Table of Contents

Table of Contents

Page No.

Table of Contents

Page No.

List of Tables

Page No.

List of Figures

Page No.

List of Appendices

Population Equivalent and Acres

Basin	Subbasin	Population Equivalent			Developed Acres			Total Acres
		2000	2010	2025	2000	2010	2025	
Baldwin Creek	BC-1	302	3,557	7,725	0	522	1,190	1,719
	BC-2	57	1,003	2,160	0	151	337	1,269
	BC-3	146	997	2,118	0	136	316	1,798
	BC-4	0	3	269	0	0	43	262
Subtotal		505	5,559	12,272	0	810	1,886	5,048
Central	C-1	5,209	5,736	6,096	763	763	763	762
	C-2	5,495	5,627	5,884	534	534	534	533
	C-3	1,419	1,419	1,419	135	135	135	135
Subtotal		12,123	12,781	13,399	1,432	1,432	1,432	1,430
East Lawrence	EL-1	4,164	4,264	4,480	897	913	947	1,620
	EL-2	240	1,258	3,022	0	163	446	2,704
Subtotal		4,405	5,522	7,502	897	1,076	1,393	4,324
Kansas River	KR-1	854	1,734	2,833	171	312	488	2,470
	KR-2	7,095	8,787	12,539	1,681	1,757	1,926	1,927
	KR-3	3,502	3,545	3,590	412	412	412	412
	KR-4	6,485	6,485	6,485	722	722	722	721
	KR-5	14,622	14,676	15,231	1,447	1,447	1,447	1,447
	KR-6	4,725	5,545	6,486	1,245	1,376	1,527	3,765
Subtotal		37,282	40,770	47,162	5,678	6,026	6,522	10,742
North Lawrence	NL-1	1,168	3,342	4,437	450	450	450	1,724
	NL-2	17	97	171	0	13	25	312
	NL-3	31	569	1,142	0	86	178	1,767
Subtotal		1,216	4,007	5,750	450	549	653	3,803
Wakarusa River	WR-1	293	750	1,419		73	180	1,065
	WR-2	8,983	9,204	12,166	1,892	1,892	1,892	1,892
	WR-3	4,667	4,941	5,387	913	913	913	913
	WR-4	8,539	8,808	9,374	1,404	1,404	1,404	1,404
	WR-5	2,053	2,053	2,053	226	226	226	225
	WR-6	8,386	8,461	9,753	1,879	1,891	2,098	2,624
Subtotal		32,921	34,217	40,151	6,314	6,400	6,714	8,123
Wakarusa River South	WRS-1	0	0	417	0	0	67	2,150
	WRS-2	0	0	2,134	0	0	342	3,875
	WRS-3	0	0	1,549	0	0	248	682
	WRS-4	0	0	3,431	0	0	550	1,623
	WRS-5	0	0	3,410	0	0	547	1,962
	WRS-6	281	1,554	3,437	0	204	506	2,427
	WRS-7	0	0	1,440	0	0	231	662
	WRS-8	0	0	3,897	0	0	624	1,465
	WRS-9	0	0	564	0	0	90	207
Subtotal		281	1,554	20,279	0	204	3,205	15,053
Yankee Tank Creek	YTC-1	1,433	1,446	1,473	554	556	560	567
	YTC-2	502	2,499	5,216	100	420	855	953
	YTC-3	214	2,336	5,155	43	383	835	1,331
	YTC-4	28	1,514	3,513	0	238	558	1,300
	YTC-5	0	15	1,865	0	2	299	695
	YTC-6	0	0	919	0	0	147	1,659
Subtotal		2,177	7,809	18,141	696	1,599	3,255	6,505
Total		90,908	112,220	164,654	15,468	18,096	25,059	55,028

Flow Metering Methodology

All equipment was calibrated before installation to ensure depth sensor accuracy and proper operation of the velocity sensor.

After completion of the site investigations and meter calibration, the flow meters were installed. After installation, the sensors were tested to ensure that the meters were working properly. A site report was completed during installation and updated each time the site was visited.

During the metering, certain steps were taken to assure the integrity of the data collected at each metering location. The quality of the field data was analyzed throughout the project. Regular field visits to each flow meter included the following tests:

- Download Data. The time, depth, and sensed velocity data accumulated in the meter's memory were downloaded to a laptop computer.
- Measure Power Supply. Power levels were recorded and batteries replaced, if necessary.
- Verify Depth of Flow and Velocity. During about half of the site visits, a member of the field crew descended into the manhole to measure the depth and velocity of flow at the sensor for comparison with the meter readings. The depth-velocity profiles were used to verify that each meter was properly calibrated.
- Measure Silt Level. The depth of silt at the sensor was measured.

The downloaded data were processed in the office each week, and reviewed to ensure accuracy and consistency. Any deviations from expected value ranges were addressed by additional field checks. In the office, the meter manufacturer's software was used to convert the sensed velocities to the average cross section velocities, calculate flows from the average velocities and depth/diameter data, and prepare flow data printouts and plots.

Preliminary Data Analysis

After sufficient data were collected, preliminary analysis was initiated, which included the following:

- Verification. Digitized flow data were checked against field documentation to ensure accuracy. Key values such as pipe diameter, flow depth, sewer line calibration results, and silt depth were also checked for accuracy.

- Review of Hydraulic Calibration Data. Calibration data were collected for each site to develop the relationship of depth to discharge. The calibration tasks included the following steps:

  – A hand-held portable velocity meter was used to obtain average flow velocities through velocity profiling. The flow depth was recorded and the instantaneous flow rate determined from the Continuity Equation (Q=AV). These values were entered into software provided with the equipment, which then output a "site coefficient" value. The Manning's formula was solved for the energy gradient ($s^{½}/n$), which is the actual slope of the water surface at the monitoring point. (The as-built pipe slope was obtained from computer model inventory tables.)
  – After several site visits, statistical analyses were performed to evaluate the quality of the calibration data and to determine the final site coefficient to be used for final flow data processing.
  – Flow tables and graphs at 15 minute and daily intervals were printed using the manufacturer's software. Flow quantities were calculated using the depth and velocity of flow (Continuity Equation, Q=AV). Since velocity probes may sometimes be inaccurate, such as during extremely low nighttime flows or if a meter has temporarily fouled, flows were also calculated using the depth and the calibrated energy gradient from the Manning's formula. Close agreement between the results of the two methods is evidence of proper flow meter operation.

Summary of Inflow Parameters

An average "K" based on specific inflow coefficients calculated for each monitored storm event was used for analysis. The average inflow coefficient is used to determine inflow for any storm event with a selected recurrence interval using the following relationship:

$$Q = KIA$$

where: Q = peak inflow (cfs)
K = inflow coefficient
I = rainfall intensity for selected recurrence interval and time of concentration (in/hr)
A = developed area (acres)

The inflow coefficient for interior subsystems can be calculated using measured cumulative flow, tributary subsystem inflow coefficients, and tributary area. The inflow generated within an interior subsystem must be calculated because measured flow includes the dynamic cumulative effect from all tributary subsystems. System dynamics considers the time of travel through the sewer system. Each interior subsystem inflow coefficient was determined using the following weighted coefficient formula:

$$K_t = K_i A_i + K_2 A_3 \quad K_i A_i / A_t$$

where: K_t = cumulative inflow coefficient
K_i = tributary subsystem inflow coefficient
A_i = tributary subsystem area
A_t = total tributary area

A summary of tributary areas, times of concentration, and inflow coefficients is presented in Table G-1.

Table G-1 Summary of Inflow Parameters						
	Area (acres)		Time of Concentration, t_c (min)		Inflow Coefficient "K"	
Subbasin	Subbasin	Cum-ulative	Subbasin	Cum-ulative	Subbasin	Cum-ulative
C-1	763	1,432	120	150	0.00434	0.00641
C-2	534	534	105	105	0.00875	0.00875
C-3	135	135	90	90	0.00877	0.00877
EL-1	897	897	120	120	0.00465	0.00465
KR-1	517	517	120	120	0.00113	0.00113
KR-2	1,681	2,199	150	165	0.00288	0.00247
KR-3	412	412	105	105	0.00239	0.00239
KR-4	722	3,333	120	180	0.00484	0.00297
KR-5	1,447	18,396	135	300	0.00863	0.00502
KR-6	1,245	1,245	135	135	0.00315	0.00315
NL-1	1,118	1,118	135	135	0.00805	0.00805
WR-2	1,892	1,892	165	165	0.00452	0.00452
WR-3	913	913	135	135	0.00522	0.00522
WR-4	1,404	1,404	150	150	0.00310	0.00310
WR-5	226	7,046	90	240	0.00466	0.00463
WR-6	1,879	8,925	150	240	0.00499	0.00471
YTC-1	1,103	1,103	135	135	0.00535	0.00535
YTC-2	953	953	165	165	0.00535	0.00535
YTC-3	554	2,610	105	165	0.00528	0.00533

Average Daily Dry Weather Flows

Basin	Subbasin	ADDF (gpcd)	ADDF (mgd) 2000	2010	2025
Baldwin Creek	BC-1	110.46	0.033	0.393	0.853
	BC-2	110.46	0.006	0.111	0.239
	BC-3	110.46	0.016	0.110	0.234
	BC-4	110.46	0.000	0.000	0.030
Subtotal			0.056	0.614	1.356
Central	C-1	92.53	0.482	0.531	0.564
	C-2	110.46	0.607	0.622	0.650
	C-3	108.57	0.154	0.154	0.154
Subtotal			1.243	1.306	1.368
East Lawrence	EL-1	47.31	0.197	0.202	0.212
	EL-2	110.46	0.027	0.139	0.334
Subtotal			0.224	0.341	0.546
Kansas River	KR-1	91.36	0.078	0.158	0.259
	KR-2	89.08	0.632	0.783	1.117
	KR-3	108.51	0.380	0.385	0.390
	KR-4	109.64	0.711	0.711	0.711
	KR-5	106.02	1.550	1.556	1.615
	KR-6	36.40	0.172	0.202	0.236
Subtotal			3.523	3.794	4.327
North Lawrence	NL-1	72.77	0.085	0.243	0.323
	NL-2	110.46	0.002	0.011	0.019
	NL-3	110.46	0.003	0.063	0.126
Subtotal			0.090	0.317	0.468
Wakarusa River	WR-1	110.46	0.032	0.083	0.157
	WR-2	103.97	0.934	0.957	1.265
	WR-3	104.15	0.486	0.515	0.561
	WR-4	104.23	0.890	0.918	0.977
	WR-5	112.52	0.231	0.231	0.231
	WR-6	86.33	0.724	0.730	0.842
Subtotal			3.297	3.434	4.033
Wakarusa River South	WRS-1	110.46	0.000	0.000	0.046
	WRS-2	110.46	0.000	0.000	0.236
	WRS-3	110.46	0.000	0.000	0.171
	WRS-4	110.46	0.000	0.000	0.379
	WRS-5	110.46	0.000	0.000	0.377
	WRS-6	110.46	0.031	0.172	0.380
	WRS-7	110.46	0.000	0.000	0.159
	WRS-8	110.46	0.000	0.000	0.430
	WRS-9	110.46	0.000	0.000	0.062
Subtotal			0.031	0.172	2.240
Yankee Tank Creek	YTC-1	79.53	0.114	0.115	0.117
	YTC-2	79.72	0.040	0.199	0.416
	YTC-3	110.26	0.024	0.258	0.568
	YTC-4	110.46	0.003	0.167	0.388
	YTC-5	110.46	0.000	0.002	0.206
	YTC-6	110.46	0.000	0.000	0.101
Subtotal			0.181	0.741	1.797
Total			8.645	10.718	16.134

Lawrence, Kansas
Wastewater Master Plan
Present Worth of Capital Costs for Wastewater Treatment Plant Alternatives

Alternative 1 - All Flow to Existing Kansas River WWTP

All flow would be conveyed to an 18.8 mgd Kansas River WWTP.

Item	Year 2002 Project Cost $	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
		Implementation Schedule Cost, $1000's																						
Wastewater Treatment Plant Costs:																								
Upgrade 12.5 mgd Kansas River WWTP with BNR	$6,500,000						1,200	1,800	1,800	1,700														
Expand WWTP from 12.5 to 18.8 mgd with BNR & Solids Proc.	$40,900,000						7,400	11,200	11,200	11,100														
Expand Excess Flow Treatment Facilities	$5,100,000						920	1,400	1,390	1,390														
Flood Protection and WWTP Site Fill	$500,000						90	410																
Collection System Costs:																								
Wakarusa Pumping Station PS -5C (10.0 mgd)	$3,400,000			680	2,720																			
Wakarusa Pumping Station PS-5C Force Main (24" & 36")	$9,200,000			1,840	7,360																			
31st Street Relief Sewer -- 4 Seasons to PS-5C (30")	$3,400,000				680	2,720																		
Wakarusa River South Pumping Station PS-WRS-2 (2.0 mgd)	$840,000													840										
Wakarusa River South Pumping Station PS-WRS-2 Force Main (10")	$400,000													400										
Wakarusa River South Interceptor - South of Wakarusa River (30-42")	$4,160,000		830	3,330																				
Initial Pumping Station & Force Main for South Wakarusa Area	$750,000		150	600																				
Wakarusa River South Pumping Station PS-WRS-1 (11.0 mgd)	$3,000,000								600	2,400														
Wakarusa River South Pumping Station PS-WRS-1 Force Main (24")	$4,800,000								960	3,840														
Total Capital Cost	$82,950,000	0	980	6,450	10,760	2,720	9,610	14,810	15,950	20,430	0	0	0	1,240	0	0	0	0	0	0	0	0	0	0
Present Worth Factor (5.875%)		0.945	0.892	0.843	0.796	0.752	0.710	0.671	0.633	0.598	0.565	0.534	0.504	0.476	0.450	0.425	0.401	0.379	0.358	0.338	0.319	0.301	0.285	0.269
Total Present Worth	**$56,600,000**	0	874	5,437	8,565	2,045	6,823	9,938	10,096	12,217	0	0	0	590	0	0	0	0	0	0	0	0	0	0

Alternative 2 - Wakarusa River WWTP (Site A) & Kansas River WWTP

Flow would be conveyed via force main to a 6.9 mgd Wakarusa River WWTP located southeast of the Wakarusa River and an 11.9 mgd Kansas River WWTP.

Item	Year 2002 Project Cost $	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Wastewater Treatment Plant Costs:																								
Upgrade Kansas River WWTP with 11.9 mgd BNR	$6,200,000													1,100	2,600	2,500								
Aquire Wakarusa WWTP Site / Siting & Environm. Studies	$1,500,000	400	400	700																				
6.9 mgd Wakarusa WWTP with BNR & Solids Processing	$50,600,000					4,500	4,500	13,900	13,900	13,800														
Wakarusa WWTP Excess Flow Handling Facility	$5,100,000						920	1,400	1,390	1,390														
Second Electrical Power Feed to WWTP	$500,000							500																
Flood Protection and WWTP Site Fill	$1,500,000						270	1,230																
Collection System Costs:																								
4-Seasons Force Main to Wakarusa South Interceptor (20")	$1,600,000								320	1,280														
Wakarusa South Interceptor - South of Wakarusa River (42")	$3,800,000		760	3,040																				
Initial Pumping Station & Force Main for South Wakarusa Area	$750,000		150	600																				
Wakarusa South Pumping Station PS-WRS-1 (20 mgd)	$5,400,000								1,080	4,320														
Wakarusa South Pumping Station PS-WRS-1 Force Main (30")	$3,700,000								740	2,960														
Total Capital Cost	$80,650,000	400	1,310	4,340	0	4,500	5,690	17,030	17,430	23,750	0	0	0	1,100	2,600	2,500	0	0	0	0	0	0	0	0
Present Worth Factor (5.875%)		0.945	0.892	0.843	0.796	0.752	0.710	0.671	0.633	0.598	0.565	0.534	0.504	0.476	0.450	0.425	0.401	0.379	0.358	0.338	0.319	0.301	0.285	0.269
Total Present Worth	**$52,000,000**	378	1,169	3,659	0	3,384	4,040	11,427	11,033	14,203	0	0	0	524	1,170	1,063	0	0	0	0	0	0	0	0

Notes:
1. **Facilities will meet year 2025 development needs.**
2. **BNR denotes Biological Nutrient Removal.**
3. **Costs include engr & constr and are in year 2002 dollars.**

Lawrence, Kansas
Wastewater Master Plan
Present Worth of Capital Costs for Wastewater Treatment Plant Alternatives

Implementation Schedule Cost, $1000's

Alternative 2b - Wakarusa River WWTP (Site A) & Kansas River WWTP	Year 2002 Project Cost $	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
(Note: Alt. 2b was screened out during the evaluation)																								
Flow would be conveyed via ***sewer tunnel*** *to a 6.9 mgd Wakarusa River WWTP located southeast of the Wakarusa River and an 11.9 mgd Kansas River WWTP.*																								
Wastewater Treatment Plant Costs:																								
Upgrade Kansas River WWTP with 11.9 mgd BNR	$6,200,000													1,100	2,600	2,500								
Aquire Wakarusa WWTP Site / Siting & Environm. Studies	$1,500,000	400	400	700																				
6.9 mgd Wakarusa WWTP with BNR & Solids Processing	$54,400,000					4,900	4,900	14,900	14,900	14,800														
Wakarusa WWTP Excess Flow Handling Facility	$5,100,000						920	1,400	1,390	1,390														
Second Electrical Power Feed to WWTP	$500,000							500																
Flood Protection and WWTP Site Fill	$1,500,000						270	1,230																
Collection System Costs:																								
4-Seasons Force Main to Wakarusa South Interceptor (20")	$1,600,000								320	1,280														
Initial Pumping Station & Force Main for South Wakarusa Area	$750,000		150	600																				
Wakarusa South Interceptor - South of Wakarusa River (42"-48")	$9,300,000		830	3,310					1,030	4,130														
Wakarusa South Interceptor Tunnels - South of Wakarusa River	$4,600,000		60	240					860	3,440														
Total Capital Cost	$85,450,000	400	1,440	4,850	0	4,900	6,090	18,030	18,500	25,040	0	0	0	1,100	2,600	2,500	0	0	0	0	0	0	0	0
Present Worth Factor (5.875%)		0.945	0.892	0.843	0.796	0.752	0.710	0.671	0.633	0.598	0.565	0.534	0.504	0.476	0.450	0.425	0.401	0.379	0.358	0.338	0.319	0.301	0.285	0.269
Total Present Worth	**$55,300,000**	378	1,284	4,089	0	3,685	4,324	12,098	11,711	14,974	0	0	0	524	1,170	1,063	0	0	0	0	0	0	0	0

Alternative 3 - Wakarusa River WWTP (Site B) & Kansas River WWTP	Project Cost $	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Flow would be conveyed via sewer & F.M. to a 6.9 mgd Wakarusa River WWTP located southwest of the Wakarusa River and an 11.9 mgd Kansas River WWTP.																								
Wastewater Treatment Plant Costs:																								
Upgrade Kansas River WWTP with 11.9 mgd BNR	$6,200,000													1,100	2,600	2,500								
Aquire Wakarusa WWTP Site / Siting & Environm. Studies	$1,500,000	400	400	700																				
6.9 mgd Wakarusa WWTP with BNR & Solids Processing	$52,500,000					4,700	4,700	14,400	14,400	14,300														
Wakarusa WWTP Excess Flow Handling Facility	$5,100,000						920	1,400	1,390	1,390														
Second Electrical Power Feed to WWTP	$500,000							500																
Flood Protection and WWTP Site Fill	$1,500,000						270	1,230																
Collection System Costs:																								
4-Seasons Force Main to Wakarusa River WWTP (20")	$2,500,000								500	2,000														
Wakarusa South Interceptor (West) - South of Wakarusa River (30")	$1,100,000		200	900																				
Wakarusa South Interceptor (East) - South of Wakarusa River (21"-27")	$1,900,000		380	1,520																				
Initial Pumping Station & Force Main for South Wakarusa Area	$750,000		150	600																				
Wakarusa River South Pumping Station PS-WRS-1 (2.0 mgd)	$840,000													840										
Wakarusa River South Pumping Station PS-WRS-1 Force Main (10")	$830,000													830										
Total Capital Cost	$75,220,000	400	1,130	3,720	0	4,700	5,890	17,530	16,290	17,690	0	0	0	2,770	2,600	2,500	0	0	0	0	0	0	0	0
Present Worth Factor (5.875%)		0.945	0.892	0.843	0.796	0.752	0.710	0.671	0.633	0.598	0.565	0.534	0.504	0.476	0.450	0.425	0.401	0.379	0.358	0.338	0.319	0.301	0.285	0.269
Total Present Worth	**$48,400,000**	378	1,008	3,136	0	3,534	4,182	11,763	10,312	10,579	0	0	0	1,319	1,170	1,063	0	0	0	0	0	0	0	0

Notes:
1. **Facilities will meet year 2025 development needs.**
2. **BNR denotes Biological Nutrient Removal.**
3. **Costs include engr & constr and are in year 2002 dollars.**

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
C-1	SW062200	SW062201	866.86	863.91	873.00	410	12	0.00720	3.02	2098062.553	234433.565	6.14
C-1	SW062201	SW062202	863.91	861.03	869.00	398	12	0.00724	3.03	2098047.932	234843.304	5.09
C-1	SW062202	SW062049	860.93	860.16	867.00	64	12	0.01203	3.90	2098033.722	235241.531	6.07
C-1	PS_08	SW062211	836.00	869.34	855.50	1715	10	-.01944	0.00	2095220.121	234050.646	19.50
C-1	SW062211	SW062012	869.34	868.34	879.34	41	18	0.02439	16.40	2096823.100	234661.175	10.00
C-1	SW062012	SW062015	868.34	867.27	878.34	350	18	0.00306	5.81	2096856.344	234637.430	10.00
C-1	SW062015	SW062016	867.27	866.20	877.27	305	18	0.00351	6.22	2096837.347	234988.865	10.00
C-1	SW062016	SW062003	866.20	864.64	876.20	332	18	0.00470	7.20	2096837.347	235302.308	10.00
C-1	NW01124B	NE011021	870.10	869.90	888.00	158	12	0.00127	1.26	2093905.145	236502.443	17.90
C-1	NE011021	NE011019	869.90	869.25	882.50	400	12	0.00163	1.43	2094063.526	236500.004	12.60
C-1	NE011019	NE011017	869.25	868.60	877.60	323	15	0.00201	2.89	2094463.182	236516.581	8.35
C-1	NE011017	NE011016	868.60	868.00	874.75	322	15	0.00186	2.78	2094785.951	236529.968	6.15
C-1	NE011093	NE011094	867.68	867.56	874.50	64	15	0.00188	2.80	2095215.628	236547.790	6.82
C-1	SW062020	SW062026	864.64	863.04	874.64	350	8	0.00457	0.81	2097169.786	235288.061	10.00
C-1	SW062026	SW062034	863.04	861.35	873.04	330	8	0.00512	0.86	2097521.222	235302.308	10.00
C-1	SW062034	SW062049	861.35	860.16	871.35	169	8	0.00704	1.01	2097853.661	235307.057	10.00
C-1	SW062049	SW062048	860.16	859.28	867.00	308	12	0.00286	1.90	2098019.175	235304.203	6.84
C-1	SW062048	SW062047	859.28	859.09	867.50	300	12	0.00063	0.89	2098009.701	235611.731	8.22
C-1	NW01066E	NW01066D	890.53	889.00	898.00	458	8	0.00334	0.69	2092339.916	238977.311	7.47
C-1	NW01066D	NW01066C	888.54	888.13	898.00	145	8	0.00283	0.64	2092797.677	238990.086	9.46
C-1	NW01066C	NW01066B	888.13	888.00	898.00	66	8	0.00325	0.68	2092942.458	238996.473	9.87
C-1	NW01066B	NW01066A	888.00	887.00	897.00	331	8	0.00302	0.66	2093008.461	238998.602	9.00
C-1	NW01066A	NW011066	887.00	886.00	897.00	347	8	0.00288	0.64	2093338.475	239026.281	10.00
C-1	NW011066	NW011065	886.00	884.00	896.00	466	8	0.00429	0.79	2093504.547	238721.816	10.00
C-1	NW011065	NW011064	884.00	883.00	894.00	139	8	0.00719	1.02	2093791.979	238355.607	10.00
C-1	NW011064	NW011067	883.00	882.00	893.00	454	8	0.00220	0.56	2093928.243	238325.799	10.00
C-1	NW011067	NE011027	882.00	881.00	892.00	300	8	0.00333	0.69	2093941.018	237872.295	10.00
C-1	NE011027	NE011037	881.00	879.00	891.00	298	8	0.00671	0.98	2093949.534	237572.089	10.00

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
C-1	NE011037	NW01124A	879.00	878.00	889.00	302	8	0.00331	0.69	2093958.051	237274.011	10.00
C-1	NW01124A	NE011023	877.99	877.70	889.40	162	10	0.00179	0.92	2093967.548	236972.281	11.41
C-1	NE011023	NE011040	877.70	877.20	887.00	147	10	0.00340	1.27	2094129.589	236978.370	9.30
C-1	NE011040	NE011042	877.20	876.00	883.00	334	10	0.00359	1.31	2094275.290	236984.450	5.80
C-1	NE011042	NE011043	876.00	873.88	881.20	480	10	0.00442	1.45	2094610.176	236995.415	5.20
C-1	NE011043	NE011045	873.88	873.12	882.45	173	18	0.00439	6.96	2095089.719	237011.979	8.57
C-1	NE011045	NE011094	872.20	867.56	880.00	487	18	0.00953	10.25	2095262.227	237019.057	7.80
C-1	NE011094	SE011096	867.56	867.28	874.50	106	18	0.00264	5.39	2095277.856	236534.292	6.94
C-1	SE011096	SE011098	867.28	866.25	876.30	406	18	0.00254	5.29	2095379.534	236502.793	9.02
C-1	SE011098	SE011100	866.25	865.37	878.00	345	18	0.00255	5.30	2095785.160	236520.211	11.75
C-1	SE011100	SE011101	865.37	864.48	883.00	350	18	0.00254	5.29	2096129.843	236535.011	17.63
C-1	SE011101	SE012104	864.48	864.03	883.00	176	18	0.00256	5.31	2096479.520	236550.027	18.52
C-1	NE011094	NE011095	867.56	867.49	874.50	9	24	0.00778	19.95	2095277.738	236532.351	6.94
C-1	NE011095	SE011093	867.19	867.00	874.50	97	24	0.00196	10.01	2095276.838	236523.597	7.31
C-1	SE011093	SE011097	866.90	866.07	874.00	417	24	0.00199	10.09	2095367.397	236490.261	7.10
C-1	SE011097	SE011099	866.07	865.26	877.30	404	24	0.00200	10.11	2095784.013	236508.151	11.23
C-1	SE011099	SE011102	865.26	864.43	882.50	416	24	0.00200	10.11	2096187.641	236525.482	17.24
C-1	SE011102	SE012104	864.34	864.07	881.80	85	24	0.00318	12.75	2096602.998	236543.318	17.46
C-1	SE012104	SE012105	864.03	863.89	882.00	55	18	0.00255	5.30	2096655.358	236557.577	17.97
C-1	SE012105	SW062002	863.89	863.22	881.50	263	18	0.00255	5.30	2096698.387	236591.834	17.61
C-1	SW062002	SW062203	863.22	862.86	880.00	364	24	0.00099	7.11	2096960.995	236594.162	16.78
C-1	SW062203	SW062003	862.86	862.50	877.00	350	18	0.00103	3.37	2096972.079	236230.783	14.14
C-1	SW062003	SW062018	862.40	861.93	875.00	170	18	0.00276	5.51	2096982.748	235881.046	12.60
C-1	SW062018	SW062024	861.93	860.76	874.00	350	18	0.00334	6.07	2097152.330	235886.192	12.07
C-1	SW062024	SW062032	860.76	859.65	872.00	330	18	0.00336	6.08	2097502.020	235896.803	11.24
C-1	SW062032	SW062047	859.65	859.09	870.00	169	18	0.00331	6.04	2097831.892	235906.813	10.35
C-1	SW062047	SW062046	858.89	857.94	870.00	162	18	0.00586	8.04	2098000.453	235911.928	11.11
C-1	SW062046	SW062060	857.94	857.33	868.00	105	18	0.00581	8.00	2098162.378	235916.841	10.06

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
C-1	SW062060	SW062059	857.33	856.74	867.00	101	18	0.00584	8.02	2098267.574	235920.033	9.67
C-1	SW062059	SW062058	856.74	855.87	866.00	149	18	0.00584	8.02	2098368.061	235930.279	9.26
C-1	SW062058	SW062069	855.87	854.02	866.00	319	18	0.00580	8.00	2098516.721	235931.849	10.13
C-1	SW062069	SW062077	854.02	852.20	860.00	271	18	0.00672	8.61	2098835.500	235938.984	5.98
C-1	SW062077	SW062087	852.20	851.50	859.00	95	18	0.00737	9.01	2099106.750	235944.250	6.80
C-1	SW062087	SW062088	851.50	851.40	858.00	13	18	0.00769	9.21	2099201.500	235945.688	6.50
C-1	SW062088	SE062111	851.40	848.42	858.00	402	18	0.00741	9.04	2099202.500	235933.063	6.60
C-1	SE062111	SE062135	848.42	848.15	855.00	36	18	0.00750	9.09	2099604.500	235939.391	6.58
C-1	SE062135	SE062114	848.15	846.25	855.00	256	18	0.00742	9.04	2099608.500	235903.609	6.85
C-1	SE062114	SE062113	846.25	843.54	855.00	365	18	0.00742	9.04	2099864.000	235908.422	8.75
C-1	SE062113	NE06212B	843.54	842.31	851.00	434	18	0.00283	5.58	2099851.500	236273.094	7.46
C-1	NE06212B	NE06227B	842.31	841.67	847.61	418	18	0.00153	4.10	2100078.000	236643.375	5.30
C-1	NE06227B	NE062145	841.67	841.22	855.00	278	18	0.00162	4.22	2100496.038	236650.263	13.33
C-2	NW011024	NW011023	891.00	889.90	899.00	400	12	0.00275	1.86	2093682.355	236481.752	8.00
C-2	NW011023	NW011022	889.90	887.30	899.90	400	12	0.00650	2.87	2093282.502	236470.920	10.00
C-2	NW011022	NW011021	887.30	885.76	893.40	362	12	0.00425	2.32	2092882.648	236460.089	6.10
C-2	NW011021	SW011018	885.76	884.89	898.50	217	10	0.00401	1.38	2092520.814	236444.492	12.74
C-2	SW011018	SW011017	884.79	884.32	891.50	117	10	0.00402	1.38	2092526.823	236227.575	6.71
C-2	SW011017	SW011016	884.22	883.17	890.50	53	10	0.01981	3.08	2092530.052	236111.020	6.28
C-2	SW011016	SW011011	883.07	880.08	890.50	148	10	0.02020	3.11	2092516.476	236059.403	7.43
C-2	SW011011	SW011010	879.98	876.73	888.90	325	10	0.01000	2.19	2092520.575	235911.444	8.92
C-2	SW011010	SW011068	872.84	871.52	882.80	330	10	0.00400	1.38	2092529.576	235586.535	9.96
C-2	SW011068	SW011067	871.42	870.84	879.60	137	10	0.00423	1.42	2092538.715	235256.627	8.18
C-2	SW011067	SW011057	870.74	870.25	882.00	123	10	0.00398	1.38	2092542.509	235119.666	11.26
C-2	SW011057	SW011052	867.24	866.32	880.00	196	10	0.00469	1.50	2092665.413	235124.844	12.76
C-2	SW011052	SW011051	866.32	862.62	882.00	415	10	0.00892	2.06	2092670.836	234929.099	15.68
C-2	SW011051	SW011045	862.52	860.20	869.50	270	10	0.00859	2.03	2093085.219	234946.580	6.98
C-2	SW011045	SW011044	860.10	858.77	866.50	337	12	0.00395	2.23	2093355.006	234957.915	6.40

NETWORK INVENTORY DETAIL

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C-2	SW011044	SW011042	858.67	854.72	870.00	399	12	0.00990	3.54	2093691.741	234972.062	11.33
C-2	SW011042	SW011071	854.53	853.23	865.75	330	12	0.00394	2.23	2094090.348	234988.732	11.22
C-2	SW011071	SE011006	853.13	845.72	868.00	639	12	0.01160	3.83	2094099.477	234659.036	14.87
C-2	SE011018	SE011020	844.97	836.50	854.20	311	10	0.02723	3.61	2095321.177	234364.089	9.23
C-2	SE011020	PS_08	836.50	836.00	855.50	42	10	0.01190	2.39	2095291.603	234051.869	19.00
C-2	SW011098	SW011097	859.24	858.94	865.50	75	10	0.00400	1.38	2092849.636	233962.245	6.26
C-2	SW011097	SW011096	858.84	857.84	866.75	259	10	0.00386	1.36	2092923.235	233950.365	7.91
C-2	SW011096	SW011095	857.74	856.33	877.00	355	10	0.00397	1.38	2093181.735	233961.037	19.26
C-2	SW011095	SW011094	856.23	847.71	866.00	183	10	0.04656	4.72	2093536.763	233975.695	9.77
C-2	SW011094	SW011093	847.61	847.09	855.75	83	10	0.00627	1.73	2093719.623	233983.244	8.14
C-2	SW011093	SE011006	846.99	845.73	854.00	320	10	0.00394	1.37	2093799.000	234006.469	7.01
C-2	SE011006	SW011090	845.70	845.60	857.80	310	12	0.00032	0.63	2094111.207	234007.492	12.10
C-2	SW011090	SE011023	845.60	843.82	854.00	375	15	0.00475	4.45	2094265.573	234011.457	8.40
C-2	SE011023	SE011022	843.72	842.14	850.10	400	15	0.00395	4.06	2094475.964	234017.506	6.38
C-2	SE011022	SE011021	842.04	841.68	851.50	90	15	0.00400	4.08	2094875.617	234034.162	9.46
C-2	SE011021	PS_08	841.68	840.39	852.55	323	15	0.00399	4.08	2094965.577	234037.911	10.87
C-2	SW011090	NE121116	847.00	837.05	854.00	375	15	0.02653	10.52	2094265.657	234009.377	7.00
C-3	SW06255A	SW062200	869.93	866.86	876.00	421	12	0.00729	3.04	2098077.579	234012.446	6.07
EL-1	NE082011	NE082010	885.71	884.74	889.35	245	8	0.00396	0.76	2107133.302	231592.455	3.64
EL-1	NE082010	SE082032	884.54	884.43	890.45	25	8	0.00440	0.80	2106888.501	231582.578	5.91
EL-1	SE082032	SE082031	884.23	881.94	889.76	404	8	0.00567	0.90	2106904.239	231563.211	5.53
EL-1	SE082031	SE082020	881.74	880.22	893.24	380	8	0.00400	0.76	2106915.595	231158.981	11.50
EL-1	SE082020	SE082019	880.02	878.89	885.72	282	8	0.00401	0.76	2106930.859	230779.278	5.70
EL-1	SE082019	SE082018	878.69	877.83	890.09	215	8	0.00400	0.76	2106649.054	230767.762	11.40
EL-1	SE082018	SE08217A	877.63	877.37	894.43	65	8	0.00400	0.76	2106434.257	230758.984	16.80
EL-1	SE08217A	SE082017	872.52	871.57	894.72	339	8	0.00280	0.63	2106436.083	230693.997	22.20
EL-1	SE082017	SE082016	871.37	870.07	888.27	326	8	0.00399	0.76	2106445.606	230355.101	16.90
EL-1	SE082016	SE082015	869.87	869.43	886.67	109	8	0.00404	0.76	2106454.756	230029.426	16.80

NETWORK INVENTORY DETAIL

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EL-1	SE082015	SE082014	869.23	868.96	884.73	69	8	0.00391	0.75	2106346.086	230024.941	15.50
EL-1	SE082014	SE082006	868.76	866.61	882.06	120	8	0.01792	1.61	2106283.163	229997.028	13.30
EL-1	SE082006	SE082005	866.41	860.20	877.01	296	8	0.02098	1.75	2106163.270	229992.095	10.60
EL-1	SE082005	SE082004	860.00	848.00	871.00	267	8	0.04494	2.56	2106117.326	229709.938	11.00
EL-1	SE082004	SE082003	847.80	847.45	860.90	89	8	0.00393	0.75	2106058.492	229446.917	13.10
EL-1	SE082003	SE082002	847.25	846.98	864.75	67	8	0.00403	0.76	2106079.257	229353.475	17.50
EL-1	SE082002	SE082001	846.78	846.29	864.28	123	8	0.00398	0.76	2106068.874	229284.260	17.50
EL-1	SE082057	SE082067	836.45	836.00	844.95	100	12	0.00450	2.39	2105641.610	229186.975	8.50
EL-1	SE082067	SE082056	836.00	835.73	845.02	60	12	0.00450	2.39	2105738.700	229208.926	9.02
EL-1	SE082056	PS_32	835.73	835.20	845.38	120	12	0.00442	2.36	2105797.183	229222.148	9.65
EL-1	PS_23	SE082040	846.37	846.23	851.40	502	4	0.00028	0.03	2107245.410	229389.233	5.03
EL-1	SE082040	SE082001	846.23	846.09	876.85	624	8	0.00022	0.17	2106751.444	229298.168	30.62
EL-1	SE082001	PS_32	846.09	840.00	860.79	281	8	0.02167	1.77	2106138.090	229183.896	14.70
EL-1	PS_32	SE082033	835.20	882.72	847.80	2436	6	-.01951	0.00	2105837.001	229142.367	12.60
EL-1	SE082033	SW082133	882.52	879.30	891.52	729	8	0.00442	0.80	2104985.024	231424.942	9.00
EL-1	SW082133	SW082134	879.20	877.83	887.85	159	8	0.00862	1.12	2104256.403	231420.872	8.65
EL-1	SW082134	SW082136	877.63	874.41	885.00	383	8	0.00841	1.10	2104166.402	231289.380	7.37
EL-1	SW082136	SW082137	874.31	870.95	883.00	400	8	0.00840	1.10	2103944.241	230977.397	8.69
EL-1	SW082137	SW082138	870.75	860.93	878.00	400	8	0.02455	1.89	2103712.218	230651.567	7.25
EL-1	SW082138	SW082139	860.83	859.15	866.29	263	8	0.00639	0.96	2103480.196	230325.736	5.46
EL-1	SW082139	SW082140	858.95	857.20	866.00	437	8	0.00400	0.76	2103327.641	230111.502	7.05
EL-1	SW082140	SW082141	857.10	855.40	871.00	170	8	0.01000	1.20	2102890.958	230093.821	13.90
EL-1	SW082141	SW082142	854.68	832.72	862.00	300	8	0.07320	3.26	2102721.081	230086.943	7.32
EL-1	SW082142	SW082143	832.62	824.00	842.00	330	8	0.02612	1.95	2102421.298	230074.805	9.38
EL-1	SE052233	SE052232	897.00	896.60	901.80	129	8	0.00310	0.67	2106806.063	234656.434	4.80
EL-1	SE052232	PS_13	890.00	889.00	901.60	188	8	0.00532	0.88	2106806.063	234527.531	11.60
EL-1	PS_13	SE052230	889.00	907.94	901.00	306	4	-.06190	0.00	2106826.416	234340.961	12.00
EL-1	SE052230	SE052229	907.94	907.00	915.80	233	8	0.00403	0.76	2106528.441	234271.037	7.86

NETWORK INVENTORY DETAIL

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EL-1	SE052229	SE052228	906.90	905.20	915.60	355	8	0.00479	0.83	2106296.083	234260.246	8.70
EL-1	SE052228	NE082501	905.10	903.80	915.60	132	8	0.00985	1.19	2105941.614	234243.783	10.50
EL-1	NE082501	NE082187	903.55	902.83	914.00	179	8	0.00402	0.76	2105925.626	234112.475	10.45
EL-1	NE082187	NE082186	902.73	901.47	914.00	341	8	0.00370	0.73	2105746.337	234120.637	11.27
EL-1	NE082186	NE082185	901.37	900.40	912.60	162	8	0.00599	0.93	2105405.978	234105.384	11.23
EL-1	NE082185	NE082182	899.96	889.36	910.00	368	8	0.02880	2.05	2105402.329	233943.071	10.04
EL-1	NE082182	NE082178	889.00	885.99	900.60	157	8	0.01917	1.67	2105412.196	233575.204	11.60
EL-1	NE082178	NE082176	885.80	883.89	897.00	367	8	0.00520	0.87	2105416.406	233418.276	11.20
EL-1	NE082176	NE082175	883.69	883.50	892.50	37	8	0.00514	0.86	2105434.237	233051.765	8.81
EL-1	NE082175	NE082174	883.20	880.97	893.00	223	8	0.01000	1.20	2105435.231	233014.779	9.80
EL-1	NE082174	NE082254	880.57	879.42	891.00	190	8	0.00605	0.93	2105212.456	233004.796	10.43
EL-1	NE082254	NE082255	878.50	878.20	886.50	23	8	0.01304	1.38	2105217.545	232815.082	8.00
EL-1	NE082255	NW082025	878.00	873.00	885.90	655	8	0.00763	1.05	2105194.671	232814.149	7.90
EL-1	NW082025	NW082024	873.00	870.00	902.00	342	8	0.00877	1.13	2104539.369	232784.238	29.00
EL-1	NW082024	NW082023	870.00	866.40	892.00	349	8	0.01032	1.22	2104198.950	232773.382	22.00
EL-1	NW082023	NW082026	866.40	861.82	878.40	200	10	0.02290	3.31	2103838.974	232762.063	12.00
EL-1	NW082026	NW082027	861.60	854.98	873.50	200	10	0.03310	3.98	2103731.155	232592.137	11.90
EL-1	NW082027	NW082028	854.75	853.19	864.00	115	10	0.01357	2.55	2103558.679	232242.502	9.25
EL-1	NW082028	NW082037	852.99	845.93	862.50	490	10	0.01441	2.63	2103502.246	232142.301	9.51
EL-1	NW082037	NW082038	845.73	845.01	856.60	74	10	0.00973	2.16	2103261.795	231715.355	10.87
EL-1	NW082038	NW082039	844.81	841.00	856.00	227	10	0.01678	2.83	2103225.647	231651.171	11.19
EL-1	NW082039	SW082076	840.89	840.33	851.50	91	12	0.00615	2.79	2103114.254	231453.381	10.61
EL-1	SW082076	SW082075	840.13	838.15	851.60	246	12	0.00805	3.19	2103059.374	231380.189	11.47
EL-1	SW082075	SW082074	837.95	834.57	847.00	423	12	0.00799	3.18	2102915.454	231180.122	9.05
EL-1	SW082074	SW082073	834.37	833.00	844.00	170	12	0.00806	3.19	2102608.484	230889.118	9.63
EL-1	SW082073	SW082071	832.50	828.75	842.50	375	15	0.01000	6.46	2102531.022	230737.282	10.00
EL-1	SW082071	SW082070	828.55	827.29	839.00	126	15	0.01000	6.46	2102360.604	230403.242	10.45
EL-1	SW082070	SW082143	827.09	824.00	838.00	309	15	0.01000	6.46	2102281.661	230305.038	10.91

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
EL-1	SW082143	SE072315	823.80	822.95	834.50	85	15	0.01000	6.46	2102091.536	230061.453	10.70
EL-1	SE072315	SE072145	822.78	818.24	834.50	189	15	0.02402	10.01	2102006.824	230058.024	11.72
EL-1	SE072145	SE072046	818.24	817.97	833.00	245	18	0.00110	3.48	2102011.703	229869.258	14.76
EL-1	SE072046	SE072149	817.97	817.75	830.00	166	18	0.00133	3.83	2101766.733	229864.923	12.03
EL-1	SE072149	SE072150	817.65	817.31	830.25	282	18	0.00121	3.65	2101600.738	229861.986	12.60
EL-1	SE072150	SE072151	817.01	816.88	835.00	109	18	0.00119	3.62	2101318.782	229856.996	17.99
EL-1	SE072151	SE072152	816.58	816.07	830.15	425	18	0.00120	3.63	2101209.799	229855.067	13.57
EL-1	SE072152	SE072153	815.87	815.55	830.00	267	18	0.00120	3.63	2100784.866	229847.547	14.13
EL-1	SE072153	SE072154	815.45	815.03	830.00	349	18	0.00120	3.63	2100778.037	230114.758	14.55
EL-1	SE072154	SE072155	814.83	814.58	832.00	212	18	0.00118	3.60	2100769.135	230463.144	17.17
EL-1	SE072155	SE072156	814.48	814.00	829.50	398	18	0.00121	3.65	2100590.213	230576.022	15.02
KR-1	PS_11	SE231020	862.20	902.50	868.00	1219	6	-.03306	0.00	2087041.721	252387.506	5.80
KR-1	SE231020	SE231019	902.00	892.10	907.80	400	8	0.02475	1.90	2088186.146	251968.235	5.80
KR-1	SE231019	SE231018	891.84	886.30	899.25	401	8	0.01382	1.42	2088563.950	251836.599	7.41
KR-1	SE231018	SE231017	886.04	880.50	895.20	398	8	0.01392	1.42	2088943.050	251704.511	9.16
KR-1	SE231017	SE231016	880.24	874.70	890.70	400	8	0.01385	1.42	2089318.770	251571.773	10.46
KR-1	SE231016	SE231015	874.49	863.80	880.75	349	8	0.03063	2.11	2089697.270	251441.444	6.26
KR-1	SE231015	SE231014	863.54	856.90	869.10	251	8	0.02645	1.96	2090026.200	251324.568	5.56
KR-1	SE231014	SE231013	856.64	850.67	863.00	251	8	0.02378	1.86	2090269.250	251260.063	6.36
KR-1	SW241037	SW241035	862.64	862.25	867.20	98	8	0.00398	0.76	2093323.617	252090.306	4.56
KR-1	SW241035	SW241032	862.05	861.34	867.85	178	8	0.00399	0.76	2093230.393	252061.668	5.80
KR-1	SW241032	SW241031	861.14	860.67	870.04	119	8	0.00395	0.75	2093234.240	251883.700	8.90
KR-1	SW241031	SW241007	860.47	860.00	868.62	68	8	0.00691	1.00	2093238.113	251765.044	8.15
KR-1	SW241007	PS_28	860.00	857.80	867.00	274	8	0.00803	1.08	2093250.028	251698.095	7.00
KR-1	PS_28	SW241011	857.80	869.60	863.30	1681	4	-.00702	0.00	2092976.407	251688.484	5.50
KR-1	SW241011	SW241012	867.50	866.71	878.30	143	8	0.00552	0.89	2091299.070	251626.926	10.80
KR-1	SW241012	SW241013	866.20	863.64	877.00	393	8	0.00651	0.97	2091303.691	251484.122	10.80
KR-1	SW241013	SW241014	862.97	860.31	869.81	386	8	0.00689	1.00	2090911.393	251471.530	6.84

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-1	SW241014	SE231012	852.42	845.23	869.72	150	8	0.04793	2.64	2090923.760	251086.229	17.30
KR-1	NE231014	NE231019	871.35	870.00	884.50	413	8	0.00327	0.69	2089257.384	254711.536	13.15
KR-1	NE231019	NE231015	870.00	861.82	876.10	396	8	0.02066	1.73	2089669.754	254730.082	6.10
KR-1	NE231015	NE231010	861.82	846.45	869.40	404	8	0.03804	2.35	2090065.621	254737.695	7.58
KR-1	NE231006	NE231007	869.12	849.92	879.00	462	8	0.04156	2.46	2090122.717	253850.801	9.88
KR-1	NE231007	NE231012	849.92	848.90	858.00	196	8	0.00520	0.87	2090092.265	254311.377	8.08
KR-1	NE231012	NE231008	848.90	848.66	859.40	53	8	0.00453	0.81	2090172.200	254490.278	10.50
KR-1	NE231008	NE231009	848.66	847.94	857.90	145	8	0.00497	0.85	2090222.130	254472.279	9.24
KR-1	NE231009	NE231010	847.94	846.45	858.73	237	8	0.00629	0.95	2090290.199	254600.664	10.79
KR-1	NE231010	NE231011	846.45	843.89	855.40	131	8	0.01954	1.68	2090469.100	254756.727	8.95
KR-1	NE231011	PS_17	843.89	842.00	850.00	158	8	0.01196	1.32	2090600.310	254750.126	6.11
KR-1	PS_17	SE231013	842.00	849.02	850.00	3678	4	-.00191	0.00	2090708.362	254865.895	8.00
KR-1	SE231013	SE231012	849.02	845.23	858.14	284	18	0.01335	12.13	2090511.030	251193.038	9.12
KR-1	SE231012	SE231022	845.13	843.61	853.00	239	18	0.00636	8.37	2090773.980	251085.090	7.87
KR-2	NW271272	NW271271	980.74	979.36	989.30	346	12	0.00399	2.25	2082560.144	246959.947	8.56
KR-2	NW271271	NW271269	979.16	977.89	987.00	317	12	0.00401	2.25	2082683.558	247282.958	7.84
KR-2	NW271269	NW271268	977.37	973.81	992.30	121	18	0.02942	18.01	2082672.368	247600.116	14.93
KR-2	NW271268	NW271267	963.56	959.43	977.67	135	18	0.03059	18.37	2082792.883	247603.261	14.11
KR-2	NW271267	NW271266	956.28	954.00	964.94	88	18	0.02591	16.90	2082927.918	247606.785	8.66
KR-2	NW271266	NE271233	953.80	950.51	969.45	97	18	0.03392	19.34	2083015.563	247609.073	15.65
KR-2	NE271233	NE271232	950.31	943.87	975.90	165	18	0.03903	20.75	2083112.318	247619.730	25.59
KR-2	NE271232	NE271231	943.67	940.19	955.25	94	18	0.03702	20.21	2083106.937	247784.745	11.58
KR-2	NE271231	NE271230	939.99	932.69	950.59	283	18	0.02580	16.87	2083105.349	247878.254	10.60
KR-2	NE271230	NE271229	932.49	930.85	943.00	283	18	0.00580	8.00	2083284.437	248102.114	10.51
KR-2	NE271229	NE271228	930.65	927.98	942.24	153	18	0.01745	13.87	2083333.799	248172.768	11.59
KR-2	NE271228	NE271227	927.78	924.70	939.00	116	18	0.02655	17.11	2083427.836	248292.824	11.22
KR-2	NE271227	NE271226	924.50	919.72	936.00	184	18	0.02598	16.93	2083526.060	248353.901	11.50
KR-2	NE271226	NE271224	919.52	918.24	934.00	98	18	0.01306	12.00	2083703.779	248402.668	14.48

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-2	NE271224	NE271223	918.04	917.16	930.29	65	18	0.01354	12.22	2083688.426	248499.935	12.25
KR-2	NE271223	NE271222	916.96	916.06	930.00	71	18	0.01268	11.82	2083747.555	248527.123	13.04
KR-2	NE271222	NE271221	915.86	914.24	930.37	128	18	0.01266	11.82	2083817.763	248535.511	14.51
KR-2	NE271221	NE271220	914.04	912.60	930.00	107	18	0.01346	12.18	2083912.447	248621.575	15.96
KR-2	NE271220	NE271219	912.40	910.66	930.00	135	18	0.01289	11.92	2083967.817	248713.687	17.60
KR-2	NE271219	NE271217	910.46	909.10	924.30	104	18	0.01308	12.01	2083960.181	248848.271	13.84
KR-2	NE271217	NE271216	908.90	906.91	923.96	151	18	0.01318	12.06	2084057.352	248884.554	15.06
KR-2	NE271216	NE271215	906.71	904.11	918.00	203	18	0.01281	11.89	2084135.268	249013.389	11.29
KR-2	NE271215	NE271214	903.91	902.23	921.35	130	18	0.01292	11.94	2084334.671	249050.932	17.44
KR-2	NE271214	NE271213	902.03	899.14	917.34	219	18	0.01320	12.06	2084424.997	249144.890	15.31
KR-2	NE271213	NE271212	898.94	894.24	909.92	362	24	0.01298	25.77	2084418.576	249363.880	10.98
KR-2	NE271212	NE271020	894.04	889.20	903.71	420	24	0.01152	24.28	2084780.346	249373.490	9.67
KR-2	NE271020	NE271046	888.80	878.45	900.90	397	24	0.02607	36.53	2085200.062	249384.638	12.10
KR-2	SW261214	SW261283	940.00	930.00	951.56	262	10	0.03817	4.28	2086334.904	246195.444	11.56
KR-2	SW261283	SW261204	929.62	927.80	942.00	90	10	0.02022	3.11	2086417.120	246444.211	12.38
KR-2	SW261204	SW261203	927.70	925.38	936.80	66	10	0.03515	4.10	2086445.321	246529.541	9.10
KR-2	SW261203	NW261198	925.28	921.55	936.80	136	10	0.02743	3.62	2086484.631	246582.924	11.52
KR-2	NW261198	SW261197	921.43	919.34	931.28	119	10	0.01756	2.90	2086484.011	246718.776	9.85
KR-2	SW261197	NW261195	919.02	912.64	929.30	152	10	0.04197	4.48	2086602.999	246722.343	10.28
KR-2	NW261195	NW261194	912.44	910.71	924.50	76	10	0.02276	3.30	2086606.182	246874.435	12.06
KR-2	NW261194	NW261385	910.51	907.71	923.80	122	10	0.02295	3.31	2086663.837	246923.586	13.29
KR-2	NW261385	NW261191	907.51	906.07	920.50	48	10	0.03000	3.79	2086664.406	247045.966	12.99
KR-2	NW261191	NW261185	906.03	902.54	921.67	190	10	0.01837	2.96	2086636.336	247084.324	15.64
KR-2	NW261185	NW261183	902.04	899.01	913.70	129	10	0.02349	3.35	2086744.443	247241.035	11.66
KR-2	NW261183	NW261182	898.65	897.99	909.15	51	10	0.01294	2.49	2086817.585	247347.060	10.50
KR-2	NW261182	NW261180	897.79	896.07	909.15	131	10	0.01313	2.51	2086834.629	247395.147	11.36
KR-2	NW261180	NW261178	895.87	893.12	907.30	207	10	0.01329	2.52	2086900.843	247508.145	11.43
KR-2	NW261178	NW261388	892.92	891.45	903.15	111	10	0.01324	2.52	2087005.308	247686.423	10.23

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-2	NW261388	NW261177	891.35	890.06	904.65	99	10	0.01303	2.50	2087106.319	247639.259	13.30
KR-2	NW261177	NW261176	890.00	886.25	904.00	314	10	0.01194	2.39	2087204.974	247630.132	14.00
KR-2	SW261261	NW261264	915.24	908.01	926.00	208	10	0.03476	4.08	2087601.651	246765.724	10.76
KR-2	NW261264	NW261268	907.81	901.00	920.20	195	10	0.03492	4.09	2087584.617	246972.825	12.39
KR-2	NW261268	NW261282	900.80	893.88	914.27	188	10	0.03681	4.20	2087568.584	247167.616	13.47
KR-2	NW261282	NW261283	893.70	889.00	911.50	128	10	0.03672	4.19	2087553.338	247355.264	17.80
KR-2	NW261283	NW261389	888.80	886.92	904.33	189	10	0.00995	2.18	2087538.244	247482.031	15.53
KR-2	NW261389	NW261176	886.72	886.25	900.00	10	10	0.04700	4.75	2087515.847	247670.119	13.28
KR-2	NW261176	NW261168	886.10	876.21	900.50	122	10	0.08107	6.23	2087515.019	247680.098	14.40
KR-2	NW261168	NW261167	876.01	874.90	898.17	371	12	0.00299	1.94	2087504.920	247801.770	22.16
KR-2	NW261167	NW261166	874.80	873.60	890.70	399	12	0.00301	1.95	2087557.344	248168.643	15.90
KR-2	NW261166	NW261156	873.31	872.28	885.65	212	12	0.00486	2.48	2087613.738	248563.656	12.34
KR-2	NW261156	NW261153	871.88	871.20	879.10	143	12	0.00476	2.45	2087599.452	248775.282	7.22
KR-2	NW261153	NW261152	870.94	870.29	878.90	53	12	0.01226	3.94	2087589.831	248917.801	7.96
KR-2	NW261152	NW261151	870.29	869.09	876.50	240	12	0.00500	2.51	2087586.273	248970.510	6.21
KR-2	NW261151	NW261149	868.94	868.85	876.00	160	12	0.00056	0.84	2087594.587	249210.242	7.06
KR-2	SW271230	SW271234	1008.31	1006.99	1015.71	331	8	0.00399	0.76	2082126.392	245898.527	7.40
KR-2	SW271234	SW271424	1006.79	1005.26	1013.29	307	8	0.00498	0.85	2082457.594	245908.564	6.50
KR-2	SW271424	SW271400	1005.06	1003.80	1013.06	291	8	0.00433	0.79	2082764.712	245917.872	8.00
KR-2	SW271400	SW271240	1003.70	1003.41	1010.60	16	8	0.01813	1.62	2083055.124	245925.048	6.90
KR-2	SW271240	SE271167	1003.21	1001.77	1011.61	135	8	0.01067	1.24	2083071.120	245925.442	8.40
KR-2	SE271167	SE271166	1001.77	1000.00	1011.50	181	8	0.00978	1.19	2083206.104	245928.774	9.73
KR-2	SE271166	SE271165	998.68	996.10	1009.50	262	8	0.00985	1.19	2083386.704	245934.483	10.82
KR-2	SE271165	SE271161	995.90	993.10	1008.00	244	8	0.01148	1.29	2083539.328	246147.807	12.10
KR-2	SE271161	SE271160	992.89	976.97	1003.00	358	8	0.04447	2.54	2083681.490	246346.509	10.11
KR-2	SE271160	SE271159	975.00	966.31	990.60	149	8	0.05832	2.91	2084038.633	246367.335	15.60
KR-2	SE271159	SE271158	965.33	951.46	976.50	170	8	0.08159	3.45	2084187.405	246371.842	11.17
KR-2	SE271158	SE271150	950.62	950.00	960.00	116	8	0.00534	0.88	2084327.101	246274.109	9.38

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-2	SE271150	SE271151	949.15	949.00	960.80	55	10	0.00273	1.14	2084430.093	246328.067	11.65
KR-2	SE271151	SE271142	948.90	947.00	960.50	95	10	0.02000	3.09	2084475.418	246359.852	11.60
KR-2	SE271142	SE271141	946.91	942.32	957.20	121	10	0.03793	4.26	2084558.221	246313.044	10.29
KR-2	SE271141	SE271140	942.16	940.86	952.30	212	10	0.00613	1.71	2084678.814	246318.115	10.14
KR-2	SE271140	SE271172	938.36	931.80	951.70	283	12	0.02318	5.42	2084890.327	246327.011	13.34
KR-2	SE271172	SE271181	931.48	928.90	941.60	156	12	0.01654	4.58	2085056.123	246555.846	10.12
KR-2	SE271181	NE271190	928.57	926.23	940.00	142	12	0.01648	4.57	2085149.667	246680.892	11.43
KR-2	NE271190	NE271191	926.13	922.50	935.50	230	12	0.01578	4.47	2085189.093	246817.215	9.37
KR-2	NE271191	NE271195	919.02	913.36	929.00	188	12	0.03011	6.18	2085311.220	247011.819	9.98
KR-2	NE271195	NE271196	913.26	912.41	927.20	173	12	0.00491	2.49	2085411.414	247171.476	13.94
KR-2	NE271196	NE271197	912.31	911.54	930.00	154	12	0.00500	2.51	2085578.170	247217.273	17.69
KR-2	NE271197	NE271198	911.44	907.74	925.30	185	12	0.02000	5.03	2085627.680	247363.310	13.86
KR-2	NE271198	NW261083	907.64	907.05	920.00	108	12	0.00546	2.63	2085643.300	247547.650	12.36
KR-2	NW261083	NW261084	907.05	905.50	918.90	128	12	0.01211	3.92	2085751.420	247551.677	11.85
KR-2	NW261084	NW261092	905.26	903.48	916.05	147	12	0.01211	3.92	2085756.066	247679.223	10.79
KR-2	NW261092	NW261093	903.28	900.23	916.25	254	12	0.01201	3.90	2085768.131	247826.072	12.97
KR-2	NW261093	NW261094	900.03	896.66	911.00	281	12	0.01199	3.90	2086021.170	247804.000	10.97
KR-2	NW261094	NW261099	896.46	895.00	907.00	122	12	0.01197	3.89	2086238.806	247982.358	10.54
KR-2	NW261099	NW26199A	889.97	887.87	905.00	350	12	0.00600	2.75	2086295.549	248090.549	15.03
KR-2	NW26199A	NW261100	885.87	885.07	899.00	112	12	0.00714	3.01	2086639.618	248155.634	13.13
KR-2	NW261100	NW261105	884.87	883.53	898.00	186	12	0.00720	3.02	2086743.708	248114.246	13.13
KR-2	NW261105	NW261106	883.33	880.81	898.20	434	12	0.00581	2.71	2086884.416	247992.977	14.87
KR-2	NW261106	NW261107	880.01	875.00	889.50	291	12	0.01722	4.67	2087213.789	248275.588	9.49
KR-2	NW261107	NW261147	874.26	873.70	885.00	196	12	0.00286	1.90	2087361.578	248526.266	10.74
KR-2	NW261147	NW261145	873.59	872.10	884.62	265	12	0.00562	2.67	2087544.818	248597.035	11.03
KR-2	NW261145	NW261144	871.71	871.00	880.60	118	12	0.00602	2.76	2087536.613	248861.436	8.89
KR-2	NW261144	NW261143	870.90	869.04	879.30	333	12	0.00559	2.66	2087532.938	248979.851	8.40
KR-2	NW261143	NW261347	868.94	868.84	877.40	17	15	0.00588	4.95	2087522.609	249312.690	8.46

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-2	NW261347	NW261149	868.74	868.55	876.29	80	15	0.00238	3.15	2087536.257	249322.827	7.55
KR-2	NW261149	NW261150	868.55	868.39	876.20	103	15	0.00155	2.54	2087600.136	249370.269	7.65
KR-2	NW261150	NW261165	868.29	868.11	877.00	75	15	0.00240	3.16	2087701.588	249388.906	8.71
KR-2	NW261165	NW261163	868.11	867.89	879.00	174	15	0.00126	2.29	2087776.798	249390.237	10.89
KR-2	NW261163	NW261164	867.89	867.45	883.50	275	15	0.00160	2.58	2087950.406	249398.615	15.61
KR-2	NW261164	NE261001	867.35	866.87	891.00	302	15	0.00159	2.57	2088225.213	249409.128	23.65
KR-2	NE261001	NE261002	866.87	866.35	885.00	323	15	0.00161	2.59	2088527.299	249418.117	18.13
KR-2	NE261002	NE261346	866.25	861.86	874.00	326	15	0.01347	7.49	2088850.160	249427.603	7.75
KR-2	NE261346	NE261526	861.75	855.50	865.50	320	15	0.01953	9.02	2089176.166	249432.179	3.75
KR-2	NE261526	NE261525	855.40	854.00	860.20	353	15	0.00397	4.07	2089496.057	249440.577	4.80
KR-2	NE261525	NE261049	854.00	852.60	864.00	351	15	0.00399	4.08	2089848.905	249450.943	10.00
KR-2	NE261049	NE261051	852.60	851.20	868.00	352	15	0.00398	4.07	2090199.783	249460.252	15.40
KR-2	NE261051	NE261053	851.20	849.29	872.00	357	15	0.00535	4.72	2090551.631	249470.589	20.80
KR-2	NE261053	SE231008	848.99	847.79	870.00	300	15	0.00400	4.08	2090908.565	249478.075	21.01
KR-2	SE231008	SE231118	847.69	842.27	858.00	300	15	0.01807	8.68	2090901.403	249777.989	10.31
KR-2	SE231118	SE231100	841.97	840.70	847.50	65	15	0.01954	9.03	2090894.240	250077.904	5.53
KR-2	SE231100	SW241006	840.49	840.00	847.00	28	15	0.01750	8.54	2090958.757	250078.497	6.51
KR-2	NE221023	NE221024	880.11	869.95	887.41	435	8	0.02336	1.84	2083919.055	252259.201	7.30
KR-2	NE221024	NE221025	869.95	866.99	875.45	56	8	0.05286	2.77	2084353.700	252249.379	5.50
KR-2	NE221025	NE221026	866.99	862.13	872.49	64	8	0.07594	3.33	2084402.813	252276.391	5.50
KR-2	NE221026	PS_42	862.13	845.00	869.83	379	8	0.04520	2.56	2084447.014	252323.047	7.70
KR-2	NE221012	NE221011	863.00	861.92	873.00	182	8	0.00593	0.93	2084857.103	251974.349	10.00
KR-2	NE221011	NE221010	861.92	858.91	870.27	167	8	0.01802	1.62	2084844.825	252156.065	8.35
KR-2	NE221010	NE221013	858.91	851.79	863.36	84	8	0.08476	3.51	2084901.304	252313.225	4.45
KR-2	NE221013	NE221002	851.79	849.00	862.49	169	8	0.01651	1.55	2084923.405	252394.260	10.70
KR-2	NE221003	NE221002	851.20	849.00	859.70	514	8	0.00428	0.79	2085468.553	252394.260	8.50
KR-2	NE221002	PS_42	849.00	845.00	862.20	422	8	0.00948	1.17	2084979.884	252553.876	13.20
KR-2	PS_42	NE271046	845.00	877.55	857.50	3438	6	-.00947	0.00	2084577.162	252679.113	12.50

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Rim Elevation	Pipe Length	Pipe Dia.	Pipe Slope	Pipe Capacity	East (X) Coordinate	North (Y) Coordinate	Manhole Depth
			(ft)	(ft)	(ft)	(ft)	(in)	(ft/ft)	(cfs)			(ft)
KR-2	NE271046	SW231140	877.55	875.00	895.25	122	24	0.02090	32.70	2085596.725	249395.795	17.70
KR-2	SW231140	SW231139	875.00	873.90	895.50	380	24	0.00289	12.16	2085719.126	249393.188	20.50
KR-2	SW231139	SW231138	873.71	872.81	886.00	403	24	0.00223	10.68	2086099.053	249402.756	12.29
KR-2	SW231138	SW231137	872.81	872.01	889.50	396	24	0.00202	10.16	2086502.150	249416.784	16.69
KR-2	SW231137	SW231133	872.01	871.20	889.25	411	24	0.00197	10.04	2086898.022	249427.046	17.24
KR-2	SW231111	SW231112	857.58	857.12	863.48	72	8	0.00639	0.96	2087222.202	250983.694	5.90
KR-2	SW231112	SW231113	857.12	856.13	864.42	89	8	0.01112	1.27	2087230.630	250912.051	7.30
KR-2	SW231113	SW231037	856.13	855.28	864.73	268	8	0.00317	0.68	2087222.202	250823.551	8.60
KR-2	SW231028	SW231027	849.25	848.30	870.00	208	8	0.00457	0.81	2086493.131	250625.480	20.75
KR-2	SW231027	SW231026	848.30	847.54	866.30	179	8	0.00425	0.78	2086661.702	250747.694	18.00
KR-2	SW231026	PS_27	847.54	846.50	874.34	134	8	0.00776	1.06	2086788.131	250621.266	26.80
KR-2	SW231004	SW231003	866.80	864.30	876.20	143	8	0.01748	1.59	2086358.274	249993.338	9.40
KR-2	SW231003	SW231006	864.30	862.66	875.10	381	8	0.00430	0.79	2086278.203	250111.338	10.80
KR-2	SW231006	SW231007	862.66	848.75	876.96	335	8	0.04152	2.46	2086611.131	250296.766	14.30
KR-2	SW231117	SW231038	860.60	856.96	875.90	169	8	0.02154	1.77	2087702.630	250604.409	15.30
KR-2	SW231038	SW231037	856.96	855.28	872.31	177	8	0.00949	1.17	2087534.059	250591.766	15.35
KR-2	SW231037	SW231036	855.28	854.23	866.00	238	8	0.00441	0.80	2087357.059	250591.766	10.72
KR-2	SW231036	SW231007	854.23	848.75	879.93	233	8	0.02352	1.85	2087137.916	250499.052	25.70
KR-2	SW231008	SW231007	866.28	848.75	879.98	325	8	0.05394	2.80	2086931.416	250123.981	13.70
KR-2	SW231007	PS_27	848.75	846.50	875.25	236	10	0.00953	2.13	2086910.345	250448.480	26.50
KR-2	PS_27	SW231133	846.50	867.20	856.50	1308	6	-.01583	0.00	2086906.131	250684.480	10.00
KR-2	SW231133	SW231132	867.20	866.80	877.50	193	24	0.00207	10.29	2087308.825	249439.771	10.30
KR-2	SW231132	SW231131	862.80	862.25	874.50	273	24	0.00201	10.14	2087501.794	249443.747	11.70
KR-2	SW231131	SW231124	862.25	861.80	878.00	221	24	0.00204	10.21	2087774.601	249454.198	15.75
KR-2	SW231124	SW231100	861.80	861.30	887.00	294	24	0.00170	9.32	2087995.433	249463.040	25.20
KR-2	SW231100	SE231106	861.20	860.60	891.00	306	24	0.00196	10.01	2088289.323	249471.143	29.80
KR-2	SE231106	SE231105	860.60	859.75	885.00	428	24	0.00199	10.09	2088595.453	249480.145	24.40
KR-2	SE231105	SE231107	857.75	857.20	871.25	269	24	0.00204	10.21	2089023.268	249492.714	13.50

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-2	SE231107	SE231108	853.70	853.30	863.00	205	24	0.00195	9.99	2089292.183	249499.615	9.30
KR-2	SE231108	NE261109	850.10	849.70	860.20	202	24	0.00198	10.06	2089497.126	249504.636	10.10
KR-2	NE261109	SE231048	849.70	848.90	864.00	402	24	0.00199	10.09	2089699.038	249510.568	14.30
KR-2	SE231048	SE231110	848.90	848.18	865.48	451	24	0.00160	9.04	2090100.741	249526.372	16.58
KR-2	SE231110	SE231009	847.98	847.30	872.50	339	24	0.00201	10.14	2090551.547	249539.617	24.52
KR-2	SE231009	SE231007	847.20	845.62	872.00	323	24	0.00489	15.82	2090890.799	249549.584	24.80
KR-2	SE231007	SE231010	845.62	837.66	854.50	224	24	0.03554	42.65	2090882.708	249872.482	8.88
KR-2	SE231010	SW241006	837.35	837.00	846.10	95	24	0.00368	13.72	2090877.087	250096.815	8.75
KR-2	SE231022	SE231011	843.51	841.15	850.00	351	18	0.00672	8.61	2090775.426	250846.494	6.49
KR-2	SE231011	SE231103	841.08	839.14	851.00	235	18	0.00826	9.54	2090787.461	250495.501	9.92
KR-2	SE231103	SW241006	838.09	837.00	845.00	220	18	0.00495	7.39	2090946.757	250322.492	6.91
KR-2	SW241006	SW241005	837.00	835.69	846.00	453	24	0.00289	12.16	2090971.308	250104.066	9.00
KR-2	SW241005	SW241004	835.59	834.77	848.00	314	24	0.00261	11.55	2091422.041	250062.582	12.41
KR-2	SW241004	SW241003	834.67	834.42	847.50	98	24	0.00255	11.42	2091636.753	249833.602	12.83
KR-2	SW241003	SW241002	834.32	833.81	846.00	233	24	0.00219	10.58	2091733.057	249815.448	11.68
KR-2	SW241002	SW241001	833.71	832.95	840.00	330	24	0.00230	10.85	2091960.082	249765.291	6.29
KR-2	SW241001	SW24101A	832.85	831.86	841.00	19	24	0.05211	51.64	2092279.239	249681.279	8.15
KR-2	SW24101A	NW251023	831.86	828.66	843.00	285	27	0.01123	32.82	2092680.213	249529.250	11.14
KR-2	NW251023	NW251022	828.56	827.25	838.00	285	27	0.00460	21.00	2092705.810	249261.509	9.44
KR-2	NW251022	NW251021	827.25	827.09	840.50	144	27	0.00111	10.31	2092990.668	249270.502	13.25
KR-2	NW251021	NW251018	827.09	827.03	838.96	430	27	0.00014	3.66	2093134.197	249275.033	11.87
KR-2	NW251018	NE251030	826.93	826.34	833.00	325	27	0.00182	13.21	2093563.750	249288.063	6.07
KR-2	NE251030	NE251077	826.24	825.57	841.00	34	27	0.01971	43.48	2093573.974	248963.626	14.76
KR-2	SW24101A	NW251200	831.86	829.30	843.00	155	24	0.01652	29.07	2092682.581	249532.765	11.14
KR-2	NW251200	NW251202	829.30	829.21	834.30	125	24	0.00072	6.07	2092819.461	249604.987	5.00
KR-2	NW251202	NW251199	828.91	828.04	836.90	325	24	0.00268	11.71	2092854.399	249444.482	7.99
KR-2	NW251199	NW251203	828.04	827.26	833.10	285	24	0.00274	11.84	2093187.993	249453.998	5.06
KR-2	NW251203	NW251204	827.09	826.86	830.20	86	24	0.00267	11.69	2093472.583	249463.247	3.11

