

Project Name:		Reclaim Model - Overview of Program
MGM - I78		All users are urged to read the Reclaim Model User Manual - Scroll down for overview description of program.
Important! Reclaim 7.0 works better with no other excel files open. If other excel files are open ignore run time error and proceed		
Reclaim Menu	The default Excel menu bar has an additional tab labelled "Add-Ins" that provides options specific to the Reclaim Model.	
Clear	This option deletes all input data and blanks out the project name. It also allows for segregation into land costs vs water costs if required.	
Unit Costs	This option opens a window of unit costs to provide easy reference. NOTE: the unit cost table has a filter in the 'UNITS' column. You can select to only see a particular unit (eg km) or multiple units (km and m3) or all units.	
Print All	This option prints the Summary Worksheet, Unit Cost Worksheet, and the individual component worksheets having non-zero balances. Individual worksheets can be printed directly using standard printing methods, such as Ctl - P.	
Quit	Select Quit to exit the program	
Help	Redirects user to Instructions worksheet.	
WorkSheets		
Summary	This worksheet contains a cumulative summary of costs for each component of the project. Associated costs such as engineering and project management are added as a percentage of the component costs.	
Components	Costs are derived for individual closure and reclamation activities by multiplying a "quantity" of activity by a "unit cost". An activity can be edited, added, or deleted from worksheet. However, care should be taken not to modify cells that are defined and used elsewhere in the program. Do not change the content or column width of the first column of each component worksheet.	
Unit Costs	This worksheet contains a look up table with costs for typical work associated with each closure and reclamation activity	
Limitations	The Reclaim Program will NOT work if the worksheets are changed such that the following requirements are not met. Please review the following prior to modifying worksheets.	
WorkSheet Names	<i>The names of the worksheets must not be changed.</i>	
Defined Names	Certain cells have defined names, which must not be changed. Where the cell is named, the name will appear in the "Name Box" to the left of the formula bar.	
First line of data	The first line of data for any component worksheet starts on line 4. Do not change the first line of a component worksheet, ie the component name.	
Adding Lines	You can add lines to components and the unit cost table, as long as they are not the last lines. The last line might fall outside the named ranges. You can check the size of the named range by selecting the name from the drop down box at the top left of the sheet. Usually this box has a cell reference, or a name.	
Printing	A component will only be printed if its sub-total is greater than zero. In addition, a component and the summary sheet cannot be printed if there is an error. Printing has been set to print 1 page per component.	
Conditions of Use	The Reclamation Cost Estimating Model was prepared to serve as a guide for Government Agencies, mining companies, and others to estimate the cost of mine reclamation. This model is not intended to replace reclamation planning or to be used to determine the activities required to reclaim a site or to dictate how much should be spent on reclamation. Reclaim was prepared by Brodie Consulting Ltd. on behalf of AANDC. AANDC and Brodie Consulting Ltd. are not responsible for the completeness or accuracy of any reclamation estimate made using this model. The user agrees to check and take responsibility for all aspects of any cost estimate made using this model.	

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
WELLS AND FACILITIES		\$175,000	\$0	\$175,000
BUILDINGS AND EQUIPMENT		\$0	\$0	\$0
CHEMICALS AND CONTAMINATED SOILD MANAGEMENT		\$5,423	\$0	\$5,423
SURFACE AND GROUNDWATER MANAGEMENT		\$0	-	\$0
INTERIM CARE AND MAINTENANCE		\$0	-	\$0
	SUBTOTAL: Capital Costs	\$180,423	\$0	\$180,423
	PERCENT OF SUBTOTAL		0%	100%

INDIRECT COSTS		COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION		\$468,500	\$0	\$468,500
POST-CLOSURE MONITORING AND MAINTENANCE		\$84,000	\$0	\$84,000
ENGINEERING (Includes PM, HSE)	2%	\$3,608	\$0	\$3,608
PROJECT MANAGEMENT	0%	\$0	\$0	\$0
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	0%	\$0	\$0	\$0
BONDING/INSURANCE	0%	\$0	\$0	\$0
CONTINGENCY (Estimates used are AFE quality)	0%	\$0	\$0	\$0
MARKET PRICE FACTOR ADJUSTMENT	0%	\$0	\$0	\$0
	SUBTOTAL: Indirect Costs	\$556,108	\$0	\$556,108

TOTAL COSTS		\$736,531	\$0	\$736,531
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Wells and Facilities

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost % Land	Land Cost	Water Cost
OBJECTIVE: ABANDONMENT OF WELLS				#N/A				
All wells- Drilled / Cased		m		WELAs	\$0.00	\$0	50%	\$0
Sweet Well - Completed / Active / Inactive		m	1	#N/A	\$75,000.00	\$75,000		\$75,000
Sour Well (H2S>1%) - Completed / Active / Inactive		m		#N/A	\$0.00	\$0		\$0
Vent Flow / Gas Migration				VFGMs	\$0.00	\$0	100%	\$0
Additional Completion Zones			4	#N/A	\$25,000.00	\$100,000		\$100,000
OBJECTIVE: ABANDONMENT OF PRODUCTION FACILITIES				#N/A				
Oil / bitumen process or injection / disposal facility		m3/day		#N/A	\$0.00	\$0		\$0
Gas processing facility		m3/day		#N/A	\$0.00	\$0		\$0
Gas dehydration facility		m3/day		#N/A	\$0.00	\$0		\$0
Compressor station		KW		#N/A	\$0.00	\$0		\$0
Battery sites		m3/day		#N/A	\$0.00	\$0		\$0
Battery sites w/ separation, compression, injection and/or disposal equipment		m3/day		#N/A	\$0.00	\$0		\$0
Satellite batteries		m3/day		#N/A	\$0.00	\$0		\$0
Other stations		ha		#N/A	\$0.00	\$0		\$0
Total						\$175,000		\$0
% of Total								0
								\$175,000
								100

