



Attachment A-11

Financial Security

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
WELLS AND FACILITIES		\$1,308,278	\$0	\$1,308,278
BUILDINGS AND EQUIPMENT (Construction Execution)		\$605,725	\$605,725	\$0
CHEMICALS AND CONTAMINATED SOILD MANAGEMENT		\$60,000	\$60,000	\$0
SURFACE AND GROUNDWATER MANAGEMENT		\$0	-	\$0
INTERIM CARE AND MAINTENANCE		\$0	-	\$0
INFLATION - 0%	0.00%	\$0	\$0	\$0
	SUBTOTAL: Capital Costs	\$1,974,003	\$665,725	\$1,308,278
	PERCENT OF SUBTOTAL		34%	66%
INDIRECT COSTS		COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION/WORKER ACCOMODATIONS		\$766,920	\$258,641	\$508,279
POST-CLOSURE MONITORING AND MAINTENANCE		\$0	\$0	\$0
ENGINEERING	5%	\$98,700	\$33,286	\$65,414
PROJECT MANAGEMENT	5%	\$98,700	\$33,286	\$65,414
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	\$19,740	\$6,657	\$13,083
BONDING/INSURANCE	1%	\$19,740	\$6,657	\$13,083
CONTINGENCY	25%	\$493,501	\$166,431	\$327,069
CONTINGENCY - MOBILIZATION AND ACCOMODATIONS	25%	\$191,730	\$64,660	\$127,070
MARKET PRICE FACTOR ADJUSTMENT	0%	\$0	\$0	\$0
	SUBTOTAL: Indirect Costs	\$1,689,031	\$569,619	\$1,119,412
TOTAL COSTS		\$3,663,033	\$1,235,344	\$2,427,689

1 **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	1	WLS	\$12,500.00	\$12,500	\$0	\$12,500
Sweet Well - Completed / Active / Inactive		m	785	SWWL1S	\$1,650.67	\$1,295,778	\$0	\$1,295,778
Sour Well (H2S>1%) - Completed / Active / Inactive		m		#N/A	\$0.00	\$0	\$0	\$0
Vent Flow / Gas Migration				#N/A	\$0.00	\$0	\$0	\$0
Additional Completion Zones				#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: ABANDONMENT OF PRODUCTION FACILITIES				#N/A				
Oil / bitumen process or injection / disposal facility		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Gas processing facility		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Gas dehydration facility		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Compressor station		KW		#N/A	\$0.00	\$0	\$0	\$0
Battery sites		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Battery sites w/ separation, compression, injection and/or disposal equipment		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Satellite batteries		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Other stations		ha		#N/A	\$0.00	\$0	\$0	\$0
Total						\$1,308,278	\$0	\$1,308,278
% of Total							0	100

