

**Table 3-1
Summary of Alternative Service Areas**

Alternative	Description	Proposed Sewer Service Areas	Impacted Needs Area
1	Provide Sewer Service to the Leibert Creek Basin through the Borough of Emmaus Collection System Using Gravity Flow	PSA-1	SC-1
		PSA-2	LC-1
		PSA-3	LC-2
		PSA-4	LC-3
2	Provide Sewer Service to the Leibert Creek Basin through the Borough of Emmaus Collection System Using Pumping Station	PSA-1	SC-1
		PSA-2	LC-1
		PSA-3	LC-2
		PSA-4	LC-3
3	Provide Sewer Service to the Leibert Creek Basin through the LCA Route 29 Facilities Using Pumping Station and Gravity Interceptor	PSA-1	SC-1
		PSA-2	LC-1
		PSA-3	LC-2
		PSA-4	LC-3
4	Provide Sewer Service to the Leibert's Creek Basin through the LCA Route 29 Facilities Using Pumping Stations	PSA-1	SC-1
		PSA-2	LC-1
		PSA-3	LC-2
		PSA-4	LC-3
5	Provide Sewer Service to the Leibert Creek Basin through New WWTP with Stream Discharge	PSA-1	SC-1
		PSA-2	LC-1
		PSA-3	LC-2
		PSA-4	LC-3
6	Provide Sewer Service to the Leibert Creek Basin through New WWTP with Land Application	PSA-1	SC-1
		PSA-2	LC-1
		PSA-3	LC-2
		PSA-4	LC-3
7	Provide Sewer Service to the Leibert Creek Basin through the LCA Route 29 Facilities Using Low Pressure Collection System	PSA-1	SC-1
		PSA-2	LC-1

**Table 3-1
Summary of Alternative Service Areas**

Alternative	Description	Proposed Sewer Service Areas	Impacted Needs Area
		PSA-3 PSA-4	LC-2 LC-3
8	Extending Sewer Service to the 7th St. Extension Area	PSA-13	LL-2
9	Extending Sewer Service to the Indian Creek Basin	PSA-7	IC-1
10	Extending Sewer Service to the Hosensack Creek Basin	PSA-8 PSA-9 PSA-10	HC-1 HC-2 HC-3
11	Extending Sewer Service to the Swadia Creek Basin	PSA-11	SWC-1

Note:
 South 7th St. Extension Area (PSA 13) will be addressed by a PADEP Sewage Planning Module for Minor Act 537 Plan Revision
 Golf Circle Area (PSA 14) will be addressed by a private developer through a PADEP Planning Module

**Table 3-2
Summary of Gravity Sewer Construction Costs**

Alternative	Area	8 in Sanitary Sewer Off Road		8 in Sanitary Sewer Township Road		8 in Sanitary Sewer State Road		Interceptor Sewer 12 in Diameter		Total Construction Cost
		Length (ft)	Total (\$)	Length (ft)	Total (\$)	Length (ft)	Total (\$)	Length (ft)	Total (\$)	
3	Vera Cruz Proj.	4,050	\$324,000	9,500	\$1,187,500	15,000	\$2,325,000	6,200	\$899,000	\$4,735,500
4	Vera Cruz Proj.	3,300	\$264,000	8,500	\$1,062,500	15,000	\$2,325,000	0	\$0	\$3,651,500
5	Vera Cruz Proj.	4,050	\$324,000	9,500	\$1,187,500	15,000	\$2,325,000	0	\$0	\$3,836,500
7	Vera Cruz Proj.	0	\$0	0	\$0	0	\$0	0	\$0	\$0
8	S. 5th Street	0	\$0	3,700	\$462,500	2,300	\$356,500	0	\$0	\$819,000
9	Indian Creek	0	\$0	18,300	\$2,287,500	0	\$0	0	\$0	\$2,287,500
10	Hosensack	0	\$0	23,100	\$2,887,500	0	\$0	0	\$0	\$2,887,500
11	Swabia Creek	800	\$64,000	9,000	\$1,125,000	2,600	\$403,000	0	\$0	\$1,592,000
Total Construction Costs										\$19,809,500

Unit Costs

12 in Diameter Sanitary Sewer Pipe - Off Road	ft	\$145
8 in Diameter Sanitary Sewer Pipe - Off Road	ft	\$80
8 in Diameter Sanitary Sewer Pipe - Twp Road	ft	\$125
8 in Diameter Sanitary Sewer Pipe - State Road	ft	\$155