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-2	NW251204	NW251205	826.86	826.57	830.50	109	24	0.00266	11.66	2093548.462	249422.665	3.64
KR-2	NW251205	NW251206	826.57	826.40	833.00	62	24	0.00274	11.84	2093552.000	249313.813	6.43
KR-2	NW251206	NE251077	826.40	825.57	831.90	308	24	0.00269	11.73	2093597.705	249272.127	5.50
KR-2	NE251077	NE251170	825.47	825.13	837.10	190	27	0.00179	13.10	2093607.464	248964.454	11.63
KR-2	NE251170	NE251207	825.13	824.91	836.00	215	27	0.00102	9.89	2093797.036	248969.141	10.87
KR-2	NE251207	NE251208	824.91	824.54	837.80	105	27	0.00352	18.37	2093870.953	248766.967	12.89
KR-2	NE251077	NW251209	825.47	825.09	837.10	305	30	0.00125	14.50	2093607.464	248964.454	11.63
KR-2	NW251209	NE251208	824.89	824.54	843.60	290	30	0.00121	14.26	2093617.140	248659.348	18.71
KR-2	NE251208	NE251210	824.54	824.44	839.00	40	30	0.00250	20.51	2093903.398	248668.646	14.46
KR-2	NE251210	NE251211	823.63	823.16	834.50	400	30	0.00118	14.09	2094416.802	248684.784	10.87
KR-2	NE251211	NE251212	822.86	822.66	828.00	164	30	0.00122	14.32	2094816.599	248697.501	5.14
KR-2	NE251208	NE251169	824.54	824.44	839.00	42	27	0.00238	15.11	2093903.426	248668.819	14.46
KR-2	NE251169	NE251163	824.44	823.79	839.00	520	27	0.00125	10.95	2093920.756	248630.748	14.56
KR-3	SE261320	SE261319	1005.68	1005.57	1013.00	11	10	0.01000	2.19	2088785.720	244176.855	7.32
KR-3	SE261319	SE261318	1005.47	1003.78	1012.10	188	10	0.00899	2.07	2088796.715	244177.197	6.63
KR-3	SE261318	SE261317	1003.68	999.66	1011.80	398	10	0.01010	2.20	2088984.624	244183.039	8.12
KR-3	SE261317	SE261306	999.56	998.35	1007.50	160	10	0.00756	1.90	2089381.766	244206.827	7.94
KR-3	SE261306	SE261305	998.25	992.56	1005.50	265	10	0.02147	3.21	2089538.555	244237.714	7.25
KR-3	SE261305	SE261304	992.46	987.00	1002.00	325	12	0.01680	4.61	2089801.375	244272.082	9.54
KR-3	SE261304	SE261303	986.90	962.00	992.50	341	8	0.07302	3.26	2089942.404	244564.889	5.60
KR-3	SE261303	SE261302	961.90	946.00	969.00	279	8	0.05699	2.88	2090073.349	244879.758	7.10
KR-3	SE261302	SE261301	945.90	923.48	951.50	395	8	0.05676	2.87	2090223.168	245115.235	5.60
KR-3	SE261301	SE261300	923.25	898.12	928.50	377	8	0.06666	3.12	2090538.006	245353.399	5.25
KR-3	SE261300	SE261346	898.00	893.56	910.00	301	12	0.01475	4.32	2090840.125	245579.016	12.00
KR-3	SE261346	SE261345	893.46	890.23	903.50	217	12	0.01488	4.34	2090851.500	245880.188	10.04
KR-3	SE261345	SW25178A	890.13	887.09	899.50	214	12	0.01421	4.24	2090866.547	246103.120	9.37
KR-3	SW25178A	SW251082	887.00	884.33	894.00	84	12	0.03179	6.35	2091039.424	246200.242	7.00
KR-3	SW251082	SW251081	884.23	880.02	890.50	248	12	0.01698	4.64	2091128.749	246232.290	6.27

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Rim Elevation	Pipe Length	Pipe Dia.	Pipe Slope	Pipe Capacity	East (X) Coordinate	North (Y) Coordinate	Manhole Depth
			(ft)	(ft)	(ft)	(ft)	(in)	(ft/ft)	(cfs)			(ft)
KR-3	SW251081	SW251080	880.02	873.05	887.00	410	12	0.01700	4.64	2091204.384	246468.139	6.98
KR-3	SW251080	SE251235	872.95	866.49	881.00	380	12	0.01700	4.64	2091414.612	246820.139	8.05
KR-3	SE251235	SW251078	866.49	862.00	875.00	87	12	0.05161	8.09	2091794.435	246831.761	8.51
KR-3	SW251078	SW25179A	862.00	861.73	870.30	116	12	0.00233	1.71	2091881.237	246836.872	8.30
KR-3	SW25179A	SW25173A	861.73	857.59	870.70	176	12	0.02352	5.46	2091996.967	246843.685	8.97
KR-3	SW25173A	SW25172A	857.31	856.00	867.48	88	12	0.01489	4.34	2092172.780	246854.036	10.17
KR-3	SW25172A	SW25171A	855.47	853.74	866.50	95	12	0.01821	4.80	2092260.290	246856.917	11.03
KR-3	SW25171A	SW25170A	853.74	848.74	868.00	221	12	0.02262	5.35	2092355.680	246860.058	14.26
KR-3	SW25170A	SW251099	848.74	844.29	853.00	285	12	0.01561	4.45	2092576.181	246876.325	4.26
KR-3	SW251099	SW251119	844.29	838.86	857.00	320	12	0.01697	4.64	2092861.040	246885.291	12.71
KR-3	SW251119	SW251120	838.86	833.38	852.50	335	12	0.01636	4.55	2093180.882	246895.357	13.64
KR-3	SW251120	SW251125	833.28	832.32	837.75	156	12	0.00615	2.79	2093515.716	246905.895	4.47
KR-3	SW251125	NE251128	832.02	830.06	840.00	197	12	0.00995	3.55	2093671.569	246910.800	7.98
KR-3	NE251128	NE251130	830.06	829.14	849.00	237	18	0.00388	6.54	2093838.614	247015.796	18.94
KR-3	NE251130	NE251129	829.04	828.50	835.00	220	18	0.00245	5.19	2093831.390	247252.185	5.96
KR-3	NE251129	NE251246	828.50	828.40	833.50	23	18	0.00435	6.92	2093824.685	247471.583	5.00
KR-3	NE251246	NE251132	828.40	828.08	838.60	124	18	0.00258	5.33	2093847.324	247472.275	10.20
KR-3	NE251132	NE251143	827.98	827.50	839.00	216	18	0.00222	4.94	2093971.066	247476.058	11.02
KR-3	NE251143	NE251142	827.50	827.07	834.00	118	18	0.00364	6.33	2094116.384	247635.393	6.50
KR-3	NE251142	NE251141	826.97	826.87	836.00	50	18	0.00200	4.69	2094229.410	247668.053	9.03
KR-3	NE251141	NE251166	826.87	826.42	835.00	270	18	0.00167	4.29	2094272.996	247693.519	8.13
KR-3	NE251166	NE251165	826.42	825.70	834.00	338	18	0.00213	4.84	2094282.107	247963.642	7.58
KR-3	NE251165	NE251164	825.60	825.45	835.00	74	18	0.00203	4.73	2094278.166	248301.899	9.40
KR-3	NE251164	NE251163	825.35	824.04	832.00	260	18	0.00504	7.45	2094352.361	248302.764	6.65
KR-3	SW25178A	SW251019	887.00	886.00	894.00	171	10	0.00585	1.67	2091039.850	246200.344	7.00
KR-3	SW251019	SW251022	886.00	884.00	895.00	229	10	0.00873	2.04	2091210.928	246192.646	9.00
KR-3	SW251022	SW251234	884.00	883.00	898.00	309	10	0.00324	1.24	2091439.512	246198.550	14.00
KR-3	SW251234	SW251025	883.00	882.00	893.00	83	10	0.01205	2.40	2091748.688	246208.594	10.00

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-3	SW251025	SW251031	882.00	880.00	897.00	189	10	0.01058	2.25	2091831.731	246209.515	15.00
KR-3	SW251031	SW251042	876.50	874.00	888.00	65	10	0.03846	4.29	2092020.672	246215.420	11.50
KR-3	SW251042	SW251043	874.00	873.00	886.00	262	10	0.00382	1.35	2092073.811	246177.463	12.00
KR-3	SW251043	SW251044	873.00	872.00	878.00	164	10	0.00610	1.71	2092336.134	246184.211	5.00
KR-3	SW251044	SW251047	872.00	871.00	876.00	241	10	0.00415	1.41	2092341.195	246020.575	4.00
KR-3	SW251047	SW251053	871.00	869.80	891.00	363	10	0.00331	1.26	2092350.473	245779.339	20.00
KR-3	SW251053	SW251054	869.80	869.00	875.00	211	10	0.00379	1.34	2092713.171	245786.930	5.20
KR-3	SW251054	SW251060	869.00	868.00	878.00	339	8	0.00295	0.65	2092719.075	245576.060	9.00
KR-3	SW251060	SW251065	868.00	866.00	877.00	303	8	0.00660	0.98	2093058.155	245584.494	9.00
KR-3	SW251065	SW25072A	866.00	862.00	876.00	190	8	0.02105	1.75	2093360.966	245592.929	10.00
KR-3	SW25072A	SW25071A	862.00	860.00	872.00	172	15	0.01163	6.96	2093550.749	245597.990	10.00
KR-3	NE251163	NE251162	823.79	823.49	828.00	301	30	0.00100	12.97	2094434.720	248549.800	4.21
KR-4	NE361030	NE361031	855.00	852.77	865.00	330	8	0.00676	0.99	2094935.783	244233.989	10.00
KR-4	NE361031	NE361034	852.77	850.53	856.00	331	8	0.00677	0.99	2095265.627	244244.123	3.23
KR-4	NE361034	NE361036	850.53	848.29	864.00	330	8	0.00679	0.99	2095596.250	244254.281	13.47
KR-4	NE361036	NE361039	848.29	846.09	858.57	330	8	0.00667	0.98	2095926.095	244264.415	10.28
KR-4	NE361039	NW312002	846.09	843.84	858.81	328	8	0.00686	1.00	2096255.939	244274.549	12.72
KR-4	NW361104	NW361103	946.70	945.57	959.00	82	12	0.01378	4.18	2093502.125	241694.828	12.30
KR-4	NW361103	NW361102	945.27	943.48	964.00	130	12	0.01377	4.18	2093583.250	241706.344	18.73
KR-4	NW361102	NW361101	943.28	933.40	960.00	318	12	0.03107	6.28	2093642.875	241821.938	16.72
KR-4	SW302131	SW302132	833.10	828.96	841.00	455	9	0.00910	1.57	2096890.549	245219.947	7.90
KR-4	SW36145A	NW361115	973.04	946.50	978.04	346	12	0.07671	9.86	2093249.918	241493.756	5.00
KR-4	NW361115	NW361114	946.50	939.90	955.00	373	12	0.01769	4.73	2093478.875	241753.703	8.50
KR-4	NW361114	NW361101	939.90	933.40	948.00	79	12	0.08228	10.22	2093559.125	242117.875	8.10
KR-4	NW361101	NW361100	933.00	931.30	944.00	160	12	0.01063	3.67	2093635.002	242139.868	11.00
KR-4	NW361100	NW36112A	931.00	927.51	937.00	348	12	0.01003	3.56	2093795.000	242140.641	6.00
KR-4	NW36112A	NW361124	927.41	923.00	936.00	325	12	0.01357	4.15	2093786.375	242488.313	8.59
KR-4	NW361124	NE361009	923.00	921.74	934.00	65	12	0.01938	4.96	2093784.750	242812.969	11.00

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-4	NE361009	NE361225	918.50	907.00	931.00	144	12	0.07986	10.06	2093809.500	242873.328	12.50
KR-4	NE361225	NE361004	906.70	897.88	915.00	233	12	0.03785	6.93	2093953.505	242878.920	8.30
KR-4	NE361004	NE361122	897.88	889.59	907.18	194	12	0.04273	7.36	2093947.625	243111.813	9.30
KR-4	NE361122	NE361121	889.59	879.77	899.00	422	12	0.02327	5.43	2093940.500	243305.672	9.41
KR-4	NE361121	NE361012	879.77	870.29	892.00	441	12	0.02150	5.22	2093909.187	243728.677	12.23
KR-4	NE361012	NW36109A	869.36	867.91	887.40	192	12	0.00755	3.09	2093903.547	244134.761	18.04
KR-4	NW36109A	SW251189	867.81	863.83	882.00	320	12	0.01244	3.97	2093751.824	244215.715	14.19
KR-4	SW251189	SW251188	863.83	859.80	874.50	320	12	0.01259	3.99	2093741.662	244535.553	10.67
KR-4	SW251188	SE251022	859.55	857.11	869.00	331	15	0.00737	5.54	2093731.505	244855.225	9.45
KR-4	SW251188	SE251016	861.00	860.00	868.00	39	8	0.02564	1.93	2093730.504	244854.991	7.00
KR-4	SE251016	SE251017	860.00	855.00	869.00	279	8	0.01792	1.61	2093768.262	244862.568	9.00
KR-4	SE251017	SE251018	855.00	841.80	865.00	250	10	0.05280	5.03	2094046.805	244862.568	10.00
KR-4	SE251018	SE25-057	841.80	841.00	861.00	180	10	0.00444	1.46	2094097.231	245107.494	19.20
KR-4	SE25-057	SE251056	841.00	840.00	856.00	257	10	0.00389	1.36	2094097.231	245287.586	15.00
KR-4	SE251056	SE251054	840.00	839.00	856.00	47	10	0.02128	3.19	2094354.163	245297.191	16.00
KR-4	SE251054	SE251053	839.00	838.42	843.00	179	10	0.00324	1.24	2094394.984	245273.179	4.00
KR-4	SE251053	SE251051	838.42	837.98	841.00	140	10	0.00000	0.00	2094563.070	245335.611	3.00
KR-4	SE251051	SE251049	837.98	837.81	847.00	56	10	0.00304	1.20	2094702.342	245352.419	9.02
KR-4	SE251049	SE251048	837.81	836.99	848.00	181	10	0.00453	1.47	2094757.570	245362.024	10.19
KR-4	SE251048	SE251047	836.99	836.54	843.00	141	10	0.00319	1.23	2094930.459	245414.851	6.01
KR-4	SE251047	SE251046	836.54	835.82	842.00	334	10	0.00216	1.01	2095055.323	245479.685	5.46
KR-4	SE251046	SE251045	835.82	834.44	842.00	115	10	0.01200	2.40	2095389.095	245494.092	6.18
KR-4	SE251045	SE251114	834.44	832.57	844.44	169	10	0.01107	2.30	2095382.155	245608.840	10.00
KR-4	SE251114	SE251244	832.57	828.94	842.57	445	10	0.00816	1.97	2095550.701	245615.083	10.00
KR-4	SE251244	SE251110	828.94	828.80	838.94	29	10	0.00483	1.52	2095995.997	245627.568	10.00
KR-4	SE251110	SE251242	828.80	828.50	838.80	49	10	0.00612	1.71	2096023.048	245637.972	10.00
KR-4	SW25071A	SW251069	860.00	859.00	870.00	238	15	0.00420	4.18	2093557.497	245425.920	10.00
KR-4	SW251069	SE251022	859.00	857.11	869.00	157	15	0.01204	7.08	2093564.245	245188.058	10.00

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-4	SE251022	SE251024	857.11	855.48	870.00	398	15	0.00410	4.13	2093720.997	245185.973	12.89
KR-4	SE251024	SE251065	855.38	853.63	872.00	450	15	0.00389	4.02	2093708.372	245583.324	16.62
KR-4	SE251065	SE251066	853.63	846.80	869.50	410	15	0.01666	8.33	2094157.662	245597.059	15.87
KR-4	SE251066	SE251067	846.80	839.97	858.00	410	15	0.01666	8.33	2094565.472	245611.753	11.20
KR-4	SE251067	SE251073	839.97	833.14	850.50	410	15	0.01666	8.33	2094976.879	245622.101	10.53
KR-4	SE251073	SE251085	833.14	829.75	840.00	396	15	0.00856	5.97	2095386.488	245634.623	6.86
KR-4	SE251085	SE251228	829.75	828.85	832.50	105	18	0.00857	9.72	2095782.403	245646.726	2.75
KR-4	SE251228	SE251081	828.85	827.26	831.53	187	18	0.00850	9.68	2095887.793	245649.947	2.68
KR-4	SE251081	SW302171	827.20	824.69	832.10	301	18	0.00834	9.59	2096076.383	245657.583	4.90
KR-4	SW302171	SW302092	824.69	823.80	835.00	330	18	0.00270	5.45	2096375.000	245666.922	10.31
KR-4	SW302092	SW302133	823.80	823.16	839.00	254	18	0.00252	5.27	2096704.875	245677.547	15.20
KR-4	SW302133	SW302150	823.12	823.09	836.00	23	18	0.00130	3.78	2096958.375	245686.172	12.88
KR-4	SE251081	SE251242	828.75	828.50	832.10	20	8	0.01250	1.35	2096076.383	245657.583	3.35
KR-4	SE251242	SE251243	828.50	828.28	838.50	11	10	0.02000	3.09	2096072.245	245638.446	10.00
KR-4	SE251243	SE251254	828.28	827.90	838.28	138	10	0.00275	1.14	2096076.653	245628.771	10.00
KR-4	SE251254	SE302105	827.90	826.90	837.90	334	10	0.00299	1.19	2096212.403	245604.679	10.00
KR-4	SE302105	SW302132	826.90	826.32	836.90	336	10	0.00173	0.91	2096541.173	245665.022	10.00
KR-4	SW302132	SW302150	826.32	823.09	837.00	104	12	0.03106	6.27	2096876.625	245674.734	10.68
KR-4	SW302150	SW302134	822.79	818.69	832.79	52	24	0.07885	63.53	2096978.734	245680.188	10.00
KR-4	SW302150	SW302135	829.74	828.10	836.00	538	12	0.00305	1.96	2096978.507	245680.063	6.26
KR-4	SW302135	SW302017	828.10	826.52	837.00	587	12	0.00269	1.84	2097071.676	245181.589	8.90
KR-4	NE251212	NE251213	822.66	822.04	827.00	536	30	0.00116	13.97	2094935.077	248583.872	4.34
KR-4	NE251213	NE251214	821.84	821.49	828.00	300	30	0.00117	14.03	2095370.542	248271.133	6.16
KR-4	NE251214	NE251215	821.49	821.12	826.20	314	30	0.00118	14.09	2095504.925	248002.881	4.71
KR-4	NE251215	NE251216	820.92	820.63	828.70	244	30	0.09667	127.54	2095650.174	247727.608	7.78
KR-4	NE251216	NE251217	820.43	820.35	827.00	448	30	0.00018	5.50	2095870.022	247621.768	6.57
KR-4	NE251217	SE251099	820.25	819.60	828.00	492	30	0.00132	14.90	2096132.577	247258.951	7.75
KR-4	SE251099	SW302098	819.60	819.26	826.80	251	30	0.00135	15.07	2096300.024	246796.175	7.20

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-4	SW302098	SW30297A	819.26	818.89	825.00	285	30	0.00130	14.79	2096407.927	246569.421	5.74
KR-4	SW30297A	SW302096	818.89	818.60	825.00	226	30	0.00128	14.67	2096531.011	246312.271	6.11
KR-4	SW302096	SW302095	818.60	818.34	824.00	193	30	0.00135	15.07	2096638.431	246113.716	5.40
KR-4	SW302095	SW302134	818.34	817.90	826.00	368	30	0.00120	14.21	2096761.456	245965.009	7.66
KR-4	SW302134	SW302136	817.90	817.24	826.00	439	30	0.00150	15.88	2097023.179	245706.658	8.10
KR-4	SW302136	SW302141	817.24	816.25	828.00	53	30	0.01868	56.06	2097335.250	245398.609	10.76
KR-4	NE251162	NE251161	823.39	823.14	827.00	200	30	0.00125	14.50	2094734.049	248580.115	3.61
KR-4	NE251161	NE251160	823.04	822.35	827.00	532	30	0.00130	14.79	2094933.397	248569.317	3.96
KR-4	NE251160	NE251159	822.25	821.35	830.00	306	30	0.00294	22.24	2095365.373	248258.629	7.75
KR-4	NE251159	NE251157	821.35	820.89	826.20	305	30	0.00151	15.94	2095493.579	247980.750	4.85
KR-4	NE251157	NE251158	820.89	820.43	829.00	242	30	0.00190	17.88	2095628.981	247706.414	8.11
KR-4	NE251158	NE251172	820.43	819.89	827.00	451	30	0.00120	14.21	2095853.966	247612.041	6.57
KR-4	NE251172	NE251218	819.79	819.70	826.80	75	30	0.00120	14.21	2096128.951	247252.021	7.01
KR-4	NE251218	SE251219	819.70	819.34	826.50	304	30	0.00118	14.09	2096154.435	247181.590	6.80
KR-4	SE251219	SE251221	819.34	819.22	830.40	111	30	0.00108	13.48	2096255.983	246895.078	11.06
KR-4	SE251221	SW302198	819.22	819.04	826.80	251	30	0.00072	11.00	2096293.085	246790.399	7.58
KR-4	SW302198	SW302197	819.04	818.82	827.00	279	30	0.00079	11.52	2096400.987	246563.645	7.96
KR-4	SW302197	SW302196	818.82	818.60	825.00	231	30	0.00095	12.64	2096521.481	246311.906	6.18
KR-4	SW302196	SW302195	818.60	818.34	824.00	201	30	0.00129	14.73	2096631.280	246108.954	5.40
KR-4	SW302195	SW302137	818.34	817.90	826.00	337	30	0.00131	14.84	2096759.125	245954.422	7.66
KR-4	SW302137	SW302138	817.90	817.70	826.00	135	30	0.00148	15.78	2096995.497	245714.738	8.10
KR-4	SW302138	SW302139	817.70	817.57	826.00	140	30	0.00093	12.50	2097091.133	245619.540	8.30
KR-4	SW302139	SW302140	817.57	817.14	828.00	217	30	0.00198	18.25	2097181.000	245511.813	10.43
KR-4	SW302140	SW302141	817.14	816.25	831.00	67	30	0.01328	47.27	2097292.000	245324.828	13.86
KR-4	SW302141	SW302142	816.25	816.13	830.00	15	60	0.00800	232.97	2097354.750	245349.547	13.75
KR-4	SW302142	PS_16	816.13	816.00	830.10	29	60	0.00448	174.34	2097359.000	245335.469	13.97
KR-5	PS_04	NW322071	801.70	801.56	811.70	2263	12	0.00006	0.27	2103193.321	245676.444	10.00
KR-5	PS_25	NW322002	784.80	801.15	817.00	638	10	-.02563	0.00	2112486.450	236895.119	32.20

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	SW322004	SW322003	813.64	813.15	826.00	101	21	0.00485	11.03	2101715.000	241031.938	12.36
KR-5	NE062111	NE062110	834.52	834.00	844.90	162	12	0.00321	2.01	2100312.180	237024.555	10.38
KR-5	NE062110	NE062112	834.00	833.30	845.00	280	15	0.00250	3.23	2100401.114	237159.889	11.00
KR-5	NE062112	NE062113	833.30	831.24	840.59	300	15	0.00687	5.35	2100562.957	237388.378	7.29
KR-5	NE062113	NE062114	831.24	829.14	838.00	307	15	0.00684	5.34	2100736.360	237633.187	6.76
KR-5	NE062160	SE312080	828.02	827.63	835.00	39	15	0.01000	6.46	2101040.186	239211.433	6.98
KR-5	SE312080	SE312081	827.63	824.46	835.00	317	15	0.01000	6.46	2101045.588	239250.057	7.37
KR-5	SE312081	SE312123	824.26	818.15	832.26	65	15	0.09400	19.80	2101089.497	239564.002	8.00
KR-5	NE072005	NE072004	858.89	858.55	862.00	79	10	0.00430	1.43	2101283.897	233668.575	3.11
KR-5	NE072004	NE072003	858.55	858.13	864.75	176	10	0.00239	1.07	2101207.115	233651.033	6.20
KR-5	NE072003	NE072002	858.13	857.70	863.00	247	10	0.00174	0.91	2101031.617	233655.272	4.87
KR-5	NE072002	NE072001	857.70	856.85	874.00	331	10	0.00257	1.11	2101026.360	233902.555	16.30
KR-5	NE072001	SE062051	856.85	856.37	869.00	172	10	0.00279	1.15	2100695.000	233896.125	12.15
KR-5	NE361080	NE361079	879.69	879.56	889.19	50	18	0.00260	5.35	2095349.971	241692.510	9.50
KR-5	NE361079	NE361077	879.18	877.15	886.04	190	18	0.01068	10.85	2095343.427	241742.332	6.86
KR-5	NE361077	NE361076	877.15	874.78	884.45	324	18	0.00731	8.98	2095332.824	241931.636	7.30
KR-5	NE361076	NE361075	874.57	873.78	881.72	630	18	0.00125	3.71	2095330.254	242255.170	7.15
KR-5	NW062004	NW062203	920.35	917.95	924.00	24	12	0.10000	11.26	2096612.020	237908.752	3.65
KR-5	NW062203	NW062204	917.95	911.35	924.00	93	12	0.07097	9.49	2096655.993	237908.260	6.05
KR-5	NW062204	NW062005	911.35	909.24	923.00	30	12	0.07033	9.44	2096749.338	237910.832	11.65
KR-5	NW062005	NW062006	909.24	905.71	913.00	50	12	0.07060	9.46	2096750.233	237880.845	3.76
KR-5	NW062006	NW062007	905.71	895.97	913.00	139	12	0.07007	9.43	2096751.726	237830.868	7.29
KR-5	NW062007	NW062008	895.97	879.03	902.00	240	12	0.07058	9.46	2096755.868	237692.242	6.03
KR-5	NW062008	NW062009	879.03	864.21	888.00	210	12	0.07057	9.46	2096763.035	237452.349	8.97
KR-5	NW062011	NW062009	875.41	864.21	881.00	593	12	0.01889	4.89	2096787.028	236649.212	5.59
KR-5	NW062009	NW062017	864.21	861.33	882.00	340	12	0.00847	3.27	2096769.306	237242.443	17.79
KR-5	NW062017	NW062206	861.33	861.16	871.02	20	12	0.00850	3.28	2097108.928	237263.406	9.69
KR-5	NW062206	NW062211	861.16	860.00	871.00	138	12	0.00841	3.26	2097128.942	237264.004	9.84

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	NW062211	NW062212	860.00	858.36	875.30	323	12	0.00508	2.53	2097266.381	237268.110	15.30
KR-5	NW062212	NW062213	858.36	856.75	875.56	299	12	0.00538	2.61	2097256.736	237590.966	17.20
KR-5	NW062213	NW062209	856.75	856.65	875.25	193	12	0.00052	0.81	2097247.815	237889.557	18.50
KR-5	NW062209	NW062208	856.65	855.30	875.25	193	12	0.00699	2.97	2097247.218	237909.548	18.60
KR-5	NW062208	NW062037	855.30	854.85	872.00	330	12	0.00136	1.31	2097440.081	237914.864	16.70
KR-5	NW062037	NW062036	854.85	853.70	872.00	465	12	0.00247	1.77	2097769.871	237928.954	17.15
KR-5	NW062036	NW062035	853.60	851.65	866.90	275	12	0.00709	3.00	2098234.509	237947.910	13.30
KR-5	NW062035	NW062034	851.65	849.65	864.65	285	12	0.00702	2.98	2098226.297	238222.791	13.00
KR-5	NW062034	NW062070	849.55	847.07	861.65	380	12	0.00653	2.87	2098217.786	238507.663	12.10
KR-5	NW062070	NW062066	846.97	844.56	859.97	366	12	0.00658	2.89	2098597.763	238514.124	13.00
KR-5	NW062066	NW062065	844.56	842.83	854.96	255	12	0.00678	2.93	2098586.834	238879.961	10.40
KR-5	NW062065	NW062064	842.66	841.46	854.86	152	12	0.00789	3.16	2098579.223	239134.706	12.20
KR-5	NW062064	NW062076	841.46	839.36	850.19	357	12	0.00588	2.73	2098730.666	239138.880	8.73
KR-5	NW062089	NW062087	845.75	844.50	858.00	352	12	0.00355	2.12	2099161.786	237059.672	12.25
KR-5	NW062087	NW062084	844.50	843.71	860.00	360	12	0.00219	1.66	2099148.470	237411.426	15.50
KR-5	NW062084	NW062081	843.51	842.75	859.00	189	12	0.00402	2.25	2099134.851	237771.175	15.49
KR-5	NW062081	NW062080	842.75	842.22	860.87	262	12	0.00202	1.60	2099127.706	237959.885	18.12
KR-5	NW062080	NW062079	842.22	841.34	860.00	280	12	0.00314	1.99	2099117.814	238221.199	17.78
KR-5	NW062079	NW062078	841.34	840.41	862.36	275	12	0.00338	2.07	2099111.336	238501.127	21.02
KR-5	NW062078	NW062076	840.41	839.36	860.00	373	12	0.00282	1.89	2099101.098	238775.948	19.59
KR-5	NW062205	NW062077	853.06	846.31	860.00	200	12	0.03375	6.54	2099003.240	238793.259	6.94
KR-5	NW062077	NW062076	846.11	839.36	853.00	180	12	0.03750	6.89	2098996.447	238993.147	6.89
KR-5	NW062076	SE312006	839.36	835.24	850.00	457	12	0.00902	3.38	2099087.212	239148.706	10.64
KR-5	SE312006	SE312005	835.20	834.70	844.44	73	12	0.00685	2.94	2099190.686	239593.483	9.24
KR-5	SE312005	SE312003	834.70	833.70	843.00	127	12	0.00787	3.16	2099263.329	239594.847	8.30
KR-5	SE312003	SE312007	833.50	830.41	842.87	536	12	0.00576	2.70	2099390.307	239597.232	9.37
KR-5	SE312007	SE312014	830.21	826.01	840.00	526	12	0.00798	3.18	2099713.817	239834.201	9.79
KR-5	SE312014	SE312022	825.81	825.40	837.88	125	12	0.00328	2.04	2100033.188	240094.087	12.07

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	SE312022	SE31239A	825.40	824.74	836.00	206	12	0.00320	2.01	2100157.825	240097.892	10.60
KR-5	SE31239A	SE312039	824.54	822.82	833.48	180	12	0.00956	3.48	2100363.524	240099.171	8.94
KR-5	SE312039	SE312038	822.82	819.85	832.00	278	12	0.01068	3.68	2100541.158	240130.140	9.18
KR-5	SE312038	SE312036	819.85	816.66	828.00	301	12	0.01060	3.66	2100819.139	240138.715	8.15
KR-5	SE312036	SE312125	816.66	816.21	829.00	42	15	0.01071	6.68	2101119.954	240147.994	12.34
KR-5	SE312125	SE312084	816.21	816.08	829.50	12	18	0.01083	10.93	2101150.255	240177.077	13.29
KR-5	NW312021	NW312020	846.72	824.61	858.62	776	15	0.02849	10.90	2097282.822	242996.304	11.90
KR-5	NW322005	NW322071	802.60	802.56	817.00	15	18	0.00267	5.42	2102038.098	243746.763	14.40
KR-5	SW052059	SE062058	864.66	863.50	879.90	391	10	0.00297	1.19	2101955.250	234094.859	15.24
KR-5	SE062058	SE062057	863.50	862.30	872.00	400	10	0.00300	1.20	2101564.373	234080.043	8.50
KR-5	SE062057	SE062052	862.30	859.45	878.00	274	10	0.01040	2.23	2101164.430	234073.336	15.70
KR-5	SE062052	SE062051	859.45	856.57	886.00	226	10	0.01274	2.47	2100890.298	234068.739	26.55
KR-5	SE062051	SE062050	856.37	856.09	872.00	97	24	0.00289	12.16	2100664.500	234064.953	15.63
KR-5	SE062050	SE062049	856.09	855.76	872.00	394	27	0.00084	8.97	2100653.500	234161.016	15.91
KR-5	SW312036	SW312039	869.45	861.78	879.37	395	10	0.01942	3.05	2097330.155	241577.689	9.92
KR-5	SW312039	SW31243A	861.78	857.12	870.25	270	10	0.01726	2.87	2097722.053	241586.754	8.47
KR-5	SW31243A	SW312046	857.12	846.13	864.00	610	10	0.01802	2.94	2097991.836	241594.535	6.88
KR-5	SW312046	SW312049	845.93	838.61	854.29	395	12	0.01853	4.85	2098601.960	241612.130	8.36
KR-5	SW312049	SE312052	838.41	833.89	849.54	163	12	0.02773	5.93	2098996.797	241623.517	11.13
KR-5	SW312103	SW312077	889.63	888.93	899.00	165	10	0.00424	1.42	2097390.926	239536.177	9.37
KR-5	SW312077	SW312076	888.73	871.96	897.50	667	10	0.02514	3.47	2097555.850	239541.213	8.77
KR-5	SW312076	SW312100	871.90	868.17	882.08	165	10	0.02261	3.29	2097535.021	240207.888	10.18
KR-5	SW312100	SW312070	867.97	857.58	877.71	330	10	0.03148	3.88	2097699.899	240212.923	9.74
KR-5	SW312070	SW312065	857.38	847.27	870.51	350	10	0.02889	3.72	2098029.656	240222.993	13.13
KR-5	SW312065	SW312063	847.07	843.21	864.84	165	10	0.02339	3.35	2098379.568	240233.678	17.77
KR-5	NW062213	NW062024	856.75	855.30	875.25	193	12	0.00751	3.08	2097247.815	237889.557	18.50
KR-5	NW062024	NW062049	855.30	854.85	872.00	331	12	0.00136	1.31	2097440.767	237891.874	16.70
KR-5	NW062049	NW062050	854.85	853.70	871.58	330	8	0.00348	0.71	2097767.584	237905.052	16.73

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	NW062050	NW062053	853.70	851.85	864.70	155	8	0.01194	1.32	2098099.082	237921.731	11.00
KR-5	NW062053	NW062071	851.83	851.20	867.25	570	10	0.00111	0.73	2098255.105	237928.257	15.42
KR-5	NW062071	NW062072	851.00	849.67	861.80	645	10	0.00206	0.99	2098243.083	238498.092	10.80
KR-5	NW062072	SW312069	849.67	848.08	862.78	356	10	0.00447	1.46	2098222.488	239143.043	13.11
KR-5	SW312069	SW312067	847.88	846.74	869.92	191	10	0.00597	1.69	2098209.447	239561.172	22.04
KR-5	SW312067	SW312064	846.74	846.00	861.00	165	10	0.00448	1.46	2098400.373	239567.002	14.26
KR-5	SE062050	SE062048	855.10	854.00	872.00	394	27	0.00279	16.36	2100653.500	234161.016	16.90
KR-5	SE062048	SE06247A	853.90	853.78	872.00	47	27	0.00255	15.64	2100672.500	234554.969	18.10
KR-5	SE06247A	SE062047	853.68	853.13	872.00	212	27	0.00259	15.76	2100625.250	234554.953	18.32
KR-5	SE062047	SE062046	853.08	852.08	869.00	390	27	0.00256	15.67	2100631.500	234767.219	15.92
KR-5	SE062046	SE062035	852.03	847.43	864.00	502	27	0.00916	29.64	2100669.215	235154.979	11.97
KR-5	NW062072	NW062207	849.67	847.00	862.78	356	10	0.00750	1.89	2098222.488	239143.043	13.11
KR-5	NW062207	SW312064	847.00	846.00	857.56	419	10	0.00239	1.07	2098578.648	239152.937	10.56
KR-5	SW312064	SW312063	845.80	843.21	857.50	667	10	0.00388	1.36	2098565.428	239572.043	11.70
KR-5	SW312063	SW312061	843.01	842.28	865.58	165	12	0.00442	2.36	2098544.610	240238.718	22.57
KR-5	SW312061	SW312058	842.08	839.75	859.00	328	12	0.00710	3.00	2098709.653	240243.758	16.92
KR-5	SW312058	SE312057	839.51	838.63	855.06	164	24	0.00537	16.57	2099037.825	240253.779	15.55
KR-5	SE312057	SE312054	838.63	835.98	851.35	690	24	0.00384	14.01	2099201.249	240258.769	12.72
KR-5	SE312054	SE312052	835.98	833.89	853.38	680	24	0.00307	12.53	2099180.434	240948.831	17.40
KR-5	SE312052	NE312077	833.70	828.90	847.36	692	24	0.00694	18.84	2099159.942	241628.222	13.66
KR-5	NE312077	NE312076	828.88	824.68	834.59	668	24	0.00629	17.94	2099139.066	242320.308	5.71
KR-5	NW312002	NW312014	843.84	835.30	852.00	329	8	0.02596	1.94	2096583.608	244284.173	8.16
KR-5	NW312014	NW312019	832.30	825.32	851.61	519	8	0.01345	1.40	2096912.224	244294.703	19.31
KR-5	NE361225	NE361067	906.70	891.54	915.00	352	12	0.04307	7.39	2093955.522	242879.034	8.30
KR-5	NE361067	NE361066	891.54	889.55	902.71	325	10	0.00612	1.71	2094317.092	242854.338	11.17
KR-5	NE361066	NE361072	889.55	879.20	894.75	340	10	0.03044	3.82	2094641.939	242864.319	5.20
KR-5	NE361072	NE361075	879.20	873.78	887.84	325	10	0.01668	2.82	2094981.779	242874.760	8.64
KR-5	NE361075	NE361082	873.57	872.27	881.72	151	24	0.00861	20.99	2095306.625	242884.741	8.15

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	NE361082	NE361085	872.22	866.56	879.45	179	24	0.03162	40.23	2095457.431	242889.374	7.23
KR-5	NE361085	NE361090	866.56	861.98	873.72	108	24	0.04241	46.59	2095636.470	242894.875	7.16
KR-5	NE361090	NE361089	861.88	859.06	868.68	57	24	0.04947	50.32	2095744.789	242898.203	6.80
KR-5	NE361089	NE361107	859.06	850.57	866.30	165	24	0.05145	51.31	2095801.392	242899.942	7.24
KR-5	NE361107	NE361230	850.57	847.20	863.27	330	24	0.01021	22.86	2095966.315	242905.009	12.70
KR-5	NE361230	NW312005	847.20	845.62	859.45	330	24	0.00479	15.65	2096296.159	242915.143	12.25
KR-5	NW312005	NW312011	845.62	843.62	857.13	330	24	0.00606	17.61	2096626.152	242924.028	11.51
KR-5	NW312011	NW312022	843.52	841.37	854.92	329	24	0.00653	18.28	2096955.731	242921.186	11.40
KR-5	NW312022	NW312031	841.37	839.30	856.42	330	24	0.00627	17.91	2097284.852	242931.336	15.05
KR-5	NW312031	NW312045	839.30	836.13	855.68	338	24	0.00938	21.91	2097614.957	242941.516	16.38
KR-5	NW312045	NW312051	836.13	832.54	843.40	342	24	0.01050	23.18	2097952.780	242951.935	7.27
KR-5	NW312051	NW312061	832.54	830.50	841.30	330	24	0.00618	17.78	2098294.777	242962.482	8.76
KR-5	NW312061	NW312067	830.30	826.40	842.00	330	24	0.01182	24.59	2098624.758	242972.658	11.70
KR-5	NW312067	NE312076	826.32	824.68	836.42	165	26	0.00994	27.92	2098954.154	242982.817	10.10
KR-5	NE312076	NE312075	824.43	820.06	833.83	695	34	0.00629	45.42	2099118.930	242987.898	9.40
KR-5	SW302017	NW312019	826.52	825.32	835.70	590	15	0.00203	2.91	2097391.495	244858.280	9.18
KR-5	NW312019	NW312020	825.32	824.61	843.00	639	15	0.00111	2.15	2097408.499	244268.317	17.68
KR-5	NW312020	NW312043	824.41	823.68	851.20	465	15	0.00157	2.55	2097428.113	243629.731	26.79
KR-5	NW312043	NW312060	823.48	822.88	859.72	621	15	0.00097	2.01	2097892.956	243644.516	36.24
KR-5	NW312060	NE312075	822.68	820.06	852.92	584	15	0.00449	4.32	2098513.842	243664.264	30.24
KR-5	NE312075	NE312074	820.06	818.61	832.76	175	34	0.00829	52.14	2099097.968	243682.842	12.70
KR-5	NE312074	NE312100	818.51	816.60	830.26	320	34	0.00597	44.25	2099273.116	243688.413	11.75
KR-5	NE312100	NE312099	816.60	814.45	827.50	330	34	0.00652	46.24	2099593.195	243698.594	10.90
KR-5	NE312099	NE312093	814.45	813.23	825.09	140	34	0.00871	53.45	2099923.512	243709.100	10.64
KR-5	NE312093	NE312092	813.03	812.59	824.65	68	34	0.00647	46.07	2100063.441	243713.550	11.62
KR-5	NE312092	NE312090	812.45	811.84	825.15	119	34	0.00513	41.02	2100128.321	243733.653	12.70
KR-5	NE312090	NE312089	811.74	810.81	824.74	157	34	0.00592	44.06	2100247.319	243737.283	13.00
KR-5	PS_16	NW312056	816.00	850.51	829.00	1505	16	-.02293	0.00	2097371.308	245308.819	13.00

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	NW312056	NW312069	850.51	837.51	855.40	426	24	0.03052	39.52	2098503.615	244318.004	4.89
KR-5	NW312069	NE312081	837.51	825.88	846.00	400	24	0.02908	38.58	2098927.450	244330.214	8.49
KR-5	NE312081	SE302102	825.78	817.95	835.00	324	24	0.02417	35.17	2099326.750	244342.844	9.22
KR-5	SE302102	NE312082	817.91	817.48	823.31	247	27	0.00174	12.92	2099536.750	244589.703	5.40
KR-5	NE312082	NE312083	817.48	816.68	824.00	204	27	0.00392	19.39	2099742.041	244452.355	6.52
KR-5	NE312083	NE312084	816.68	814.78	824.00	512	27	0.00371	18.86	2099885.804	244308.308	7.32
KR-5	NE312084	NE312085	814.78	813.17	825.00	425	27	0.00379	19.06	2100288.139	243991.652	10.22
KR-5	NE312085	NE312037	813.07	811.45	826.00	437	27	0.00371	18.86	2100614.319	243719.198	12.93
KR-5	NE312037	NE312036	811.45	810.29	817.00	315	27	0.00368	18.78	2101050.589	243738.591	5.55
KR-5	NE312036	NW322011	810.29	803.98	820.00	320	27	0.01972	43.49	2101365.065	243742.407	9.71
KR-5	SE302102	SE302103	817.91	817.32	823.31	50	21	0.01180	17.21	2099567.648	244588.538	5.40
KR-5	SE302103	NE312104	817.22	816.77	824.00	238	21	0.00189	6.88	2099567.648	244588.538	6.78
KR-5	NE312104	NE312105	816.67	815.71	823.40	507	21	0.00189	6.88	2099761.718	244451.611	6.73
KR-5	NE312105	NE312123	813.68	810.75	824.20	474	21	0.00618	12.45	2100149.858	244126.004	10.52
KR-5	SE072156	SE072157	813.34	812.86	829.10	486	24	0.00099	7.11	2100252.873	230787.516	15.76
KR-5	SE072157	PS_05B	812.86	812.81	833.00	24	24	0.00208	10.31	2100446.338	231231.536	20.14
KR-5	PS_05B	NE072011	812.81	868.00	835.00	3625	18	-.01522	0.00	2100451.591	231254.503	22.19
KR-5	NE072011	NE072010	867.50	861.50	873.50	449	24	0.01336	26.15	2100602.500	233267.844	6.00
KR-5	NE072010	SE062049	861.40	855.86	868.00	449	24	0.01234	25.13	2100586.500	233716.484	6.60
KR-5	SE062049	SE06249A	855.76	855.24	872.00	307	24	0.00169	9.30	2100604.750	234165.531	16.24
KR-5	SE06249A	SE062085	855.24	854.25	872.00	295	24	0.00336	13.11	2100606.381	234472.155	16.76
KR-5	SE062085	SE062086	854.25	853.25	869.00	400	24	0.00250	11.31	2100624.000	234767.047	14.75
KR-5	SE062086	SE062087	853.25	852.06	865.00	490	24	0.00243	11.15	2100659.811	235165.441	11.75
KR-5	SE062087	SE062088	852.06	849.00	861.00	403	24	0.00759	19.71	2100703.680	235653.473	8.94
KR-5	SE062088	SE06288A	849.00	847.29	858.00	107	24	0.01598	28.60	2100739.750	236054.750	9.00
KR-5	SE06288A	SE06289A	847.29	843.86	856.00	215	24	0.01595	28.57	2100748.500	236161.234	8.71
KR-5	SE06289A	NE062029	843.81	840.61	852.00	337	24	0.00950	22.05	2100767.000	236375.359	8.19
KR-5	SE072156	SE072105	813.50	811.81	829.10	25	24	0.06760	58.82	2100237.925	230807.126	15.60

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	NE062029	NE062028	840.51	839.31	851.00	159	24	0.00755	19.65	2100850.000	236656.844	10.49
KR-5	NE062028	NE062026	839.31	837.82	852.00	468	24	0.00318	12.75	2100871.250	236805.172	12.69
KR-5	NE062026	NE062019	837.82	833.12	844.00	332	24	0.01416	26.92	2100908.250	237272.188	6.18
KR-5	NE062019	NE062018	833.12	832.08	839.00	350	24	0.00297	12.32	2100938.500	237603.250	5.88
KR-5	NE062018	NE062016	832.08	831.50	836.00	198	24	0.00293	12.24	2100971.000	237951.641	3.92
KR-5	NE062016	NE062007	831.30	830.58	839.00	216	24	0.00333	13.05	2100989.750	238148.578	7.70
KR-5	NE062007	NE062003	830.38	829.65	838.00	189	24	0.00386	14.05	2101010.500	238363.125	7.62
KR-5	NE062003	NE062002	829.45	828.88	838.00	182	24	0.00313	12.65	2101032.500	238550.781	8.55
KR-5	NE062002	NE062001	828.68	826.00	836.00	493	24	0.00544	16.68	2101053.500	238731.125	7.32
KR-5	NE062001	SE312034	826.00	825.11	837.00	425	24	0.00209	10.34	2101109.250	239221.000	11.00
KR-5	SE312034	SE312033	824.91	822.75	832.00	501	24	0.00431	14.85	2101158.349	239642.741	7.09
KR-5	SE312033	SE312085	817.00	816.62	829.00	90	24	0.00422	14.69	2101215.274	240140.130	12.00
KR-5	NE062145	NE062151	841.02	840.36	850.00	57	24	0.01158	24.34	2100774.000	236654.844	8.98
KR-5	NE062151	NE062152	840.16	835.88	851.00	357	24	0.01199	24.77	2100804.000	236703.797	10.84
KR-5	NE062152	NE062153	835.88	831.58	845.00	430	24	0.01000	22.62	2100835.168	237059.036	9.12
KR-5	NE062153	NE062114	831.58	829.14	841.00	402	24	0.00607	17.62	2100872.750	237487.391	9.42
KR-5	NE062114	NE062115	829.14	826.35	837.00	455	24	0.00613	17.71	2100906.750	237888.016	7.86
KR-5	NE062115	NE062116	826.35	823.49	838.00	469	24	0.00610	17.67	2100951.500	238340.344	11.65
KR-5	NE062116	NE06295A	823.49	821.54	835.00	321	24	0.00607	17.62	2100996.750	238806.828	11.51
KR-5	NE06295A	NE062159	821.32	820.68	835.00	233	24	0.00275	11.86	2101034.250	239125.688	13.68
KR-5	NE062159	SE312120	820.52	820.33	832.00	65	24	0.00292	12.22	2100816.315	239208.109	11.48
KR-5	SE312120	SE312121	820.23	819.16	832.00	357	24	0.00300	12.39	2100792.124	239268.440	11.77
KR-5	SE312121	SE312122	818.96	818.18	830.00	258	24	0.00302	12.43	2100829.790	239623.532	11.04
KR-5	SE312122	SE312123	818.18	818.15	821.71	11	24	0.00273	11.82	2101087.750	239628.063	3.53
KR-5	SE312123	SE312124	817.85	817.12	828.69	242	24	0.00302	12.43	2101098.500	239628.375	10.84
KR-5	SE312124	SE312084	817.02	816.08	828.00	315	24	0.00298	12.35	2101126.250	239869.000	10.98
KR-5	SE312084	SE312065	815.95	815.60	829.00	58	18	0.00603	8.15	2101161.089	240182.239	13.05
KR-5	SE312065	SE312128	815.50	814.46	829.00	100	12	0.01040	3.63	2101178.655	240299.380	13.50

NETWORK INVENTORY DETAIL

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KR-5	SE312128	SE312129	814.36	813.16	827.00	399	30	0.00301	22.50	2101217.500	240643.188	12.64
KR-5	SE312129	SE312130	812.86	812.68	826.00	62	30	0.00290	22.09	2101262.750	241039.266	13.14
KR-5	SE312084	SE312086	817.00	816.75	829.00	58	18	0.00431	6.89	2101161.089	240182.239	12.00
KR-5	SE312065	SE312127	815.50	815.47	829.00	100	12	0.00030	0.61	2101178.693	240299.334	13.50
KR-5	SE312127	SE312067	815.47	814.70	829.00	619	12	0.00124	1.25	2101179.958	240398.651	13.53
KR-5	SE312067	SE312151	814.70	814.26	828.00	349	12	0.00126	1.26	2101208.505	241017.260	13.30
KR-5	SE312151	NE312022	814.26	813.30	828.00	768	12	0.00125	1.25	2101289.750	241333.453	13.74
KR-5	NE312022	NE312021	813.30	813.23	828.00	50	12	0.00140	1.33	2101242.403	242084.657	14.70
KR-5	NE312021	NE312020	813.23	813.04	828.00	154	12	0.00123	1.24	2101226.161	242152.708	14.77
KR-5	NE312020	NE312017	813.04	812.04	828.00	154	12	0.00649	2.87	2101179.008	242263.519	14.96
KR-5	NE312017	NE312016	812.04	811.68	826.00	291	12	0.00124	1.25	2100547.569	242776.551	13.96
KR-5	NE312016	NE312089	811.68	810.81	826.00	690	12	0.00126	1.26	2100463.250	243054.859	14.32
KR-5	NE312089	NE312088	810.79	810.61	826.71	26	34	0.00692	47.64	2100404.246	243742.069	15.92
KR-5	NE312088	NE312122	810.61	810.45	826.50	19	34	0.00126	20.33	2100428.698	243743.976	15.89
KR-5	NE312122	NE312087	810.45	810.28	826.35	116	21	0.00147	6.07	2100447.226	243743.379	15.90
KR-5	SE312086	SE312126	821.68	821.63	829.00	17	30	0.00294	22.24	2101213.074	240207.007	7.32
KR-5	SE312126	SE312032	821.63	821.58	829.00	15	18	0.00333	6.06	2101228.819	240214.509	7.37
KR-5	SE312032	SE312031	821.58	821.36	829.00	83	18	0.00265	5.40	2101236.921	240218.369	7.42
KR-5	SE312031	SE312064	821.36	814.65	829.00	372	18	0.01804	14.10	2101245.750	240300.781	7.64
KR-5	SE312064	SE312060	814.65	814.30	827.00	341	18	0.00103	3.37	2101289.500	240669.844	12.35
KR-5	SE312059	SE312058	812.80	812.34	826.00	275	24	0.00167	9.24	2101313.250	241017.578	13.20
KR-5	SE312058	SW322220	812.34	812.09	825.00	153	24	0.00163	9.13	2101587.750	241024.094	12.66
KR-5	SW322220	SW322x69	812.09	812.08	826.00	7	24	0.00143	8.55	2101702.000	241125.375	13.91
KR-5	SW322x69	SW32256A	812.08	811.50	826.00	350	21	0.00166	6.45	2101701.294	241132.747	13.92
KR-5	SW32256A	SW322215	811.50	809.40	822.00	414	21	0.00507	11.28	2101691.000	241482.172	10.50
KR-5	NE312088	NE312123	810.61	810.38	826.50	116	21	0.00198	7.05	2100520.747	243830.587	15.89
KR-5	NE312123	NE312087	810.38	810.28	826.20	12	21	0.00833	14.46	2100520.747	243830.587	15.82
KR-5	NE312087	NE312038	810.28	808.30	826.50	518	21	0.00382	9.79	2100530.755	243824.007	16.22

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

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KR-5	NE312038	NE312120	808.30	805.39	817.00	427	21	0.00681	13.07	2101040.015	243731.730	8.70
KR-5	NE312120	NW322035	805.39	803.95	820.00	210	21	0.00686	13.12	2101465.929	243757.224	14.61
KR-5	SE312126	SE312030	821.63	819.56	829.00	131	30	0.01580	51.56	2101228.819	240214.509	7.37
KR-5	SE312030	SE312063	819.56	814.65	829.00	311	30	0.01579	51.54	2101243.250	240345.047	9.44
KR-5	SE312063	SE312062	814.65	814.40	827.00	357	30	0.00070	10.85	2101280.250	240653.703	12.35
KR-5	SE312062	SE312060	814.40	814.30	826.00	9	30	0.01111	43.23	2101321.500	241008.781	11.60
KR-5	SE312060	SE312061	814.30	813.57	826.00	296	30	0.00247	20.38	2101330.000	241008.266	11.70
KR-5	SE312061	SW322218	813.57	813.32	825.00	105	30	0.00238	20.01	2101626.000	241016.906	11.43
KR-5	SW322218	SW322216	813.32	813.30	826.00	7	30	0.00286	21.93	2101701.500	241089.328	12.68
KR-5	SW322216	SW322217	813.30	813.20	826.00	40	30	0.00250	20.51	2101707.750	241092.531	12.70
KR-5	SW322x69	SW322217	813.25	813.20	826.00	10	21	0.00500	11.20	2101701.304	241132.752	12.75
KR-5	SW322217	SW322003	813.20	813.15	826.00	5	30	0.01000	41.02	2101707.000	241132.719	12.80
KR-5	SW322003	SW322002	813.15	811.50	826.00	339	30	0.00487	28.62	2101712.250	241132.641	12.85
KR-5	SW322002	SW322001	811.50	809.58	822.00	393	30	0.00489	28.68	2101705.500	241471.844	10.50
KR-5	SW322001	SW322215	809.58	809.40	822.00	35	30	0.00514	29.40	2101696.250	241865.094	12.42
KR-5	SW322215	NE312023	809.40	809.26	822.00	28	30	0.00500	29.00	2101679.750	241896.328	12.60
KR-5	NE312023	NE312026	809.26	807.16	822.00	451	30	0.00466	28.00	2101669.250	241922.250	12.74
KR-5	NE312026	NE312028	807.16	805.44	824.00	369	30	0.00466	28.00	2101618.750	242370.094	16.84
KR-5	NE312028	NW322029	805.44	804.55	824.00	192	30	0.00464	27.94	2101578.250	242736.563	18.56
KR-5	NE312087	NE312107	810.28	808.58	826.50	200	21	0.00850	14.60	2100688.941	243714.145	16.22
KR-5	NE312107	NE312108	808.08	806.36	825.00	495	21	0.00347	9.33	2100688.941	243714.145	16.92
KR-5	NE312108	NW322109	806.26	804.54	819.80	495	21	0.00347	9.33	2101183.820	243708.754	13.54
KR-5	SW322215	NW322023	809.40	809.26	822.00	28	21	0.00500	11.20	2101679.750	241896.328	12.60
KR-5	NW322023	NW322025	809.26	807.90	822.00	280	21	0.00486	11.04	2101679.000	241924.625	12.74
KR-5	NW322025	NW322027	807.90	805.69	824.00	452	21	0.00489	11.08	2101717.750	242202.047	16.10
KR-5	NW322027	NW322029	805.69	804.55	824.00	234	21	0.00487	11.05	2101705.500	242653.688	18.31
KR-5	NW322029	NW322107	804.55	804.46	816.00	18	30	0.00100	12.97	2101696.750	242887.391	11.45
KR-5	NW322107	NW322108	804.46	804.10	814.00	75	30	0.00480	28.42	2101708.750	242901.141	9.54

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	NW322108	NW322033	804.10	801.99	816.00	431	30	0.00490	28.71	2101706.431	242975.605	11.90
KR-5	NW322029	NW322031	804.55	804.00	816.00	90	21	0.00611	12.38	2101696.750	242887.391	11.45
KR-5	NW322031	NW322034	804.00	802.01	816.00	429	21	0.00464	10.79	2101696.750	242977.359	12.00
KR-5	NW322034	NW322109	805.54	804.54	818.00	282	21	0.00355	9.44	2101684.980	243406.306	12.46
KR-5	NW322109	NW322035	804.54	803.95	817.80	81	21	0.00728	13.52	2101678.182	243688.720	13.26
KR-5	NW322035	NW322012	803.95	803.89	820.00	8	30	0.00750	35.52	2101675.951	243769.796	16.05
KR-5	NW322033	NW322110	805.00	804.15	818.00	291	48	0.00267	74.23	2101698.009	243407.400	13.00
KR-5	NW322109	NW322110	804.74	804.15	817.80	14	21	0.00728	13.52	2101678.195	243688.713	13.06
KR-5	NW322110	NW322011	804.15	803.98	818.68	292	36	0.00058	16.06	2101685.780	243700.643	14.53
KR-5	NW322011	NW322012	803.98	803.89	820.00	266	36	0.00034	12.29	2101684.534	243762.106	16.02
KR-5	NW322012	NW322010	803.89	802.98	820.00	255	30	0.00357	24.51	2101684.338	243770.328	16.11
KR-5	NW322010	NW32236A	802.98	802.93	817.22	14	30	0.00357	24.51	2101938.730	243787.221	14.24
KR-5	NW32236A	NW32236B	802.93	802.88	818.00	13	36	0.00385	41.38	2101943.375	243796.282	15.07
KR-5	NW322110	NW322111	804.15	803.13	818.68	292	36	0.00349	39.40	2101686.002	243700.515	14.53
KR-5	NW322011	NW32236C	803.98	803.24	820.00	266	36	0.00278	35.17	2101684.534	243762.106	16.02
KR-5	NW32236C	NW32248A	803.24	803.21	818.00	10	24	0.00300	12.39	2101949.382	243783.692	14.76
KR-5	NW32248A	NW322111	803.21	803.13	818.00	26	48	0.00308	79.72	2101955.561	243777.992	14.79
KR-5	NW322111	NW322070	803.13	803.04	816.79	35	48	0.00257	72.82	2101972.585	243758.115	13.66
KR-5	NW322070	NW322003	802.52	801.02	817.01	321	48	0.00467	98.17	2102002.862	243740.120	14.49
KR-5	NW32236A	WEIR	802.93	802.86	818.00	18	24	0.00389	14.11	2101943.587	243796.976	15.07
KR-5	WEIR	NW32230A	802.86	802.50	818.00	15	24	0.02400	35.04	2101944.401	243799.686	0.00
KR-5	NW32230A		802.50	802.49	818.00	2	24	0.00500	15.99	2101951.517	243813.514	15.50
KR-5	NW32236C	NW32236B	803.21	802.88	818.00	9	24	0.03667	43.32	2101950.015	243783.892	14.79
KR-5	NW32236B	NW32236D	802.88	802.83	818.00	16	24	0.00313	12.65	2101957.403	243788.448	15.12
KR-5	NW32236D	NW322071	802.83	802.56	818.00	77	24	0.00351	13.40	2101963.548	243783.380	15.17
KR-5	NW322071	NW322004	801.56	801.50	817.00	251	36	0.00024	10.33	2102025.920	243738.005	15.44
KR-5	NW322004	NW322002	801.50	800.99	821.00	67	36	0.00761	58.19	2102032.233	243486.982	19.50
KR-5	WWTP		800.83	800.75	826.00	10	54	0.00800	175.91	2102102.221	243421.917	25.17

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-6	NE092021	NE092005	882.00	870.25	887.25	662	8	0.01775	1.61	2111167.250	233413.703	5.25
KR-6	NE092005	NE092004	865.92	864.30	876.25	351	8	0.00462	0.82	2111153.541	234063.655	10.33
KR-6	NE092004	SE042015	864.10	852.20	873.40	348	8	0.03420	2.23	2111479.000	234073.781	9.30
KR-6	SE042015	SE042002	852.00	847.50	859.80	319	8	0.01411	1.43	2111460.000	234421.313	7.80
KR-6	SE042002	SE042003	839.61	836.14	853.58	391	8	0.00887	1.13	2111560.750	234724.453	13.97
KR-6	SE042003	SE042004	835.91	835.74	848.83	247	8	0.00069	0.31	2111440.250	235096.688	12.92
KR-6	SE042004	SE042006	834.63	830.19	852.60	274	8	0.01620	1.53	2111653.250	235220.766	17.97
KR-6	SE042006	SE042008	828.28	826.01	841.34	253	8	0.00897	1.14	2111576.500	235483.422	13.06
KR-6	SE042008	SE042009	825.83	822.18	837.31	267	8	0.01367	1.41	2111581.000	235736.859	11.48
KR-6	SE042009	SE042011	821.19	816.66	832.02	250	8	0.01812	1.62	2111624.750	236000.422	10.83
KR-6	SE042011	SE042013	814.73	810.94	827.16	271	18	0.01399	12.42	2111745.250	236219.266	12.43
KR-6	SE042013	SE042014	810.83	807.41	821.04	234	18	0.01462	12.70	2111958.750	236386.328	10.21
KR-6	SE042014	SW032002	807.21	800.25	818.09	334	18	0.02084	15.16	2112184.000	236450.609	10.88
KR-6	NW052036	NW052037	838.50	835.57	849.00	181	10	0.01619	2.78	2102631.246	237797.851	10.50
KR-6	NW052037	NW052038	835.47	834.18	846.50	351	10	0.00368	1.32	2102678.518	237972.068	11.03
KR-6	NW052038	NW052012	834.08	832.90	846.00	298	10	0.00396	1.37	2102663.114	238322.429	11.92
KR-6	NW052012	NW052011	832.80	831.97	843.75	248	10	0.00335	1.26	2102650.016	238620.341	10.95
KR-6	NW052011	NW052010	831.97	831.62	841.50	52	10	0.00673	1.79	2102639.120	238868.161	9.53
KR-6	NW052010	NW052003	831.52	831.07	840.75	208	10	0.00216	1.01	2102636.838	238920.052	9.23
KR-6	NW052003	SW322069	830.87	830.09	839.00	161	10	0.00484	1.52	2102627.711	239128.037	8.13
KR-6	SW322069	SW322070	829.98	829.54	836.00	86	10	0.00512	1.56	2102620.652	239288.897	6.02
KR-6	NW052166	NW052167	844.75	842.35	856.50	303	15	0.00792	5.74	2103186.765	237240.615	11.75
KR-6	NW052167	NW052061	842.25	841.10	854.50	140	15	0.00821	5.85	2103172.751	237543.291	12.25
KR-6	NW052061	NW052060	841.00	840.81	852.90	49	15	0.00388	4.02	2103113.262	237670.409	11.90
KR-6	NW052060	NW052059	840.71	839.81	854.00	187	15	0.00481	4.48	2103072.414	237697.473	13.29
KR-6	NW052059	NW052058	839.71	838.59	851.10	278	15	0.00403	4.10	2102916.455	237800.799	11.39
KR-6	NW052058	NW052057	838.44	835.69	847.20	433	15	0.00635	5.14	2102684.703	237954.341	8.76
KR-6	NW052057	NW052013	835.59	835.05	846.90	85	15	0.00635	5.14	2102665.684	238386.923	11.31

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

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KR-6	NW052013	NW052046	834.95	832.83	847.00	345	15	0.00614	5.06	2102661.951	238471.841	12.05
KR-6	NW052046	NW052005	832.73	831.00	842.00	435	15	0.00398	4.07	2102646.797	238816.508	9.27
KR-6	NW052005	NW052008	830.90	830.56	833.50	90	15	0.00378	3.97	2102627.690	239251.088	2.60
KR-6	NW052008	SW322070	830.56	829.54	838.75	36	8	0.02833	2.03	2102707.120	239256.549	8.19
KR-6	SW322070	SW322023	829.54	827.19	840.50	149	10	0.01577	2.75	2102706.586	239291.374	10.96
KR-6	SW322023	SW322025	827.19	826.89	841.00	18	15	0.01667	8.34	2102700.868	239440.275	13.81
KR-6	SW322025	SW322026	826.89	825.93	841.00	238	15	0.00403	4.10	2102715.551	239451.491	14.11
KR-6	SW322026	SW322027	825.93	822.91	834.00	253	15	0.01194	7.05	2102708.702	239689.392	8.07
KR-6	SW322027	SW322028	822.91	820.40	831.00	212	15	0.01184	7.02	2102701.421	239942.287	8.09
KR-6	SW322028	SW322029	820.40	818.34	828.00	173	15	0.01191	7.05	2102682.210	240153.415	7.60
KR-6	SW322029	SW322030	817.84	817.76	828.00	60	21	0.00133	5.77	2102680.130	240326.402	10.16
KR-6	SW032009	SW032008	806.13	805.38	816.68	177	18	0.00424	6.84	2114517.750	236087.156	10.55
KR-6	SW032008	SW032011	805.30	804.76	817.45	255	18	0.00212	4.83	2114341.000	236080.859	12.15
KR-6	SW032011	SW032007	804.56	804.50	815.51	148	18	0.00041	2.12	2114086.500	236075.000	10.95
KR-6	SW032007	SW032006	804.40	803.17	816.64	400	18	0.00308	5.83	2113938.750	236069.047	12.24
KR-6	SW032006	SW032005	803.04	802.10	816.69	396	18	0.00237	5.11	2113539.750	236096.609	13.65
KR-6	SW032005	SW032004	802.01	801.09	814.62	347	18	0.00265	5.40	2113151.250	236174.672	12.61
KR-6	SW032004	SW032003	801.01	800.33	817.16	301	18	0.00226	4.99	2112813.000	236251.063	16.15
KR-6	SW032003	SW032002	800.33	800.25	817.87	99	18	0.00081	2.98	2112519.000	236313.500	17.54
KR-6	SW032002	SW032015	800.25	799.83	817.87	94	18	0.00447	7.02	2112516.000	236412.766	17.62
KR-6	SW032015	SW032001	799.83	799.14	817.94	350	18	0.00197	4.66	2112510.250	236506.094	18.11
KR-6	SW032001	PS_25	798.94	785.00	817.93	40	18	0.34850	62.01	2112489.000	236855.203	18.99
KR-6	SW322035	SW322034	820.00	819.83	828.00	62	15	0.00274	3.38	2103001.558	240007.136	8.00
KR-6	SW322034	SW322031	819.73	818.61	828.00	386	15	0.00290	3.47	2102951.357	240044.030	8.27
KR-6	SW322031	SW322030	818.61	818.26	828.00	99	15	0.00354	3.84	2102778.366	240388.928	9.39
KR-6	SW322030	SW322015	817.76	817.21	828.00	360	21	0.00153	6.19	2102679.258	240386.037	10.24
KR-6	SW322015	SW322013	817.21	816.72	824.00	317	21	0.00155	6.23	2102668.177	240745.864	6.79
KR-6	SW322013	SW322008	816.62	815.87	822.00	483	21	0.00155	6.23	2102658.086	241062.703	5.38

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

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KR-6	SW322008	SW322004	815.87	813.64	828.00	461	21	0.00484	11.02	2102175.286	241048.803	12.13
NL-1	NE192001	NE192002	806.75	806.41	815.50	294	12	0.00116	1.21	2098853.725	254374.520	8.75
NL-1	NE192002	NE192004	806.08	805.76	814.50	158	12	0.00203	1.60	2099008.305	254124.555	8.42
NL-1	NE192004	NE192005	805.70	804.94	818.50	403	12	0.00189	1.54	2099014.467	253967.176	12.80
NL-1	NE192005	NE192006	804.88	804.30	823.10	263	12	0.00221	1.67	2099030.232	253564.492	18.22
NL-1	NE192006	NE192007	804.18	803.81	821.00	186	12	0.00199	1.58	2099040.503	253302.161	16.82
NL-1	NE192007	PS_12	803.75	803.25	823.00	37	12	0.01351	4.14	2098853.085	253296.954	19.25
NL-1	PS_12	SW192019	803.25	810.12	823.00	574	6	-.01197	0.00	2098811.025	253294.551	19.75
NL-1	SW192019	SW192020	802.93	802.27	818.73	395	12	0.00167	1.45	2098536.734	251453.736	15.80
NL-1	SW192020	SW192021	802.27	801.54	818.00	332	12	0.00220	1.67	2098561.107	251059.929	15.73
NL-1	SW192021	SW192022	801.54	800.60	818.00	361	12	0.00260	1.81	2098574.279	250728.289	16.46
NL-1	SW192022	SW192025	800.60	799.51	819.00	97	12	0.01124	3.77	2098543.672	250368.589	18.40
NL-1	NW292140	SW292141	822.16	821.40	826.00	3402	10	0.00022	0.32	2101619.169	247387.849	3.84
NL-1	SW292141	SW292039	821.40	820.90	828.00	130	10	0.00385	1.35	2101659.406	247228.052	6.60
NL-1	SW292039	SW292040	820.50	819.44	828.00	215	12	0.00493	2.50	2101695.239	247103.088	7.50
NL-1	SW292040	SW292041	819.44	816.56	828.00	300	12	0.00960	3.49	2101898.497	247173.905	8.56
NL-1	SW292041	SW292042	816.56	814.40	828.00	300	12	0.00720	3.02	2102198.298	247184.828	11.44
NL-1	SW292042	SW292043	814.40	812.20	826.00	262	12	0.00840	3.26	2102498.099	247195.751	11.60
NL-1	SW292043	SW292034	811.96	811.33	826.00	315	12	0.00200	1.59	2102760.325	247205.305	14.04
NL-1	SW292034	SW292033	811.33	811.26	822.00	40	12	0.00175	1.49	2102773.613	246890.981	10.67
NL-1	SW292033	SW292031	811.26	810.97	822.00	141	12	0.00206	1.61	2102775.302	246851.021	10.74
NL-1	SW292031	SW292021	810.97	809.98	821.00	169	12	0.00586	2.72	2102781.253	246710.246	10.03
NL-1	SW292021	SW292020	809.98	809.65	821.00	330	12	0.00100	1.12	2102788.387	246541.486	11.02
NL-1	SW292020	SW292050	809.65	809.12	818.00	330	12	0.00161	1.42	2102802.312	246212.081	8.35
NL-1	NW292146	NW292147	805.63	804.65	816.00	325	10	0.00302	1.20	2102271.583	247852.817	10.37
NL-1	NW292147	NW292179	804.65	801.98	815.00	342	10	0.00781	1.93	2101946.410	247843.857	10.35
NL-1	NW302039	NW302004	805.71	804.91	818.00	140	10	0.00571	1.65	2098231.327	249055.278	12.29
NL-1	NW302004	NW302038	804.81	803.86	818.00	287	10	0.00331	1.26	2098264.836	249191.209	13.19