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

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost
OBJECTIVE: Construction Execution for Wellsite Access, Cut and Cap				#N/A				
Project Coordination for Construction, building access		each	1		\$137,725.00	\$137,725	100%	\$137,725
Fuel, Heavy Equipment, Personnel and Rental Equipment for Construction Execution		each	1		\$268,000.00	\$268,000	100%	\$268,000
Estimated costs to cut and cap well, fill cellar, and complete rollback.		each	1		\$200,000.00	\$200,000	100%	\$200,000
OBJECTIVE: BUILDING DECONTAMINATION & HAZ. MATERIAL REMOVAL				#N/A				
Decontaminate, oil, fuel and glycol systems		mandays		#N/A	\$0.00	\$0		\$0
Decontaminate, general		mandays		#N/A	\$0.00	\$0		\$0
Mechanical		mandays		#N/A	\$0.00	\$0		\$0
Electrical		mandays		#N/A	\$0.00	\$0		\$0
Decontaminate maintenance shop		each		#N/A	\$0.00	\$0		\$0
Decontaminate power plant		each		#N/A	\$0.00	\$0		\$0
Decontaminate bulk fuel storage		each		#N/A	\$0.00	\$0		\$0
Decontaminate offices/warehouse/accom		each		#N/A	\$0.00	\$0		\$0
Removal of asbestos siding on buildings		each		#N/A	\$0.00	\$0		\$0
Removal of friable asbestos on equipment		each		#N/A	\$0.00	\$0		\$0
Other				#N/A	\$0.00	\$0		\$0
OBJECTIVE: REMOVE BUILDINGS - ALL BUILDING AREAS SCALED TO ACCOUNT FOR HEIGHT				#N/A				
Accommodation Complex		m2		#N/A	\$0.00	\$0		\$0
Process Facilities		m2		#N/A	\$0.00	\$0		\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0		\$0
Storage Facilities		m2		#N/A	\$0.00	\$0		\$0
Water and Wastewater Treatment Facilities		m2		#N/A	\$0.00	\$0		\$0
U/G Heating Plant		m2		#N/A	\$0.00	\$0		\$0
Emulsion Plant		m2		#N/A	\$0.00	\$0		\$0
AN Storage Facility		m2		#N/A	\$0.00	\$0		\$0
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0		\$0
Storage Facility at Laydown/Airstrip		m2		#N/A	\$0.00	\$0		\$0
Fuel tanks		m2		#N/A	\$0.00	\$0		\$0
Fuel Tanks		m2		#N/A	\$0.00	\$0		\$0
Freshwater intake		m2		#N/A	\$0.00	\$0		\$0
Reclaim pumps		m2		#N/A	\$0.00	\$0		\$0
Outfall & Diffuser		m2		#N/A	\$0.00	\$0		\$0
Airstrip lighting, navigation, electrician		mandays		#N/A	\$0.00	\$0		\$0
Airstrip lighting, navigation, mechanical		mandays		#N/A	\$0.00	\$0		\$0
Consolidate & dump boneyard debris		m3		#N/A	\$0.00	\$0		\$0
other				#N/A	\$0.00	\$0		\$0
OBJECTIVE: BREAK BASEMENT SLABS				#N/A				
Accommodation Complex		m2		#N/A	\$0.00	\$0		\$0
Process Facilities		m2		#N/A	\$0.00	\$0		\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0		\$0
Storage Facilities		m2		#N/A	\$0.00	\$0		\$0
Water and Wastewater Treatment Facilities		m2		#N/A	\$0.00	\$0		\$0
U/G Heating Plant		m2		#N/A	\$0.00	\$0		\$0
Emulsion Plant		m2		#N/A	\$0.00	\$0		\$0
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0		\$0
Other				#N/A	\$0.00	\$0		\$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE				#N/A				
Place soil cover		m3		#N/A	\$0.00	\$0		\$0
Vegetate		ha		#N/A	\$0.00	\$0		\$0
Landfill disposal fee		tonne		#N/A	\$0.00	\$0		\$0
OBJECTIVE: GRADE AND CONTOUR				#N/A				
Accommodation Complex		ha		#N/A	\$0.00	\$0		\$0
Process Facilities		ha		#N/A	\$0.00	\$0		\$0
Offices, Repair, Lab, Warehouse		ha		#N/A	\$0.00	\$0		\$0
