

APPENDIX E

COST ESTIMATE

1.	SITE PREPARATION	
	a. Grubbing - 18.5 Acres @ \$350.00 Acre	\$ 6,475.00
	b. Excavation	
	(1) Channel - 11,407 C.Y. @ \$2.00 C.Y.	22,814.00
	(2) General - 46,503 C.Y. @ \$1.00 C.Y.	46,503.00
2.	STONE BASE & PAVING	
	a. Access Road - 533 S.Y. @ \$3.25 S.Y.	1,732.00
	b. Parking Area - 963 S.Y. @ \$3.25 S.Y.	3,130.00
3.	FABRIFORM MATTRESS	
	a. Spillway Channel	67,300.00
	b. Drainage Channel	9,480.00
	c. Lagoons	9,088.00
4.	BRIDGE	21,000.00
5.	CONCRETE - 4,816 C.Y. @ \$100.00 C.Y.	481,600.00
6.	SLUDGE LINE - (Pipe, Valves, Fittings)	445,175.00
7.	RAILROAD CROSSING	8,000.00
8.	HIGHWAY CROSSING	3,500.00
9.	YARD PIPING	92,095.00
10.	MECHANICAL EQUIPMENT	250,000.00
	a. (2) Flash Mixers	
	b. (8) Slow Mixers	
	c. (2) Aerators	
	d. (2) 115' Dia. Sedimentation Basins	
	e. (2) Underflow Pumps	
	f. (1) 75' Dia. Sludge Thickener	
	g. (1) Pump for Sludge Thickener	
	h. (2) 56' Dia. Reactor Clarifiers	

11. SAND FILTERS	\$ 77,000.00
12. SLUDGE PUMPS - (2) Required	20,000.00
13. CHLORINATION EQUIPMENT	25,000.00
14. ELECTRICAL EQUIPMENT	100,000.00
15. KITTANNING RUN INTAKE STRUCTURE	12,000.00
16. CHEMICAL FEED EQUIPMENT	40,000.00
17. MEHCANICAL PIPING	150,000.00
18. PUMPING EQUIPMENT	50,000.00
19. CONTROL BUILDING	225,000.00
20. CONTROL EQUIPMENT	100,000.00
21. RECARBONATION EQUIPMENT	6,000.00
22. CONTINGENCIES & OMISSIONS	<u>227,108.00</u>
TOTAL	\$2,500,000.00

APPENDIX F
ESTIMATE OF
ANNUAL OPERATING COSTS
WATER TREATMENT FACILITIES

Labor	\$ 54,500.00
Chemicals	200,000.00
Power	26,750.00
Maintenance	12,000.00
Materials & Supplies	2,500.00
Telephone	650.00
Heating	3,600.00
Contingencies	<u>15,000.00</u>
ESTIMATED ANNUAL OPERATING COSTS	\$315,000.00

The above Cost Estimate was based upon an average flow of 9.0 MGD to the mine drainage treatment facilities and an average flow of 5.0 MGD to the potable water treatment facilities.

APPENDIX F (Continued)

CHEMICAL COSTS

WATER TREATMENT FACILITIES

Chemical Costs - Neutralization

Average Lime Dosage - 175 mg/l.
 Pebble Lime Cost - \$15.50/ton

Average Dosage/1000 gallons treated =
 $(175 \text{ mg/l} \times 8.34\#/\text{gallon}) \div 1000 = 1.46\#/1000 \text{ gallons}$

Cost/1000 gallons treated =
 $1.46\#/1000 \text{ gallons} \times \$15.50/2000 \text{ lbs.} = \underline{\$0.01/1000 \text{ gallons treated}}$

Chemical Costs - Softening

<u>Chemical</u>	<u>Average Dosage</u>	<u>Cost</u>
Lime	25 mg/l	\$15.50/Ton
Soda Ash	Varied	\$ 1.55/100 lbs.
Coagulant Aid	2 mg/l	\$ 2.00/lb.
Chlorine	2 mg/l	\$ 7.50/100 lbs.

Lime: $(25 \text{ mg/l} \times 8.34) \div 1000 = 0.208\#/1000 \text{ gallons}$
 $0.208\#/1000 \text{ gallons} \times \$0.00775/\# = \underline{\$0.002/1000 \text{ gallons treated}}$

Coagulant Aid: $(2 \text{ mg/l} \times 8.34) \div 1000 = 0.0167\#/1000 \text{ gallons}$
 $0.0167\#/1000 \text{ gallons} \times \$2.00/\# = \underline{\$0.033/1000 \text{ gallons treated}}$

Chlorine: $(2.0 \text{ mg/l} \times 8.34) \div 1000 \text{ gallons} = 0.016\#/1000 \text{ gallons}$
 $0.016\#/1000 \text{ gallons} \times \$0.075/\# = \underline{\$0.001/100 \text{ gallons treated}}$

Soda Ash/100 mg/l required:
 $(100 \text{ mg/l} \times 8.34) \div 1000 \text{ gallons} = 0.834\#/1000 \text{ gallons}$
 $0.834\#/1000 \text{ gallons} \times \$0.0155/\# = \underline{\$0.013/1000 \text{ gallons treated}}$

COST/1000 GALLONS TREATED - LIME & SODA SOFTENING

<u>Soda Ash Dosage (mg/l)</u>	<u>Chemical Costs Softening</u>	<u>Chemical Costs Chlorine</u>	<u>Chemical Costs Neutralization</u>	<u>Chemical Costs Treatment Facilities</u>	<u>Residual Hardness</u>
300	\$0.074	\$0.001	\$0.01	\$0.085	160
500	0.100	0.001	0.01	0.111	80
700	0.126	0.001	0.01	0.137	60
900	0.152	0.001	0.01	0.163	52
1100	0.178	0.001	0.01	0.189	48

COST/1000 GALLONS TREATED - ION EXCHANGE

<u>Chemical Costs Ion Exchange Process</u>	<u>Chemical Costs Chlorine</u>	<u>Chemical Costs Neutralization</u>	<u>Chemical Costs Treatment Facilities</u>	<u>Residual Hardness</u>
0.117	\$0.001	\$0.01	\$0.128	50