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NL-1	NW302038	NW302037	803.66	802.52	816.00	286	10	0.00399	1.38	2098362.176	249461.225	12.34
NL-1	NW302037	NW302001	802.22	797.80	817.00	270	10	0.01637	2.80	2098459.047	249730.320	14.78
NL-1	NW302061	NW302080	813.30	811.52	822.00	41	10	0.04341	4.56	2098733.500	247749.969	8.70
NL-1	NW302080	NE302081	811.25	810.63	822.00	313	10	0.00198	0.97	2098774.250	247751.031	10.75
NL-1	NE302081	NE302082	810.63	809.97	822.00	330	10	0.00200	0.97	2099086.636	247760.244	11.37
NL-1	NE302082	NE302083	809.97	809.31	822.00	332	10	0.00199	0.97	2099416.500	247769.719	12.03
NL-1	NE302083	NE302084	809.31	808.80	818.00	332	10	0.00154	0.85	2099748.574	247778.869	8.69
NL-1	NE302084	NE302114	808.65	807.99	818.00	332	10	0.00199	0.97	2100080.648	247788.020	9.35
NL-1	NE302114	NE302241	807.99	807.35	818.00	50	10	0.01280	2.47	2100412.722	247797.171	10.01
NL-1	NE302241	NE302113	807.35	807.33	818.18	281	10	0.00007	0.18	2100463.068	247798.558	10.83
NL-1	NE302113	NE302135	807.15	805.79	818.00	331	10	0.00411	1.40	2100743.596	247806.288	10.85
NL-1	NE302135	NE302133	805.79	804.60	817.00	258	10	0.00461	1.48	2101074.471	247815.406	11.21
NL-1	NE302133	NW292157	804.60	804.25	816.00	87	10	0.00402	1.38	2101332.010	247822.502	11.40
NL-1	NW292157	NW292137	804.25	803.74	815.00	176	10	0.00290	1.17	2101418.486	247824.885	10.75
NL-1	NW292137	NW292138	803.68	803.20	815.00	160	10	0.00300	1.20	2101593.765	247833.764	11.32
NL-1	NW292138	NW292139	803.20	802.20	816.00	200	10	0.00500	1.54	2101601.635	247671.367	12.80
NL-1	NW292139	NW292180	802.20	800.20	819.00	12	10	0.16667	8.94	2101610.096	247471.546	16.80
NL-1	SW192026	SW192025	807.13	806.85	818.00	68	12	0.00412	2.28	2098695.931	250326.007	10.87
NL-1	SW192025	SW192034	799.51	799.21	819.00	226	12	0.00133	1.29	2098628.224	250321.190	19.49
NL-1	SW192034	SW192035	799.01	798.55	818.00	302	12	0.00152	1.38	2098637.595	250095.385	18.99
NL-1	SW192035	NW302001	798.35	797.80	818.00	98	12	0.00561	2.66	2098650.111	249793.794	19.65
NL-1	NW302001	PS_01	797.60	797.58	814.00	16	12	0.00125	1.25	2098729.223	249735.703	16.40
NL-1	PS_01	NE302096	797.58	818.40	814.00	1375	8	-.01514	0.00	2098742.442	249725.996	16.42
NL-1	NE302096	NE302097	818.20	816.56	823.00	410	8	0.00400	0.76	2100113.722	249772.915	4.80
NL-1	NE302097	SE192098	816.46	814.86	823.00	400	8	0.00400	0.76	2100513.867	249780.535	6.54
NL-1	SE192098	NW292099	814.76	813.13	822.00	409	8	0.00399	0.76	2100918.881	249787.832	7.24
NL-1	NW292099	NW292169	810.77	809.45	821.10	331	15	0.00399	4.08	2101325.188	249806.730	10.33
NL-1	NW292169	NW292170	809.37	808.05	820.49	330	15	0.00400	4.08	2101339.190	249475.977	11.12

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
NL-1	NW292170	NW292172	807.93	807.37	819.63	147	15	0.00381	3.98	2101353.156	249146.042	11.70
NL-1	NW292172	NW292173	806.85	806.83	819.52	11	15	0.00182	2.75	2101369.174	248989.785	12.67
NL-1	NW292173	NW292174	806.69	805.93	819.93	173	15	0.00439	4.28	2101377.505	248982.130	13.24
NL-1	NW292174	NW292175	805.83	804.36	819.01	325	15	0.00452	4.34	2101384.831	248809.085	13.18
NL-1	NW292175	NW292076	804.36	803.64	817.75	331	18	0.00218	4.90	2101398.566	248484.611	13.39
NL-1	NW292076	NW292200	803.59	803.04	816.69	305	18	0.00180	4.45	2101412.563	248153.972	13.10
NL-1	NW292200	NW292178	802.49	802.08	816.58	166	21	0.00247	7.87	2101422.036	247853.104	14.09
NL-1	NW292178	NW292179	802.08	801.98	816.00	166	21	0.00060	3.88	2101606.441	247864.868	13.92
NL-1	NW292179	NW292180	801.98	800.05	815.00	25	21	0.07720	44.02	2101609.083	247833.034	13.02
NL-1	NW292180	PS_03	800.05	799.74	820.57	367	21	0.00084	4.59	2101624.028	247465.281	20.52
NL-1	PS_03	SW292059	799.74	801.95	826.00	2369	12	-.00093	0.00	2101626.624	247414.796	26.26
NL-1	SE302128	SE302010	808.84	807.60	818.84	391	15	0.00317	3.63	2100644.365	247138.720	10.00
NL-1	SE302010	SE302008	807.60	807.32	817.60	100	15	0.00280	3.41	2100649.598	246746.245	10.00
NL-1	SE302006	SE302007	810.66	809.06	820.66	331	8	0.00483	0.83	2099995.472	246615.420	10.00
NL-1	SE302007	SE302008	809.06	807.46	819.06	328	8	0.00488	0.84	2100330.384	246636.352	10.00
NL-1	SE302008	SE302019	807.32	806.90	817.32	152	15	0.00276	3.39	2100654.831	246641.585	10.00
NL-1	SE302019	SE202021	806.90	805.35	816.90	679	15	0.00228	3.08	2100654.831	246489.828	10.00
NL-1	SE202021	SE302155	805.35	805.00	815.35	83	15	0.00422	4.19	2100675.763	245820.004	10.00
NL-1	SE302155	SE302158	805.00	804.75	815.00	21	8	0.01190	1.31	2100675.312	245736.891	10.00
NL-1	SE302158	PS_02	804.75	804.50	814.75	21	8	0.01190	1.31	2100654.741	245736.480	10.00
NL-1	PS_02	SE302001	804.50	819.60	814.50	140	6	-.10786	0.00	2100654.831	245757.208	10.00
NL-1	SE302001	SE202002	819.60	818.30	829.60	145	8	0.00897	1.14	2100780.423	245820.004	10.00
NL-1	SE202002	SE302003	818.30	816.87	826.67	302	8	0.00474	0.83	2101083.937	245825.237	8.37
NL-1	SE302003	SE292054	816.87	815.50	825.50	271	8	0.00506	0.85	2101340.354	245840.936	8.63
NL-1	SE292054	SE292053	815.50	814.00	825.50	271	8	0.00554	0.89	2101617.703	245846.169	10.00
NL-1	SE292053	SE292052	814.00	812.50	824.00	300	8	0.00500	0.85	2101921.217	245851.402	10.00
NL-1	SE292052	SE292051	812.50	811.00	822.50	300	8	0.00500	0.85	2102209.033	245861.868	10.00
NL-1	SE292051	SW292050	811.00	809.32	821.00	300	8	0.00560	0.90	2102512.547	245872.334	10.00

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Rim Elevation	Pipe Length	Pipe Dia.	Pipe Slope	Pipe Capacity	East (X) Coordinate	North (Y) Coordinate	Manhole Depth
			(ft)	(ft)	(ft)	(ft)	(in)	(ft/ft)	(cfs)			(ft)
NL-1	SW292050	SW292010	809.12	808.66	818.00	331	12	0.00139	1.32	2102816.250	245882.375	8.88
NL-1	SW292010	SW292058	808.66	806.80	822.00	308	12	0.00604	2.76	2102830.530	245552.184	13.34
NL-1	SW292058	SW292057	806.80	804.38	823.00	400	12	0.00605	2.77	2102843.860	245243.973	16.20
NL-1	SW292057	SW292056	804.34	803.37	823.48	209	12	0.00464	2.42	2103243.759	245256.970	19.14
NL-1	SW292056	SW292059	803.12	801.89	822.75	216	12	0.00569	2.68	2103236.976	245465.690	19.63
NL-1	SW292059	SW292101	801.89	801.80	822.00	23	12	0.00391	2.22	2103240.700	245680.590	20.11
NL-1	SW292101	PS_04	801.80	801.70	811.80	26	12	0.00385	2.21	2103218.241	245678.828	10.00
WR-2	SW101153	SE101152	821.60	820.57	833.50	600	27	0.00172	12.84	2083020.330	229449.280	11.90
WR-2	SE101152	SE101151	820.57	817.49	833.50	600	27	0.00513	22.18	2083620.027	229468.367	12.93
WR-2	SE101151	SE101150	817.49	816.25	833.50	600	27	0.00207	14.09	2084219.705	229488.009	16.01
WR-2	SE101150	SE101058	816.15	816.00	833.50	60	27	0.00208	14.12	2084800.842	229508.129	17.35
WR-2	SE101319	HB2	819.00	817.00	833.00	400	24	0.00500	15.99	2084947.358	229628.708	14.00
WR-2	NE101310	NE101054	833.79	823.30	843.79	203	12	0.05167	8.09	2084553.365	231127.235	10.00
WR-2	NE101054	SE101311	822.97	822.53	832.00	174	12	0.00253	1.79	2084601.000	230929.875	9.03
WR-2	SE101311	SE101055	822.33	821.33	832.00	400	12	0.00250	1.78	2084641.899	230760.428	9.67
WR-2	SE101055	SE101056	821.13	820.81	831.00	126	12	0.00254	1.79	2084735.750	230371.594	9.87
WR-2	SE101056	SE101057	820.51	819.82	831.00	391	12	0.00176	1.49	2084839.500	230299.844	10.49
WR-2	SE101057	PS_09SC	819.67	816.00	833.17	342	12	0.01073	3.69	2084850.375	229909.438	13.50
WR-2	NW041101	NE041100	960.09	957.13	980.31	401	10	0.00738	1.88	2077983.672	238475.330	20.22
WR-2	NE041100	NE041099	953.28	950.30	964.00	200	10	0.01490	2.67	2078384.341	238485.978	10.72
WR-2	NE041099	SE331101	950.19	946.50	961.00	119	10	0.03101	3.85	2078584.270	238491.292	10.81
WR-2	SE331101	SE331100	944.94	936.64	958.00	187	10	0.04439	4.61	2078580.943	238610.244	13.06
WR-2	SE331100	SE331097	936.56	934.68	943.20	150	10	0.01253	2.45	2078575.702	238797.093	6.64
WR-2	SE331097	SE331096	934.36	927.85	943.00	169	10	0.03852	4.30	2078571.506	238947.035	8.64
WR-2	SE331096	SE331095	926.66	918.66	938.00	303	10	0.02640	3.56	2078738.804	238973.832	11.34
WR-2	SE331095	SE331094	918.56	915.15	930.60	158	10	0.02158	3.21	2079041.644	238982.363	12.04
WR-2	SE331094	SE331093	915.00	911.30	922.20	308	10	0.01201	2.40	2079185.756	239046.500	7.20
WR-2	SE331093	SE331092	911.15	895.62	923.70	249	10	0.06237	5.47	2079478.692	238950.647	12.55

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-2	SE331092	SE331081	895.53	891.72	904.60	307	10	0.01241	2.44	2079722.356	239001.531	9.07
WR-2	PS_40	SE281016	985.50	977.56	995.50	495	4	0.01604	0.24	2079369.271	246453.977	10.00
WR-2	SE281016	SE281025	977.36	975.08	988.56	456	8	0.00500	0.85	2079205.422	246094.631	11.20
WR-2	SE281025	SE281019	974.88	973.36	986.38	304	8	0.00500	0.85	2078749.966	246080.351	11.50
WR-2	SE281019	SE281018	969.41	964.70	980.11	254	8	0.01854	1.64	2078446.225	246070.828	10.70
WR-2	SE281018	SE281017	964.50	953.70	968.90	231	8	0.04675	2.61	2078285.755	246267.213	4.40
WR-2	SE281017	PS_18	953.50	935.75	961.60	300	8	0.05917	2.93	2078111.129	246418.263	8.10
WR-2	PS_18	SE281001	935.75	1002.09	940.40	2582	6	-.02569	0.00	2077811.623	246437.595	4.65
WR-2	SE281001	SW281001	1001.89	1001.44	1010.89	113	8	0.00398	0.76	2077926.695	243858.072	9.00
WR-2	SW281001	NW31168A	1001.24	1000.15	1009.24	113	8	0.00965	1.18	2077813.716	243854.347	8.00
WR-2	NW31168A	NW33167A	999.09	997.72	1008.39	343	8	0.00399	0.76	2077799.490	243742.095	9.30
WR-2	NW33167A	NW33126A	997.34	988.20	1006.54	445	8	0.02054	1.73	2077811.699	243399.010	9.20
WR-2	NW33126A	NW33125A	988.00	981.20	997.80	274	8	0.02482	1.90	2077826.008	242954.185	9.80
WR-2	NW33125A	NW331005	979.70	975.20	989.50	300	8	0.01500	1.48	2077834.965	242680.746	9.80
WR-2	NW331005	NW331002	975.00	973.91	984.40	215	8	0.00507	0.86	2077840.876	242380.879	9.40
WR-2	NW331002	NW331001	973.71	973.55	983.91	38	8	0.00421	0.78	2077851.026	242166.380	10.20
WR-2	NW331001	NE331005	973.55	969.91	982.80	89	10	0.04090	4.43	2077889.422	242167.133	9.25
WR-2	NE331005	NE331004	969.71	967.10	979.90	126	10	0.02071	3.15	2077978.075	242170.016	10.19
WR-2	NE331004	NE331003	967.10	958.50	976.30	400	10	0.02150	3.21	2078063.784	242078.124	9.20
WR-2	NE331003	NE331002	957.50	951.86	967.90	310	10	0.01819	2.95	2078337.433	241786.370	10.40
WR-2	NE331002	NE331001	951.56	948.00	960.20	297	10	0.01199	2.39	2078347.528	241476.784	8.64
WR-2	NE331001	SE33155A	947.90	944.85	956.00	332	10	0.00919	2.10	2078389.016	241182.952	8.10
WR-2	SE33155A	SE331001	944.65	944.00	953.75	92	10	0.00707	1.84	2078413.585	240852.202	9.10
WR-2	SE331001	SE331002	942.90	940.50	951.70	98	10	0.02449	3.42	2078420.389	240760.611	8.80
WR-2	SE331002	SE331003	939.66	931.61	949.66	397	10	0.02028	3.12	2078474.131	240678.340	10.00
WR-2	SE331005	SE331004	950.30	938.93	964.50	299	10	0.03803	4.27	2078032.147	240389.424	14.20
WR-2	SE331004	SE331003	937.00	931.61	946.00	203	10	0.02655	3.57	2078322.833	240321.570	9.00
WR-2	SE331003	SE331010	931.61	926.50	938.90	257	12	0.01988	5.02	2078521.868	240284.220	7.29

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-2	SE331010	SE331014	926.00	920.00	936.80	365	12	0.01644	4.56	2078720.439	240121.130	10.80
WR-2	SE331014	SE331019	914.90	906.58	924.40	329	12	0.02529	5.66	2079026.288	239922.260	9.50
WR-2	SE331019	SE331027	906.48	905.93	918.48	140	12	0.00393	2.23	2079314.188	239762.901	12.00
WR-2	SE331027	SE331028	905.73	904.65	917.93	240	12	0.00450	2.39	2079446.855	239718.795	12.20
WR-2	SE331028	SE331033	904.45	902.75	915.35	204	12	0.00833	3.25	2079631.962	239566.028	10.90
WR-2	SE331033	SE331036	902.55	895.93	910.15	362	12	0.01829	4.81	2079790.425	239437.445	7.60
WR-2	SE331044	SE331043	912.50	910.48	923.00	138	12	0.01464	4.31	2080309.689	240270.402	10.50
WR-2	SE331043	SE331042	910.05	909.50	919.85	110	12	0.00500	2.51	2080310.805	240132.303	9.80
WR-2	SE331042	SE331041	907.50	906.28	916.60	163	12	0.00748	3.08	2080282.631	240025.604	9.10
WR-2	SE331041	SE331040	906.08	905.14	914.98	148	12	0.00635	2.83	2080233.047	239870.043	8.90
WR-2	SE331040	SE331039	905.14	898.62	912.50	262	12	0.02489	5.62	2080214.334	239723.608	7.36
WR-2	SE331039	SE331038	898.42	897.39	913.52	134	12	0.00769	3.12	2080226.647	239461.629	15.10
WR-2	SE331038	SE331037	897.39	896.87	912.84	76	12	0.00684	2.94	2080205.876	239328.809	15.45
WR-2	SE331037	SE331036	896.67	895.93	912.97	155	12	0.00477	2.46	2080161.299	239267.130	16.30
WR-2	SE331036	SE331081	895.73	891.72	902.93	163	15	0.02460	10.13	2080038.207	239173.131	7.20
WR-2	SE331081	SE331089	891.30	890.74	902.80	219	15	0.00256	3.26	2080029.424	239010.185	11.50
WR-2	SE331089	SE331090	883.46	881.99	900.00	79	16	0.01861	10.46	2080017.632	238791.432	16.54
WR-2	SE331090	NE041207	881.99	880.71	896.00	318	16	0.00403	4.87	2080031.648	238714.163	14.01
WR-2	NE041207	NE041080	880.71	878.76	894.80	401	18	0.00486	7.32	2080095.020	238402.414	14.09
WR-2	NE041080	NE041081	878.76	876.78	889.00	344	18	0.00576	7.97	2080304.513	238060.223	10.24
WR-2	NE041081	NW031269	876.68	875.18	889.20	398	18	0.00377	6.45	2080621.535	237925.564	12.52
WR-2	NW031269	NW031007	875.08	873.50	886.70	400	18	0.00395	6.60	2080986.888	237767.666	11.62
WR-2	NW031007	NW031008	871.30	871.00	883.20	145	18	0.00207	4.77	2081340.213	237580.153	11.90
WR-2	NW031008	NW031009	871.00	870.15	885.20	230	18	0.00370	6.39	2081398.273	237447.646	14.20
WR-2	NW031009	NW031010	870.05	866.70	882.10	400	18	0.00838	9.61	2081490.712	237236.678	12.05
WR-2	SW041015	NE041111	970.24	968.47	983.77	88	10	0.02011	3.10	2078040.185	235936.200	13.53
WR-2	NE041111	SE041110	968.27	967.77	976.86	68	10	0.00735	1.87	2078127.693	235935.625	8.59
WR-2	SE041110	SE041109	967.27	967.21	979.37	31	10	0.00194	0.96	2078194.721	235925.288	12.10

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-2	SE041109	NE041047	967.01	960.00	978.71	407	10	0.01722	2.87	2078224.902	235920.633	11.70
WR-2	NE041047	NE041046	959.80	958.55	969.50	258	10	0.00484	1.52	2078631.655	235934.824	9.70
WR-2	NE041046	NE041045	958.35	957.94	973.65	83	10	0.00494	1.54	2078616.179	236192.854	15.30
WR-2	NE041045	NE041044	957.74	956.23	972.24	272	10	0.00555	1.63	2078691.472	236227.121	14.50
WR-2	NE041044	NE041043	956.03	954.80	967.93	142	10	0.00866	2.03	2078961.704	236196.163	11.90
WR-2	NE041043	NE041042	954.60	950.88	968.20	402	10	0.00925	2.10	2079103.115	236201.193	13.60
WR-2	NE041042	NE041041	950.68	949.23	962.08	314	10	0.00462	1.48	2079488.766	236313.286	11.40
WR-2	NE041041	NE041040	949.03	945.27	963.43	294	10	0.01279	2.47	2079798.629	236364.081	14.40
WR-2	NE041040	NE041039	945.07	937.02	957.57	422	10	0.01908	3.02	2080092.242	236374.754	12.50
WR-2	NE041039	NE041038	936.82	935.70	945.02	188	10	0.00596	1.69	2080499.274	236486.356	8.20
WR-2	NE041038	NW031295	935.50	935.10	942.20	75	10	0.00533	1.59	2080662.832	236579.277	6.70
WR-2	NW031295	NW031294	934.90	933.29	946.10	274	10	0.00588	1.68	2080713.340	236523.361	11.20
WR-2	NW031294	NW031292	933.08	922.07	944.28	211	10	0.05218	5.00	2080946.907	236666.422	11.20
WR-2	NW031292	NW031291	921.97	889.03	982.57	240	10	0.13725	8.11	2081135.156	236571.116	60.60
WR-2	NW031291	NW031290	886.83	886.00	895.85	187	10	0.00444	1.46	2081372.386	236606.870	9.02
WR-2	NW031290	NW031010	875.70	866.70	894.20	274	10	0.03285	3.97	2081336.435	236790.462	18.50
WR-2	NW031010	NW031011	866.60	863.26	877.40	398	18	0.00839	9.62	2081603.279	236852.843	10.80
WR-2	NW031011	NW031013	863.16	860.00	875.50	377	18	0.00838	9.61	2081738.933	236478.675	12.34
WR-2	NW031013	SW031012	859.80	856.44	872.00	400	18	0.00840	9.62	2081876.664	236127.735	12.20
WR-2	SW031012	SW031314	856.24	854.14	868.50	250	18	0.00840	9.62	2082172.256	235858.244	12.26
WR-2	SW031314	SW031312	854.04	851.10	864.80	180	18	0.01633	13.42	2082227.124	235614.340	10.76
WR-2	SW031312	SW031017	851.00	847.64	865.00	170	18	0.01976	14.76	2082266.649	235438.644	14.00
WR-2	SW031017	SW031018	847.54	844.18	861.70	400	18	0.00840	9.62	2082303.940	235272.873	14.16
WR-2	SW031018	SW031022	844.08	841.56	858.90	400	18	0.00630	8.33	2082446.709	234899.220	14.82
WR-2	SW031022	SW031400	841.46	839.78	857.00	300	18	0.00560	7.86	2082469.350	234499.861	15.54
WR-2	SW031400	SW031023	839.48	837.93	855.80	200	21	0.00775	13.95	2082533.743	234206.853	16.32
WR-2	SE041162	SE041161	939.31	937.20	945.00	113	8	0.01867	1.65	2078488.859	234115.002	5.69
WR-2	SE041161	SE041160	937.20	927.30	942.50	222	8	0.04459	2.55	2078553.304	234022.537	5.30

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-2	SE041160	SE041159	927.30	919.15	937.30	167	8	0.04880	2.66	2078614.948	233809.587	10.00
WR-2	SE041159	PS_33	919.15	918.00	930.85	286	8	0.00402	0.76	2078460.839	233745.141	11.70
WR-2	PS_33	SE041041	918.00	944.90	922.50	601	8	-.04476	0.00	2078516.878	233464.943	4.50
WR-2	SE041041	SE041042	944.90	942.84	949.30	131	8	0.01573	1.51	2079117.127	233495.250	4.40
WR-2	SE041042	SE041043	942.64	935.60	950.74	235	8	0.02996	2.09	2079247.794	233499.600	8.10
WR-2	SE041043	SE041048	935.40	917.20	943.00	289	8	0.06298	3.03	2079482.210	233490.938	7.60
WR-2	SE041048	SE041050	917.00	909.31	924.10	264	8	0.02913	2.06	2079770.853	233479.508	7.10
WR-2	SE041050	SE041051	904.59	894.60	913.19	301	8	0.03319	2.20	2080034.388	233488.343	8.60
WR-2	SE041051	SE041052	894.40	885.19	901.30	401	8	0.02297	1.83	2080335.219	233498.429	6.90
WR-2	SE041052	SW031266	884.98	883.26	895.70	186	10	0.00925	2.10	2080735.566	233509.519	10.72
WR-2	SW031266	SW031267	883.06	882.01	893.60	109	10	0.00963	2.15	2080921.562	233510.630	10.54
WR-2	SW031267	SW031268	881.81	879.44	893.60	241	10	0.00983	2.17	2081026.839	233480.877	11.79
WR-2	SW031268	SW031042	879.24	870.14	888.90	250	10	0.03640	4.18	2081267.582	233488.031	9.66
WR-2	SW031042	SW031041	869.94	867.33	874.80	265	10	0.00985	2.17	2081517.472	233495.456	4.86
WR-2	SW031041	SW031038	867.13	861.68	877.50	155	10	0.03516	4.10	2081509.599	233760.443	10.37
WR-2	SW031038	SW031037	861.35	856.20	875.75	326	10	0.01580	2.75	2081510.271	233915.628	14.40
WR-2	SW031037	SW031032	856.00	853.84	870.30	214	12	0.01009	3.57	2081820.244	234016.589	14.30
WR-2	SW031032	SW031024	853.64	843.95	867.50	362	12	0.02677	5.82	2082011.538	233921.309	13.86
WR-2	SW031024	SW031023	843.75	837.93	856.60	218	12	0.02670	5.82	2082373.176	233932.053	12.85
WR-2	SW031023	SW031403	837.12	835.00	851.20	420	21	0.00505	11.26	2082576.672	234011.515	14.08
WR-2	SW031403	NW101149	834.90	833.70	847.70	300	21	0.00400	10.02	2082732.157	233621.355	12.80
WR-2	NW101149	NW101148	833.70	832.50	847.00	426	21	0.00282	8.41	2082843.218	233342.670	13.30
WR-2	NW101148	NW101147	832.50	831.78	845.70	338	21	0.00213	7.31	2083063.657	232978.607	13.20
WR-2	NW101147	NW101304	831.78	829.57	844.00	596	21	0.00371	9.65	2083121.060	232645.517	12.22
WR-2	NW101304	NW101146	829.47	828.01	841.00	395	21	0.00370	9.63	2083005.714	232060.581	11.53
WR-2	NW101146	NW101308	827.51	826.01	838.00	535	24	0.00280	11.97	2082929.255	231672.848	10.49
WR-2	NW101308	NE101145	825.91	824.43	836.00	530	24	0.00279	11.95	2083245.197	231241.348	10.09
WR-2	NE101145	SE101062	824.23	822.69	834.00	550	24	0.00280	11.97	2083558.303	230813.721	9.77

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-2	SE101062	SE101061	822.59	821.04	833.00	552	24	0.00281	11.99	2083573.769	230263.939	10.41
WR-2	SE101061	SE101060	820.74	819.35	833.00	495	24	0.00281	11.99	2083589.299	229711.887	12.26
WR-2	SE101060	SE101059	819.25	818.48	833.00	274	24	0.00281	11.99	2084063.325	229569.741	13.75
WR-2	SE101059	SE101317	818.38	817.61	833.00	275	24	0.00280	11.97	2084337.183	229554.171	14.62
WR-2	SE101317	SE101058	817.10	816.35	833.00	187	12	0.00401	2.25	2084612.067	229562.144	15.90
WR-2	SE101058	PS_09SC	816.00	815.70	833.00	52	30	0.00577	31.16	2084798.987	229567.622	17.00
WR-3	NE341098	SE341097	942.00	934.00	948.55	224	10	0.03571	4.14	2083620.703	241286.025	6.55
WR-3	SE341097	SE341096	929.00	924.20	939.60	190	10	0.02526	3.48	2083647.072	241063.956	10.60
WR-3	SE341096	SE341095	924.00	922.73	931.90	322	10	0.00394	1.37	2083701.100	240881.570	7.90
WR-3	SE341095	SE341094	922.49	915.20	927.90	335	10	0.02176	3.23	2083843.386	240593.091	5.41
WR-3	SE341094	SE341093	914.91	908.90	923.60	527	10	0.01140	2.33	2083991.706	240292.380	8.69
WR-3	SE341093	SE341516	908.70	907.49	919.00	179	10	0.00676	1.80	2084216.551	239815.885	10.30
WR-3	SE341516	SE341517	902.03	901.84	913.49	60	10	0.00317	1.23	2084229.421	239637.348	11.46
WR-3	SE341517	SE341091	901.60	900.54	910.70	193	10	0.00549	1.62	2084266.603	239590.056	9.10
WR-3	SE341091	SE341090	900.34	899.60	910.81	188	10	0.00394	1.37	2084385.673	239438.607	10.47
WR-3	SE341090	SE341089	899.40	893.50	908.00	268	10	0.02201	3.25	2084479.195	239276.027	8.60
WR-3	SE341089	SE341179	893.00	883.82	905.14	309	12	0.02971	6.14	2084598.061	239035.327	12.14
WR-3	SE341179	NE031178	883.52	882.00	904.00	179	12	0.00849	3.28	2084647.230	238730.406	20.48
WR-3	NE031178	NE031233	882.00	881.69	897.00	24	12	0.01292	4.05	2084649.535	238551.141	15.00
WR-3	NE031233	NE031165	881.69	880.00	896.00	174	12	0.00971	3.51	2084649.840	238527.443	14.31
WR-3	NE031165	NE031234	880.00	878.85	896.50	136	12	0.00846	3.27	2084670.303	238354.355	16.50
WR-3	NE031234	NE031302	878.85	875.88	892.50	330	12	0.00900	3.38	2084683.965	238219.327	13.65
WR-3	NE031302	NE031158	875.88	873.80	890.00	160	12	0.01300	4.06	2084701.390	237889.787	14.12
WR-3	NE031158	NE031157	873.80	872.69	888.00	86	15	0.01291	7.34	2084672.169	237732.478	14.20
WR-3	NE031157	NE031156	872.69	872.04	885.00	50	15	0.01300	7.36	2084692.813	237649.302	12.31
WR-3	NE031156	NE031126	872.04	868.60	884.00	266	15	0.01293	7.34	2084703.954	237600.558	11.96
WR-3	NE031126	NE031089	868.60	866.69	882.39	386	15	0.00495	4.54	2084762.568	237340.633	13.79
WR-3	NE031089	NE031088	866.69	863.49	882.50	400	15	0.00800	5.77	2084834.260	236960.951	15.81

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-3	NE031088	NE031087	863.14	857.30	880.00	365	15	0.01600	8.17	2084872.793	236562.811	16.86
WR-3	NE031087	SE031080	857.00	855.85	876.00	143	15	0.00804	5.79	2084907.968	236199.370	19.00
WR-3	SE031080	SE031079	855.55	854.05	874.00	188	15	0.00798	5.77	2085020.881	236110.923	18.45
WR-3	SE031079	SE031078	854.05	852.67	872.40	172	15	0.00802	5.78	2085024.002	235922.862	18.35
WR-3	SE031078	SE031070	852.67	849.87	867.00	350	15	0.00800	5.77	2085027.868	235750.741	14.33
WR-3	SE031070	SE031077	849.87	847.48	865.50	305	15	0.00784	5.72	2085034.657	235400.807	15.63
WR-3	SE031077	SE031071	847.04	846.26	862.50	572	21	0.00136	5.84	2085040.564	235096.295	15.46
WR-3	SE031071	SE031283	846.26	845.31	856.50	600	24	0.00158	8.99	2085071.224	234525.118	10.24
WR-3	SE031283	SE031288	845.31	844.90	853.50	266	24	0.00154	8.87	2085103.385	233925.980	8.19
WR-3	SE031288	NE101144	844.90	844.58	854.35	204	24	0.00157	8.96	2085117.654	233660.151	9.45
WR-3	NE101144	NE101143	844.58	844.36	852.00	395	24	0.00056	5.35	2085128.577	233456.656	7.42
WR-3	NE101143	NE101142	844.26	843.95	859.00	390	24	0.00079	6.35	2085523.405	233468.334	14.74
WR-3	NE101142	NE101155	843.85	843.72	870.00	158	24	0.00082	6.47	2085913.166	233482.075	26.15
WR-3	NE101155	NE101157	843.62	843.53	866.00	112	24	0.00080	6.39	2085918.277	233324.158	22.38
WR-3	NE101157	NE101258	843.43	843.34	866.00	109	24	0.00083	6.51	2085991.849	233239.711	22.57
WR-3	NE101258	NW111050	843.24	843.22	866.00	100	24	0.00020	3.19	2086100.557	233243.564	22.76
WR-3	NW111050	NW111003	843.12	842.92	866.00	213	24	0.00094	6.93	2086103.279	233143.601	22.88
WR-3	NW111003	NW111004	842.92	842.54	866.00	402	24	0.00095	6.97	2086316.521	233150.729	23.08
WR-3	NW111004	NW111005	842.54	842.53	856.00	12	24	0.00083	6.51	2086718.365	233164.160	13.46
WR-3	NW111005	NW111010	842.53	842.46	856.00	77	24	0.00091	6.82	2086730.719	233164.573	13.47
WR-3	NW111010	NW111016	842.46	842.10	850.00	390	24	0.00092	6.86	2086807.426	233167.137	7.54
WR-4	NE021074	NE021073	921.67	910.21	932.00	395	12	0.02901	6.06	2089434.559	237308.121	10.33
WR-4	NE021073	NE021072	910.21	898.21	917.50	392	12	0.03061	6.23	2089126.315	237060.446	7.29
WR-4	NE021072	NW021071	898.01	888.48	905.50	338	12	0.02820	5.98	2088820.652	236814.845	7.49
WR-4	NW021071	NW021070	888.28	879.17	897.00	335	12	0.02719	5.87	2088482.932	236804.141	8.72
WR-4	NW021070	NW021069	878.97	870.19	888.00	335	12	0.02621	5.76	2088148.100	236793.528	9.03
WR-4	NW021069	NW021097	869.99	863.05	878.50	326	12	0.02129	5.19	2087813.268	236782.916	8.51
WR-4	NW351310	NW351112	935.59	925.53	944.50	300	10	0.03353	4.01	2086988.271	242819.777	8.91

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-4	NW351112	NW351314	925.43	917.43	934.50	398	10	0.02010	3.10	2086968.370	242520.330	9.07
WR-4	NW351314	NW351000	917.33	915.62	925.50	182	10	0.00940	2.12	2086943.125	242123.578	8.17
WR-4	NW351000	NW351315	915.42	912.73	926.25	87	12	0.03092	6.26	2086963.875	241942.766	10.83
WR-4	NW351315	NW351277	911.72	909.59	924.50	355	12	0.00600	2.75	2086992.500	241861.078	12.78
WR-4	NW351277	SW351130	909.49	909.15	920.50	210	12	0.00162	1.43	2087031.750	241507.938	11.01
WR-4	SW351130	SW351128	909.15	905.73	918.50	188	12	0.01819	4.80	2087122.875	241318.563	9.35
WR-4	SW351128	SW351127	905.73	903.52	923.31	369	12	0.00599	2.75	2087205.500	241149.234	17.58
WR-4	SW351127	SW351260	903.42	902.75	911.00	93	12	0.00720	3.02	2087234.125	240781.234	7.58
WR-4	SE021092	SE021091	902.99	892.60	911.00	360	12	0.02886	6.05	2090371.383	235602.652	8.01
WR-4	SE021091	SE021090	892.50	890.19	901.00	367	12	0.00629	2.82	2090184.284	235295.453	8.50
WR-4	SE021090	SE021089	889.99	874.23	895.00	360	12	0.04378	7.45	2090012.869	234971.160	5.01
WR-4	SE021089	SE021088	874.03	867.22	882.00	360	12	0.01892	4.90	2089844.636	234652.887	7.97
WR-4	SE021088	SE021087	867.02	864.20	875.00	360	12	0.00783	3.15	2089676.403	234334.614	7.98
WR-4	SE021087	SE021086	864.00	857.31	872.50	361	12	0.01853	4.85	2089508.170	234016.341	8.50
WR-4	SE021086	SE021085	857.00	853.00	865.50	410	12	0.00976	3.52	2089339.246	233696.760	8.50
WR-4	SE021085	SW021041	852.90	849.45	861.50	372	12	0.00927	3.43	2088929.898	233670.240	8.60
WR-4	SW021041	SW021028	849.25	847.36	858.00	347	12	0.00545	2.63	2088558.056	233658.886	8.75
WR-4	SW021028	SW021027	847.16	846.81	857.50	96	12	0.00365	2.15	2088211.141	233650.542	10.34
WR-4	SW021027	SW021026	846.61	844.48	856.50	406	12	0.00525	2.58	2088115.170	233648.085	9.89
WR-4	SW021026	SW021118	844.28	843.67	851.50	123	12	0.00496	2.50	2087709.397	233634.522	7.22
WR-4	SW021118	SW021017	843.67	841.60	855.10	288	12	0.00719	3.02	2087586.805	233633.110	11.43
WR-4	SE351044	SE351045	912.40	907.65	920.00	299	12	0.01589	4.49	2089667.830	238929.060	7.60
WR-4	SE351045	SE351052	907.30	899.93	915.00	98	12	0.07520	9.77	2089369.190	238917.060	7.70
WR-4	SE351052	NE021100	899.73	897.53	912.00	127	12	0.01732	4.68	2089271.490	238916.420	12.27
WR-4	NE021100	NE021082	897.33	895.19	909.00	122	12	0.01754	4.71	2089191.625	238817.594	11.67
WR-4	NE021082	NE021081	894.99	888.52	909.00	370	12	0.01749	4.71	2089115.629	238721.899	14.01
WR-4	NE021081	NE021080	888.42	884.48	902.50	221	12	0.01783	4.75	2088865.397	238449.140	14.08
WR-4	NE021080	NW021079	884.38	880.13	900.00	234	12	0.01816	4.80	2088674.493	238337.933	15.62

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-4	NW021079	NW021078	880.03	877.45	892.50	235	15	0.01098	6.76	2088446.491	238286.824	12.47
WR-4	NW021078	NW021077	877.35	873.69	889.00	327	15	0.01119	6.83	2088217.347	238235.460	11.65
WR-4	NW021077	NW021076	873.69	868.61	883.50	325	15	0.01563	8.07	2087939.693	238062.403	9.81
WR-4	SE351169	SE351168	954.89	949.00	972.00	201	12	0.02930	6.09	2089439.360	241513.568	17.11
WR-4	SE351168	SE351167	948.70	945.22	959.00	128	12	0.02719	5.87	2089238.831	241507.016	10.30
WR-4	SE351167	SE351165	944.92	942.25	961.00	138	12	0.01935	4.95	2089243.687	241379.082	16.08
WR-4	SE351165	SE351304	940.25	938.25	956.18	112	12	0.01786	4.76	2089105.641	241374.584	15.93
WR-4	SE351304	SE351164	938.05	935.23	951.00	100	12	0.02820	5.98	2088993.386	241370.926	12.95
WR-4	SE351164	SE351161	935.03	934.42	944.00	215	12	0.00284	1.89	2088893.439	241367.670	8.97
WR-4	SE351161	SE351160	932.42	932.24	947.49	126	12	0.00143	1.34	2088678.577	241360.669	15.07
WR-4	SE351160	SE351152	932.24	931.50	949.00	103	12	0.00718	3.01	2088552.931	241356.575	16.76
WR-4	SE351152	SW351151	931.20	930.20	941.00	205	12	0.00488	2.48	2088555.480	241253.345	9.80
WR-4	SW351151	SW351149	930.00	929.21	946.00	283	12	0.00279	1.88	2088355.606	241300.952	16.00
WR-4	SW351149	SW351135	928.02	922.50	935.88	292	12	0.01890	4.89	2088087.053	241211.117	7.86
WR-4	SW351135	SW351132	921.34	911.20	929.40	357	12	0.02840	6.00	2087809.077	241122.928	8.06
WR-4	SW351132	SW351260	905.11	902.75	918.50	378	12	0.00624	2.81	2087585.212	240845.417	13.39
WR-4	SW351260	SW351258	902.75	896.94	907.50	364	12	0.01596	4.50	2087241.500	240688.078	4.75
WR-4	SW351258	SW351119	896.84	894.80	906.50	230	12	0.00887	3.35	2087268.826	240324.864	9.66
WR-4	SW351119	SW351118	892.84	889.75	904.14	172	12	0.01797	4.77	2087343.250	240107.031	11.30
WR-4	SW351118	SW351117	889.75	889.60	898.00	196	12	0.00077	0.98	2087398.418	239943.810	8.25
WR-4	SW351117	SW351116	889.50	882.38	897.50	387	12	0.01840	4.83	2087450.472	239754.547	8.00
WR-4	SW351116	SW351115	881.98	880.16	899.50	166	15	0.01096	6.76	2087612.125	239403.453	17.52
WR-4	SW351115	SW351194	880.16	875.35	894.00	340	15	0.01415	7.68	2087594.250	239238.844	13.84
WR-4	SW351194	SE351250	875.35	874.80	889.00	73	15	0.00753	5.60	2087560.500	238900.047	13.65
WR-4	SE351250	NW021083	874.70	871.58	890.50	502	15	0.00622	5.09	2087552.875	238827.578	15.80
WR-4	NW021083	NW021076	871.48	868.61	883.50	441	15	0.00651	5.21	2087617.503	238329.265	12.02
WR-4	NW021076	NW021075	868.31	865.57	878.50	544	18	0.00504	7.45	2087663.881	237890.495	10.19
WR-4	NW021075	NW021068	865.47	861.85	873.50	601	18	0.00602	8.15	2087660.353	237346.554	8.03

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-4	NW021068	NW021066	861.75	858.29	871.00	522	18	0.00663	8.55	2087470.005	236776.628	9.25
WR-4	NW021066	SW021064	858.04	857.25	867.00	14	18	0.05643	24.95	2087473.625	236254.203	8.96
WR-4	SW021064	SW021063	857.25	856.00	868.00	350	18	0.00357	6.27	2087475.000	236240.031	10.75
WR-4	SW021063	SW021202	855.97	854.27	863.00	43	18	0.03953	20.88	2087531.125	235895.063	7.03
WR-4	SW021202	SW021051	854.27	852.30	868.00	403	18	0.00489	7.34	2087536.376	235852.701	13.73
WR-4	SW021051	SW021050	850.00	849.89	860.00	366	18	0.00030	1.81	2087601.758	235454.594	10.00
WR-4	SW021087	SW021086	854.98	854.44	874.50	67	10	0.00806	1.96	2086776.741	235096.632	19.52
WR-4	SW021086	SW021085	854.44	851.55	872.50	381	10	0.00759	1.90	2086844.108	235093.548	18.06
WR-4	SW021085	SW021122	851.45	850.60	865.00	378	10	0.00225	1.03	2087224.709	235076.123	13.55
WR-4	SW261091	SW261090	978.39	976.70	992.47	190	12	0.00889	3.35	2087121.920	244174.011	14.08
WR-4	SW261090	NW351301	976.50	974.96	987.86	155	12	0.00994	3.55	2087311.640	244179.273	11.36
WR-4	NW351301	NW351302	972.44	963.88	985.04	138	12	0.06203	8.87	2087312.248	244023.985	12.60
WR-4	NW351302	NW351399	963.68	958.93	971.48	158	12	0.03006	6.17	2087260.342	243895.742	7.80
WR-4	NW351399	NW351303	958.73	956.80	966.53	123	12	0.01569	4.46	2087153.960	243779.599	7.80
WR-4	NW351303	NW351305	956.60	953.70	964.10	139	12	0.02086	5.14	2087091.215	243674.389	7.50
WR-4	NW351305	NW351208	953.30	951.59	962.90	114	12	0.01500	4.36	2087058.013	243539.134	9.60
WR-4	NW351208	NW351307	949.39	945.63	961.59	173	12	0.02173	5.25	2087050.404	243425.388	12.20
WR-4	NW351307	NW351308	945.43	936.21	956.43	329	12	0.02802	5.96	2087038.891	243253.273	11.00
WR-4	NW351308	NW351311	936.11	925.72	949.50	354	18	0.02935	17.99	2087016.933	242925.007	13.39
WR-4	NW351311	NW351113	925.52	917.70	934.76	450	18	0.01738	13.84	2086975.373	242573.861	9.24
WR-4	NW351113	NW351202	917.33	914.05	925.50	278	18	0.01180	11.41	2086964.875	242124.375	8.17
WR-4	NW351202	NW351318	912.06	907.17	924.56	304	18	0.01609	13.32	2087005.000	241849.484	12.50
WR-4	NW351318	SW351263	906.97	901.63	920.70	308	18	0.01734	13.83	2087039.375	241547.594	13.73
WR-4	SW351263	SW351262	901.43	898.41	918.72	291	18	0.01038	10.70	2086921.375	241263.234	17.29
WR-4	SW351262	SW351261	898.21	896.80	907.41	191	18	0.00738	9.02	2087096.875	241031.531	9.20
WR-4	SW351261	SW351126	896.60	895.12	908.01	206	18	0.00718	8.90	2087180.500	240859.266	11.41
WR-4	SW351126	SW351125	894.92	891.22	907.38	241	18	0.01535	13.01	2087257.625	240668.547	12.46
WR-4	SW351125	SW351221	891.02	889.40	904.93	221	18	0.00733	8.99	2087267.707	240427.841	13.91

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-4	SW351221	SW351257	889.40	886.96	903.80	274	18	0.00891	9.91	2087133.919	240252.001	14.40
WR-4	SW351257	SW351256	886.76	885.24	905.36	220	18	0.00691	8.73	2087070.125	239985.734	18.60
WR-4	SW351256	SW351255	885.04	883.16	904.04	272	18	0.00691	8.73	2087192.346	239802.808	19.00
WR-4	SW351255	SW351254	882.96	882.39	897.12	100	18	0.00570	7.93	2087307.375	239556.328	14.16
WR-4	SW351254	SW351253	878.57	876.66	895.67	259	18	0.00737	9.01	2087328.875	239458.734	17.10
WR-4	SW351253	SW351252	876.46	875.12	889.96	183	18	0.00732	8.98	2087453.462	239231.965	13.50
WR-4	SW351252	SW351251	875.02	874.92	887.92	105	18	0.00095	3.23	2087497.625	239054.281	12.90
WR-4	SW351251	NW021103	874.72	870.62	891.75	318	18	0.01289	11.92	2087561.000	238970.344	17.03
WR-4	NW021103	NW021102	870.42	868.26	886.62	319	18	0.00677	8.64	2087600.256	238655.271	16.20
WR-4	NW021102	NW021101	868.06	865.06	885.26	446	18	0.00673	8.61	2087629.958	238337.978	17.20
WR-4	NW021101	NW021100	864.86	862.99	879.63	285	18	0.00656	8.50	2087678.296	237894.494	14.77
WR-4	NW021100	NW021099	862.79	861.28	875.72	264	18	0.00572	7.94	2087676.735	237609.289	12.93
WR-4	NW021099	NW021098	861.08	858.91	874.43	301	18	0.00721	8.92	2087675.289	237345.173	13.35
WR-4	NW021098	NW021097	858.71	857.04	872.32	299	18	0.00559	7.85	2087583.523	237058.628	13.61
WR-4	NW021097	NW021096	857.04	855.66	871.43	480	18	0.00288	5.63	2087487.000	236775.906	14.39
WR-4	NW021096	NW021095	855.46	855.31	870.06	54	18	0.00278	5.53	2087486.750	236296.188	14.60
WR-4	NW021095	SW021074	855.11	854.11	868.71	405	18	0.00247	5.22	2087445.000	236262.500	13.60
WR-4	SW021074	SW021123	853.91	852.28	864.51	417	18	0.00391	6.56	2087514.375	235863.875	10.60
WR-4	SW021123	SW021122	852.08	850.60	861.06	366	18	0.00404	6.67	2087593.301	235454.228	8.98
WR-4	SW021122	SW021121	850.40	850.05	859.19	12	18	0.02917	17.94	2087602.750	235088.266	8.79
WR-4	SW021121	SW021120	849.95	848.06	859.82	579	21	0.00326	9.04	2087609.098	234978.939	9.87
WR-4	SW021120	SW021200	847.86	846.09	855.95	434	21	0.00408	10.12	2087320.627	234476.974	8.09
WR-4	SW021200	SW021119	845.89	844.35	853.53	397	21	0.00388	9.87	2087317.709	234042.954	7.64
WR-4	SW021119	SW021017	844.15	841.60	856.32	23	21	0.11087	52.76	2087315.040	233646.133	12.17
WR-4	SW021122	SW021050	850.40	849.89	859.19	12	10	0.04250	4.51	2087602.750	235088.266	8.79
WR-4	SW021050	SW021049	849.89	847.45	858.50	54	18	0.04519	22.33	2087614.500	235089.156	8.61
WR-4	SW021049	SW021048	847.16	844.65	858.50	630	21	0.00398	9.99	2087618.673	235034.924	11.34
WR-4	SW021048	SW021015	844.55	843.85	852.50	199	21	0.00352	9.40	2087304.817	234489.081	7.95

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-4	SW021015	SW021016	843.85	843.17	855.50	173	21	0.00393	9.93	2087302.867	234289.673	11.65
WR-4	SW021016	SW021017	843.07	841.60	853.50	487	21	0.00302	8.70	2087301.180	234117.135	10.43
WR-5	NW111031	NW111030	842.62	840.37	850.20	426	8	0.00528	0.87	2087353.113	231511.350	7.58
WR-5	NW111030	PS_24	840.37	838.60	846.30	153	8	0.01157	1.29	2087385.298	231086.178	5.93
WR-5	PS_24	NW111029	838.60	838.78	845.40	223	4	-.00081	0.00	2087389.782	230932.964	6.80
WR-5	NW111016	NW11116A	842.10	842.09	848.00	110	24	0.00009	2.14	2087190.385	233180.702	5.90
WR-5	NW111016	NW111017	842.10	842.06	848.00	87	24	0.00046	4.85	2087193.049	233185.727	5.90
WR-5	NW111017	SW021018	842.06	841.84	848.00	355	24	0.00062	5.63	2087221.228	233268.301	5.94
WR-5	SW021018	SW021017	841.80	841.60	850.00	91	24	0.00220	10.61	2087207.510	233622.750	8.20
WR-5	SW021017	NW11118A	841.30	841.17	851.50	225	24	0.00058	5.44	2087302.494	233630.692	10.20
WR-5	NW11118A	NW111018	841.08	840.84	851.00	221	24	0.00109	7.46	2087308.223	233405.428	9.92
WR-5	NW111018	NW111019	840.84	840.66	846.00	176	24	0.00102	7.22	2087329.493	233185.181	5.16
WR-5	NW111019	NW111020	840.66	840.35	850.00	309	24	0.00100	7.15	2087332.797	233009.043	9.34
WR-5	NW111020	NW111021	840.32	840.15	847.00	166	24	0.00102	7.22	2087349.836	232700.549	6.68
WR-5	NW111021	NW111022	840.15	840.05	848.00	140	24	0.00071	6.02	2087358.719	232534.983	7.85
WR-5	NW111022	NW111023	840.05	839.95	848.00	97	24	0.00103	7.26	2087370.722	232395.516	7.95
WR-5	NW111023	NW111024	839.95	839.79	849.90	160	24	0.00100	7.15	2087374.939	232298.245	9.95
WR-5	NW111024	NW111025	839.79	839.60	850.00	192	24	0.00099	7.11	2087386.387	232138.413	10.21
WR-5	NW111025	NW111027	839.60	839.29	850.00	309	24	0.00100	7.15	2087395.033	231946.227	10.40
WR-5	NW111027	NW111028	839.29	839.15	852.50	143	24	0.00098	7.08	2087420.563	231638.769	13.21
WR-5	NW111028	NW111029	839.15	838.78	850.00	411	24	0.00090	6.78	2087433.410	231496.775	10.85
WR-5	NW111029	SW111033	838.60	838.59	848.83	152	24	0.00007	1.89	2087464.022	231087.258	10.23
WR-5	SW111033	SW11133A	838.39	838.30	844.71	93	24	0.00097	7.04	2087479.469	230936.352	6.32
WR-5	SW11133A	SW111034	838.30	838.15	847.90	146	24	0.00103	7.26	2087572.895	230939.338	9.60
WR-5	SW111034	SW111039	837.95	837.66	849.16	288	24	0.00101	7.19	2087718.737	230943.999	11.21
WR-5	SW111039	SW111044	837.61	837.33	846.50	332	24	0.00084	6.55	2087749.676	230652.584	8.89
WR-5	SW111044	SW111072	837.33	836.97	842.56	374	24	0.00096	7.00	2087780.340	230326.583	5.23
WR-5	SW111072	SW111077	836.95	836.78	849.00	169	24	0.00101	7.19	2087574.991	230014.069	12.05

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-5	SW111077	SW111078	836.68	836.59	848.00	192	24	0.00047	4.90	2087482.119	229872.730	11.32
WR-5	SW111078	SW111214	836.54	836.41	848.00	285	24	0.00046	4.85	2087388.884	229704.981	11.46
WR-5	SW111214	SW111084	836.36	836.27	848.90	86	24	0.00105	7.33	2087250.356	229455.751	12.54
WR-5	SW111084	SW111215	836.32	836.20	848.00	21	24	0.00571	17.09	2087210.664	229379.451	11.68
WR-5	SW111215	SW111180	836.10	835.97	847.00	228	24	0.00057	5.40	2087201.125	229360.703	10.90
WR-5	SW111180	SW111086	835.92	835.75	845.00	166	24	0.00102	7.22	2087076.030	229169.540	9.08
WR-5	SW111086	SW111087	835.70	835.55	844.00	152	24	0.00099	7.11	2086986.570	229029.708	8.30
WR-5	SW111087	SW111090	835.45	835.24	846.15	253	24	0.00083	6.51	2086904.826	228901.936	10.70
WR-5	SW111090	SW111091	835.19	834.86	842.30	334	24	0.00099	7.11	2086911.981	228648.814	7.11
WR-5	SW111091	NW141003	834.76	834.33	844.00	635	24	0.00068	5.89	2086921.424	228314.731	9.24
WR-5	NW111018	NW11116A	840.84	840.70	846.00	20	24	0.00700	18.92	2087322.843	233185.727	5.16
WR-5	NW11116A	NW111188	835.50	834.74	846.00	420	36	0.00181	28.37	2087300.308	233184.534	10.50
WR-5	NW111188	NW111187	834.69	834.02	843.00	369	36	0.00182	28.45	2087237.610	232769.956	8.31
WR-5	NW111187	NW111186	833.97	833.16	848.00	436	36	0.00186	28.76	2087293.613	232405.635	14.03
WR-5	NW111186	NW111185	833.11	833.00	846.00	211	36	0.00052	15.21	2087282.875	231969.668	12.89
WR-5	NW111185	NW111184	832.93	832.66	840.00	519	36	0.00052	15.21	2087184.084	231783.563	7.07
WR-5	NW111184	SW111165	832.61	832.30	841.00	597	36	0.00052	15.21	2087239.244	231267.905	8.39
WR-5	SW111165	SW111166	832.25	832.04	838.50	396	36	0.00053	15.35	2087302.785	230673.894	6.25
WR-5	SW111166	SW111168	831.97	831.89	838.50	144	36	0.00056	15.78	2087493.965	230327.249	6.53
WR-5	SW111168	SW111169	831.82	831.65	838.00	322	36	0.00053	15.35	2087489.688	230183.211	6.18
WR-5	SW111169	SW111170	831.60	831.29	838.00	595	36	0.00052	15.21	2087313.224	229913.589	6.40
WR-5	SW111084	SW111176	837.58	834.16	848.00	62	15	0.05516	15.17	2087208.907	229379.821	10.42
WR-5	SW111176	SW111170	834.06	831.29	844.50	203	15	0.01365	7.54	2087149.121	229394.452	10.44
WR-5	SW111170	SW111177	831.24	831.10	837.00	138	24	0.00101	7.19	2086958.061	229439.530	5.76
WR-5	SW111177	SW111178	831.10	830.50	836.90	472	36	0.00127	23.77	2086818.284	229226.098	5.80
WR-5	SW111178	SW11190A	830.50	829.90	836.90	278	36	0.00216	31.00	2086621.800	228797.048	6.40
WR-5	SW11190A	SW111189	829.90	829.46	842.30	360	36	0.00122	23.29	2086875.653	228684.394	12.40
WR-5	SW111170	RL119L1	834.30	828.58	837.00	138	24	0.04145	46.06	2086958.114	229439.596	2.70

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-5	RL119L1	SW111ch1	828.58	828.43	834.00	27	24	0.00556	16.87	2086816.125	229467.813	5.42
WR-5	SW111ch1	SW111ch2	828.43	828.26	835.00	30	24	0.00567	17.03	2086789.759	229473.627	6.57
WR-5	SW111ch2	RL219L2	828.26	827.05	835.00	218	24	0.00555	16.85	2086760.463	229480.088	6.74
WR-2	RL219L2	SW111325	827.05	825.44	832.00	289	24	0.00557	16.88	2086547.500	229527.359	4.95
WR-2	SW111325	SE101313	825.24	824.00	836.86	324	24	0.00383	14.00	2086265.500	229591.484	11.62
WR-2	SE101313	SE101314	823.90	822.70	833.38	326	24	0.00368	13.72	2085941.750	229583.688	9.48
WR-2	SE101314	SE101316	822.60	821.40	833.02	318	24	0.00377	13.89	2085616.250	229575.625	10.42
WR-2	SE101316	SE101318	821.30	820.20	833.25	322	24	0.00342	13.23	2085298.625	229567.953	11.95
WR-2	SE101318	SE101320	820.00	819.80	831.54	54	24	0.00370	13.76	2084977.000	229561.203	11.54
WR-2	SE101320	SE101319	819.60	818.00	830.73	156	24	0.01026	22.91	2084976.742	229627.808	11.13
WR-2	SE101319	HB1	819.10	819.00	833.00	89	24	0.00112	7.57	2084947.397	229628.820	13.90
WR-5	HB1	HB2	821.00	817.25	831.42	250	36	0.01500	81.69	2084946.930	229610.653	10.42
WR-5	HB2	PS_09SC	822.00	821.00	834.50	90	30	0.01111	43.23	2084917.676	229610.653	12.50
WR-5	PS_09SC	PS_09	816.00	810.75	833.00	44	36	0.11932	230.42	2084851.043	229568.380	17.00
WR-5	PS_09	NW141501	829.17	832.00	834.50	2403	20	-.00118	0.00	2084894.776	229568.806	5.33
WR-5	NW141501	SW111189	832.00	829.46	844.00	541	36	0.00470	45.73	2086889.175	228227.501	12.00
WR-5	SW111189	SW111092	829.46	828.59	844.00	97	36	0.00897	63.17	2086885.334	228331.840	14.54
WR-5	SW111092	SW111093	828.53	827.92	857.00	510	36	0.00120	23.10	2087568.845	228344.375	28.47
WR-6	SW111093	SW111094	827.89	827.13	860.00	588	36	0.00129	23.95	2088078.927	228359.299	32.11
WR-6	SW111094	SE111095	827.00	826.00	852.95	552	36	0.00181	28.37	2088666.575	228376.492	25.95
WR-6	SE111095	SE111096	825.90	825.55	845.00	626	36	0.00056	15.78	2089218.339	228392.635	19.10
WR-6	SE111096	SE111283	825.45	825.31	844.00	104	36	0.00135	24.50	2089843.772	228410.933	18.55
WR-6	SE111283	SE111284	825.19	825.14	844.00	23	36	0.00217	31.07	2089894.290	228322.643	18.81
WR-6	SE111284	NE141011	825.14	824.60	844.00	146	36	0.00370	40.57	2089923.405	228319.289	18.86
WR-6	NE141011	NE141002	824.55	824.10	858.19	463	36	0.00097	20.77	2090455.590	228344.212	33.64
WR-6	NE141002	NE141050	824.05	823.70	856.00	409	36	0.00086	19.56	2090918.400	228360.400	31.95
WR-6	NE141050	NW131087	823.70	823.30	852.00	327	36	0.00122	23.29	2091326.715	228375.662	28.30
WR-6	NW131087	NW131088	823.25	822.99	850.00	261	36	0.00100	21.09	2091648.270	228368.675	26.75

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-6	NW131088	NW131089	822.94	822.52	846.00	425	36	0.00099	20.98	2091914.710	228374.250	23.06
WR-6	NW131089	NW131090	822.47	822.45	846.00	20	36	0.00100	21.09	2092339.558	228393.398	23.53
WR-6	NW131090	NW131091	822.35	821.92	846.00	440	36	0.00098	20.88	2092359.159	228391.054	23.65
WR-6	NW131091	NW131092	821.82	821.38	840.00	364	36	0.00121	23.20	2092373.850	227951.130	18.18
WR-6	NW131092	NW131093	821.38	820.99	834.00	395	36	0.00099	20.98	2092771.840	227965.610	12.62
WR-6	NW131093	NW131094	820.89	820.55	837.00	346	36	0.00098	20.88	2093166.230	227980.250	16.11
WR-6	NW131094	NW131095	820.45	819.93	829.08	546	36	0.00095	20.56	2093179.300	227634.640	8.63
WR-6	NW131095	NW131144	819.88	819.36	828.00	517	36	0.00101	21.19	2093724.490	227659.970	8.12
WR-6	NW131144	NE131143	819.28	818.88	826.00	416	36	0.00096	20.66	2094241.402	227678.750	6.72
WR-6	NE131143	NE131142	818.83	818.44	826.00	396	36	0.00098	20.88	2094510.234	227996.610	7.17
WR-6	NE131142	NE131135	818.39	818.00	832.00	399	36	0.00098	20.88	2094766.150	228299.200	13.61
WR-6	NE131135	SE121136	817.92	817.49	824.00	440	36	0.00098	20.88	2095025.640	228601.740	6.08
WR-6	SE121136	SE121137	817.39	817.03	824.00	225	36	0.00160	26.68	2095465.090	228617.460	6.61
WR-6	SE121137	SE121138	816.93	816.37	822.00	565	36	0.00099	20.98	2095550.860	228825.630	5.07
WR-6	SE121138	SE121139	816.27	816.17	828.00	101	36	0.00099	20.98	2095532.126	229390.635	11.73
WR-6	SE121139	SE121140	816.12	815.60	829.00	525	36	0.00099	20.98	2095633.477	229393.794	12.88
WR-6	SE121140	SE121141	815.52	814.46	826.00	215	36	0.00493	46.83	2096158.172	229410.150	10.48
WR-6	SE121141	SE121511	814.46	814.19	826.00	293	48	0.00092	43.57	2096302.306	229569.003	11.54
WR-6	SE121511	SE121113	814.19	814.06	828.00	189	48	0.00069	37.73	2096535.007	229747.124	13.81
WR-6	SE121113	SW072098	814.01	813.66	830.00	542	48	0.00065	36.62	2096724.079	229758.427	15.99
WR-6	SW072098	SW072099	813.60	813.20	831.00	456	48	0.00088	42.61	2097243.601	229785.767	17.40
WR-6	SW072099	SW072100	813.15	812.67	841.10	555	48	0.00086	42.12	2097722.000	229781.172	27.95
WR-6	SW072100	SW072101	812.62	812.10	836.50	569	48	0.00091	43.33	2098277.250	229785.516	23.88
WR-6	SW072101	SW072102	812.08	811.71	827.00	616	48	0.00060	35.18	2098846.500	229802.359	14.92
WR-6	SW072102	SE072103	811.62	811.32	831.00	431	48	0.00070	38.00	2099462.327	229811.817	19.38
WR-6	SE072103	SE072104	811.23	811.06	831.00	517	48	0.00033	26.09	2099893.250	229827.344	19.77
WR-6	SE072104	SE072105	811.02	810.85	830.50	521	48	0.00033	26.09	2100063.500	230315.641	19.48
KR-5	SE072105	SE072106	810.81	810.56	829.00	466	48	0.00054	33.38	2100237.925	230807.126	18.19

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	SE072106	PS_05A	810.56	810.50	834.00	24	48	0.00250	71.83	2100434.900	231232.599	23.44
KR-5	PS_05A	SE062140	810.50	852.98	835.00	3625	18	-.01172	0.00	2100443.860	231254.848	24.50
KR-5	SE062140	SE062035	852.78	847.43	869.00	894	18	0.00598	8.12	2100627.750	234767.133	16.22
KR-5	SE062035	SE062034	847.38	845.08	858.00	346	27	0.00665	25.25	2100717.789	235654.382	10.62
KR-5	SE062034	SE062031	845.08	843.86	856.00	379	27	0.00322	17.57	2100751.250	235998.406	10.92
KR-5	SE062031	NE062144	843.81	841.35	852.00	264	27	0.00932	29.90	2100777.750	236376.172	8.19
KR-5	NE062144	NE062030	841.30	840.87	851.00	48	27	0.00896	29.31	2100802.750	236638.625	9.70
KR-5	NE062030	NE062029	840.77	840.61	851.00	20	27	0.00800	27.70	2100851.000	236637.188	10.23
KR-5	NE062029	NE062150	840.51	839.31	851.00	159	27	0.00755	26.91	2100848.957	236656.846	10.49
KR-5	NE062150	NE062090	839.26	835.72	852.00	467	27	0.00758	26.96	2100859.250	236814.125	12.74
KR-5	NE062090	NE062091	835.67	831.55	844.00	342	27	0.01205	34.00	2100896.750	237279.859	8.33
KR-5	NE062091	NE062092	831.35	829.12	842.00	538	27	0.00414	19.92	2100928.000	237620.109	10.65
KR-5	NE062092	NE062093	829.07	828.19	839.00	215	27	0.00409	19.80	2100979.250	238155.609	9.93
KR-5	NE062093	NE062094	828.14	826.64	838.00	375	27	0.00400	19.58	2100999.750	238369.516	9.86
KR-5	NE062094	NE062095	826.00	824.57	835.00	493	27	0.00290	16.67	2101042.000	238741.938	9.00
KR-5	NE062095	SE312082	824.52	822.81	837.00	416	30	0.00411	26.29	2101098.750	239232.156	12.48
KR-5	SE312082	SE312083	822.76	820.60	832.00	522	30	0.00414	26.39	2101147.250	239645.719	9.24
KR-5	SE312083	SE312086	816.95	816.75	829.00	43	30	0.00465	27.97	2101208.066	240164.300	12.05
KR-5	SE312086	SE312085	816.75	816.62	829.00	17	18	0.00765	9.18	2101213.074	240207.007	12.25
KR-5	SE312085	SE312501	816.62	814.65	829.00	409	24	0.00482	15.70	2101225.507	240229.547	12.38
KR-5	SE312501	SE312059	814.65	812.80	827.00	384	24	0.00482	15.70	2101272.000	240635.781	12.35
KR-5	SE312059	SE312130	812.80	812.68	826.00	275	24	0.00044	4.74	2101313.146	241017.532	13.20
KR-5	SE312130	SE312150	812.68	812.38	826.00	199	36	0.00151	25.92	2101324.750	241039.906	13.32
KR-5	SE312150	SE312152	812.38	811.79	826.00	399	36	0.00148	25.66	2101345.500	241237.594	13.62
KR-5	SE312152	SE312154	811.69	810.22	827.00	254	36	0.00579	50.75	2101392.500	241633.688	15.31
KR-5	SE312154	NE312109	810.22	809.23	827.00	171	36	0.00579	50.75	2101396.750	241888.078	16.78
KR-5	NE312109	NE312110	808.93	808.56	825.00	79	36	0.00468	45.63	2101482.250	242036.297	16.07
KR-5	NE312110	NE312111	808.56	807.52	822.00	227	36	0.00458	45.14	2101416.000	242080.094	13.44

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
KR-5	NE312111	NE312112	807.52	806.35	820.00	254	36	0.00461	45.29	2101472.500	242300.156	12.48
KR-5	NE312112	NE312113	806.35	805.29	824.00	229	36	0.00463	45.38	2101591.500	242524.047	17.65
KR-5	NE312113	NW322105	805.29	804.31	824.00	212	36	0.00462	45.34	2101557.250	242750.656	18.71
KR-5	NW322105	NW322013	804.31	802.04	814.00	492	36	0.00461	45.29	2101691.500	242914.906	9.69
KR-5	NW322013	NW322034	802.04	802.01	818.00	13	36	0.00231	32.06	2101673.000	243406.219	15.96
KR-5	NW322034	NW322033	802.01	801.99	818.00	13	48	0.00154	56.37	2101684.988	243406.305	15.99
KR-5	NW322033	NW322003	801.99	801.02	818.00	313	48	0.00310	79.98	2101698.025	243407.383	16.01
KR-5	NW322003	NW322002	801.02	800.99	824.00	22	48	0.00136	52.97	2102010.988	243420.185	22.98
KR-5	NW322002	WWTP	800.99	800.85	826.00	30	54	0.00467	134.40	2102032.793	243420.580	25.01
WR-6	NE111060	NE111064	871.90	868.11	882.00	383	10	0.00990	2.18	2090397.315	231622.923	10.10
WR-6	NE111064	NE111065	867.91	866.31	873.00	373	10	0.00429	1.43	2090409.734	231240.478	5.09
WR-6	NE111065	NE111066	866.21	866.01	876.00	50	10	0.00400	1.38	2090782.379	231252.383	9.79
WR-6	NE111066	NE111067	865.81	865.24	876.00	142	10	0.00401	1.38	2090783.756	231202.588	10.19
WR-6	NE111067	NE111068	864.84	863.90	874.00	235	12	0.00400	2.25	2090787.682	231060.640	9.16
WR-6	NE111068	NE111069	863.80	862.20	878.00	401	12	0.00399	2.25	2091022.555	231068.355	14.20
WR-6	NE111069	SE111072	862.00	860.64	880.00	331	12	0.00411	2.28	2091422.867	231081.504	18.00
WR-6	SE111072	SE111073	860.54	859.76	874.00	194	12	0.00402	2.25	2091432.207	230750.580	13.46
WR-6	SE111073	SW121008	859.31	858.40	872.00	92	12	0.00989	3.54	2091437.680	230556.657	12.69
WR-6	SW121008	SW121007	857.91	855.49	870.00	168	12	0.01440	4.27	2091528.073	230541.764	12.09
WR-6	SW121007	SW121006	855.49	852.51	866.00	207	12	0.01440	4.27	2091696.026	230548.502	10.51
WR-6	SW121006	SW121010	852.31	850.97	859.00	335	12	0.00400	2.25	2091902.772	230556.795	6.69
WR-6	SW121010	SW121011	850.87	850.21	862.00	164	12	0.00402	2.25	2092237.503	230570.222	11.13
WR-6	SW121011	SW121013	850.01	846.09	862.00	297	12	0.01320	4.09	2092401.375	230574.589	11.99
WR-6	SW121013	SW121014	845.99	837.19	854.00	400	12	0.02200	5.28	2092413.404	230277.809	8.01
WR-6	SW121014	SW121026	836.99	836.24	846.00	125	12	0.00600	2.75	2092429.605	229878.103	9.01
WR-6	SW121026	SW121027	836.14	835.82	846.00	50	12	0.00640	2.85	2092554.565	229881.639	9.86
WR-6	SW121027	SW121028	835.72	833.53	846.00	365	12	0.00600	2.75	2092601.434	229899.672	10.28
WR-6	SW121028	SW121032	833.43	832.70	844.00	122	12	0.00598	2.75	2092966.130	229914.561	10.57

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-6	PS_07	NE12135D	840.25	833.55	844.00	960	4	0.00698	0.15	2096403.807	232027.446	3.75
WR-6	NE12135D	SE121091	833.45	824.75	838.00	164	8	0.05305	2.78	2096343.656	231232.487	4.55
WR-6	SE121091	SE12135F	824.65	824.46	834.00	7	12	0.02714	5.86	2096331.462	231069.366	9.35
WR-6	SE111007	SE111270	842.56	841.51	853.00	134	10	0.00784	1.94	2090444.202	229698.150	10.44
WR-6	SE111270	SE111008	841.51	840.40	854.85	166	10	0.00669	1.79	2090362.853	229591.356	13.34
WR-6	SE111008	SE111013	840.30	837.65	850.45	369	10	0.00718	1.85	2090262.415	229459.501	10.15
WR-6	SE111013	SE111014	837.58	837.28	849.00	40	10	0.00750	1.89	2090156.725	229105.633	11.42
WR-6	SE111014	SE111018	837.18	835.78	846.00	210	10	0.00667	1.78	2090145.223	229067.125	8.82
WR-6	SE111018	SE111019	835.68	835.12	845.00	234	12	0.00239	1.74	2090085.010	228865.522	9.32
WR-6	SE111019	SE111020	835.02	834.47	844.00	230	12	0.00239	1.74	2090091.514	228631.312	8.98
WR-6	SE111020	SE111282	834.17	833.75	846.00	180	12	0.00233	1.71	2090097.899	228401.401	11.83
WR-6	SE111282	SE111284	833.45	825.19	844.00	74	12	0.11162	11.90	2089917.832	228395.609	10.55
WR-6	SE121058	SE121059	819.26	819.12	826.00	140	24	0.00100	7.15	2096141.998	229564.721	6.74
WR-6	SE121092	SE12135F	824.88	824.46	837.88	164	12	0.00256	1.80	2096354.726	231232.938	13.00
WR-6	SE12135F	SE121093	824.29	824.20	834.49	84	12	0.00107	1.16	2096338.521	231069.587	10.20
WR-6	SE121093	SE121094	824.20	823.91	835.00	103	12	0.00282	1.89	2096421.998	231072.203	10.80
WR-6	SE121094	SE121100	823.81	822.89	835.00	330	12	0.00279	1.88	2096413.084	230969.937	11.19
WR-6	SE121100	SE121105	822.79	821.89	831.00	322	12	0.00280	1.88	2096384.390	230640.729	8.21
WR-6	SE121105	SE121106	821.79	821.41	828.00	132	12	0.00288	1.91	2096356.410	230319.712	6.21
WR-6	SE121106	SE121109	821.31	820.66	826.00	234	12	0.00278	1.87	2096344.906	230187.734	4.69
WR-6	SE121109	SE121112	820.56	819.97	828.00	211	12	0.00280	1.88	2096489.659	230003.600	7.44
WR-6	SE121112	SE121113	819.87	814.06	829.00	131	12	0.04435	7.50	2096619.912	229837.911	9.13
WR-6	SW121034	SW121033	834.10	833.40	846.00	318	12	0.00220	1.67	2093105.279	229303.506	11.90
WR-6	SW121033	SW121032	833.40	832.70	846.00	298	12	0.00235	1.72	2093096.347	229621.831	12.60
WR-6	SW121032	SW121050	832.70	831.03	842.00	278	12	0.00601	2.76	2093087.993	229919.536	9.30
WR-6	SW121050	SW121051	830.93	823.63	844.00	444	12	0.01644	4.56	2093365.797	229930.878	13.07
WR-6	NW141003	NW141005	834.03	833.43	843.00	601	24	0.00100	7.15	2086939.353	227680.484	8.97
WR-6	NW141005	NW141004	833.43	833.33	847.00	103	24	0.00097	7.04	2087539.545	227699.713	13.57

