

APPENDIX E

PUMP STATION MAINTENANCE AND REPLACEMENT SCHEDULE AND COSTS

**DE SOTO, KANSAS
WASTEWATER MASTER PLAN
PUMP STATION MAINTENANCE AND REPLACEMENT COSTS**

Calculations for Pump Station Equipment Maintenance & Replacement

Note: Assume interest rate i = 4.00% Assume inflation rate e = 2.5%
City Personnel Labor is not included in costs - only parts and outside labor. This does not include costs for the collection system or equipment at the WWTF

Pump Station	Item	Costs Estimated as Year 0 dollars					Inflated Cost in Year n																					
		Qty	Unit	Unit Cost	Total Cost	Total Cost 0	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Cedar Ridge (1996) ? gpm	Pumps (20 Hp submersible)	2	EA	\$ 750	\$ 1,500	\$ 1,500		\$ 1,538					\$ 1,740					\$ 1,968				\$ 5,504	\$ 2,227					
	Mech seals	2	EA	\$ 1,900	\$ 3,800	\$ 3,800																						
	Motor rewind/bearings	2	EA	\$ 1,500	\$ 3,000	\$ 3,000			\$ 4,092				\$ 3,479					\$ 3,936										
	Wear rings	2	EA	\$ 1,500	\$ 3,000	\$ 3,000													\$ 2,690									\$ 3,197
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000						\$ 2,263	\$ 5,219						\$ 5,904	\$ 2,690			\$ 5,504	\$ 6,680			\$ 3,197	
Station Subtotal							\$ 4,613		\$ 4,092		\$ 2,263	\$ 5,219					\$ 5,904	\$ 2,690			\$ 5,504	\$ 6,680			\$ 3,197			
De Meadows (1991) 330 gpm	Pumps (7.5 Hp submersible)	3	EA	\$ 400	\$ 1,200	\$ 1,200		\$ 1,230					\$ 1,392				\$ 3,840	\$ 1,575										
	Mech seals	3	EA	\$ 1,000	\$ 3,000	\$ 3,000																						
	Motor rewind/bearings	3	EA	\$ 700	\$ 2,100	\$ 2,100																						
	Wear rings	3	EA	\$ 15,000	\$ 45,000	\$ 45,000																						\$ 66,803
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000							\$ 2,377								\$ 2,826						
Station Subtotal						\$ 2,000	\$ 3,383					\$ 3,827	\$ 2,377			\$ 3,840	\$ 4,330			\$ 2,826		\$ 66,803						
Lawhead (2004) ? gpm	Pumps (4.5 Hp submersible)	2	EA	\$ 400	\$ 800	\$ 800				\$ 883					\$ 999							\$ 1,130					\$ 1,279	
	Mech seals	2	EA	\$ 1,000	\$ 2,000	\$ 2,000												\$ 2,624										
	Motor rewind/bearings	2	EA	\$ 700	\$ 1,400	\$ 1,400			\$ 1,545						\$ 1,748							\$ 1,978					\$ 2,238	
	Wear rings	2	EA	\$ 700	\$ 1,400	\$ 1,400																						
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000					\$ 2,428	\$ 2,319			\$ 2,747				\$ 2,624	\$ 2,757		\$ 3,109					\$ 3,517	
Station Subtotal										\$ 2,428	\$ 2,319		\$ 2,747			\$ 2,624	\$ 2,757		\$ 3,109					\$ 3,517				
Lewis (1998) 100 gpm	Pumps (3 Hp vacuum prime)	2	EA	\$ 400	\$ 800	\$ 800				\$ 862					\$ 975							\$ 1,103					\$ 1,248	
	Mech seals	2	EA	\$ 2,000	\$ 4,000	\$ 4,000				\$ 4,308					\$ 4,874							\$ 5,514					\$ 6,239	
	Rebuild	1	LS	\$ 2,000	\$ 2,000	\$ 2,000																						
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000							\$ 2,377								\$ 2,826						
Station Subtotal						\$ 2,000			\$ 5,169				\$ 2,377	\$ 5,848					\$ 6,617	\$ 2,826				\$ 7,486				
Main (1978) 400/800 gpm	Install new pump station	1	LS	included w/capital improvements																								
	Pumps (40 Hp submersible)	2	EA	\$ 750	\$ 1,500	\$ 1,500				\$ 1,697						\$ 1,920						\$ 2,172				\$ 2,458		
	Mech seals	2	EA	\$ 1,900	\$ 3,800	\$ 3,800																						
	Motor rewind/bearings	2	EA	\$ 1,500	\$ 3,000	\$ 3,000																					\$ 4,916	
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000					\$ 5,091			\$ 2,377			\$ 5,760			\$ 5,111		\$ 2,826		\$ 6,517			\$ 7,374	
Station Subtotal										\$ 5,091		\$ 2,377		\$ 5,760		\$ 5,111		\$ 2,826		\$ 6,517				\$ 7,374				