1 Building / Equip Name:		Bldg / Equip #: 1							
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	%		Land Cost	Water Cost
				Cost		Cost	Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT				#N/A					
Decontaminate and ship off-site		each		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate, dispose on-site		each		#N/A	\$0.00	\$0		\$0	\$0
Other		each		MHERI	\$0.00	\$0	50%	\$0	\$0
OBJECTIVE: BUILDING DECONTAMINATION & HAZ. MATERIAL REMOVAL				#N/A					
Decontaminate, oil, fuel and glycol systems		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate, general		mandays		#N/A	\$0.00	\$0		\$0	\$0
Mechanical		mandays		#N/A	\$0.00	\$0		\$0	\$0
Electrical		mandays		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate maintenance shop		each		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate power plant		each		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate bulk fuel storage		each		#N/A	\$0.00	\$0		\$0	\$0
Decontaminate offices/warehouse/accum		each		#N/A	\$0.00	\$0		\$0	\$0
Removal of asbestos siding on buildings		each		#N/A	\$0.00	\$0		\$0	\$0
Removal of friable asbestos on equipment		each		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
OBJECTIVE: REMOVE BUILDINGS - ALL BUILDING AREAS SCALED TO ACCOUNT FOR HEIGHT				#N/A					
Accommodation Complex		m2		#N/A	\$0.00	\$0		\$0	\$0
Process Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0		\$0	\$0
Storage Facilites		m2		#N/A	\$0.00	\$0		\$0	\$0
Water and Wastewater Treatment Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0
U/G Heating Plant		m2		#N/A	\$0.00	\$0		\$0	\$0
Emulsion Plant		m2		#N/A	\$0.00	\$0		\$0	\$0
AN Storage Facility		m2		#N/A	\$0.00	\$0		\$0	\$0
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0		\$0	\$0
Storage Facility at Laydown/Airstrip		m2		#N/A	\$0.00	\$0		\$0	\$0
Fuel tanks		m2		#N/A	\$0.00	\$0		\$0	\$0
Fuel Tanks		m2		#N/A	\$0.00	\$0		\$0	\$0
Freshwater intake		m2		#N/A	\$0.00	\$0		\$0	\$0
Reclaim pumps		m2		#N/A	\$0.00	\$0		\$0	\$0
Outfall & Diffuser		m2		#N/A	\$0.00	\$0		\$0	\$0
Airstrip lighting, navigation, electrician		mandays		#N/A	\$0.00	\$0		\$0	\$0
Airstrip lighting, navigation, mechanical		mandays		#N/A	\$0.00	\$0		\$0	\$0
Consolidate & dump boneyard debris		m3		#N/A	\$0.00	\$0		\$0	\$0
other				#N/A	\$0.00	\$0		\$0	\$0
OBJECTIVE: BREAK BASEMENT SLABS				#N/A					
Accommodation Complex		m2		#N/A	\$0.00	\$0		\$0	\$0
Process Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0		\$0	\$0
Storage Facilites		m2		#N/A	\$0.00	\$0		\$0	\$0
Water and Wastewater Treatment Facilities		m2		#N/A	\$0.00	\$0		\$0	\$0
U/G Heating Plant		m2		#N/A	\$0.00	\$0		\$0	\$0
Emulsion Plant		m2		#N/A	\$0.00	\$0		\$0	\$0
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$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	\$0.00	\$0		\$0	\$0
Landfill disposal fee		tonne		#N/A	\$0.00	\$0		\$0	\$0
OBJECTIVE: GRADE AND CONTOUR				#N/A					
Accommodation Complex		ha		#N/A	\$0.00	\$0		\$0	\$0
Process Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0
Offices, Repair, Lab, Warehouse		ha		#N/A	\$0.00	\$0		\$0	\$0
Storage Facilites		ha		#N/A	\$0.00	\$0		\$0	\$0
Water and Wastewater Treatment Facilities		ha		#N/A	\$0.00	\$0		\$0	\$0
U/G Heating Plant		ha		#N/A	\$0.00	\$0		\$0	\$0
Emulsion Plant		ha		#N/A	\$0.00	\$0		\$0	\$0
Warehouse, Shops and Other		ha		#N/A	\$0.00	\$0		\$0	\$0
Place rock cover		m3		#N/A	\$0.00	\$0		\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	50%	\$0	\$0
Other				#N/A	\$0.00	\$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	\$0.00	\$0		\$0	\$0
Remove bridges		each		#N/A	\$0.00	\$0		\$0	\$0
Scarify and install water breaks		ha		#N/A	\$0.00	\$0		\$0	\$0
Scarify airstrip		ha		#N/A	\$0.00	\$0		\$0	\$0
Scarify laydown areas		ha		#N/A	\$0.00	\$0		\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
SPECIALIZED ITEMS				#N/A					
Dispose of misc. debris and laydown area refuse				#N/A	\$0.00	\$0		\$0	\$0
Total						\$0		\$0	\$0
% of Total								#DIV/0!	#DIV/0!

1 **Chemicals/Soil Area Name:**

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.