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-6	NW141004	NW141002	833.33	832.90	845.00	422	24	0.00102	7.22	2087642.492	227703.012	11.67
WR-6	NW141002	NW141001	832.90	832.35	839.50	550	24	0.00100	7.15	2088064.276	227716.525	6.60
WR-6	NW141001	NE141019	832.35	831.77	838.00	575	24	0.00101	7.19	2088613.994	227734.138	5.65
WR-6	NE141019	NE141015	831.77	830.64	836.00	575	24	0.00197	10.04	2089188.699	227752.551	4.23
WR-6	NE141015	NE141063	830.64	830.57	841.00	64	24	0.00109	7.46	2089759.798	227768.955	10.36
WR-6	NE141063	NE141060	830.57	830.14	838.75	438	24	0.00098	7.08	2089763.874	227706.959	8.18
WR-6	NE141060	NE141016	830.14	830.09	842.85	48	24	0.00104	7.29	2089770.514	227268.922	12.71
WR-6	NE141016	NE141017	830.09	829.49	840.00	600	24	0.00100	7.15	2089771.248	227220.511	9.91
WR-6	NE141017	NE141018	829.49	828.89	842.00	600	24	0.00100	7.15	2089780.341	226620.580	12.51
WR-6	NE141018	SE141001	828.89	828.45	843.50	354	24	0.00124	7.96	2089789.435	226020.649	14.61
WR-6	SE141001	SE141002	828.45	828.03	840.00	386	24	0.00109	7.46	2089801.909	225676.731	11.55
WR-6	SE141002	SE141003	828.03	827.59	840.00	401	24	0.00110	7.50	2090187.835	225680.380	11.97
WR-6	SE141003	SE141004	827.59	827.09	840.55	460	24	0.00109	7.46	2090675.551	225692.228	12.96
WR-6	SE141004	NE141021	827.09	826.93	842.00	147	24	0.00109	7.46	2091135.426	225703.830	14.91
WR-6	NE141021	NW131043	826.93	826.61	846.50	296	24	0.00108	7.43	2091254.590	225790.110	19.57
WR-6	NW131043	SW131048	826.61	826.25	848.00	331	24	0.00109	7.46	2091550.995	225793.910	21.39
WR-6	SW131048	SW131049	826.25	826.08	849.00	156	24	0.00109	7.46	2091881.780	225803.000	22.75
WR-6	SW131049	SW131081	826.08	825.63	849.00	409	24	0.00110	7.50	2092021.380	225732.830	22.92
WR-6	SW131081	SW131082	825.63	825.21	850.00	411	24	0.00102	7.22	2092430.360	225751.450	24.37
WR-6	SW131082	SW131083	825.21	824.84	847.00	365	24	0.00101	7.19	2092840.970	225768.970	21.79
WR-6	SW131083	NW131084	824.84	824.45	846.00	387	24	0.00101	7.19	2093205.400	225782.430	21.16
WR-6	NW131084	NW131085	824.45	824.10	839.00	387	24	0.00090	6.78	2093534.475	225986.710	14.55
WR-6	NW131085	NW131086	824.10	823.95	845.00	161	24	0.00093	6.89	2093863.550	226190.990	20.90
WR-6	NW131086	SW131087	823.95	823.54	847.00	506	24	0.00081	6.43	2093993.610	226286.540	23.05
WR-6	SW131087	SE131134	823.44	823.01	838.00	386	24	0.00111	7.53	2094284.730	225872.580	14.56
WR-6	SE131134	SE131133	823.01	822.46	832.00	553	24	0.00099	7.11	2094670.010	225886.070	8.99
WR-6	SE131133	NE131132	822.46	822.09	831.00	370	24	0.00100	7.15	2095222.240	225907.520	8.54
WR-6	NE131132	NE131131	822.09	821.61	827.00	482	24	0.00100	7.15	2095331.130	226260.830	4.91

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
WR-6	NE131131	NE131130	821.61	821.07	834.00	521	24	0.00104	7.29	2095472.870	226721.020	12.39
WR-6	NE131130	NE131129	821.07	820.60	836.00	473	24	0.00099	7.11	2095626.340	227219.360	14.93
WR-6	NE131129	NE131128	820.60	820.04	831.00	462	24	0.00121	7.87	2095819.850	227650.780	10.40
WR-6	NE131128	NE131127	820.04	819.84	830.04	404	24	0.00050	5.05	2096189.840	227926.800	10.00
WR-6	NE131127	NE131126	819.84	819.64	829.54	350	24	0.00057	5.40	2096513.420	228168.750	9.70
WR-6	NE131126	SE121116	819.64	819.46	829.84	190	24	0.00095	6.97	2096567.500	228514.790	10.20
WR-6	SE121116	SE121115	819.46	819.05	829.65	504	24	0.00081	6.43	2096596.450	228702.940	10.19
WR-6	SE121115	SE121114	819.05	818.67	829.05	383	24	0.00099	7.11	2096672.972	229201.361	10.00
WR-6	NE141015	NE141014	830.64	832.75	841.00	438	12	-.00482	0.00	2089762.082	227769.482	10.36
WR-6	NE141014	SE111284	832.95	833.80	841.00	144	12	-.00590	0.00	2089924.595	228175.744	8.05
WR-6	NE121116	NE121115	836.93	835.49	850.00	370	15	0.00389	4.02	2094277.319	233634.350	13.07
WR-6	NE121115	NE121114	835.29	834.17	846.00	295	15	0.00380	3.98	2094288.819	233264.528	10.71
WR-6	NE121114	NE121113	834.17	833.06	845.00	291	15	0.00381	3.98	2094181.809	232989.621	10.83
WR-6	NE121113	NW121112	833.06	831.90	841.00	290	15	0.00400	4.08	2094076.323	232718.628	7.94
WR-6	NW121112	NW121111	831.90	831.31	842.00	145	15	0.00407	4.12	2093952.761	232456.667	10.10
WR-6	NW121111	NW121110	831.31	830.42	841.00	232	15	0.00384	4.00	2093890.993	232325.713	9.69
WR-6	NW121110	NW121512	830.42	829.75	839.00	178	15	0.00376	3.96	2093792.196	232116.254	8.58
WR-6	NW121512	NW121106	829.55	828.58	836.00	164	15	0.00591	4.96	2093716.320	231955.391	6.45
WR-6	NW121106	NW121105	828.58	827.83	835.80	240	15	0.00313	3.61	2093726.717	231792.198	7.22
WR-6	NW121105	NW121104	827.83	827.72	837.50	84	15	0.00131	2.33	2093743.361	231553.277	9.67
WR-6	NW121104	SW121076	827.62	826.26	837.50	284	15	0.00479	4.47	2093749.181	231469.737	9.88
WR-6	SW121076	SW121075	826.26	826.15	833.00	27	21	0.00407	10.10	2093759.137	231186.312	6.74
WR-6	SW121075	SW121503	826.05	825.60	833.00	99	21	0.00455	10.68	2093760.215	231159.333	6.95
WR-6	SW121503	SW121067	825.50	825.18	833.00	160	21	0.00200	7.08	2093764.268	231060.071	7.50
WR-6	SW121067	SW121061	825.08	824.52	832.00	280	21	0.00200	7.08	2093770.795	230900.172	6.92
WR-6	SW121061	SW121056	824.42	823.90	831.00	260	21	0.00200	7.08	2093782.217	230620.405	6.58
WR-6	SW121056	SW121052	823.80	823.28	831.00	260	21	0.00200	7.08	2093792.821	230360.654	7.20
WR-6	SW121052	SW121051	823.18	822.53	829.00	152	21	0.00428	10.36	2093803.427	230100.870	5.82

LAWRENCE, KS 2002 10-YR EXISTING SYSTEM

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Rim Elevation	Pipe Length	Pipe Dia.	Pipe Slope	Pipe Capacity	East (X) Coordinate	North (Y) Coordinate	Manhole Depth
			(ft)	(ft)	(ft)	(ft)	(in)	(ft/ft)	(cfs)			(ft)
WR-6	SW121051	SE12104A	822.53	822.17	828.00	364	24	0.00099	7.11	2093809.625	229949.051	5.47
WR-6	SE12104A	SE121120	822.07	821.68	829.00	387	24	0.00101	7.19	2094172.667	229968.548	6.93
WR-6	SE121120	SE121119	821.58	821.47	828.00	112	24	0.00098	7.08	2094467.416	229717.566	6.42
WR-6	SE121119	SE121118	821.27	820.67	828.00	601	24	0.00100	7.15	2094478.165	229606.280	6.73
WR-6	SE121118	SE121117	820.67	820.11	828.00	585	24	0.00096	7.00	2095039.449	229390.285	7.33
WR-6	SE121117	SE121060	820.11	819.56	828.00	528	24	0.00104	7.29	2095623.665	229408.496	7.89
WR-6	SE121060	SE121059	819.42	819.12	826.00	194	24	0.00155	8.90	2096151.358	229424.945	6.58
WR-6	SE121059	SE121141	819.12	815.31	826.00	21	24	0.18143	96.36	2096281.952	229568.323	6.88
WR-6	SE121141	SE121114	819.10	818.57	826.00	293	48	0.00181	61.11	2096302.358	229569.058	6.90
WR-6	SE121114	SE12159A	818.57	817.86	828.57	162	24	0.00438	14.97	2096723.991	229573.580	10.00
WR-6	SE121113	SE12159A	818.00	817.86	830.00	37	12	0.00378	2.19	2096724.070	229758.400	12.00
WR-6	SE12159A	SW072091	817.76	817.31	830.00	162	24	0.00278	11.92	2096755.303	229739.017	12.24
WR-6	SW072091	SW072092	817.31	816.79	831.00	524	24	0.00099	7.11	2097205.280	229749.239	13.69
WR-6	SW072092	SW072093	816.79	816.25	841.00	541	24	0.00100	7.15	2097729.750	229759.297	24.21
WR-6	SW072093	SW072094	816.25	815.65	836.00	592	24	0.00101	7.19	2098271.000	229770.188	19.75
WR-6	SW072094	SE072095	815.65	815.05	830.00	599	24	0.00100	7.15	2098863.250	229783.828	14.35
WR-6	SE072095	SE072096	814.85	814.61	830.00	441	24	0.00054	5.25	2099462.500	229793.031	15.15
WR-6	SE072096	SE072097	814.41	813.83	830.00	548	24	0.00106	7.36	2099903.750	229802.281	15.59
WR-6	SE072097	SE072156	813.83	813.34	830.00	497	24	0.00099	7.11	2100086.000	230318.953	16.17
C-1	NE011016	NE011093	868.00	867.68	875.50	108	15	0.00296	3.51	2095107.879	236543.321	7.50
YTC-1	SE051001	SE05101A	850.49	848.17	864.00	169	24	0.01373	26.51	2075022.716	233307.193	13.51
YTC-1	SE05101A	NW091502	848.17	847.09	863.00	443	24	0.00244	11.17	2075028.142	233137.810	14.83
YTC-1	NW091502	NW091501	847.09	846.60	865.50	346	24	0.00142	8.52	2075471.209	233153.360	18.41
YTC-1	NW091501	NW091007	846.60	846.40	860.36	176	24	0.00114	7.63	2075478.781	232807.183	13.76
YTC-1	NW091007	NW091006	846.20	845.60	861.36	240	24	0.00250	11.31	2075652.829	232778.081	15.16
YTC-1	NW091006	NW091005	845.60	844.10	859.70	600	24	0.00250	11.31	2075769.469	232568.871	14.10
YTC-1	NW091005	NW091004	844.10	842.60	856.70	600	24	0.00250	11.31	2076230.626	232185.030	12.60
YTC-1	NW091004	NW091003	842.60	841.10	855.00	600	24	0.00250	11.31	2076691.783	231801.189	12.40

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
YTC-1	NW091003	NW091002	834.36	832.86	850.00	600	24	0.00250	11.31	2077152.941	231417.348	15.64
YTC-1	NW091002	NW091001	832.86	831.40	846.40	600	24	0.00243	11.15	2077614.098	231033.507	13.54
YTC-1	NW091001	NE091005	831.36	829.68	844.00	578	24	0.00291	12.20	2078088.495	230666.155	12.64
YTC-1	NE091005	SE091004	829.43	828.48	848.40	616	27	0.00154	12.15	2078666.430	230674.849	18.97
YTC-1	SE091004	SE091003	828.48	827.55	839.20	605	27	0.00154	12.15	2078952.042	230129.474	10.72
YTC-1	SE091003	SE091002	827.55	826.63	837.80	600	27	0.00153	12.11	2079512.324	229900.932	10.25
YTC-1	SE091002	SE091001	826.63	825.70	837.70	600	27	0.00155	12.19	2080068.151	229674.975	11.07
YTC-1	SE091001	SE091500	825.70	824.67	835.50	600	27	0.00172	12.84	2080623.978	229449.018	9.80
YTC-1	SE091500	SW101155	824.67	823.65	833.50	600	27	0.00170	12.77	2081221.247	229391.834	8.83
YTC-1	SW101155	SW101154	823.65	822.62	833.50	600	27	0.00172	12.84	2081820.940	229411.014	9.85
YTC-1	SW101154	SW101153	822.62	821.60	833.50	600	27	0.00170	12.77	2082420.634	229430.193	10.88
YTC-2	SE321006	SE321005	907.00	903.77	917.30	395	10	0.00818	1.98	2074412.355	238888.534	10.30
YTC-2	SE321005	SE321001	903.73	900.50	911.70	406	10	0.00796	1.95	2074716.628	238637.293	7.97
YTC-2	SE321001	NE051015	900.30	898.00	911.20	401	12	0.00574	2.69	2075122.703	238634.750	10.90
YTC-2	NE051015	NE051014	892.70	890.97	903.50	403	12	0.00429	2.33	2075212.840	238244.012	10.80
YTC-2	NE051014	NE051013	888.02	886.29	900.10	403	12	0.00429	2.33	2075203.194	237841.127	12.08
YTC-2	NE051013	NE051012	886.29	884.55	896.20	403	12	0.00432	2.34	2075170.104	237439.488	9.91
YTC-2	NE051012	NE051011	884.55	882.82	892.10	402	12	0.00430	2.33	2075102.508	237042.197	7.55
YTC-2	NE051011	NE051010	882.82	881.10	890.10	401	12	0.00429	2.33	2074899.011	236695.509	7.28
YTC-2	NE051010	NE051009	881.00	875.80	889.10	402	12	0.01294	4.05	2074657.409	236375.462	8.10
YTC-2	NE051009	SE051008	875.30	874.85	884.30	400	18	0.00113	3.53	2074621.141	235975.102	9.00
YTC-2	SE051008	SE051007	874.74	874.39	885.59	400	18	0.00088	3.11	2074811.774	235623.450	10.85
YTC-2	SE051007	SE051006	874.39	873.83	884.70	400	18	0.00140	3.93	2074983.111	235262.003	10.31
YTC-2	SE051006	SE051005	873.83	873.27	885.00	400	18	0.00140	3.93	2075065.992	234870.684	11.17
YTC-2	SE051005	SE051004	873.27	872.60	885.00	384	18	0.00174	4.38	2075201.341	234494.279	11.73
YTC-2	SE051004	SE051003	872.40	862.40	889.90	299	18	0.03344	19.21	2075454.902	234205.900	17.50
YTC-2	SE051003	SE051002	862.20	858.70	870.70	600	18	0.00583	8.02	2075411.219	233910.108	8.50
YTC-2	SE051002	SE051001	858.50	851.25	864.70	396	18	0.01831	14.21	2075418.705	233310.155	6.20

NETWORK INVENTORY DETAIL

Sub-System	Upstream Manhole	Downstream Manhole	Upstream Elevation (ft)	Downstream Elevation (ft)	Rim Elevation (ft)	Pipe Length (ft)	Pipe Dia. (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	East (X) Coordinate	North (Y) Coordinate	Manhole Depth (ft)
YTC-3	SW321018	SW321017	933.71	932.31	940.70	350	10	0.00400	1.38	2069639.366	239161.194	6.99
YTC-3	SW321017	SW321016	932.21	916.90	939.31	473	10	0.03237	3.94	2069942.121	238985.582	7.10
YTC-3	SW321016	SW321013	916.80	911.00	921.80	400	10	0.01450	2.63	2070351.272	238748.255	5.00
YTC-3	SW321013	NW051032	910.90	906.60	918.00	389	12	0.01105	3.74	2070697.278	238547.556	7.10
YTC-3	NW051032	NW051031	906.31	901.78	912.60	383	12	0.01183	3.87	2070953.500	238254.860	6.29
YTC-3	NW051031	NW051030	901.78	897.23	908.40	385	12	0.01182	3.87	2071293.900	238078.320	6.62
YTC-3	NW051030	NW051029	897.23	894.62	904.30	224	12	0.01165	3.84	2071558.200	237798.540	7.07
YTC-3	NW051029	NW051028	894.52	890.24	901.90	399	12	0.01073	3.69	2071736.300	237663.040	7.38
YTC-3	NW051028	NW051027	890.00	886.86	901.50	402	15	0.00781	5.70	2071772.600	237266.000	11.50
YTC-3	NW051027	NW051026	886.76	883.52	898.60	390	15	0.00831	5.88	2071786.000	236864.360	11.84
YTC-3	NW051026	NW051025	883.52	880.20	894.10	400	15	0.00830	5.88	2071904.034	236492.650	10.58
YTC-3	NW051025	NW051024	879.96	878.28	888.90	397	18	0.00423	6.83	2072093.000	236140.100	8.94
YTC-3	NW051024	SW051023	878.20	876.60	888.00	404	18	0.00396	6.61	2072241.400	235771.410	9.80
YTC-3	SW051023	SW051022	876.60	874.92	885.70	397	18	0.00423	6.83	2072424.200	235411.510	9.10
YTC-3	SW051022	SE051021	874.92	873.25	884.20	397	18	0.00421	6.81	2072679.500	235107.700	9.28
YTC-3	SE051021	SE051020	872.99	872.07	882.00	561	21	0.00164	6.41	2072935.200	234803.690	9.01
YTC-3	SE051020	SE051019	872.07	871.10	882.80	606	21	0.00160	6.33	2073294.000	234372.620	10.73
YTC-3	SE051019	SE051018	871.10	870.45	884.30	393	21	0.00165	6.43	2073646.900	233880.420	13.20
YTC-3	SE051018	SE051017	870.45	869.66	883.60	487	21	0.00162	6.37	2074037.700	233843.700	13.15
YTC-3	SE051017	SE051016	869.56	867.71	885.49	161	16	0.01149	8.22	2074441.500	233572.200	15.93
YTC-3	SE051016	SE051015	867.61	864.26	877.83	222	15	0.01509	7.93	2074543.000	233447.460	10.22
YTC-3	SE051015	SE051001	856.00	851.25	869.50	308	15	0.01542	8.02	2074715.000	233306.830	13.50

TOTAL SEWER LENGTH: 464,669 ft.

LAWRENCE, KS 2002: FUTURE 2025

Model Improvement Criteria

EXISTING SEWER EVALUATION:

Proposed Sewers 18" and Smaller, Allowable Flow/Cap Ratio =	1.000
Larger Existing Sewers, Allowable Flow/Cap Ratio =	1.000

RELIEF SEWER EVALUATION:

( ) Use Parallel Reliefs
(*) Use Replacement Reliefs

Proposed Sewers 18" and Smaller, n =	0.013
Large Proposed Sewers, n =	0.013
Proposed Sewers 18" and Smaller, Design Flow/Cap Ratio =	0.650
Larger Existing Sewers, Design Flow/Cap Ratio =	0.780
Relief Sewers 18" and Smaller, Design Flow/Cap Ratio =	0.650
Larger Relief Sewers, Design Flow/Cap Ratio =	0.780

PUMPING STATION EVALUATION:

Station Expansion, Allowable Flow/Cap Ratio:	2.000
Station Replaced When Flow/Cap Ratio >	2.000

FORCE MAIN EVALUATION:

( ) Use Parallel Force Mains
(*) Use Replacement Force Mains

Maximum Velocity at Peak Flow	12.0
Design Velocity for New Force Mains	6.0

Improvement Cost Basis

The improvement cost basis includes planning level construction costs for relief sewers. The cost figures are planning level construction costs only and do not include allowances for construction contingencies, legal, administrative, and engineering costs. The costs are considered to be averages for the Kansas City area based on average restoration costs and average construction complexity. In the future, these costs could be updated based on the September 2000 Engineering News Record (ENR) Construction Cost Index of 6,224.

LAWRENCE, KS 2002: FUTURE 2025

RELIEF SEWER CONSTRUCTION COST BASIS
(No Cost Factors Applied)

Table Description: B&V STD COST CURVES

Current ENR: 6224.0
ENR Cost Basis: 5400.0
Additional Cost Factor: 1.00000

Overall Cost Multiplier: 1.15259

Additional Fixed Cost/foot: 0.00 $/lineal foot

Unit Costs per Lineal Foot - by Trench Depth

Sewer Diameter	Up to 10 ft.	10-15 ft.	15-20 ft.	20-30 ft.	> 30 ft.
(in)	($)	($/ft)	($/ft)	($/ft)	($/ft)
8	55.94	6.46	6.46	6.46	6.46
10	60.90	6.50	6.50	6.50	6.50
12	67.01	6.58	6.58	6.58	6.58
15	77.13	6.60	6.60	6.60	6.60
18	83.37	6.69	6.69	6.69	6.69
21	91.16	6.76	6.76	6.76	6.76
24	100.90	6.82	6.82	6.82	6.82
27	123.59	6.92	6.92	6.92	6.92
30	136.58	7.01	7.01	7.01	7.01
33	146.58	7.07	7.07	7.07	7.07
36	156.58	7.13	7.13	7.13	7.13
42	196.38	7.41	7.41	7.41	7.41
48	236.93	7.49	7.49	7.49	7.49
54	289.03	7.69	7.69	7.69	7.69
60	319.68	7.92	7.92	7.92	7.92
66	378.84	8.81	8.81	8.81	8.81
72	400.00	9.00	9.00	9.00	9.00
84	436.41	10.00	10.00	10.00	10.00
96	465.00	11.00	11.00	11.00	11.00
108	530.00	12.00	12.00	12.00	12.00
120	610.00	14.00	14.00	14.00	14.00

* NOTE: Cost determined by SSMS program interpolates cost for each foot of depth greater than 10 feet.

LAWRENCE, KS 2002

Current ENR:	6224
ENR Cost Basis:	5400
Additional Cost Factor:	1
Overall Cost Multiplier:	1.153

Pump Capacity (mgd)	Expansion Cost ($)	Replacement Cost ($)
1.00	196,060	392,119
2.00	339,292	678,311
3.00	473,880	946,772
4.00	552,497	1,104,390
5.00	615,850	1,231,699
10.00	1,001,114	2,002,228
15.00	1,321,021	2,642,042
20.00	1,588,626	3,177,251

LAWRENCE, KS 2002: FUTURE 2025

FORCE MAIN COST BASIS

Table Description: TYPE 1

Current ENR:	6224.0	
ENR Cost Basis:	5400.0	
Additional Cost Factor:	1.00000	
Overall Cost Multiplier:	1.15259	
Additional Fixed Cost/ft:	0.00	$ per lineal foot

Force Main Cost per Lineal Foot

Forcemain Diameter (in)	Cost per Foot ($)
3	12.00
4	14.00
6	18.00
8	23.00
10	30.00
12	35.00
16	46.00
20	58.00
24	69.00
27	78.00
30	87.00
33	96.00
36	105.00
42	122.00
48	139.00
54	157.00
60	174.00
72	209.00
84	244.00
96	278.00
108	313.00
120	348.00

Basin	Subbasin	Upstream MH	Downstream MH	Length (ft.)	Diameter (in.)	Capacity (cfs)	Capacity (mgd)	10-year 2025 Flow (cfs)	10-year 2025 Flow (mgd)	Percent Utilized
Central	C-1	NE011037	NW01124A	302	8	0.70	0.45	0.88	0.57	127%
Central	C-1	NE06212B	NE06227B	418	18	4.11	2.66	5.93	3.83	144%
Central	C-1	NE06227B	NE062145	278	18	4.23	2.73	5.97	3.86	141%
Central	C-1	NW011064	NW011067	454	8	0.57	0.37	0.71	0.46	125%
Central	C-1	NW011067	NE011027	300	8	0.70	0.45	0.78	0.50	111%
Central	C-1	SE062113	NE06212B	434	18	5.59	3.62	5.93	3.83	106%
Central	C-1	SW062048	SW062047	300	12	0.90	0.58	3.04	1.96	339%
Central	C-1	SW062049	SW062048	308	12	1.90	1.23	2.97	1.92	156%
Central	C-2	SW011093	SE011006	320	10	1.38	0.89	1.94	1.26	141%
East Lawrence	EL-1	NE082186	NE082185	162	8	0.94	0.60	0.81	0.52	87%
East Lawrence	EL-1	NE082187	NE082186	341	8	0.74	0.48	0.78	0.50	106%
East Lawrence	EL-1	NE082501	NE082187	179	8	0.77	0.50	0.74	0.48	97%
East Lawrence	EL-1	SE052229	SE052228	355	8	0.84	0.54	0.60	0.39	72%
East Lawrence	EL-1	SE072046	SE072149	166	18	3.82	2.47	3.78	2.44	99%
East Lawrence	EL-1	SE072145	SE072046	245	18	3.49	2.25	3.78	2.44	108%
East Lawrence	EL-1	SE072149	SE072150	282	18	3.65	2.36	3.78	2.44	104%
East Lawrence	EL-1	SE072150	SE072151	109	18	3.63	2.35	3.81	2.46	105%
East Lawrence	EL-1	SE072151	SE072152	425	18	3.64	2.35	3.81	2.46	105%
East Lawrence	EL-1	SE072152	SE072153	267	18	3.64	2.35	3.78	2.44	104%
East Lawrence	EL-1	SE072153	SE072154	349	18	3.64	2.36	3.78	2.44	104%
East Lawrence	EL-1	SE072154	SE072155	212	18	3.61	2.33	3.78	2.44	105%
East Lawrence	EL-1	SE072155	SE072156	398	18	3.65	2.36	3.78	2.44	104%
East Lawrence	EL-1	SE082001	PS_32	281	8	1.78	1.15	2.05	1.32	115%
East Lawrence	EL-1	SE082002	SE082001	123	8	0.76	0.49	1.73	1.12	227%
East Lawrence	EL-1	SE082003	SE082002	67	8	0.77	0.50	1.62	1.05	212%
East Lawrence	EL-1	SE082004	SE082003	89	8	0.76	0.49	1.52	0.98	200%
East Lawrence	EL-1	SE082015	SE082014	69	8	0.76	0.49	1.17	0.75	154%
East Lawrence	EL-1	SE082016	SE082015	109	8	0.77	0.50	1.06	0.68	138%
East Lawrence	EL-1	SE082017	SE082016	326	8	0.76	0.49	0.99	0.64	130%
East Lawrence	EL-1	SE082018	SE08217A	65	8	0.76	0.49	0.78	0.50	102%
East Lawrence	EL-1	SE082040	SE082001	624	8	0.18	0.12	0.39	0.25	214%
East Lawrence	EL-1	SE08217A	SE082017	339	8	0.64	0.41	0.88	0.57	138%
East Lawrence	EL-1	SW082138	SW082139	263	8	0.97	0.62	0.64	0.41	66%
East Lawrence	EL-1	SW082139	SW082140	437	8	0.77	0.49	0.74	0.48	97%
East Lawrence	EL-1	SW082140	SW082141	170	8	1.21	0.78	0.85	0.55	70%
East Lawrence	EL-1	SW082143	SE072315	85	15	6.46	4.18	3.67	2.37	57%
Kansas River	KR-2	NE251170	NE251207	215	27	9.91	6.40	10.13	6.55	102%
Kansas River	KR-2	NW251021	NW251018	430	27	3.67	2.37	9.75	6.30	266%
Kansas River	KR-2	NW251200	NW251202	125	24	6.07	3.92	10.81	6.98	178%
Kansas River	KR-2	NW261107	NW261147	196	12	1.90	1.23	2.68	1.73	141%
Kansas River	KR-2	NW261144	NW261143	333	12	2.66	1.72	2.75	1.78	103%
Kansas River	KR-2	NW261147	NW261145	265	12	2.67	1.73	2.72	1.76	102%
Kansas River	KR-2	NW261151	NW261149	160	12	0.85	0.55	2.65	1.71	313%
Kansas River	KR-2	NW261152	NW261151	240	12	2.52	1.63	2.61	1.69	104%
Kansas River	KR-2	NW261167	NW261166	399	12	1.95	1.26	2.26	1.46	116%
Kansas River	KR-2	NW261168	NW261167	371	12	1.95	1.26	2.19	1.41	112%
Kansas River	KR-2	SE271158	SE271150	116	8	0.88	0.57	1.06	0.68	120%
Kansas River	KR-4	NE251216	NE251217	448	30	5.49	3.55	12.96	8.38	236%
Kansas River	KR-4	SE251047	SE251046	334	10	1.02	0.66	1.45	0.94	142%
Kansas River	KR-4	SE251048	SE251047	141	10	1.24	0.80	1.31	0.84	106%
Kansas River	KR-4	SE251110	SE251242	49	10	1.71	1.11	2.05	1.32	120%
Kansas River	KR-4	SE251243	SE251254	138	10	1.15	0.74	1.98	1.28	172%
Kansas River	KR-4	SE251244	SE251110	29	10	1.52	0.98	1.91	1.23	125%
Kansas River	KR-4	SE251254	SE302105	334	10	1.20	0.78	2.08	1.35	174%
Kansas River	KR-4	SE302105	SW302132	336	10	0.91	0.59	2.15	1.39	237%

Basin	Subbasin	Upstream MH	Downstream MH	Length (ft.)	Diameter (in.)	Capacity		10-year 2025 Flow		Percent Utilized
						(cfs)	(mgd)	(cfs)	(mgd)	
Kansas River	KR-5	NE062001	SE312034	425	24	10.35	6.69	13.10	8.47	127%
Kansas River	KR-5	NE062003	NE062002	182	24	12.66	8.18	13.07	8.45	103%
Kansas River	KR-5	NE062018	NE062016	198	24	12.25	7.92	13.03	8.42	106%
Kansas River	KR-5	NE062019	NE062018	350	24	12.33	7.97	12.99	8.40	105%
Kansas River	KR-5	NE062028	NE062026	468	24	12.77	8.25	12.96	8.38	102%
Kansas River	KR-5	NE062094	NE062095	493	27	16.68	10.78	16.77	10.84	101%
Kansas River	KR-5	NE312016	NE312089	690	12	1.27	0.82	2.40	1.55	190%
Kansas River	KR-5	NE312017	NE312016	291	12	1.25	0.81	2.26	1.46	180%
Kansas River	KR-5	NE312021	NE312020	154	12	1.25	0.81	2.01	1.30	161%
Kansas River	KR-5	NE312022	NE312021	50	12	1.33	0.86	1.98	1.28	148%
Kansas River	KR-5	NE312087	NE312038	518	21	9.80	6.33	10.03	6.48	102%
Kansas River	KR-5	NE312104	NE312105	507	21	6.90	4.46	9.00	5.82	131%
Kansas River	KR-5	NE312107	NE312108	495	21	9.34	6.04	10.95	7.08	117%
Kansas River	KR-5	NE312108	NW322109	495	21	9.34	6.04	10.98	7.10	118%
Kansas River	KR-5	NE312122	NE312087	116	21	6.07	3.92	7.31	4.72	121%
Kansas River	KR-5	NW062037	NW062036	465	12	1.77	1.15	2.15	1.39	122%
Kansas River	KR-5	NW062208	NW062037	330	12	1.32	0.85	2.01	1.30	153%
Kansas River	KR-5	NW062213	NW062209	193	12	0.81	0.52	1.94	1.26	240%
Kansas River	KR-5	NW322003	NW322002	22	48	53.06	34.30	56.50	36.52	107%
Kansas River	KR-5	NW322071	NW322004	251	36	10.31	6.67	23.13	14.95	224%
Kansas River	KR-5	NW32236B	NW32236D	16	24	12.65	8.18	14.05	9.08	111%
Kansas River	KR-5	NW32236D	NW322071	77	24	13.40	8.66	14.09	9.11	105%
Kansas River	KR-5	SE062049	SE06249A	307	24	9.31	6.02	12.32	7.97	132%
Kansas River	KR-5	SE062085	SE062086	400	24	11.31	7.31	12.01	7.76	106%
Kansas River	KR-5	SE062086	SE062087	490	24	11.15	7.21	12.01	7.76	108%
Kansas River	KR-5	SE302102	NE312082	247	27	12.92	8.35	15.11	9.77	117%
Kansas River	KR-5	SE302103	NE312104	238	21	6.89	4.45	9.00	5.82	131%
Kansas River	KR-5	SE312003	SE312007	536	12	2.71	1.75	3.18	2.05	118%
Kansas River	KR-5	SE312006	SE312005	73	12	2.95	1.91	2.97	1.92	101%
Kansas River	KR-5	SE312014	SE312022	125	12	2.04	1.32	3.00	1.94	147%
Kansas River	KR-5	SE312022	SE31239A	206	12	2.02	1.30	3.07	1.99	152%
Kansas River	KR-5	SE312058	SW322220	153	24	9.15	5.91	11.09	7.17	121%
Kansas River	KR-5	SE312059	SE312130	275	24	4.72	3.05	10.10	6.53	214%
Kansas River	KR-5	SE312059	SE312058	275	24	9.25	5.98	11.05	7.14	119%
Kansas River	KR-5	SE312065	SE312128	100	12	3.63	2.35	8.76	5.66	241%
Kansas River	KR-5	SE312065	SE312127	100	12	0.62	0.40	1.91	1.23	309%
Kansas River	KR-5	SE312067	SE312151	349	12	1.27	0.82	1.94	1.26	154%
Kansas River	KR-5	SE312084	SE312065	58	18	8.16	5.27	10.66	6.89	131%
Kansas River	KR-5	SE312085	SE312501	409	24	15.70	10.15	20.94	13.54	133%
Kansas River	KR-5	SE312086	SE312085	17	18	9.19	5.94	10.38	6.71	113%
Kansas River	KR-5	SE312127	SE312067	619	12	1.26	0.81	1.91	1.23	152%
Kansas River	KR-5	SE312151	NE312022	768	12	1.26	0.81	1.98	1.28	157%
Kansas River	KR-5	SE312501	SE312059	384	24	15.70	10.15	20.97	13.56	134%
Kansas River	KR-5	SW322220	SW322x69	7	24	8.55	5.53	11.09	7.17	130%
Kansas River	KR-6	SE042003	SE042004	247	8	0.32	0.20	0.78	0.50	245%
North Lawrence	NL-1	NE302241	NE302113	281	10	0.19	0.12	0.74	0.48	401%
North Lawrence	NL-1	NW292137	NW292138	160	10	1.20	0.78	1.62	1.05	135%
North Lawrence	NL-1	NW292138	NW292139	200	10	1.55	1.00	1.70	1.10	109%
North Lawrence	NL-1	NW292157	NW292137	176	10	1.18	0.76	1.55	1.00	132%
North Lawrence	NL-1	NW292158	NW292157	330	8	0.47	0.30	0.64	0.41	135%
North Lawrence	NL-1	NW292159	NW292158	329	8	0.47	0.30	0.53	0.34	113%
North Lawrence	NL-1	NW292172	NW292173	11	15	2.76	1.78	3.60	2.33	131%
North Lawrence	NL-1	NW292180	PS_03	367	21	4.61	2.98	5.37	3.47	117%
North Lawrence	NL-1	NW302001	PS_01	16	12	1.26	0.81	1.80	1.16	143%
North Lawrence	NL-1	SW292057	SW292056	209	12	2.43	1.57	2.58	1.67	106%

Wastewater Collection System Watch List

Basin	Subbasin	Upstream MH	Downstream MH	Length (ft.)	Diameter (in.)	Capacity (cfs)	Capacity (mgd)	10-year 2025 Flow (cfs)	10-year 2025 Flow (mgd)	Percent Utilized
North Lawrence	NL-1	SW292059	SW292101	23	12	2.23	1.44	9.60	6.21	431%
North Lawrence	NL-1	SW292101	PS_04	26	12	2.21	1.43	9.57	6.19	433%
Wakarusa River	WR-2	NE041038	NW031295	75	10	1.60	1.03	1.91	1.23	119%
Wakarusa River	WR-2	NE041039	NE041038	188	10	1.69	1.09	1.80	1.16	107%
Wakarusa River	WR-2	NE041081	NW031269	398	18	6.45	4.17	6.85	4.43	106%
Wakarusa River	WR-2	NW031007	NW031008	145	18	4.78	3.09	6.96	4.50	146%
Wakarusa River	WR-2	NW031008	NW031009	230	18	6.39	4.13	6.99	4.52	110%
Wakarusa River	WR-2	NW031269	NW031007	400	18	6.60	4.27	6.89	4.45	104%
Wakarusa River	WR-2	NW031291	NW031290	187	10	1.46	0.94	2.44	1.57	167%
Wakarusa River	WR-2	NW031295	NW031294	274	10	1.68	1.09	2.05	1.32	122%
Wakarusa River	WR-2	SE101317	SE101058	187	12	2.26	1.46	11.58	7.49	513%
Wakarusa River	WR-2	SE331019	SE331027	140	12	2.23	1.44	3.81	2.46	171%
Wakarusa River	WR-2	SE331027	SE331028	240	12	2.39	1.54	3.85	2.49	161%
Wakarusa River	WR-2	SE331028	SE331033	204	12	3.25	2.10	3.92	2.53	121%
Wakarusa River	WR-2	SE331090	NE041207	318	16	4.87	3.15	6.78	4.38	139%
Wakarusa River	WR-2	SW031018	SW031022	400	18	8.34	5.39	9.50	6.14	114%
Wakarusa River	WR-2	SW031022	SW031400	300	18	7.86	5.08	9.53	6.16	121%
Wakarusa River	WR-2	SW031042	SW031041	265	10	2.18	1.41	2.44	1.57	112%
Wakarusa River	WR-2	SW031400	SW031023	200	21	13.95	9.02	9.57	6.19	69%
Wakarusa River	WR-4	SW021051	SW021050	366	18	1.82	1.18	3.64	2.35	200%
Wakarusa River	WR-4	SW351118	SW351117	196	12	0.99	0.64	2.37	1.53	240%
Wakarusa River	WR-5	NW111016	NW11116A	110	24	2.16	1.39	5.23	3.38	242%
Wakarusa River	WR-5	NW111029	SW111033	152	24	1.84	1.19	2.68	1.73	146%
Wakarusa River	WR-5	NW11118A	NW111018	221	24	7.46	4.82	9.64	6.23	129%
Wakarusa River	WR-5	SW021017	NW11118A	225	24	5.44	3.52	9.64	6.23	177%
Wakarusa River	WR-6	NE111066	NE111067	142	10	1.39	0.90	1.41	0.91	102%
Wakarusa River	WR-6	NE111067	NE111068	235	12	2.25	1.46	1.77	1.14	78%
Wakarusa River	WR-6	NE111068	NE111069	401	12	2.25	1.46	2.12	1.37	94%
Wakarusa River	WR-6	NE111069	SE111072	331	12	2.28	1.48	2.47	1.60	108%
Wakarusa River	WR-6	NE131127	NE131126	350	24	5.41	3.49	6.39	4.13	118%
Wakarusa River	WR-6	NE131128	NE131127	404	24	5.03	3.25	6.36	4.11	126%
Wakarusa River	WR-6	NW121105	NW121104	84	15	2.34	1.51	3.46	2.24	148%
Wakarusa River	WR-6	SE111018	SE111019	234	12	1.74	1.13	2.12	1.37	122%
Wakarusa River	WR-6	SE111019	SE111020	230	12	1.74	1.13	2.47	1.60	142%
Wakarusa River	WR-6	SE111020	SE111282	180	12	1.72	1.11	2.83	1.83	164%
Wakarusa River	WR-6	SE111072	SE111073	194	12	2.26	1.46	2.79	1.80	124%
Wakarusa River	WR-6	SE111073	SW121008	92	12	3.54	2.29	3.14	2.03	89%
Wakarusa River	WR-6	SE121093	SE121094	103	12	1.89	1.22	2.58	1.67	136%
Wakarusa River	WR-6	SE121094	SE121100	330	12	1.88	1.22	2.90	1.87	154%
Wakarusa River	WR-6	SE121100	SE121105	322	12	1.88	1.22	3.21	2.08	171%
Wakarusa River	WR-6	SE121105	SE121106	132	12	1.91	1.24	3.53	2.28	185%
Wakarusa River	WR-6	SE121106	SE121109	234	12	1.88	1.21	3.88	2.51	207%
Wakarusa River	WR-6	SE121109	SE121112	211	12	1.88	1.22	4.20	2.72	223%
Wakarusa River	WR-6	SE121116	SE121115	504	24	6.45	4.17	6.46	4.18	100%
Wakarusa River	WR-6	SE12135F	SE121093	84	12	1.17	0.75	2.23	1.44	191%
Wakarusa River	WR-6	SW121006	SW121010	335	12	2.25	1.46	4.17	2.69	185%
Wakarusa River	WR-6	SW121007	SW121006	207	12	4.28	2.76	3.85	2.49	90%
Wakarusa River	WR-6	SW121008	SW121007	168	12	4.28	2.76	3.50	2.26	82%
Wakarusa River	WR-6	SW121010	SW121011	164	12	2.26	1.46	4.48	2.90	198%
Wakarusa River	WR-6	SW121011	SW121013	297	12	4.09	2.65	4.84	3.13	118%
Wakarusa River	WR-6	SW121013	SW121014	400	12	5.29	3.42	5.16	3.33	98%

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Central	C-1	NE011016	NE011093		15	108	3.52	2.27	0.57	0.37	16	0.42	0.27	12	0.46	0.30	13
Central	C-1	NE011017	NE011016		15	322	2.79	1.80	0.46	0.30	16	0.35	0.23	13	0.35	0.23	13
Central	C-1	NE011019	NE011017		15	323	2.90	1.87	0.35	0.23	12	0.28	0.18	10	0.28	0.18	10
Central	C-1	NE011021	NE011019		12	400	1.44	0.93	0.25	0.16	17	0.18	0.11	12	0.18	0.11	12
Central	C-1	NE011023	NE011040		10	147	1.28	0.83	1.13	0.73	88	0.95	0.62	75	0.99	0.64	77
Central	C-1	NE011027	NE011037		8	298	0.99	0.64	0.85	0.55	86	0.81	0.52	82	0.81	0.52	82
Central	C-1	NE011037	NW01124A		8	302	0.70	0.45	0.92	0.59	132	0.85	0.55	122	0.88	0.57	127
Central	C-1	NE011040	NE011042		10	334	1.31	0.85	1.20	0.78	91	1.02	0.66	78	1.06	0.68	81
Central	C-1	NE011042	NE011043		10	480	1.46	0.94	1.31	0.84	90	1.06	0.68	73	1.10	0.71	75
Central	C-1	NE011043	NE011045		18	173	6.96	4.50	1.34	0.87	19	1.10	0.71	16	1.13	0.73	16
Central	C-1	NE011045	NE011094		18	487	10.25	6.63	1.45	0.94	14	1.17	0.75	11	1.20	0.78	12
Central	C-1	NE011093	NE011094		15	64	2.80	1.81	0.71	0.46	25	0.53	0.34	19	0.53	0.34	19
Central	C-1	NE011094	SE011096		18	106	5.40	3.49	0.74	0.48	14	0.60	0.39	11	0.60	0.39	11
Central	C-1	NE011094	NE011095		24	9	19.95	12.90	1.45	0.94	7	0.60	0.39	3	0.60	0.39	3
Central	C-1	NE011095	SE011093		24	97	10.01	6.47	1.55	1.00	16	1.20	0.78	12	1.27	0.82	13
Central	C-1	NE06212B	NE06227B		18	418	4.11	2.66	6.43	4.15	156	5.79	3.74	141	5.93	3.83	144
Central	C-1	NE06227B	NE062145		18	278	4.23	2.73	6.46	4.18	153	5.79	3.74	137	5.97	3.86	141
Central	C-1	NW01066A	NW011066		8	347	0.65	0.42	0.60	0.39	92	0.46	0.30	71	0.46	0.30	71
Central	C-1	NW01066B	NW01066A		8	331	0.66	0.43	0.46	0.30	69	0.35	0.23	53	0.35	0.23	53
Central	C-1	NW01066C	NW01066B		8	66	0.54	0.35	0.35	0.23	66	0.28	0.18	53	0.28	0.18	53
Central	C-1	NW01066D	NW01066C		8	145	0.64	0.42	0.25	0.16	38	0.18	0.11	28	0.18	0.11	28
Central	C-1	NW01066E	NW01066D		8	458	0.70	0.45	0.11	0.07	15	0.11	0.07	15	0.11	0.07	15
Central	C-1	NW011064	NW011067		8	454	0.57	0.37	0.74	0.48	131	0.71	0.46	125	0.71	0.46	125
Central	C-1	NW011065	NW011064		8	139	1.03	0.66	0.67	0.43	65	0.60	0.39	59	0.64	0.41	62
Central	C-1	NW011066	NW011065		8	466	0.79	0.51	0.71	0.46	89	0.53	0.34	67	0.57	0.37	71
Central	C-1	NW011067	NE011027		8	300	0.70	0.45	0.81	0.52	116	0.74	0.48	106	0.78	0.50	111
Central	C-1	NW01124A	NE011023		10	162	0.93	0.60	1.02	0.66	110	0.88	0.57	95	0.92	0.59	99
Central	C-1	NW01124B	NE011021		12	158	1.27	0.82	0.11	0.07	8	0.11	0.07	8	0.11	0.07	8
Central	C-1	SE011093	SE011097		24	417	10.09	6.52	1.66	1.07	16	1.31	0.84	13	1.34	0.87	13
Central	C-1	SE011096	SE011098		18	406	5.29	3.42	0.85	0.55	16	0.67	0.43	13	0.71	0.46	13
Central	C-1	SE011097	SE011099		24	404	10.13	6.55	1.70	1.10	17	1.31	0.84	13	1.34	0.87	13
Central	C-1	SE011098	SE011100		18	345	5.31	3.43	0.95	0.62	18	0.74	0.48	14	0.74	0.48	14
Central	C-1	SE011099	SE011102		24	416	10.11	6.53	1.73	1.12	17	1.31	0.84	13	1.38	0.89	14
Central	C-1	SE011100	SE011101		18	350	5.30	3.42	1.02	0.66	19	0.78	0.50	15	0.81	0.52	15
Central	C-1	SE011101	SE012104		18	176	5.31	3.43	1.06	0.68	20	0.81	0.52	15	0.85	0.55	16
Central	C-1	SE011102	SE012104		24	85	12.75	8.24	1.77	1.14	14	1.34	0.87	11	1.38	0.89	11
Central	C-1	SE012104	SE012105		18	55	5.30	3.43	2.83	1.83	53	2.15	1.39	41	2.23	1.44	42
Central	C-1	SE012105	SW062002		18	263	5.30	3.43	2.90	1.87	55	2.23	1.44	42	2.30	1.48	43

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
							(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Central	C-1	SE062111	SE062135		18	36	9.10	5.88	6.57	4.25	72	5.69	3.67	62	5.86	3.79	64
Central	C-1	SE062113	NE06212B		18	434	5.59	3.62	6.39	4.13	114	5.79	3.74	104	5.93	3.83	106
Central	C-1	SE062114	SE062113		18	365	9.05	5.85	6.53	4.22	72	5.76	3.72	64	5.93	3.83	66
Central	C-1	SE062135	SE062114		18	256	9.05	5.85	6.60	4.27	73	5.72	3.70	63	5.90	3.81	65
Central	C-1	SW062002	SW062203		24	364	7.12	4.60	2.90	1.87	41	2.23	1.44	31	2.30	1.48	32
Central	C-1	SW062003	SW062018		18	170	5.52	3.57	3.25	2.10	59	2.51	1.62	45	2.58	1.67	47
Central	C-1	SW062012	SW062015		18	350	5.81	3.75	0.25	0.16	4	0.18	0.11	3	0.18	0.11	3
Central	C-1	SW062015	SW062016		18	305	6.22	4.02	0.35	0.23	6	0.28	0.18	5	0.28	0.18	5
Central	C-1	SW062016	SW062003		18	332	7.20	4.65	0.46	0.30	6	0.35	0.23	5	0.35	0.23	5
Central	C-1	SW062018	SW062024		18	350	6.07	3.93	3.25	2.10	53	2.51	1.62	41	2.61	1.69	43
Central	C-1	SW062020	SW062026		8	350	0.82	0.53	0.11	0.07	13	0.11	0.07	13	0.11	0.07	13
Central	C-1	SW062024	SW062032		18	330	6.09	3.94	3.28	2.12	54	2.54	1.64	42	2.65	1.71	43
Central	C-1	SW062026	SW062034		8	330	0.87	0.56	0.25	0.16	29	0.18	0.11	20	0.18	0.11	20
Central	C-1	SW062032	SW062047		18	169	6.05	3.91	3.32	2.15	55	2.58	1.67	43	2.68	1.73	44
Central	C-1	SW062034	SW062049		8	169	1.01	0.66	0.46	0.30	45	0.28	0.18	28	0.28	0.18	28
Central	C-1	SW062046	SW062060		18	105	8.01	5.18	6.25	4.04	78	5.47	3.54	68	5.61	3.63	70
Central	C-1	SW062047	SW062046		18	162	8.05	5.20	6.22	4.02	77	5.44	3.52	68	5.58	3.61	69
Central	C-1	SW062048	SW062047		12	300	0.90	0.58	3.04	1.96	339	3.04	1.96	339	3.04	1.96	339
Central	C-1	SW062049	SW062048		12	308	1.90	1.23	2.97	1.92	156	2.97	1.92	156	2.97	1.92	156
Central	C-1	SW062058	SW062069		18	319	8.00	5.17	6.39	4.13	80	5.54	3.58	69	5.72	3.70	72
Central	C-1	SW062059	SW062058		18	149	8.03	5.19	6.36	4.11	79	5.54	3.58	69	5.69	3.67	71
Central	C-1	SW062060	SW062059		18	101	8.03	5.19	6.29	4.06	78	5.51	3.56	69	5.65	3.65	70
Central	C-1	SW062069	SW062077		18	271	8.61	5.56	6.43	4.15	75	5.58	3.61	65	5.72	3.70	66
Central	C-1	SW062077	SW062087		18	95	9.02	5.83	6.46	4.18	72	5.61	3.63	62	5.76	3.72	64
Central	C-1	SW062087	SW062088		18	13	9.21	5.96	6.50	4.20	71	5.65	3.65	61	5.79	3.74	63
Central	C-1	SW062088	SE062111		18	402	9.05	5.85	6.53	4.22	72	5.69	3.67	63	5.83	3.77	64
Central	C-1	SW062200	SW062201		12	410	3.02	1.95	2.90	1.87	96	2.44	1.57	81	2.44	1.57	81
Central	C-1	SW062201	SW062202		12	398	3.03	1.96	2.75	1.78	91	2.54	1.64	84	2.54	1.64	84
Central	C-1	SW062202	SW062049		12	64	3.91	2.53	2.79	1.80	71	2.61	1.69	67	2.61	1.69	67
Central	C-1	SW062203	SW062003		18	350	3.37	2.18	2.86	1.85	85	2.23	1.44	66	2.30	1.48	68
Central	C-1	SW062211	SW062012		18	41	16.41	10.61	0.11	0.07	1	0.11	0.07	1	0.11	0.07	1
Central	C-2	NW011021	SW011018		10	217	1.39	0.90	1.59	1.03	115	1.31	0.84	94	1.31	0.84	94
Central	C-2	NW011022	NW011021		12	362	2.32	1.50	1.20	0.78	52	0.95	0.62	41	0.99	0.64	43
Central	C-2	NW011023	NW011022		12	400	2.87	1.86	0.78	0.50	27	0.64	0.41	22	0.64	0.41	22
Central	C-2	NW011024	NW011023		12	400	1.87	1.21	0.39	0.25	21	0.32	0.21	17	0.32	0.21	17
Central	C-2	SE011006	SW011090		12	310	0.64	0.41	9.36	6.05	1462	7.49	4.84	1170	7.66	4.95	1197
Central	C-2	SE011018	SE011020		10	311	3.62	2.34	0.39	0.25	11	0.32	0.21	9	0.32	0.21	9
Central	C-2	SE011020	PS_08		10	42	2.39	1.55	0.78	0.50	32	0.64	0.41	27	0.64	0.41	27

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Central	C-2	SE011021	PS_08	C-2-1	15	323	4.08	2.64	10.06	6.50	246	8.12	5.25	199	8.26	5.34	202
Central	C-2	SE011022	SE011021		15	90	4.09	2.64	9.82	6.35	240	7.95	5.14	194	8.05	5.20	197
Central	C-2	SE011023	SE011022		15	400	4.06	2.62	9.78	6.32	241	7.80	5.04	192	7.91	5.11	195
Central	C-2	SW011010	SW011068		10	330	1.39	0.90	3.57	2.31	257	2.90	1.87	209	2.93	1.89	211
Central	C-2	SW011011	SW011010		10	325	2.19	1.42	3.18	2.05	145	2.58	1.67	118	2.61	1.69	119
Central	C-2	SW011016	SW011011		10	148	3.11	2.01	2.79	1.80	90	2.26	1.46	73	2.26	1.46	73
Central	C-2	SW011017	SW011016		10	53	3.08	1.99	2.37	1.53	77	1.94	1.26	63	1.94	1.26	63
Central	C-2	SW011018	SW011017		10	117	1.39	0.90	1.98	1.28	142	1.62	1.05	117	1.62	1.05	117
Central	C-2	SW011042	SW011071		12	330	2.24	1.45	6.46	4.18	289	5.23	3.38	234	5.30	3.42	237
Central	C-2	SW011044	SW011042		12	399	3.55	2.29	6.18	3.99	174	4.98	3.22	140	5.01	3.24	141
Central	C-2	SW011045	SW011044		12	337	2.24	1.45	5.83	3.77	260	4.73	3.06	211	4.77	3.08	213
Central	C-2	SW011051	SW011045		10	270	2.03	1.31	5.47	3.54	269	4.45	2.88	219	4.48	2.90	221
Central	C-2	SW011052	SW011051		10	415	2.07	1.34	5.12	3.31	247	4.13	2.67	200	4.17	2.69	201
Central	C-2	SW011057	SW011052		10	196	1.50	0.97	4.73	3.06	315	3.85	2.49	256	3.85	2.49	256
Central	C-2	SW011067	SW011057		10	123	1.38	0.89	4.34	2.81	314	3.53	2.28	255	3.53	2.28	255
Central	C-2	SW011068	SW011067		10	137	1.43	0.92	3.96	2.56	277	3.21	2.08	225	3.21	2.08	225
Central	C-2	SW011071	SE011006	C-2-2	12	330	5.35	3.46	6.78	4.38	127	5.47	3.54	102	5.51	3.56	103
Central	C-2	SW011090	SE011023		15	375	4.45	2.88	9.68	6.25	217	7.70	4.98	173	7.77	5.02	175
Central	C-2	SW011093	SE011006		10	320	1.38	0.89	2.33	1.51	169	1.91	1.23	139	1.94	1.26	141
Central	C-2	SW011094	SW011093		10	83	1.73	1.12	1.94	1.26	112	1.62	1.05	94	1.62	1.05	94
Central	C-2	SW011095	SW011094		10	183	4.73	3.06	1.59	1.03	34	1.31	0.84	28	1.31	0.84	28
Central	C-2	SW011096	SW011095		10	355	1.38	0.89	1.20	0.78	87	0.95	0.62	69	0.99	0.64	72
Central	C-2	SW011097	SW011096		10	259	1.36	0.88	0.78	0.50	57	0.64	0.41	47	0.64	0.41	47
Central	C-2	SW011098	SW011097		10	75	1.39	0.90	0.39	0.25	28	0.32	0.21	23	0.32	0.21	23
Central	C-3	SW06255A	SW062200		12	421	3.04	1.97	2.86	1.85	94	2.37	1.53	78	2.37	1.53	78
East Lawrence	EL-1	NE082010	SE082032		8	25	0.80	0.52	0.25	0.16	31	0.25	0.16	31	0.21	0.14	26
East Lawrence	EL-1	NE082011	NE082010		8	245	0.76	0.49	0.14	0.09	19	0.14	0.09	19	0.11	0.07	14
East Lawrence	EL-1	NE082174	NE082254		8	190	0.94	0.61	1.59	1.03	169	1.62	1.05	173	1.41	0.91	150
East Lawrence	EL-1	NE082175	NE082174		8	223	1.21	0.78	1.48	0.96	123	1.52	0.98	126	1.34	0.87	111
East Lawrence	EL-1	NE082176	NE082175		8	37	0.87	0.56	1.34	0.87	155	1.41	0.91	163	1.24	0.80	143
East Lawrence	EL-1	NE082178	NE082176		8	367	0.87	0.56	1.24	0.80	142	1.31	0.84	150	1.13	0.73	130
East Lawrence	EL-1	NE082182	NE082178		8	157	1.67	1.08	1.13	0.73	68	1.20	0.78	72	1.02	0.66	61
East Lawrence	EL-1	NE082185	NE082182		8	368	2.05	1.33	1.02	0.66	50	1.13	0.73	55	0.92	0.59	45
East Lawrence	EL-1	NE082186	NE082185		8	162	0.94	0.60	0.92	0.59	98	1.06	0.68	113	0.81	0.52	87
East Lawrence	EL-1	NE082187	NE082186		8	341	0.74	0.48	0.88	0.57	120	0.99	0.64	135	0.78	0.50	106
East Lawrence	EL-1	NE082254	NE082255		8	23	1.38	0.89	1.70	1.10	123	1.73	1.12	125	1.52	0.98	110
East Lawrence	EL-1	NE082255	NW082025		8	655	1.06	0.68	1.80	1.16	171	1.87	1.21	177	1.62	1.05	154
East Lawrence	EL-1	NE082501	NE082187		8	179	0.77	0.50	0.81	0.52	106	0.88	0.57	115	0.74	0.48	97

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
East Lawrence	EL-1	NW082023	NW082026		10	200	3.32	2.14	2.01	1.30	61	2.08	1.35	63	1.80	1.16	54
East Lawrence	EL-1	NW082024	NW082023	EL-1-1	8	349	1.23	0.79	1.94	1.26	158	2.01	1.30	164	1.73	1.12	141
East Lawrence	EL-1	NW082025	NW082024		8	342	1.13	0.73	1.87	1.21	165	1.91	1.23	168	1.66	1.07	147
East Lawrence	EL-1	NW082026	NW082027		10	200	3.99	2.58	2.08	1.35	52	2.15	1.39	54	1.91	1.23	48
East Lawrence	EL-1	NW082027	NW082028		10	115	2.55	1.65	2.19	1.41	86	2.26	1.46	89	1.98	1.28	77
East Lawrence	EL-1	NW082028	NW082037		10	490	2.63	1.70	2.30	1.48	87	2.37	1.53	90	2.08	1.35	79
East Lawrence	EL-1	NW082037	NW082038		10	74	2.16	1.40	2.33	1.51	108	2.40	1.55	111	2.12	1.37	98
East Lawrence	EL-1	NW082038	NW082039		10	227	2.84	1.84	2.44	1.57	86	2.47	1.60	87	2.19	1.41	77
East Lawrence	EL-1	NW082039	SW082076		12	91	2.80	1.81	2.51	1.62	90	2.58	1.67	92	2.26	1.46	81
East Lawrence	EL-1	SE052228	NE082501		8	132	1.20	0.78	0.78	0.50	65	0.78	0.50	65	0.67	0.43	56
East Lawrence	EL-1	SE052229	SE052228		8	355	0.84	0.54	0.64	0.41	76	0.67	0.43	80	0.60	0.39	72
East Lawrence	EL-1	SE052230	SE052229		8	233	0.77	0.50	0.53	0.34	69	0.53	0.34	69	0.49	0.32	64
East Lawrence	EL-1	SE052232	PS_13		8	188	0.88	0.57	0.25	0.16	28	0.25	0.16	28	0.21	0.14	24
East Lawrence	EL-1	SE052233	SE052232		8	129	0.67	0.44	0.14	0.09	21	0.14	0.09	21	0.11	0.07	16
East Lawrence	EL-1	SE072046	SE072149		18	166	3.82	2.47	4.17	2.69	109	4.31	2.78	113	3.78	2.44	99
East Lawrence	EL-1	SE072145	SE072046		18	245	3.49	2.25	4.20	2.72	121	4.34	2.81	125	3.78	2.44	108
East Lawrence	EL-1	SE072149	SE072150		18	282	3.65	2.36	4.20	2.72	115	4.34	2.81	119	3.78	2.44	104
East Lawrence	EL-1	SE072150	SE072151		18	109	3.63	2.35	4.17	2.69	115	4.34	2.81	120	3.81	2.46	105
East Lawrence	EL-1	SE072151	SE072152		18	425	3.64	2.35	4.17	2.69	115	4.38	2.83	120	3.81	2.46	105
East Lawrence	EL-1	SE072152	SE072153		18	267	3.64	2.35	4.10	2.65	113	4.34	2.81	119	3.78	2.44	104
East Lawrence	EL-1	SE072153	SE072154		18	349	3.64	2.36	4.06	2.63	111	4.34	2.81	119	3.78	2.44	104
East Lawrence	EL-1	SE072154	SE072155		18	212	3.61	2.33	4.06	2.63	113	4.34	2.81	120	3.78	2.44	105
East Lawrence	EL-1	SE072155	SE072156		18	398	3.65	2.36	4.06	2.63	111	4.31	2.78	118	3.78	2.44	104
East Lawrence	EL-1	SE072315	SE072145		15	189	10.01	6.47	4.17	2.69	42	4.24	2.74	42	3.74	2.42	37
East Lawrence	EL-1	SE082001	PS_32		8	281	1.78	1.15	1.98	1.28	111	2.37	1.53	133	2.05	1.32	115
East Lawrence	EL-1	SE082002	SE082001		8	123	0.76	0.49	1.59	1.03	208	1.98	1.28	259	1.73	1.12	227
East Lawrence	EL-1	SE082003	SE082002		8	67	0.77	0.50	1.55	1.00	203	1.84	1.19	239	1.62	1.05	212
East Lawrence	EL-1	SE082004	SE082003		8	89	0.76	0.49	1.52	0.98	200	1.73	1.12	228	1.52	0.98	200
East Lawrence	EL-1	SE082005	SE082004		8	267	2.56	1.66	1.55	1.00	61	1.62	1.05	63	1.45	0.94	57
East Lawrence	EL-1	SE082006	SE082005		8	296	1.75	1.13	1.45	0.94	83	1.55	1.00	89	1.34	0.87	77
East Lawrence	EL-1	SE082014	SE082006		8	120	1.62	1.05	1.34	0.87	83	1.41	0.91	87	1.27	0.82	79
East Lawrence	EL-1	SE082015	SE082014		8	69	0.76	0.49	1.24	0.80	163	1.31	0.84	173	1.17	0.75	154
East Lawrence	EL-1	SE082016	SE082015		8	109	0.77	0.50	1.10	0.71	143	1.20	0.78	156	1.06	0.68	138
East Lawrence	EL-1	SE082017	SE082016		8	326	0.76	0.49	1.02	0.66	134	1.10	0.71	144	0.99	0.64	130
East Lawrence	EL-1	SE082018	SE08217A		8	65	0.76	0.49	0.85	0.55	111	0.85	0.55	111	0.78	0.50	102
East Lawrence	EL-1	SE082019	SE082018		8	215	0.76	0.49	0.74	0.48	97	0.74	0.48	97	0.67	0.43	88
East Lawrence	EL-1	SE082020	SE082019		8	282	0.77	0.49	0.64	0.41	83	0.64	0.41	83	0.57	0.37	74
East Lawrence	EL-1	SE082031	SE082020		8	380	0.76	0.49	0.49	0.32	65	0.49	0.32	65	0.42	0.27	55

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
East Lawrence	EL-1	SE082032	SE082031		8	404	0.91	0.59	0.39	0.25	43	0.39	0.25	43	0.32	0.21	35
East Lawrence	EL-1	SE082033	SW082133		8	729	0.80	0.52	0.14	0.09	18	0.14	0.09	18	0.11	0.07	13
East Lawrence	EL-1	SE082040	SE082001		8	624	0.18	0.12	0.39	0.25	214	0.42	0.27	234	0.39	0.25	214
East Lawrence	EL-1	SE082056	PS_32		12	120	2.37	1.53	0.39	0.25	16	0.39	0.25	16	0.32	0.21	13
East Lawrence	EL-1	SE082057	SE082067		12	100	2.39	1.54	0.14	0.09	6	0.14	0.09	6	0.11	0.07	4
East Lawrence	EL-1	SE082067	SE082056		12	60	2.39	1.54	0.25	0.16	10	0.25	0.16	10	0.21	0.14	9
East Lawrence	EL-1	SE08217A	SE082017		8	339	0.64	0.41	0.95	0.62	149	0.99	0.64	155	0.88	0.57	138
East Lawrence	EL-1	SW082070	SW082143		15	309	6.46	4.18	2.90	1.87	45	2.93	1.89	45	2.58	1.67	40
East Lawrence	EL-1	SW082071	SW082070		15	126	6.46	4.18	2.83	1.83	44	2.86	1.85	44	2.51	1.62	39
East Lawrence	EL-1	SW082073	SW082071		15	375	6.46	4.18	2.79	1.80	43	2.83	1.83	44	2.47	1.60	38
East Lawrence	EL-1	SW082074	SW082073		12	170	3.20	2.07	2.68	1.73	84	2.75	1.78	86	2.44	1.57	76
East Lawrence	EL-1	SW082075	SW082074		12	423	3.19	2.06	2.68	1.73	84	2.72	1.76	85	2.40	1.55	75
East Lawrence	EL-1	SW082076	SW082075		12	246	3.20	2.07	2.61	1.69	82	2.68	1.73	84	2.37	1.53	74
East Lawrence	EL-1	SW082133	SW082134		8	159	1.12	0.73	0.25	0.16	22	0.25	0.16	22	0.21	0.14	19
East Lawrence	EL-1	SW082134	SW082136		8	383	1.11	0.72	0.39	0.25	35	0.39	0.25	35	0.32	0.21	29
East Lawrence	EL-1	SW082136	SW082137		8	400	1.11	0.72	0.49	0.32	45	0.49	0.32	45	0.42	0.27	38
East Lawrence	EL-1	SW082137	SW082138		8	400	1.89	1.22	0.60	0.39	32	0.60	0.39	32	0.53	0.34	28
East Lawrence	EL-1	SW082138	SW082139		8	263	0.97	0.62	0.74	0.48	77	0.74	0.48	77	0.64	0.41	66
East Lawrence	EL-1	SW082139	SW082140		8	437	0.77	0.49	0.81	0.52	106	0.85	0.55	111	0.74	0.48	97
East Lawrence	EL-1	SW082140	SW082141		8	170	1.21	0.78	0.92	0.59	76	0.95	0.62	79	0.85	0.55	70
East Lawrence	EL-1	SW082141	SW082142		8	300	3.27	2.11	1.02	0.66	31	1.06	0.68	32	0.92	0.59	28
East Lawrence	EL-1	SW082142	SW082143		8	330	1.95	1.26	1.13	0.73	58	1.20	0.78	61	1.02	0.66	52
East Lawrence	EL-1	SW082143	SE072315		15	85	6.46	4.18	4.06	2.63	63	4.17	2.69	65	3.67	2.37	57
Kansas River	KR-1	NE231006	NE231007		8	462	2.46	1.59	0.04	0.02	1	0.04	0.02	1	0.07	0.05	3
Kansas River	KR-1	NE231007	NE231012		8	196	0.87	0.56	0.04	0.02	4	0.07	0.05	8	0.14	0.09	16
Kansas River	KR-1	NE231008	NE231009		8	145	0.85	0.55	0.11	0.07	12	0.18	0.11	21	0.28	0.18	33
Kansas River	KR-1	NE231009	NE231010		8	237	0.96	0.62	0.11	0.07	11	0.21	0.14	22	0.35	0.23	37
Kansas River	KR-1	NE231010	NE231011		8	131	1.69	1.09	0.21	0.14	13	0.39	0.25	23	0.60	0.39	36
Kansas River	KR-1	NE231011	PS_17		8	158	1.32	0.85	0.21	0.14	16	0.42	0.27	32	0.67	0.43	51
Kansas River	KR-1	NE231012	NE231008		8	53	0.81	0.53	0.07	0.05	9	0.14	0.09	17	0.21	0.14	26
Kansas River	KR-1	NE231014	NE231019		8	413	0.69	0.45	0.04	0.02	5	0.04	0.02	5	0.07	0.05	10
Kansas River	KR-1	NE231015	NE231010		8	404	2.36	1.52	0.07	0.05	3	0.14	0.09	6	0.21	0.14	9
Kansas River	KR-1	NE231019	NE231015		8	396	1.74	1.12	0.04	0.02	2	0.07	0.05	4	0.14	0.09	8
Kansas River	KR-1	SE231012	SE231022		18	239	8.38	5.42	0.78	0.50	9	1.62	1.05	19	2.54	1.64	30
Kansas River	KR-1	SE231013	SE231012		18	284	12.14	7.84	0.64	0.41	5	1.13	0.73	9	1.62	1.05	13
Kansas River	KR-1	SE231014	SE231013		8	251	1.86	1.20	0.18	0.11	9	0.39	0.25	21	0.71	0.46	38
Kansas River	KR-1	SE231015	SE231014		8	251	1.97	1.27	0.14	0.09	7	0.39	0.25	20	0.67	0.43	34
Kansas River	KR-1	SE231016	SE231015		8	349	2.12	1.37	0.14	0.09	7	0.35	0.23	17	0.67	0.43	32

