

Calculation of Infiltration (Table WW-4)

This worksheet will calculate the infiltration into your collection system. Enter data into the gray areas. The numbers in bold will be the numbers that must be reported on **Table WW-4** of Part B of the application.

	Month	Year	ADF ^a (gpd)
Month 1	January	2008	1,240,000
Month 2	February	2008	1,270,000
Month 3	March	2008	1,280,000
Average ADF (gpd):			1,263,333

Expected Flow:

Flow from Water billing records:

	Month	Year	Flow (gpd)
Month 1	January	2008	980,000
Month 2	February	2008	987,000
Month 3	March	2008	998,500

Expected Flow from Water

Billing (gpd): **988,500**

Consumptive Loss (gpd): **98,850**

Total Expected Flow (gpd): **889,650**

Total Inch-miles of pipe (im): **120**

Infiltration (gpd/im): **3,114**

Excessive Infiltration: **Yes**

^aADF = Average Daily Flow

$$Infiltration = \frac{\left[\frac{\sum_{i=1}^3 ADF[WWTP]_i}{3} - \left(CL - \frac{\sum_{i=1}^3 DWU[AVG]_i}{3} \right) \right]}{L_{gs}}$$

Infil= Infiltration (gpd/im)
 ADF[WWTP]= Average Daily Flow from the WWTP (gpd)
 i= Days 1 through 3
 CL= Consumptive Loss=10%
 DWU[AVG]= Average Daily Water Use from Water Billing Records (gpd)
 L_{gs}= Total inch-miles of pipe (im)

Calculation of Inflow (Table WW-5)

This worksheet will calculate the inflow into your collection system. Enter data into the gray areas. The numbers in bold will be the numbers that must be reported on **Table WW-5** of Part B of the application.

Rainfall Amounts:

	Date	Amount (inches)	ADF (gpd)
Day 1	11/5/2008	0.05	1,250,000
Day 2	11/6/2008	0.10	1,260,000
Day 3	11/7/2008	0.00	1,245,000
Day 4	11/8/2008	0.05	1,248,000
Day 5	11/9/2008	0.05	1,265,000
Rain Event:	11/10/2008	1.15	1,350,000
Total Flow including Industrial (gpd):			7,618,000
Peak Peak Flow from Industry (gpd):			30,000
Total non-industrial flow (gpd):			7,588,000
Service Population (from Table WW-3):			16,700
Inflow (gpd/capita):			454.37
Excessive Inflow?			Yes

$$\text{Inflow} = \frac{\text{ADF}_{\text{Rain}} + \sum_{i=1}^5 \text{ADF}(\text{Day})_i}{P_{SA}} + \text{PF}_{\text{Ind}}$$

Inflow = Amount of flow into a system following a rain event greater than 1 inch which is preceded by 5 days of dry weather (gpd/capita).

ADF_{Rain} = Instantaneous non-industrial peak flow occurring on the day of the 1-inch or greater rain event.

$\text{ADF}(\text{Day})$ = ADF for the 5 days preceding the rainfall event.
i = Days 1 to 5

PF_{Ind} = Peak Flow from Industry (gpd)

P_{SA} = Population in the Service Area

Calculation of Current Flows (Table WW-6)

This worksheet will calculate the current flows of your system. Enter data into the gray areas. The numbers in bold will be the numbers that must be reported on **Table WW-6** of Part B of the application.

	ADF (gpd)	Consumptive Loss (gpd)	Estimated Flow (gpd)
Residential Flow:	1,169,000	116,900	1,052,100
Commercial Flow:	250,500	25,050	225,450
Industrial Flow:	30,000		30,000
Flow Commitments:	12,740		12,740
Non-Excessive I/I:			0
	Total Estimated Flow (gpd):		1,320,290

$$Flow = (ADF_{Res} - (CL \times ADF_{Res})) + (ADF_{Com} - (CL \times ADF_{Com})) + ADF_{Ind} + FC + I/I$$

Flow= Total Estimated Flow (gpd)

ADFRes= Residential flow based on water billing records (gpd)

ADFCom= Commercial flow based on water billing records (gpd)

ADFInd= Industrial flow based on dual metering

CL= Consumptive loss (10%)

FC= Flow commitments (gpd)

I/I= Non-excessive I/I (gpd)

Calculation of Future Flows (Table WW-7)

This worksheet will calculate the current flows of your system. Enter data into the gray areas. The numbers in bold will be the numbers that must be reported on **Table WW-7** of Part B of the application.