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	Land Cost	Water Cost
HAZARDOUS MATERIALS AUDIT			#N/A				
Phase 1 audit	each	0	#N/A	\$0.00	\$0	100%	\$0
Phase 2 audit	each	0	#N/A	\$0.00	\$0		\$0
CONSOLIDATE HAZARDOUS MATERIALS FOR REMOVAL			#N/A				
Waste oils	litre		#N/A	\$0.00	\$0		\$0
Fuel - Type 1, eg diesel dregs	litre		#N/A	\$0.00	\$0		\$0
Fuel - Type 1, eg gasoline dregs	litre		#N/A	\$0.00	\$0		\$0
Waste batteries	kg		#N/A	\$0.00	\$0		\$0
Assay & environmental lab reagents	kg		#N/A	\$0.00	\$0		\$0
Machine shop, paints, solvents etc	litre		#N/A	\$0.00	\$0		\$0
Contaminated soils - hydrocarbon	m3		CSRh	\$0.00	\$0	100%	\$0
Metal contam. soil at conc. load-out	m3		#N/A	\$0.00	\$0		\$0
Glycol	litre		#N/A	\$0.00	\$0		\$0
Nuclear sources	each		#N/A	\$0.00	\$0		\$0
HAZARDOUS MATERIALS			#N/A				
Transportation to disposal facility	included in well ABD cost.	allow	#N/A	\$0.00	\$0	100%	\$0
Disposal fees		allow	#N/A	\$0.00	\$0	100%	\$0
Other			#N/A	\$0.00	\$0		\$0
CONTAMINATED SOILS			#N/A				
Contam. soil investigation - technical	each		#N/A	\$0.00	\$0	100%	\$0
Contam. soil investigation - drilling & sampling	each		#N/A	\$0.00	\$0		\$0
CONTAMINATED SOIL REMOVAL			#N/A				
Contaminated soils - hydrocarbon	Well Centre Excavate During Cut and Cap	m2	10	#N/A	\$92.30	\$923	\$0
Metal contam. soil at conc. load-out		m3		#N/A	\$0.00	\$0	\$0
Load, haul, dump or doze	Landfill trucking and tipping.	m3	10	#N/A	\$250.00	\$2,500	\$0
Reagents/stabilizing agent		m2		#N/A	\$0.00	\$0	\$0
Contour reclaimed area	Backfill and contour	m3	10	#N/A	\$200.00	\$2,000	\$0
Type 2, heavy fuel and oil		m3		#N/A	\$0.00	\$0	\$0
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER			#N/A				
Supply geomembrane, HDPE, ES3, GCL		m2		#N/A	\$0.00	\$0	\$0
Upper and lower bedding layers		m3		#N/A	\$0.00	\$0	\$0
Install geomembrane, HDPE, ES3, GCL		m2		#N/A	\$0.00	\$0	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0	\$0
Vegetate		m2		#N/A	\$0.00	\$0	\$0
Install infiltration/seepage instrumentation		allow		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
OTHER			#N/A				
				Total	\$5,423	\$0	\$5,423
				% of Total		0	100

Capital Expenditures and Short Term Water Treatment

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
OBJECTIVE: STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS				#N/A		
Place soil cover		m3		#N/A	\$0.00	\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0
Rip rap in channel base		each		#N/A	\$0.00	\$0
OBJECTIVE: REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES				#N/A		
Excavate ditches -soil		m3		#N/A	\$0.00	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0
Stabilize side slopes		m3		#N/A	\$0.00	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0
OBJECTIVE: BREACH DITCHES				#N/A		
Excavate breaches		m3		#N/A	\$0.00	\$0
Backfill/recontour		m3		#N/A	\$0.00	\$0
Install flow dissipation		m3		#N/A	\$0.00	\$0
Vegetate remainder of ditch		m2		#N/A	\$0.00	\$0
OBJECTIVE: FRESH WATER SUPPLY				#N/A		
Breach embankment		m		#N/A	\$0.00	\$0
Remove pump		LS		#N/A	\$0.00	\$0
Remove pipeline		m		#N/A	\$0.00	\$0
OBJECTIVE: WATER CONTROL IN RECLAMATION QUARRY				#N/A		
Install pumping system		LS		#N/A	\$0.00	\$0
Remove pumping system		LS		#N/A	\$0.00	\$0
OBJECTIVE: REMOVE WATER PIPELINES				#N/A		
Remove pipes		m		#N/A	\$0.00	\$0
Concrete plug deep pipes		m3		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
OBJECTIVE: GROUNDWATER COLLECTION SYSTEM				#N/A		
Excavate/install sumps		m3		#N/A	\$0.00	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0
OBJECTIVE: CONSTRUCT CONTAMINATED WATER STORAGE POND				#N/A		
Excavate pond		m3		#N/A	\$0.00	\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0
Bedding layer		m3		#N/A	\$0.00	\$0
Supply geomembrane		m2		#N/A	\$0.00	\$0
Install geomembrane		m2		#N/A	\$0.00	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0
OBJECTIVE: CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)				#N/A		
Construct access roads		km		#N/A	\$0.00	\$0
install HDPE piping system from collection pond		m		#N/A	\$0.00	\$0
Inter-cell flow structures		allow		#N/A	\$0.00	\$0
Install liners		m2		#N/A	\$0.00	\$0
Install growth media		m3		#N/A	\$0.00	\$0
Wetland vegetation		ha		#N/A	\$0.00	\$0
OBJECTIVE: CONSTRUCT WATER TREATMENT PLANT				#N/A		
Build treatment plant		LS		#N/A	\$0.00	\$0
Build sludge containment facility		LS		#N/A	\$0.00	\$0
					Total	\$0