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Kansas River	KR-1	SE231017	SE231016		8	400	1.42	0.92	0.14	0.09	10	0.35	0.23	25	0.67	0.43	47
Kansas River	KR-1	SE231018	SE231017		8	398	1.43	0.92	0.14	0.09	10	0.39	0.25	27	0.71	0.46	50
Kansas River	KR-1	SE231019	SE231018		8	401	1.42	0.92	0.14	0.09	10	0.42	0.27	30	0.74	0.48	52
Kansas River	KR-1	SE231020	SE231019		8	400	1.90	1.23	0.18	0.11	9	0.53	0.34	28	0.78	0.50	41
Kansas River	KR-1	SW241007	PS_28		8	274	1.08	0.70	0.11	0.07	10	0.21	0.14	20	0.35	0.23	33
Kansas River	KR-1	SW241011	SW241012		8	143	0.90	0.58	0.21	0.14	24	0.60	0.39	67	0.71	0.46	79
Kansas River	KR-1	SW241012	SW241013		8	393	0.98	0.63	0.21	0.14	22	0.60	0.39	62	0.74	0.48	76
Kansas River	KR-1	SW241013	SW241014		8	386	1.00	0.65	0.25	0.16	25	0.60	0.39	60	0.81	0.52	81
Kansas River	KR-1	SW241014	SE231012		8	150	2.65	1.71	0.25	0.16	9	0.60	0.39	23	0.85	0.55	32
Kansas River	KR-1	SW241031	SW241007		8	68	1.01	0.65	0.11	0.07	11	0.18	0.11	18	0.28	0.18	28
Kansas River	KR-1	SW241032	SW241031		8	119	0.76	0.49	0.07	0.05	9	0.14	0.09	19	0.21	0.14	28
Kansas River	KR-1	SW241035	SW241032		8	178	0.76	0.49	0.04	0.02	5	0.07	0.05	9	0.14	0.09	18
Kansas River	KR-1	SW241037	SW241035		8	98	0.76	0.49	0.04	0.02	5	0.04	0.02	5	0.07	0.05	9
Kansas River	KR-2	NE221002	PS_42		8	422	1.18	0.76	0.49	0.32	42	0.39	0.25	33	0.53	0.34	45
Kansas River	KR-2	NE221003	NE221002		8	514	0.79	0.51	0.07	0.05	9	0.07	0.05	9	0.07	0.05	9
Kansas River	KR-2	NE221010	NE221013		8	84	3.52	2.27	0.25	0.16	7	0.21	0.14	6	0.25	0.16	7
Kansas River	KR-2	NE221011	NE221010		8	167	1.62	1.05	0.18	0.11	11	0.14	0.09	9	0.18	0.11	11
Kansas River	KR-2	NE221012	NE221011		8	182	0.93	0.60	0.07	0.05	8	0.07	0.05	8	0.07	0.05	8
Kansas River	KR-2	NE221013	NE221002		8	169	1.55	1.00	0.32	0.21	20	0.28	0.18	18	0.35	0.23	23
Kansas River	KR-2	NE221023	NE221024		8	435	1.85	1.19	0.07	0.05	4	0.07	0.05	4	0.07	0.05	4
Kansas River	KR-2	NE221024	NE221025		8	56	2.78	1.80	0.18	0.11	6	0.14	0.09	5	0.18	0.11	6
Kansas River	KR-2	NE221025	NE221026		8	64	3.33	2.15	0.25	0.16	7	0.21	0.14	6	0.25	0.16	7
Kansas River	KR-2	NE221026	PS_42		8	379	2.57	1.66	0.32	0.21	12	0.28	0.18	11	0.35	0.23	14
Kansas River	KR-2	NE251030	NE251077		27	34	43.48	28.11	4.59	2.97	11	5.93	3.83	14	9.68	6.25	22
Kansas River	KR-2	NE251077	NE251170		27	190	13.10	8.47	4.84	3.13	37	6.39	4.13	49	10.10	6.53	77
Kansas River	KR-2	NE251077	NW251209		30	305	14.48	9.36	4.84	3.13	33	6.39	4.13	44	10.10	6.53	70
Kansas River	KR-2	NE251169	NE251163		27	520	10.95	7.08	3.71	2.40	34	4.77	3.08	44	7.24	4.68	66
Kansas River	KR-2	NE251170	NE251207		27	215	9.91	6.40	4.84	3.13	49	6.39	4.13	65	10.13	6.55	102
Kansas River	KR-2	NE251207	NE251208		27	105	18.39	11.89	4.84	3.13	26	6.39	4.13	35	10.13	6.55	55
Kansas River	KR-2	NE251208	NE251169		27	42	15.11	9.77	3.67	2.37	24	8.02	5.18	53	13.28	8.58	88
Kansas River	KR-2	NE251208	NE251210		30	40	20.51	13.26	5.97	3.86	29	8.02	5.18	39	13.28	8.58	65
Kansas River	KR-2	NE251210	NE251211		30	400	14.06	9.09	6.00	3.88	43	8.02	5.18	57	13.28	8.58	94
Kansas River	KR-2	NE251211	NE251212		30	164	14.33	9.26	5.97	3.86	42	7.98	5.16	56	13.21	8.54	92
Kansas River	KR-2	NE261001	NE261002		15	323	2.59	1.68	4.73	3.06	183	4.06	2.63	157	5.40	3.49	208
Kansas River	KR-2	NE261002	NE261346		15	326	7.50	4.85	4.73	3.06	63	4.06	2.63	54	5.40	3.49	72
Kansas River	KR-2	NE261049	NE261051		15	352	4.07	2.63	4.77	3.08	117	4.10	2.65	101	5.51	3.56	135
Kansas River	KR-2	NE261051	NE261053		15	357	4.73	3.05	4.80	3.10	102	4.13	2.67	87	5.51	3.56	117
Kansas River	KR-2	NE261053	SE231008		15	300	4.09	2.64	4.80	3.10	118	4.13	2.67	101	5.51	3.56	135

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
							(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Kansas River	KR-2	NE261109	SE231048		24	402	10.09	6.52	4.34	2.81	43	7.77	5.02	77	13.74	8.88	136
Kansas River	KR-2	NE261346	NE261526		15	320	9.03	5.84	4.73	3.06	52	4.06	2.63	45	5.44	3.52	60
Kansas River	KR-2	NE261525	NE261049		15	351	4.08	2.64	4.77	3.08	117	4.10	2.65	100	5.47	3.54	134
Kansas River	KR-2	NE261526	NE261525		15	353	4.07	2.63	4.77	3.08	117	4.10	2.65	101	5.47	3.54	135
Kansas River	KR-2	NE271020	NE271046		24	397	36.53	23.61	2.12	1.37	6	6.07	3.93	17	15.68	10.13	43
Kansas River	KR-2	NE271046	SW231140		24	122	32.71	21.14	3.28	2.12	10	6.89	4.45	21	16.49	10.66	50
Kansas River	KR-2	NE271190	NE271191		12	230	4.48	2.89	1.55	1.00	35	1.31	0.84	29	1.73	1.12	39
Kansas River	KR-2	NE271191	NE271195		12	188	6.18	4.00	1.62	1.05	26	1.38	0.89	22	1.80	1.16	29
Kansas River	KR-2	NE271195	NE271196		12	173	2.50	1.61	1.73	1.12	69	1.45	0.94	58	1.87	1.21	75
Kansas River	KR-2	NE271196	NE271197		12	154	2.52	1.63	1.77	1.14	70	1.48	0.96	59	1.94	1.26	77
Kansas River	KR-2	NE271197	NE271198		12	185	5.04	3.26	1.84	1.19	36	1.55	1.00	31	2.01	1.30	40
Kansas River	KR-2	NE271198	NW261083		12	108	2.63	1.70	1.91	1.23	72	1.59	1.03	60	2.08	1.35	79
Kansas River	KR-2	NE271212	NE271020		24	420	24.29	15.70	2.08	1.35	9	6.04	3.90	25	16.21	10.48	67
Kansas River	KR-2	NE271213	NE271212		24	362	25.78	16.66	2.01	1.30	8	6.11	3.95	24	16.91	10.93	66
Kansas River	KR-2	NE271214	NE271213		18	219	12.07	7.80	1.91	1.23	16	1.59	1.03	13	2.08	1.35	17
Kansas River	KR-2	NE271215	NE271214		18	130	11.94	7.72	1.84	1.19	15	1.52	0.98	13	2.01	1.30	17
Kansas River	KR-2	NE271216	NE271215		18	203	11.89	7.69	1.77	1.14	15	1.48	0.96	12	1.91	1.23	16
Kansas River	KR-2	NE271217	NE271216		18	151	12.06	7.80	1.70	1.10	14	1.41	0.91	12	1.84	1.19	15
Kansas River	KR-2	NE271219	NE271217		18	104	12.01	7.77	1.62	1.05	14	1.34	0.87	11	1.73	1.12	14
Kansas River	KR-2	NE271220	NE271219		18	135	11.93	7.71	1.52	0.98	13	1.27	0.82	11	1.66	1.07	14
Kansas River	KR-2	NE271221	NE271220		18	107	12.19	7.88	1.45	0.94	12	1.20	0.78	10	1.55	1.00	13
Kansas River	KR-2	NE271222	NE271221		18	128	11.82	7.64	1.38	0.89	12	1.13	0.73	10	1.48	0.96	13
Kansas River	KR-2	NE271223	NE271222		18	71	11.83	7.65	1.31	0.84	11	1.06	0.68	9	1.41	0.91	12
Kansas River	KR-2	NE271224	NE271223		18	65	12.22	7.90	1.20	0.78	10	1.02	0.66	8	1.31	0.84	11
Kansas River	KR-2	NE271226	NE271224		18	98	12.01	7.76	1.13	0.73	9	0.95	0.62	8	1.24	0.80	10
Kansas River	KR-2	NE271227	NE271226		18	184	16.93	10.95	1.06	0.68	6	0.88	0.57	5	1.13	0.73	7
Kansas River	KR-2	NE271228	NE271227		18	116	17.12	11.07	0.95	0.62	6	0.81	0.52	5	1.06	0.68	6
Kansas River	KR-2	NE271229	NE271228		18	153	13.88	8.97	0.88	0.57	6	0.74	0.48	5	0.95	0.62	7
Kansas River	KR-2	NE271230	NE271229		18	283	8.00	5.17	0.81	0.52	10	0.67	0.43	8	0.88	0.57	11
Kansas River	KR-2	NE271231	NE271230		18	283	16.87	10.91	0.74	0.48	4	0.60	0.39	4	0.78	0.50	5
Kansas River	KR-2	NE271232	NE271231		18	94	20.21	13.07	0.64	0.41	3	0.53	0.34	3	0.71	0.46	3
Kansas River	KR-2	NE271233	NE271232		18	165	20.75	13.42	0.57	0.37	3	0.46	0.30	2	0.60	0.39	3
Kansas River	KR-2	NW251018	NE251030		27	325	13.20	8.53	4.56	2.94	35	5.93	3.83	45	9.68	6.25	73
Kansas River	KR-2	NW251021	NW251018		27	430	3.67	2.37	4.59	2.97	125	6.00	3.88	164	9.75	6.30	266
Kansas River	KR-2	NW251022	NW251021		27	144	10.32	6.67	4.63	2.99	45	6.04	3.90	58	9.75	6.30	94
Kansas River	KR-2	NW251023	NW251022		27	285	21.00	13.57	4.66	3.01	22	6.04	3.90	29	9.78	6.32	47
Kansas River	KR-2	NW251199	NW251203		24	285	11.84	7.65	5.09	3.29	43	6.85	4.43	58	10.77	6.96	91
Kansas River	KR-2	NW251200	NW251202		24	125	6.07	3.92	5.09	3.29	84	6.85	4.43	113	10.81	6.98	178

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Kansas River	KR-2	NW251202	NW251199		24	325	11.71	7.57	5.09	3.29	43	6.89	4.45	59	10.81	6.98	92
Kansas River	KR-2	NW251203	NW251204		24	86	11.70	7.56	5.09	3.29	43	6.85	4.43	59	10.77	6.96	92
Kansas River	KR-2	NW251204	NW251205		24	109	11.67	7.54	5.09	3.29	44	6.89	4.45	59	10.77	6.96	92
Kansas River	KR-2	NW251205	NW251206		24	62	11.85	7.66	5.12	3.31	43	6.89	4.45	58	10.81	6.98	91
Kansas River	KR-2	NW251206	NE251077		24	308	11.75	7.59	5.12	3.31	44	6.89	4.45	59	10.81	6.98	92
Kansas River	KR-2	NW251209	NE251208		30	290	14.25	9.21	4.84	3.13	34	6.39	4.13	45	10.35	6.69	73
Kansas River	KR-2	NW261083	NW261084		12	128	3.92	2.53	1.98	1.28	50	1.66	1.07	42	2.19	1.41	56
Kansas River	KR-2	NW261084	NW261092		12	147	3.92	2.53	2.05	1.32	52	1.73	1.12	44	2.26	1.46	58
Kansas River	KR-2	NW261092	NW261093		12	254	3.90	2.52	2.12	1.37	54	1.77	1.14	45	2.33	1.51	60
Kansas River	KR-2	NW261093	NW261094		12	281	3.90	2.52	2.19	1.41	56	1.84	1.19	47	2.40	1.55	62
Kansas River	KR-2	NW261094	NW261099		12	122	3.90	2.52	2.23	1.44	57	1.87	1.21	48	2.44	1.57	62
Kansas River	KR-2	NW261099	NW26199A		12	350	2.76	1.78	2.30	1.48	83	1.91	1.23	69	2.51	1.62	91
Kansas River	KR-2	NW261100	NW261105		12	186	3.02	1.95	2.37	1.53	78	1.98	1.28	65	2.61	1.69	86
Kansas River	KR-2	NW261105	NW261106		12	434	2.72	1.76	2.40	1.55	88	2.01	1.30	74	2.65	1.71	98
Kansas River	KR-2	NW261106	NW261107		12	291	4.68	3.02	2.40	1.55	51	2.01	1.30	43	2.65	1.71	57
Kansas River	KR-2	NW261107	NW261147		12	196	1.90	1.23	2.44	1.57	128	2.01	1.30	106	2.68	1.73	141
Kansas River	KR-2	NW261143	NW261347		15	17	4.96	3.20	2.47	1.60	50	2.08	1.35	42	2.79	1.80	56
Kansas River	KR-2	NW261144	NW261143		12	333	2.66	1.72	2.47	1.60	93	2.08	1.35	78	2.75	1.78	103
Kansas River	KR-2	NW261145	NW261144		12	118	2.76	1.79	2.44	1.57	88	2.05	1.32	74	2.72	1.76	98
Kansas River	KR-2	NW261147	NW261145		12	265	2.67	1.73	2.44	1.57	91	2.05	1.32	77	2.72	1.76	102
Kansas River	KR-2	NW261149	NW261150		15	103	2.55	1.65	4.66	3.01	183	4.06	2.63	160	5.37	3.47	211
Kansas River	KR-2	NW261150	NW261165		15	75	3.17	2.05	4.70	3.04	148	4.06	2.63	128	5.40	3.49	171
Kansas River	KR-2	NW261151	NW261149		12	160	0.85	0.55	2.23	1.44	263	2.05	1.32	242	2.65	1.71	313
Kansas River	KR-2	NW261152	NW261151		12	240	2.52	1.63	2.26	1.46	90	2.01	1.30	80	2.61	1.69	104
Kansas River	KR-2	NW261153	NW261152		12	53	3.95	2.55	2.23	1.44	56	1.94	1.26	49	2.51	1.62	64
Kansas River	KR-2	NW261156	NW261153		12	143	2.46	1.59	2.15	1.39	88	1.87	1.21	76	2.44	1.57	99
Kansas River	KR-2	NW261163	NW261164		15	275	2.58	1.67	4.70	3.04	182	4.06	2.63	157	5.40	3.49	209
Kansas River	KR-2	NW261164	NE261001		15	302	2.58	1.66	4.70	3.04	182	4.06	2.63	158	5.40	3.49	210
Kansas River	KR-2	NW261165	NW261163		15	174	2.30	1.48	4.70	3.04	204	4.06	2.63	177	5.40	3.49	235
Kansas River	KR-2	NW261166	NW261156		12	212	2.48	1.61	2.08	1.35	84	1.80	1.16	73	2.37	1.53	95
Kansas River	KR-2	NW261167	NW261166		12	399	1.95	1.26	2.05	1.32	105	1.77	1.14	90	2.26	1.46	116
Kansas River	KR-2	NW261168	NW261167		12	371	1.95	1.26	2.01	1.30	103	1.70	1.10	87	2.19	1.41	112
Kansas River	KR-2	NW261176	NW261168		10	122	6.24	4.03	1.94	1.26	31	1.62	1.05	26	2.08	1.35	33
Kansas River	KR-2	NW261177	NW261176		10	314	2.40	1.55	1.38	0.89	57	1.13	0.73	47	1.48	0.96	62
Kansas River	KR-2	NW261178	NW261388		10	111	2.52	1.63	1.20	0.78	48	1.02	0.66	41	1.31	0.84	52
Kansas River	KR-2	NW261180	NW261178		10	207	2.53	1.63	1.13	0.73	45	0.95	0.62	38	1.24	0.80	49
Kansas River	KR-2	NW261182	NW261180		10	131	2.51	1.62	1.06	0.68	42	0.88	0.57	35	1.13	0.73	45
Kansas River	KR-2	NW261183	NW261182		10	51	2.49	1.61	0.95	0.62	38	0.81	0.52	33	1.06	0.68	42

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
							(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Kansas River	KR-2	NW261185	NW261183		10	129	3.36	2.17	0.88	0.57	26	0.74	0.48	22	0.95	0.62	28
Kansas River	KR-2	NW261191	NW261185		10	190	2.97	1.92	0.81	0.52	27	0.67	0.43	23	0.88	0.57	30
Kansas River	KR-2	NW261194	NW261385		10	122	3.32	2.15	0.64	0.41	19	0.53	0.34	16	0.71	0.46	21
Kansas River	KR-2	NW261195	NW261194		10	76	3.31	2.14	0.57	0.37	17	0.46	0.30	14	0.60	0.39	18
Kansas River	KR-2	NW261198	SW261197		10	119	2.90	1.88	0.39	0.25	13	0.35	0.23	12	0.42	0.27	15
Kansas River	KR-2	NW261264	NW261268		10	195	4.10	2.65	0.18	0.11	4	0.14	0.09	3	0.18	0.11	4
Kansas River	KR-2	NW261268	NW261282		10	188	4.20	2.72	0.25	0.16	6	0.21	0.14	5	0.25	0.16	6
Kansas River	KR-2	NW261282	NW261283		10	128	4.20	2.71	0.32	0.21	8	0.28	0.18	7	0.35	0.23	8
Kansas River	KR-2	NW261283	NW261389		10	189	2.19	1.41	0.39	0.25	18	0.35	0.23	16	0.42	0.27	19
Kansas River	KR-2	NW261347	NW261149		15	80	3.15	2.03	2.51	1.62	80	2.12	1.37	67	2.83	1.83	90
Kansas River	KR-2	NW261385	NW261191		10	48	3.80	2.45	0.74	0.48	20	0.60	0.39	16	0.78	0.50	20
Kansas River	KR-2	NW261388	NW261177		10	99	2.50	1.62	1.31	0.84	52	1.10	0.71	44	1.41	0.91	56
Kansas River	KR-2	NW261389	NW261176		10	10	4.75	3.07	0.49	0.32	10	0.39	0.25	8	0.53	0.34	11
Kansas River	KR-2	NW26199A	NW261100		12	112	3.01	1.95	2.30	1.48	76	1.94	1.26	64	2.54	1.64	84
Kansas River	KR-2	NW271266	NE271233		18	97	19.35	12.51	0.49	0.32	3	0.39	0.25	2	0.53	0.34	3
Kansas River	KR-2	NW271267	NW271266		18	88	16.91	10.93	0.39	0.25	2	0.35	0.23	2	0.42	0.27	3
Kansas River	KR-2	NW271268	NW271267		18	135	18.38	11.88	0.32	0.21	2	0.28	0.18	2	0.35	0.23	2
Kansas River	KR-2	NW271269	NW271268		18	121	18.02	11.65	0.25	0.16	1	0.21	0.14	1	0.25	0.16	1
Kansas River	KR-2	NW271271	NW271269		12	317	2.26	1.46	0.18	0.11	8	0.14	0.09	6	0.18	0.11	8
Kansas River	KR-2	NW271272	NW271271		12	346	2.25	1.45	0.07	0.05	3	0.07	0.05	3	0.07	0.05	3
Kansas River	KR-2	SE231007	SE231010		24	224	42.65	27.57	4.31	2.78	10	7.73	5.00	18	13.70	8.86	32
Kansas River	KR-2	SE231008	SE231118		15	300	8.68	5.61	4.80	3.10	55	4.13	2.67	48	5.54	3.58	64
Kansas River	KR-2	SE231009	SE231007		24	323	15.82	10.23	4.31	2.78	27	7.73	5.00	49	13.70	8.86	87
Kansas River	KR-2	SE231010	SW241006	KR-2-2	24	95	13.73	8.88	4.34	2.81	32	7.77	5.02	57	13.74	8.88	100
Kansas River	KR-2	SE231011	SE231103		18	235	9.55	6.17	0.78	0.50	8	1.59	1.03	17	2.65	1.71	28
Kansas River	KR-2	SE231022	SE231011		18	351	8.61	5.57	0.78	0.50	9	1.59	1.03	18	2.58	1.67	30
Kansas River	KR-2	SE231048	SE231110		24	451	9.04	5.84	4.31	2.78	48	7.73	5.00	86	13.74	8.88	152
Kansas River	KR-2	SE231100	SW241006	KR-2-3	15	28	8.55	5.52	4.84	3.13	57	4.17	2.69	49	5.58	3.61	65
Kansas River	KR-2	SE231103	SW241006		18	220	7.40	4.78	0.85	0.55	11	1.55	1.00	21	2.68	1.73	36
Kansas River	KR-2	SE231105	SE231107		24	269	10.23	6.61	4.34	2.81	42	7.77	5.02	76	13.74	8.88	134
Kansas River	KR-2	SE231106	SE231105		24	428	10.08	6.52	4.38	2.83	43	7.80	5.04	77	13.74	8.88	136
Kansas River	KR-2	SE231107	SE231108		24	205	9.99	6.46	4.34	2.81	43	7.77	5.02	78	13.74	8.88	137
Kansas River	KR-2	SE231108	NE261109		24	202	10.07	6.51	4.34	2.81	43	7.77	5.02	77	13.74	8.88	136
Kansas River	KR-2	SE231110	SE231009		24	339	10.13	6.55	4.31	2.78	43	7.73	5.00	76	13.70	8.86	135
Kansas River	KR-2	SE231118	SE231100		15	65	9.03	5.84	4.84	3.13	54	4.17	2.69	46	5.58	3.61	62
Kansas River	KR-2	SE271140	SE271172		12	283	5.43	3.51	1.34	0.87	25	1.13	0.73	21	1.48	0.96	27
Kansas River	KR-2	SE271141	SE271140		10	212	1.72	1.11	1.27	0.82	74	1.06	0.68	62	1.38	0.89	80
Kansas River	KR-2	SE271142	SE271141		10	121	4.27	2.76	1.20	0.78	28	0.99	0.64	23	1.31	0.84	31

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Kansas River	KR-2	SE271150	SE271151		10	55	1.14	0.74	1.02	0.66	90	0.88	0.57	77	1.13	0.73	99
Kansas River	KR-2	SE271151	SE271142		10	95	3.10	2.00	1.13	0.73	36	0.92	0.59	30	1.20	0.78	39
Kansas River	KR-2	SE271158	SE271150		8	116	0.88	0.57	0.95	0.62	108	0.81	0.52	92	1.06	0.68	120
Kansas River	KR-2	SE271159	SE271158		8	170	3.45	2.23	0.88	0.57	26	0.74	0.48	21	0.95	0.62	28
Kansas River	KR-2	SE271160	SE271159		8	149	2.92	1.89	0.81	0.52	28	0.67	0.43	23	0.88	0.57	30
Kansas River	KR-2	SE271161	SE271160		8	358	2.55	1.65	0.74	0.48	29	0.60	0.39	24	0.78	0.50	30
Kansas River	KR-2	SE271165	SE271161		8	244	1.30	0.84	0.64	0.41	49	0.53	0.34	41	0.71	0.46	55
Kansas River	KR-2	SE271166	SE271165		8	262	1.20	0.78	0.57	0.37	47	0.46	0.30	38	0.60	0.39	50
Kansas River	KR-2	SE271167	SE271166		8	181	1.20	0.77	0.49	0.32	41	0.39	0.25	32	0.53	0.34	44
Kansas River	KR-2	SE271172	SE271181		12	156	4.58	2.96	1.41	0.91	31	1.20	0.78	26	1.55	1.00	34
Kansas River	KR-2	SE271181	NE271190		12	142	4.57	2.96	1.48	0.96	32	1.24	0.80	27	1.62	1.05	36
Kansas River	KR-2	SW231003	SW231006		8	381	0.79	0.51	0.18	0.11	22	0.14	0.09	18	0.18	0.11	22
Kansas River	KR-2	SW231004	SW231003		8	143	1.60	1.03	0.07	0.05	4	0.07	0.05	4	0.07	0.05	4
Kansas River	KR-2	SW231006	SW231007		8	335	2.46	1.59	0.25	0.16	10	0.21	0.14	9	0.25	0.16	10
Kansas River	KR-2	SW231007	PS_27		10	236	2.14	1.38	0.95	0.62	45	0.81	0.52	38	1.06	0.68	50
Kansas River	KR-2	SW231008	SW231007		8	325	2.81	1.81	0.07	0.05	3	0.07	0.05	3	0.07	0.05	3
Kansas River	KR-2	SW231026	PS_27		8	134	1.07	0.69	0.25	0.16	23	0.21	0.14	20	0.25	0.16	23
Kansas River	KR-2	SW231027	SW231026		8	179	0.79	0.51	0.18	0.11	22	0.14	0.09	18	0.18	0.11	22
Kansas River	KR-2	SW231028	SW231027		8	208	0.82	0.53	0.07	0.05	9	0.07	0.05	9	0.07	0.05	9
Kansas River	KR-2	SW231036	SW231007		8	233	1.85	1.20	0.57	0.37	30	0.46	0.30	25	0.60	0.39	32
Kansas River	KR-2	SW231037	SW231036		8	238	0.80	0.52	0.49	0.32	62	0.39	0.25	48	0.53	0.34	66
Kansas River	KR-2	SW231038	SW231037		8	177	1.18	0.76	0.18	0.11	15	0.14	0.09	12	0.18	0.11	15
Kansas River	KR-2	SW231100	SE231106		24	306	10.02	6.48	4.41	2.85	44	7.84	5.07	78	13.77	8.90	137
Kansas River	KR-2	SW231111	SW231112		8	72	0.97	0.62	0.07	0.05	7	0.07	0.05	7	0.07	0.05	7
Kansas River	KR-2	SW231112	SW231113		8	89	1.28	0.82	0.18	0.11	14	0.14	0.09	11	0.18	0.11	14
Kansas River	KR-2	SW231113	SW231037		8	268	0.68	0.44	0.25	0.16	36	0.21	0.14	31	0.25	0.16	36
Kansas River	KR-2	SW231117	SW231038		8	169	1.77	1.15	0.07	0.05	4	0.07	0.05	4	0.07	0.05	4
Kansas River	KR-2	SW231124	SW231100		24	294	9.33	6.03	4.48	2.90	48	7.91	5.11	85	13.88	8.97	149
Kansas River	KR-2	SW231131	SW231124		24	221	10.21	6.60	4.59	2.97	45	8.05	5.20	79	14.02	9.06	137
Kansas River	KR-2	SW231132	SW231131		24	273	10.16	6.56	4.77	3.08	47	8.23	5.32	81	14.37	9.29	142
Kansas River	KR-2	SW231133	SW231132		24	193	10.30	6.66	5.23	3.38	51	8.62	5.57	84	14.90	9.63	145
Kansas River	KR-2	SW231137	SW231133		24	411	10.04	6.49	3.18	2.05	32	6.99	4.52	70	13.77	8.90	137
Kansas River	KR-2	SW231138	SW231137		24	396	10.17	6.57	3.21	2.08	32	6.99	4.52	69	14.34	9.27	141
Kansas River	KR-2	SW231139	SW231138		24	403	10.69	6.91	3.21	2.08	30	6.99	4.52	65	15.15	9.79	142
Kansas River	KR-2	SW231140	SW231139		24	380	12.17	7.87	3.28	2.12	27	6.96	4.50	57	16.38	10.59	135
Kansas River	KR-2	SW241001	SW24101A		24	19	51.64	33.38	9.68	6.25	19	12.85	8.31	25	20.55	13.28	40
Kansas River	KR-2	SW241002	SW241001		24	330	10.86	7.02	9.68	6.25	89	12.85	8.31	118	20.55	13.28	189
Kansas River	KR-2	SW241003	SW241002		24	233	10.59	6.84	9.71	6.28	92	12.89	8.33	122	20.55	13.28	194

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Kansas River	KR-2	SW241004	SW241003		24	98	11.43	7.39	9.71	6.28	85	12.89	8.33	113	20.52	13.26	180
Kansas River	KR-2	SW241005	SW241004		24	314	11.56	7.47	9.71	6.28	84	12.89	8.33	111	20.55	13.28	178
Kansas River	KR-2	SW241006	SW241005		24	453	12.17	7.86	9.75	6.30	80	12.96	8.38	107	20.62	13.33	169
Kansas River	KR-2	SW24101A	NW251023	KR-2-1	27	285	32.82	21.22	4.63	2.99	14	6.04	3.90	18	9.78	6.32	30
Kansas River	KR-2	SW24101A	NW251200		24	155	29.08	18.80	5.05	3.26	17	6.04	3.90	21	9.78	6.32	34
Kansas River	KR-2	SW261197	NW261195		10	152	4.49	2.90	0.49	0.32	11	0.39	0.25	9	0.53	0.34	12
Kansas River	KR-2	SW261203	NW261198		10	136	3.63	2.35	0.32	0.21	9	0.28	0.18	8	0.35	0.23	10
Kansas River	KR-2	SW261204	SW261203		10	66	4.11	2.66	0.25	0.16	6	0.21	0.14	5	0.25	0.16	6
Kansas River	KR-2	SW261214	SW261283		10	262	4.28	2.77	0.07	0.05	2	0.07	0.05	2	0.07	0.05	2
Kansas River	KR-2	SW261261	NW261264		10	208	4.09	2.64	0.07	0.05	2	0.07	0.05	2	0.07	0.05	2
Kansas River	KR-2	SW261283	SW261204		10	90	3.12	2.01	0.18	0.11	6	0.14	0.09	5	0.18	0.11	6
Kansas River	KR-2	SW271230	SW271234		8	331	0.76	0.49	0.07	0.05	9	0.07	0.05	9	0.07	0.05	9
Kansas River	KR-2	SW271234	SW271424		8	307	0.85	0.55	0.18	0.11	21	0.14	0.09	17	0.18	0.11	21
Kansas River	KR-2	SW271240	SE271167		8	135	1.25	0.81	0.39	0.25	31	0.35	0.23	28	0.42	0.27	34
Kansas River	KR-2	SW271400	SW271240		8	16	1.63	1.05	0.32	0.21	20	0.28	0.18	17	0.35	0.23	22
Kansas River	KR-2	SW271424	SW271400		8	291	0.80	0.51	0.25	0.16	31	0.21	0.14	27	0.25	0.16	31
Kansas River	KR-3	NE251128	NE251130		18	237	6.55	4.23	1.31	0.84	20	0.95	0.62	15	0.95	0.62	15
Kansas River	KR-3	NE251129	NE251246		18	23	6.93	4.48	1.34	0.87	19	0.99	0.64	14	0.99	0.64	14
Kansas River	KR-3	NE251130	NE251129		18	220	5.21	3.36	1.34	0.87	26	0.95	0.62	18	0.95	0.62	18
Kansas River	KR-3	NE251132	NE251143		18	216	4.95	3.20	1.45	0.94	29	1.06	0.68	21	1.06	0.68	21
Kansas River	KR-3	NE251141	NE251166		18	270	4.29	2.77	1.55	1.00	36	1.13	0.73	26	1.13	0.73	26
Kansas River	KR-3	NE251142	NE251141		18	50	4.70	3.04	1.48	0.96	32	1.10	0.71	23	1.10	0.71	23
Kansas River	KR-3	NE251143	NE251142		18	118	6.34	4.10	1.45	0.94	23	1.06	0.68	17	1.06	0.68	17
Kansas River	KR-3	NE251163	NE251162		30	301	12.95	8.37	4.48	2.90	35	5.44	3.52	42	7.95	5.14	61
Kansas River	KR-3	NE251164	NE251163		18	260	7.46	4.82	1.55	1.00	21	1.17	0.75	16	1.17	0.75	16
Kansas River	KR-3	NE251165	NE251164		18	74	4.73	3.06	1.55	1.00	33	1.13	0.73	24	1.13	0.73	24
Kansas River	KR-3	NE251166	NE251165		18	338	4.85	3.13	1.55	1.00	32	1.13	0.73	23	1.13	0.73	23
Kansas River	KR-3	NE251246	NE251132		18	124	5.34	3.45	1.41	0.91	26	1.02	0.66	19	1.02	0.66	19
Kansas River	KR-3	SE251235	SW251078		12	87	8.09	5.23	0.78	0.50	10	0.57	0.37	7	0.57	0.37	7
Kansas River	KR-3	SE261300	SE261346		12	301	4.33	2.80	0.64	0.41	15	0.46	0.30	11	0.46	0.30	11
Kansas River	KR-3	SE261301	SE261300		8	377	3.12	2.02	0.57	0.37	18	0.42	0.27	14	0.42	0.27	14
Kansas River	KR-3	SE261302	SE261301		8	395	2.88	1.86	0.53	0.34	18	0.39	0.25	13	0.39	0.25	13
Kansas River	KR-3	SE261303	SE261302		8	279	2.89	1.86	0.46	0.30	16	0.35	0.23	12	0.35	0.23	12
Kansas River	KR-3	SE261304	SE261303		8	341	3.27	2.11	0.39	0.25	12	0.28	0.18	9	0.28	0.18	9
Kansas River	KR-3	SE261305	SE261304		12	325	4.62	2.99	0.35	0.23	8	0.25	0.16	5	0.25	0.16	5
Kansas River	KR-3	SE261306	SE261305		10	265	3.21	2.08	0.28	0.18	9	0.21	0.14	7	0.21	0.14	7
Kansas River	KR-3	SE261317	SE261306		10	160	1.91	1.23	0.25	0.16	13	0.18	0.11	9	0.18	0.11	9
Kansas River	KR-3	SE261318	SE261317		10	398	2.20	1.42	0.18	0.11	8	0.14	0.09	6	0.14	0.09	6

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Kansas River	KR-3	SE261319	SE261318		10	188	2.08	1.34	0.11	0.07	5	0.07	0.05	3	0.07	0.05	3
Kansas River	KR-3	SE261320	SE261319		10	11	2.19	1.42	0.07	0.05	3	0.04	0.02	2	0.04	0.02	2
Kansas River	KR-3	SE261345	SW25178A		12	214	4.25	2.75	0.74	0.48	17	0.57	0.37	13	0.57	0.37	13
Kansas River	KR-3	SE261346	SE261345		12	217	4.35	2.81	0.71	0.46	16	0.49	0.32	11	0.53	0.34	12
Kansas River	KR-3	SW25072A	SW25071A		15	172	6.97	4.50	0.85	0.55	12	0.67	0.43	10	0.67	0.43	10
Kansas River	KR-3	SW251019	SW251022		10	229	2.05	1.32	0.32	0.21	16	0.21	0.14	10	0.21	0.14	10
Kansas River	KR-3	SW251022	SW251234		10	309	1.25	0.81	0.35	0.23	28	0.28	0.18	23	0.28	0.18	23
Kansas River	KR-3	SW251025	SW251031		10	189	2.25	1.46	0.46	0.30	20	0.35	0.23	16	0.35	0.23	16
Kansas River	KR-3	SW251031	SW251042		10	65	4.30	2.78	0.53	0.34	12	0.39	0.25	9	0.39	0.25	9
Kansas River	KR-3	SW251042	SW251043		10	262	1.35	0.88	0.57	0.37	42	0.42	0.27	31	0.42	0.27	31
Kansas River	KR-3	SW251043	SW251044		10	164	1.71	1.11	0.64	0.41	37	0.46	0.30	27	0.46	0.30	27
Kansas River	KR-3	SW251044	SW251047		10	241	1.41	0.91	0.67	0.43	48	0.49	0.32	35	0.49	0.32	35
Kansas River	KR-3	SW251047	SW251053		10	363	1.26	0.81	0.71	0.46	56	0.53	0.34	42	0.53	0.34	42
Kansas River	KR-3	SW251053	SW251054		10	211	1.35	0.87	0.74	0.48	55	0.57	0.37	42	0.57	0.37	42
Kansas River	KR-3	SW251054	SW251060		8	339	0.66	0.42	0.74	0.48	113	0.60	0.39	91	0.60	0.39	91
Kansas River	KR-3	SW251060	SW251065		8	303	0.98	0.63	0.78	0.50	79	0.60	0.39	61	0.60	0.39	61
Kansas River	KR-3	SW251065	SW25072A		8	190	1.75	1.13	0.81	0.52	46	0.64	0.41	36	0.64	0.41	36
Kansas River	KR-3	SW251078	SW25179A		12	116	1.72	1.11	0.85	0.55	49	0.60	0.39	35	0.60	0.39	35
Kansas River	KR-3	SW251080	SE251235		12	380	4.65	3.00	0.74	0.48	16	0.53	0.34	11	0.53	0.34	11
Kansas River	KR-3	SW251081	SW251080		12	410	4.65	3.00	0.67	0.43	14	0.49	0.32	11	0.49	0.32	11
Kansas River	KR-3	SW251082	SW251081		12	248	4.64	3.00	0.64	0.41	14	0.46	0.30	10	0.46	0.30	10
Kansas River	KR-3	SW251099	SW251119		12	320	4.64	3.00	1.13	0.73	24	0.81	0.52	17	0.81	0.52	17
Kansas River	KR-3	SW251119	SW251120		12	335	4.56	2.95	1.17	0.75	26	0.85	0.55	19	0.85	0.55	19
Kansas River	KR-3	SW251120	SW251125		12	156	2.80	1.81	1.20	0.78	43	0.88	0.57	32	0.88	0.57	32
Kansas River	KR-3	SW251125	NE251128		12	197	3.55	2.30	1.24	0.80	35	0.92	0.59	26	0.92	0.59	26
Kansas River	KR-3	SW251234	SW251025		10	83	2.41	1.55	0.42	0.27	18	0.32	0.21	13	0.32	0.21	13
Kansas River	KR-3	SW25170A	SW251099		12	285	4.45	2.88	1.10	0.71	25	0.78	0.50	17	0.78	0.50	17
Kansas River	KR-3	SW25171A	SW25170A		12	221	5.36	3.46	1.02	0.66	19	0.74	0.48	14	0.74	0.48	14
Kansas River	KR-3	SW25172A	SW25171A		12	95	4.81	3.11	0.99	0.64	21	0.71	0.46	15	0.71	0.46	15
Kansas River	KR-3	SW25173A	SW25172A		12	88	4.35	2.81	0.92	0.59	21	0.67	0.43	15	0.67	0.43	15
Kansas River	KR-3	SW25178A	SW251019		10	171	1.68	1.08	0.25	0.16	15	0.42	0.27	25	0.42	0.27	25
Kansas River	KR-3	SW25178A	SW251082		12	84	6.35	4.11	0.57	0.37	9	0.42	0.27	7	0.42	0.27	7
Kansas River	KR-3	SW25179A	SW25173A		12	176	5.47	3.53	0.88	0.57	16	0.64	0.41	12	0.64	0.41	12
Kansas River	KR-4	NE251157	NE251158		30	242	17.89	11.56	4.52	2.92	25	5.47	3.54	31	7.95	5.14	44
Kansas River	KR-4	NE251158	NE251172		30	451	14.19	9.17	4.56	2.94	32	5.47	3.54	39	7.95	5.14	56
Kansas River	KR-4	NE251159	NE251157		30	305	15.93	10.30	4.52	2.92	28	5.47	3.54	34	7.95	5.14	50
Kansas River	KR-4	NE251160	NE251159		30	306	22.25	14.38	4.52	2.92	20	5.47	3.54	25	7.95	5.14	36
Kansas River	KR-4	NE251161	NE251160		30	532	14.77	9.55	4.52	2.92	31	5.47	3.54	37	7.95	5.14	54

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Kansas River	KR-4	NE251162	NE251161		30	200	14.50	9.37	4.48	2.90	31	5.44	3.52	37	7.95	5.14	55
Kansas River	KR-4	NE251172	NE251218		30	75	14.21	9.19	4.56	2.94	32	5.47	3.54	39	7.95	5.14	56
Kansas River	KR-4	NE251212	NE251213		30	536	13.95	9.02	5.97	3.86	43	7.98	5.16	57	13.21	8.54	95
Kansas River	KR-4	NE251213	NE251214		30	300	14.01	9.06	5.93	3.83	42	7.95	5.14	57	13.10	8.47	93
Kansas River	KR-4	NE251214	NE251215		30	314	14.08	9.10	5.90	3.81	42	7.91	5.11	56	13.07	8.45	93
Kansas River	KR-4	NE251215	NE251216		30	244	14.15	9.14	5.90	3.81	42	7.91	5.11	56	13.03	8.42	92
Kansas River	KR-4	NE251216	NE251217		30	448	5.49	3.55	5.86	3.79	107	7.87	5.09	143	12.96	8.38	236
Kansas River	KR-4	NE251217	SE251099		30	492	14.91	9.64	5.83	3.77	39	7.77	5.02	52	12.75	8.24	85
Kansas River	KR-4	NE251218	SE251219		30	304	14.12	9.12	4.56	2.94	32	5.47	3.54	39	7.95	5.14	56
Kansas River	KR-4	NE361004	NE361122		12	194	7.37	4.76	1.02	0.66	14	0.92	0.59	12	0.92	0.59	12
Kansas River	KR-4	NE361009	NE361225		12	144	10.07	6.51	1.62	1.05	16	1.45	0.94	14	1.45	0.94	14
Kansas River	KR-4	NE361012	NW36109A		12	192	3.10	2.00	1.48	0.96	48	1.31	0.84	42	1.31	0.84	42
Kansas River	KR-4	NE361030	NE361031		8	330	0.99	0.64	0.14	0.09	14	0.14	0.09	14	0.14	0.09	14
Kansas River	KR-4	NE361031	NE361034		8	331	0.99	0.64	0.28	0.18	28	0.25	0.16	25	0.25	0.16	25
Kansas River	KR-4	NE361034	NE361036		8	330	1.00	0.64	0.42	0.27	43	0.39	0.25	39	0.39	0.25	39
Kansas River	KR-4	NE361036	NE361039		8	330	0.99	0.64	0.60	0.39	61	0.53	0.34	54	0.53	0.34	54
Kansas River	KR-4	NE361039	NW312002		8	328	1.00	0.65	0.74	0.48	74	0.67	0.43	67	0.67	0.43	67
Kansas River	KR-4	NE361121	NE361012		12	441	5.22	3.38	1.34	0.87	26	1.20	0.78	23	1.20	0.78	23
Kansas River	KR-4	NE361122	NE361121		12	422	5.44	3.51	1.20	0.78	22	1.06	0.68	19	1.06	0.68	19
Kansas River	KR-4	NE361225	NE361004		12	233	6.93	4.48	0.88	0.57	13	0.78	0.50	11	0.78	0.50	11
Kansas River	KR-4	NW36109A	SW251189		12	320	3.97	2.57	1.62	1.05	41	1.45	0.94	36	1.45	0.94	36
Kansas River	KR-4	NW361100	NW36112A		12	348	3.57	2.31	1.17	0.75	33	1.06	0.68	30	1.06	0.68	30
Kansas River	KR-4	NW361101	NW361100		12	160	3.67	2.37	1.02	0.66	28	0.92	0.59	25	0.92	0.59	25
Kansas River	KR-4	NW361102	NW361101		12	318	6.28	4.06	0.42	0.27	7	0.39	0.25	6	0.39	0.25	6
Kansas River	KR-4	NW361103	NW361102		12	130	4.18	2.70	0.28	0.18	7	0.25	0.16	6	0.25	0.16	6
Kansas River	KR-4	NW361104	NW361103		12	82	4.18	2.70	0.14	0.09	3	0.14	0.09	3	0.14	0.09	3
Kansas River	KR-4	NW361114	NW361101		12	79	10.22	6.61	0.42	0.27	4	0.39	0.25	4	0.39	0.25	4
Kansas River	KR-4	NW361115	NW361114		12	373	4.74	3.06	0.28	0.18	6	0.25	0.16	5	0.25	0.16	5
Kansas River	KR-4	NW361124	NE361009		12	65	4.96	3.21	1.48	0.96	30	1.31	0.84	26	1.31	0.84	26
Kansas River	KR-4	NW36112A	NW361124		12	325	4.15	2.68	1.31	0.84	31	1.20	0.78	29	1.20	0.78	29
Kansas River	KR-4	SE25-057	SE251056		10	257	1.37	0.88	0.60	0.39	44	0.53	0.34	39	0.53	0.34	39
Kansas River	KR-4	SE251016	SE251017		8	279	1.62	1.05	0.14	0.09	9	0.14	0.09	9	0.14	0.09	9
Kansas River	KR-4	SE251017	SE251018		10	250	5.04	3.25	0.28	0.18	6	0.25	0.16	5	0.25	0.16	5
Kansas River	KR-4	SE251018	SE25-057		10	180	1.46	0.94	0.42	0.27	29	0.39	0.25	27	0.39	0.25	27
Kansas River	KR-4	SE251022	SE251024		15	398	4.13	2.67	3.14	2.03	76	2.72	1.76	66	2.72	1.76	66
Kansas River	KR-4	SE251024	SE251065		15	450	4.03	2.60	3.21	2.08	80	2.79	1.80	69	2.79	1.80	69
Kansas River	KR-4	SE251045	SE251114		10	169	2.31	1.49	1.73	1.12	75	1.70	1.10	74	1.70	1.10	74
Kansas River	KR-4	SE251046	SE251045		10	115	2.40	1.55	1.59	1.03	66	1.59	1.03	66	1.55	1.00	65

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Kansas River	KR-4	SE251047	SE251046		10	334	1.02	0.66	1.45	0.94	142	1.45	0.94	142	1.45	0.94	142
Kansas River	KR-4	SE251048	SE251047		10	141	1.24	0.80	1.31	0.84	105	1.31	0.84	105	1.31	0.84	105
Kansas River	KR-4	SE251049	SE251048		10	181	1.48	0.95	1.24	0.80	84	1.20	0.78	81	1.20	0.78	81
Kansas River	KR-4	SE251051	SE251049		10	56	1.21	0.78	1.13	0.73	94	1.06	0.68	88	1.06	0.68	88
Kansas River	KR-4	SE251053	SE251051		10	140	1.23	0.79	1.02	0.66	83	0.92	0.59	75	0.92	0.59	75
Kansas River	KR-4	SE251054	SE251053		10	179	1.25	0.81	0.88	0.57	71	0.78	0.50	62	0.78	0.50	62
Kansas River	KR-4	SE251056	SE251054		10	47	3.20	2.07	0.74	0.48	23	0.67	0.43	21	0.67	0.43	21
Kansas River	KR-4	SE251065	SE251066		15	410	8.34	5.39	3.25	2.10	39	2.83	1.83	34	2.83	1.83	34
Kansas River	KR-4	SE251066	SE251067		15	410	8.34	5.39	3.32	2.15	40	2.86	1.85	34	2.86	1.85	34
Kansas River	KR-4	SE251067	SE251073		15	410	8.34	5.39	3.39	2.19	41	2.93	1.89	35	2.93	1.89	35
Kansas River	KR-4	SE251073	SE251085		15	396	5.98	3.86	3.46	2.24	58	3.00	1.94	50	3.00	1.94	50
Kansas River	KR-4	SE251081	SE251242		8	20	1.35	0.87	0.00	0.00	0	3.50	2.26	259	3.50	2.26	259
Kansas River	KR-4	SE251081	SW302171		18	301	9.59	6.20	4.87	3.15	51	3.50	2.26	36	3.50	2.26	36
Kansas River	KR-4	SE251085	SE251228		18	105	9.73	6.29	3.50	2.26	36	3.04	1.96	31	3.04	1.96	31
Kansas River	KR-4	SE251099	SW302098		30	251	15.10	9.76	5.79	3.74	38	7.73	5.00	51	12.68	8.19	84
Kansas River	KR-4	SE251110	SE251242		10	49	1.71	1.11	2.01	1.30	117	2.05	1.32	119	2.05	1.32	119
Kansas River	KR-4	SE251114	SE251244		10	445	1.98	1.28	1.84	1.19	93	1.84	1.19	93	1.84	1.19	93
Kansas River	KR-4	SE251219	SE251221		30	111	13.49	8.72	4.56	2.94	34	5.47	3.54	41	7.95	5.14	59
Kansas River	KR-4	SE251221	SW302198		30	251	10.98	7.10	4.59	2.97	42	5.51	3.56	50	7.95	5.14	72
Kansas River	KR-4	SE251228	SE251081		18	187	9.69	6.26	3.57	2.31	37	3.11	2.01	32	3.11	2.01	32
Kansas River	KR-4	SE251242	SE251243		10	11	3.10	2.00	1.06	0.68	34	1.84	1.19	59	1.84	1.19	59
Kansas River	KR-4	SE251243	SE251254		10	138	1.15	0.74	1.17	0.75	101	1.98	1.28	172	1.98	1.28	172
Kansas River	KR-4	SE251244	SE251110		10	29	1.52	0.98	1.91	1.23	125	1.94	1.26	128	1.91	1.23	125
Kansas River	KR-4	SE251254	SE302105		10	334	1.20	0.78	1.24	0.80	103	2.08	1.35	174	2.08	1.35	174
Kansas River	KR-4	SE302105	SW302132		10	336	0.91	0.59	1.34	0.87	147	2.15	1.39	237	2.15	1.39	237
Kansas River	KR-4	SW25071A	SW251069		15	238	4.19	2.71	0.99	0.64	24	0.78	0.50	19	0.78	0.50	19
Kansas River	KR-4	SW251069	SE251022		15	157	7.09	4.58	1.13	0.73	16	0.88	0.57	12	0.88	0.57	12
Kansas River	KR-4	SW251188	SE251016		8	39	1.94	1.25	0.00	0.00	0	1.73	1.12	89	1.73	1.12	89
Kansas River	KR-4	SW251188	SE251022		15	331	5.55	3.59	1.91	1.23	34	1.73	1.12	31	1.73	1.12	31
Kansas River	KR-4	SW251189	SW251188		12	320	4.00	2.59	1.77	1.14	44	1.59	1.03	40	1.59	1.03	40
Kansas River	KR-4	SW302092	SW302133		18	254	5.27	3.41	4.87	3.15	92	3.57	2.31	68	3.53	2.28	67
Kansas River	KR-4	SW302095	SW302134		30	368	14.19	9.17	5.79	3.74	41	7.70	4.98	54	12.61	8.15	89
Kansas River	KR-4	SW302096	SW302095		30	193	15.06	9.73	5.79	3.74	38	7.70	4.98	51	12.61	8.15	84
Kansas River	KR-4	SW302098	SW30297A		30	285	14.78	9.55	5.79	3.74	39	7.70	4.98	52	12.64	8.17	86
Kansas River	KR-4	SW302131	SW302132		9	455	1.58	1.02	0.14	0.09	9	0.14	0.09	9	0.14	0.09	9
Kansas River	KR-4	SW302132	SW302150		12	104	6.28	4.06	1.62	1.05	26	2.37	1.53	38	2.37	1.53	38
Kansas River	KR-4	SW302133	SW302150		18	23	3.79	2.45	4.91	3.17	129	3.60	2.33	95	3.57	2.31	94
Kansas River	KR-4	SW302134	SW302136		30	439	15.90	10.28	9.18	5.93	58	9.99	6.46	63	14.16	9.15	89

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Kansas River	KR-4	SW302135	SW302017		12	587	1.85	1.20	0.14	0.09	8	0.14	0.09	8	0.14	0.09	8
Kansas River	KR-4	SW302136	SW302141		30	53	56.07	36.24	9.18	5.93	16	9.99	6.46	18	14.20	9.18	25
Kansas River	KR-4	SW302137	SW302138		30	135	15.79	10.20	4.63	2.99	29	5.51	3.56	35	7.95	5.14	50
Kansas River	KR-4	SW302138	SW302139		30	140	12.50	8.08	4.66	3.01	37	5.54	3.58	44	7.98	5.16	64
Kansas River	KR-4	SW302139	SW302140		30	217	18.26	11.81	4.66	3.01	26	5.54	3.58	30	7.98	5.16	44
Kansas River	KR-4	SW302140	SW302141		30	67	47.28	30.56	4.70	3.04	10	5.58	3.61	12	8.02	5.18	17
Kansas River	KR-4	SW302141	SW302142		60	15	232.98	150.60	12.92	8.35	6	14.83	9.59	6	22.35	14.45	10
Kansas River	KR-4	SW302142	PS_16		60	29	174.40	112.74	12.96	8.38	7	14.87	9.61	9	22.56	14.59	13
Kansas River	KR-4	SW302150	SW302135		12	538	1.97	1.27	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Kansas River	KR-4	SW302150	SW302134		24	52	63.53	41.07	6.50	4.20	10	0.00	0.00	0	0.00	0.00	0
Kansas River	KR-4	SW302171	SW302092		18	330	5.46	3.53	4.87	3.15	89	3.57	2.31	65	3.53	2.28	65
Kansas River	KR-4	SW302195	SW302137		30	337	14.83	9.58	4.63	2.99	31	5.51	3.56	37	7.95	5.14	54
Kansas River	KR-4	SW302196	SW302195		30	201	14.76	9.54	4.59	2.97	31	5.51	3.56	37	7.95	5.14	54
Kansas River	KR-4	SW302197	SW302196		30	231	12.66	8.18	4.59	2.97	36	5.51	3.56	44	7.95	5.14	63
Kansas River	KR-4	SW302198	SW302197		30	279	11.52	7.45	4.59	2.97	40	5.51	3.56	48	7.95	5.14	69
Kansas River	KR-4	SW30297A	SW302096		30	226	14.69	9.50	5.79	3.74	39	7.70	4.98	52	12.61	8.15	86
Kansas River	KR-4	SW36145A	NW361115		12	346	9.87	6.38	0.14	0.09	1	0.14	0.09	1	0.14	0.09	1
Kansas River	KR-5	NE062001	SE312034		24	425	10.35	6.69	13.28	8.58	128	13.74	8.88	133	13.10	8.47	127
Kansas River	KR-5	NE062002	NE062001		24	493	16.68	10.78	13.28	8.58	80	13.74	8.88	82	13.10	8.47	79
Kansas River	KR-5	NE062003	NE062002		24	182	12.66	8.18	13.28	8.58	105	13.70	8.86	108	13.07	8.45	103
Kansas River	KR-5	NE062007	NE062003		24	189	14.06	9.09	13.24	8.56	94	13.70	8.86	97	13.07	8.45	93
Kansas River	KR-5	NE062016	NE062007		24	216	13.06	8.44	13.24	8.56	101	13.67	8.83	105	13.03	8.42	100
Kansas River	KR-5	NE062018	NE062016		24	198	12.25	7.92	13.21	8.54	108	13.67	8.83	112	13.03	8.42	106
Kansas River	KR-5	NE062019	NE062018		24	350	12.33	7.97	13.21	8.54	107	13.70	8.86	111	12.99	8.40	105
Kansas River	KR-5	NE062026	NE062019		24	332	26.92	17.40	13.21	8.54	49	13.70	8.86	51	12.99	8.40	48
Kansas River	KR-5	NE062028	NE062026		24	468	12.77	8.25	13.21	8.54	103	13.70	8.86	107	12.96	8.38	102
Kansas River	KR-5	NE062029	NE062028		24	159	19.66	12.71	13.21	8.54	67	16.49	10.66	84	16.67	10.77	85
Kansas River	KR-5	NE062029	NE062150		27	159	26.91	17.39	17.27	11.16	64	16.49	10.66	61	16.67	10.77	62
Kansas River	KR-5	NE062030	NE062029		27	20	27.70	17.91	18.33	11.85	66	15.61	10.09	56	17.58	11.37	63
Kansas River	KR-5	NE062090	NE062091		27	342	34.00	21.98	17.30	11.18	51	16.49	10.66	49	16.70	10.80	49
Kansas River	KR-5	NE062091	NE062092		27	538	19.94	12.89	17.34	11.21	87	16.53	10.68	83	16.74	10.82	84
Kansas River	KR-5	NE062092	NE062093		27	215	19.82	12.81	17.30	11.18	87	16.49	10.66	83	16.74	10.82	84
Kansas River	KR-5	NE062093	NE062094		27	375	19.59	12.66	17.30	11.18	88	16.49	10.66	84	16.77	10.84	86
Kansas River	KR-5	NE062094	NE062095		27	493	16.68	10.78	17.30	11.18	104	16.49	10.66	99	16.77	10.84	101
Kansas River	KR-5	NE062095	SE312082		30	416	26.30	17.00	17.30	11.18	66	16.49	10.66	63	16.77	10.84	64
Kansas River	KR-5	NE062110	NE062112		15	280	3.23	2.09	0.46	0.30	14	0.39	0.25	12	0.39	0.25	12
Kansas River	KR-5	NE062111	NE062110		12	162	2.02	1.31	0.25	0.16	12	0.18	0.11	9	0.18	0.11	9
Kansas River	KR-5	NE062112	NE062113		15	300	5.35	3.46	0.71	0.46	13	0.57	0.37	11	0.57	0.37	11

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	(mgd)	Year 2000 10-year Peak Flow (cfs)	(mgd)	% Util.	Year 2010 10-Year Peak Flow (cfs)	(mgd)	% Util.	Year 2025 10-Year Peak Flow (cfs)	(mgd)	% Util.
Kansas River	KR-5	NE062113	NE062114		15	307	5.34	3.45	0.92	0.59	17	0.74	0.48	14	0.74	0.48	14
Kansas River	KR-5	NE062114	NE062115		24	455	17.72	11.45	6.89	4.45	39	6.11	3.95	34	6.29	4.06	35
Kansas River	KR-5	NE062115	NE062116		24	469	17.67	11.42	6.92	4.47	39	6.14	3.97	35	6.32	4.09	36
Kansas River	KR-5	NE062116	NE06295A		24	321	17.63	11.40	6.92	4.47	39	6.18	3.99	35	6.36	4.11	36
Kansas River	KR-5	NE062144	NE062030		27	48	29.32	18.95	18.29	11.82	62	15.57	10.07	53	17.55	11.34	60
Kansas River	KR-5	NE062145	NE062151		24	57	24.35	15.74	6.50	4.20	27	5.83	3.77	24	6.00	3.88	25
Kansas River	KR-5	NE062150	NE062090		27	467	26.97	17.43	17.30	11.18	64	16.53	10.68	61	16.70	10.80	62
Kansas River	KR-5	NE062151	NE062152		24	357	24.77	16.01	6.57	4.25	27	5.86	3.79	24	6.04	3.90	24
Kansas River	KR-5	NE062152	NE062153		24	430	22.63	14.63	6.60	4.27	29	5.90	3.81	26	6.07	3.93	27
Kansas River	KR-5	NE062153	NE062114		24	402	17.63	11.39	6.64	4.29	38	5.93	3.83	34	6.11	3.95	35
Kansas River	KR-5	NE062159	SE312120		24	65	12.23	7.91	6.92	4.47	57	6.25	4.04	51	6.43	4.15	53
Kansas River	KR-5	NE062160	SE312080		15	39	6.46	4.18	0.25	0.16	4	0.18	0.11	3	0.18	0.11	3
Kansas River	KR-5	NE06295A	NE062159		24	233	11.86	7.67	6.82	4.41	57	6.22	4.02	52	6.39	4.13	54
Kansas River	KR-5	NE072001	SE062051		10	172	1.16	0.75	1.10	0.71	95	0.92	0.59	79	0.92	0.59	79
Kansas River	KR-5	NE072002	NE072001		10	331	1.11	0.72	0.92	0.59	83	0.74	0.48	67	0.74	0.48	67
Kansas River	KR-5	NE072003	NE072002		10	247	0.91	0.59	0.71	0.46	77	0.57	0.37	62	0.57	0.37	62
Kansas River	KR-5	NE072004	NE072003		10	176	1.07	0.69	0.46	0.30	43	0.39	0.25	36	0.39	0.25	36
Kansas River	KR-5	NE072005	NE072004		10	79	1.44	0.93	0.25	0.16	17	0.18	0.11	12	0.18	0.11	12
Kansas River	KR-5	NE072010	SE062049		24	449	25.13	16.25	23.09	14.93	92	22.88	14.79	91	22.92	14.81	91
Kansas River	KR-5	NE072011	NE072010		24	449	26.15	16.91	23.09	14.93	88	22.85	14.77	87	22.88	14.79	87
Kansas River	KR-5	NE312016	NE312089		12	690	1.27	0.82	2.54	1.64	201	3.28	2.12	260	2.40	1.55	190
Kansas River	KR-5	NE312017	NE312016		12	291	1.25	0.81	2.33	1.51	186	3.28	2.12	262	2.26	1.46	180
Kansas River	KR-5	NE312020	NE312017		12	154	2.87	1.86	2.12	1.37	74	3.25	2.10	113	2.08	1.35	73
Kansas River	KR-5	NE312021	NE312020		12	154	1.25	0.81	2.05	1.32	164	3.25	2.10	260	2.01	1.30	161
Kansas River	KR-5	NE312022	NE312021		12	50	1.33	0.86	2.01	1.30	151	3.21	2.08	241	1.98	1.28	148
Kansas River	KR-5	NE312023	NE312026		30	451	27.99	18.09	11.48	7.42	41	9.15	5.91	33	9.75	6.30	35
Kansas River	KR-5	NE312026	NE312028		30	369	28.01	18.10	11.51	7.44	41	9.22	5.96	33	9.78	6.32	35
Kansas River	KR-5	NE312028	NW322029		30	192	27.93	18.05	11.55	7.46	41	9.29	6.00	33	9.82	6.35	35
Kansas River	KR-5	NE312036	NW322011		27	320	43.49	28.12	6.85	4.43	16	7.10	4.59	16	14.62	9.45	34
Kansas River	KR-5	NE312037	NE312036		27	315	18.80	12.15	6.92	4.47	37	7.10	4.59	38	14.65	9.47	78
Kansas River	KR-5	NE312038	NE312120		21	427	13.08	8.46	10.81	6.98	83	10.52	6.80	80	10.03	6.48	77
Kansas River	KR-5	NE312074	NE312100		34	320	44.25	28.60	12.57	8.13	28	10.66	6.89	24	10.38	6.71	23
Kansas River	KR-5	NE312075	NE312074		34	175	52.14	33.70	12.54	8.10	24	10.63	6.87	20	10.35	6.69	20
Kansas River	KR-5	NE312076	NE312075		34	695	45.42	29.36	10.49	6.78	23	8.90	5.75	20	8.65	5.59	19
Kansas River	KR-5	NE312077	NE312076		24	668	17.94	11.60	5.16	3.33	29	4.70	3.04	26	4.38	2.83	24
Kansas River	KR-5	NE312081	SE302102		24	324	35.17	22.74	16.84	10.89	48	16.88	10.91	48	24.15	15.61	69
Kansas River	KR-5	NE312082	NE312083		27	204	19.40	12.54	7.77	5.02	40	7.10	4.59	37	15.08	9.75	78
Kansas River	KR-5	NE312083	NE312084		27	512	18.87	12.20	7.63	4.93	40	7.13	4.61	38	15.08	9.75	80

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
							(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Kansas River	KR-5	NE312084	NE312085		27	425	19.06	12.32	7.24	4.68	38	7.13	4.61	37	14.97	9.68	79
Kansas River	KR-5	NE312085	NE312037		27	437	18.86	12.19	7.06	4.56	37	7.13	4.61	38	14.80	9.56	78
Kansas River	KR-5	NE312087	NE312038		21	518	9.80	6.33	10.84	7.01	111	10.56	6.82	108	10.03	6.48	102
Kansas River	KR-5	NE312087	NE312107		21	200	14.61	9.44	11.41	7.37	78	10.56	6.82	72	10.03	6.48	69
Kansas River	KR-5	NE312088	NE312123		21	116	7.06	4.56	6.43	4.15	91	9.68	6.25	137	7.27	4.70	103
Kansas River	KR-5	NE312088	NE312122		34	19	52.56	33.97	8.33	5.39	16	9.68	6.25	18	7.27	4.70	14
Kansas River	KR-5	NE312089	NE312088		34	26	47.66	30.81	14.69	9.50	31	13.91	8.99	29	12.64	8.17	27
Kansas River	KR-5	NE312090	NE312089		34	157	44.08	28.50	12.82	8.29	29	10.84	7.01	25	10.59	6.85	24
Kansas River	KR-5	NE312092	NE312090		34	119	41.01	26.51	12.78	8.26	31	10.81	6.98	26	10.56	6.82	26
Kansas River	KR-5	NE312093	NE312092		34	68	46.07	29.78	12.71	8.22	28	10.77	6.96	23	10.49	6.78	23
Kansas River	KR-5	NE312099	NE312093		34	140	53.47	34.56	12.68	8.19	24	10.73	6.94	20	10.45	6.76	20
Kansas River	KR-5	NE312100	NE312099		34	330	46.23	29.88	12.61	8.15	27	10.70	6.92	23	10.42	6.73	23
Kansas River	KR-5	NE312104	NE312105		21	507	6.90	4.46	8.09	5.23	117	9.60	6.21	139	9.00	5.82	131
Kansas River	KR-5	NE312105	NE312123		21	474	12.46	8.05	7.87	5.09	63	9.60	6.21	77	9.04	5.84	73
Kansas River	KR-5	NE312107	NE312108		21	495	9.34	6.04	11.23	7.26	120	12.96	8.38	139	10.95	7.08	117
Kansas River	KR-5	NE312108	NW322109		21	495	9.34	6.04	11.26	7.28	121	12.89	8.33	138	10.98	7.10	118
Kansas River	KR-5	NE312109	NE312110		36	79	45.65	29.51	19.70	12.74	43	19.39	12.53	42	19.00	12.28	42
Kansas River	KR-5	NE312110	NE312111		36	227	45.15	29.18	19.70	12.74	44	19.42	12.55	43	19.00	12.28	42
Kansas River	KR-5	NE312111	NE312112		36	254	45.27	29.26	19.74	12.76	44	19.42	12.55	43	19.03	12.30	42
Kansas River	KR-5	NE312112	NE312113		36	229	45.39	29.34	19.77	12.78	44	19.42	12.55	43	19.07	12.33	42
Kansas River	KR-5	NE312113	NW322105		36	212	45.36	29.32	19.77	12.78	44	19.46	12.58	43	19.07	12.33	42
Kansas River	KR-5	NE312120	NW322035		21	210	13.12	8.48	10.84	7.01	83	10.52	6.80	80	10.06	6.50	77
Kansas River	KR-5	NE312122	NE312087		21	116	6.07	3.92	8.40	5.43	139	9.71	6.28	160	7.31	4.72	120
Kansas River	KR-5	NE312123	NE312087		21	12	14.47	9.35	13.63	8.81	94	13.74	8.88	95	13.74	8.88	95
Kansas River	KR-5	NE361066	NE361072		10	340	3.82	2.47	1.41	0.91	37	1.24	0.80	32	1.24	0.80	32
Kansas River	KR-5	NE361067	NE361066		10	325	1.72	1.11	1.20	0.78	70	1.02	0.66	60	1.02	0.66	60
Kansas River	KR-5	NE361072	NE361075		10	325	2.83	1.83	1.66	1.07	59	1.41	0.91	50	1.41	0.91	50
Kansas River	KR-5	NE361075	NE361082		24	151	20.99	13.57	2.79	1.80	13	2.33	1.51	11	2.33	1.51	11
Kansas River	KR-5	NE361076	NE361075		18	630	3.72	2.40	0.92	0.59	25	0.74	0.48	20	0.74	0.48	20
Kansas River	KR-5	NE361077	NE361076		18	324	8.99	5.81	0.71	0.46	8	0.57	0.37	6	0.57	0.37	6
Kansas River	KR-5	NE361079	NE361077		18	190	10.86	7.02	0.46	0.30	4	0.39	0.25	4	0.39	0.25	4
Kansas River	KR-5	NE361080	NE361079		18	50	5.36	3.46	0.25	0.16	5	0.18	0.11	3	0.18	0.11	3
Kansas River	KR-5	NE361082	NE361085		24	179	40.23	26.01	3.04	1.96	8	2.51	1.62	6	2.51	1.62	6
Kansas River	KR-5	NE361085	NE361090		24	108	46.59	30.12	3.25	2.10	7	2.72	1.76	6	2.72	1.76	6
Kansas River	KR-5	NE361089	NE361107		24	165	51.32	33.17	3.71	2.40	7	3.07	1.99	6	3.07	1.99	6
Kansas River	KR-5	NE361090	NE361089		24	57	50.32	32.53	3.50	2.26	7	2.90	1.87	6	2.90	1.87	6
Kansas River	KR-5	NE361107	NE361230		24	330	22.86	14.78	3.96	2.56	17	3.25	2.10	14	3.25	2.10	14
Kansas River	KR-5	NE361225	NE361067		12	352	7.39	4.78	0.95	0.62	13	0.78	0.50	11	0.78	0.50	11

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Kansas River	KR-5	NE361230	NW312005		24	330	15.66	10.12	4.17	2.69	27	3.43	2.21	22	3.43	2.21	22
Kansas River	KR-5	NW062004	NW062203		12	24	11.27	7.28	0.25	0.16	2	0.18	0.11	2	0.18	0.11	2
Kansas River	KR-5	NW062005	NW062006		12	50	9.47	6.12	0.92	0.59	10	0.74	0.48	8	0.74	0.48	8
Kansas River	KR-5	NW062006	NW062007		12	139	9.43	6.10	1.17	0.75	12	0.95	0.62	10	0.95	0.62	10
Kansas River	KR-5	NW062007	NW062008		12	240	9.47	6.12	1.38	0.89	15	1.13	0.73	12	1.13	0.73	12
Kansas River	KR-5	NW062008	NW062009		12	210	9.47	6.12	1.62	1.05	17	1.31	0.84	14	1.31	0.84	14
Kansas River	KR-5	NW062009	NW062017		12	340	3.28	2.12	2.08	1.35	64	1.70	1.10	52	1.70	1.10	52
Kansas River	KR-5	NW062011	NW062009		12	593	4.90	3.17	0.25	0.16	5	0.18	0.11	4	0.18	0.11	4
Kansas River	KR-5	NW062017	NW062206		12	20	3.29	2.12	2.30	1.48	70	1.87	1.21	57	1.87	1.21	57
Kansas River	KR-5	NW062024	NW062049		12	331	1.31	0.85	1.06	0.68	81	1.77	1.14	134	1.13	0.73	86
Kansas River	KR-5	NW062034	NW062070		12	380	2.88	1.86	2.97	1.92	103	1.80	1.16	63	2.23	1.44	77
Kansas River	KR-5	NW062035	NW062034		12	285	2.99	1.93	2.93	1.89	98	1.70	1.10	57	2.19	1.41	73
Kansas River	KR-5	NW062036	NW062035		12	275	3.00	1.94	2.79	1.80	93	1.55	1.00	52	2.12	1.37	71
Kansas River	KR-5	NW062037	NW062036		12	465	1.77	1.15	2.61	1.69	147	1.48	0.96	84	2.15	1.39	122
Kansas River	KR-5	NW062049	NW062050		8	330	0.71	0.46	0.99	0.64	139	1.80	1.16	253	0.99	0.64	139
Kansas River	KR-5	NW062050	NW062053		8	155	1.32	0.85	1.17	0.75	88	1.73	1.12	131	1.10	0.71	83
Kansas River	KR-5	NW062053	NW062071		10	570	0.73	0.47	1.38	0.89	189	1.91	1.23	262	1.24	0.80	170
Kansas River	KR-5	NW062064	NW062076		12	357	2.73	1.77	2.54	1.64	93	2.23	1.44	81	2.26	1.46	83
Kansas River	KR-5	NW062065	NW062064		12	152	3.17	2.05	2.47	1.60	78	2.08	1.35	66	2.33	1.51	74
Kansas River	KR-5	NW062066	NW062065		12	255	2.94	1.90	2.58	1.67	88	1.98	1.28	67	2.33	1.51	79
Kansas River	KR-5	NW062070	NW062066		12	366	2.89	1.87	2.90	1.87	100	1.91	1.23	66	2.30	1.48	79
Kansas River	KR-5	NW062071	NW062072	KR-5-2	10	645	1.00	0.64	1.59	1.03	160	1.94	1.26	195	1.41	0.91	142
Kansas River	KR-5	NW062072	NW062207		10	356	1.90	1.23	0.99	0.64	52	0.85	0.55	45	0.71	0.46	37
Kansas River	KR-5	NW062072	SW312069		10	356	1.46	0.95	1.10	0.71	75	0.85	0.55	58	0.71	0.46	48
Kansas River	KR-5	NW062076	SE312006		12	457	3.38	2.19	3.43	2.21	101	3.53	2.28	104	3.32	2.15	98
Kansas River	KR-5	NW062077	NW062076		12	180	6.90	4.46	0.46	0.30	7	0.39	0.25	6	0.39	0.25	6
Kansas River	KR-5	NW062078	NW062076		12	373	1.89	1.22	1.41	0.91	75	1.27	0.82	67	1.27	0.82	67
Kansas River	KR-5	NW062079	NW062078		12	275	2.07	1.34	1.34	0.87	65	1.10	0.71	53	1.10	0.71	53
Kansas River	KR-5	NW062080	NW062079		12	280	2.00	1.29	1.13	0.73	57	0.92	0.59	46	0.92	0.59	46
Kansas River	KR-5	NW062081	NW062080		12	262	1.60	1.04	0.92	0.59	57	0.74	0.48	46	0.74	0.48	46
Kansas River	KR-5	NW062084	NW062081		12	189	2.26	1.46	0.71	0.46	31	0.57	0.37	25	0.57	0.37	25
Kansas River	KR-5	NW062087	NW062084		12	360	1.67	1.08	0.46	0.30	28	0.39	0.25	23	0.39	0.25	23
Kansas River	KR-5	NW062089	NW062087		12	352	2.12	1.37	0.25	0.16	12	0.18	0.11	8	0.18	0.11	8
Kansas River	KR-5	NW062203	NW062204		12	93	9.49	6.14	0.46	0.30	5	0.39	0.25	4	0.39	0.25	4
Kansas River	KR-5	NW062204	NW062005		12	30	9.45	6.11	0.71	0.46	7	0.57	0.37	6	0.57	0.37	6
Kansas River	KR-5	NW062205	NW062077		12	200	6.55	4.23	0.25	0.16	4	0.18	0.11	3	0.18	0.11	3
Kansas River	KR-5	NW062206	NW062211		12	138	3.27	2.11	2.51	1.62	77	2.05	1.32	63	2.05	1.32	63
Kansas River	KR-5	NW062207	SW312064		10	419	1.07	0.69	0.99	0.64	92	1.20	0.78	112	0.99	0.64	92

