7.7 WEST CLEAR BRANCH FACILITY PLANNING BASIN

Tables 7-8 and 7-9 present cost per EDU calculations for PCRSD customers for the two scenarios for the West Clear Branch Basin. The average cost per EDU for the "Treatment by Platte City" scenario is $6578/EDU [($10,218,762 + 10,515.600) ÷ 3152] versus $5543/EDU ($17,471,470 ÷ 3152 EDU) for the "Treatment by PCRSD" scenario (note that the 3152 EDU includes 1,012 EDU pumped from the Prairie Creek watershed). The "Treatment by Platte City" scenario includes a representative treatment cost allowance which has been added in to provide for an apples-to-apples comparison. In lieu of performing a detailed evaluation of the Platte City WWTP, and its cost of treatment/expansion, a reasonable assumption for this cost would be on the order of 90% of the "Treatment by PCRSD" cost of treatment, recognizing the economies of scale of consolidated treatment at a larger facility and the likelihood that they would be subject to the same permit requirements. The above figures indicate that their treatment by PCRSD's scenario is less costly by about 19%, which appears logical in that the same amount of treatment capacity is provided (although not as economically as at a larger facility), but the cost of a higher head pump station and a long forcemain are avoided. However, prior to drawing a conclusion based on capital cost alone, a Net Present Cost (NPC) analysis taking into account annual operation, maintenance, and replacement costs, is warranted.

The NPC analysis will incorporate the following assumptions:

- As described above, the capital cost equivalent of treatment capacity at Platte City is assumed to be 90% of the cost of equivalent capacity at a smaller PCRSD-owned facility (PCRSD WWTP cost = $11,684,000 (from Table 7-9), Platte City WWTP cost = 0.90 x 11,684,000 = $10,515,600).
- The PCRSD annual cost of treatment will be $145/EDU/year (per TM No. 4, Section 6.3), or $145 x 3152 EDU's = $457,040/year. Platte City cost of treatment will be taken as 90% of this, or $411,340/year, recognizing that the same economies of scale would also apply to O&M.
- Higher head pumping is required in the "Treatment by Platte City" alternative. This results in a higher pump station capital cost, $6,300,000 versus $4,970,000 for the "Treatment by PCRSD" alternative. The higher head pump station would have higher annual O&M costs, estimated at 2% of the capital cost difference of $1,330,000, or $26,600/year. In addition, the incremental electrical power cost resulting from pumping 3152 EDU, or 945,600 gallons per day against an additional 50 feet (or more) of head is calculated to be approximately $7,000/year.

Treatment by Platte City

Capital Cost	=	Conveyance + Treatment
	=	$10,218,762 + 10,515,600
	=	$20,734,362
Annual Cost	=	Treatment + Incremental Pumping Cost (Maintenance and Electricity)
	=	$411,540 + 26,600 + 7,000
	=	$444,940
NPC	=	Capital Cost + P/A (Annual Cost)
	=	$20,734,362 + 16.35 (444,940)
	=	$28,009,131

Note: See Section 7.2 for derivation of P/A time value of money factor.

Table 7-8
Cost Allocation
West Clear Branch Regional Planning Basin
Treatment by Platte City