For cost of long-term/post-closure water treatment see "WATER TREATMENT" Worksheet"

1 Post-Closure Water Treatment

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
OBJECTIVE: ADDITION OF REAGENTS TO WTP				#N/A		
H2O2		kg		#N/A	\$0.00	\$0
lime		kg		#N/A	\$0.00	\$0
ferric sulphate		kg		#N/A	\$0.00	\$0
ferrous sulphate		kg		#N/A	\$0.00	\$0
flocculents		kg		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
OBJECTIVE: LABOUR AND SUPPLIES				#N/A		
Annual fuel		litres		#N/A	\$0.00	\$0
Annual power		kW-h		#N/A	\$0.00	\$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	\$0.00	\$0
Equipment maintenance and parts		allow		#N/A	\$0.00	\$0
Misc. supplies, hoses, tools		allow		#N/A	\$0.00	\$0
Communications		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
OBJECTIVE: WTP WATER SAMPLING AND ANALYSES				#N/A		
Sampling equipment		allow		#N/A	\$0.00	\$0
Analyses		allow		#N/A	\$0.00	\$0
Shipping to laboratory		allow		#N/A	\$0.00	\$0
Reporting		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
OBJECTIVE: SITE ACCESS				#N/A		
Road maintenance (incl. snow removal)		allow		#N/A	\$0.00	\$0
Winter road tariff		allow		#N/A	\$0.00	\$0
Truck rental		allow		#N/A	\$0.00	\$0
Air support		allow		#N/A	\$0.00	\$0
Annual water treatment costs						\$0
Number of years of water treatment		years	0			
Total water treatment costs						\$0

Interim Care and Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
INTERIM CARE & MAINTENANCE						
on-site caretaker		manmonths		#N/A	\$0.00	\$0 Captured in post closure
extra personnel		manmonths		#N/A	\$0.00	\$0
-electrician		manmonths		#N/A	\$0.00	\$0
-mechanic		manmonths		#N/A	\$0.00	\$0
annual fuel		litre		#N/A	\$0.00	\$0
misc. supplies		allow		#N/A	\$0.00	\$0
pick-up truck		each		#N/A	\$0.00	\$0
small dozer		allow		#N/A	\$0.00	\$0
small excavator		allow		#N/A	\$0.00	\$0
snow machine		allow		#N/A	\$0.00	\$0
communications		allow		#N/A	\$0.00	\$0
SNP/AEMP water sampling & reporting		each		#N/A	\$0.00	\$0
geotechnical assessment		each		#N/A	\$0.00	\$0
interim water treatment				#N/A	\$0.00	\$0
other		each		#N/A	\$0.00	\$0
				Annual Interim C&M Cost		\$0
Number of years of ICM		years	1	Total Cost		\$0

1 Post-Closure Monitoring & Maintenance

ACTIVITY/MATERIAL	Notes	Unit	Quantit	Cost	Unit Cost	Cost
		s	y	Code		
OBJECTIVE: MONITORING & INSPECTIONS				#N/A		
Annual geotechnical inspection		each		#N/A	\$0.00	\$0
Survey inspection	Consulting Fees, Veg Maintenance.	each	3	RPTI	\$20,000.00	\$60,000
Site water monitoring (soil testing)		Spec			\$0.00	\$0
- During pit flooding		each		#N/A	\$0.00	\$0
- Post pit flooding		each		#N/A	\$0.00	\$0
Air Quality Monitoring Program (AQMP)		each		#N/A	\$0.00	\$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	\$0.00	\$0
Vegetation Monitoring		each		#N/A	\$0.00	\$0
Other - Site inspection following summer	Annual Flights 3 Years		3	MWI	\$8,000.00	\$24,000
OBJECTIVE: SITE MAINTENANCE				#N/A		
Repair erosion - infill gullies		allow		#N/A	\$0.00	\$0
Repair erosion - upgrade diversion ditches		allow		#N/A	\$0.00	\$0
Remove problem vegetation		allow		#N/A	\$0.00	\$0
Repair animal damage		allow		#N/A	\$0.00	\$0
Repair/upgrade access controls		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SPILLWAY MAINTENANCE				#N/A		
Repair erosion		m3		#N/A	\$0.00	\$0
Clear spillway		each		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"				#N/A	\$0.00	\$0
<hr/>						
Subtotal, Annual post-closure costs						\$84,000
Discount rate for calculation of net present value of post-closure cost, %				0.00%		
Number of years of post-closure activity				1	years	
Present Value of payment stream						\$84,000