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Kansas River	KR-5	NW062208	NW062037		12	330	1.32	0.85	2.40	1.55	182	1.48	0.96	113	2.01	1.30	153
Kansas River	KR-5	NW062209	NW062208		12	193	2.98	1.93	2.26	1.46	76	1.38	0.89	46	2.01	1.30	68
Kansas River	KR-5	NW062211	NW062212		12	323	2.54	1.64	2.65	1.71	104	2.26	1.46	89	2.26	1.46	89
Kansas River	KR-5	NW062212	NW062213		12	299	2.62	1.69	2.61	1.69	100	2.44	1.57	93	2.40	1.55	92
Kansas River	KR-5	NW062213	NW062024		12	193	3.09	2.00	1.27	0.82	41	1.34	0.87	43	1.94	1.26	63
Kansas River	KR-5	NW062213	NW062209		12	193	0.81	0.52	2.19	1.41	270	1.34	0.87	165	1.94	1.26	239
Kansas River	KR-5	NW312002	NW312014		8	329	1.95	1.26	0.95	0.62	49	0.85	0.55	44	0.85	0.55	44
Kansas River	KR-5	NW312005	NW312011		24	330	17.61	11.39	4.38	2.83	25	3.60	2.33	20	3.60	2.33	20
Kansas River	KR-5	NW312011	NW312022		24	329	18.29	11.82	4.56	2.94	25	3.74	2.42	20	3.74	2.42	20
Kansas River	KR-5	NW312014	NW312019		8	519	1.40	0.91	1.20	0.78	86	1.02	0.66	73	1.02	0.66	73
Kansas River	KR-5	NW312019	NW312020		15	639	2.15	1.39	1.73	1.12	80	1.48	0.96	69	1.48	0.96	69
Kansas River	KR-5	NW312020	NW312043		15	465	2.56	1.65	2.01	1.30	79	1.70	1.10	66	1.70	1.10	66
Kansas River	KR-5	NW312021	NW312020		15	776	10.91	7.05	0.25	0.16	2	0.18	0.11	2	0.18	0.11	2
Kansas River	KR-5	NW312022	NW312031		24	330	17.92	11.58	4.73	3.06	26	3.85	2.49	21	3.85	2.49	21
Kansas River	KR-5	NW312031	NW312045		24	338	21.91	14.16	4.84	3.13	22	3.96	2.56	18	3.96	2.56	18
Kansas River	KR-5	NW312043	NW312060		15	621	2.01	1.30	2.05	1.32	102	1.70	1.10	84	1.70	1.10	84
Kansas River	KR-5	NW312045	NW312051		24	342	23.18	14.98	4.98	3.22	21	4.06	2.63	18	4.06	2.63	18
Kansas River	KR-5	NW312051	NW312061		24	330	17.79	11.50	5.09	3.29	29	4.13	2.67	23	4.13	2.67	23
Kansas River	KR-5	NW312056	NW312069		24	426	39.52	25.55	16.67	10.77	42	16.63	10.75	42	24.12	15.59	61
Kansas River	KR-5	NW312060	NE312075		15	584	4.33	2.80	2.05	1.32	47	1.73	1.12	40	1.73	1.12	40
Kansas River	KR-5	NW312061	NW312067		24	330	24.60	15.90	5.19	3.36	21	4.20	2.72	17	4.20	2.72	17
Kansas River	KR-5	NW312067	NE312076		26	165	27.92	18.05	5.30	3.42	19	4.27	2.76	15	4.27	2.76	15
Kansas River	KR-5	NW312069	NE312081		24	400	38.58	24.94	16.77	10.84	43	16.95	10.96	44	24.19	15.63	63
Kansas River	KR-5	NW322002	WWTP		54	30	134.36	86.85	74.75	48.32	56	71.72	46.36	53	86.76	56.08	65
Kansas River	KR-5	NW322003	NW322002		48	22	53.06	34.30	52.26	33.78	98	47.00	30.38	89	56.50	36.52	106
Kansas River	KR-5	NW322004	NW322002		36	67	58.20	37.62	22.14	14.31	38	23.59	15.25	41	23.59	15.25	41
Kansas River	KR-5	NW322005	NW322071		18	15	5.43	3.51	4.45	2.88	82	4.52	2.92	83	4.56	2.94	84
Kansas River	KR-5	NW322010	NW32236A		30	14	24.51	15.85	11.72	7.58	48	11.97	7.74	49	12.29	7.94	50
Kansas River	KR-5	NW322011	NW322012		36	266	12.26	7.93	-4.48	-2.90	-37	-3.28	-2.12	-27	-2.15	-1.39	-18
Kansas River	KR-5	NW322011	NW32236C		36	266	35.18	22.74	9.68	6.25	27	-3.28	-2.12	-9	-2.15	-1.39	-6
Kansas River	KR-5	NW322012	NW322010		30	255	24.51	15.84	11.69	7.56	48	11.97	7.74	49	12.29	7.94	50
Kansas River	KR-5	NW322013	NW322034		36	13	32.05	20.72	19.84	12.83	62	19.46	12.58	61	19.14	12.37	60
Kansas River	KR-5	NW322023	NW322025		21	280	11.04	7.14	8.02	5.18	73	6.67	4.31	60	7.03	4.54	64
Kansas River	KR-5	NW322025	NW322027		21	452	11.08	7.16	8.05	5.20	73	6.82	4.41	62	7.10	4.59	64
Kansas River	KR-5	NW322027	NW322029		21	234	11.06	7.15	8.09	5.23	73	6.92	4.47	63	7.13	4.61	64
Kansas River	KR-5	NW322029	NW322031		21	90	12.39	8.01	8.09	5.23	65	9.18	5.93	74	9.68	6.25	78
Kansas River	KR-5	NW322029	NW322107		30	18	29.01	18.75	11.55	7.46	40	9.18	5.93	32	9.68	6.25	33
Kansas River	KR-5	NW322031	NW322034		21	429	10.79	6.98	8.09	5.23	75	7.27	4.70	67	7.34	4.75	68

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Kansas River	KR-5	NW322033	NW322110		48	291	77.64	50.19	0.00	0.00	0	35.20	22.76	45	36.02	23.28	46
Kansas River	KR-5	NW322033	NW322003		48	313	79.97	51.70	39.58	25.59	49	35.20	22.76	44	36.02	23.28	45
Kansas River	KR-5	NW322034	NW322109		21	282	9.44	6.10	0.00	0.00	0	26.31	17.00	279	26.38	17.05	280
Kansas River	KR-5	NW322034	NW322033		48	13	56.34	36.42	27.93	18.05	50	26.31	17.00	47	26.38	17.05	47
Kansas River	KR-5	NW322035	NW322012		30	8	35.53	22.96	14.97	9.68	42	15.22	9.84	43	14.16	9.15	40
Kansas River	KR-5	NW322070	NW322003		48	321	98.21	63.48	15.78	10.20	16	15.22	9.84	15	19.10	12.35	19
Kansas River	KR-5	NW322071	NW322004		36	251	10.31	6.67	22.14	14.31	215	24.15	15.61	234	23.13	14.95	224
Kansas River	KR-5	NW322105	NW322013		36	492	45.31	29.29	19.81	12.80	44	19.46	12.58	43	19.10	12.35	42
Kansas River	KR-5	NW322107	NW322108		30	75	28.42	18.37	11.58	7.49	41	9.32	6.03	33	9.75	6.30	34
Kansas River	KR-5	NW322108	NW322033		30	431	28.70	18.55	11.62	7.51	40	9.46	6.12	33	9.78	6.32	34
Kansas River	KR-5	NW322109	NW322035		21	81	13.52	8.74	4.20	2.72	31	4.70	3.04	35	4.20	2.72	31
Kansas River	KR-5	NW322109	NW322110		21	14	32.53	21.03	7.17	4.63	22	4.70	3.04	14	4.20	2.72	13
Kansas River	KR-5	NW322110	NW322011		36	292	16.09	10.40	0.64	0.41	4	-0.71	-0.46	-4	-2.33	-1.51	-14
Kansas River	KR-5	NW322110	NW322111		36	292	39.42	25.48	7.63	4.93	19	-0.71	-0.46	-2	-2.33	-1.51	-6
Kansas River	KR-5	NW322111	NW322070		48	35	72.84	47.09	15.75	10.18	22	15.18	9.81	21	19.07	12.33	26
Kansas River	KR-5	NW32230A			24	2	16.00	10.34	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Kansas River	KR-5	NW32236A	WEIR		24	18	14.11	9.12	0.00	0.00	0	12.04	7.78	85	12.39	8.01	88
Kansas River	KR-5	NW32236A	NW32236B		36	13	41.37	26.74	11.79	7.62	29	12.04	7.78	29	12.39	8.01	30
Kansas River	KR-5	NW32236B	NW32236D		24	16	12.65	8.18	13.38	8.65	106	15.15	9.79	120	14.05	9.08	111
Kansas River	KR-5	NW32236C	NW32236B		24	9	43.32	28.00	1.91	1.23	4	7.03	4.54	16	10.28	6.64	24
Kansas River	KR-5	NW32236C	NW32248A		24	10	12.39	8.01	8.23	5.32	66	7.03	4.54	57	10.28	6.64	83
Kansas River	KR-5	NW32236D	NW322071		24	77	13.40	8.66	13.42	8.67	100	15.18	9.81	113	14.09	9.11	105
Kansas River	KR-5	NW32248A	NW322111		48	26	79.69	51.51	8.26	5.34	10	7.06	4.56	9	10.31	6.67	13
Kansas River	KR-5	SE062031	NE062144		27	264	29.90	19.33	18.29	11.82	61	15.57	10.07	52	17.55	11.34	59
Kansas River	KR-5	SE062034	SE062031		27	379	17.57	11.36	18.29	11.82	104	15.61	10.09	89	17.55	11.34	100
Kansas River	KR-5	SE062035	SE062034		27	346	25.25	16.32	18.43	11.91	73	15.68	10.13	62	17.66	11.41	70
Kansas River	KR-5	SE062046	SE062035		27	502	29.65	19.17	13.21	8.54	45	10.49	6.78	35	12.46	8.06	42
Kansas River	KR-5	SE062047	SE062046		27	390	15.68	10.14	13.28	8.58	85	10.56	6.82	67	12.54	8.10	80
Kansas River	KR-5	SE062048	SE06247A		27	47	15.65	10.12	13.35	8.63	85	10.66	6.89	68	12.64	8.17	81
Kansas River	KR-5	SE062049	SE06249A		24	307	9.31	6.02	12.29	7.94	132	14.62	9.45	157	12.32	7.97	132
Kansas River	KR-5	SE062050	SE062049		27	394	8.97	5.80	-10.06	-6.50	-112	-8.47	-5.48	-95	-10.98	-7.10	-122
Kansas River	KR-5	SE062050	SE062048		27	394	16.37	10.58	13.52	8.74	83	-8.47	-5.48	-52	-10.98	-7.10	-67
Kansas River	KR-5	SE062051	SE062050		24	97	12.16	7.86	5.12	3.31	42	4.80	3.10	40	4.24	2.74	35
Kansas River	KR-5	SE062052	SE062051		10	226	2.47	1.60	0.92	0.59	37	0.74	0.48	30	0.74	0.48	30
Kansas River	KR-5	SE062057	SE062052		10	274	2.24	1.44	0.71	0.46	32	0.57	0.37	25	0.57	0.37	25
Kansas River	KR-5	SE062058	SE062057		10	400	1.20	0.78	0.46	0.30	38	0.39	0.25	32	0.39	0.25	32
Kansas River	KR-5	SE062085	SE062086		24	400	11.31	7.31	12.04	7.78	106	14.44	9.34	128	12.01	7.76	106
Kansas River	KR-5	SE062086	SE062087		24	490	11.15	7.21	12.04	7.78	108	14.48	9.36	130	12.01	7.76	108

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Kansas River	KR-5	SE062087	SE062088		24	403	19.72	12.74	12.08	7.81	61	14.51	9.38	74	12.04	7.78	61
Kansas River	KR-5	SE062088	SE06288A		24	107	28.60	18.49	12.11	7.83	42	14.51	9.38	51	12.04	7.78	42
Kansas River	KR-5	SE062140	SE062035		18	894	8.13	5.25	5.44	3.52	67	5.37	3.47	66	5.30	3.42	65
Kansas River	KR-5	SE06247A	SE062047		27	212	15.78	10.20	13.35	8.63	85	10.66	6.89	68	12.61	8.15	80
Kansas River	KR-5	SE06249A	SE062085		24	295	13.11	8.47	12.08	7.81	92	14.44	9.34	110	12.08	7.81	92
Kansas River	KR-5	SE06288A	SE06289A		24	215	28.58	18.47	12.11	7.83	42	14.55	9.40	51	12.08	7.81	42
Kansas River	KR-5	SE06289A	NE062029		24	337	22.05	14.25	12.15	7.85	55	14.55	9.40	66	12.08	7.81	55
Kansas River	KR-5	SE302102	NE312082		27	247	12.92	8.35	8.09	5.23	63	7.24	4.68	56	15.11	9.77	117
Kansas River	KR-5	SE302102	SE302103		21	50	17.21	11.13	8.62	5.57	50	7.24	4.68	42	15.11	9.77	88
Kansas River	KR-5	SE302103	NE312104		21	238	6.89	4.45	8.55	5.52	124	9.71	6.28	141	9.00	5.82	131
Kansas River	KR-5	SE312003	SE312007		12	536	2.71	1.75	3.28	2.12	121	3.81	2.46	141	3.18	2.05	117
Kansas River	KR-5	SE312005	SE312003		12	127	3.16	2.04	3.14	2.03	99	3.64	2.35	115	3.07	1.99	97
Kansas River	KR-5	SE312006	SE312005		12	73	2.95	1.91	3.04	1.96	103	3.57	2.31	121	2.97	1.92	101
Kansas River	KR-5	SE312007	SE312014		12	526	3.18	2.06	3.21	2.08	101	3.64	2.35	114	3.14	2.03	99
Kansas River	KR-5	SE312014	SE312022		12	125	2.04	1.32	3.25	2.10	159	3.67	2.37	180	3.00	1.94	147
Kansas River	KR-5	SE312022	SE31239A		12	206	2.02	1.30	3.32	2.15	165	3.74	2.42	186	3.07	1.99	152
Kansas River	KR-5	SE312030	SE312063		30	311	51.54	33.32	5.79	3.74	11	0.18	0.11	0	3.46	2.24	7
Kansas River	KR-5	SE312031	SE312064		18	372	14.11	9.12	2.05	1.32	15	0.49	0.32	4	1.38	0.89	10
Kansas River	KR-5	SE312032	SE312031		18	83	5.41	3.50	2.05	1.32	38	0.32	0.21	6	1.34	0.87	25
Kansas River	KR-5	SE312033	SE312085		24	90	14.70	9.50	13.31	8.61	91	13.74	8.88	93	13.14	8.49	89
Kansas River	KR-5	SE312034	SE312033		24	501	14.86	9.60	13.31	8.61	90	13.70	8.86	92	13.10	8.47	88
Kansas River	KR-5	SE312036	SE312125		15	42	6.69	4.32	3.92	2.53	59	3.81	2.46	57	3.25	2.10	49
Kansas River	KR-5	SE312038	SE312036		12	301	3.67	2.37	3.74	2.42	102	3.74	2.42	102	3.18	2.05	87
Kansas River	KR-5	SE312039	SE312038		12	278	3.68	2.38	3.57	2.31	97	3.71	2.40	101	3.14	2.03	85
Kansas River	KR-5	SE312052	NE312077		24	692	18.84	12.18	5.12	3.31	27	4.63	2.99	25	4.31	2.78	23
Kansas River	KR-5	SE312054	SE312052		24	680	12.54	8.11	3.96	2.56	32	3.92	2.53	31	3.39	2.19	27
Kansas River	KR-5	SE312057	SE312054		24	690	14.02	9.06	3.92	2.53	28	3.92	2.53	28	3.32	2.15	24
Kansas River	KR-5	SE312058	SW322220		24	153	9.15	5.91	11.19	7.24	122	13.88	8.97	152	11.09	7.17	121
Kansas River	KR-5	SE312059	SE312130		24	275	4.72	3.05	10.59	6.85	224	9.32	6.03	197	10.10	6.53	214
Kansas River	KR-5	SE312059	SE312058		24	275	9.25	5.98	11.16	7.21	121	9.32	6.03	101	10.10	6.53	109
Kansas River	KR-5	SE312060	SE312061		30	296	20.37	13.17	7.87	5.09	39	1.41	0.91	7	4.77	3.08	23
Kansas River	KR-5	SE312061	SW322218		30	105	20.02	12.94	7.91	5.11	40	1.59	1.03	8	4.77	3.08	24
Kansas River	KR-5	SE312062	SE312060		30	9	43.24	27.95	5.83	3.77	13	0.57	0.37	1	3.39	2.19	8
Kansas River	KR-5	SE312063	SE312062		30	357	10.85	7.02	5.83	3.77	54	0.39	0.25	4	3.46	2.24	32
Kansas River	KR-5	SE312064	SE312060		18	341	3.37	2.18	2.08	1.35	62	0.71	0.46	21	1.38	0.89	41
Kansas River	KR-5	SE312065	SE312127		12	100	0.62	0.40	1.91	1.23	309	12.78	8.26	2072	8.76	5.66	1419
Kansas River	KR-5	SE312065	SE312128		12	100	3.63	2.35	8.93	5.77	246	12.78	8.26	352	8.76	5.66	241
Kansas River	KR-5	SE312067	SE312151		12	349	1.27	0.82	1.94	1.26	154	3.50	2.26	276	1.94	1.26	154

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Kansas River	KR-5	SE312080	SE312081		15	317	6.46	4.18	0.46	0.30	7	0.39	0.25	6	0.39	0.25	6
Kansas River	KR-5	SE312081	SE312123		15	65	19.81	12.80	0.71	0.46	4	0.57	0.37	3	0.57	0.37	3
Kansas River	KR-5	SE312082	SE312083		30	522	26.39	17.06	17.30	11.18	66	16.49	10.66	62	16.81	10.86	64
Kansas River	KR-5	SE312083	SE312086		30	43	27.98	18.08	17.41	11.25	62	16.49	10.66	59	16.84	10.89	60
Kansas River	KR-5	SE312084	SE312086		18	58	6.90	4.46	-10.28	-6.64	-149	16.31	10.54	237	10.66	6.89	155
Kansas River	KR-5	SE312084	SE312065		18	58	8.16	5.27	10.81	6.98	132	16.31	10.54	200	10.66	6.89	131
Kansas River	KR-5	SE312085	SE312501		24	409	15.70	10.15	21.12	13.65	134	22.99	14.86	146	20.94	13.54	133
Kansas River	KR-5	SE312086	SE312126		30	17	22.25	14.38	7.77	5.02	35	9.25	5.98	42	10.38	6.71	47
Kansas River	KR-5	SE312086	SE312085		18	17	9.19	5.94	10.59	6.85	115	9.25	5.98	101	10.38	6.71	113
Kansas River	KR-5	SE312120	SE312121		24	357	12.39	8.01	6.99	4.52	56	6.29	4.06	51	6.46	4.18	52
Kansas River	KR-5	SE312121	SE312122		24	258	12.44	8.04	7.10	4.59	57	6.29	4.06	51	6.50	4.20	52
Kansas River	KR-5	SE312122	SE312123		24	11	11.82	7.64	7.17	4.63	61	6.32	4.09	53	6.53	4.22	55
Kansas River	KR-5	SE312123	SE312124		24	242	12.43	8.03	7.49	4.84	60	6.53	4.22	53	6.67	4.31	54
Kansas River	KR-5	SE312124	SE312084		24	315	12.36	7.99	7.56	4.88	61	6.60	4.27	53	6.71	4.34	54
Kansas River	KR-5	SE312125	SE312084		18	12	10.93	7.07	4.13	2.67	38	3.96	2.56	36	3.32	2.15	30
Kansas River	KR-5	SE312126	SE312032		18	15	6.07	3.92	2.01	1.30	33	0.14	0.09	2	1.34	0.87	22
Kansas River	KR-5	SE312126	SE312030		30	131	51.57	33.33	5.79	3.74	11	0.14	0.09	0	1.34	0.87	3
Kansas River	KR-5	SE312127	SE312067		12	619	1.26	0.81	1.94	1.26	154	3.57	2.31	284	1.91	1.23	152
Kansas River	KR-5	SE312128	SE312129		30	399	22.50	14.54	8.97	5.80	40	12.82	8.29	57	8.79	5.68	39
Kansas River	KR-5	SE312129	SE312130		30	62	22.10	14.29	9.00	5.82	41	12.78	8.26	58	8.79	5.68	40
Kansas River	KR-5	SE312130	SE312150		36	199	25.90	16.74	19.60	12.67	76	19.39	12.53	75	18.93	12.23	73
Kansas River	KR-5	SE312150	SE312152		36	399	25.65	16.58	19.63	12.69	77	19.35	12.51	75	18.93	12.23	74
Kansas River	KR-5	SE312151	NE312022		12	768	1.26	0.81	1.98	1.28	157	3.50	2.26	277	1.98	1.28	157
Kansas River	KR-5	SE312152	SE312154		36	254	50.75	32.80	19.63	12.69	39	19.35	12.51	38	18.96	12.26	37
Kansas River	KR-5	SE312154	NE312109		36	171	50.75	32.81	19.67	12.71	39	19.39	12.53	38	18.96	12.26	37
Kansas River	KR-5	SE31239A	SE312039		12	180	3.48	2.25	3.46	2.24	99	3.67	2.37	105	3.18	2.05	91
Kansas River	KR-5	SE312501	SE312059		24	384	15.70	10.15	21.12	13.65	134	22.99	14.86	146	20.97	13.56	134
Kansas River	KR-5	SW052059	SE062058		10	391	1.19	0.77	0.25	0.16	21	0.18	0.11	15	0.18	0.11	15
Kansas River	KR-5	SW302017	NW312019		15	590	2.91	1.88	0.39	0.25	13	0.32	0.21	11	0.32	0.21	11
Kansas River	KR-5	SW312036	SW312039		10	395	3.05	1.97	0.25	0.16	8	0.18	0.11	6	0.18	0.11	6
Kansas River	KR-5	SW312039	SW31243A		10	270	2.88	1.86	0.46	0.30	16	0.39	0.25	13	0.39	0.25	13
Kansas River	KR-5	SW312046	SW312049		12	395	4.85	3.14	0.92	0.59	19	0.74	0.48	15	0.74	0.48	15
Kansas River	KR-5	SW312049	SE312052		12	163	5.93	3.84	1.17	0.75	20	0.95	0.62	16	0.95	0.62	16
Kansas River	KR-5	SW312058	SE312057		24	164	16.57	10.71	3.74	2.42	23	3.78	2.44	23	3.18	2.05	19
Kansas River	KR-5	SW312061	SW312058	KR-5-1	12	328	3.00	1.94	3.53	2.28	118	3.67	2.37	122	3.07	1.99	102
Kansas River	KR-5	SW312063	SW312061		12	165	2.37	1.53	3.32	2.15	140	3.53	2.28	149	2.93	1.89	124
Kansas River	KR-5	SW312064	SW312063		10	667	1.37	0.88	1.91	1.23	140	2.40	1.55	176	1.73	1.12	127
Kansas River	KR-5	SW312065	SW312063		10	165	3.35	2.17	1.38	0.89	41	1.13	0.73	34	1.13	0.73	34

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Kansas River	KR-5	SW312067	SW312064		10	165	1.47	0.95	0.95	0.62	65	1.13	0.73	77	0.88	0.57	60
Kansas River	KR-5	SW312069	SW312067		10	191	1.69	1.09	0.92	0.59	54	0.99	0.64	58	0.85	0.55	50
Kansas River	KR-5	SW312070	SW312065		10	350	3.72	2.41	1.17	0.75	31	0.95	0.62	26	0.95	0.62	26
Kansas River	KR-5	SW312076	SW312100		10	165	3.29	2.13	0.71	0.46	21	0.57	0.37	17	0.57	0.37	17
Kansas River	KR-5	SW312077	SW312076		10	667	3.47	2.25	0.46	0.30	13	0.39	0.25	11	0.39	0.25	11
Kansas River	KR-5	SW312100	SW312070		10	330	3.89	2.51	0.92	0.59	24	0.74	0.48	19	0.74	0.48	19
Kansas River	KR-5	SW312103	SW312077		10	165	1.43	0.92	0.25	0.16	17	0.18	0.11	12	0.18	0.11	12
Kansas River	KR-5	SW31243A	SW312046		10	610	2.94	1.90	0.71	0.46	24	0.57	0.37	19	0.57	0.37	19
Kansas River	KR-5	SW322001	SW322215		30	35	29.42	19.02	9.96	6.44	34	6.46	4.18	22	7.49	4.84	25
Kansas River	KR-5	SW322002	SW322001		30	393	28.67	18.53	9.92	6.41	35	6.43	4.15	22	7.49	4.84	26
Kansas River	KR-5	SW322003	SW322002		30	339	28.62	18.50	9.89	6.39	35	6.39	4.13	22	7.45	4.82	26
Kansas River	KR-5	SW322004	SW322003		21	101	11.04	7.13	3.67	2.37	33	3.74	2.42	34	3.81	2.46	35
Kansas River	KR-5	SW322215	NW322023		21	28	11.21	7.24	8.02	5.18	72	8.97	5.80	80	9.68	6.25	86
Kansas River	KR-5	SW322215	NE312023		30	28	29.01	18.75	11.48	7.42	40	8.97	5.80	31	9.68	6.25	33
Kansas River	KR-5	SW322216	SW322217		30	40	20.51	13.26	7.95	5.14	39	1.94	1.26	9	4.80	3.10	23
Kansas River	KR-5	SW322217	SW322003		30	5	41.02	26.52	9.11	5.89	22	5.19	3.36	13	6.60	4.27	16
Kansas River	KR-5	SW322218	SW322216		30	7	21.93	14.17	7.91	5.11	36	1.77	1.14	8	4.77	3.08	22
Kansas River	KR-5	SW322220	SW322x69		24	7	8.55	5.53	11.19	7.24	131	13.88	8.97	162	11.09	7.17	130
Kansas River	KR-5	SW32256A	SW322215		21	414	11.29	7.30	9.50	6.14	84	9.04	5.84	80	9.11	5.89	81
Kansas River	KR-5	SW322x69	SW322217		21	10	11.21	7.24	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Kansas River	KR-5	SW322x69	SW32256A		21	350	6.45	4.17	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Kansas River	KR-5	WEIR	NW32230A		24	15	35.05	22.66	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Kansas River	KR-5	WWTP			54	10	134.36	86.85	74.75	48.32	56	71.72	46.36	53	86.76	56.08	65
Kansas River	KR-6	NE092004	SE042015		8	348	2.24	1.44	0.39	0.25	17	0.39	0.25	17	0.39	0.25	17
Kansas River	KR-6	NE092005	NE092004		8	351	0.82	0.53	0.25	0.16	30	0.25	0.16	30	0.25	0.16	30
Kansas River	KR-6	NE092021	NE092005		8	662	1.61	1.04	0.14	0.09	9	0.14	0.09	9	0.14	0.09	9
Kansas River	KR-6	NW052003	SW322069		10	161	1.53	0.99	0.88	0.57	58	0.92	0.59	60	0.92	0.59	60
Kansas River	KR-6	NW052005	NW052008		15	90	3.97	2.57	1.27	0.82	32	1.27	0.82	32	1.31	0.84	33
Kansas River	KR-6	NW052008	SW322070		8	36	2.03	1.31	1.38	0.89	68	1.41	0.91	69	1.45	0.94	71
Kansas River	KR-6	NW052010	NW052003		10	208	1.02	0.66	0.78	0.50	76	0.78	0.50	76	0.78	0.50	76
Kansas River	KR-6	NW052011	NW052010		10	52	1.80	1.16	0.64	0.41	35	0.64	0.41	35	0.67	0.43	37
Kansas River	KR-6	NW052012	NW052011		10	248	1.27	0.82	0.49	0.32	39	0.53	0.34	42	0.53	0.34	42
Kansas River	KR-6	NW052013	NW052046		15	345	5.06	3.27	1.02	0.66	20	1.02	0.66	20	1.06	0.68	21
Kansas River	KR-6	NW052036	NW052037		10	181	2.79	1.80	0.14	0.09	5	0.14	0.09	5	0.14	0.09	5
Kansas River	KR-6	NW052037	NW052038		10	351	1.33	0.86	0.25	0.16	19	0.25	0.16	19	0.25	0.16	19
Kansas River	KR-6	NW052038	NW052012		10	298	1.38	0.89	0.39	0.25	28	0.39	0.25	28	0.39	0.25	28
Kansas River	KR-6	NW052046	NW052005		15	435	4.07	2.63	1.13	0.73	28	1.17	0.75	29	1.17	0.75	29
Kansas River	KR-6	NW052057	NW052013		15	85	5.15	3.33	0.88	0.57	17	0.92	0.59	18	0.92	0.59	18

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Kansas River	KR-6	NW052058	NW052057		15	433	5.15	3.33	0.78	0.50	15	0.78	0.50	15	0.78	0.50	15
Kansas River	KR-6	NW052059	NW052058		15	278	4.10	2.65	0.64	0.41	16	0.64	0.41	16	0.67	0.43	16
Kansas River	KR-6	NW052060	NW052059		15	187	4.48	2.90	0.49	0.32	11	0.53	0.34	12	0.53	0.34	12
Kansas River	KR-6	NW052061	NW052060		15	49	4.02	2.60	0.39	0.25	10	0.39	0.25	10	0.39	0.25	10
Kansas River	KR-6	NW052166	NW052167		15	303	5.75	3.72	0.14	0.09	2	0.14	0.09	2	0.14	0.09	2
Kansas River	KR-6	NW052167	NW052061		15	140	5.86	3.78	0.25	0.16	4	0.25	0.16	4	0.25	0.16	4
Kansas River	KR-6	SE042002	SE042003		8	391	1.14	0.74	0.64	0.41	56	0.64	0.41	56	0.67	0.43	59
Kansas River	KR-6	SE042003	SE042004		8	247	0.32	0.20	0.74	0.48	234	0.78	0.50	245	0.78	0.50	245
Kansas River	KR-6	SE042004	SE042006		8	274	1.54	0.99	0.88	0.57	57	0.88	0.57	57	0.92	0.59	60
Kansas River	KR-6	SE042006	SE042008		8	253	1.15	0.74	0.99	0.64	86	1.02	0.66	89	1.06	0.68	92
Kansas River	KR-6	SE042008	SE042009		8	267	1.41	0.91	1.13	0.73	80	1.13	0.73	80	1.17	0.75	82
Kansas River	KR-6	SE042009	SE042011		8	250	1.63	1.05	1.24	0.80	76	1.27	0.82	78	1.31	0.84	80
Kansas River	KR-6	SE042011	SE042013		18	271	12.42	8.03	1.34	0.87	11	1.38	0.89	11	1.41	0.91	11
Kansas River	KR-6	SE042013	SE042014		18	234	12.70	8.21	1.48	0.96	12	1.48	0.96	12	1.52	0.98	12
Kansas River	KR-6	SE042014	SW032002		18	334	15.17	9.80	1.59	1.03	10	1.62	1.05	11	1.66	1.07	11
Kansas River	KR-6	SE042015	SE042002		8	319	1.44	0.93	0.49	0.32	34	0.53	0.34	37	0.53	0.34	37
Kansas River	KR-6	SW032001	PS_25	KR-6-1	18	40	62.02	40.09	1.98	1.28	3	2.97	1.92	5	6.60	4.27	11
Kansas River	KR-6	SW032002	SW032015		18	94	7.02	4.54	1.80	1.16	26	2.97	1.92	42	6.71	4.34	96
Kansas River	KR-6	SW032003	SW032002		18	99	2.99	1.93	0.21	0.14	7	1.98	1.28	66	5.90	3.81	197
Kansas River	KR-6	SW032004	SW032003		18	301	4.99	3.23	0.88	0.57	18	0.88	0.57	18	0.88	0.57	18
Kansas River	KR-6	SW032005	SW032004		18	347	5.41	3.50	0.78	0.50	14	0.78	0.50	14	0.78	0.50	14
Kansas River	KR-6	SW032006	SW032005		18	396	5.12	3.31	0.64	0.41	12	0.64	0.41	12	0.67	0.43	13
Kansas River	KR-6	SW032007	SW032006		18	400	5.83	3.77	0.49	0.32	8	0.53	0.34	9	0.53	0.34	9
Kansas River	KR-6	SW032008	SW032011		18	255	4.84	3.13	0.25	0.16	5	0.25	0.16	5	0.25	0.16	5
Kansas River	KR-6	SW032009	SW032008		18	177	6.84	4.42	0.14	0.09	2	0.14	0.09	2	0.14	0.09	2
Kansas River	KR-6	SW032011	SW032007		18	148	2.11	1.37	0.39	0.25	18	0.39	0.25	18	0.39	0.25	18
Kansas River	KR-6	SW032015	SW032001		18	350	4.66	3.01	1.91	1.23	41	2.97	1.92	64	6.71	4.34	144
Kansas River	KR-6	SW322008	SW322004		21	461	11.02	7.12	3.64	2.35	33	3.71	2.40	34	3.78	2.44	34
Kansas River	KR-6	SW322013	SW322008		21	483	6.25	4.04	3.64	2.35	58	3.71	2.40	59	3.78	2.44	60
Kansas River	KR-6	SW322015	SW322013		21	317	6.23	4.03	3.64	2.35	58	3.71	2.40	60	3.78	2.44	61
Kansas River	KR-6	SW322023	SW322025		15	18	8.34	5.39	2.65	1.71	32	2.68	1.73	32	2.75	1.78	33
Kansas River	KR-6	SW322025	SW322026		15	238	4.10	2.65	2.79	1.80	68	2.83	1.83	69	2.86	1.85	70
Kansas River	KR-6	SW322026	SW322027		15	253	7.06	4.56	2.90	1.87	41	2.93	1.89	42	2.97	1.92	42
Kansas River	KR-6	SW322027	SW322028		15	212	7.03	4.54	3.00	1.94	43	3.04	1.96	43	3.11	2.01	44
Kansas River	KR-6	SW322028	SW322029		15	173	7.05	4.56	3.11	2.01	44	3.14	2.03	45	3.21	2.08	46
Kansas River	KR-6	SW322029	SW322030		21	60	5.79	3.74	3.21	2.08	56	3.25	2.10	56	3.32	2.15	57
Kansas River	KR-6	SW322030	SW322015		21	360	6.19	4.00	3.67	2.37	59	3.71	2.40	60	3.78	2.44	61
Kansas River	KR-6	SW322031	SW322030		15	99	3.84	2.48	0.39	0.25	10	0.39	0.25	10	0.39	0.25	10

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Kansas River	KR-6	SW322034	SW322031		15	386	3.48	2.25	0.25	0.16	7	0.25	0.16	7	0.28	0.18	8
Kansas River	KR-6	SW322035	SW322034		15	62	3.38	2.19	0.14	0.09	4	0.14	0.09	4	0.14	0.09	4
Kansas River	KR-6	SW322069	SW322070		10	86	1.57	1.01	1.02	0.66	65	1.02	0.66	65	1.06	0.68	68
Kansas River	KR-6	SW322070	SW322023		10	149	2.75	1.78	2.54	1.64	92	2.58	1.67	94	2.61	1.69	95
North Lawrence	NL-1	NE192001	NE192002		12	294	1.21	0.78	0.14	0.09	12	0.11	0.07	9	0.11	0.07	9
North Lawrence	NL-1	NE192002	NE192004		12	158	1.60	1.04	0.28	0.18	18	0.18	0.11	11	0.21	0.14	13
North Lawrence	NL-1	NE192004	NE192005		12	403	1.55	1.00	0.42	0.27	27	0.28	0.18	18	0.28	0.18	18
North Lawrence	NL-1	NE192005	NE192006		12	263	1.67	1.08	0.53	0.34	32	0.39	0.25	23	0.39	0.25	23
North Lawrence	NL-1	NE192006	NE192007		12	186	1.59	1.03	0.67	0.43	42	0.46	0.30	29	0.49	0.32	31
North Lawrence	NL-1	NE192007	PS_12		12	37	4.14	2.68	0.81	0.52	20	0.57	0.37	14	0.57	0.37	14
North Lawrence	NL-1	NE302081	NE302082		10	330	0.98	0.63	0.42	0.27	43	0.28	0.18	29	0.28	0.18	29
North Lawrence	NL-1	NE302082	NE302083		10	332	0.98	0.63	0.53	0.34	54	0.39	0.25	40	0.39	0.25	40
North Lawrence	NL-1	NE302083	NE302084		10	332	0.86	0.56	0.67	0.43	78	0.46	0.30	53	0.49	0.32	58
North Lawrence	NL-1	NE302084	NE302114		10	332	0.98	0.63	0.78	0.50	80	0.57	0.37	58	0.57	0.37	58
North Lawrence	NL-1	NE302096	NE302097		8	410	0.76	0.49	4.87	3.15	638	3.32	2.15	434	3.57	2.31	467
North Lawrence	NL-1	NE302097	SE192098		8	400	0.76	0.49	3.18	2.05	416	2.30	1.48	300	2.26	1.46	296
North Lawrence	NL-1	NE302113	NE302135		10	331	1.41	0.91	1.10	0.71	78	0.74	0.48	53	0.78	0.50	55
North Lawrence	NL-1	NE302114	NE302241		10	50	2.48	1.60	0.85	0.55	34	0.64	0.41	26	0.64	0.41	26
North Lawrence	NL-1	NE302133	NW292157		10	87	1.39	0.90	1.20	0.78	86	0.88	0.57	64	0.88	0.57	64
North Lawrence	NL-1	NE302135	NE302133		10	258	1.49	0.96	1.17	0.75	78	0.81	0.52	55	0.85	0.55	57
North Lawrence	NL-1	NE302241	NE302113		10	281	0.19	0.12	0.95	0.62	515	0.71	0.46	382	0.74	0.48	401
North Lawrence	NL-1	NW292076	NW292200		18	305	4.46	2.88	3.07	1.99	69	3.18	2.05	71	3.67	2.37	82
North Lawrence	NL-1	NW292099	NW292169	NL-1-2	15	331	4.08	2.64	3.00	1.94	74	3.21	2.08	79	3.78	2.44	93
North Lawrence	NL-1	NW292137	NW292138		10	160	1.20	0.78	1.34	0.87	112	1.55	1.00	130	1.62	1.05	135
North Lawrence	NL-1	NW292138	NW292139		10	200	1.55	1.00	1.45	0.94	93	1.62	1.05	105	1.70	1.10	109
North Lawrence	NL-1	NW292139	NW292180		10	12	8.95	5.78	1.59	1.03	18	1.70	1.10	19	1.73	1.12	19
North Lawrence	NL-1	NW292140	SW292141		10	3402	0.33	0.21	0.14	0.09	43	0.11	0.07	32	0.11	0.07	32
North Lawrence	NL-1	NW292146	NW292147		10	325	1.20	0.78	0.14	0.09	12	0.11	0.07	9	0.11	0.07	9
North Lawrence	NL-1	NW292147	NW292179		10	342	1.94	1.25	0.28	0.18	15	0.18	0.11	9	0.21	0.14	11
North Lawrence	NL-1	NW292157	NW292137		10	176	1.18	0.76	1.27	0.82	108	1.48	0.96	126	1.55	1.00	132
North Lawrence	NL-1	NW292169	NW292170		15	330	4.09	2.64	3.00	1.94	73	3.25	2.10	80	3.78	2.44	92
North Lawrence	NL-1	NW292170	NW292172		15	147	3.99	2.58	3.00	1.94	75	3.25	2.10	81	3.81	2.46	96
North Lawrence	NL-1	NW292172	NW292173		15	11	2.76	1.78	3.00	1.94	109	3.11	2.01	113	3.60	2.33	131
North Lawrence	NL-1	NW292173	NW292174		15	173	4.28	2.77	3.04	1.96	71	3.14	2.03	73	3.67	2.37	86
North Lawrence	NL-1	NW292174	NW292175		15	325	4.35	2.81	3.04	1.96	70	3.18	2.05	73	3.71	2.40	85
North Lawrence	NL-1	NW292175	NW292076		18	331	4.90	3.17	3.04	1.96	62	3.18	2.05	65	3.67	2.37	75
North Lawrence	NL-1	NW292178	NW292179		21	166	3.89	2.51	3.07	1.99	79	3.21	2.08	83	3.71	2.40	95
North Lawrence	NL-1	NW292179	NW292180		21	25	44.03	28.46	3.25	2.10	7	3.32	2.15	8	3.81	2.46	9

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North Lawrence	NL-1	NW292180	PS_03		21	367	4.61	2.98	4.80	3.10	104	4.94	3.20	107	5.37	3.47	117
North Lawrence	NL-1	NW292200	NW292178		21	166	7.88	5.09	3.07	1.99	39	3.18	2.05	40	3.71	2.40	47
North Lawrence	NL-1	NW302001	PS_01		12	16	1.26	0.81	3.64	2.35	289	1.73	1.12	137	1.80	1.16	143
North Lawrence	NL-1	NW302004	NW302038		10	287	1.26	0.82	0.28	0.18	22	0.18	0.11	14	0.21	0.14	17
North Lawrence	NL-1	NW302037	NW302001		10	270	2.80	1.81	0.53	0.34	19	0.39	0.25	14	0.39	0.25	14
North Lawrence	NL-1	NW302038	NW302037		10	286	1.38	0.89	0.42	0.27	31	0.28	0.18	20	0.28	0.18	20
North Lawrence	NL-1	NW302039	NW302004		10	140	1.66	1.07	0.14	0.09	9	0.11	0.07	6	0.11	0.07	6
North Lawrence	NL-1	NW302061	NW302080		10	41	4.57	2.95	0.14	0.09	3	0.11	0.07	2	0.11	0.07	2
North Lawrence	NL-1	NW302080	NE302081		10	313	0.98	0.63	0.28	0.18	29	0.18	0.11	18	0.21	0.14	22
North Lawrence	NL-1	SE192098	NW292099		8	409	0.76	0.49	3.07	1.99	403	2.15	1.39	282	2.15	1.39	282
North Lawrence	NL-1	SE202002	SE302003		8	302	0.83	0.54	2.33	1.51	280	1.94	1.26	233	1.98	1.28	238
North Lawrence	NL-1	SE202021	SE302155		15	83	4.20	2.71	0.95	0.62	23	0.67	0.43	16	0.67	0.43	16
North Lawrence	NL-1	SE292051	SW292050		8	300	0.90	0.58	1.91	1.23	211	1.70	1.10	188	1.59	1.03	176
North Lawrence	NL-1	SE292052	SE292051		8	300	0.86	0.55	2.19	1.41	256	1.62	1.05	190	1.55	1.00	182
North Lawrence	NL-1	SE292053	SE292052		8	300	0.86	0.55	2.12	1.37	248	1.59	1.03	186	1.52	0.98	178
North Lawrence	NL-1	SE292054	SE292053		8	271	0.90	0.58	2.08	1.35	232	1.55	1.00	173	1.52	0.98	169
North Lawrence	NL-1	SE302001	SE202002		8	145	1.14	0.74	2.37	1.53	207	2.30	1.48	201	2.30	1.48	201
North Lawrence	NL-1	SE302003	SE292054		8	271	0.86	0.56	2.12	1.37	247	1.66	1.07	193	1.62	1.05	189
North Lawrence	NL-1	SE302006	SE302007		8	331	0.84	0.54	0.14	0.09	17	0.11	0.07	13	0.11	0.07	13
North Lawrence	NL-1	SE302007	SE302008		8	328	0.84	0.55	0.28	0.18	33	0.18	0.11	21	0.21	0.14	25
North Lawrence	NL-1	SE302008	SE302019		15	152	3.40	2.20	0.67	0.43	20	0.49	0.32	15	0.49	0.32	15
North Lawrence	NL-1	SE302010	SE302008		15	100	3.42	2.21	0.28	0.18	8	0.18	0.11	5	0.21	0.14	6
North Lawrence	NL-1	SE302019	SE202021		15	679	3.09	2.00	0.81	0.52	26	0.57	0.37	18	0.60	0.39	19
North Lawrence	NL-1	SE302128	SE302010		15	391	3.64	2.35	0.14	0.09	4	0.11	0.07	3	0.11	0.07	3
North Lawrence	NL-1	SE302155	SE302158		8	21	1.32	0.85	1.06	0.68	80	0.74	0.48	56	0.78	0.50	59
North Lawrence	NL-1	SE302158	PS_02		8	21	1.32	0.85	1.24	0.80	94	0.85	0.55	64	0.88	0.57	67
North Lawrence	NL-1	SW192019	SW192020		12	395	1.46	0.94	2.33	1.51	160	1.38	0.89	95	1.38	0.89	95
North Lawrence	NL-1	SW192020	SW192021		12	332	1.67	1.08	1.38	0.89	82	1.13	0.73	68	1.06	0.68	63
North Lawrence	NL-1	SW192021	SW192022		12	361	1.82	1.18	1.38	0.89	76	1.06	0.68	58	1.02	0.66	56
North Lawrence	NL-1	SW192022	SW192025		12	97	3.78	2.44	1.38	0.89	36	1.02	0.66	27	1.02	0.66	27
North Lawrence	NL-1	SW192025	SW192034		12	226	1.30	0.84	1.62	1.05	125	1.17	0.75	90	1.20	0.78	93
North Lawrence	NL-1	SW192026	SW192025		12	68	2.29	1.48	0.14	0.09	6	0.11	0.07	5	0.11	0.07	5
North Lawrence	NL-1	SW192034	SW192035		12	302	1.39	0.90	1.70	1.10	122	1.20	0.78	86	1.27	0.82	91
North Lawrence	NL-1	SW192035	NW302001		12	98	2.67	1.73	1.84	1.19	69	1.27	0.82	48	1.34	0.87	50
North Lawrence	NL-1	SW292010	SW292058		12	308	2.77	1.79	2.79	1.80	101	2.58	1.67	93	2.54	1.64	92
North Lawrence	NL-1	SW292020	SW292050		12	330	1.43	0.92	0.95	0.62	67	0.99	0.64	69	1.02	0.66	72
North Lawrence	NL-1	SW292021	SW292020		12	330	1.13	0.73	1.13	0.73	100	0.95	0.62	85	0.99	0.64	88
North Lawrence	NL-1	SW292031	SW292021		12	169	2.73	1.76	1.13	0.73	41	0.88	0.57	32	0.88	0.57	32

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North Lawrence	NL-1	SW292033	SW292031		12	141	1.62	1.04	1.06	0.68	66	0.78	0.50	48	0.78	0.50	48
North Lawrence	NL-1	SW292034	SW292033		12	40	1.49	0.96	0.92	0.59	62	0.67	0.43	45	0.71	0.46	47
North Lawrence	NL-1	SW292039	SW292040		12	215	2.50	1.62	0.28	0.18	11	0.21	0.14	8	0.21	0.14	8
North Lawrence	NL-1	SW292040	SW292041		12	300	3.49	2.26	0.42	0.27	12	0.28	0.18	8	0.32	0.21	9
North Lawrence	NL-1	SW292041	SW292042		12	300	3.02	1.95	0.53	0.34	18	0.39	0.25	13	0.39	0.25	13
North Lawrence	NL-1	SW292042	SW292043		12	262	3.27	2.11	0.67	0.43	21	0.49	0.32	15	0.49	0.32	15
North Lawrence	NL-1	SW292043	SW292034		12	315	1.59	1.03	0.81	0.52	51	0.60	0.39	38	0.60	0.39	38
North Lawrence	NL-1	SW292050	SW292010	NL-1-1	12	331	1.33	0.86	2.75	1.78	207	2.61	1.69	197	2.58	1.67	194
North Lawrence	NL-1	SW292056	SW292059		12	216	2.69	1.74	2.72	1.76	101	2.65	1.71	98	2.65	1.71	98
North Lawrence	NL-1	SW292057	SW292056		12	209	2.43	1.57	2.58	1.67	106	2.61	1.69	108	2.58	1.67	106
North Lawrence	NL-1	SW292058	SW292057		12	400	2.77	1.79	2.61	1.69	94	2.61	1.69	94	2.58	1.67	93
North Lawrence	NL-1	SW292059	SW292101		12	23	2.23	1.44	8.26	5.34	371	9.36	6.05	420	9.60	6.21	431
North Lawrence	NL-1	SW292101	PS_04		12	26	2.21	1.43	8.23	5.32	372	9.32	6.03	422	9.57	6.19	433
North Lawrence	NL-1	SW292141	SW292039		10	130	1.36	0.88	0.14	0.09	10	0.11	0.07	8	0.11	0.07	8
Wakarusa River	WR-2	NE041038	NW031295		10	75	1.60	1.03	2.05	1.32	128	1.84	1.19	115	1.91	1.23	119
Wakarusa River	WR-2	NE041039	NE041038		10	188	1.69	1.09	1.98	1.28	117	1.70	1.10	100	1.80	1.16	107
Wakarusa River	WR-2	NE041040	NE041039		10	422	3.03	1.96	1.91	1.23	63	1.59	1.03	53	1.66	1.07	55
Wakarusa River	WR-2	NE041041	NE041040		10	294	2.48	1.60	1.77	1.14	71	1.45	0.94	58	1.52	0.98	61
Wakarusa River	WR-2	NE041042	NE041041		10	314	1.49	0.96	1.59	1.03	107	1.31	0.84	88	1.38	0.89	92
Wakarusa River	WR-2	NE041043	NE041042		10	402	2.11	1.36	1.45	0.94	69	1.20	0.78	57	1.24	0.80	59
Wakarusa River	WR-2	NE041044	NE041043		10	142	2.04	1.32	1.31	0.84	64	1.06	0.68	52	1.10	0.71	54
Wakarusa River	WR-2	NE041045	NE041044		10	272	1.63	1.06	1.13	0.73	69	0.92	0.59	56	0.95	0.62	58
Wakarusa River	WR-2	NE041046	NE041045		10	83	1.54	1.00	0.95	0.62	62	0.78	0.50	50	0.81	0.52	53
Wakarusa River	WR-2	NE041047	NE041046		10	258	1.53	0.99	0.81	0.52	53	0.67	0.43	44	0.71	0.46	46
Wakarusa River	WR-2	NE041080	NE041081		18	344	7.97	5.15	7.59	4.91	95	6.96	4.50	87	6.82	4.41	86
Wakarusa River	WR-2	NE041081	NW031269		18	398	6.45	4.17	7.45	4.82	116	6.99	4.52	108	6.85	4.43	106
Wakarusa River	WR-2	NE041099	SE331101		10	119	3.86	2.49	0.49	0.32	13	0.39	0.25	10	0.42	0.27	11
Wakarusa River	WR-2	NE041100	NE041099		10	200	2.68	1.73	0.32	0.21	12	0.25	0.16	9	0.28	0.18	11
Wakarusa River	WR-2	NE041111	SE041110		10	68	1.88	1.21	0.32	0.21	17	0.25	0.16	13	0.28	0.18	15
Wakarusa River	WR-2	NE041207	NE041080		18	401	7.33	4.74	7.98	5.16	109	6.96	4.50	95	6.78	4.38	93
Wakarusa River	WR-2	NE101054	SE101311		12	174	1.79	1.16	0.32	0.21	18	0.25	0.16	14	0.28	0.18	16
Wakarusa River	WR-2	NE101145	SE101062		24	550	11.97	7.74	11.12	7.19	93	10.84	7.01	91	11.58	7.49	97
Wakarusa River	WR-2	NE101310	NE101054		12	203	8.10	5.24	0.18	0.11	2	0.14	0.09	2	0.14	0.09	2
Wakarusa River	WR-2	NE331001	SE33155A		10	332	2.10	1.36	3.07	1.99	146	2.65	1.71	126	2.75	1.78	131
Wakarusa River	WR-2	NE331002	NE331001		10	297	2.40	1.55	2.93	1.89	122	2.51	1.62	105	2.61	1.69	109
Wakarusa River	WR-2	NE331003	NE331002		10	310	2.96	1.91	2.79	1.80	94	2.40	1.55	81	2.58	1.67	87
Wakarusa River	WR-2	NE331004	NE331003		10	400	3.21	2.08	2.65	1.71	82	2.26	1.46	70	2.54	1.64	79
Wakarusa River	WR-2	NE331005	NE331004		10	126	3.15	2.04	2.51	1.62	79	2.12	1.37	67	2.51	1.62	79

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Wakarusa River	WR-2	NW031007	NW031008		18	145	4.78	3.09	7.38	4.77	154	6.99	4.52	146	6.96	4.50	146
Wakarusa River	WR-2	NW031008	NW031009		18	230	6.39	4.13	7.38	4.77	116	7.03	4.54	110	6.99	4.52	109
Wakarusa River	WR-2	NW031009	NW031010		18	400	9.61	6.21	7.42	4.79	77	7.03	4.54	73	7.03	4.54	73
Wakarusa River	WR-2	NW031010	NW031011		18	398	9.62	6.22	9.60	6.21	100	8.83	5.71	92	9.46	6.12	98
Wakarusa River	WR-2	NW031011	NW031013		18	377	9.62	6.22	9.50	6.14	99	8.86	5.73	92	9.43	6.09	98
Wakarusa River	WR-2	NW031013	SW031012		18	400	9.63	6.22	9.53	6.16	99	8.90	5.75	92	9.43	6.09	98
Wakarusa River	WR-2	NW031269	NW031007		18	400	6.60	4.27	7.42	4.79	112	6.96	4.50	105	6.89	4.45	104
Wakarusa River	WR-2	NW031290	NW031010		10	274	3.84	2.48	2.75	1.78	72	2.40	1.55	62	2.54	1.64	66
Wakarusa River	WR-2	NW031291	NW031290		10	187	1.46	0.94	2.61	1.69	179	2.33	1.51	160	2.44	1.57	167
Wakarusa River	WR-2	NW031292	NW031291		10	240	8.12	5.25	2.47	1.60	30	2.19	1.41	27	2.30	1.48	28
Wakarusa River	WR-2	NW031294	NW031292		10	211	5.01	3.24	2.33	1.51	47	2.08	1.35	42	2.19	1.41	44
Wakarusa River	WR-2	NW031295	NW031294		10	274	1.68	1.09	2.19	1.41	130	1.98	1.28	118	2.05	1.32	122
Wakarusa River	WR-2	NW041101	NE041100		10	401	1.88	1.22	0.18	0.11	9	0.14	0.09	7	0.14	0.09	7
Wakarusa River	WR-2	NW101146	NW101308	WR-2-1	24	535	11.98	7.74	11.65	7.53	97	10.88	7.03	91	11.69	7.56	98
Wakarusa River	WR-2	NW101147	NW101304		21	596	9.65	6.24	11.62	7.51	120	10.88	7.03	113	11.65	7.53	121
Wakarusa River	WR-2	NW101148	NW101147		21	338	7.31	4.73	11.58	7.49	158	10.84	7.01	148	11.65	7.53	159
Wakarusa River	WR-2	NW101149	NW101148		21	426	8.41	5.44	11.69	7.56	139	10.84	7.01	129	11.69	7.56	139
Wakarusa River	WR-2	NW101304	NW101146		21	395	9.63	6.23	11.62	7.51	121	10.88	7.03	113	11.69	7.56	121
Wakarusa River	WR-2	NW101308	NE101145		24	530	11.96	7.73	11.44	7.39	96	10.88	7.03	91	11.65	7.53	97
Wakarusa River	WR-2	NW31168A	NW33167A		8	343	0.76	0.49	2.23	1.44	291	1.20	0.78	157	2.15	1.39	282
Wakarusa River	WR-2	NW331001	NE331005		10	89	4.43	2.86	2.47	1.60	56	1.98	1.28	45	2.47	1.60	56
Wakarusa River	WR-2	NW331002	NW331001		8	38	0.78	0.51	2.40	1.55	306	1.87	1.21	239	2.44	1.57	311
Wakarusa River	WR-2	NW331005	NW331002		8	215	0.86	0.56	2.40	1.55	279	1.73	1.12	201	2.40	1.55	279
Wakarusa River	WR-2	NW33125A	NW331005		8	300	1.48	0.96	2.33	1.51	157	1.59	1.03	107	2.33	1.51	157
Wakarusa River	WR-2	NW33126A	NW33125A		8	274	1.90	1.23	2.30	1.48	121	1.45	0.94	76	2.30	1.48	121
Wakarusa River	WR-2	NW33167A	NW33126A		8	445	1.73	1.12	2.23	1.44	128	1.34	0.87	77	2.23	1.44	128
Wakarusa River	WR-2	PS_09SC	PS_09		36	44	230.42	148.95	7.49	4.84	3	10.84	7.01	5	21.05	13.60	9
Wakarusa River	WR-2	RL219L2	SW111325		24	289	16.89	10.92	0.35	0.23	2	0.25	0.16	1	0.25	0.16	1
Wakarusa River	WR-2	SE041041	SE041042		8	131	1.52	0.98	1.13	0.73	75	1.02	0.66	68	1.06	0.68	70
Wakarusa River	WR-2	SE041042	SE041043		8	235	2.09	1.35	1.27	0.82	61	1.17	0.75	56	1.20	0.78	57
Wakarusa River	WR-2	SE041043	SE041048		8	289	3.03	1.96	1.41	0.91	47	1.31	0.84	43	1.34	0.87	44
Wakarusa River	WR-2	SE041048	SE041050		8	264	2.06	1.33	1.59	1.03	77	1.45	0.94	70	1.48	0.96	72
Wakarusa River	WR-2	SE041050	SE041051		8	301	2.20	1.42	1.73	1.12	79	1.59	1.03	72	1.59	1.03	72
Wakarusa River	WR-2	SE041051	SE041052		8	401	1.83	1.18	1.91	1.23	104	1.70	1.10	93	1.73	1.12	94
Wakarusa River	WR-2	SE041052	SW031266		10	186	2.11	1.36	2.05	1.32	97	1.84	1.19	87	1.87	1.21	89
Wakarusa River	WR-2	SE041109	NE041047		10	407	2.88	1.86	0.64	0.41	22	0.53	0.34	18	0.57	0.37	20
Wakarusa River	WR-2	SE041110	SE041109		10	31	0.96	0.62	0.49	0.32	51	0.39	0.25	40	0.42	0.27	44
Wakarusa River	WR-2	SE041159	PS_33		8	286	0.77	0.50	0.64	0.41	83	0.53	0.34	69	0.57	0.37	74

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Wakarusa River	WR-2	SE041160	SE041159		8	167	2.67	1.73	0.49	0.32	19	0.39	0.25	15	0.42	0.27	16
Wakarusa River	WR-2	SE041161	SE041160		8	222	2.55	1.65	0.32	0.21	12	0.25	0.16	10	0.28	0.18	11
Wakarusa River	WR-2	SE041162	SE041161		8	113	1.65	1.07	0.18	0.11	11	0.14	0.09	9	0.14	0.09	9
Wakarusa River	WR-2	SE101055	SE101056		12	126	1.80	1.16	0.64	0.41	35	0.53	0.34	30	0.57	0.37	31
Wakarusa River	WR-2	SE101056	SE101057		12	391	1.50	0.97	0.81	0.52	54	0.67	0.43	45	0.71	0.46	47
Wakarusa River	WR-2	SE101057	PS_09SC		12	342	3.69	2.39	0.95	0.62	26	0.78	0.50	21	0.81	0.52	22
Wakarusa River	WR-2	SE101058	PS_09SC	YTC-1-1	30	52	31.16	20.14	14.41	9.31	46	21.12	13.65	68	37.18	24.03	119
Wakarusa River	WR-2	SE101059	SE101317		24	275	11.97	7.74	8.37	5.41	70	10.77	6.96	90	11.55	7.46	96
Wakarusa River	WR-2	SE101060	SE101059		24	274	11.99	7.75	8.37	5.41	70	10.77	6.96	90	11.55	7.46	96
Wakarusa River	WR-2	SE101061	SE101060		24	495	11.99	7.75	8.76	5.66	73	10.81	6.98	90	11.55	7.46	96
Wakarusa River	WR-2	SE101062	SE101061		24	552	11.99	7.75	10.35	6.69	86	10.81	6.98	90	11.58	7.49	97
Wakarusa River	WR-2	SE101150	SE101058		27	60	15.49	10.01	6.00	3.88	39	15.01	9.70	97	29.45	19.04	190
Wakarusa River	WR-2	SE101151	SE101150		27	600	14.08	9.10	6.00	3.88	43	14.97	9.68	106	29.38	18.99	209
Wakarusa River	WR-2	SE101152	SE101151		27	600	22.19	14.34	6.00	3.88	27	14.97	9.68	67	29.38	18.99	132
Wakarusa River	WR-2	SE101311	SE101055		12	400	1.78	1.15	0.49	0.32	28	0.39	0.25	22	0.42	0.27	24
Wakarusa River	WR-2	SE101313	SE101314		24	326	13.73	8.87	0.67	0.43	5	0.49	0.32	4	0.53	0.34	4
Wakarusa River	WR-2	SE101314	SE101316		24	318	13.90	8.98	0.85	0.55	6	0.64	0.41	5	0.67	0.43	5
Wakarusa River	WR-2	SE101316	SE101318		24	322	13.22	8.55	1.02	0.66	8	0.78	0.50	6	0.81	0.52	6
Wakarusa River	WR-2	SE101317	SE101058		12	187	2.26	1.46	8.37	5.41	371	10.81	6.98	479	11.58	7.49	513
Wakarusa River	WR-2	SE101318	SE101320		24	54	13.77	8.90	1.17	0.75	8	0.88	0.57	6	0.92	0.59	7
Wakarusa River	WR-2	SE101319	HB2		24	400	16.00	10.34	1.48	0.96	9	1.17	0.75	7	1.20	0.78	8
Wakarusa River	WR-2	SE101320	SE101319		24	156	22.91	14.81	1.31	0.84	6	1.02	0.66	4	1.06	0.68	5
Wakarusa River	WR-2	SE281001	SW281001		8	113	0.76	0.49	1.91	1.23	250	0.92	0.59	120	1.87	1.21	245
Wakarusa River	WR-2	SE281016	SE281025		8	456	0.86	0.55	0.46	0.30	54	0.39	0.25	45	0.39	0.25	45
Wakarusa River	WR-2	SE281017	PS_18		8	300	2.94	1.90	1.02	0.66	35	0.85	0.55	29	0.88	0.57	30
Wakarusa River	WR-2	SE281018	SE281017		8	231	2.61	1.69	0.88	0.57	34	0.71	0.46	27	0.74	0.48	28
Wakarusa River	WR-2	SE281019	SE281018		8	254	1.65	1.06	0.74	0.48	45	0.60	0.39	36	0.64	0.41	39
Wakarusa River	WR-2	SE281025	SE281019		8	304	0.86	0.55	0.60	0.39	70	0.49	0.32	58	0.49	0.32	58
Wakarusa River	WR-2	SE331001	SE331002		10	98	3.43	2.22	3.39	2.19	99	2.90	1.87	84	3.00	1.94	88
Wakarusa River	WR-2	SE331002	SE331003	WR-2-2	10	397	3.12	2.02	3.57	2.31	114	3.04	1.96	97	3.14	2.03	101
Wakarusa River	WR-2	SE331003	SE331010		12	257	5.02	3.25	4.03	2.60	80	3.43	2.21	68	3.53	2.28	70
Wakarusa River	WR-2	SE331004	SE331003		10	203	3.57	2.31	0.32	0.21	9	0.25	0.16	7	0.28	0.18	8
Wakarusa River	WR-2	SE331005	SE331004		10	299	4.27	2.76	0.18	0.11	4	0.14	0.09	3	0.14	0.09	3
Wakarusa River	WR-2	SE331010	SE331014		12	365	4.57	2.95	4.17	2.69	91	3.57	2.31	78	3.64	2.35	80
Wakarusa River	WR-2	SE331014	SE331019		12	329	5.67	3.66	4.20	2.72	74	3.67	2.37	65	3.74	2.42	66
Wakarusa River	WR-2	SE331019	SE331027		12	140	2.23	1.44	4.27	2.76	191	3.78	2.44	169	3.81	2.46	171
Wakarusa River	WR-2	SE331027	SE331028		12	240	2.39	1.54	4.34	2.81	182	3.92	2.53	164	3.85	2.49	161
Wakarusa River	WR-2	SE331028	SE331033		12	204	3.25	2.10	4.41	2.85	136	3.99	2.58	123	3.92	2.53	120

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Wakarusa River	WR-2	SE331033	SE331036		12	362	4.82	3.11	4.56	2.94	95	4.10	2.65	85	3.96	2.56	82
Wakarusa River	WR-2	SE331036	SE331081		15	163	10.13	6.55	5.90	3.81	58	5.23	3.38	52	4.98	3.22	49
Wakarusa River	WR-2	SE331037	SE331036		12	155	2.46	1.59	1.31	0.84	53	1.06	0.68	43	1.10	0.71	44
Wakarusa River	WR-2	SE331038	SE331037		12	76	2.95	1.90	1.13	0.73	38	0.92	0.59	31	0.95	0.62	32
Wakarusa River	WR-2	SE331039	SE331038		12	134	3.12	2.02	0.95	0.62	31	0.78	0.50	25	0.81	0.52	26
Wakarusa River	WR-2	SE331040	SE331039		12	262	5.62	3.63	0.81	0.52	14	0.67	0.43	12	0.71	0.46	13
Wakarusa River	WR-2	SE331041	SE331040		12	148	2.84	1.84	0.64	0.41	22	0.53	0.34	19	0.57	0.37	20
Wakarusa River	WR-2	SE331042	SE331041		12	163	3.08	1.99	0.49	0.32	16	0.39	0.25	13	0.42	0.27	14
Wakarusa River	WR-2	SE331043	SE331042		12	110	2.52	1.63	0.32	0.21	13	0.25	0.16	10	0.28	0.18	11
Wakarusa River	WR-2	SE331044	SE331043		12	138	4.31	2.79	0.18	0.11	4	0.14	0.09	3	0.14	0.09	3
Wakarusa River	WR-2	SE331081	SE331089		15	219	12.22	7.90	7.80	5.04	64	6.78	4.38	55	6.57	4.25	54
Wakarusa River	WR-2	SE331089	SE331090		16	79	10.47	6.77	7.77	5.02	74	6.89	4.45	66	6.67	4.31	64
Wakarusa River	WR-2	SE331090	NE041207		16	318	4.87	3.15	7.87	5.09	162	6.99	4.52	144	6.78	4.38	139
Wakarusa River	WR-2	SE331092	SE331081		10	307	2.44	1.58	1.77	1.14	72	1.45	0.94	59	1.52	0.98	62
Wakarusa River	WR-2	SE331093	SE331092		10	249	5.47	3.54	1.62	1.05	30	1.31	0.84	24	1.38	0.89	25
Wakarusa River	WR-2	SE331094	SE331093		10	308	2.40	1.55	1.45	0.94	60	1.20	0.78	50	1.24	0.80	51
Wakarusa River	WR-2	SE331095	SE331094		10	158	3.22	2.08	1.31	0.84	41	1.06	0.68	33	1.10	0.71	34
Wakarusa River	WR-2	SE331096	SE331095		10	303	3.56	2.30	1.13	0.73	32	0.92	0.59	26	0.95	0.62	27
Wakarusa River	WR-2	SE331097	SE331096		10	169	4.30	2.78	0.95	0.62	22	0.78	0.50	18	0.81	0.52	19
Wakarusa River	WR-2	SE331100	SE331097		10	150	2.45	1.59	0.81	0.52	33	0.67	0.43	27	0.71	0.46	29
Wakarusa River	WR-2	SE331101	SE331100		10	187	4.62	2.98	0.64	0.41	14	0.53	0.34	11	0.57	0.37	12
Wakarusa River	WR-2	SE33155A	SE331001		10	92	1.84	1.19	3.25	2.10	176	2.79	1.80	151	2.86	1.85	155
Wakarusa River	WR-2	SW031012	SW031314		18	250	9.63	6.22	9.57	6.19	99	8.90	5.75	92	9.43	6.09	98
Wakarusa River	WR-2	SW031017	SW031018		18	400	9.63	6.22	9.60	6.21	100	9.00	5.82	94	9.50	6.14	99
Wakarusa River	WR-2	SW031018	SW031022		18	400	8.34	5.39	9.64	6.23	116	9.00	5.82	108	9.50	6.14	114
Wakarusa River	WR-2	SW031022	SW031400		18	300	7.86	5.08	9.68	6.25	123	9.04	5.84	115	9.53	6.16	121
Wakarusa River	WR-2	SW031023	SW031403		21	420	11.26	7.28	11.83	7.65	105	10.81	6.98	96	11.65	7.53	103
Wakarusa River	WR-2	SW031024	SW031023		12	218	5.82	3.76	3.14	2.03	54	2.72	1.76	47	3.00	1.94	52
Wakarusa River	WR-2	SW031032	SW031024		12	362	5.83	3.77	3.04	1.96	52	2.68	1.73	46	2.90	1.87	50
Wakarusa River	WR-2	SW031037	SW031032		12	214	3.58	2.31	2.93	1.89	82	2.61	1.69	73	2.79	1.80	78
Wakarusa River	WR-2	SW031038	SW031037		10	326	2.75	1.78	2.86	1.85	104	2.54	1.64	92	2.68	1.73	97
Wakarusa River	WR-2	SW031041	SW031038		10	155	4.11	2.66	2.75	1.78	67	2.44	1.57	59	2.54	1.64	62
Wakarusa River	WR-2	SW031042	SW031041		10	265	2.18	1.41	2.58	1.67	119	2.37	1.53	109	2.44	1.57	112
Wakarusa River	WR-2	SW031266	SW031267		10	109	2.15	1.39	2.19	1.41	102	1.98	1.28	92	2.01	1.30	94
Wakarusa River	WR-2	SW031267	SW031268		10	241	2.17	1.40	2.33	1.51	107	2.08	1.35	96	2.15	1.39	99
Wakarusa River	WR-2	SW031268	SW031042		10	250	4.18	2.70	2.47	1.60	59	2.23	1.44	53	2.30	1.48	55
Wakarusa River	WR-2	SW031312	SW031017		18	170	14.77	9.55	9.60	6.21	65	8.97	5.80	61	9.50	6.14	64
Wakarusa River	WR-2	SW031314	SW031312		18	180	13.43	8.68	9.60	6.21	72	8.93	5.77	67	9.46	6.12	70

