

Shenandoah WWTF UV Disinfection Equipment Lifecycle Cost Evaluation Form

Item	Units	Value	Notes
A. System Design Criteria and Configuration			
A.1	Design UV Dose	mJ.cm2	50.00
A.2	Total Number of Channels	#	2.00
A.3	Organism		MS2
A.4	UV Transmittance		65% @ 254 nm
A.5	Number of Banks per Channel	#	Vendor Entry
A.6	Total Number of Banks	#	Vendor Entry
A.7	Number of Modules per Bank	#	Vendor Entry
A.8	Total Number of Modules	#	Vendor Entry
B. Equipment			
B.1	Number of Lamps per Module	#	Vendor Entry
B.2	Total Number of Lamps	#	Vendor Entry
B.3	Power Consumption per lamp	Watts	Vendor Entry
B.4	No. of Ballasts	#	Vendor Entry
B.5	No. of Quartz Sleeves	#	Vendor Entry
B.6	No. of UV Intensity Sensors	#	Vendor Entry
B.7	No. Replaceable Cleaning Components	#	Vendor Entry
C. Equipment Operating at Average Daily Flow Condition 0.9 MGD			
C.1	No. of Lamps	#	Vendor Entry
C.2	No. of Ballasts	#	Vendor Entry
C.3	No. of Quartz Sleeves	#	Vendor Entry
C.4	No. of UV Intensity Sensors (UVIS)	#	Vendor Entry
C.5	No. of Replaceable Cleaning Components (RCC)	#	Vendor Entry
D. Parts Warranty			
D.1	Lamp Warranty	hours	Vendor Entry
D.2	Lamp Warranty	years	Divide Value in D.1 by 8,760 hrs/yr. Entry to be to the nearest Hundreth
D.3	Ballast Warranty	years	Vendor Entry
D.4	Quartz Sleeve Warranty	years	Vendor Entry
D.5	UVIS Warranty	years	Vendor Entry
D.6	RCC Warranty	years	Vendor Entry
E. Replacement Parts Pricing			
E.1	Lamp Cost	\$/unit	Vendor Entry
E.2	Ballast Cost	\$/unit	Vendor Entry
E.3	Quartz Sleeve Cost	\$/unit	Vendor Entry
E.4	UVIS Cost	\$/unit	Vendor Entry
E.5	RCC Cost per lamp	\$/unit	Vendor Entry
F. Estimated No. of Parts Replaced Annually			
F.1	Estimated Annual Lamp Replacement	#	Divide value in C.1 by value in D.2. Round up to the nearest whole number
F.2	Estimated Annual Ballast Replacement	#	Divide value in C.2 by value in D.3. Round up to the nearest whole number
F.3	Estimated Annual Sleeve Replacement	#	Divide value in C.3 by value in D.4. Round up to the nearest whole number
F.4	Estimated Annual UVIS Replacement	#	Divide value in C.4 by value in D.5. Round up to the nearest whole number
F.5	Estimated Annual RCC Replacement	#	Divide value in C.5 by value in D.6. Round up to the nearest whole number

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G. Estimated Annual Part Replacement Cost				
G.1	Est. Annual Lamp Replacement Costs	\$		Multiply value in E.1 by value in F.1. Round up to the nearest dollar
G.2	Est. Annual Ballast Replacement Costs	\$		Multiply value in E.2 by value in F.2. Round up to the nearest dollar
G.3	Est. Annual Sleeve Replacement Costs	\$		Multiply value in E.3 by value in F.3. Round up to the nearest dollar
G.4	Est. Annual UVIS Replacement Costs	\$		Multiply value in E.4 by value in F.4. Round up to the nearest dollar
G.5	Est. Annual RCC Replacement Costs	\$		Multiply value in E.5 by value in F.5. Round up to the nearest dollar
G.6	Total Est. Annual Replacement Costs	\$		Add values G.1 through G.5
H. Estimated Labor Requirements				
H.1	Time to Replace Lamp	hours		Vendor Entry
H.2	Time to Replace Ballast	hours		Vendor Entry
H.3	Time to Replace Sleeve	hours		Vendor Entry
H.4	Time to Replace UVIS	hours		Vendor Entry
H.5	Time to Replace RCC	hours		Vendor Entry
I. Estimated Annual Labor Costs				
I.1	Est. Labor Rate	\$/hour		
I.2	Est. Annual Labor Cost for Lamp Replacement	\$	\$0.00	Multiply value in F.1 by value in H.1 by Value in I.1
I.3	Est. Annual Labor Cost for Ballast Replacement	\$	\$0.00	Multiply value in F.2 by value in H.2 by Value in I.1
I.4	Est. Annual Labor Cost for Sleeve Replacement	\$	\$0.00	Multiply value in F.3 by value in H.3 by Value in I.1
I.5	Est. Annual Labor Cost for UVIS Replacement	\$	\$0.00	Multiply value in F.4 by value in H.4 by Value in I.1
I.6	Est. Annual Labor Cost for RCC Replacement	\$	\$0.00	Multiply value in F.5 by value in H.5 by Value in I.1
I.7	Total Est. Annual Labor Cost	\$	\$0.00	Add values I.2 through I.6
J. Estimated Annual Power Cost				
J.1	Power Draw at Max Daily Flow - 12 MGD	kW		Vendor Entry
J.2	Power Draw at Monthly Average Flow - 6 MGD	kW		Vendor Entry
J.3	Power Draw at Minimum Flow - 2 MGD	kW		Vendor Entry
J.4	Operating time at Peak Condition	%	5%	
J.5	Operating time at Average Condition	%	50%	
J.6	Operating time at Minimum Condition	%	45%	
J.7	Power Cost	\$/kWh	\$0.15	
J.8	Power Usage for Operating time at Peak Condition	kW		Multiple value in J.1 by value in J.4 by 8,760 hrs/yr
J.9	Power Usage for Operating time at Average Condition	kW		Multiple value in J.2 by value in J.5 by 8,760 hrs/yr
J.10	Power Usage for Operating time at Minimum Condition	kW		Multiply value in J.3 by value in J.6 by 8,760 hrs/yr
J.11	Total Annual Power Usage	kW		Add Values in J.8, J.9, and J.10
J.12	Est. Annual Power Costs at AF	\$		Multiply value in J.11 by J.7
K. Estimated Present Worth				
K.1	TOTAL EQUIPMENT COST	\$		Vendor Entry
K.2	Est. Total Annual Replacement Parts Cost	\$		Enter value in G.6
K.3	Est. Total Annual Labor Cost	\$		Enter value in I.7
K.4	Est. Total Annual Power Cost at ADF	\$		Enter value in J.12
K.5	Est. Total Annual Operating Costs	\$		Add values in K.2 through K.4
K.6	Present Value of Est. Annual Operating Costs	\$		Multiply value in K.5 by 12.46. Assumes (P/A, 5%, 10)
K.7	ESTIMATED PRESENT WORTH (10 years)	\$		Add values in K.1 and K.6