Mobilization/Demobilization

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT						
Excavators		each		#/N/A	0	\$0
Dump trucks		each		#/N/A	0	\$0
Dozers		each		#/N/A	0	\$0
Demolition shears		each		#/N/A	0	\$0
Crane		each		#/N/A	0	\$0
Loader		each		#/N/A	0	\$0
Compactor		each		#/N/A	0	\$0
Light duty vehicles		each		#/N/A	0	\$0
Other - program equipment	3 pieces reclamation equipment @ \$1000 each way from Tulita		3		1000	\$3,000
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#/N/A	0	\$0
Pipe shipping		m		#/N/A	0	\$0
Minor tools and equipment		allow		#/N/A	0	\$0
Truck tires		allow		#/N/A	0	\$0
Other				#/N/A	0	\$0
MOBILIZE CAMP						
Reclamation activities	Camp	allow	1	#/N/A	100000	\$100,000
Long term reclamation activities (eg pump flooding)		allow		#/N/A	0	\$0
MOBILIZE WORKERS						
Reclamation activities - transport	Included in abandonment and reclamation estimate	each	0	MWs	0	\$0
Reclamation activities - incl. travel time	Included in abandonment and reclamation estimate	manhours	0	Lab-usl	0	\$0
Long term reclamation activities (eg pump flooding) - transport		each		#/N/A	0	\$0
Long term reclamation activities (eg pump flooding) - travel time		each		#/N/A	0	\$0
Monitoring Airfare		each		#/N/A	0	\$0
WORKER ACCOMODATIONS						
Reclamation activities	Included in abandonment and reclamation estimate	manmonths	0	ACCMh	0	\$0
Long term reclamation activities (eg pump flooding)		manmonths		#/N/A	0	\$0
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre		#/N/A	0	\$0
Fuel freight - long reclamation activities		litre		#/N/A	0	\$0
Fuel freight accomodations		litre		#/N/A	0	\$0
WINTER ROAD						
Construction and operation	From Tulita to I-78. Ice road across river costs are higher than normal.	km	35	WRCI	7500	\$262,500
Limited winter use		km		#/N/A	0	\$0
Winter road tariff		km		#/N/A	0	\$0
DEMobilize OTHER INFRASTRUCTURE AND SITE EQUIPMENT						
Excavators		km		#/N/A	0	\$0
Dump trucks		km		#/N/A	0	\$0
Dozers		km		#/N/A	0	\$0
Demolition shears		km		#/N/A	0	\$0
Crane		km		#/N/A	0	\$0
Loader		km		#/N/A	0	\$0
Compactor		each		#/N/A	0	\$0
Light duty vehicles		km		#/N/A	0	\$0
Other - program equipment	3 pieces reclamation equipment @ \$1000 each way from Tulita		3		1000	\$3,000
DEMobilize CAMP						
	Camp	allow	1	#/N/A	100000	\$100,000
DEMobilize WORKERS						
crew travel time		mandays		#/N/A	0	\$0
crew transportation	Included in abandonment and reclamation estimate	each		MWs	100	\$0
WINTER ROAD						
Construction and operation		km		#/N/A	0	\$0
Limited winter use		km		#/N/A	0	\$0
Winter road tariff		km		#/N/A	0	\$0
Mobilization/Demobilization Cost						\$468,500

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW \$	HIGH \$	SPECIFIED \$	COMMENTS
Accommodation							
		ACCM	manday	100.00	175.00		
Buildings - Decontaminate							
	Asbestos	BDA	m2	25.60	51.20		Low: removal of asbestos siding & flooring; High: removal of insulated pipes, friable asbestos
Buildings - Remove							
	areas are per floor of 3 m average height						
	Wood	BRW	m2	27.50	41.00		
	Concrete	BRC	m2	40.00	65.00		
	Steel - teardown	BRS1	m2	45.00	65.00		
	Steel - for salvage	BRS2	m2	67.00	100.00		
Concrete work							
	Small pour	CSF	m3	426.50	639.75		Low: YK; High=1.5xLow
	Large pour	CLF	m3	353.50	530.25	2,130.00	Specified: concrete crown pillar
Contaminated Soils							
	Remediate on site	CSR	m3	47.00	146.00		
	Env. investigation Phase I/II	CSEI	each	25000.00			Low: small, "clean" site
Dozing							
	doze rock piles	DR	m3	1.05	2.40		Low cost: doze crest off dump
	doze overburden/soil piles	DS	m3	0.95	3.80		High cost: push up to 300 m
Excavate Rock; Low Spec's and QA/QC							
	drill/blast/load/short haul	RB1	m3	11.40	17.05		Low:quarry operations for bulk fill
	drill/blast/load/long haul	RB2	m3	12.05	17.80		
	RB1 + spread and compact	RB3	m3	12.05	17.80		
	RB2 + spread and compact	RB4	m3	12.70	30.75		
	Specified activity	RBS	m3				
Excavate Rock; High Spec's and QA/QC							
	drill/blast/load/short haul	RC1	m3				(e.g. ditch/spillway excavation)
	drill/blast/load/long haul	RC2	m3	12.70	18.40		Low:foundation excavation;High:spillway excavation
	RC1 + spread and compact	RC3	m3	12.70	18.40		e.g. cover construction
	RC2 + spread and compact	RC4	m3	13.50	19.20		e.g. cover construction
	Specified activity	RCS	m3			175.00	Specified-drift excavation
Excavate Rip Rap							
	drill/blast/load/short haul/place	RR1	m3	13.50	17.75		High: quarry & place rip rap in channel
	drill/blast/load/long haul/place	RR2	m3	13.50	20.65		
	source is waste dump/short haul	RR3	m3	5.20	7.00		
	source is waste dump/long haul	RR4	m3	5.70	7.60		
	specified rip rap source	RR5	m3				
Excavate Soil; Low Spec's and QA/QC							
	clear & grub	SBC	m2	3.40	5.00		
	excavate/load/short haul	SB1	m3	4.30	5.90		Low: non-engineered; High:engineered
	excavate/load/long haul	SB2	m3	4.30	7.30		Low: non-engineered; High:engineered
	SB1 + spread and compact	SB3	m3	4.50	6.50		
	SB2 + spread and compact	SB4	m3	5.50	11.00		
	Specified activity	SBS	m3	3.20	6.00		Low: rehandle waste rock dump by dozing; High:rehandle waste rock by hauling
	Tailings	SBT	m3	1.35	3.70	15.50	Low:doze frost heaves; High:contour surface - wet or frozen; Specified:haul/place wet infill
Excavate Soil, High Spec's and QA/QC							
	excavate/load/short haul	SC1	m3	6.80	9.30		
	excavate/load/long haul	SC2	m3	7.10	11.75		
	SC1 + spread and compact	SC3	m3	8.50	14.20		Low: non-engineered; High:engineered
	SC2 + spread and compact	SC4	m3	8.90	23.20		Low: non-engineered; High:engineered (e.g. complex covers, low volume dam construction)
	Specified activity	SCS	m3			18.80	Backfill adit with waste rock
Fence							
		FNC	m	13.55	203.00		
Fuel and Electricity							
	Fuel operating cost automotive	FOA	litre	1.05			
	automotive	FONA	litre	0.99	1.31		
	Fuel mobilization	FM	litre	0.22	0.42		High: winter road usage
	Electricity	FE	kW-h	0.17	0.19	0.49	Low and High:Yellowknife; Specified:diesel generator
Geo-Synthetics							
	geotextile	GST	m2	3.44			Supply and install
	geogrid	GSG	m2	5.75			
	liner, HDPE	GSHDPE	m2	7.95			Supply and install; large quantity
	liner, ES3	GSES3	m2	20.20			FOB Yellowknife
	geosynthetic installation	GSI	m2	3.16	14.00		Low:geotextile; High:ES3 or HDPE
	benetnite soil ammendment	GGBA	tonne	308.30	348.50		FOB Edmonton, add shipping & mixing
Grouting (/m3 of rock grouted)							
		grout	m3	236.55	286.75		High: cement, FOB Yellowknife
Labour & Equipment Rates							
	Manager	Sman	\$/hr	125.00			
	Superintendent		\$/hr	103.54			
	Registered engineer	Eng	\$/hr	220.00			
	Environmental coordinator	Envco	\$/hr	74.16			
	Electrician	Elec	\$/hr	74.00			
	Journeyman - various	Jour	\$/hr	71.79			
	Labour - skilled	Lab-s	\$/hr	49.60			
	Labour - unskilled	Lab-us	\$/hr	43.98	50.00		
	Equipment operator	oper	\$/hr	65.00	80.00		

