20	#N/A		large - 250 hp Gould w/diesel motor
PiPes							
Small, < 6 inch diameter	PPS	m	0.56	5.62	#N/A		LOW cost: pipe removal, HIGH cost: supply new pipe
Large, > 6 inch diameter	PPL	m	1.12	202.25	#N/A		LOW cost: pipe removal, HIGH cost: supply 24" 100 psi HDPE pipe, FOB

Unit Cost Table
for additional construction cost data check the associations below, or use the Estimator Worksheet

Alberta Road Builders & Heavy
 Construction Association

this version updated

May-11 2% added to all costs for inflation

						add shipping & installation
pump sand BackFill	BF	m3	6.18	18.54	#N/A	
Fence	F	m	12.48	187.27	#N/A	
Signs	S	each	12.36	37.08	#N/A	
rock, Drill and Blast only	DB	m3	12.36	24.72	#N/A	
excavate Rip Rap						
drill, blast, load short haul (<500 m) dump and spread	RR1	m3	12.30	18.37	#N/A	
RR1 + long haul	RR2	m3	12.47	19.05	#N/A	HIGH cost: quarry & place rip rap in channel
excavate rock from waste dump, short haul, spread	RR3	m3	4.72	6.49	#N/A	LOW cost: removal of 18 in minus from dump, long haul and spread
RR3 + long haul	RR4	m3	5.26	7.02	#N/A	
specified rip rap source	RR5	m3	#N/A	#N/A	#N/A	
Import LimeStone	ILS	tonne	9.89	14.83	#N/A	
Import LiMe	ILM	tonne	187.27	556.61	#N/A	LOW cost: bulk shipping, high volume, FOB Vancouver/Edmonton HIGH cost: bags delivered to central Yukon, small volume
Grouting	G	m3	218.12	264.38	#N/A	HIGH cost: cement, FOB Yellowknife
Dozing						
doze Rock piles	DR	m3	0.96	2.19	#N/A	LOW cost: doze crest off dump
doze overburden/Soil piles	DS	m3	0.88	3.49	#N/A	HIGH cost: push up to 300 m
		each	0	0	#N/A	
		each	0	0	#N/A	
Buildings - Decontaminate						
Chemicals	BDC	m3	#N/A	#N/A	#N/A	
Asbestos	BDA	m2	23.60	47.19	#N/A	LOW cost: removal of asbestos siding & flooring HIGH cost: removal of insulated pipes, friable
			0.00	0.00	0.00	
Buildings - Remove						
areas are per floor on 3 m average height			0.00	0.00	0.00	LOW cost: removal and on-site disposal - small wooden structures
Wood - teardown	BRW1	m2	24.16	37.08	#N/A	
Wood - burn	BRW2	m2	6.18	11.24	#N/A	high cost: wooden tent structures
Masonry	BRM	m2	26.57	37.08	#N/A	assumed 2 people and 3 hours per tent 21m2 I

Unit Cost Table this version updated May-11 2% added to all costs for inflation
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Alberta Road Builders & Heavy
Construction Association

Concrete	BRC	m	37.08	55.62	6.61
Steel - teardown	BRS1	m2	39.55	59.33	264.38
Steel - salvage	BRS2	m2	61.80	92.70	#N/A

Power & Pipe Lines

Power lines, remove	POWR	each	23.48	5191.18	#N/A
		kg	0.00	1.77	#N/A

Laboratory Chemicals

Remove from site	LCR	pallet	1966.36	2606.83	#N/A
Dispose on site	LCD	each	#N/A	#N/A	#N/A

PCB - Remove from site

PCBR	litre	37.08	43.26	#N/A
		0.00	0.00	0.00

LOW cost: shipping, handling & disposal from Yellowknife

Fuel

Remove from site	FR	kg	1.23	1.77	#N/A
Burn on site	FB	kg	#N/A	#N/A	#N/A

cost updated from helicopter and t

Oil

Remove from site	OR	litre	0.39	1.15	#N/A
Burn on site	OB	litre	0.39	0.62	#N/A

cost not changed

Process Chemicals

Remove from site	PCR	kg	0.39	2.30	#N/A
Dispose on site	PCD	kg	#N/A	#N/A	#N/A

Explosives

Remove from site	ER	kg	0	2.47	#N/A
Dispose on site	ED	kg	#N/A	#N/A	#N/A

Contaminated Soils

Remediate on site	CSR	m3	43.26	134.84	#N/A
environmental investigation	CSEI	each	2080.80	0.00	
consolidate & cover	Use cost code items		0	0	0.00
cover in place	Use cost code items		0	0	0.00

