

RIVER ROCK COUNTY WATER & SEWER DISTRICT
Annual Replacement & Operation/Maintenance Cost Estimate
 July 21, 2011

REPLACEMENT COSTS

OPERATING COSTS

MEMBRANE REPLACEMENT	
Item	Value
Number of membrane elements proposed in MBR System (MN)	96
Membrane replacement life (ML) in years	6
Membrane replacement price (MP)	\$1,200
Total Present Cost (PC) = MN x MP	\$115,200
Future Cost of Membrane Replacement = PC x 1.2653 ¹⁾ (FC)	\$145,763
Annual Cost of Membrane Replacement = FC x .147²⁾	\$21,427

- 1) Assumes 4% Inflation over 6 years
 2) Assumes 5% Rate of Return over 6 years

BLOWER REPLACEMENT	
Item	Value
Number of blowers proposed (BN)	5
Blower replacement life (BL) in years	20
Blower replacement price (BP)	\$18,220
Total Present Cost (PC) = BN x BP	\$91,100
Future Cost of Blower Replacement = PC x 2.19 ¹⁾ (FC)	\$199,509
Annual Cost of Blower Replacement = FC x .0302²⁾	\$6,025

- 1) Assumes 4% Inflation over 20 years
 2) Assumes 5% Rate of Return over 20 years

PUMP REPLACEMENT	
Item	Value
Number of pumps proposed (PN)	7
Pump replacement life (PL) in years	20
Pump replacement price (PP)	\$30,000
Total Present Cost (PC) = PN x PP	\$210,000
Future Cost of Pump Replacement = PC x 2.19 ¹⁾ (FC)	\$459,900
Annual Cost of Pump Replacement = FC x .0302²⁾	\$13,889

- 1) Assumes 4% Inflation over 20 years
 2) Assumes 5% Rate of Return over 20 years

LINER REPLACEMENT	
Item	Value
Number of liners proposed (LN)	2
Total square footage of each liner (LF)	75,000
Liner replacement life (LL) in years	20
Liner replacement price (LP)	\$1.25
Total Present Cost (PC) = LN x LF x LP	\$187,500
Future Cost of Liner Replacement = PC x 2.19 ¹⁾ (FC)	\$410,625
Annual Cost of Liner Replacement = FC x .0302²⁾	\$12,401

- 1) Assumes 4% Inflation over 20 years
 2) Assumes 5% Rate of Return over 20 years

OPERATING COSTS

OPERATING COSTS- POWER, CHEMICALS & LABOR	
Item	Value
Power Consumption	607,803
Power Cost per KWH	\$0.085
Total MBR System Power Consumption (PC)	\$51,663
Annual Chemical Cost (CC)	\$8,491
Total Labor (1000 hours @ \$30/hr) (LT)	\$30,000
Annual Cost of Power Consumption = PC + CC + LT	\$90,154

INTERIOR VALVE AND PIPING REPLACEMENT	
Item	Value
Valve and Piping Replacement (PN)	1
Valve and Piping life (PL) in years	40
Valve and Piping replacement price (PP)	\$100,000
Total Present Cost (PC) = PN x PP	\$100,000
Future Cost of Interior Valve and Piping Replacement = PC x 4.801 ¹⁾ (FC)	\$480,100
Annual Cost of Interior Valve and Piping Replacement = FC x .0083²⁾	\$3,985

- 1) Assumes 4% Inflation over 40 years
 2) Assumes 5% Rate of Return over 40 years

EXTERIOR VALVE AND PIPING REPLACEMENT	
Item	Value
Valve and Piping Replacement (PN)	1
Valve and Piping life (PL) in years	40
Valve and Piping replacement price (PP)	\$150,000
Total Present Cost (PC) = PN x PP	\$150,000
Future Cost of Exterior Valve and Piping Replacement = PC x 4.801 ¹⁾ (FC)	\$720,150
Annual Cost of Exterior Valve and Piping Replacement = FC x .0083²⁾	\$5,977

- 1) Assumes 4% Inflation over 40 years
 2) Assumes 5% Rate of Return over 40 years

MISCELLANEOUS SLUDGE HANDLING INFRASTRUCTURE REPLACEMENT	
Item	Value
Sludge handling and disposal (SN)	1
Sludge handling life (SL) in years	10
Sludge handling and disposal price (SP)	\$12,000
Solar Bee - Bee Keeper cost per year (BK)	\$1,700
Total Present Cost (PC) = SN x SP + BK	\$13,700
Future Cost of Misc. Sludge Handling Replacement = PC x 1.4802 ¹⁾ (FC)	\$20,279
Annual Cost of Misc. Sludge Handling Replacement = FC x .0795²⁾	\$1,612

- 1) Assumes 4% Inflation over 10 years
 2) Assumes 5% Rate of Return over 10 years

GENERATOR REPLACEMENT	
Item	Value
Number of Generator Sets proposed in MBR System (GN)	3
Generator replacement life (GL) in years	30
Generator replacement price (GP)	\$50,000.00
Generator Maintenance and Fuel Annual Cost (GM)	\$2,000
Total Present Cost (PC) = GN x GP + GM	\$152,000
Future Cost of Generator Replacement = PC x 3.2434 ¹⁾ (FC)	\$492,997
Annual Cost of Generator Replacement = FC x .0151²⁾	\$7,444

- 1) Assumes 4% Inflation over 30 years
 2) Assumes 5% Rate of Return over 30 years

TOTAL ANNUAL REPLACEMENT COST ESTIMATE

SUMMARY TOTALS	
Item	Value
Total Replacement Costs	\$72,761
Total Annual Operating Costs	\$90,154
Annual Cost of Replacement Depreciation & Operations	\$162,915