Segment Designation	Total Cost ($)	Total Peak Flow (MGD)	Allocated Peak Flow (MGD)		% of Total Cost (based on Peak Flow)		Cost Share ($)		PCRSD EDU	PCRSD Cost/EDU ($)
			PCRSD	Platte City	PCRSD	Platte City	PCRSD	Platte City		
GS WCB1	$248,400	1.48	0.8	0.68	54%	46%	$134,270	$114,130	348	$386
PS WCB1 (5.44 mgd, HH)	$2,700,000	5.44	4.76	0.68	88%	13%	$2,362,500	$337,500	2140	$1,104
FM WCB1	$817,500	5.44	4.76	0.68	88%	13%	$715,313	$102,188	2140	$334
FM WCB/PC (Note 4)	$1,818,000	7.74	7.06	0.68	91%	9%	$1,658,279	$159,721	3152	$526
PS WCB2a (0.44 mgd, MH)	$400,000	0.44	0.44	0	100%	0%	$400,000	$0	190	$2,105
FM WCB2a	$18,000	0.44	0.44	0	100%	0%	$18,000	$0	190	$95
FM WCB2a/b	$372,000	3.96	3.96	0	100%	0%	$372,000	$0	1792	$208
GS WCB2b(1)	$113,400	3.52	3.52	0	100%	0%	$113,400	$0	1602	$71
GS WCB2b(2)	$162,000	1.48	1.48	0	100%	0%	$162,000	$0	684	$237
GS WCB2b(3)	$112,500	0.74	0.74	0	100%	0%	$112,500	$0	342	$329
PS WCB2b (3.52 mgd, MH)	$1,600,000	3.52	3.52	0	100%	0%	$1,600,000	$0	1602	$999
FM WCB2b	$300,000	3.52	3.52	0	100%	0%	$300,000	$0	1602	$187
GS WCB2c	$432,000	1.38	1.38	0	100%	0%	$432,000	$0	918	$471
PS WCB2c (2.04 mgd, MH)	$1,100,000	2.04	2.04	0	100%	0%	$1,100,000	$0	918	$1,198
FM WCB2c	$184,500	2.04	2.04	0	100%	0%	$184,500	$0	918	$201
PS WCB3a (1.06 mgd, LH)	$500,000	1.06	1.06	0	100%	0%	$500,000	$0	479	$1,044
FM WCB3a	$54,000	1.06	1.06	0	100%	0%	$54,000	$0	479	$113
	$10,932,300						$10,218,762	$713,538		
Treatment Allowance	$11,430,000	1.06[3]	0.97[3]	0.09[3]	92%	8%	$10,515,600	$914,400	3152	$3,336

Note:

1. Costs shown are conceptual in nature, are all inclusive (including construction, engineering, legal, administrative, and contingencies), are presented in 2009 dollars, and are intended for master planning purposes only. They do not take into consideration detailed assessment of site specific conditions or constraints. Actual costs may differ significantly from those shown.
2. Reference Figure 5-4-1, Table 5-15 for segment description, location, and sizing information.
3. WWTP is apportioned based on average daily flows, not peak flow.
4. Forcemain WCG/PC is located within the Platte City limits west of I-29 (including the I-29 crossing). It continues to the existing Platte City WWTP assuming the worst case scenario that there is no available capacity within Platte City's existing conveyance system.

Table 7-9
Cost Allocation
West Clear Branch Facility Planning Basin
Treatment by PCRSD

Segment Designation	Total Cost ($)	Total Peak Flow (MGD)	Allocated Peak Flow (MGD)		% of Total Cost (based on Peak Flow)		Cost Share ($)		PCRSD EDU	PCRSD Cost/EDU ($)
			PCRSD	Platte City	PCRSD	Platte City	PCRSD	Platte City		
GS WCB1a	$444,150	3.78	3.1	0.68	82%	18%	$364,250	$79,900	1360	$268
GS WCB1b	$388,800	2.7	2.02	0.68	75%	25%	$290,880	$97,920	1012	$287
PS WCB1 (3.78 mgd, MH)	$1,700,000	3.78	3.1	0.68	82%	18%	$1,394,180	$305,820	1360	$1,025
FM WCB1	$408,000	3.78	3.78	0	100%	0%	$408,000	$0	1360	$300
PS WCB2a (0.44 mgd, MH)	$400,000	0.44	0.44	0	100%	0%	$400,000	$0	190	$2,105
FM WCB2a	$18,000	0.44	0.44	0	100%	0%	$18,000	$0	190	$95
FM WCB1/2a	$264,000	4.22	3.54	0.68	84%	16%	$221,460	$42,540	1550	$143
GS WCB2b(1)	$132,300	3.52	3.52	0	100%	0%	$132,300	$0	1602	$83
GS WCB2b(2)	$162,000	1.48	1.48	0	100%	0%	$162,000	$0	684	$237
GS WCB2B(3)	$112,500	0.74	0.74	0	100%	0%	$112,500	$0	342	$329
WWTP (1.06 mgd)	$12,700,000	1.06 [3]	0.97 [3]	0.09 [3]	92%	8%	$11,684,000	$1,016,000	3152	$3,707
GS WCB2c	$432,000	1.38	1.38	0	100%	0%	$432,000	$0	918	$471
PS WCB2c (2.04 mgd, MH)	$1,100,000	2.04	2.04	0	100%	0%	$1,100,000	$0	918	$1,198
FM WCB2c	$184,500	2.04	2.04	0	100%	0%	$184,500	$0	918	$201
PS WCB3a (1.06 mgd, LH)	$500,000	0.16	0.16	0	100%	0%	$500,000	$0	479	$1,044
FM WCB3a	$67,500	1.06	1.06	0	100%	0%	$67,500	$0	479	$141
	$19,013,750						$17,471,570	$1,542,180		