**Table 3-3
Summary of Pumping System Construction Costs**

Alternative	Area	Low Pressure Sewer (Twp Road)		Low Pressure Sewer (State Road)		6 in Force Main Township Road		6 in Force Main State Road		Grinder Pumps (2)		Pumping Station	Total Construction Cost	
		Length (ft)	Total (\$)	Length (ft)	Total (\$)	Length (ft)	Total (\$)	Length (ft)	Total (\$)	Units (#)	Cost (\$)			Units (#)
3	Vera Cruz Proj.	1,500	\$150,000	0	\$0	3,200	\$256,000	0	\$0	35	\$122,500	1	\$300,000	\$828,500
4	Vera Cruz Proj.	2,000	\$200,000	0	\$0	3,600	\$288,000	2,600	\$247,000	45	\$157,500	2	\$600,000	\$1,492,500
5	Vera Cruz Proj.	1,500	\$150,000	0	\$0	1,200	\$96,000	2,200	\$209,000	35	\$122,500	2	\$600,000	\$1,177,500
7	Vera Cruz Proj.	12,500	\$1,250,000	15,500	\$1,937,500	0	\$0	0	\$0	270	\$945,000	0	\$0	\$4,132,500
8	S. 5th Street	0	\$0	0	\$0	0	\$0	0	\$0	5	\$17,500	0	\$0	\$17,500
9	Indian Creek	0	\$0	0	\$0	5,200	\$416,000	0	\$0	0	\$0	2	\$600,000	\$1,016,000
10	Hosensack	0	\$0	0	\$0	3,200	\$256,000	0	\$0	0	\$0	3	\$900,000	\$1,156,000
11	Swabia Creek	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
Total Construction Costs													\$9,820,500	

Unit Costs

2-5 in Dia Low Pressure Main Twp Road	\$100	ft
2-5 in Dia Low Pressure Main State Road	\$125	ft
6 in Dia Force Main - Twp Road	\$80	ft
6 in Dia Force Main - State Road (1)	\$95	ft
Grinder Pump Unit Cost (2)	\$3,500	unit
Estimated Pumping Station Cost	\$300,000	unit

(1) Assumes FM is installed adjacent to gravity main. The full lane overlay is included in gravity main unit price
 (2) Purchased as part of the project and provided to the property owner for installation by their plumber.
 (3) Includes simplex and duplex units. Duplex units counted as two simplex units

**Table 3-4
Wastewater Treatment Plant Construction Costs**

Alternative #5

Vera Cruz WWTP	\$2,300,000
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Alternative #9

St. Peters Rd Community System	\$185,000
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Alternative #10

Churcview Road Community System	\$166,000
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Zionsville Community System	\$30,500
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Old Zionsville Community System	\$181,000
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Total WWTP Costs	\$377,500
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Table 3-5**Summary of LCA Non-Project
Capacity Tapping Fees**

Alternative	Area	Number of EDU's	Total Cost
3	Vera Cruz Project	310	\$497,860
4	Vera Cruz Project	310	\$497,860
5	Vera Cruz Project	N/A	\$0
7	Vera Cruz Project	310	\$497,860
8	S. 5th Street	63	\$101,178
9	Indian Creek	N/A	\$0
10	Hosensack Creek	N/A	\$0
11	Swadia Creek	124	\$199,144

Unit Costs

Wastewater Treatment Capacity	\$884
Western Lehigh Interceptor Capacity	\$603
Little Lehigh Relief Interceptor Capacity	\$119
Route 29 Capacity (1)	Waived
UMIT Capacity-other (1)	Waived
Connection Inspection Fee (1)	Waived

(1) Route 29 Capacity Fee of \$1,738, UMIT Capacity-Other Fee of \$118 and Connection Inspection Fee of \$90 are waived by LCA when applicable to an Alternative

**Table 3-6
Summary of Sewer Alternative Capital Costs**

	Vera Cruz Project Area					S. 5th Street Alternative #8	Indian Creek Alternative #9	Hosensack Alternative #10	Swabia Alternative #11
	Alternative #3	Alternative #4	Alternative #5	Alternative #7	Alternative #11				
Gravity Sewer Construction Costs	\$4,735,500	\$3,651,500	\$3,836,500	\$0	\$819,000	\$2,287,500	\$2,887,500	\$1,592,000	
Pumping System Construction Costs	\$828,500	\$1,492,500	\$1,177,500	\$4,132,500	\$17,500	\$1,016,000	\$1,156,000	\$0	
Treatment Facility Costs	\$0	\$0	\$2,300,000	\$0	\$0	\$185,000	\$377,500	\$0	
Total Construction Costs	\$5,564,000	\$5,144,000	\$7,314,000	\$4,132,500	\$836,500	\$3,488,500	\$4,421,000	\$1,592,000	
Land Acquisition	\$115,000	\$60,000	\$130,000	\$30,000	\$25,000	\$100,000	\$200,000	\$25,000	
LCA Connection Fees	\$497,860	\$497,860	\$0	\$497,860	\$101,178	\$0	\$0	\$199,144	
Engineering, Legal and Administrative	\$834,600	\$771,600	\$1,097,100	\$619,875	\$125,475	\$523,275	\$663,150	\$238,800	
Contingency	\$834,600	\$771,600	\$1,097,100	\$619,875	\$125,475	\$523,275	\$663,150	\$238,800	
Total Capital Costs	\$7,846,060	\$7,245,060	\$9,638,200	\$5,900,110	\$1,213,628	\$4,635,050	\$5,947,300	\$2,293,744	
Engineering, Legal and Administrative Costs								15%	
Contingency Costs								15%	

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**Table 3-7
Summary of Collection System Operations and Maintenance Costs**