Storage Facilities		ha		#N/A	\$0.00	\$0		\$0
Water and Wastewater Treatment Facilities		ha		#N/A	\$0.00	\$0		\$0
U/G Heating Plant		ha		#N/A	\$0.00	\$0		\$0
Emulsion Plant		ha		#N/A	\$0.00	\$0		\$0
Warehouse, Shops and Other		ha		#N/A	\$0.00	\$0		\$0
Place rock cover		m3		#N/A	\$0.00	\$0		\$0
Vegetate		ha		#N/A	\$0.00	\$0		\$0
Other				#N/A	\$0.00	\$0		\$0
OBJECTIVE: LINED SUMPS				#N/A				
Puncture liner and place soil cover		m3		#N/A	\$0.00	\$0		\$0
OBJECTIVE: RECLAIM ROADS				#N/A				
Remove culverts		each		#N/A	\$0.00	\$0		\$0
Remove bridges		each		#N/A	\$0.00	\$0		\$0
Scarify and install water breaks		ha		#N/A	\$0.00	\$0		\$0
Scarify airstrip		ha		#N/A	\$0.00	\$0		\$0
Scarify laydown areas		ha		#N/A	\$0.00	\$0		\$0
Vegetate		ha		#N/A	\$0.00	\$0		\$0
Other				#N/A	\$0.00	\$0		\$0
SPECIALIZED ITEMS				#N/A				
Dispose of misc. debris and laydown area refuse				#N/A	\$0.00	\$0		\$0
Total						\$605,725	\$605,725	\$0
% of Total							100	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		#N/A	\$0.00	\$0	\$0	\$0
Phase 2 audit	each		#N/A	\$0.00	\$0	\$0	\$0
CONSOLIDATE HAZARDOUS MATERIALS FOR REMOVAL			#N/A				
Waste oils	litre		#N/A	\$0.00	\$0	\$0	\$0
Fuel - Type 1, eg diesel dregs	litre		#N/A	\$0.00	\$0	\$0	\$0
Fuel - Type 1, eg gasoline dregs	litre		#N/A	\$0.00	\$0	\$0	\$0
Waste batteries	kg		#N/A	\$0.00	\$0	\$0	\$0
Assay & environmental lab reagents	kg		#N/A	\$0.00	\$0	\$0	\$0
Machine shop, paints, solvents etc	litre		#N/A	\$0.00	\$0	\$0	\$0
Contaminated soils - hydrocarbon	m3		#N/A	\$0.00	\$0	\$0	\$0
Metal contam. soil at conc. load-out	m3		#N/A	\$0.00	\$0	\$0	\$0
Glycol	litre		#N/A	\$0.00	\$0	\$0	\$0
Nuclear sources	each		#N/A	\$0.00	\$0	\$0	\$0
HAZARDOUS MATERIALS			#N/A				
Transportation to disposal facility	allow		#N/A	\$0.00	\$0	\$0	\$0
Disposal fees	allow		#N/A	\$0.00	\$0	\$0	\$0
Other			#N/A	\$0.00	\$0	\$0	\$0
CONTAMINATED SOILS			#N/A				
Contam. soil investigation - technical	each		#N/A	\$0.00	\$0	\$0	\$0
Environmental Monitoring - Flux	each	1		\$60,000.00	\$60,000	100%	\$60,000
Rec. Aerial Monitoring by Helicopter	each			\$0	\$0	100%	\$0
Contam. soil investigation - drilling & sampling	each		CSEIS	\$25,000.00	\$0	100%	\$0
CONTAMINATED SOIL REMOVAL			#N/A				
Contaminated soils - hydrocarbon	TBD	m2	#N/A	\$0.00	\$0	\$0	\$0
Metal contam. soil at conc. load-out	TBD	m3	#N/A	\$0.00	\$0	\$0	\$0
Load, haul, dump or doze	TBD	m3	#N/A	\$0.00	\$0	\$0	\$0
Reagents/stabilizing agent	TBD	m2	#N/A	\$0.00	\$0	\$0	\$0
Contour reclaimed area	TBD	m3	#N/A	\$0.00	\$0	\$0	\$0
Type 2, heavy fuel and oil	TBD	m3	#N/A	\$0.00	\$0	\$0	\$0
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER			#N/A				
Supply geomembrane, HDPE, ES3, GCL	m2		#N/A	\$0.00	\$0	\$0	\$0
Upper and lower bedding layers	m3		#N/A	\$0.00	\$0	\$0	\$0
Install geomembrane, HDPE, ES3, GCL	m2		#N/A	\$0.00	\$0	\$0	\$0
Erosion protection layer	m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate	m2		#N/A	\$0.00	\$0	\$0	\$0
Install infiltration/seepage instrumentation	allow		#N/A	\$0.00	\$0	\$0	\$0
Other			#N/A	\$0.00	\$0	\$0	\$0
OTHER			#N/A				
			#N/A	\$0.00	\$0	\$0	\$0
				Total	\$60,000	\$60,000	\$0
				% of Total		100	0