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

Heavy duty mechanic	mech	\$/hr	72.85		
Water treatment plant operator	oper-wt	\$/hr	59.86		
Security / first aid	safety	\$/hr	66.97		
Administrative staff	admin	\$/hr	57.89		
Equipment rates include operator and fuel unless specified					
Loader - 4 cu.yd (3.06m3)	load-s	\$/hr	175.00		
Loader - 7 cu.yd (5.35m3)	load-l	\$/hr	315.00		
Excavator - 26.76-30.84 tonnes	exc-s	\$/hr	190.00		
Excavator - 68.95+tonnes	exc-l	\$/hr	420.00		
Grader	grad	\$/hr	190.00		
Dump truck off hwy 30-50 tonnes	truck-s	\$/hr	225.00		
Dump truck off hwy 55-75 tonnes	truck-l	\$/hr	300.00		
dozer, small	dozers	\$/hr	205.00	260.00	
dozer, large	dozerl	\$/hr	490.00	565.00	
smooth drum compactor	comp	\$/hr	155.00		
scooptram, 6 yd3 bucket	scoop	\$/hr	170.00		
flat bed truck with hiab	hiab	\$/hr	155.00		
fuel truck	ftruck	\$/hr	150.00		
water truck	wtruck	\$/hr	150.00		
Mobilize Heavy Equipment					
Road access	MHER	kmtonne	3.40	10.25	
Air access	MHEA	kmtonne	12		cargo rate>500lb
Mobilize Camp					
Road access	MCR	each	50000		refurbish existing camp
Mobilize Workers					
flight	MW	each	4500.00	9100.00	Low:e.g. 8 passenger; High: Dash 7
Oil Removal					
oil removal	OR	litre	0.43	1.20	Low:waste oil heater; High: ship offsite
PCB Removal					
Remove from site	PCBR	litre	40.20	46.90	Low: shipping, handling & disposal from Yellowknife
Pipes, small (<6in dia.)					
remove/dispose on site	PSR	m	1.00	24.00	Low: remove/dispose on site; High: remove/re-use
supply	PSS	m	6.10	11.10	Low:supply; High:supply and ship
install	PSI	m	25.00		
Pipes, large (>6in dia.)					
remove/dispose on site	PLR	m	22.00	72.00	Low: remove/dispose on site; High: remove/re-use
supply	PLS	m	129.00	143.00	Low:supply; High:supply and ship
install	PLI	m	50.00		
Power Lines					
remove/dispose on site	POWR	each	25.50		
Process Chemicals					
Remove from site	PCR	kg	0.45	2.50	
Pumps					
Pump capital cost	PCR	each	#####		
Pump shipping	PS	each	2500.00		
Pump maintenance	PM	each	20000.00		
Pump sand BackFill					
	BF	m3	85.00	300.00	
Scarify - road/mine site					
	SCFY	ha	4300	6030	2150
Shaft, Raise & Portal Closures					
Shaft & Raises	SR	m2	645	2132	Low:pre-cast concrete slabs, little site prep. Area=shaft+>1m all around
Portals	POR	m3	18.8	250	1200.00
Site Inspection Report					
	RPT	each	10000.00	20000.00	
SpillWay - Clear					
	CSW	each	3000.00	7000.00	
Survey/Instrumentation					
	SI	each	1800	3600	2 person crew
Treatment Plant - Construct					
Small (< 1000 m3/d)	BTPS	lump sum	1218600	2437300	
Large (> 1000 m3/d)	BTPL	lump sum	2437300	42650200	
Treatment Plant - Operate					
	OTP	m3	0.35	2	
Vegetation					
Hydroseed, Flat	VHF	ha	4000.00		
Hydroseed, Sloped	VHS	ha	6000.00		
veg. Blanket/erosion mat	VB	ha			
Tree planting	VT	ha			
Wetland species	VW	ha	50000.00	47.72	Specified= /m3, Wetland Growth Media Substrate mixed and installed (sand-local, biochar and fertilizer, woodchips-local)
Water Sampling/Analysis/Reporting					
	WS	each	7000.00	10000.00	
Water Treatment Chemicals					
ferric sulphate	ferric	kg	1.19		
ferrous sulphate	ferrous	kg	1.32		
lime	lime	kg	0.51		
hydrogen peroxide, 35%	hperox	kg	1.50		
Sodium Metabisulfate	Nametab	kg	1.18		
Caustic soda, 50%	caustic	kg	0.74		