IF you provided a municipality population in Table 1, then do the following:

Current Population in Service Area:	16,700
Current Municipal Population Estimate:	16,700
Current County Population Estimate:	156,400
Percent of county population in municipality:	10.7%
Estimated Future County Population:	184,755
Estimated Future Municipal Population:	19,728
Percent Future Population in Service Area (from Table 1):	100.0%
Estimated Future Population in Service Area:	19,728
Estimated Population Increase in Service Area:	3,028
Enter this number in Estimated Population in Service Area ^a :	3,028
Current Flow (gpd):	1,320,290
Planned Industrial Flows (gpd):	0
Estimated Residential Flow (gpd):	211,960
Estimated Commercial Flow:	45,420
Industrial Reserve:	157,767
Total Estimated Flow:	1,735,437

IF you provided only a county population estimate in Table 1, then do the following

Current Population in Service Area:	
Estimated County Population:	
Percent Future County Population in Service Area:	
Estimated Population in Service Area:	0
Estimated Population Increase in Service Area:	0
Enter this number into the Estimated Population in Service Area below.	

$$Flow_{20-year} = Flow_{Existing} + PIL + (70 \text{ gpd/capita} \times Pop_{Projected}) + (15 \text{ gpd/capita} \times Pop_{Projected}) + IR$$

Flow_{20-year}= Estimated flows at the end of the 20-year project life (gpd)

Flow_{Existing}= Existing flows, including non-excessive I/I (gpd)

PIL= Planned industrial flows with letter of intent (gpd)

IR= Industrial Reserve=10% of design wastewater flows, excluding I/I

Pop_{Projected}= Projected population at end of 20-year project life

^aEstimated population at the end of the planning

Project Present Worth, Interest and Payment Calculations (Tables WW-9 & WW-11)

This worksheet will calculate the project present worth, interest, and annual payment required for the project.
 For the Present Worth Analysis, enter the numbers listed in bold into the appropriate places on Table WW-9.
 For the project cost, enter the percentages for project administration.
 Report the numbers for payment calculations in the appropriate places on Table WW-11.

Present Worth Analysis

	Construction Costs	Replacement Costs	Salvage Value Present Worth	Annual O&M Costs	Present Worth Cost	Construction Contingency	Project Administration	Project Subtotal	Closing Fee	Total Project Cost
Alternative #1	\$7,287,900	\$19,299	\$183,416	\$157,442	\$7,281,225	\$728,122	\$1,092,184	\$9,101,531	\$91,015	\$9,192,546
Alternative #2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Alternative #3	\$0	\$19,299	\$0	\$0	\$19,299	\$1,930	\$2,895	\$24,124	\$241	\$24,365
Preferred Alternative	\$2,257,500	\$19,299	\$254,744	\$314,884	\$2,336,939	\$233,694	\$350,541	\$2,921,173	\$29,212	\$2,950,385

Construction Contingencies: 10.0%
 Project Administration: 15.0%
 Is your community a High Unit Cost (HUC) community? No

$$PW = Cost_{Capital} + Cost_{Replacement} + Cost_{O\&M}(P/A, i, n) - SV(P/F, i, n)$$

PW= Present worth of project

Cost_{Capital}= Capital costs of project

Cost_{Replacement}= Replacement costs of components.

Cost_{O&M}= Operations and Maintenance Costs

SV= Salvage Value at the end of 20 years

Project Cost (Preferred Alternative)

Project Cost: \$2,921,173
 Current Interest Rate^a: 0.00%
 Repayment (years): 20
 Current Interest to Repay: \$0
 Current Total Loan & Interest Cost: \$2,921,173
 Principal Forgiveness^a: \$1,460,587
 Principal to Repay: \$1,460,587

$$I = PRT \quad \text{Repayment}_{Annual} = \left(\frac{P + I}{\text{Payments}_{Number}} \right)$$

I= Total interest of the loan (\$0 for stimulus funding)

P= Principal of the loan (total project cost minus closing fee). For stimulus funds, 1/2 of total project cost

R= Interest (0% for Stimulus funds)

T= Time (20 years)

Repayment_{Annual}= Annual repayments made

Payments_{Number}= Number of payments made over life of loan (20)

Current Annual Payment: \$73,029
^aStimulus Funding Only

User Fees and Revenue Generated (Tables WW-12 & WW-13)

This worksheet will calculate the current flows of your system. Enter data into the gray areas. The numbers in bold will be the numbers that must be reported on **Tables WW-12 and WW-13** of Part B of the application.

Current monthly User Charge for 5,000 gallons:	\$36.00
Current population of municipality or County owning the project (from Table WW-3):	16,700
Estimated Monthly ADF at start of project (gpd):	1,320,290
Current Annual Payment:	\$73,029
Annual O&M Cost (Preferred Alternative from Table WW-9):	\$314,884
Total Annual Cost for first year of project @ 0% Interest Rate:	\$387,913
Monthly Cost @ 0% Interest Rate:	\$32,326
Monthly User Fee increase to treat 5,000 gallons of wastewater (\$/5,000 gal) due to project @ 0% Interest Rate:	\$122.42
Median household income:	\$38,640
Monthly Median Household Income:	\$3,220
New total monthly user charge @ 0% Interest Rate:	\$158.42
Percentage of monthly median income @ 0% Interest Rate:	4.92%
Is the rate increase excessive (greater than 1.5%) for the 0% interest scenario?:	Yes
Total current revenue:	\$601,200
Total new revenue @ 0% interest rate:	\$2,645,622.25
Are user charges sufficient to repay loan @ 0% interest rate?:	Yes