

Facilities Plan Update Springfield Water & Sewer Commission Springfield, Kentucky

Chapter 6 - Project Implementation

Purpose

The purpose of this chapter is to:

- Summarize improvements to be completed within 11-20 year time period for the interceptor system.
- Summarize improvements to be completed within the 3-10 year time period for the wastewater treatment plant (WWTP).
- Estimate additional user charges required for the 3-10 year improvements for the WWTP.
- Present a list of project activities and a proposed implementation schedule for the improvements.

Interceptor System Expansion

The selected alternative for the interceptor system expansion is the use of conventional design sewer system. The expansion to the interceptor system will be implemented over the 11-20 year period covering the nine proposed expansion areas as outlined in Chapter 5 and as illustrated in Figure 6-1. With the expansion of the service area, the interceptor system will be extended concurrently, along with some rehabilitation and upgrading of the existing interceptor/collection system.

WWTP Improvements

The selected alternative for the WWTP expansion is construction of a sequencing batch reactor (SBR) WWTP at the existing site. When implemented, this will increase treatment capacity to 1.8 million gallons per day (MGD).

Implementation of the selected alternative will reserve adequate capacity through the 20-year planning period. It is anticipated that this expansion will be implemented in the 3-10 year period of the planning period. A boundary survey of the existing WWTP is included in Appendix J.

Figure 6-1

Implementation

No improvements are recommended for the WWTP during the 0-2 year period. Table 6-1 summarizes the project cost for implementing the Springfield WWTP expansion recommended improvements for the 3-10 year period.

Table 6-1
3-10 Year Opinion of WWTP Probable Project Cost¹ - One Project
Springfield Facilities Plan Update

<i>Item</i>	<i>Cost</i>
Total Construction Cost	\$4,550,000
Project Development @ 25%	1,138,000
Total Opinion of Probable Project Cost	\$5,688,000

Notes: ¹All costs in 2001 dollars

²Project development cost includes administrative, engineering, legal, interest during construction, and contingencies.

Phased Implementation

An option to the implementation of the recommended 20-year 1.8 MGD Expand Existing SBR WWTP alternative would be to phase the expansion. Phase I-WWTP expansion would increase the WWTP permitted capacity to 1.3 MGD and cover the initial 10 years of the planning period (3 to 10-year period). Phase II-WWTP expansion would increase the WWTP permitted capacity to 1.8 MGD as projected for the 20 year planning period (11 to 20-year period). Figures 6-2 and 6-3 illustrate possible layouts for the phased expansion of the SBR WWTP at the existing site. Table 6-2 and 6-3 provide opinions of probable construction costs and project costs for the phased implementation of the WWTP.

It is recommended for this study that improvements to the WWTP be implemented in phases, 3 to 10-year period, to expand the WWTP to 1.3 MGD. The project cost for this phase is \$4,436,000. It is also recommended that the phased expansion of the SBR WWTP follow the layout as illustrated in Figure 6-2.

User Costs

The City of Springfield's current user charges generate sufficient revenue to cover existing costs associated with the wastewater collection and treatment system. It is assumed for this report that all future costs will be covered by additional user charges for the proposed projects. The current user charges are summarized in Table 6-4.

Figure 6-2

Figure 6-3

Based on the 3-10 year opinion of probable project cost (Table 6-1) for the WWTP expansion, estimated user fee increases were calculated for various funding scenarios. These estimates are presented in Table 6-5. Potential grant funding sources are Rural Development (RD), Department of Agriculture, Economic Development Administration (EDA), Community Development Block Grant (CDBG), Special Appropriations from the General Assembly, and Line Item Appropriation from Congress.

Based on phased implementation for the WWTP expansion, estimated user fee increases were calculated for various funding scenarios using the opinion of probable project cost in Tables 6-2 and 6-3. The estimates are presented in Tables 6-6 and 6-7.

Please note that, based on actual funding obtained and construction bids received, a detailed user cost study will be necessary to determine the actual user costs.

Table 6-2
Opinion of Probable Project Cost¹
Phase I - Expand Existing SBR WWTP (1.3 MGD) - Two Projects
Springfield Facilities Plan Update

<i>Item</i>	<i>Capital Cost</i>
Site/Civil Improvements	\$ 50,000
Headworks - Mechanical Screen/Flow Measurement	210,000
Influent Pump Station	225,000
SBR Tanks/Equipment/Blowers/Building	1,158,000
Ferric Chloride, Polymer Equipment/Chemical Building	150,000
Post Equalization Basin/Modification	30,000
Post Equalization PS Modifications	40,000
UV Disinfection Equipment/Basin Modifications	180,000
Existing SBR Modifications	22,000
Site Piping	370,000
Miscellaneous Metals	100,000
Electrical/Instrumentation	254,000
Mobilization/Demobilization	101,000
Miscellaneous	203,000
Contractor's Overhead and Profit	456,000
Subtotal Construction Cost	\$3,549,000
Project Development Cost ² @ 25%	887,000
Total Opinion of Probable Project Cost/Salvage Value	\$4,436,000

Notes: ¹All costs in 2001 dollars

²Project development cost includes administrative, engineering, legal, interest during construction, and contingencies.