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit				
Sulfuric acid, 93%	sulfuric	kg	0.31	
flocculant	flocc	kg	6.00	
copper sulphate	copper	kg		
shipping	shipping	kg	0.20	
Winter Road				
Construction	WRC	km	2000.00	11500.00
Usage	WRU	kmtonne	0.29	
Well Abandonment				
All wells - Drilled / Cased	WL	m	12500	-
Sweet Well - Completed / Active / Inactive				
	SWWL1	m	56600	0 - 1000 m
	SWWL2	m	71200	1000 - 2000 m
	SWWL3	m	88000	2000 - 3000 m
	SWWL4	m	104900	>3000 m
Sour Well (H2S > 1%) - Completed / Active / Inactive				
	SRWL1	m	74700	0 - 1000 m
	SRWL2	m	94400	1000 - 2000 m
	SRWL3	m	116500	2000 - 3000 m
	SRWL4	m	138600	>3000 m
Source Water Well				
	WWL1	m	5000	0 - 150 m
	WWL2	m	10000	151 - 300 m
	WWL3	m	30000	>300 m
Vent Flow / Gas Migration	VFGM	each	87200	-
Additional Completion Zones	ACZ	each		Add 30% per zone -
Facility Abandonment				
Oil / bitumen processing or injection / disposal facility				
	OBP1	m3/day	50000	0 - 50 m3/d
	OBP2	m3/day	100000	>50 m3 < 500 m3/d
	OBP3	m3/day	200000	>50 m3 < 3000 m3/d
	OBP4	m3/day	400000	>3000 m3/d
Gas processing facility				
	GPF1	m3/day	192900	0 - 999 e3m3/d
	GPF2	m3/day	372200	1000 - 2999 e3m3/d
	GPF3	m3/day	500700	3000 - 4999 e3m3/d
	GPF4	m3/day	638700	>5000 e3m3/d
Gas dehydration facility				
	GDF1	m3/day	53000	0 - 299 e3m3/d
	GDF2	m3/day	132500	300 - 1499 e3m3/d
	GDF3	m3/day	238700	>1500 e3m3/d
Compressor stations				
	CST1	KW	46600	0 - 599 KW
	CST2	KW	113600	600 - 2999 KW
	CST3	KW	210500	>3000 KW
Battery sites				
	BAT1	m3/day	46600	0 - 49 m3/d
	BAT2	m3/day	136400	50 - 499 m3/d
	BAT3	m3/day	244300	500 - 1500 m3/d
	BAT4	m3/day	353100	>1500 m3/d
Battery sites w/ separation, compression, injection and/or disposal equipment				
	BATS1	m3/day	71900	0 - 49 m3/d
	BATS2	m3/day	158800	50 - 499 m3/d
	BATS3	m3/day	296900	500 - 1500 m3/d
	BATS4	m3/day	406200	>1500 m3/d
Satellite batteries				
	SBAT1	m3/day	49600	0 - 99 m3/d
	SBAT2	m3/day	74400	>100 m3/d
Other stations	OST	each	39900	
H2S premium (>1%)	H2S	each		Add 10%
Legacy premium (Pre 1990)	LEG	each		Add 20%

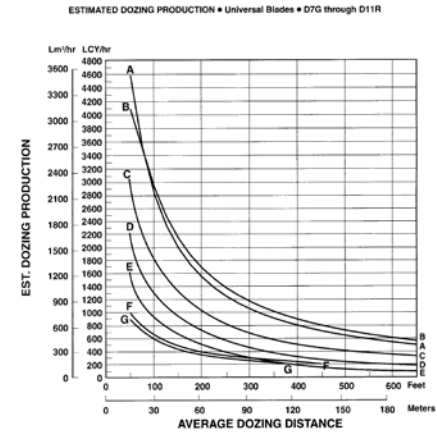
Unit Cost Estimator

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

EXCAVATION	
Productivity	
Machine Cat 345 B	
bucket capacity	2.4 m ³
fill factor	75% %
cycle time	45 seconds
operator skill	80% %
machine availability	83% %
altitude adjustment	100% %
Hourly productivity	95.62 m ³ /hr
Operating Costs	
- Contractor	
Contractor hourly rate	\$150.00 \$/hr
Excavation cost - contractor rate	1.57 \$/m ³
- Owner	
ownership, daily	\$/day
maintenance	\$/hr
fuel	\$/hr
consumables (cutters, tires)	\$/hr
operator	\$/hr
Owner hourly rate	\$0.00 \$/hr
Excavation cost - owner rate	\$0.00 \$/m ³
Excavation cost - select contractor or owner rate (D22 or D31)	\$/m ³