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
							(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Wakarusa River	WR-2	SW031400	SW031023		21	200	13.95	9.02	9.71	6.28	70	9.08	5.87	65	9.57	6.19	69
Wakarusa River	WR-2	SW031403	NW101149		21	300	10.02	6.48	11.79	7.62	118	10.84	7.01	108	11.69	7.56	117
Wakarusa River	WR-2	SW041015	NE041111		10	88	3.11	2.01	0.18	0.11	6	0.14	0.09	5	0.14	0.09	5
Wakarusa River	WR-2	SW101153	SE101152		27	600	12.83	8.30	5.97	3.86	46	15.01	9.70	117	29.41	19.01	229
Wakarusa River	WR-2	SW111325	SE101313		24	324	14.00	9.05	0.53	0.34	4	0.39	0.25	3	0.39	0.25	3
Wakarusa River	WR-2	SW281001	NW31168A		8	113	1.19	0.77	2.08	1.35	175	1.06	0.68	89	2.01	1.30	170
Wakarusa River	WR-3	NE031087	SE031080		15	143	5.79	3.74	7.70	4.98	133	6.36	4.11	110	6.39	4.13	110
Wakarusa River	WR-3	NE031088	NE031087		15	365	8.17	5.28	7.42	4.79	91	6.14	3.97	75	6.22	4.02	76
Wakarusa River	WR-3	NE031089	NE031088		15	400	5.78	3.73	7.20	4.66	125	5.97	3.86	103	6.00	3.88	104
Wakarusa River	WR-3	NE031126	NE031089		15	386	4.54	2.94	6.92	4.47	152	5.76	3.72	127	5.83	3.77	128
Wakarusa River	WR-3	NE031156	NE031126		15	266	7.35	4.75	6.64	4.29	90	5.51	3.56	75	5.54	3.58	75
Wakarusa River	WR-3	NE031157	NE031156		15	50	7.37	4.76	6.29	4.06	85	5.23	3.38	71	5.30	3.42	72
Wakarusa River	WR-3	NE031158	NE031157		15	86	7.34	4.74	5.97	3.86	81	4.94	3.20	67	5.01	3.24	68
Wakarusa River	WR-3	NE031165	NE031234		12	136	3.28	2.12	5.01	3.24	153	4.13	2.67	126	4.20	2.72	128
Wakarusa River	WR-3	NE031178	NE031233		12	24	4.05	2.62	4.34	2.81	107	3.60	2.33	89	3.64	2.35	90
Wakarusa River	WR-3	NE031233	NE031165		12	174	3.51	2.27	4.66	3.01	133	3.88	2.51	111	3.92	2.53	112
Wakarusa River	WR-3	NE031234	NE031302		12	330	3.38	2.18	5.33	3.45	158	4.41	2.85	131	4.48	2.90	133
Wakarusa River	WR-3	NE031302	NE031158		12	160	4.06	2.63	5.65	3.65	139	4.70	3.04	116	4.73	3.06	116
Wakarusa River	WR-3	NE101142	NE101155		24	158	6.49	4.20	8.47	5.48	131	7.06	4.56	109	7.10	4.59	109
Wakarusa River	WR-3	NE101143	NE101142		24	390	6.38	4.12	8.51	5.50	133	7.06	4.56	111	7.10	4.59	111
Wakarusa River	WR-3	NE101144	NE101143		24	395	5.34	3.45	8.55	5.52	160	7.13	4.61	134	7.13	4.61	134
Wakarusa River	WR-3	NE101155	NE101157		24	112	6.42	4.15	8.51	5.50	133	7.10	4.59	111	7.13	4.61	111
Wakarusa River	WR-3	NE101157	NE101258		24	109	6.50	4.20	8.55	5.52	131	7.13	4.61	110	7.17	4.63	110
Wakarusa River	WR-3	NE101258	NW111050		24	100	3.20	2.07	8.62	5.57	269	7.17	4.63	224	7.24	4.68	226
Wakarusa River	WR-3	NE341098	SE341097		10	224	4.14	2.68	0.35	0.23	9	0.28	0.18	7	0.28	0.18	7
Wakarusa River	WR-3	NW111003	NW111004		24	402	6.96	4.50	8.65	5.59	124	7.24	4.68	104	7.27	4.70	105
Wakarusa River	WR-3	NW111004	NW111005		24	12	6.53	4.22	8.65	5.59	132	7.24	4.68	111	7.31	4.72	112
Wakarusa River	WR-3	NW111005	NW111010		24	77	6.82	4.41	8.72	5.64	128	7.27	4.70	107	7.38	4.77	108
Wakarusa River	WR-3	NW111010	NW111016	WR-3-1	24	390	6.87	4.44	8.76	5.66	127	7.34	4.75	107	7.42	4.79	108
Wakarusa River	WR-3	NW111050	NW111003		24	213	6.93	4.48	8.65	5.59	125	7.20	4.66	104	7.27	4.70	105
Wakarusa River	WR-3	SE031070	SE031077	WR-3-3	15	305	5.72	3.70	8.65	5.59	151	7.20	4.66	126	7.24	4.68	127
Wakarusa River	WR-3	SE031071	SE031283		24	600	9.00	5.82	8.69	5.61	96	7.24	4.68	80	7.20	4.66	80
Wakarusa River	WR-3	SE031077	SE031071		21	572	5.85	3.78	8.79	5.68	150	7.34	4.75	125	7.38	4.77	126
Wakarusa River	WR-3	SE031078	SE031070		15	350	5.78	3.73	8.47	5.48	147	7.03	4.54	122	7.06	4.56	122
Wakarusa River	WR-3	SE031079	SE031078		15	172	5.79	3.74	8.23	5.32	142	6.82	4.41	118	6.85	4.43	118
Wakarusa River	WR-3	SE031080	SE031079		15	188	5.77	3.73	7.98	5.16	138	6.60	4.27	114	6.64	4.29	115
Wakarusa River	WR-3	SE031283	SE031288		24	266	8.88	5.74	8.55	5.52	96	7.13	4.61	80	7.10	4.59	80
Wakarusa River	WR-3	SE031288	NE101144	WR-3-2	24	204	8.96	5.79	8.55	5.52	95	7.13	4.61	80	7.10	4.59	79

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Wakarusa River	WR-3	SE341089	SE341179		12	309	6.14	3.97	3.67	2.37	60	3.04	1.96	49	3.07	1.99	50
Wakarusa River	WR-3	SE341090	SE341089		10	268	3.25	2.10	3.35	2.17	103	2.75	1.78	85	2.79	1.80	86
Wakarusa River	WR-3	SE341091	SE341090		10	188	1.38	0.89	3.00	1.94	218	2.51	1.62	182	2.54	1.64	185
Wakarusa River	WR-3	SE341093	SE341516		10	179	1.80	1.16	2.01	1.30	112	1.66	1.07	92	1.70	1.10	94
Wakarusa River	WR-3	SE341094	SE341093		10	527	2.34	1.51	1.70	1.10	72	1.38	0.89	59	1.41	0.91	60
Wakarusa River	WR-3	SE341095	SE341094		10	335	3.23	2.09	1.34	0.87	42	1.10	0.71	34	1.13	0.73	35
Wakarusa River	WR-3	SE341096	SE341095		10	322	1.38	0.89	1.02	0.66	74	0.85	0.55	62	0.85	0.55	62
Wakarusa River	WR-3	SE341097	SE341096		10	190	3.48	2.25	0.67	0.43	19	0.57	0.37	16	0.57	0.37	16
Wakarusa River	WR-3	SE341179	NE031178		12	179	3.28	2.12	3.99	2.58	122	3.32	2.15	101	3.35	2.17	102
Wakarusa River	WR-3	SE341516	SE341517		10	60	1.23	0.80	2.33	1.51	189	1.94	1.26	158	1.98	1.28	160
Wakarusa River	WR-3	SE341517	SE341091		10	193	1.62	1.05	2.68	1.73	165	2.23	1.44	137	2.26	1.46	139
Wakarusa River	WR-4	NE021072	NW021071		12	338	5.98	3.87	0.32	0.21	5	0.28	0.18	5	0.28	0.18	5
Wakarusa River	WR-4	NE021073	NE021072		12	392	6.23	4.03	0.21	0.14	3	0.18	0.11	3	0.18	0.11	3
Wakarusa River	WR-4	NE021074	NE021073		12	395	6.07	3.92	0.11	0.07	2	0.11	0.07	2	0.11	0.07	2
Wakarusa River	WR-4	NE021080	NW021079		12	234	4.80	3.10	0.74	0.48	15	0.64	0.41	13	0.64	0.41	13
Wakarusa River	WR-4	NE021081	NE021080		12	221	4.76	3.07	0.64	0.41	13	0.53	0.34	11	0.57	0.37	12
Wakarusa River	WR-4	NE021082	NE021081		12	370	4.71	3.05	0.53	0.34	11	0.46	0.30	10	0.46	0.30	10
Wakarusa River	WR-4	NE021100	NE021082		12	122	4.72	3.05	0.42	0.27	9	0.35	0.23	7	0.35	0.23	7
Wakarusa River	WR-4	NW021066	SW021064		18	14	24.96	16.13	4.03	2.60	16	3.46	2.24	14	3.53	2.28	14
Wakarusa River	WR-4	NW021068	NW021066		18	522	8.55	5.53	3.99	2.58	47	3.43	2.21	40	3.50	2.26	41
Wakarusa River	WR-4	NW021069	NW021097		12	326	5.20	3.36	0.64	0.41	12	0.53	0.34	10	0.57	0.37	11
Wakarusa River	WR-4	NW021070	NW021069		12	335	5.77	3.73	0.53	0.34	9	0.46	0.30	8	0.46	0.30	8
Wakarusa River	WR-4	NW021071	NW021070		12	335	5.88	3.80	0.42	0.27	7	0.35	0.23	6	0.35	0.23	6
Wakarusa River	WR-4	NW021075	NW021068		18	601	8.15	5.27	3.99	2.58	49	3.43	2.21	42	3.50	2.26	43
Wakarusa River	WR-4	NW021076	NW021075		18	544	7.46	4.82	3.99	2.58	54	3.43	2.21	46	3.46	2.24	46
Wakarusa River	WR-4	NW021077	NW021076		15	325	8.08	5.22	1.06	0.68	13	0.88	0.57	11	0.92	0.59	11
Wakarusa River	WR-4	NW021078	NW021077		15	327	6.84	4.42	0.95	0.62	14	0.81	0.52	12	0.81	0.52	12
Wakarusa River	WR-4	NW021079	NW021078		15	235	6.77	4.38	0.85	0.55	13	0.71	0.46	10	0.74	0.48	11
Wakarusa River	WR-4	NW021083	NW021076		15	441	5.21	3.37	3.04	1.96	58	2.61	1.69	50	2.65	1.71	51
Wakarusa River	WR-4	NW021095	SW021074		18	405	5.22	3.37	3.32	2.15	64	2.86	1.85	55	2.93	1.89	56
Wakarusa River	WR-4	NW021096	NW021095		18	54	5.54	3.58	3.28	2.12	59	2.83	1.83	51	2.90	1.87	52
Wakarusa River	WR-4	NW021097	NW021096		18	480	5.63	3.64	3.25	2.10	58	2.83	1.83	50	2.90	1.87	51
Wakarusa River	WR-4	NW021098	NW021097		18	299	7.85	5.07	2.68	1.73	34	2.30	1.48	29	2.37	1.53	30
Wakarusa River	WR-4	NW021099	NW021098		18	301	8.92	5.77	2.65	1.71	30	2.30	1.48	26	2.33	1.51	26
Wakarusa River	WR-4	NW021100	NW021099		18	264	7.95	5.14	2.65	1.71	33	2.26	1.46	28	2.30	1.48	29
Wakarusa River	WR-4	NW021101	NW021100		18	285	8.51	5.50	2.61	1.69	31	2.23	1.44	26	2.30	1.48	27
Wakarusa River	WR-4	NW021102	NW021101		18	446	8.62	5.57	2.58	1.67	30	2.23	1.44	26	2.26	1.46	26
Wakarusa River	WR-4	NW021103	NW021102		18	319	8.64	5.59	2.54	1.64	29	2.19	1.41	25	2.23	1.44	26

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Wakarusa River	WR-4	NW351000	NW351315		12	87	6.27	4.05	0.42	0.27	7	0.35	0.23	6	0.35	0.23	6
Wakarusa River	WR-4	NW351112	NW351314		10	398	3.11	2.01	0.21	0.14	7	0.18	0.11	6	0.18	0.11	6
Wakarusa River	WR-4	NW351113	NW351202		18	278	11.41	7.38	1.24	0.80	11	1.10	0.71	10	1.10	0.71	10
Wakarusa River	WR-4	NW351202	NW351318		18	304	13.32	8.61	1.34	0.87	10	1.17	0.75	9	1.20	0.78	9
Wakarusa River	WR-4	NW351208	NW351307		12	173	5.25	3.40	0.85	0.55	16	0.71	0.46	13	0.74	0.48	14
Wakarusa River	WR-4	NW351277	SW351130		12	210	1.43	0.93	0.64	0.41	44	0.53	0.34	37	0.57	0.37	39
Wakarusa River	WR-4	NW351301	NW351302		12	138	8.87	5.74	0.32	0.21	4	0.28	0.18	3	0.28	0.18	3
Wakarusa River	WR-4	NW351302	NW351399		12	158	6.18	3.99	0.42	0.27	7	0.35	0.23	6	0.35	0.23	6
Wakarusa River	WR-4	NW351303	NW351305		12	139	5.15	3.33	0.64	0.41	12	0.53	0.34	10	0.57	0.37	11
Wakarusa River	WR-4	NW351305	NW351208		12	114	4.36	2.82	0.74	0.48	17	0.64	0.41	15	0.64	0.41	15
Wakarusa River	WR-4	NW351307	NW351308		12	329	5.97	3.86	0.95	0.62	16	0.81	0.52	14	0.81	0.52	14
Wakarusa River	WR-4	NW351308	NW351311		18	354	18.00	11.63	1.06	0.68	6	0.88	0.57	5	0.92	0.59	5
Wakarusa River	WR-4	NW351310	NW351112		10	300	4.01	2.59	0.11	0.07	3	0.11	0.07	3	0.11	0.07	3
Wakarusa River	WR-4	NW351311	NW351113		18	450	13.85	8.95	1.13	0.73	8	0.99	0.64	7	0.99	0.64	7
Wakarusa River	WR-4	NW351314	NW351000		10	182	2.12	1.37	0.32	0.21	15	0.28	0.18	13	0.28	0.18	13
Wakarusa River	WR-4	NW351315	NW351277		12	355	2.76	1.78	0.53	0.34	19	0.46	0.30	17	0.46	0.30	17
Wakarusa River	WR-4	NW351318	SW351263		18	308	13.83	8.94	1.45	0.94	10	1.27	0.82	9	1.27	0.82	9
Wakarusa River	WR-4	NW351399	NW351303		12	123	4.46	2.88	0.53	0.34	12	0.46	0.30	10	0.46	0.30	10
Wakarusa River	WR-4	SE021085	SW021041		12	372	3.43	2.22	0.85	0.55	25	0.71	0.46	21	0.74	0.48	22
Wakarusa River	WR-4	SE021086	SE021085		12	410	3.52	2.27	0.74	0.48	21	0.64	0.41	18	0.64	0.41	18
Wakarusa River	WR-4	SE021087	SE021086		12	361	4.85	3.14	0.64	0.41	13	0.53	0.34	11	0.57	0.37	12
Wakarusa River	WR-4	SE021088	SE021087		12	360	3.15	2.04	0.53	0.34	17	0.46	0.30	15	0.46	0.30	15
Wakarusa River	WR-4	SE021089	SE021088		12	360	4.90	3.17	0.42	0.27	9	0.35	0.23	7	0.35	0.23	7
Wakarusa River	WR-4	SE021090	SE021089		12	360	7.46	4.82	0.32	0.21	4	0.28	0.18	4	0.28	0.18	4
Wakarusa River	WR-4	SE021091	SE021090		12	367	2.83	1.83	0.21	0.14	7	0.18	0.11	6	0.18	0.11	6
Wakarusa River	WR-4	SE021092	SE021091		12	360	6.05	3.91	0.11	0.07	2	0.11	0.07	2	0.11	0.07	2
Wakarusa River	WR-4	SE351044	SE351045		12	299	4.49	2.90	0.11	0.07	2	0.11	0.07	2	0.11	0.07	2
Wakarusa River	WR-4	SE351045	SE351052		12	98	9.77	6.32	0.21	0.14	2	0.18	0.11	2	0.18	0.11	2
Wakarusa River	WR-4	SE351052	NE021100		12	127	4.69	3.03	0.32	0.21	7	0.28	0.18	6	0.28	0.18	6
Wakarusa River	WR-4	SE351152	SW351151		12	205	2.49	1.61	0.95	0.62	38	0.81	0.52	33	0.81	0.52	33
Wakarusa River	WR-4	SE351160	SE351152		12	103	3.02	1.95	0.85	0.55	28	0.71	0.46	23	0.74	0.48	25
Wakarusa River	WR-4	SE351161	SE351160		12	126	1.35	0.87	0.74	0.48	55	0.64	0.41	47	0.64	0.41	47
Wakarusa River	WR-4	SE351164	SE351161		12	215	1.90	1.23	0.64	0.41	34	0.53	0.34	28	0.57	0.37	30
Wakarusa River	WR-4	SE351165	SE351304		12	112	4.76	3.08	0.42	0.27	9	0.35	0.23	7	0.35	0.23	7
Wakarusa River	WR-4	SE351167	SE351165		12	138	4.96	3.20	0.32	0.21	6	0.28	0.18	6	0.28	0.18	6
Wakarusa River	WR-4	SE351168	SE351167		12	128	5.88	3.80	0.21	0.14	4	0.18	0.11	3	0.18	0.11	3
Wakarusa River	WR-4	SE351169	SE351168		12	201	6.10	3.94	0.11	0.07	2	0.11	0.07	2	0.11	0.07	2
Wakarusa River	WR-4	SE351250	NW021083		15	502	5.09	3.29	3.04	1.96	60	2.58	1.67	51	2.65	1.71	52

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Wakarusa River	WR-4	SE351304	SE351164		12	100	5.98	3.87	0.53	0.34	9	0.46	0.30	8	0.46	0.30	8
Wakarusa River	WR-4	SW021015	SW021016		21	173	9.94	6.42	5.76	3.72	58	4.98	3.22	50	5.12	3.31	52
Wakarusa River	WR-4	SW021016	SW021017		21	487	8.71	5.63	5.76	3.72	66	5.01	3.24	58	5.12	3.31	59
Wakarusa River	WR-4	SW021026	SW021118		12	123	2.51	1.62	1.20	0.78	48	1.02	0.66	41	1.06	0.68	42
Wakarusa River	WR-4	SW021027	SW021026		12	406	2.58	1.67	1.13	0.73	44	0.99	0.64	38	0.99	0.64	38
Wakarusa River	WR-4	SW021028	SW021027		12	96	2.15	1.39	1.02	0.66	48	0.88	0.57	41	0.92	0.59	43
Wakarusa River	WR-4	SW021041	SW021028		12	347	2.63	1.70	0.95	0.62	36	0.81	0.52	31	0.81	0.52	31
Wakarusa River	WR-4	SW021048	SW021015		21	199	9.40	6.08	5.72	3.70	61	4.98	3.22	53	5.09	3.29	54
Wakarusa River	WR-4	SW021049	SW021048		21	630	10.00	6.47	5.72	3.70	57	4.94	3.20	49	5.05	3.26	50
Wakarusa River	WR-4	SW021050	SW021049		18	54	22.33	14.44	5.69	3.67	25	4.91	3.17	22	5.05	3.26	23
Wakarusa River	WR-4	SW021051	SW021050		18	366	1.82	1.18	4.10	2.65	225	3.53	2.28	194	3.64	2.35	200
Wakarusa River	WR-4	SW021063	SW021202		18	43	20.89	13.50	4.06	2.63	19	3.50	2.26	17	3.57	2.31	17
Wakarusa River	WR-4	SW021064	SW021063		18	350	6.28	4.06	4.03	2.60	64	3.50	2.26	56	3.57	2.31	57
Wakarusa River	WR-4	SW021074	SW021123		18	417	6.57	4.25	3.32	2.15	51	2.86	1.85	44	2.93	1.89	45
Wakarusa River	WR-4	SW021085	SW021122		10	378	1.04	0.67	0.32	0.21	31	0.28	0.18	27	0.28	0.18	27
Wakarusa River	WR-4	SW021086	SW021085		10	381	1.91	1.23	0.21	0.14	11	0.18	0.11	9	0.18	0.11	9
Wakarusa River	WR-4	SW021087	SW021086		10	67	1.97	1.27	0.11	0.07	5	0.11	0.07	5	0.11	0.07	5
Wakarusa River	WR-4	SW021118	SW021017		12	288	2.46	1.59	1.31	0.84	53	1.10	0.71	45	1.13	0.73	46
Wakarusa River	WR-4	SW021119	SW021017		21	23	52.76	34.11	2.01	1.30	4	1.73	1.12	3	1.77	1.14	3
Wakarusa River	WR-4	SW021120	SW021200		21	434	10.12	6.54	1.98	1.28	20	1.70	1.10	17	1.73	1.12	17
Wakarusa River	WR-4	SW021121	SW021120		21	579	9.05	5.85	1.94	1.26	21	1.66	1.07	18	1.70	1.10	19
Wakarusa River	WR-4	SW021122	SW021050		10	12	4.52	2.92	1.66	1.07	37	1.62	1.05	36	1.70	1.10	38
Wakarusa River	WR-4	SW021122	SW021121		18	12	17.94	11.60	1.91	1.23	11	1.62	1.05	9	1.70	1.10	9
Wakarusa River	WR-4	SW021123	SW021122		18	366	6.68	4.32	3.35	2.17	50	2.90	1.87	43	2.97	1.92	44
Wakarusa River	WR-4	SW021200	SW021119		21	397	9.87	6.38	1.98	1.28	20	1.70	1.10	17	1.77	1.14	18
Wakarusa River	WR-4	SW021202	SW021051		18	403	7.35	4.75	4.10	2.65	56	3.53	2.28	48	3.60	2.33	49
Wakarusa River	WR-4	SW261090	NW351301		12	155	3.55	2.30	0.21	0.14	6	0.18	0.11	5	0.18	0.11	5
Wakarusa River	WR-4	SW261091	SW261090		12	190	3.36	2.17	0.11	0.07	3	0.11	0.07	3	0.11	0.07	3
Wakarusa River	WR-4	SW351115	SW351194		15	340	7.68	4.97	2.90	1.87	38	2.47	1.60	32	2.54	1.64	33
Wakarusa River	WR-4	SW351116	SW351115		15	166	6.77	4.37	2.83	1.83	42	2.44	1.57	36	2.47	1.60	37
Wakarusa River	WR-4	SW351117	SW351116		12	387	4.83	3.12	2.75	1.78	57	2.37	1.53	49	2.40	1.55	50
Wakarusa River	WR-4	SW351118	SW351117		12	196	0.99	0.64	2.65	1.71	269	2.30	1.48	233	2.37	1.53	240
Wakarusa River	WR-4	SW351119	SW351118		12	172	4.78	3.09	2.58	1.67	54	2.23	1.44	47	2.26	1.46	47
Wakarusa River	WR-4	SW351125	SW351221		18	221	8.99	5.81	1.98	1.28	22	1.70	1.10	19	1.73	1.12	19
Wakarusa River	WR-4	SW351126	SW351125		18	241	13.02	8.41	1.87	1.21	14	1.62	1.05	12	1.62	1.05	12
Wakarusa River	WR-4	SW351127	SW351260		12	93	3.02	1.95	0.95	0.62	32	0.81	0.52	27	0.81	0.52	27
Wakarusa River	WR-4	SW351128	SW351127		12	369	2.76	1.78	0.85	0.55	31	0.71	0.46	26	0.74	0.48	27
Wakarusa River	WR-4	SW351130	SW351128		12	188	4.81	3.11	0.74	0.48	15	0.64	0.41	13	0.64	0.41	13

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Wakarusa River	WR-4	SW351132	SW351260		12	378	2.82	1.82	1.34	0.87	48	1.17	0.75	41	1.20	0.78	43
Wakarusa River	WR-4	SW351135	SW351132		12	357	6.01	3.88	1.24	0.80	21	1.10	0.71	18	1.10	0.71	18
Wakarusa River	WR-4	SW351149	SW351135		12	292	4.90	3.17	1.13	0.73	23	0.99	0.64	20	0.99	0.64	20
Wakarusa River	WR-4	SW351151	SW351149		12	283	1.88	1.22	1.06	0.68	56	0.88	0.57	47	0.92	0.59	49
Wakarusa River	WR-4	SW351194	SE351250		15	73	5.61	3.62	2.93	1.89	52	2.54	1.64	45	2.58	1.67	46
Wakarusa River	WR-4	SW351221	SW351257		18	274	9.91	6.41	2.08	1.35	21	1.77	1.14	18	1.80	1.16	18
Wakarusa River	WR-4	SW351251	NW021103		18	318	11.93	7.71	2.51	1.62	21	2.15	1.39	18	2.19	1.41	18
Wakarusa River	WR-4	SW351252	SW351251		18	105	3.24	2.10	2.44	1.57	75	2.12	1.37	65	2.15	1.39	66
Wakarusa River	WR-4	SW351253	SW351252		18	183	8.99	5.81	2.40	1.55	27	2.05	1.32	23	2.08	1.35	23
Wakarusa River	WR-4	SW351254	SW351253		18	259	9.02	5.83	2.37	1.53	26	2.01	1.30	22	2.05	1.32	23
Wakarusa River	WR-4	SW351255	SW351254		18	100	7.93	5.13	2.30	1.48	29	1.94	1.26	24	1.98	1.28	25
Wakarusa River	WR-4	SW351256	SW351255		18	272	8.73	5.65	2.23	1.44	25	1.91	1.23	22	1.94	1.26	22
Wakarusa River	WR-4	SW351257	SW351256		18	220	8.73	5.64	2.15	1.39	25	1.84	1.19	21	1.87	1.21	21
Wakarusa River	WR-4	SW351258	SW351119		12	230	3.36	2.17	2.51	1.62	75	2.15	1.39	64	2.19	1.41	65
Wakarusa River	WR-4	SW351260	SW351258		12	364	4.50	2.91	2.40	1.55	53	2.05	1.32	45	2.08	1.35	46
Wakarusa River	WR-4	SW351261	SW351126		18	206	8.90	5.76	1.77	1.14	20	1.52	0.98	17	1.55	1.00	17
Wakarusa River	WR-4	SW351262	SW351261		18	191	9.03	5.83	1.66	1.07	18	1.45	0.94	16	1.45	0.94	16
Wakarusa River	WR-4	SW351263	SW351262		18	291	10.70	6.92	1.55	1.00	15	1.34	0.87	13	1.38	0.89	13
Wakarusa River	WR-5	NW111016	NW111017		24	87	4.85	3.14	2.44	1.57	50	4.77	3.08	98	5.23	3.38	108
Wakarusa River	WR-5	NW111016	NW11116A		24	110	2.16	1.39	6.74	4.36	313	4.77	3.08	221	5.23	3.38	242
Wakarusa River	WR-5	NW111017	SW021018		24	355	5.63	3.64	2.40	1.55	43	2.54	1.64	45	2.19	1.41	39
Wakarusa River	WR-5	NW111018	NW111019		24	176	7.24	4.68	2.83	1.83	39	2.68	1.73	37	2.65	1.71	37
Wakarusa River	WR-5	NW111018	NW11116A		24	20	18.93	12.24	7.49	4.84	40	2.68	1.73	14	2.65	1.71	14
Wakarusa River	WR-5	NW111019	NW111020		24	309	7.17	4.63	2.83	1.83	39	2.68	1.73	37	2.65	1.71	37
Wakarusa River	WR-5	NW111020	NW111021		24	166	7.24	4.68	2.83	1.83	39	2.68	1.73	37	2.65	1.71	37
Wakarusa River	WR-5	NW111021	NW111022		24	140	6.05	3.91	2.83	1.83	47	2.68	1.73	44	2.65	1.71	44
Wakarusa River	WR-5	NW111022	NW111023		24	97	7.27	4.70	2.83	1.83	39	2.68	1.73	37	2.65	1.71	36
Wakarusa River	WR-5	NW111023	NW111024		24	160	7.16	4.63	2.86	1.85	40	2.68	1.73	38	2.65	1.71	37
Wakarusa River	WR-5	NW111024	NW111025		24	192	7.12	4.60	2.86	1.85	40	2.68	1.73	38	2.65	1.71	37
Wakarusa River	WR-5	NW111025	NW111027		24	309	7.17	4.63	2.86	1.85	40	2.68	1.73	37	2.65	1.71	37
Wakarusa River	WR-5	NW111027	NW111028		24	143	7.08	4.58	2.86	1.85	40	2.68	1.73	38	2.65	1.71	37
Wakarusa River	WR-5	NW111028	NW111029		24	411	6.79	4.39	2.90	1.87	43	2.68	1.73	40	2.65	1.71	39
Wakarusa River	WR-5	NW111029	SW111033		24	152	1.84	1.19	2.90	1.87	158	2.72	1.76	148	2.68	1.73	146
Wakarusa River	WR-5	NW111030	PS_24		8	153	1.30	0.84	0.14	0.09	11	0.07	0.05	5	0.07	0.05	5
Wakarusa River	WR-5	NW111031	NW111030		8	426	0.88	0.57	0.07	0.05	8	0.04	0.02	4	0.04	0.02	4
Wakarusa River	WR-5	NW11116A	NW111188		36	420	28.38	18.34	14.23	9.20	50	11.90	7.69	42	12.25	7.92	43
Wakarusa River	WR-5	NW111184	SW111165		36	597	15.20	9.82	13.52	8.74	89	11.37	7.35	75	11.72	7.58	77
Wakarusa River	WR-5	NW111185	NW111184		36	519	15.21	9.83	13.77	8.90	91	11.58	7.49	76	11.94	7.71	78

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Wakarusa River	WR-5	NW111186	NW111185		36	211	15.23	9.84	13.88	8.97	91	11.65	7.53	77	12.01	7.76	79
Wakarusa River	WR-5	NW111187	NW111186		36	436	28.75	18.59	14.09	9.11	49	11.79	7.62	41	12.15	7.85	42
Wakarusa River	WR-5	NW111188	NW111187		36	369	28.43	18.37	14.20	9.18	50	11.86	7.67	42	12.22	7.90	43
Wakarusa River	WR-5	NW11118A	NW111018		24	221	7.46	4.82	10.31	6.67	138	9.78	6.32	131	9.64	6.23	129
Wakarusa River	WR-5	NW141501	SW111189		36	541	45.71	29.55	0.07	0.05	0	0.04	0.02	0	0.04	0.02	0
Wakarusa River	WR-5	RL119L1	SW111ch1		24	27	16.86	10.90	0.07	0.05	0	0.04	0.02	0	0.04	0.02	0
Wakarusa River	WR-5	SW021017	NW11118A		24	225	5.44	3.52	10.28	6.64	189	9.78	6.32	180	9.64	6.23	177
Wakarusa River	WR-5	SW021018	SW021017		24	91	10.61	6.86	2.44	1.57	23	2.58	1.67	24	2.26	1.46	21
Wakarusa River	WR-5	SW111033	SW11133A		24	93	7.04	4.55	2.93	1.89	42	2.72	1.76	39	2.68	1.73	38
Wakarusa River	WR-5	SW111034	SW111039		24	288	7.18	4.64	2.93	1.89	41	2.72	1.76	38	2.72	1.76	38
Wakarusa River	WR-5	SW111039	SW111044		24	332	6.57	4.25	2.93	1.89	45	2.72	1.76	41	2.72	1.76	41
Wakarusa River	WR-5	SW111044	SW111072		24	374	7.02	4.54	2.93	1.89	42	2.72	1.76	39	2.72	1.76	39
Wakarusa River	WR-5	SW111072	SW111077		24	169	7.18	4.64	2.93	1.89	41	2.72	1.76	38	2.68	1.73	37
Wakarusa River	WR-5	SW111077	SW111078		24	192	4.90	3.17	2.97	1.92	61	2.72	1.76	55	2.68	1.73	55
Wakarusa River	WR-5	SW111078	SW111214		24	285	4.83	3.12	2.97	1.92	61	2.72	1.76	56	2.72	1.76	56
Wakarusa River	WR-5	SW111084	SW111176		15	62	15.17	9.81	0.00	0.00	0	2.72	1.76	18	2.72	1.76	18
Wakarusa River	WR-5	SW111084	SW111215		24	21	17.10	11.05	2.97	1.92	17	2.72	1.76	16	2.72	1.76	16
Wakarusa River	WR-5	SW111086	SW111087		24	152	7.11	4.59	3.00	1.94	42	2.75	1.78	39	2.72	1.76	38
Wakarusa River	WR-5	SW111087	SW111090		24	253	6.52	4.21	3.00	1.94	46	2.75	1.78	42	2.72	1.76	42
Wakarusa River	WR-5	SW111090	SW111091		24	334	7.11	4.60	3.00	1.94	42	2.75	1.78	39	2.72	1.76	38
Wakarusa River	WR-5	SW111091	NW141003		24	635	5.89	3.81	3.00	1.94	51	2.75	1.78	47	2.72	1.76	46
Wakarusa River	WR-5	SW111092	SW111093		36	510	23.07	14.91	12.89	8.33	56	10.84	7.01	47	11.23	7.26	49
Wakarusa River	WR-5	SW111165	SW111166		36	396	15.36	9.93	13.28	8.58	86	11.19	7.24	73	11.55	7.46	75
Wakarusa River	WR-5	SW111166	SW111168		36	144	15.73	10.17	13.14	8.49	84	11.05	7.14	70	11.44	7.39	73
Wakarusa River	WR-5	SW111168	SW111169		36	322	15.33	9.91	13.10	8.47	85	11.02	7.12	72	11.41	7.37	74
Wakarusa River	WR-5	SW111169	SW111170		36	595	15.23	9.84	13.03	8.42	86	10.95	7.08	72	11.34	7.33	74
Wakarusa River	WR-5	SW111170	RL119L1		24	138	46.06	29.78	0.00	0.00	0	10.88	7.03	24	11.26	7.28	24
Wakarusa River	WR-5	SW111170	SW111177		36	138	21.24	13.73	12.92	8.35	61	10.88	7.03	51	11.26	7.28	53
Wakarusa River	WR-5	SW111176	SW111170		15	203	7.55	4.88	0.07	0.05	1	0.04	0.02	0	0.04	0.02	0
Wakarusa River	WR-5	SW111177	SW111178		36	472	23.78	15.37	12.92	8.35	54	10.88	7.03	46	11.26	7.28	47
Wakarusa River	WR-5	SW111178	SW11190A		36	278	30.99	20.03	12.89	8.33	42	10.84	7.01	35	11.23	7.26	36
Wakarusa River	WR-5	SW111180	SW111086		24	166	7.24	4.68	3.00	1.94	41	2.75	1.78	38	2.72	1.76	38
Wakarusa River	WR-5	SW111189	SW111092		36	97	63.17	40.84	12.89	8.33	20	10.84	7.01	17	11.23	7.26	18
Wakarusa River	WR-5	SW111214	SW111084		24	86	7.32	4.73	2.97	1.92	41	2.72	1.76	37	2.72	1.76	37
Wakarusa River	WR-5	SW111215	SW111180		24	228	5.40	3.49	2.97	1.92	55	2.72	1.76	50	2.72	1.76	50
Wakarusa River	WR-5	SW11133A	SW111034		24	146	7.25	4.69	2.93	1.89	40	2.72	1.76	38	2.68	1.73	37
Wakarusa River	WR-5	SW11190A	SW111189		36	360	23.32	15.07	12.89	8.33	55	10.84	7.01	46	11.23	7.26	48
Wakarusa River	WR-5	SW111ch1	SW111ch2		24	30	17.03	11.01	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
							(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Wakarusa River	WR-5	SW111ch2	RL219L2		24	218	16.86	10.90	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Wakarusa River	WR-6	NE111060	NE111064		10	383	2.18	1.41	0.42	0.27	19	0.35	0.23	16	0.35	0.23	16
Wakarusa River	WR-6	NE111064	NE111065		10	373	1.44	0.93	0.88	0.57	62	0.71	0.46	49	0.71	0.46	49
Wakarusa River	WR-6	NE111065	NE111066		10	50	1.39	0.90	1.31	0.84	94	1.06	0.68	76	1.06	0.68	76
Wakarusa River	WR-6	NE111066	NE111067		10	142	1.39	0.90	1.73	1.12	125	1.41	0.91	102	1.41	0.91	102
Wakarusa River	WR-6	NE111067	NE111068		12	235	2.25	1.46	2.12	1.37	94	1.77	1.14	78	1.77	1.14	78
Wakarusa River	WR-6	NE111068	NE111069		12	401	2.25	1.46	2.40	1.55	107	2.08	1.35	93	2.12	1.37	94
Wakarusa River	WR-6	NE111069	SE111072		12	331	2.28	1.48	2.51	1.62	110	2.44	1.57	107	2.47	1.60	108
Wakarusa River	WR-6	NE121113	NW121112		15	290	4.09	2.64	1.77	1.14	43	1.41	0.91	35	1.41	0.91	35
Wakarusa River	WR-6	NE121114	NE121113		15	291	3.99	2.58	1.31	0.84	33	1.06	0.68	27	1.06	0.68	27
Wakarusa River	WR-6	NE121115	NE121114		15	295	3.98	2.57	0.88	0.57	22	0.71	0.46	18	0.71	0.46	18
Wakarusa River	WR-6	NE121116	NE121115		15	370	4.03	2.61	0.42	0.27	11	0.35	0.23	9	0.35	0.23	9
Wakarusa River	WR-6	NE12135D	SE121091		8	164	2.78	1.80	1.38	0.89	49	1.24	0.80	44	1.20	0.78	43
Wakarusa River	WR-6	NE131126	SE121116		24	190	6.96	4.50	6.43	4.15	92	5.79	3.74	83	6.43	4.15	92
Wakarusa River	WR-6	NE131127	NE131126		24	350	5.41	3.49	6.39	4.13	118	5.76	3.72	106	6.39	4.13	118
Wakarusa River	WR-6	NE131128	NE131127		24	404	5.03	3.25	6.36	4.11	126	5.76	3.72	114	6.36	4.11	126
Wakarusa River	WR-6	NE131129	NE131128		24	462	7.88	5.09	6.36	4.11	81	5.72	3.70	73	6.36	4.11	81
Wakarusa River	WR-6	NE131130	NE131129		24	473	7.13	4.61	6.39	4.13	90	5.69	3.67	80	6.32	4.09	89
Wakarusa River	WR-6	NE131131	NE131130		24	521	7.28	4.71	6.39	4.13	88	5.65	3.65	78	6.29	4.06	86
Wakarusa River	WR-6	NE131132	NE131131		24	482	7.14	4.62	6.36	4.11	89	5.61	3.63	79	6.25	4.04	88
Wakarusa River	WR-6	NE131135	SE121136		36	440	20.85	13.48	12.78	8.26	61	10.84	7.01	52	11.30	7.30	54
Wakarusa River	WR-6	NE131142	NE131135		36	399	20.85	13.48	12.78	8.26	61	10.84	7.01	52	11.30	7.30	54
Wakarusa River	WR-6	NE131143	NE131142		36	396	20.94	13.53	12.82	8.29	61	10.84	7.01	52	11.30	7.30	54
Wakarusa River	WR-6	NE141002	NE141050		36	409	19.52	12.62	13.14	8.49	67	11.09	7.17	57	11.48	7.42	59
Wakarusa River	WR-6	NE141011	NE141002		36	463	20.80	13.44	13.17	8.51	63	11.12	7.19	53	11.55	7.46	56
Wakarusa River	WR-6	NE141014	SE111284		12	144	0.00	0.00	0.00	0.00	-	0.00	0.00	-	0.00	0.00	-
Wakarusa River	WR-6	NE141015	NE141014		12	438	0.00	0.00	0.00	0.00	-	4.17	2.69	-	5.23	3.38	-
Wakarusa River	WR-6	NE141015	NE141063		24	64	7.48	4.84	4.20	2.72	56	4.17	2.69	56	5.23	3.38	70
Wakarusa River	WR-6	NE141016	NE141017		24	600	7.16	4.63	5.09	3.29	71	4.73	3.06	66	5.61	3.63	78
Wakarusa River	WR-6	NE141017	NE141018		24	600	7.16	4.63	5.05	3.26	71	4.70	3.04	66	5.54	3.58	77
Wakarusa River	WR-6	NE141018	SE141001		24	354	7.98	5.16	5.09	3.29	64	4.70	3.04	59	5.58	3.61	70
Wakarusa River	WR-6	NE141019	NE141015		24	575	10.03	6.48	3.67	2.37	37	3.78	2.44	38	4.98	3.22	50
Wakarusa River	WR-6	NE141021	NW131043		24	296	7.44	4.81	5.47	3.54	74	4.98	3.22	67	5.79	3.74	78
Wakarusa River	WR-6	NE141050	NW131087		36	327	23.33	15.08	13.10	8.47	56	11.05	7.14	47	11.48	7.42	49
Wakarusa River	WR-6	NE141060	NE141016		24	48	7.30	4.72	4.70	3.04	64	4.48	2.90	61	5.44	3.52	74
Wakarusa River	WR-6	NE141063	NE141060		24	438	7.09	4.58	4.56	2.94	64	4.38	2.83	62	5.37	3.47	76
Wakarusa River	WR-6	NW121104	SW121076		15	284	4.47	2.89	4.56	2.94	102	3.78	2.44	85	3.81	2.46	85
Wakarusa River	WR-6	NW121105	NW121104		15	84	2.34	1.51	4.17	2.69	178	3.46	2.24	148	3.46	2.24	148

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Wakarusa River	WR-6	NW121106	NW121105		15	240	3.61	2.33	3.78	2.44	105	3.11	2.01	86	3.14	2.03	87
Wakarusa River	WR-6	NW121110	NW121512		15	178	3.96	2.56	3.04	1.96	77	2.44	1.57	61	2.44	1.57	61
Wakarusa River	WR-6	NW121111	NW121110		15	232	4.00	2.59	2.61	1.69	65	2.08	1.35	52	2.12	1.37	53
Wakarusa River	WR-6	NW121112	NW121111		15	145	4.12	2.66	2.19	1.41	53	1.73	1.12	42	1.77	1.14	43
Wakarusa River	WR-6	NW121512	NW121106		15	164	4.97	3.21	3.46	2.24	70	2.79	1.80	56	2.79	1.80	56
Wakarusa River	WR-6	NW131043	SW131048		24	331	7.46	4.82	5.58	3.61	75	5.01	3.24	67	5.83	3.77	78
Wakarusa River	WR-6	NW131084	NW131085		24	387	6.80	4.40	6.04	3.90	89	5.37	3.47	79	6.07	3.93	89
Wakarusa River	WR-6	NW131085	NW131086		24	161	6.91	4.46	6.11	3.95	88	5.40	3.49	78	6.11	3.95	88
Wakarusa River	WR-6	NW131086	SW131087		24	506	6.44	4.16	6.18	3.99	96	5.47	3.54	85	6.14	3.97	95
Wakarusa River	WR-6	NW131087	NW131088		36	261	21.05	13.61	13.07	8.45	62	11.05	7.14	52	11.48	7.42	55
Wakarusa River	WR-6	NW131088	NW131089		36	425	20.97	13.55	13.07	8.45	62	11.02	7.12	53	11.44	7.39	55
Wakarusa River	WR-6	NW131089	NW131090		36	20	21.09	13.64	13.03	8.42	62	11.02	7.12	52	11.44	7.39	54
Wakarusa River	WR-6	NW131090	NW131091		36	440	20.85	13.48	13.07	8.45	63	11.02	7.12	53	11.48	7.42	55
Wakarusa River	WR-6	NW131091	NW131092		36	364	23.19	14.99	13.03	8.42	56	11.02	7.12	47	11.44	7.39	49
Wakarusa River	WR-6	NW131092	NW131093		36	395	20.96	13.55	12.99	8.40	62	10.98	7.10	52	11.44	7.39	55
Wakarusa River	WR-6	NW131093	NW131094		36	346	20.91	13.52	12.96	8.38	62	10.98	7.10	53	11.41	7.37	55
Wakarusa River	WR-6	NW131094	NW131095		36	546	20.58	13.30	12.96	8.38	63	10.95	7.08	53	11.41	7.37	55
Wakarusa River	WR-6	NW131095	NW131144		36	517	21.16	13.68	12.89	8.33	61	10.91	7.05	52	11.34	7.33	54
Wakarusa River	WR-6	NW131144	NE131143		36	416	20.69	13.37	12.85	8.31	62	10.88	7.03	53	11.34	7.33	55
Wakarusa River	WR-6	NW141001	NE141019		24	575	7.19	4.65	3.46	2.24	48	3.67	2.37	51	4.94	3.20	69
Wakarusa River	WR-6	NW141002	NW141001		24	550	7.16	4.63	3.25	2.10	45	3.57	2.31	50	4.91	3.17	69
Wakarusa River	WR-6	NW141003	NW141005		24	601	7.15	4.62	3.04	1.96	42	3.00	1.94	42	4.34	2.81	61
Wakarusa River	WR-6	NW141004	NW141002		24	422	7.22	4.67	3.07	1.99	43	3.35	2.17	46	4.77	3.08	66
Wakarusa River	WR-6	NW141005	NW141004		24	103	7.05	4.56	3.07	1.99	44	3.04	1.96	43	4.45	2.88	63
Wakarusa River	WR-6	SE072095	SE072096		24	441	5.28	3.41	4.84	3.13	92	4.27	2.76	81	4.59	2.97	87
Wakarusa River	WR-6	SE072096	SE072097		24	548	7.36	4.76	4.91	3.17	67	4.34	2.81	59	4.66	3.01	63
Wakarusa River	WR-6	SE072097	SE072156		24	497	7.10	4.59	4.98	3.22	70	4.38	2.83	62	4.70	3.04	66
Wakarusa River	WR-6	SE072103	SE072104		48	517	26.06	16.84	27.82	17.99	107	25.11	16.23	96	25.85	16.71	99
Wakarusa River	WR-6	SE072104	SE072105		48	521	25.94	16.77	25.74	16.64	99	24.12	15.59	93	24.26	15.68	94
Wakarusa River	WR-6	SE072105	SE072106		48	466	33.26	21.50	29.94	19.36	90	28.43	18.37	85	28.71	18.56	86
Wakarusa River	WR-6	SE072106	PS_05A		48	24	71.83	46.43	27.40	17.71	38	26.98	17.44	38	27.01	17.46	38
Wakarusa River	WR-6	SE072156	SE072157		24	486	7.11	4.60	6.29	4.06	88	2.54	1.64	36	3.35	2.17	47
Wakarusa River	WR-6	SE072156	SE072105		24	25	58.82	38.02	7.20	4.66	12	2.54	1.64	4	3.35	2.17	6
Wakarusa River	WR-6	SE072157	PS_05B		24	24	10.33	6.67	5.76	3.72	56	2.58	1.67	25	3.35	2.17	32
Wakarusa River	WR-6	SE111007	SE111270		10	134	1.94	1.25	0.42	0.27	22	0.35	0.23	18	0.35	0.23	18
Wakarusa River	WR-6	SE111008	SE111013		10	369	1.86	1.20	1.31	0.84	70	1.06	0.68	57	1.06	0.68	57
Wakarusa River	WR-6	SE111013	SE111014		10	40	1.90	1.23	1.62	1.05	86	1.41	0.91	74	1.41	0.91	74
Wakarusa River	WR-6	SE111014	SE111018		10	210	1.79	1.16	1.98	1.28	111	1.77	1.14	99	1.77	1.14	99

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Wakarusa River	WR-6	SE111018	SE111019		12	234	1.74	1.13	2.40	1.55	138	2.08	1.35	120	2.12	1.37	122
Wakarusa River	WR-6	SE111019	SE111020		12	230	1.74	1.13	2.83	1.83	162	2.44	1.57	140	2.47	1.60	142
Wakarusa River	WR-6	SE111020	SE111282		12	180	1.72	1.11	3.25	2.10	189	2.79	1.80	162	2.83	1.83	164
Wakarusa River	WR-6	SE111072	SE111073		12	194	2.26	1.46	2.72	1.76	120	2.79	1.80	123	2.79	1.80	123
Wakarusa River	WR-6	SE111073	SW121008		12	92	3.54	2.29	3.04	1.96	86	3.14	2.03	89	3.14	2.03	89
Wakarusa River	WR-6	SE111095	SE111096		36	626	15.77	10.19	12.78	8.26	81	10.77	6.96	68	11.16	7.21	71
Wakarusa River	WR-6	SE111096	SE111283		36	104	24.47	15.82	12.75	8.24	52	10.73	6.94	44	11.16	7.21	46
Wakarusa River	WR-6	SE111270	SE111008		10	166	1.79	1.16	0.88	0.57	49	0.71	0.46	39	0.71	0.46	39
Wakarusa River	WR-6	SE111282	SE111284		12	74	11.90	7.69	3.67	2.37	31	3.14	2.03	26	3.14	2.03	26
Wakarusa River	WR-6	SE111283	SE111284		36	23	31.10	20.10	12.78	8.26	41	10.77	6.96	35	11.16	7.21	36
Wakarusa River	WR-6	SE111284	NE141011		36	146	40.57	26.22	13.17	8.51	32	11.12	7.19	27	11.51	7.44	28
Wakarusa River	WR-6	SE12104A	SE121120		24	387	7.18	4.64	15.43	9.97	215	13.24	8.56	184	13.28	8.58	185
Wakarusa River	WR-6	SE121058	SE121059		24	140	7.16	4.63	0.42	0.27	6	0.35	0.23	5	0.35	0.23	5
Wakarusa River	WR-6	SE121059	SE121141	WR-6-1	24	21	96.37	62.29	15.01	9.70	16	12.64	8.17	13	12.75	8.24	13
Wakarusa River	WR-6	SE121060	SE121059		24	194	8.90	5.75	14.83	9.59	167	12.54	8.10	141	12.61	8.15	142
Wakarusa River	WR-6	SE121091	SE12135F		12	7	5.87	3.79	1.59	1.03	27	1.52	0.98	26	1.55	1.00	26
Wakarusa River	WR-6	SE121092	SE12135F		12	164	1.80	1.17	0.39	0.25	22	0.35	0.23	20	0.35	0.23	20
Wakarusa River	WR-6	SE121093	SE121094		12	103	1.89	1.22	2.47	1.60	131	2.54	1.64	134	2.58	1.67	136
Wakarusa River	WR-6	SE121094	SE121100		12	330	1.88	1.22	2.86	1.85	152	2.90	1.87	154	2.90	1.87	154
Wakarusa River	WR-6	SE121100	SE121105		12	322	1.88	1.22	3.25	2.10	172	3.21	2.08	171	3.21	2.08	171
Wakarusa River	WR-6	SE121105	SE121106		12	132	1.91	1.24	3.67	2.37	192	3.53	2.28	185	3.53	2.28	185
Wakarusa River	WR-6	SE121106	SE121109		12	234	1.88	1.21	3.71	2.40	197	3.85	2.49	205	3.88	2.51	207
Wakarusa River	WR-6	SE121109	SE121112		12	211	1.88	1.22	4.13	2.67	219	4.20	2.72	223	4.20	2.72	223
Wakarusa River	WR-6	SE121112	SE121113		12	131	7.50	4.85	4.56	2.94	61	4.56	2.94	61	4.56	2.94	61
Wakarusa River	WR-6	SE121113	SE12159A		12	37	2.19	1.42	-1.59	-1.03	-72	27.44	17.73	1252	28.43	18.37	1297
Wakarusa River	WR-6	SE121113	SW072098		48	542	36.51	23.60	33.76	21.82	92	27.44	17.73	75	28.43	18.37	78
Wakarusa River	WR-6	SE121114	SE12159A		24	162	14.98	9.68	5.97	3.86	40	5.47	3.54	37	5.93	3.83	40
Wakarusa River	WR-6	SE121115	SE121114		24	383	7.13	4.61	6.53	4.22	92	5.86	3.79	82	6.50	4.20	91
Wakarusa River	WR-6	SE121116	SE121115		24	504	6.45	4.17	6.46	4.18	100	5.83	3.77	90	6.46	4.18	100
Wakarusa River	WR-6	SE121117	SE121060		24	528	7.30	4.72	14.87	9.61	204	12.57	8.13	172	12.68	8.19	174
Wakarusa River	WR-6	SE121118	SE121117		24	585	7.00	4.52	15.08	9.75	215	12.82	8.29	183	12.89	8.33	184
Wakarusa River	WR-6	SE121119	SE121118		24	601	7.15	4.62	15.43	9.97	216	13.17	8.51	184	13.24	8.56	185
Wakarusa River	WR-6	SE121120	SE121119		24	112	7.09	4.58	15.36	9.93	217	13.14	8.49	185	13.21	8.54	186
Wakarusa River	WR-6	SE121136	SE121137		36	225	26.68	17.25	12.78	8.26	48	10.84	7.01	41	11.26	7.28	42
Wakarusa River	WR-6	SE121137	SE121138		36	565	21.00	13.57	12.78	8.26	61	10.84	7.01	52	11.30	7.30	54
Wakarusa River	WR-6	SE121138	SE121139		36	101	20.99	13.57	12.78	8.26	61	10.81	6.98	51	11.26	7.28	54
Wakarusa River	WR-6	SE121139	SE121140		36	525	20.99	13.57	12.78	8.26	61	10.84	7.01	52	11.30	7.30	54
Wakarusa River	WR-6	SE121140	SE121141		36	215	46.84	30.28	12.85	8.31	27	10.84	7.01	23	11.30	7.30	24

							Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Wakarusa River	WR-6	SE121141	SE121114		48	293	61.10	39.50	0.00	0.00	0	21.12	13.65	35	21.79	14.08	36
Wakarusa River	WR-6	SE121141	SE121511		48	293	43.62	28.20	24.93	16.11	57	21.12	13.65	48	21.79	14.08	50
Wakarusa River	WR-6	SE12135F	SE121093		12	84	1.17	0.75	2.15	1.39	185	2.23	1.44	191	2.23	1.44	191
Wakarusa River	WR-6	SE121511	SE121113	WR-6-3	48	189	37.68	24.36	30.19	19.52	80	25.25	16.32	67	26.06	16.84	69
Wakarusa River	WR-6	SE12159A	SW072091		24	162	11.93	7.71	4.45	2.88	37	4.13	2.67	35	4.41	2.85	37
Wakarusa River	WR-6	SE131133	NE131132		24	370	7.16	4.63	6.32	4.09	88	5.58	3.61	78	6.22	4.02	87
Wakarusa River	WR-6	SE131134	SE131133		24	553	7.14	4.61	6.29	4.06	88	5.54	3.58	78	6.22	4.02	87
Wakarusa River	WR-6	SE141001	SE141002		24	386	7.46	4.82	5.16	3.33	69	4.77	3.08	64	5.61	3.63	75
Wakarusa River	WR-6	SE141002	SE141003		24	401	7.49	4.84	5.23	3.38	70	4.80	3.10	64	5.65	3.65	75
Wakarusa River	WR-6	SE141003	SE141004		24	460	7.46	4.82	5.33	3.45	71	4.84	3.13	65	5.69	3.67	76
Wakarusa River	WR-6	SE141004	NE141021		24	147	7.46	4.82	5.40	3.49	72	4.91	3.17	66	5.76	3.72	77
Wakarusa River	WR-6	SW072091	SW072092		24	524	7.13	4.61	4.52	2.92	63	4.17	2.69	58	4.45	2.88	62
Wakarusa River	WR-6	SW072092	SW072093		24	541	7.15	4.62	4.66	3.01	65	4.20	2.72	59	4.48	2.90	63
Wakarusa River	WR-6	SW072093	SW072094		24	592	7.20	4.66	4.73	3.06	66	4.24	2.74	59	4.52	2.92	63
Wakarusa River	WR-6	SW072094	SE072095		24	599	7.16	4.63	4.77	3.08	67	4.24	2.74	59	4.56	2.94	64
Wakarusa River	WR-6	SW072098	SW072099		48	456	42.54	27.50	33.44	21.62	79	27.30	17.64	64	28.28	18.28	66
Wakarusa River	WR-6	SW072099	SW072100		48	555	42.25	27.31	33.09	21.39	78	27.12	17.53	64	28.14	18.19	67
Wakarusa River	WR-6	SW072100	SW072101		48	569	43.43	28.07	32.42	20.95	75	26.84	17.35	62	27.86	18.01	64
Wakarusa River	WR-6	SW072101	SW072102		48	616	35.22	22.77	31.25	20.20	89	26.45	17.10	75	27.44	17.73	78
Wakarusa River	WR-6	SW072102	SE072103		48	431	37.90	24.50	29.41	19.01	78	25.78	16.66	68	26.66	17.23	70
Wakarusa River	WR-6	SW111093	SW111094		36	588	23.99	15.50	12.85	8.31	54	10.84	7.01	45	11.19	7.24	47
Wakarusa River	WR-6	SW111094	SE111095		36	552	28.40	18.35	12.82	8.29	45	10.81	6.98	38	11.19	7.24	39
Wakarusa River	WR-6	SW121006	SW121010		12	335	2.25	1.46	3.96	2.56	176	4.17	2.69	185	4.17	2.69	185
Wakarusa River	WR-6	SW121007	SW121006		12	207	4.28	2.76	3.71	2.40	87	3.81	2.46	89	3.85	2.49	90
Wakarusa River	WR-6	SW121008	SW121007		12	168	4.28	2.76	3.32	2.15	78	3.50	2.26	82	3.50	2.26	82
Wakarusa River	WR-6	SW121010	SW121011		12	164	2.26	1.46	4.38	2.83	194	4.48	2.90	198	4.48	2.90	198
Wakarusa River	WR-6	SW121011	SW121013		12	297	4.09	2.65	4.77	3.08	116	4.80	3.10	117	4.84	3.13	118
Wakarusa River	WR-6	SW121013	SW121014		12	400	5.29	3.42	5.19	3.36	98	5.12	3.31	97	5.16	3.33	98
Wakarusa River	WR-6	SW121014	SW121026		12	125	2.76	1.78	5.51	3.56	200	5.44	3.52	197	5.44	3.52	197
Wakarusa River	WR-6	SW121026	SW121027		12	50	2.85	1.84	5.93	3.83	208	5.76	3.72	202	5.76	3.72	202
Wakarusa River	WR-6	SW121027	SW121028		12	365	2.76	1.78	6.36	4.11	230	6.07	3.93	220	6.11	3.95	221
Wakarusa River	WR-6	SW121028	SW121032		12	122	2.76	1.78	6.74	4.36	245	6.32	4.09	229	6.36	4.11	231
Wakarusa River	WR-6	SW121032	SW121050		12	278	2.76	1.79	7.95	5.14	288	7.27	4.70	263	7.31	4.72	265
Wakarusa River	WR-6	SW121033	SW121032		12	298	1.73	1.12	0.81	0.52	47	0.71	0.46	41	0.71	0.46	41
Wakarusa River	WR-6	SW121034	SW121033		12	318	1.67	1.08	0.42	0.27	25	0.35	0.23	21	0.35	0.23	21
Wakarusa River	WR-6	SW121050	SW121051	WR-6-2	12	444	4.57	2.95	8.30	5.36	182	7.49	4.84	164	7.52	4.86	165
Wakarusa River	WR-6	SW121051	SE12104A		24	364	7.12	4.60	15.50	10.02	218	13.31	8.61	187	13.38	8.65	188
Wakarusa River	WR-6	SW121052	SW121051		21	152	10.36	6.70	6.92	4.47	67	5.69	3.67	55	5.69	3.67	55

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity		Year 2000 10-year Peak Flow			Year 2010 10-Year Peak Flow			Year 2025 10-Year Peak Flow		
							(cfs)	(mgd)	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.	(cfs)	(mgd)	% Util.
Wakarusa River	WR-6	SW121056	SW121052		21	260	7.09	4.58	6.71	4.34	95	5.51	3.56	78	5.54	3.58	78
Wakarusa River	WR-6	SW121061	SW121056		21	260	7.09	4.58	6.46	4.18	91	5.30	3.42	75	5.33	3.45	75
Wakarusa River	WR-6	SW121067	SW121061		21	280	7.09	4.58	6.14	3.97	87	5.05	3.26	71	5.09	3.29	72
Wakarusa River	WR-6	SW121075	SW121503		21	99	10.68	6.91	5.37	3.47	50	4.45	2.88	42	4.45	2.88	42
Wakarusa River	WR-6	SW121076	SW121075		21	27	10.12	6.54	4.94	3.20	49	4.10	2.65	40	4.13	2.67	41
Wakarusa River	WR-6	SW121503	SW121067		21	160	7.09	4.58	5.76	3.72	81	4.77	3.08	67	4.80	3.10	68
Wakarusa River	WR-6	SW131048	SW131049		24	156	7.47	4.83	5.65	3.65	76	5.09	3.29	68	5.86	3.79	78
Wakarusa River	WR-6	SW131049	SW131081		24	409	7.50	4.85	5.83	3.77	78	5.16	3.33	69	5.93	3.83	79
Wakarusa River	WR-6	SW131081	SW131082		24	411	7.23	4.68	5.86	3.79	81	5.19	3.36	72	5.97	3.86	82
Wakarusa River	WR-6	SW131082	SW131083		24	365	7.20	4.66	5.90	3.81	82	5.26	3.40	73	5.97	3.86	83
Wakarusa River	WR-6	SW131083	NW131084		24	387	7.18	4.64	5.97	3.86	83	5.30	3.42	74	6.04	3.90	84
Wakarusa River	WR-6	SW131087	SE131134		24	386	7.55	4.88	6.25	4.04	83	5.51	3.56	73	6.18	3.99	82
Yankee Tank Creek	YTC-1	NE091005	SE091004		27	616	12.16	7.86	5.51	3.56	45	15.29	9.88	126	29.70	19.20	244
Yankee Tank Creek	YTC-1	NW091001	NE091005		24	578	12.20	7.88	5.40	3.49	44	15.29	9.88	125	29.70	19.20	243
Yankee Tank Creek	YTC-1	NW091002	NW091001		24	600	11.16	7.21	5.26	3.40	47	15.29	9.88	137	29.66	19.17	266
Yankee Tank Creek	YTC-1	NW091003	NW091002		24	600	11.31	7.31	5.12	3.31	45	15.29	9.88	135	29.63	19.15	262
Yankee Tank Creek	YTC-1	NW091004	NW091003		24	600	11.31	7.31	4.87	3.15	43	15.25	9.86	135	29.55	19.10	261
Yankee Tank Creek	YTC-1	NW091005	NW091004		24	600	11.31	7.31	4.52	2.92	40	15.25	9.86	135	29.52	19.08	261
Yankee Tank Creek	YTC-1	NW091006	NW091005		24	600	11.31	7.31	4.06	2.63	36	15.25	9.86	135	29.48	19.06	261
Yankee Tank Creek	YTC-1	NW091007	NW091006		24	240	11.31	7.31	3.50	2.26	31	15.22	9.84	135	29.38	18.99	260
Yankee Tank Creek	YTC-1	NW091501	NW091007		24	176	7.63	4.93	2.93	1.89	38	15.18	9.81	199	29.31	18.94	384
Yankee Tank Creek	YTC-1	NW091502	NW091501		24	346	8.51	5.50	2.40	1.55	28	15.15	9.79	178	29.24	18.90	343
Yankee Tank Creek	YTC-1	SE051001	SE05101A		24	169	26.51	17.14	1.27	0.82	5	15.11	9.77	57	29.06	18.78	110
Yankee Tank Creek	YTC-1	SE05101A	NW091502		24	443	11.17	7.22	1.87	1.21	17	15.18	9.81	136	29.24	18.90	262
Yankee Tank Creek	YTC-1	SE091001	SE091500		27	600	12.83	8.30	5.83	3.77	45	15.11	9.77	118	29.52	19.08	230
Yankee Tank Creek	YTC-1	SE091002	SE091001		27	600	12.19	7.88	5.76	3.72	47	15.11	9.77	124	29.52	19.08	242
Yankee Tank Creek	YTC-1	SE091003	SE091002		27	600	12.13	7.84	5.69	3.67	47	15.18	9.81	125	29.59	19.13	244
Yankee Tank Creek	YTC-1	SE091004	SE091003		27	605	12.14	7.85	5.58	3.61	46	15.22	9.84	125	29.63	19.15	244
Yankee Tank Creek	YTC-1	SE091500	SW101155		27	600	12.77	8.26	5.86	3.79	46	15.08	9.75	118	29.48	19.06	231
Yankee Tank Creek	YTC-1	SW101154	SW101153		27	600	12.77	8.26	5.97	3.86	47	15.04	9.72	118	29.48	19.06	231
Yankee Tank Creek	YTC-1	SW101155	SW101154		27	600	12.83	8.30	5.93	3.83	46	15.04	9.72	117	29.48	19.06	230
Yankee Tank Creek	YTC-2	NE051009	SE051008		18	400	3.52	2.28	0.49	0.32	14	8.30	5.36	235	17.66	11.41	501
Yankee Tank Creek	YTC-2	NE051010	NE051009	YTC-2-2	12	402	4.05	2.62	0.46	0.30	11	8.26	5.34	204	17.55	11.34	433
Yankee Tank Creek	YTC-2	NE051011	NE051010		12	401	2.33	1.51	0.42	0.27	18	8.23	5.32	353	17.44	11.28	748
Yankee Tank Creek	YTC-2	NE051012	NE051011		12	402	2.34	1.51	0.39	0.25	17	8.19	5.30	351	17.34	11.21	742
Yankee Tank Creek	YTC-2	NE051013	NE051012		12	403	2.34	1.51	0.35	0.23	15	8.19	5.30	350	17.27	11.16	738
Yankee Tank Creek	YTC-2	NE051014	NE051013		12	403	2.34	1.51	0.32	0.21	14	8.16	5.27	349	17.16	11.09	735
Yankee Tank Creek	YTC-2	NE051015	NE051014		12	403	2.34	1.51	0.25	0.16	11	8.12	5.25	348	17.02	11.00	729

Basin	Subbasin	Upstream Manhole	Downstream Manhole	Root MH of Project	Existing Diameter (in)	Length (ft)	Existing Capacity (cfs)	Existing Capacity (mgd)	Year 2000 10-year Peak Flow (cfs)	Year 2000 10-year Peak Flow (mgd)	Year 2000 10-year Peak Flow % Util.	Year 2010 10-Year Peak Flow (cfs)	Year 2010 10-Year Peak Flow (mgd)	Year 2010 10-Year Peak Flow % Util.	Year 2025 10-Year Peak Flow (cfs)	Year 2025 10-Year Peak Flow (mgd)	Year 2025 10-Year Peak Flow % Util.
Yankee Tank Creek	YTC-2	SE051002	SE051001	YTC-2-1	18	396	14.21	9.19	0.53	0.34	4	8.09	5.23	57	17.62	11.39	124
Yankee Tank Creek	YTC-2	SE051003	SE051002		18	600	8.02	5.19	0.53	0.34	7	8.05	5.20	100	17.51	11.32	218
Yankee Tank Creek	YTC-2	SE051004	SE051003		18	299	19.21	12.42	0.53	0.34	3	8.02	5.18	42	17.44	11.28	91
Yankee Tank Creek	YTC-2	SE051005	SE051004		18	384	4.39	2.84	0.49	0.32	11	7.98	5.16	182	17.37	11.23	396
Yankee Tank Creek	YTC-2	SE051006	SE051005		18	400	3.93	2.54	0.49	0.32	13	8.02	5.18	204	17.37	11.23	442
Yankee Tank Creek	YTC-2	SE051007	SE051006		18	400	3.93	2.54	0.49	0.32	13	8.09	5.23	206	17.41	11.25	443
Yankee Tank Creek	YTC-2	SE051008	SE051007		18	400	3.11	2.01	0.49	0.32	16	8.16	5.27	262	17.55	11.34	565
Yankee Tank Creek	YTC-2	SE321001	NE051015		12	401	2.70	1.74	0.18	0.11	7	8.05	5.20	298	16.84	10.89	624
Yankee Tank Creek	YTC-2	SE321005	SE321001		24	406	20.18	13.04	0.14	0.09	1	7.95	5.14	39	16.63	10.75	82
Yankee Tank Creek	YTC-2	SE321006	SE321005		24	395	20.46	13.22	0.07	0.05	0	7.73	5.00	38	16.35	10.57	80
Yankee Tank Creek	YTC-3	NW051024	SW051023		18	404	6.61	4.27	0.21	0.14	3	6.78	4.38	103	11.65	7.53	176
Yankee Tank Creek	YTC-3	NW051025	NW051024		18	397	6.83	4.42	0.21	0.14	3	6.74	4.36	99	11.65	7.53	171
Yankee Tank Creek	YTC-3	NW051026	NW051025	YTC-3-3	15	400	5.89	3.80	0.21	0.14	4	6.67	4.31	113	11.58	7.49	197
Yankee Tank Creek	YTC-3	NW051027	NW051026		15	390	5.89	3.81	0.18	0.11	3	6.57	4.25	112	11.55	7.46	196
Yankee Tank Creek	YTC-3	NW051028	NW051027		15	402	5.71	3.69	0.18	0.11	3	6.46	4.18	113	11.51	7.44	202
Yankee Tank Creek	YTC-3	NW051029	NW051028		12	399	3.69	2.39	0.14	0.09	4	6.36	4.11	172	11.44	7.39	310
Yankee Tank Creek	YTC-3	NW051030	NW051029		12	224	3.85	2.49	0.14	0.09	4	6.22	4.02	162	11.41	7.37	297
Yankee Tank Creek	YTC-3	NW051031	NW051030		12	385	3.87	2.50	0.11	0.07	3	6.07	3.93	157	11.37	7.35	294
Yankee Tank Creek	YTC-3	NW051032	NW051031		12	383	3.88	2.50	0.11	0.07	3	5.90	3.81	152	11.34	7.33	293
Yankee Tank Creek	YTC-3	SE051015	SE051001	YTC-3-1	15	308	8.02	5.19	0.25	0.16	3	6.99	4.52	87	11.94	7.71	149
Yankee Tank Creek	YTC-3	SE051016	SE051015		15	222	7.94	5.13	0.25	0.16	3	6.96	4.50	88	11.90	7.69	150
Yankee Tank Creek	YTC-3	SE051017	SE051016		16	161	8.23	5.32	0.25	0.16	3	6.92	4.47	84	11.83	7.65	144
Yankee Tank Creek	YTC-3	SE051018	SE051017		21	487	6.38	4.13	0.25	0.16	4	6.89	4.45	108	11.79	7.62	185
Yankee Tank Creek	YTC-3	SE051019	SE051018		21	393	6.45	4.17	0.25	0.16	4	6.89	4.45	107	11.76	7.60	182
Yankee Tank Creek	YTC-3	SE051020	SE051019		21	606	6.34	4.10	0.21	0.14	3	6.92	4.47	109	11.79	7.62	186
Yankee Tank Creek	YTC-3	SE051021	SE051020		21	561	6.42	4.15	0.21	0.14	3	6.96	4.50	108	11.79	7.62	184
Yankee Tank Creek	YTC-3	SW051022	SE051021	YTC-3-2	18	397	6.81	4.40	0.21	0.14	3	6.89	4.45	101	11.76	7.60	173
Yankee Tank Creek	YTC-3	SW051023	SW051022		18	397	6.83	4.42	0.21	0.14	3	6.85	4.43	100	11.72	7.58	172
Yankee Tank Creek	YTC-3	SW321013	NW051032		12	389	3.75	2.42	0.07	0.05	2	5.72	3.70	153	11.34	7.33	303
Yankee Tank Creek	YTC-3	SW321016	SW321013		10	400	2.64	1.71	0.07	0.05	3	5.51	3.56	209	11.30	7.30	428
Yankee Tank Creek	YTC-3	SW321017	SW321016		10	473	3.94	2.55	0.04	0.02	1	5.26	3.40	133	11.26	7.28	286
Yankee Tank Creek	YTC-3	SW321018	SW321017		10	350	1.39	0.90	0.04	0.02	3	5.05	3.26	364	11.26	7.28	813

Wastewater Capital Improvement Plan - Pump Station and Force Main Analysis

Subbasin	Basin	CIP Name	Pump Station Name	Pump Station Ref.	Total Capacity mgd	Firm Capacity mgd	2000 Peak Flow* mgd	2010 Peak Flow* mgd	2025 Peak Flow* mgd	Calculated Improvement Required at 2025, mgd	Selected Improvement Required at 2025, mgd	Cost Basis	Construction Cost ($M)	Capital Cost ($M)	Planning Year	Note
NL-1	North Lawrence	PS_01	North St.	PS_01	0.58	0.29	1.35	1.09	1.17	0.88	2.00	Replacement	0.678	0.950	2000	
NL-1	North Lawrence	PS_02	Walnut St.	PS_02	0.58	0.29	0.63	0.55	0.56	0.27	0.50	Expansion	0.117	0.163	2000	
NL-1	North Lawrence	PS_03	Grant St.	PS_03	1.73	0.86	3.50	2.42	3.71	2.85	3.00	Expansion	0.474	0.663	2000	
NL-1	North Lawrence	PS_04	Oak St.	PS_04	2.02	1.01	5.31	3.81	6.15	5.14						capacity of old pumps
WR-6	Wakarusa River		Wakarusa Old	PS_05A												
WR-6	Wakarusa River		Wakarusa New	PS_05B	22.77	17.58			18.18	0.60						wetwells connected by 24-in pipe
WR-6	Wakarusa River		Bell Haven	PS_07	1.01	0.50			0.55	0.05						
C-2	Central		Alabama St.	PS_08	3.46	2.31			0.00							Abandon
WR-2	Wakarusa River	PS_09A	Four Seasons	PS_09	8.85	4.42	12.35	13.13	14.00	9.58	5.00	Expansion	0.616	0.862	2010	length to new WWTP
		PS_09B			4.63	0.00			13.12	13.12	5.00	Expansion	0.616	0.862	2010	to HB-1
BC-2	Baldwin Creek			PS_10	1.72	0.86			0.31							
KR-1	Kansas River		Harris Ind. Park	PS_11	0.86	0.43			0.47	0.04						
NL-1	North Lawrence		North 3rd St.	PS_12	0.86	0.43			0.37							
KR-6	Kansas River		Knights of Columbus	PS_13	0.23	0.12			0.14	0.02						
BC-1	Baldwin Creek			PS_14	1.80	0.90		0.55	1.18	0.28						
KR-4	Kansas River	PS_16	Kentucky St.	PS_16	11.53	7.93	8.37	9.38	14.96	7.03	10.00	Expansion	1.001	1.402	2000	
KR-1	Kansas River		Santa Fe St.	PS_17	2.31	1.15			0.50							
BC-1	Baldwin Creek			PS_18	no data	no data			0.56	#VALUE!						
EL-1				PS_19	3.89	1.94			1.98	0.04						
EL-1	East Lawrence			PS_23	no data	no data			0.19	#VALUE!						
WR-5	Wakarusa River		Maple St.	PS_24	0.29	0.14			0.07							
KR-6	Kansas River	PS_25	East Hills Business Park	PS_25	2.93	1.95	1.27	2.10	4.99	3.04	4.00	Expansion	0.552	0.773	2010	
																parallel existing force main
KR-2	Kansas River	PS_27	Sherwood Dr.	PS_27	0.86	0.43	0.79	0.65	0.85	0.42	1.00	Expansion	0.196	0.274	2000	
KR-1	Kansas River	PS_28	River Ridge Rd.	PS_28	0.23	0.12	0.07	0.14	0.22	0.10	1.00	Replacement	0.392	0.549	2010	
EL-1	East Lawrence	PS_32	Prairie Park	PS_32	1.30	0.65	1.53	1.53	1.53	0.88	1.00	Expansion	0.196	0.274	2000	
WR-2	Wakarusa River	PS_33	Clinton Pkwy.	PS_33	0.23	0.12	0.42	0.34	0.36	0.24	0.50	Replacement	0.233	0.326	2000	
BC-1	Baldwin Creek			PS_40	no data	no data			0.20	#VALUE!						
KR-2	Kansas River			PS_42	no data	0.14			0.60	0.46						
BC-1	Baldwin Creek	E-BC1PS1		BC1PS1	-	-			7.20	7.20	10.00	Replacement	2.002	2.803	2010	
BC-4	Baldwin Creek	E-BC4PS1		BC4PS1	-	-			0.35	0.35	1.00	Replacement	0.392	0.549	2025	
EL-2	East Lawrence	E-EL2PS1		EL2PS1	-	-			4.11	4.11	5.00	Replacement	1.232	1.724	2010	
NL-3	North Lawrence	E-NL3PS1		NL3PS1	-	-			1.61	1.61	2.00	Replacement	0.678	0.950	2010	
WRS-2	Wakarusa South River	E-WRS2PS1		WRS2PS1	-	-			1.55	1.55	2.00	Replacement	0.678	0.950	2025	
YTC-4	Yankee Tank Creek	E-YTC4PS1		YTC4PS1	-	-			1.56	1.56	2.00	Replacement	0.678	0.950	2010	
YTC-4	Yankee Tank Creek	E-YTC4PS2		YTC4PS2	-	-			1.84	1.84	3.00	Replacement	0.947	1.325	2010	
YTC-5	Yankee Tank Creek	E-YTC5PS1		YTC5PS1	-	-			1.93	1.93	3.00	Replacement	0.947	1.325	2025	
YTC-6	Yankee Tank Creek	E-YTC6PS1		YTC6PS1	-	-			0.97	0.97	2.00	Replacement	0.678	0.950	2025	
												Total	13.304	18.626		

*Peak Flow during 10-year rainfall event.