Table 6-3
Opinion of Probable Project Cost¹
Phase II - Expand Existing SBR WWTP (1.8 MGD) - Two Projects
Springfield Facilities Plan Update

<i>Item</i>	<i>Capital Cost</i>
Site/Civil Improvements	\$25,000
Headworks - Grit Removal	110,000
Influent Pump Station	70,000
SBR Tanks/Equipment/Blowers/Building	650,000
UV Disinfection Equipment/Basin Modifications	80,000
Site Piping	100,000
Miscellaneous Metals	40,000
Electrical/Instrumentation	108,000
Mobilization/Demobilization	43,000
Miscellaneous	86,000
Contractor's Overhead and Profit	193,000
Subtotal Construction Cost	\$1,505,000
Project Development Cost ² @ 25%	376,000
Total Opinion of Probable Project Cost/Salvage Value	\$1,881,000

Notes: ¹All costs in 2001 dollars
²Project development cost includes administrative, engineering, legal, interest during construction, and contingencies.

Table 6-4
Current Sewer User Charges¹
Springfield Facilities Plan Update

<i>Water Consumption (total gallons/month)</i>	<i>Total User Charge (per 1,000 gallons) City Rate²</i>
First 1,500	\$7.49 minimum bill ³
Next 3,500	3.45
Next 5,000	3.16
Next 15,000	2.93
Next 25,000	2.57
Next 50,000	2.47
Next 900,000	2.08
All Above 1,000,000	1.07

Notes: ¹Sewer rates as of August 9, 2000
²County sewer rate is 1.5 times the city sewer rate.
³Minimum monthly charge for all water consumption up to 1,500 gallons

Table 6-5
Preliminary User Fee Increases (1.8 MGD) - One Project
Springfield Facilities Plan Update

<i>Project Funding</i>	<i>Project Cost</i>		
	<i>Option 1¹</i>	<i>Option 2²</i>	<i>Option 3³</i>
Grant Amount ⁴	\$0	\$1,422	\$2,844
Loan Amount ⁴	5,688	4,266	2,844
Total Opinion of Project Cost ⁴	5,688	5,688	5,688
<i>Annual Revenue Requirements</i>			
KIA Debt Service ^{4, 5}	\$348	\$261	\$174
KIA Service Charge ^{4, 6}	11	8	6
Increased O,M,&R ^{4, 7}	60	60	60
Total Required Additional Annual Revenue ⁴	\$419	\$329	\$240
Monthly Increase per Thousand Gallon Usage ⁸	\$3.49	\$2.74	\$2.00
Average Increase Based on 4,000 Gallons per Month Usage ⁹	\$13.96	\$10.96	\$8.00
Existing User Charge Inside City ¹⁰	\$16.12	\$16.12	\$16.12
Projected User Charge Inside City ¹⁰	\$30.08	\$27.08	\$24.12
Existing User Charge Outside City ^{10, 11}	\$24.18	\$24.18	\$24.18
Projected User Charge Outside City ^{10, 11}	\$45.12	\$40.62	\$36.18

Notes: ¹Assume all loan

²Assume 25 percent grant with the remainder in loan

³Assume 50 percent grant with the remainder in loan

⁴All cost in thousands

⁵Based on Kentucky Infrastructure (KIA) loan with an interest rate of 2.0 percent over a 20-year period (0.0612)

⁶The service charge is based on 0.2 percent of the outstanding loan amount.

⁷Added operation and maintenance (O&M) cost based on 0.5 MGD average flow at startup

⁸Based on 120,070,500 gallons of water usage per year (FY 2000)/provided by SWSC

⁹Typical residential monthly water usage

¹⁰Based on average monthly usage of 4,000 gallons

¹¹Outside city rate 1.5 times inside city rate

Table 6-6
Phase I Preliminary User Fee Increases (1.3 MGD) - Two Projects
Springfield Facilities Plan Update