HAUL AND DUMPING	
Productivity	
Machine 769 rock truck	
truck capacity	24 m ³
fill factor	80% %
load time	6.0 min.
haul distance	1.5 km
average velocity	20.0 km/hr
haul time + return time	9.0 min.
wait time	0.5 min.
dump time	1.0 min.
cycle time	16.5 min.
machine availability	83% %
altitude adjustment	100% %
Hourly productivity	13.7 re. min/cycle
Hourly productivity	84.1 m ³ /hr
Operating Costs	
- Contractor	
Contractor hourly rate	\$140.00 \$/hr
Haul and Dump - contractor rate	1.66 \$/m ³
- Owner	
ownership, daily	\$/day
maintenance	\$/hr
fuel	\$/hr
consumables (cutters, tires)	\$/hr
operator	\$/hr
Owner hourly rate	\$0.00 \$/hr
Haul/Dumping Cost - owner rate	\$0.00 \$/m ³
Haul/Dumping Cost - select contractor or owner rate (I22 or I31)	\$/m ³

SPREADING/DOZING	
Productivity	
Machine Cat D8	
Estimate production using example curves provided or equivalent from other supplier	600 m ³ /hr
Correction factors (see table provided)	
operator skill	0.75
material type, see table	0.80
slot dozing	1.00
side by side dozing	1.00
visibility	1.00
job efficiency	0.83
altitude adjustment	1.00
slope adjustment	1.00
Hourly productivity	298.8 m ³ /hr
Operating Costs	
- Contractor	
Hourly rate - contractor supplied	\$190.00 \$/hr
Dozing - contractor rate	0.64 \$/m ³
- Owner	
ownership, daily	\$/day
maintenance	\$/hr
fuel	\$/hr
consumables (cutters, tires)	\$/hr
operator	\$/hr
Owner hourly rate	\$0.00 \$/hr
Spreading/Dozing Cost - owner rate	\$0.00 \$/hr
Spreading/Dozing Cost - select contractor or owner rate (N22 or N31)	\$/m ³



KEY
 A — D11R-11U
 B — D11R-CD
 C — D10R-10U
 D — D9R-9U
 E — D8R-DSR Series II-8U
 F — D7R Series II-7U
 G — D7G-7U

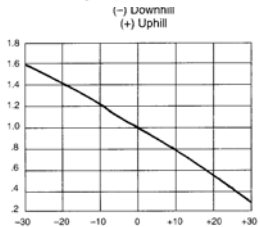
NOTE: This chart is based on numerous test studies made under varying job conditions. Refer to correction factors following these charts.

Excavator			
	Cat 320	Cat 325B	Cat 375
heaped bucket capacity, m ³	1.5	2.2	5.4
	Typical Cycle Times (seconds)		
easy dozing, shallow digging, s.m.	16	18	20
med. to hard digging, rocky soil, s.	23	23	25
tough digging, sandstone, caliche	27	29	35
Material	Fill Factor (% of heaped bucket capacity)		
Moist loam or sandy clay	100 - 110		
sand and gravel (not till)	95 - 110		
hard tough clay	80 - 90		
rock - well blasted	60 - 75		
rock - poorly blasted	40 - 60		
Operator Skill	poor	average	good
Correction factor	0.6	0.75	1
Machine availability	poor	average	good
Correction factor	0.9	0.95	1

Trucking			
	Cat 771 D	Cat 777D	Cat 789C
Truck capacity - heaped, m ³	27.5	60.5	137

Dozing		
	TRACK TYPE TRACTOR	WHEEL TYPE TRACTOR
OPERATOR —		
Excellent	1.00	1.00
Average	0.75	0.60
Poor	0.60	0.50
MATERIAL —		
Loose stockpile	1.20	1.20
Hard to cut, frozen —		
with tilt cylinder	0.80	0.75
without tilt cylinder	0.75	—
Hard to drive "head" (dry, non-cohesive material) or very sticky material	0.80	0.80
Rock, ripped or blasted	0.60-0.80	—
SLOT DOZING	1.20	1.20
SIDE BY SIDE DOZING	1.15-1.25	1.15-1.25
VISIBILITY —		
Dust, rain, snow, fog or darkness	0.80	0.70
JOB EFFICIENCY —		
50 min/hr	0.83	0.83
40 min/hr	0.67	0.67
BULLDOZER*		
Adjust based on SAE capacity relative to the blade blade used in the Estimated Dozing Production graphs.		
GRADES — See following graph.		

*NOTE: Angling blades and cushion tires are not considered production dozing tools. Depending on job conditions, the A-Blade and C-Blade will average 50-75% of straight blade production.



The functio

ons in this worksheet serve as a back up in the event that the menu item "Add-Ins" is

Save file before clearing all data

Shows both active worksheet as well as table of Unit Costs in a separate wi

Prints all worksheets except unit costs

Prints all worksheets

not shown

ndow

in Excel menu bar