Category	Alternative #3	Alternative #4	Alternative #5	Alternative #7	Alternative #8	Alternative #9	Alternative #10	Alternative #11
Labor								
Gravity System Maintenance	\$7,500	\$7,500	\$7,500	\$0	\$7,500	\$600	\$600	\$600
Pumping Station Maintenance	\$20,340	\$40,680	\$40,680	\$0	\$0	\$40,680	\$61,020	\$0
Low-Pressure Collection System Labor	\$0	\$0	\$0	\$15,000	\$0	\$0	\$0	\$0
Grinder Pump Homeowner Maintenance	\$4,375	\$5,625	\$4,375	\$33,750	\$625	\$0	\$0	\$0
Electrical								
Pumping Station	\$5,000	\$10,000	\$10,000	\$0	\$0	\$10,000	\$15,000	\$0
Grinder Pumps	\$1,050	\$1,350	\$1,050	\$8,100	\$150	\$0	\$0	\$0
Materials	\$500	\$500	\$500	\$500	\$500	N/A	N/A	N/A
Chemicals	\$200	\$500	\$500	\$500	\$500	\$0	\$0	\$0
Transportation	\$200	\$400	\$400	\$200	\$600	\$0	\$0	\$0
Total Annual O&M Costs	\$39,165	\$66,555	\$65,005	\$58,050	\$9,875	\$51,280	\$76,620	\$600

N/A-No costs associated with this category

Estimated P/S Power \$5,000 \$/yr

Estimated P/S Labor 1,366 manhours/pumping station/year
\$20,340 \$/yr @ \$15/hr

Electric for Grinder Pump \$30 ea. per /year
Maintenance Contract for Grinder Pumps \$125 ea. per /year

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**Table 3-8
Summary of WWTP Operation and Maintenance Costs**

Cost Category	Alternative #5 Annual Cost	Alternative #9 Annual Cost	Alternative #10 Annual Cost
Labor Cost	\$90,000	\$20,340	\$40,680
Energy	\$25,000	\$15,000	\$30,000
Sludge Disposal	\$10,000	\$4,000	\$6,000
Chemicals	\$500	\$100	\$100
Contracted Services	\$20,000	\$2,000	\$2,000
Maintenance and Repairs	\$2,000	\$500	\$500
Professional Services	\$10,000	\$5,000	\$5,000
Administrative	\$10,000	\$5,000	\$5,000
Insurance and Bonding	\$2,000	\$2,000	\$2,000
Total Annual Costs	\$169,500	\$53,940	\$91,280
Design Annual Flow	0.110 mgd	0.036 mgd	0.055 mgd
Cost Per Million Gallon Treated	\$4,223 \$/mg	\$4,066 \$/mg	\$4,509 \$/mg

**Table 3-9
Summary of LCA Annual UMiT Common Rate User Charges**

Alternative	Number of Connections (edu's)	Total Cost (\$)
3	310	\$139,698
4	310	\$139,698
5	N/A	\$0
7	310	\$139,698
8	31	\$13,970
9	N/A	\$0
10	N/A	\$0
11	124	\$55,879

Unit Costs

LCA Total Estimated User Fee \$451 edu

**Table 3-10
Summary of Alternative Present Worth Costs**

Category	Vera Cruz Project Area						Swabia Alternative #11	
	Alternative #3	Alternative #4	Alternative #5	Alternative #7	S. 5th Street Alternative #8	Indian Creek Alternative #9		Hosensack Alternative #10
Alternative Design Flow (mgd)								
Gravity Sewer Construction Costs	\$4,735,500	\$3,651,500	\$3,836,500	\$0	\$819,000	\$0	\$0	
Pumping System Construction Costs	\$828,500	\$1,482,500	\$1,177,500	\$4,132,500	\$17,500	\$1,016,000	\$1,156,000	
WWTP Construction Costs	\$0	\$0	\$2,300,000	\$0	\$0	\$185,000	\$377,500	
LCA Non-Project Capacity Tapping Fees	\$497,860	\$497,860	\$0	\$497,860	\$101,178	\$0	\$0	
Engineering, Legal and Administrative Fees	\$834,600	\$771,600	\$1,097,100	\$619,875	\$125,475	\$523,275	\$663,150	
Contingency	\$834,600	\$771,600	\$1,097,100	\$619,875	\$125,475	\$523,275	\$663,150	
Land Acquisition	\$115,000	\$60,000	\$130,000	\$30,000	\$25,000	\$100,000	\$200,000	
Present Worth Collection System O&M	\$532,300	\$904,500	\$883,400	\$788,900	\$134,200	\$696,900	\$1,041,300	
Present Worth WWTP O&M	\$0	\$0	\$2,303,560	\$0	\$0	\$733,062	\$1,240,525	
LCA Annual UMIT Common Rate User Charges	\$1,898,547	\$1,898,547	\$0	\$1,898,547	\$189,855	\$0	\$0	
Total Present Worth Costs	\$8,378,360	\$8,149,560	\$12,825,160	\$6,689,010	\$1,347,828	\$3,777,512	\$5,341,625	\$709,944

Notes:
Land Acquisition Present Worth Interest Rate \$50,000 acre 4.0%