<i>Project Funding</i>	<i>Project Cost</i>		
	<i>Option 1¹</i>	<i>Option 2²</i>	<i>Option 3³</i>
Grant Amount ⁴	\$0	\$1,109	\$2,218
Loan Amount ⁴	4,436	3,327	2,218
Total Opinion of Project Cost ⁴	4,436	4,436	4,436
<i>Annual Revenue Requirements</i>			
KIA Debt Service ^{4, 5}	\$272	\$204	\$136
KIA Service Charge ^{4, 6}	9	6	4
Increased O,M,&R ^{4, 7}	60	60	60
Total Required Additional Annual Revenue ⁴	\$341	\$270	\$200
Monthly Increase per Thousand Gallon Usage ⁸	\$2.84	\$2.25	\$1.67
Average Increase Based on 4,000 Gallons per Month Usage ⁹	\$11.36	\$9.00	\$6.68
Existing User Charge Inside City ¹⁰	\$16.12	\$16.12	\$16.12
Projected User Charge Inside City ¹⁰	\$27.48	\$25.12	\$22.80
Existing User Charge Outside City ^{10, 11}	\$24.18	\$24.18	\$24.18
Projected User Charge Outside City ^{10, 11}	\$41.22	\$37.68	\$34.20

Notes: ¹Assume all loan

²Assume 25 percent grant with the remainder in loan

³Assume 50 percent grant with the remainder in loan

⁴All cost in thousands

⁵Based on Kentucky Infrastructure (KIA) loan with an interest rate of 2.0 percent over a 20-year period (0.0612)

⁶The service charge is based on 0.2 percent of the outstanding loan amount.

⁷Added operation and maintenance (O&M) cost based on 0.5 MGD average flow at startup

⁸Based on 120,070,500 gallons of water usage per year (FY 2000)/provided by SWSC

⁹Typical residential monthly water usage

¹⁰Based on average monthly usage of 4,000 gallons

¹¹Outside city rate 1.5 times inside city rate

Table 6-7
Phase II Preliminary User Fee Increases (1.8 MGD) - Two Projects
Springfield Facilities Plan Update

<i>Project Funding</i>	<i>Project Cost</i>		
	<i>Option 1¹</i>	<i>Option 2²</i>	<i>Option 3³</i>
Grant Amount ⁴	\$0	\$470	\$940
Loan Amount ⁴	\$1,881	\$1,411	\$941
Total Opinion of Project Cost ⁴	\$1,881	\$1,881	\$1,881
<i>Annual Revenue Requirements</i>			
KIA Debt Service ^{4, 5}	\$115	\$86	\$58
KIA Service Charge ^{4, 6}	\$4	\$3	\$2
Increased O,M,&R ^{4, 7}	\$30	\$30	\$30
Total Required Additional Annual Revenue ⁴	\$149	\$119	\$90
Monthly Increase per Thousand Gallon Usage ⁸	\$1.24	\$0.99	\$0.75
Average Increase Based on 4,000 Gallons per Month Usage ⁹	\$4.96	\$3.96	\$3.00
Existing User Charge Inside City ^{10, 11}	\$27.48	\$25.12	\$22.80
Projected User Charge Inside City ^{10, 11}	\$32.44	\$29.08	\$25.80
Existing User Charge Outside City ^{10, 11, 12}	\$41.22	\$37.68	\$34.20
Projected User Charge Outside City ^{10, 11}	\$48.66	\$43.62	\$38.70

Notes: ¹Assume all loan

²Assume 25 percent grant with the remainder in loan

³Assume 50 percent grant with the remainder in loan

⁴All cost in thousands

⁵Based on Kentucky Infrastructure (KIA) loan with an interest rate of 2.0 percent over a 20-year period (0.0612)

⁶The service charge is based on 0.2 percent of the outstanding loan amount.

⁷Added operation and maintenance (O&M) cost based on 0.5 MGD average flow at startup

⁸Based on 120,070,500 gallons of water usage per year (FY 2000)/provided by SWSC

⁹Typical residential monthly water usage

¹⁰Based on average monthly usage of 4,000 gallons

¹¹Assuming Phase I project completed and rates implemented based on each funding scenario from Table 6-6

¹²Outside city rate 1.5 times inside city rate

Implementation Schedule

The following is a list of implementation steps recommended to cost-effectively proceed with the proposed wastewater system improvements.

- Submit Facilities Plan Update to Kentucky Division of Water (DOW) for review.
- Review Facilities Plan Update by Springfield Water and Sewer Commission and Washington County.
- Conduct public hearing.
- Obtain DOW review comments.
- Respond to comments.
- Obtain approval of Facilities Plan Update from DOW.

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- Submit loan and grant funding applications.
 - Received binding funding commitments from KIA, Rural Development, Appalachian Regional Commission, and/or other agencies.
 - Complete preliminary design of wastewater system improvements.
 - Prepare final design documents.
 - Submit final plans and specifications to DOW.
 - Respond to comments from DOW.
 - Advertise project for competitive bids.
 - Receive bids.
 - Conduct final sewer user charge study.
 - Award construction contracts and initiate project construction.
 - Construction period.
 - Perform start-up services and training.
 - Prepare O&M manual and plan of operation.