1 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				
Total water treatment costs						\$0

1 Interim Care and Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
INTERIM CARE & MAINTENANCE				#N/A		
on-site caretaker		manmonths		#N/A	\$0.00	\$0
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		Total Cost		\$0

1 Post-Closure Monitoring & Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantit y	Cost Code	Unit Cost	Cost
OBJECTIVE: MONITORING & INSPECTIONS				#N/A		
Annual geotechnical inspection		each		#N/A	\$0.00	\$0
Survey inspection		each		#N/A	\$0.00	\$0
Site water monitoring (AEMP and SNP)		each		#N/A	\$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 (Aerial Monitoring by Helicopter)		each	1	#N/A	#####	\$15,000
Contam. soil investigation - drilling & sampling		each	1	#N/A	#####	\$25,000
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
Subtotal, Annual post-closure costs						\$40,000
Discount rate for calculation of net present value of post-closure cost, %				0.00%		
Number of years of post-closure activity				0	years	
Present Value of payment stream						\$0

1 Mobilization/Demobilization

ACTIVITY/MATERIAL	Notes	Unit	Quantit	Cost	Unit Cost	Cost
		s	y	Code		
MOBILIZE HEAVY EQUIPMENT						
Heavy Equipment		each	1	#N/A	11520	\$11,520
Rental Equipment		each	1		4320	\$4,320
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
Mobilize Environmental Drilling Rig		each		TBD	0	\$0
Drilling Rig		each	1		418300	\$418,300
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		allow	1		34560	\$34,560
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	\$0
MOBILIZE WORKERS						
Reclamation activities - transport		each	1	MWS	6800	\$6,800
Reclamation activities - travel time		manhours		#N/A	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						
Construction activities - camp		Nightly Camp rate	210	#N/A	864.2857	\$181,500
Construction activities - hotels for travel days		Nightly	12	#N/A	160	\$1,920
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		km	3.3	WRCS	17454.545	\$57,600
Limited winter use		km		WRUS	0.29	\$0
Winter road tarriff		km		#N/A	0	\$0
DEMOBILIZE OTHER INFRASTRUCTURE AND SITE EQUIPMENT						
Heavy Equipment		each	1	#N/A	11520	\$11,520
Rental Equipment		each	1	#N/A	4320	\$4,320
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		km		#N/A	0	\$0
DEMOBILIZE CAMP						
		allow	1		34560	\$34,560
DEMOBILIZE WORKERS						
crew travel time		mandays		#N/A	0	\$0
crew transportation		each		#N/A	0	\$0
WINTER ROAD						
Construction and operation		km		#N/A	0	\$0
Limited winter use		km		#N/A	0	\$0
Winter road tarriff		km		#N/A	0	\$0
Mobilization/Demobilization Cost						\$766,920

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		25,000.00	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		
	excavate/load/long haul	SB2	m3	4.30	7.30		
	SB1 + spread and compact	SB3	m3	4.50	6.50		Low: non-engineered; High:engineered
	SB2 + spread and compact	SB4	m3	5.50	11.00		Low: non-engineered; High:engineered
	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
	bentonite soil ammendment	GSBA	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		
	Heavy duty mechanic	mech	\$/hr	72.85			

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

Filter by unit

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	6800.00
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	
supply	PSS	m	6.10	11.10	
install	PSI	m	25.00		
Low: remove/dispose on site; High: remove/re-use					
Low:supply; High:supply and ship					
Pipes, large (>6in dia.)					
remove/dispose on site	PLR	m	22.00	72.00	
supply	PLS	m	129.00	143.00	
install	PLI	m	50.00		
Low: remove/dispose on site; High: remove/re-use					
Low:supply; High:supply and ship					
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	
Portals	POR	m3	18.8	250	1200.00
Low:pre-cast concrete slabs, little site prep. Area=shaft+>1m all around					
Low:unit cost code SCS;High:excavate & backfill collapsed portal;Spec: installed pressure plug					
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		
Sulfuric acid, 93%	sulfuric	kg	0.31		
flocculant	flocc	kg	6.00		

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

Filter by unit

copper sulphate	copper	kg			
shipping	shipping	kg	0.20		
Winter Road					
Construction	WRC	km	2000.00	11500.00	17454.55
Usage	WRU	kmtonne	0.29		0.29
Well Abandonment					
All wells - Drilled / Cased	WL	m		12500	-
Sweet Well - Completed / Active / Inactive	SWWL1	m		1651	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%

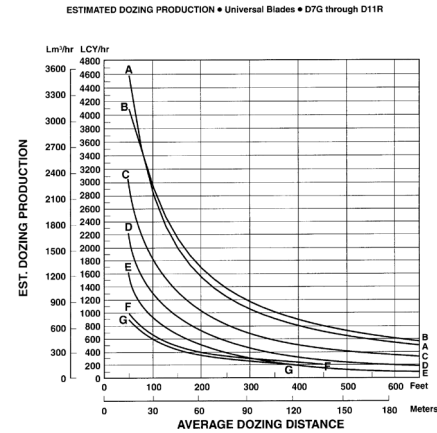
Unit Cost Estimator

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 ae. min/cycle 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
Spreading/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
Spreading/Dozing Cost - owner rate	\$0.00 \$/hr
Spreading/Dozing Cost - select contractor or owner rate (N22 or N31)	\$/m ³



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 dozing, s.m.	16	18	20
med. to hard digging, rocky soil, s.	23	23	25
tough dozing, sandstone, caliche	27	29	35
Material	Fill Factor (% of heaped bucket capacity)		
Moist loam or sandy clay	100 - 110		
sand and gravel (not fill)	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		
JOB CONDITION CORRECTION FACTORS		
	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 lift cylinder	0.80	0.75
without lift cylinder	0.70	—
Hard to dig; "dead" (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 base 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 grade production.