LOW cost: bio-remediate on-site. HIGH cost: ship off-site to landfill as haz. waste

assumed contaminated material to d

Mobilize Heavy Equipment

Unit Cost Table
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Road access	MHER	\$/km	3.16	9.46	2.26	SPECIFIED cost: \$/tonne/km in cargo plane SPECIFIED cost: helicopter cost, \$/hr of operation
Air access	MHEA	each	#N/A	#N/A	1514.7	
Mobilize Camp						
<20 persons Road access	MC<R	each	#N/A	#N/A	#N/A	
<20 persons Air access	MC<A	each	1530	#N/A	#N/A	cost of tents and equipment
Mobilize Workers						
mobilize	MM<	person	3121.20	6138.36	0.00	crew flight from yellowknife low:turbo beaver, high helicopter/twin otter
>20 persons	MM>	person	3121.20	6138.36	#N/A	used daily minimum - fuel not calculated
crew travel time	MTT	hr	39.33	42.66	0.00	
ACCoModation	ACCM	month	1483.19	2224.79	#N/A	LOW cost, accom in existing camp, per man, HIGH cost: - supply new camp removal of 20 kw generator 404 kg; 10 100lb propane
Mobilize Misc. Supplies	MMS	each	#N/A	#N/A	1473.90	
Winter Road	WR	km	1483.19	2943.92	1890.06	Speicalized winter road to 40,000 kg capacity
Visual site Inspection	VI	each	3955.18	7977.79	11016.00	
Survey site Inspection	SI	each	#N/A	#N/A	#N/A	
Water Sampling	WS	each	6179.98	10112.69	#N/A	
site inspection RePorT	RPT	each	#N/A	12359.95	#N/A	
Security Guard	SG	pers/mon	6179.98	8651.97	#N/A	
Maintain Pumping	MP	month	3707.99	#N/A	#N/A	
Clear SpillWay	CSW	each	2101.19	5932.78	#N/A	
Build Treatment Plant						
Small (< 1000 m3/d)	BTPS	lump sum	1123632	2247264	#N/A	
Large (> 1000 m3/d)	BTPL	lump sum	2247264	3932712	#N/A	
Operate Treatment Plant	OTP	m3	0.32585	1.853993	#N/A	
SCariFY road and install water breaks	SCFY	ha	3960.8	5561.978	1982.88 0.00	
Water Treatment Chemicals						
ferric sulphate	ferric	kg	0.75	0.00	0.00	
ferrous sulphate	ferrous	kg	0.49	0.00	0.00	
lime	lime	kg	0.34	0.00	0.00	
hydrogen peroxide, 50%	hperox	kg	1.61	0.00	0.00	

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Sodium Metabisulfate	Nametab	kg	1.11	0.00	0.00	
Caustic soda, 50%	caustic	kg	0.70	0.00	0.00	
Sulfuric acid, 93%	sulfuric	kg	0.29	0.00	0.00	
flocculant	flocc	kg	6.06	0.00	0.00	
copper sulphate	copper	kg	0.00	0.00	0.00	
typical shipping, to Whitehorse or Yellowknife		kg	0.08	0.00	0.00	
			0.00	0.00	0.00	
Typical Labour & Equipment Rates			0.00	0.00	0.00	updated may 2011
Site manager	Sman	\$/hr	77.11	88.13	0.00	
Mine superintendent	super	\$/hr	57.12	66.10	0.00	
Environmental coordinator	env-co	\$/hr	57.12	66.10	0.00	
Journeyman (mech, elec, weld)	trade	\$/hr	60.00	66.10	0.00	
surveyor/mech		\$/hr	63.75	0.00	0.00	
Equipment operator	oper	\$/hr	58.65	60.59	0.00	
labour - skilled	lab-s	\$/hr	65.00	41.86	46.97	specified - water treatment plant operator
labour - unskilled	lab-us	\$/hr	60.00	38.56	0.00	
Security / first aid	safety	\$/hr	38.66	52.88	0.00	
Admin.	admin	\$/hr	46.27	53.98	0.00	
			0.00	0.00	0.00	
Front end loader, ?, Cat992	loader	\$/hr	282.54	363.53	0.00	low - 988 loader, high - 992 loader
excavator, Cat325	excav	\$/hr	193.80	192.78	0.00	fuel and operator
dump truck - tandem	dumprt	\$/hr	0.00	0.00	0.00	
dump truck off road, Cat 777	dumppo	\$/hr	291.92	0.00	0.00	
dozer, D8, D10	dozer	\$/hr	229.50	330.48	0.00	fuel & oper. Incl.
smooth drum compactor, Cat CS563	comp	\$/hr	96.90	0.00	0.00	fuel & oper. Incl.
scooptram, 6 yd3 bucket	scoop	\$/hr	150.96	0.00	0.00	
flat bed truck with hiab	hiab		133.62	0.00	0.00	fuel & oper NOT included
certified mech with truck	\$hr		204.00	0.00	0.00	

about rate 37.8

win otter rates

epth of 30 cm 4.5 m³

RECLAMATION COST ESTIMATING MODEL (Version 6.1)

Prepared for:

Water Resources Division

Department of Indian Affairs and Northern Development (DIAND)

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