Note:

1. Costs shown are conceptual in nature, are all inclusive (including construction, engineering, legal, administrative, and contingencies), are presented in 2009 dollars, and are intended for master planning purposes only. They do not take into consideration detailed assessment of site specific conditions or constraints. Actual costs may differ significantly from those shown.
2. Reference Figure 5-4-2 and Table 5-16 for segment description, location, and sizing information.
3. WWTP is apportioned based on average daily flows, not peak flow.

Treatment by PCRSD

Capital Cost	=	$17,471,570
Annual Cost	=	Treatment
	=	$457,040
NPC	=	Capital Cost + P/A (Annual Cost)
	=	$17,471,570 + 16.35 (457,040)
	=	$24,944,174

The "Treatment by PCRSD" alternative has the lower NPC, making it appear preferable from a life cycle cost standpoint. However, the "Treatment by Platte City" alternative's NPC is only about 12% higher and recognizing the nature of, and level of precision in, conceptual cost estimating, this is a relatively small margin. It is recommended that a more detailed evaluation, including evaluation of the cost of treatment and expansion (if required) of the Platte City WWTP, be conducted prior to adopting this conclusion.

Other, non-economic, factors will most likely weigh heavily in the ultimate decision of which alternative to pursue, including:

- Regulatory acceptance of another discharge point.
- Public acceptance of another WWTP facility.
- Platte City's willingness to enter into a cooperative arrangement with PCRSD.
- The timing and location of development within the basin and how it impacts the manner in which facilities are phased in.

Clearly, a more detailed analysis is warranted that takes into account economic and non-economic factors that exist at that point in time at which the project is to be undertaken.

7.8 FINANCING ALTERNATIVES AND APPROACHES

PCRSD's authority to issue debt and generate the necessary revenues to cover its cost of doing business through a system of rates and charges is provided for in RsMO Section 204. PCRSD has devoted considerable effort over the past several years in developing an approach to financing of capital improvements which satisfactorily meets cost recovery needs while equitably distributing the costs between those parties benefitting from the improvements, i.e. the existing rate payers and developers. A brief discussion of each of PCRSD's cost recovery mechanisms follows:

Sewer Rate Capital Recovery Component – Improvements benefitting the existing rate payers, i.e. regulatory driven improvements, consolidation/replacement of obsolete/inefficient facilities (such as the 1996 regionalization project), etc., are financed through debt, and the principal and interest on the debt are recovered through a fixed rate component in the sewer rate structure (O&M&R are recovered through a variable rate component based on winter quarter water consumption).

PCRSD has traditionally issued debt through the Missouri State Revolving Fund (SRF) Loan Program which offers a 70% interest subsidy to qualifying projects. This approach has been very successful in the past and should be continued.

Sewer Rate Financed Pay-as-You-Go Project – PCRSD finances the capital costs of some small projects directly from funds generated from sewer rates. This is a suitable mechanism for small, short duration projects in lieu of debt financing. This is also a common method employed by many agencies to specifically budget for and fund collection system rehabilitation projects over a multi-year program.