Oak Drive (1999) 100 gpm	Pumps (7.5 Hp vacuum prime)	2	EA	\$ 400	\$ 800	\$ 800				\$ 883					\$ 999							\$ 1,130				\$ 1,279		
	Mech seals	2	EA	\$ 2,000	\$ 4,000	\$ 4,000				\$ 4,415					\$ 4,995							\$ 5,652				\$ 6,395		
	Rebuild	1	LS	\$ 2,000	\$ 2,000	\$ 2,000																						
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000								\$ 2,377														
Station Subtotal									\$ 5,298			\$ 2,377	\$ 5,995			\$ 6,782							\$ 7,674					
Plummer (1968) 80 gpm	Replace dehumidifier	1	EA	\$ 400	\$ 400	\$ 400	\$ 400																					
	Pumps (5 Hp dry pit)	2	EA	\$ 400	\$ 800	\$ 800	\$ 800																\$ 1,159			\$ 1,311		
	Mech seals	2	EA	\$ 1,000	\$ 2,000	\$ 2,000			\$ 841					\$ 951			\$ 1,024											
	Motor rewind/bearings	2	EA	\$ 700	\$ 1,400	\$ 1,400	\$ 1,400																	\$ 3,043				
	Overhaul controls	1	LS	\$ 50,000	\$ 50,000	\$ 50,000					\$ 56,570												\$ 2,690			\$ 3,197		
Station Subtotal						\$ 2,600		\$ 2,311		\$ 56,570		\$ 2,615		\$ 2,816		\$ 2,690		\$ 3,186		\$ 3,043				\$ 3,605				
Skaggs (1954) 160 gpm	Pumps (5 Hp dry pit)	2	EA	\$ 400	\$ 800	\$ 800	\$ 800									\$ 999						\$ 1,130				\$ 1,279		
	Mech seals	2	EA	\$ 1,000	\$ 2,000	\$ 2,000																						
	Motor rewind/bearings	2	EA	\$ 700	\$ 1,400	\$ 1,400	\$ 1,400																					
	Wear rings	2	EA	\$ 50,000	\$ 50,000	\$ 50,000					\$ 55,191					\$ 1,748							\$ 1,978			\$ 2,238		
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000																				\$ 3,119		
Station Subtotal						\$ 2,200			\$ 55,191			\$ 2,747		\$ 2,624		\$ 3,109		\$ 2,969		\$ 3,119		\$ 3,517						
Sunset (1968) 42 gpm	Install new pump station	1	LS	\$ 50,000		\$ 50,000	\$ 50,000																					
	Pumps	2	EA	\$ 400	\$ 800	\$ 800	\$ 800				\$ 905												\$ 1,159			\$ 1,311		
	Mech seals	2	EA	\$ 1,000	\$ 2,000	\$ 2,000																						
	Motor rewind/bearings	2	EA	\$ 700	\$ 1,400	\$ 1,400	\$ 1,400																					
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000					\$ 2,489			\$ 2,377			\$ 2,816		\$ 2,690		\$ 2,826		\$ 3,186			\$ 3,605		
Station Subtotal						\$ 50,000				\$ 2,489		\$ 2,377		\$ 2,816		\$ 2,690		\$ 3,186		\$ 3,043				\$ 3,605				
Timber Trails (1996?) 660 gpm	Pumps (15 Hp submersible)	2	EA	\$ 750	\$ 1,500	\$ 1,500		\$ 1,538					\$ 1,740					\$ 1,968					\$ 5,504	\$ 2,227				
	Mech seals	2	EA	\$ 1,900	\$ 3,800	\$ 3,800																						
	Motor rewind/bearings	2	EA	\$ 1,500	\$ 3,000	\$ 3,000			\$ 4,092				\$ 3,479															
	Wear rings	2	EA	\$ 1,500	\$ 3,000	\$ 3,000																				\$ 3,197		
	Overhaul controls	1	LS	\$ 2,000	\$ 2,000	\$ 2,000					\$ 2,263	\$ 5,219						\$ 5,904	\$ 2,690			\$ 5,504	\$ 6,680			\$ 3,197		
Station Subtotal							\$ 4,613		\$ 4,092		\$ 2,263	\$ 5,219				\$ 5,904	\$ 2,690			\$ 5,504	\$ 6,680			\$ 3,197				
Total inflated costs for year n:						\$ 58,800	\$ 12,608	\$ 2,311	\$ 13,353	\$ 62,917	\$ 68,676	\$ 16,584	\$ 9,747	\$ 5,848	\$ 11,490	\$ 15,233	\$ 18,763	\$ 13,180	\$ 9,374	\$ 18,651	\$ 23,897	\$ 83,132	\$ 3,043	\$ 7,486	\$ 21,102	\$ 14,584		
Total Present Worth of Inflated Costs for year n:						\$ 58,800	\$ 12,123	\$ 2,137	\$ 11,871	\$ 53,782	\$ 56,447	\$ 13,106	\$ 7,407	\$ 4,273	\$ 8,072	\$ 10,291	\$ 12,188	\$ 8,232	\$ 5,630	\$ 10,771	\$ 13,269	\$ 44,385	\$ 1,562	\$ 3,695	\$ 10,016	\$ 6,656		
Total Present Worth (all years):						\$ 354,714																						
Annuity for replacement: period (yr)= 20						\$ 26,100																						