					Existing Forcemain Details			Forcemain Improvement Details					
Subbasin	Basin	CIP Name	Pump Station Name	Pump Station Ref.	Diameter (in)	Length (ft)	2025 Peak Flow (cfs)	Velocity in Existing Pipe (fps)	CIP Name	Improvement Size (in)	Peak Velocity with Improvement (fps)	Construction Cost ($M)	Capital Cost ($M)
NL-1	North Lawrence	PS_01	North St.	PS_01	8	1,349	1.81	5.19					
NL-1	North Lawrence	PS_02	Walnut St.	PS_02	6	2,487	0.87	4.41					
NL-1	North Lawrence	PS_03	Grant St.	PS_03	8	20	5.74	16.45	FM-PS_03	12	7.31	0.001	0.001
NL-1	North Lawrence	PS_04	Oak St.	PS_04	18	1,300	9.51	5.39					
WR-6	Wakarusa River		Wakarusa Old	PS_05A	12	2,472	5.26	6.70					
WR-6	Wakarusa River		Wakarusa New	PS_05B	24	2,704	22.86	7.28					
WR-6	Wakarusa River		Bell Haven	PS_07	6	589	0.85	4.34					
C-2	Central		Alabama St.	PS_08	12	1,878	0.00	0.00					
WR-2	Wakarusa River	PS_09A	Four Seasons	PS_09	20	10,969	21.66	9.93	FM-PS_09	24	6.90	0.872	1.221
		PS_09B			20	310	20.30	9.31					
BC-2	Baldwin Creek			PS_10	8.00	3,210	0.48	1.37					
					8.00	3,210							
KR-1	Kansas River		Harris Ind. Park	PS_11	6	1,220	0.73	3.70					
NL-1	North Lawrence		North 3rd St.	PS_12	6	2,171	0.57	2.92					
KR-6	Kansas River		Knights of Columbus	PS_13	4	353	0.22	2.48					
BC-1	Baldwin Creek			PS_14	10.00	16,495	1.83	3.35					
					10.00	16,495							
KR-4	Kansas River	PS_16	Kentucky St.	PS_16	24	1,638	23.14	7.37					
KR-1	Kansas River		Santa Fe St.	PS_17	10	1,095	0.77	1.42					
BC-1	Baldwin Creek			PS_18	6	2,582	0.87	4.41					
EL-1				PS_19	12	7,133	3.06	3.90					
EL-1	East Lawrence			PS_23	4	508	0.29	3.37					
WR-5	Wakarusa River		Maple St.	PS_24	4	220	0.11	1.24					
KR-6	Kansas River	PS_25	East Hills Business Park	PS_25	8	11,000	2.57	7.38					
						11,000	5.15		FM-PS_25	12	6.56	0.444	0.621
KR-2	Kansas River	PS_27	Sherwood Dr.	PS_27	6	1,479	1.31	6.70					
KR-1	Kansas River	PS_28	River Ridge Rd.	PS_28	6	1,596	0.34	1.73					
EL-1	East Lawrence	PS_32	Prairie Park	PS_32	6	3,505	2.37	12.06	FM-PS_32	8	6.78	0.093	0.130
WR-2	Wakarusa River	PS_33	Clinton Pkwy.	PS_33	4	529	0.56	6.39					
BC-1	Baldwin Creek			PS_40	4	495	0.31	3.55					
KR-2	Kansas River			PS_42	8	523	0.93	2.66					
BC-1	Baldwin Creek	E-BC1PS1		BC1PS1	-	6,750	11.14	-	E-FM-BC1	20	5.11	0.451	0.632
BC-4	Baldwin Creek	E-BC4PS1		BC4PS1	-	7,411	0.54	-	E-FM-BC4	4	6.21	0.120	0.167
EL-2	East Lawrence	E-EL2PS1		EL2PS1	-	4,692	6.36	-	E-FM-EL2	16	4.56	0.249	0.348
NL-3	North Lawrence	E-NL3PS1		NL3PS1	-	5,174	2.49	-	E-FM-NL3	10	4.57	0.179	0.250
WRS-2	Wakarusa South River	E-WRS2PS1		WRS2PS1	-	8,081	2.40	-	E-FM-WRS2	10	4.40	0.279	0.391
YTC-4	Yankee Tank Creek	E-YTC4PS1		YTC4PS1	-	8,181	2.41	-	E-FM-YTC4-1	10	4.43	0.283	0.396
YTC-4	Yankee Tank Creek	E-YTC4PS2		YTC4PS2	-	10,742	2.85	-	E-FM-YTC4-2	10	5.22	0.371	0.520
YTC-5	Yankee Tank Creek	E-YTC5PS1		YTC5PS1	-	10,153	2.99	-	E-FM-YTC5	10	5.48	0.351	0.491
YTC-6	Yankee Tank Creek	E-YTC6PS1		YTC6PS1	-	13,403	1.50	-	E-FM-YTC6	8	4.30	0.355	0.497
											Total	4.048	5.668

*Peak Flow during 10-year rainfall event.

LAWRENCE, KS 2002: FUTURE 2025

Model Name: 2025cip

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
BC-1/BC-1	BC1001	BC1PS1	18	0.02850	17.73	0.000	0.000	0.000	4.096	4.096	0.230
BC-1/BC-1	BC1002	BC1001	18	0.00489	7.34	0.000	0.000	0.000	3.602	3.602	0.490
BC-1/BC-1	BC1003	BC1002	18	0.00776	9.25	0.000	0.000	0.000	3.037	3.037	0.328
BC-1/BC-1	BC1004	BC1003	15	0.00891	6.09	0.000	0.000	0.000	2.436	2.436	0.399
BC-1/BC-1	BC1005	BC1004	15	0.00933	6.24	0.000	0.000	0.000	1.836	1.836	0.294
BC-1/BC-1	BC1006	BC1005	8	0.02844	2.03	0.000	0.000	0.000	1.201	1.201	0.589
BC-1/BC-1	BC1007	BC1006	8	0.14619	4.62	0.000	0.000	0.000	0.600	0.600	0.129
BC-1/BC-1	BC1102	BC1PS1	24	0.00315	12.70	0.000	0.000	0.000	7.062	7.062	0.556
BC-1/BC-1	BC1103	BC1102	27	0.00236	15.06	0.000	0.000	0.000	6.921	6.921	0.459
BC-1/BC-1	BC1104	BC1103	24	0.00313	12.66	0.000	0.000	0.000	6.744	6.744	0.532
BC-1/BC-1	BC1105	BC1104	24	0.00266	11.68	0.000	0.000	0.000	6.568	6.568	0.562
BC-1/BC-1	BC1106	BC1105	24	0.00265	11.66	0.000	0.000	0.000	6.391	6.391	0.548
BC-1/BC-1	BC1107	BC1106	18	0.00309	5.84	0.000	0.000	0.000	4.131	4.131	0.706
BC-1/BC-1	BC1201	PS_14	15	0.00558	4.82	0.000	0.000	0.000	1.836	1.836	0.380
BC-1/BC-1	BC1202	BC1201	12	0.00597	2.75	0.000	0.000	0.000	1.201	1.201	0.436
BC-1/BC-1	BC1203	BC1202	8	0.00466	0.82	0.000	0.000	0.000	0.600	0.600	0.727
BC-1/BC-1	BC1PS1	NE271213	8	-.00911	0.00	0.000	0.000	0.000	0.000	0.000	0.000
BC-1/BC-1	PS_14	NE32-017	8	-.01082	0.00	0.000	0.000	0.000	0.000	0.000	0.000
BC-2/BC-2	BC2003	BC2009	8	0.04484	2.55	0.000	0.000	0.000	0.953	0.953	0.372
BC-2/BC-2	BC2004	BC2003	8	0.02350	1.85	0.000	0.000	0.000	0.777	0.777	0.419
BC-2/BC-2	BC2005	BC2004	8	0.01500	1.48	0.000	0.000	0.000	0.636	0.636	0.429
BC-2/BC-2	BC2006	BC2005	8	0.03344	2.21	0.000	0.000	0.000	0.459	0.459	0.207
BC-2/BC-2	BC2007	BC2006	8	0.02393	1.87	0.000	0.000	0.000	0.318	0.318	0.170
BC-2/BC-2	BC2008	BC2007	8	0.01369	1.41	0.000	0.000	0.000	0.141	0.141	0.099
BC-2/BC-2	BC2009	BC1106	15	0.00777	5.69	0.000	0.000	0.000	2.895	2.895	0.508
BC-2/BC-2	BC2010	BC2009	15	0.01330	7.45	0.000	0.000	0.000	1.977	1.977	0.265
BC-2/BC-2	BC2011	BC2010	15	0.01721	8.47	0.000	0.000	0.000	1.942	1.942	0.229
BC-2/BC-2	BC2012	BC2011	15	0.01245	7.21	0.000	0.000	0.000	1.871	1.871	0.259
BC-2/BC-2	BC2013	BC2012	15	0.02719	10.65	0.000	0.000	0.000	1.836	1.836	0.172
BC-2/BC-2	BC2014	BC2013	15	0.00762	5.64	0.000	0.000	0.000	1.801	1.801	0.319

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
BC-2/BC-2	BC2015	BC2014	15	0.00589	4.96	0.000	0.000	0.000	1.801	1.801	0.363
BC-2/BC-2	BC2016	BC2015	8	0.03417	2.23	0.000	0.000	0.000	0.636	0.636	0.284
BC-2/BC-2	BC2017	BC2016	8	0.01728	1.58	0.000	0.000	0.000	0.459	0.459	0.288
BC-2/BC-2	BC2018	BC2017	8	0.01066	1.24	0.000	0.000	0.000	0.318	0.318	0.254
BC-2/BC-2	BC2019	BC2018	8	0.04508	2.56	0.000	0.000	0.000	0.141	0.141	0.054
BC-2/BC-2	BC2020	BC2015	8	0.01591	1.52	0.000	0.000	0.000	1.059	1.059	0.694
BC-2/BC-2	BC2021	BC2020	8	0.03500	2.26	0.000	0.000	0.000	0.918	0.918	0.406
BC-2/BC-2	BC2022	BC2021	8	0.01064	1.24	0.000	0.000	0.000	0.777	0.777	0.623
BC-2/BC-2	BC2023	BC2022	8	0.01203	1.32	0.000	0.000	0.000	0.636	0.636	0.480
BC-2/BC-2	BC2024	BC2023	8	0.02351	1.85	0.000	0.000	0.000	0.459	0.459	0.247
BC-2/BC-2	BC2025	BC2024	8	0.02324	1.84	0.000	0.000	0.000	0.318	0.318	0.172
BC-2/BC-2	BC2026	BC2025	8	0.04961	2.69	0.000	0.000	0.000	0.141	0.141	0.052
BC-2/BC-2	BC2101	PS_10	8	0.00597	0.93	0.000	0.000	0.000	0.459	0.459	0.491
BC-2/BC-2	BC2102	BC2101	8	0.00680	0.99	0.000	0.000	0.000	0.318	0.318	0.319
BC-2/BC-2	BC2103	BC2102	8	0.00446	0.80	0.000	0.000	0.000	0.141	0.141	0.174
BC-2/BC-2	PS_10	NE32-017	8	-.00839	0.00	0.000	0.000	0.000	0.000	0.000	0.000
BC-3/BC-3	BC3001	BC1107	18	0.00319	5.94	0.000	0.000	0.000	3.955	3.955	0.665
BC-3/BC-3	BC3002	BC3001	18	0.00644	8.43	0.000	0.000	0.000	3.919	3.919	0.464
BC-3/BC-3	BC3003	BC3002	18	0.00601	8.14	0.000	0.000	0.000	3.884	3.884	0.476
BC-3/BC-3	BC3004	BC3003	15	0.02652	10.52	0.000	0.000	0.000	3.813	3.813	0.362
BC-3/BC-3	BC3005	BC3004	15	0.00958	6.32	0.000	0.000	0.000	3.778	3.778	0.597
BC-3/BC-3	BC3006	BC3005	8	0.02700	1.98	0.000	0.000	0.000	1.130	1.130	0.569
BC-3/BC-3	BC3007	BC3006	8	0.03863	2.37	0.000	0.000	0.000	1.059	1.059	0.445
BC-3/BC-3	BC3008	BC3007	8	0.04508	2.56	0.000	0.000	0.000	0.989	0.989	0.385
BC-3/BC-3	BC3009	BC3005	15	0.02708	10.63	0.000	0.000	0.000	2.789	2.789	0.262
BC-3/BC-3	BC3010	BC3009	15	0.02142	9.45	0.000	0.000	0.000	2.719	2.719	0.287
BC-3/BC-3	BC3011	BC3010	15	0.01156	6.94	0.000	0.000	0.000	2.684	2.684	0.386
BC-3/BC-3	BC3012	BC3011	15	0.01789	8.64	0.000	0.000	0.000	2.648	2.648	0.306
BC-3/BC-3	BC3013	BC3012	15	0.02663	10.54	0.000	0.000	0.000	2.578	2.578	0.244
BC-3/BC-3	BC3014	BC3013	15	0.00841	5.92	0.000	0.000	0.000	2.542	2.542	0.429

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
BC-3/BC-3	BC3015	BC3014	15	0.00754	5.61	0.000	0.000	0.000	2.472	2.472	0.440
BC-3/BC-3	BC3016	BC3015	10	0.01020	2.21	0.000	0.000	0.000	1.342	1.342	0.606
BC-3/BC-3	BC3017	BC3016	8	0.01213	1.33	0.000	0.000	0.000	1.201	1.201	0.902
BC-3/BC-3	BC3018	BC3017	8	0.01068	1.24	0.000	0.000	0.000	0.989	0.989	0.791
BC-3/BC-3	BC3019	BC3018	8	0.01259	1.35	0.000	0.000	0.000	0.812	0.812	0.598
BC-3/BC-3	BC3020	BC3019	8	0.01818	1.63	0.000	0.000	0.000	0.600	0.600	0.368
BC-3/BC-3	BC3021	BC3020	8	0.03238	2.17	0.000	0.000	0.000	0.388	0.388	0.178
BC-3/BC-3	BC3022	BC3021	8	0.04304	2.50	0.000	0.000	0.000	0.212	0.212	0.084
BC-3/BC-3	BC3023	BC3015	12	0.00521	2.57	0.000	0.000	0.000	1.165	1.165	0.453
BC-3/BC-3	BC3024	BC3023	8	0.00964	1.18	0.000	0.000	0.000	1.130	1.130	0.952
BC-3/BC-3	BC3025	BC3024	8	0.01286	1.37	0.000	0.000	0.000	0.989	0.989	0.721
BC-3/BC-3	BC3026	BC3025	8	0.04560	2.58	0.000	0.000	0.000	0.812	0.812	0.314
BC-3/BC-3	BC3027	BC3026	8	0.00744	1.04	0.000	0.000	0.000	0.600	0.600	0.575
BC-3/BC-3	BC3028	BC3027	8	0.03341	2.20	0.000	0.000	0.000	0.388	0.388	0.175
BC-3/BC-3	BC3029	BC3028	8	0.03922	2.39	0.000	0.000	0.000	0.212	0.212	0.088
BC-4/BC-4	BC4002	BC4PS1	8	0.00622	0.95	0.000	0.000	0.000	0.530	0.530	0.556
BC-4/BC-4	BC4003	BC4002	8	0.03894	2.38	0.000	0.000	0.000	0.212	0.212	0.088
BC-4/BC-4	BC4004	BC4003	8	0.01613	1.53	0.000	0.000	0.000	0.141	0.141	0.091
BC-4/BC-4	BC4005	BC4004	8	0.01564	1.51	0.000	0.000	0.000	0.106	0.106	0.070
BC-4/BC-4	BC4006	BC4005	8	0.02642	1.96	0.000	0.000	0.000	0.035	0.035	0.017
BC-4/BC-4	BC4007	BC4002	8	0.03422	2.23	0.000	0.000	0.000	0.282	0.282	0.126
BC-4/BC-4	BC4008	BC4007	8	0.01562	1.51	0.000	0.000	0.000	0.247	0.247	0.163
BC-4/BC-4	BC4009	BC4008	8	0.00224	0.57	0.000	0.000	0.000	0.212	0.212	0.370
BC-4/BC-4	BC4010	BC4009	8	0.03350	2.21	0.000	0.000	0.000	0.141	0.141	0.063
BC-4/BC-4	BC4011	BC4010	8	0.01017	1.21	0.000	0.000	0.000	0.106	0.106	0.087
BC-4/BC-4	BC4012	BC4011	8	0.01977	1.70	0.000	0.000	0.000	0.035	0.035	0.020
BC-4/BC-4	BC4PS1	BC3008	8	-.00549	0.00	0.000	0.000	0.000	0.000	0.000	0.000
C-1	NE011016	NE011093	15	0.00296	3.51	0.000	0.000	0.000	0.459	0.459	0.130
C-1/C-1	NE011017	NE011016	15	0.00186	2.78	0.000	0.000	0.000	0.353	0.353	0.126
C-1/C-1	NE011019	NE011017	15	0.00201	2.89	0.000	0.000	0.000	0.282	0.282	0.097

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
C-1/C-1	NE011021	NE011019	12	0.00162	1.43	0.000	0.000	0.000	0.177	0.177	0.123
C-1/C-1	NE011023	NE011040	10	0.00340	1.27	0.000	0.000	0.000	0.918	0.918	0.718
C-1/C-1	NE011027	NE011037	8	0.00671	0.99	0.000	0.000	0.000	0.742	0.742	0.749
C-1/C-1	NE011037	NW01124A	8	0.00331	0.69	0.000	0.000	0.000	0.777	0.777	1.118
C-1/C-1	NE011040	NE011042	10	0.00359	1.31	0.000	0.000	0.000	0.989	0.989	0.753
C-1/C-1	NE011042	NE011043	10	0.00441	1.45	0.000	0.000	0.000	1.059	1.059	0.727
C-1/C-1	NE011043	NE011045	18	0.00439	6.96	0.000	0.000	0.000	1.095	1.095	0.157
C-1/C-1	NE011045	NE011094	18	0.00952	10.25	0.000	0.000	0.000	1.165	1.165	0.113
C-1/C-1	NE011093	NE011094	15	0.00187	2.79	0.000	0.000	0.000	0.530	0.530	0.189
C-1/C-1	NE011094	SE011096	18	0.00264	5.40	0.000	0.000	0.000	0.600	0.600	0.111
C-1/C-1	NE011094	NE011095	24	0.00777	19.95	0.000	0.000	0.000	1.165	1.165	0.058
C-1/C-1	NE011095	SE011093	24	0.00195	10.01	0.000	0.000	0.000	1.236	1.236	0.123
C-1/C-1	NE06212B	NE06227B	18	0.00153	4.11	0.000	0.000	0.000	5.508	5.508	1.339
C-1/C-1	NE06227B	NE062145	18	0.00161	4.22	0.000	0.000	0.000	5.508	5.508	1.303
C-1/C-1	NW01066A	NW011066	8	0.00288	0.64	0.000	0.000	0.000	0.459	0.459	0.707
C-1/C-1	NW01066B	NW01066A	8	0.00302	0.66	0.000	0.000	0.000	0.353	0.353	0.531
C-1/C-1	NW01066C	NW01066B	8	0.00196	0.53	0.000	0.000	0.000	0.282	0.282	0.526
C-1/C-1	NW01066D	NW01066C	8	0.00282	0.64	0.000	0.000	0.000	0.177	0.177	0.275
C-1/C-1	NW01066E	NW01066D	8	0.00334	0.69	0.000	0.000	0.000	0.106	0.106	0.151
C-1/C-1	NW011064	NW011067	8	0.00220	0.56	0.000	0.000	0.000	0.671	0.671	1.183
C-1/C-1	NW011065	NW011064	8	0.00719	1.02	0.000	0.000	0.000	0.636	0.636	0.620
C-1/C-1	NW011066	NW011065	8	0.00429	0.79	0.000	0.000	0.000	0.565	0.565	0.713
C-1/C-1	NW011067	NE011027	8	0.00333	0.69	0.000	0.000	0.000	0.706	0.706	1.011
C-1/C-1	NW01124A	NE011023	10	0.00179	0.92	0.000	0.000	0.000	0.847	0.847	0.913
C-1/C-1	NW01124B	NE011021	12	0.00126	1.26	0.000	0.000	0.000	0.106	0.106	0.083
C-1/C-1	SE011093	SE011097	24	0.00199	10.09	0.000	0.000	0.000	1.342	1.342	0.133
C-1/C-1	SE011096	SE011098	18	0.00253	5.29	0.000	0.000	0.000	0.706	0.706	0.133
C-1/C-1	SE011097	SE011099	24	0.00200	10.13	0.000	0.000	0.000	1.342	1.342	0.132
C-1/C-1	SE011098	SE011100	18	0.00255	5.30	0.000	0.000	0.000	0.742	0.742	0.139
C-1/C-1	SE011099	SE011102	24	0.00199	10.10	0.000	0.000	0.000	1.377	1.377	0.136

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
C-1/C-1	SE011100	SE011101	18	0.00254	5.29	0.000	0.000	0.000	0.812	0.812	0.153
C-1/C-1	SE011101	SE012104	18	0.00255	5.31	0.000	0.000	0.000	0.847	0.847	0.159
C-1/C-1	SE011102	SE012104	24	0.00317	12.75	0.000	0.000	0.000	1.377	1.377	0.108
C-1/C-1	SE012104	SE012105	18	0.00254	5.30	0.000	0.000	0.000	2.225	2.225	0.419
C-1/C-1	SE012105	SW062002	18	0.00254	5.30	0.000	0.000	0.000	2.295	2.295	0.432
C-1/C-1	SE062111	SE062135	18	0.00750	9.09	0.000	0.000	0.000	5.544	5.544	0.609
C-1/C-1	SE062113	NE06212B	18	0.00283	5.59	0.000	0.000	0.000	5.473	5.473	0.978
C-1/C-1	SE062114	SE062113	18	0.00742	9.05	0.000	0.000	0.000	5.579	5.579	0.616
C-1/C-1	SE062135	SE062114	18	0.00742	9.05	0.000	0.000	0.000	5.579	5.579	0.616
C-1/C-1	SW062002	SW062203	24	0.00098	7.11	0.000	0.000	0.000	2.295	2.295	0.322
C-1/C-1	SW062003	SW062018	18	0.00276	5.52	0.000	0.000	0.000	2.613	2.613	0.473
C-1/C-1	SW062012	SW062015	18	0.00305	5.80	0.000	0.000	0.000	0.177	0.177	0.030
C-1/C-1	SW062015	SW062016	18	0.00350	6.22	0.000	0.000	0.000	0.282	0.282	0.045
C-1/C-1	SW062016	SW062003	18	0.00469	7.20	0.000	0.000	0.000	0.353	0.353	0.049
C-1/C-1	SW062018	SW062024	18	0.00334	6.07	0.000	0.000	0.000	2.613	2.613	0.430
C-1/C-1	SW062020	SW062026	8	0.00457	0.81	0.000	0.000	0.000	0.106	0.106	0.129
C-1/C-1	SW062024	SW062032	18	0.00336	6.09	0.000	0.000	0.000	2.648	2.648	0.434
C-1/C-1	SW062026	SW062034	8	0.00512	0.86	0.000	0.000	0.000	0.177	0.177	0.204
C-1/C-1	SW062032	SW062047	18	0.00331	6.04	0.000	0.000	0.000	2.684	2.684	0.443
C-1/C-1	SW062034	SW062049	8	0.00704	1.01	0.000	0.000	0.000	0.424	0.424	0.418
C-1/C-1	SW062046	SW062060	18	0.00580	8.00	0.000	0.000	0.000	5.297	5.297	0.661
C-1/C-1	SW062047	SW062046	18	0.00586	8.04	0.000	0.000	0.000	5.261	5.261	0.653
C-1/C-1	SW062048	SW062047	12	0.00063	0.89	0.000	0.000	0.000	2.648	2.648	2.955
C-1/C-1	SW062049	SW062048	12	0.00285	1.90	0.000	0.000	0.000	2.613	2.613	1.372
C-1/C-1	SW062058	SW062069	18	0.00579	8.00	0.000	0.000	0.000	5.402	5.402	0.675
C-1/C-1	SW062059	SW062058	18	0.00583	8.02	0.000	0.000	0.000	5.367	5.367	0.668
C-1/C-1	SW062060	SW062059	18	0.00584	8.03	0.000	0.000	0.000	5.332	5.332	0.664
C-1/C-1	SW062069	SW062077	18	0.00671	8.60	0.000	0.000	0.000	5.402	5.402	0.627
C-1/C-1	SW062077	SW062087	18	0.00736	9.01	0.000	0.000	0.000	5.438	5.438	0.603
C-1/C-1	SW062087	SW062088	18	0.00769	9.21	0.000	0.000	0.000	5.473	5.473	0.594

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
C-1/C-1	SW062088	SE062111	18	0.00741	9.04	0.000	0.000	0.000	5.508	5.508	0.609
C-1/C-1	SW062200	SW062201	12	0.00719	3.02	0.000	0.000	0.000	2.436	2.436	0.806
C-1/C-1	SW062201	SW062202	12	0.00723	3.03	0.000	0.000	0.000	2.472	2.472	0.815
C-1/C-1	SW062202	SW062049	12	0.01203	3.90	0.000	0.000	0.000	2.401	2.401	0.614
C-1/C-1	SW062203	SW062003	18	0.00102	3.37	0.000	0.000	0.000	2.295	2.295	0.681
C-1/C-1	SW062211	SW062012	18	0.02439	16.40	0.000	0.000	0.000	0.106	0.106	0.006
C-2/C-2	NW011021	SW011018	10	0.00400	1.38	0.000	0.000	0.000	1.306	1.306	0.941
C-2/C-2	NW011022	NW011021	12	0.00425	2.32	0.000	0.000	0.000	0.989	0.989	0.425
C-2/C-2	NW011023	NW011022	12	0.00650	2.87	0.000	0.000	0.000	0.636	0.636	0.221
C-2/C-2	NW011024	NW011023	12	0.00275	1.86	0.000	0.000	0.000	0.318	0.318	0.170
C-2	PS_08	MH24	24	0.00293	12.25	0.000	0.000	0.000	9.039	9.039	0.737
C-2/KR-2-3	SE011006	SW011090	12	0.00032	0.64	0.000	0.000	0.000	7.662	7.662	11.971
C-2/C-2	SE011018	SE011020	10	0.02723	3.61	0.000	0.000	0.000	0.318	0.318	0.087
C-2/C-2	SE011020	PS_08	10	0.01190	2.39	0.000	0.000	0.000	0.636	0.636	0.266
C-2/C-2	SE011021	PS_08	15	0.00399	4.08	0.000	0.000	0.000	8.333	8.333	2.040
C-2/KR-2-3	SE011022	SE011021	15	0.00400	4.08	0.000	0.000	0.000	8.157	8.157	1.996
C-2/KR-2-3	SE011023	SE011022	15	0.00395	4.06	0.000	0.000	0.000	8.015	8.015	1.974
C-2/C-2	SW011010	SW011068	10	0.00400	1.38	0.000	0.000	0.000	2.931	2.931	2.114
C-2/C-2	SW011011	SW011010	10	0.01000	2.19	0.000	0.000	0.000	2.613	2.613	1.192
C-2/C-2	SW011016	SW011011	10	0.02020	3.11	0.000	0.000	0.000	2.260	2.260	0.725
C-2/C-2	SW011017	SW011016	10	0.01981	3.08	0.000	0.000	0.000	1.942	1.942	0.629
C-2/C-2	SW011018	SW011017	10	0.00401	1.38	0.000	0.000	0.000	1.624	1.624	1.169
C-2/C-2	SW011042	SW011071	12	0.00393	2.23	0.000	0.000	0.000	5.297	5.297	2.369
C-2/C-2	SW011044	SW011042	12	0.00989	3.54	0.000	0.000	0.000	5.049	5.049	1.424
C-2/C-2	SW011045	SW011044	12	0.00394	2.23	0.000	0.000	0.000	4.767	4.767	2.129
C-2/C-2	SW011051	SW011045	10	0.00859	2.03	0.000	0.000	0.000	4.484	4.484	2.207
C-2/C-2	SW011052	SW011051	10	0.00891	2.06	0.000	0.000	0.000	4.202	4.202	2.030
C-2/C-2	SW011057	SW011052	10	0.00469	1.50	0.000	0.000	0.000	3.884	3.884	2.587
C-2/C-2	SW011067	SW011057	10	0.00398	1.38	0.000	0.000	0.000	3.566	3.566	2.578
C-2/C-2	SW011068	SW011067	10	0.00423	1.42	0.000	0.000	0.000	3.249	3.249	2.278

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Flow Data: Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
C-2/C-2	SW011071	SE011006	12	0.02251	5.34	0.000	0.000	0.000	5.544	5.544	1.037
C-2/KR-2-3	SW011090	SE011023	15	0.00474	4.45	0.000	0.000	0.000	7.874	7.874	1.769
C-2/C-2	SW011093	SE011006	10	0.00393	1.37	0.000	0.000	0.000	1.907	1.907	1.386
C-2/C-2	SW011094	SW011093	10	0.00626	1.73	0.000	0.000	0.000	1.589	1.589	0.916
C-2/C-2	SW011095	SW011094	10	0.04655	4.72	0.000	0.000	0.000	1.306	1.306	0.276
C-2/C-2	SW011096	SW011095	10	0.00397	1.38	0.000	0.000	0.000	0.989	0.989	0.716
C-2/C-2	SW011097	SW011096	10	0.00386	1.36	0.000	0.000	0.000	0.636	0.636	0.467
C-2/C-2	SW011098	SW011097	10	0.00400	1.38	0.000	0.000	0.000	0.318	0.318	0.229
C-3/C-3	SW06255A	SW062200	12	0.00729	3.04	0.000	0.000	0.000	2.366	2.366	0.777
EL-1/EL-1	NE082010	SE082032	8	0.00440	0.80	0.000	0.000	0.000	0.212	0.212	0.264
EL-1/EL-1	NE082011	NE082010	8	0.00395	0.76	0.000	0.000	0.000	0.106	0.106	0.139
EL-1/EL-1-1	NE082174	NE082254	8	0.00605	0.94	0.000	0.000	0.000	1.412	1.412	1.502
EL-1/EL-1-1	NE082175	NE082174	8	0.01000	1.20	0.000	0.000	0.000	1.342	1.342	1.110
EL-1/EL-1-1	NE082176	NE082175	8	0.00513	0.86	0.000	0.000	0.000	1.201	1.201	1.386
EL-1/EL-1-1	NE082178	NE082176	8	0.00520	0.87	0.000	0.000	0.000	1.130	1.130	1.295
EL-1/EL-1	NE082182	NE082178	8	0.01917	1.67	0.000	0.000	0.000	1.024	1.024	0.612
EL-1/EL-1	NE082185	NE082182	8	0.02880	2.05	0.000	0.000	0.000	0.918	0.918	0.447
EL-1/EL-1	NE082186	NE082185	8	0.00598	0.93	0.000	0.000	0.000	0.812	0.812	0.868
EL-1/EL-1	NE082187	NE082186	8	0.00369	0.73	0.000	0.000	0.000	0.777	0.777	1.057
EL-1/EL-1-1	NE082254	NE082255	8	0.01304	1.38	0.000	0.000	0.000	1.518	1.518	1.100
EL-1/EL-1-1	NE082255	NW082025	8	0.00763	1.05	0.000	0.000	0.000	1.624	1.624	1.537
EL-1/EL-1	NE082501	NE082187	8	0.00402	0.76	0.000	0.000	0.000	0.742	0.742	0.968
EL-1/EL-1	NW082023	NW082026	10	0.02290	3.31	0.000	0.000	0.000	1.766	1.766	0.532
EL-1/EL-1	NW082024	NW082023	8	0.01031	1.22	0.000	0.000	0.000	1.730	1.730	1.409
EL-1/EL-1-1	NW082025	NW082024	8	0.00877	1.13	0.000	0.000	0.000	1.660	1.660	1.466
EL-1/EL-1	NW082026	NW082027	10	0.03310	3.98	0.000	0.000	0.000	1.871	1.871	0.469
EL-1/EL-1	NW082027	NW082028	10	0.01356	2.55	0.000	0.000	0.000	1.942	1.942	0.761
EL-1/EL-1	NW082028	NW082037	10	0.01440	2.63	0.000	0.000	0.000	2.048	2.048	0.778
EL-1/EL-1	NW082037	NW082038	10	0.00972	2.16	0.000	0.000	0.000	2.083	2.083	0.963
EL-1/EL-1	NW082038	NW082039	10	0.01678	2.83	0.000	0.000	0.000	2.189	2.189	0.771

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
EL-1/EL-1	NW082039	SW082076	12	0.00615	2.79	0.000	0.000	0.000	2.260	2.260	0.808
EL-1/EL-1	PS_13	SE052230	4	-.06189	0.00	0.000	0.000	0.000	0.000	0.000	0.000
EL-1	PS_19	SE062050	12	-.00065	0.00	0.000	0.000	0.000	0.000	0.000	0.000
EL-1/EL-1	PS_23	SE082040	4	0.00027	0.03	0.000	0.000	0.000	0.000	0.000	0.000
EL-1/EL-1	PS_32	PS_19	6	-.01950	0.00	0.000	0.000	0.000	0.000	0.000	0.000
EL-1/EL-1	SE052228	NE082501	8	0.00984	1.19	0.000	0.000	0.000	0.671	0.671	0.559
EL-1/EL-1	SE052229	SE052228	8	0.00478	0.83	0.000	0.000	0.000	0.600	0.600	0.717
EL-1/EL-1	SE052230	SE052229	8	0.00403	0.76	0.000	0.000	0.000	0.494	0.494	0.643
EL-1/EL-1	SE052232	PS_13	8	0.00531	0.88	0.000	0.000	0.000	0.212	0.212	0.240
EL-1/EL-1	SE052233	SE052232	8	0.00310	0.67	0.000	0.000	0.000	0.106	0.106	0.157
EL-1/EL-1	SE072046	SE072149	18	0.00132	3.82	0.000	0.000	0.000	3.743	3.743	0.978
EL-1/EL-1	SE072145	SE072046	18	0.00110	3.48	0.000	0.000	0.000	3.778	3.778	1.083
EL-1/EL-1	SE072149	SE072150	18	0.00120	3.64	0.000	0.000	0.000	3.778	3.778	1.035
EL-1/EL-1	SE072150	SE072151	18	0.00119	3.62	0.000	0.000	0.000	3.778	3.778	1.041
EL-1/EL-1	SE072151	SE072152	18	0.00120	3.63	0.000	0.000	0.000	3.778	3.778	1.038
EL-1/EL-1	SE072152	SE072153	18	0.00119	3.63	0.000	0.000	0.000	3.743	3.743	1.028
EL-1/EL-1	SE072153	SE072154	18	0.00120	3.64	0.000	0.000	0.000	3.743	3.743	1.027
EL-1/EL-1	SE072154	SE072155	18	0.00117	3.60	0.000	0.000	0.000	3.708	3.708	1.028
EL-1/EL-1	SE072155	SE072156	18	0.00120	3.64	0.000	0.000	0.000	3.708	3.708	1.016
EL-1/EL-1	SE072315	SE072145	15	0.02402	10.01	0.000	0.000	0.000	3.708	3.708	0.370
EL-1/EL-1	SE082001	PS_32	8	0.02167	1.77	0.000	0.000	0.000	1.836	1.836	1.032
EL-1/EL-1	SE082002	SE082001	8	0.00398	0.76	0.000	0.000	0.000	1.518	1.518	1.989
EL-1/EL-1	SE082003	SE082002	8	0.00402	0.76	0.000	0.000	0.000	1.448	1.448	1.887
EL-1/EL-1	SE082004	SE082003	8	0.00393	0.75	0.000	0.000	0.000	1.342	1.342	1.770
EL-1/EL-1	SE082005	SE082004	8	0.04494	2.56	0.000	0.000	0.000	1.306	1.306	0.509
EL-1/EL-1	SE082006	SE082005	8	0.02097	1.75	0.000	0.000	0.000	1.236	1.236	0.706
EL-1/EL-1	SE082014	SE082006	8	0.01791	1.61	0.000	0.000	0.000	1.130	1.130	0.698
EL-1/EL-1	SE082015	SE082014	8	0.00391	0.75	0.000	0.000	0.000	1.059	1.059	1.400
EL-1/EL-1	SE082016	SE082015	8	0.00403	0.76	0.000	0.000	0.000	0.953	0.953	1.240
EL-1/EL-1	SE082017	SE082016	8	0.00398	0.76	0.000	0.000	0.000	0.918	0.918	1.203

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
EL-1/EL-1	SE082018	SE08217A	8	0.00400	0.76	0.000	0.000	0.000	0.777	0.777	1.017
EL-1/EL-1	SE082019	SE082018	8	0.00400	0.76	0.000	0.000	0.000	0.671	0.671	0.878
EL-1/EL-1	SE082020	SE082019	8	0.00400	0.76	0.000	0.000	0.000	0.565	0.565	0.738
EL-1/EL-1	SE082031	SE082020	8	0.00400	0.76	0.000	0.000	0.000	0.424	0.424	0.555
EL-1/EL-1	SE082032	SE082031	8	0.00566	0.91	0.000	0.000	0.000	0.318	0.318	0.349
EL-1/EL-1	SE082033	SW082133	8	0.00441	0.80	0.000	0.000	0.000	0.106	0.106	0.132
EL-1/EL-1	SE082040	SE082001	8	0.00022	0.18	0.000	0.000	0.000	0.353	0.353	1.950
EL-1/EL-1	SE082056	PS_32	12	0.00441	2.36	0.000	0.000	0.000	0.318	0.318	0.134
EL-1/EL-1	SE082057	SE082067	12	0.00450	2.39	0.000	0.000	0.000	0.106	0.106	0.044
EL-1/EL-1	SE082067	SE082056	12	0.00450	2.39	0.000	0.000	0.000	0.212	0.212	0.088
EL-1/EL-1	SE08217A	SE082017	8	0.00280	0.64	0.000	0.000	0.000	0.847	0.847	1.323
EL-1/EL-1	SW082070	SW082143	15	0.01000	6.46	0.000	0.000	0.000	2.578	2.578	0.399
EL-1/EL-1	SW082071	SW082070	15	0.01000	6.46	0.000	0.000	0.000	2.507	2.507	0.388
EL-1/EL-1	SW082073	SW082071	15	0.01000	6.46	0.000	0.000	0.000	2.472	2.472	0.382
EL-1/EL-1	SW082074	SW082073	12	0.00805	3.19	0.000	0.000	0.000	2.401	2.401	0.750
EL-1/EL-1	SW082075	SW082074	12	0.00799	3.18	0.000	0.000	0.000	2.401	2.401	0.753
EL-1/EL-1	SW082076	SW082075	12	0.00804	3.19	0.000	0.000	0.000	2.330	2.330	0.728
EL-1/EL-1	SW082133	SW082134	8	0.00861	1.12	0.000	0.000	0.000	0.212	0.212	0.188
EL-1/EL-1	SW082134	SW082136	8	0.00840	1.10	0.000	0.000	0.000	0.318	0.318	0.287
EL-1/EL-1	SW082136	SW082137	8	0.00840	1.10	0.000	0.000	0.000	0.424	0.424	0.382
EL-1/EL-1	SW082137	SW082138	8	0.02455	1.89	0.000	0.000	0.000	0.530	0.530	0.279
EL-1/EL-1	SW082138	SW082139	8	0.00638	0.96	0.000	0.000	0.000	0.636	0.636	0.658
EL-1/EL-1	SW082139	SW082140	8	0.00400	0.76	0.000	0.000	0.000	0.742	0.742	0.969
EL-1/EL-1	SW082140	SW082141	8	0.01000	1.20	0.000	0.000	0.000	0.847	0.847	0.701
EL-1/EL-1	SW082141	SW082142	8	0.07320	3.27	0.000	0.000	0.000	0.918	0.918	0.280
EL-1/EL-1	SW082142	SW082143	8	0.02612	1.95	0.000	0.000	0.000	1.024	1.024	0.524
EL-1/EL-1	SW082143	SE072315	15	0.01000	6.46	0.000	0.000	0.000	3.637	3.637	0.563
EL-2	EL2001	EL2PS1	18	0.00150	4.07	0.000	0.000	0.000	3.107	3.107	0.763
EL-2	EL2002	EL2001	15	0.00150	2.50	0.000	0.000	0.000	1.589	1.589	0.634
EL-2	EL2003	EL2PS1	15	0.00149	2.50	0.000	0.000	0.000	1.589	1.589	0.635

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
EL-2	EL2PS1	SW032003	10	-.00114	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-1/KR-1	NE231006	NE231007	8	0.04155	2.46	0.000	0.000	0.000	0.071	0.071	0.028
KR-1/KR-1	NE231007	NE231012	8	0.00520	0.87	0.000	0.000	0.000	0.141	0.141	0.161
KR-1/KR-1	NE231008	NE231009	8	0.00496	0.85	0.000	0.000	0.000	0.282	0.282	0.331
KR-1/KR-1	NE231009	NE231010	8	0.00628	0.95	0.000	0.000	0.000	0.353	0.353	0.368
KR-1/KR-1	NE231010	NE231011	8	0.01954	1.68	0.000	0.000	0.000	0.600	0.600	0.355
KR-1/KR-1	NE231011	PS_17	8	0.01196	1.32	0.000	0.000	0.000	0.671	0.671	0.507
KR-1/KR-1	NE231012	NE231008	8	0.00452	0.81	0.000	0.000	0.000	0.212	0.212	0.260
KR-1/KR-1	NE231014	NE231019	8	0.00326	0.69	0.000	0.000	0.000	0.071	0.071	0.102
KR-1/KR-1	NE231015	NE231010	8	0.03804	2.35	0.000	0.000	0.000	0.212	0.212	0.089
KR-1/KR-1	NE231019	NE231015	8	0.02065	1.73	0.000	0.000	0.000	0.141	0.141	0.081
KR-1/KR-1	PS_11	SE231020	6	-.03305	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-1/KR-1	PS_17	SE231013	4	-.00190	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-1/KR-1	PS_28	SW241011	4	-.00701	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-1/KR-1	SE231012	SE231022	18	0.00635	8.37	0.000	0.000	0.000	2.542	2.542	0.303
KR-1/KR-1	SE231013	SE231012	18	0.01334	12.13	0.000	0.000	0.000	1.660	1.660	0.136
KR-1/KR-1	SE231014	SE231013	8	0.02378	1.86	0.000	0.000	0.000	0.706	0.706	0.378
KR-1/KR-1	SE231015	SE231014	8	0.02645	1.96	0.000	0.000	0.000	0.706	0.706	0.359
KR-1/KR-1	SE231016	SE231015	8	0.03063	2.11	0.000	0.000	0.000	0.671	0.671	0.317
KR-1/KR-1	SE231017	SE231016	8	0.01385	1.42	0.000	0.000	0.000	0.671	0.671	0.471
KR-1/KR-1	SE231018	SE231017	8	0.01391	1.42	0.000	0.000	0.000	0.706	0.706	0.495
KR-1/KR-1	SE231019	SE231018	8	0.01381	1.42	0.000	0.000	0.000	0.742	0.742	0.522
KR-1/KR-1	SE231020	SE231019	8	0.02475	1.90	0.000	0.000	0.000	0.777	0.777	0.408
KR-1/KR-1	SW241007	PS_28	8	0.00802	1.08	0.000	0.000	0.000	0.353	0.353	0.325
KR-1/KR-1	SW241011	SW241012	8	0.00552	0.89	0.000	0.000	0.000	0.706	0.706	0.786
KR-1/KR-1	SW241012	SW241013	8	0.00651	0.97	0.000	0.000	0.000	0.742	0.742	0.761
KR-1/KR-1	SW241013	SW241014	8	0.00689	1.00	0.000	0.000	0.000	0.812	0.812	0.809
KR-1/KR-1	SW241014	SE231012	8	0.04793	2.64	0.000	0.000	0.000	0.883	0.883	0.333
KR-1/KR-1	SW241031	SW241007	8	0.00691	1.00	0.000	0.000	0.000	0.282	0.282	0.280
KR-1/KR-1	SW241032	SW241031	8	0.00394	0.76	0.000	0.000	0.000	0.212	0.212	0.278

MODELED PEAK WASTEWATER FLOWS

Pipe Data: | Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-1/KR-1	SW241035	SW241032	8	0.00398	0.76	0.000	0.000	0.000	0.141	0.141	0.184
KR-1/KR-1	SW241037	SW241035	8	0.00397	0.76	0.000	0.000	0.000	0.071	0.071	0.093
KR-2/KR-2	NE221002	PS_42	8	0.00947	1.17	0.000	0.000	0.000	0.530	0.530	0.450
KR-2/KR-2	NE221003	NE221002	8	0.00428	0.79	0.000	0.000	0.000	0.071	0.071	0.089
KR-2/KR-2	NE221010	NE221013	8	0.08476	3.51	0.000	0.000	0.000	0.247	0.247	0.070
KR-2/KR-2	NE221011	NE221010	8	0.01802	1.62	0.000	0.000	0.000	0.177	0.177	0.109
KR-2/KR-2	NE221012	NE221011	8	0.00593	0.93	0.000	0.000	0.000	0.071	0.071	0.076
KR-2/KR-2	NE221013	NE221002	8	0.01650	1.55	0.000	0.000	0.000	0.353	0.353	0.227
KR-2/KR-2	NE221023	NE221024	8	0.02335	1.84	0.000	0.000	0.000	0.071	0.071	0.038
KR-2/KR-2	NE221024	NE221025	8	0.05285	2.77	0.000	0.000	0.000	0.177	0.177	0.063
KR-2/KR-2	NE221025	NE221026	8	0.07593	3.33	0.000	0.000	0.000	0.247	0.247	0.074
KR-2/KR-2	NE221026	PS_42	8	0.04519	2.56	0.000	0.000	0.000	0.353	0.353	0.137
KR-2/KR-2	NE251030	NE251077	27	0.01970	43.48	0.000	0.000	0.000	10.311	10.311	0.237
KR-2/KR-2	NE251077	NE251170	27	0.00178	13.10	0.000	0.000	0.000	9.957	9.957	0.760
KR-2/KR-2	NE251077	NW251209	30	0.00124	14.48	0.000	0.000	0.000	10.628	10.628	0.734
KR-2/KR-2	NE251169	NE251163	27	0.00125	10.95	0.000	0.000	0.000	7.274	7.274	0.664
KR-2/KR-2	NE251170	NE251207	27	0.00102	9.90	0.000	0.000	0.000	9.957	9.957	1.005
KR-2/KR-2	NE251207	NE251208	27	0.00352	18.38	0.000	0.000	0.000	9.957	9.957	0.541
KR-2/KR-2	NE251208	NE251210	30	0.00250	20.51	0.000	0.000	0.000	13.347	13.347	0.650
KR-2/KR-2	NE251208	NE251169	27	0.00238	15.11	0.000	0.000	0.000	7.239	7.239	0.479
KR-2/KR-2	NE251210	NE251211	30	0.00117	14.06	0.000	0.000	0.000	13.347	13.347	0.949
KR-2/KR-2	NE251211	NE251212	30	0.00121	14.32	0.000	0.000	0.000	13.277	13.277	0.926
KR-2/KR-2-3	NE261001	NE261002	15	0.00160	2.59	0.000	0.000	0.000	5.155	5.155	1.988
KR-2/KR-2-3	NE261002	NE261346	15	0.01346	7.49	0.000	0.000	0.000	5.191	5.191	0.692
KR-2/KR-2-3	NE261049	NE261051	15	0.00397	4.07	0.000	0.000	0.000	5.261	5.261	1.291
KR-2/KR-2-3	NE261051	NE261053	15	0.00535	4.72	0.000	0.000	0.000	5.297	5.297	1.121
KR-2/KR-2-3	NE261053	SE231008	15	0.00400	4.08	0.000	0.000	0.000	5.332	5.332	1.304
KR-2/KR-2-2	NE261109	SE231048	24	0.00199	10.09	0.000	0.000	0.000	14.089	14.089	1.395
KR-2/KR-2-3	NE261346	NE261526	15	0.01953	9.02	0.000	0.000	0.000	5.226	5.226	0.578
KR-2/KR-2-3	NE261525	NE261049	15	0.00398	4.08	0.000	0.000	0.000	5.261	5.261	1.289

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-2/KR-2-3	NE261526	NE261525	15	0.00396	4.06	0.000	0.000	0.000	5.226	5.226	1.284
KR-2/KR-2	NE271020	NE271046	24	0.02607	36.53	0.000	0.000	0.000	15.536	15.536	0.425
KR-2/KR-2-2	NE271046	SW231140	24	0.02090	32.71	0.000	0.000	0.000	16.666	16.666	0.509
KR-2/KR-2	NE271190	NE271191	12	0.01578	4.47	0.000	0.000	0.000	1.695	1.695	0.378
KR-2/KR-2	NE271191	NE271195	12	0.03010	6.18	0.000	0.000	0.000	1.801	1.801	0.291
KR-2/KR-2	NE271195	NE271196	12	0.00491	2.49	0.000	0.000	0.000	1.871	1.871	0.749
KR-2/KR-2	NE271196	NE271197	12	0.00500	2.51	0.000	0.000	0.000	1.942	1.942	0.770
KR-2/KR-2	NE271197	NE271198	12	0.02000	5.03	0.000	0.000	0.000	2.013	2.013	0.399
KR-2/KR-2	NE271198	NW261083	12	0.00546	2.63	0.000	0.000	0.000	2.083	2.083	0.790
KR-2/KR-2	NE271212	NE271020	24	0.01152	24.28	0.000	0.000	0.000	16.419	16.419	0.676
KR-2/KR-2	NE271213	NE271212	24	0.01298	25.77	0.000	0.000	0.000	17.196	17.196	0.667
KR-2/KR-2	NE271214	NE271213	18	0.01319	12.06	0.000	0.000	0.000	2.083	2.083	0.172
KR-2/KR-2	NE271215	NE271214	18	0.01292	11.94	0.000	0.000	0.000	2.013	2.013	0.168
KR-2/KR-2	NE271216	NE271215	18	0.01280	11.88	0.000	0.000	0.000	1.907	1.907	0.160
KR-2/KR-2	NE271217	NE271216	18	0.01317	12.06	0.000	0.000	0.000	1.836	1.836	0.152
KR-2/KR-2	NE271219	NE271217	18	0.01307	12.01	0.000	0.000	0.000	1.730	1.730	0.144
KR-2/KR-2	NE271220	NE271219	18	0.01288	11.92	0.000	0.000	0.000	1.660	1.660	0.139
KR-2/KR-2	NE271221	NE271220	18	0.01345	12.18	0.000	0.000	0.000	1.589	1.589	0.130
KR-2/KR-2	NE271222	NE271221	18	0.01265	11.81	0.000	0.000	0.000	1.483	1.483	0.125
KR-2/KR-2	NE271223	NE271222	18	0.01267	11.82	0.000	0.000	0.000	1.412	1.412	0.119
KR-2/KR-2	NE271224	NE271223	18	0.01353	12.22	0.000	0.000	0.000	1.306	1.306	0.106
KR-2/KR-2	NE271226	NE271224	18	0.01306	12.00	0.000	0.000	0.000	1.236	1.236	0.102
KR-2/KR-2	NE271227	NE271226	18	0.02597	16.93	0.000	0.000	0.000	1.130	1.130	0.066
KR-2/KR-2	NE271228	NE271227	18	0.02655	17.11	0.000	0.000	0.000	1.059	1.059	0.061
KR-2/KR-2	NE271229	NE271228	18	0.01745	13.87	0.000	0.000	0.000	0.953	0.953	0.068
KR-2/KR-2	NE271230	NE271229	18	0.00579	7.99	0.000	0.000	0.000	0.883	0.883	0.110
KR-2/KR-2	NE271231	NE271230	18	0.02579	16.87	0.000	0.000	0.000	0.777	0.777	0.046
KR-2/KR-2	NE271232	NE271231	18	0.03702	20.21	0.000	0.000	0.000	0.706	0.706	0.034
KR-2/KR-2	NE271233	NE271232	18	0.03903	20.75	0.000	0.000	0.000	0.600	0.600	0.028
KR-2/KR-2	NW251018	NE251030	27	0.00181	13.19	0.000	0.000	0.000	10.311	10.311	0.781

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-2/KR-2	NW251021	NW251018	27	0.00013	3.66	0.000	0.000	0.000	10.311	10.311	2.813
KR-2/KR-2	NW251022	NW251021	27	0.00111	10.32	0.000	0.000	0.000	10.311	10.311	0.998
KR-2/KR-2	NW251023	NW251022	27	0.00459	20.99	0.000	0.000	0.000	10.381	10.381	0.494
KR-2/KR-2	NW251199	NW251203	24	0.00273	11.83	0.000	0.000	0.000	10.240	10.240	0.865
KR-2/KR-2	NW251200	NW251202	24	0.00072	6.07	0.000	0.000	0.000	10.205	10.205	1.680
KR-2/KR-2	NW251202	NW251199	24	0.00267	11.70	0.000	0.000	0.000	10.240	10.240	0.874
KR-2/KR-2	NW251203	NW251204	24	0.00267	11.69	0.000	0.000	0.000	10.205	10.205	0.872
KR-2/KR-2	NW251204	NW251205	24	0.00266	11.67	0.000	0.000	0.000	10.240	10.240	0.877
KR-2/KR-2	NW251205	NW251206	24	0.00274	11.84	0.000	0.000	0.000	10.240	10.240	0.864
KR-2/KR-2	NW251206	NE251077	24	0.00269	11.74	0.000	0.000	0.000	10.275	10.275	0.874
KR-2/KR-2	NW251209	NE251208	30	0.00120	14.25	0.000	0.000	0.000	10.593	10.593	0.743
KR-2/KR-2	NW261083	NW261084	12	0.01210	3.92	0.000	0.000	0.000	2.154	2.154	0.549
KR-2/KR-2	NW261084	NW261092	12	0.01210	3.92	0.000	0.000	0.000	2.260	2.260	0.576
KR-2/KR-2	NW261092	NW261093	12	0.01200	3.90	0.000	0.000	0.000	2.330	2.330	0.596
KR-2/KR-2	NW261093	NW261094	12	0.01199	3.90	0.000	0.000	0.000	2.401	2.401	0.615
KR-2/KR-2	NW261094	NW261099	12	0.01196	3.89	0.000	0.000	0.000	2.436	2.436	0.624
KR-2/KR-2	NW261099	NW26199A	12	0.00600	2.76	0.000	0.000	0.000	2.507	2.507	0.908
KR-2/KR-2	NW261100	NW261105	12	0.00720	3.02	0.000	0.000	0.000	2.613	2.613	0.864
KR-2/KR-2	NW261105	NW261106	12	0.00580	2.71	0.000	0.000	0.000	2.648	2.648	0.975
KR-2/KR-2	NW261106	NW261107	12	0.01721	4.67	0.000	0.000	0.000	2.648	2.648	0.566
KR-2/KR-2	NW261107	NW261147	12	0.00285	1.90	0.000	0.000	0.000	2.684	2.684	1.409
KR-2/KR-2	NW261143	NW261347	15	0.00588	4.95	0.000	0.000	0.000	2.719	2.719	0.548
KR-2/KR-2	NW261144	NW261143	12	0.00558	2.66	0.000	0.000	0.000	2.719	2.719	1.021
KR-2/KR-2	NW261145	NW261144	12	0.00601	2.76	0.000	0.000	0.000	2.719	2.719	0.983
KR-2/KR-2	NW261147	NW261145	12	0.00562	2.67	0.000	0.000	0.000	2.684	2.684	1.004
KR-2/KR-2-3	NW261149	NW261150	15	0.00155	2.54	0.000	0.000	0.000	5.155	5.155	2.024
KR-2/KR-2-3	NW261150	NW261165	15	0.00240	3.16	0.000	0.000	0.000	5.155	5.155	1.628
KR-2/KR-2	NW261151	NW261149	12	0.00056	0.84	0.000	0.000	0.000	2.436	2.436	2.882
KR-2/KR-2	NW261152	NW261151	12	0.00500	2.51	0.000	0.000	0.000	2.401	2.401	0.953
KR-2/KR-2	NW261153	NW261152	12	0.01226	3.94	0.000	0.000	0.000	2.330	2.330	0.590

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-2/KR-2	NW261156	NW261153	12	0.00475	2.45	0.000	0.000	0.000	2.295	2.295	0.934
KR-2/KR-2-3	NW261163	NW261164	15	0.00160	2.58	0.000	0.000	0.000	5.155	5.155	1.995
KR-2/KR-2-3	NW261164	NE261001	15	0.00158	2.57	0.000	0.000	0.000	5.155	5.155	2.001
KR-2/KR-2-3	NW261165	NW261163	15	0.00126	2.29	0.000	0.000	0.000	5.155	5.155	2.244
KR-2/KR-2	NW261166	NW261156	12	0.00485	2.48	0.000	0.000	0.000	2.260	2.260	0.910
KR-2/KR-2	NW261167	NW261166	12	0.00300	1.95	0.000	0.000	0.000	2.225	2.225	1.138
KR-2/KR-2	NW261168	NW261167	12	0.00299	1.94	0.000	0.000	0.000	2.189	2.189	1.123
KR-2/KR-2	NW261176	NW261168	10	0.08106	6.23	0.000	0.000	0.000	2.083	2.083	0.333
KR-2/KR-2	NW261177	NW261176	10	0.01194	2.39	0.000	0.000	0.000	1.483	1.483	0.619
KR-2/KR-2	NW261178	NW261388	10	0.01324	2.52	0.000	0.000	0.000	1.306	1.306	0.517
KR-2/KR-2	NW261180	NW261178	10	0.01328	2.52	0.000	0.000	0.000	1.236	1.236	0.489
KR-2/KR-2	NW261182	NW261180	10	0.01312	2.51	0.000	0.000	0.000	1.130	1.130	0.450
KR-2/KR-2	NW261183	NW261182	10	0.01294	2.49	0.000	0.000	0.000	1.059	1.059	0.424
KR-2/KR-2	NW261185	NW261183	10	0.02348	3.35	0.000	0.000	0.000	0.953	0.953	0.283
KR-2/KR-2	NW261191	NW261185	10	0.01836	2.97	0.000	0.000	0.000	0.883	0.883	0.297
KR-2/KR-2	NW261194	NW261385	10	0.02295	3.32	0.000	0.000	0.000	0.706	0.706	0.212
KR-2/KR-2	NW261195	NW261194	10	0.02276	3.30	0.000	0.000	0.000	0.600	0.600	0.181
KR-2/KR-2	NW261198	SW261197	10	0.01756	2.90	0.000	0.000	0.000	0.424	0.424	0.146
KR-2/KR-2	NW261264	NW261268	10	0.03492	4.09	0.000	0.000	0.000	0.177	0.177	0.043
KR-2/KR-2	NW261268	NW261282	10	0.03680	4.20	0.000	0.000	0.000	0.247	0.247	0.058
KR-2/KR-2	NW261282	NW261283	10	0.03671	4.19	0.000	0.000	0.000	0.353	0.353	0.084
KR-2/KR-2	NW261283	NW261389	10	0.00994	2.18	0.000	0.000	0.000	0.424	0.424	0.194
KR-2/KR-2	NW261347	NW261149	15	0.00237	3.14	0.000	0.000	0.000	2.754	2.754	0.874
KR-2/KR-2	NW261385	NW261191	10	0.03000	3.79	0.000	0.000	0.000	0.777	0.777	0.204
KR-2/KR-2	NW261388	NW261177	10	0.01303	2.50	0.000	0.000	0.000	1.412	1.412	0.564
KR-2/KR-2	NW261389	NW261176	10	0.04700	4.75	0.000	0.000	0.000	0.530	0.530	0.111
KR-2/KR-2	NW26199A	NW261100	12	0.00714	3.01	0.000	0.000	0.000	2.542	2.542	0.844
KR-2/KR-2	NW271266	NE271233	18	0.03391	19.34	0.000	0.000	0.000	0.530	0.530	0.027
KR-2/KR-2	NW271267	NW271266	18	0.02590	16.91	0.000	0.000	0.000	0.424	0.424	0.025
KR-2/KR-2	NW271268	NW271267	18	0.03059	18.37	0.000	0.000	0.000	0.353	0.353	0.019

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-2/KR-2	NW271269	NW271268	18	0.02942	18.01	0.000	0.000	0.000	0.247	0.247	0.013
KR-2/KR-2	NW271271	NW271269	12	0.00400	2.25	0.000	0.000	0.000	0.177	0.177	0.078
KR-2/KR-2	NW271272	NW271271	12	0.00398	2.25	0.000	0.000	0.000	0.071	0.071	0.031
KR-2/KR-2	PS_27	SW231133	6	-.01582	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-2/KR-2	PS_42	NE271046	6	-.00946	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-2/KR-2-2	SE231007	SE231010	24	0.03553	42.65	0.000	0.000	0.000	13.983	13.983	0.327
KR-2/KR-2-3	SE231008	SE231118	15	0.01806	8.68	0.000	0.000	0.000	5.332	5.332	0.614
KR-2/KR-2-2	SE231009	SE231007	24	0.00489	15.82	0.000	0.000	0.000	13.983	13.983	0.883
KR-2/KR-2	SE231010	SW241006	24	0.00368	13.73	0.000	0.000	0.000	14.018	14.018	1.020
KR-2/KR-2	SE231011	SE231103	18	0.00825	9.54	0.000	0.000	0.000	2.648	2.648	0.277
KR-2/KR-2	SE231022	SE231011	18	0.00672	8.61	0.000	0.000	0.000	2.613	2.613	0.303
KR-2/KR-2-2	SE231048	SE231110	24	0.00159	9.03	0.000	0.000	0.000	14.018	14.018	1.550
KR-2/KR-2	SE231100	SW241006	15	0.01750	8.54	0.000	0.000	0.000	5.402	5.402	0.632
KR-2/KR-2	SE231103	SW241006	18	0.00495	7.39	0.000	0.000	0.000	2.719	2.719	0.367
KR-2/KR-2-2	SE231105	SE231107	24	0.00204	10.23	0.000	0.000	0.000	14.124	14.124	1.380
KR-2/KR-2-2	SE231106	SE231105	24	0.00198	10.08	0.000	0.000	0.000	14.159	14.159	1.404
KR-2/KR-2-2	SE231107	SE231108	24	0.00195	9.99	0.000	0.000	0.000	14.124	14.124	1.413
KR-2/KR-2-2	SE231108	NE261109	24	0.00198	10.06	0.000	0.000	0.000	14.159	14.159	1.406
KR-2/KR-2-2	SE231110	SE231009	24	0.00200	10.13	0.000	0.000	0.000	13.983	13.983	1.379
KR-2/KR-2-3	SE231118	SE231100	15	0.01953	9.03	0.000	0.000	0.000	5.367	5.367	0.594
KR-2/KR-2	SE271140	SE271172	12	0.02318	5.42	0.000	0.000	0.000	1.448	1.448	0.266
KR-2/KR-2	SE271141	SE271140	10	0.00613	1.71	0.000	0.000	0.000	1.377	1.377	0.802
KR-2/KR-2	SE271142	SE271141	10	0.03793	4.26	0.000	0.000	0.000	1.306	1.306	0.306
KR-2/KR-2	SE271150	SE271151	10	0.00272	1.14	0.000	0.000	0.000	1.130	1.130	0.987
KR-2/KR-2	SE271151	SE271142	10	0.02000	3.09	0.000	0.000	0.000	1.201	1.201	0.387
KR-2/KR-2	SE271158	SE271150	8	0.00534	0.88	0.000	0.000	0.000	1.059	1.059	1.198
KR-2/KR-2	SE271159	SE271158	8	0.08158	3.45	0.000	0.000	0.000	0.953	0.953	0.276
KR-2/KR-2	SE271160	SE271159	8	0.05832	2.91	0.000	0.000	0.000	0.883	0.883	0.302
KR-2/KR-2	SE271161	SE271160	8	0.04446	2.54	0.000	0.000	0.000	0.777	0.777	0.304
KR-2/KR-2	SE271165	SE271161	8	0.01147	1.29	0.000	0.000	0.000	0.706	0.706	0.545

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-2/KR-2	SE271166	SE271165	8	0.00984	1.19	0.000	0.000	0.000	0.600	0.600	0.500
KR-2/KR-2	SE271167	SE271166	8	0.00977	1.19	0.000	0.000	0.000	0.530	0.530	0.443
KR-2/KR-2	SE271172	SE271181	12	0.01653	4.58	0.000	0.000	0.000	1.554	1.554	0.339
KR-2/KR-2	SE271181	NE271190	12	0.01647	4.57	0.000	0.000	0.000	1.624	1.624	0.355
KR-2/KR-2	SW231003	SW231006	8	0.00430	0.79	0.000	0.000	0.000	0.177	0.177	0.223
KR-2/KR-2	SW231004	SW231003	8	0.01748	1.59	0.000	0.000	0.000	0.071	0.071	0.044
KR-2/KR-2	SW231006	SW231007	8	0.04152	2.46	0.000	0.000	0.000	0.247	0.247	0.100
KR-2/KR-2	SW231007	PS_27	10	0.00953	2.13	0.000	0.000	0.000	1.059	1.059	0.495
KR-2/KR-2	SW231008	SW231007	8	0.05393	2.80	0.000	0.000	0.000	0.071	0.071	0.025
KR-2/KR-2	SW231026	PS_27	8	0.00776	1.06	0.000	0.000	0.000	0.247	0.247	0.231
KR-2/KR-2	SW231027	SW231026	8	0.00424	0.78	0.000	0.000	0.000	0.177	0.177	0.224
KR-2/KR-2	SW231028	SW231027	8	0.00456	0.81	0.000	0.000	0.000	0.071	0.071	0.086
KR-2/KR-2	SW231036	SW231007	8	0.02351	1.85	0.000	0.000	0.000	0.600	0.600	0.323
KR-2/KR-2	SW231037	SW231036	8	0.00441	0.80	0.000	0.000	0.000	0.530	0.530	0.660
KR-2/KR-2	SW231038	SW231037	8	0.00949	1.17	0.000	0.000	0.000	0.177	0.177	0.150
KR-2/KR-2-2	SW231100	SE231106	24	0.00196	10.01	0.000	0.000	0.000	14.265	14.265	1.423
KR-2/KR-2	SW231111	SW231112	8	0.00638	0.96	0.000	0.000	0.000	0.071	0.071	0.073
KR-2/KR-2	SW231112	SW231113	8	0.01112	1.27	0.000	0.000	0.000	0.177	0.177	0.138
KR-2/KR-2	SW231113	SW231037	8	0.00317	0.68	0.000	0.000	0.000	0.247	0.247	0.362
KR-2/KR-2	SW231117	SW231038	8	0.02153	1.77	0.000	0.000	0.000	0.071	0.071	0.040
KR-2/KR-2-2	SW231124	SW231100	24	0.00170	9.33	0.000	0.000	0.000	14.406	14.406	1.543
KR-2/KR-2-2	SW231131	SW231124	24	0.00203	10.20	0.000	0.000	0.000	14.512	14.512	1.421
KR-2/KR-2-2	SW231132	SW231131	24	0.00201	10.15	0.000	0.000	0.000	14.795	14.795	1.456
KR-2/KR-2-2	SW231133	SW231132	24	0.00207	10.30	0.000	0.000	0.000	15.430	15.430	1.497
KR-2/KR-2-2	SW231137	SW231133	24	0.00197	10.04	0.000	0.000	0.000	14.018	14.018	1.395
KR-2/KR-2-2	SW231138	SW231137	24	0.00202	10.16	0.000	0.000	0.000	14.583	14.583	1.434
KR-2/KR-2-2	SW231139	SW231138	24	0.00223	10.69	0.000	0.000	0.000	15.360	15.360	1.436
KR-2/KR-2-2	SW231140	SW231139	24	0.00289	12.17	0.000	0.000	0.000	16.419	16.419	1.348
KR-2/KR-2-1	SW241001	SW24101A	24	0.05210	51.64	0.000	0.000	0.000	20.586	20.586	0.398
KR-2/KR-2-1	SW241002	SW241001	24	0.00230	10.85	0.000	0.000	0.000	20.586	20.586	1.896

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-2/KR-2-1	SW241003	SW241002	24	0.00218	10.58	0.000	0.000	0.000	20.586	20.586	1.944
KR-2/KR-2-1	SW241004	SW241003	24	0.00255	11.42	0.000	0.000	0.000	20.586	20.586	1.801
KR-2/KR-2-1	SW241005	SW241004	24	0.00261	11.56	0.000	0.000	0.000	20.621	20.621	1.783
KR-2/KR-2-1	SW241006	SW241005	24	0.00289	12.16	0.000	0.000	0.000	20.692	20.692	1.700
KR-2/KR-2	SW24101A	NW251023	27	0.01122	32.82	0.000	0.000	0.000	10.416	10.416	0.317
KR-2/KR-2	SW24101A	NW251200	24	0.01651	29.07	0.000	0.000	0.000	10.205	10.205	0.351
KR-2/KR-2	SW261197	NW261195	10	0.04197	4.48	0.000	0.000	0.000	0.530	0.530	0.118
KR-2/KR-2	SW261203	NW261198	10	0.02742	3.62	0.000	0.000	0.000	0.353	0.353	0.097
KR-2/KR-2	SW261204	SW261203	10	0.03515	4.10	0.000	0.000	0.000	0.247	0.247	0.060
KR-2/KR-2	SW261214	SW261283	10	0.03816	4.28	0.000	0.000	0.000	0.071	0.071	0.016
KR-2/KR-2	SW261261	NW261264	10	0.03475	4.08	0.000	0.000	0.000	0.071	0.071	0.017
KR-2/KR-2	SW261283	SW261204	10	0.02022	3.11	0.000	0.000	0.000	0.177	0.177	0.056
KR-2/KR-2	SW271230	SW271234	8	0.00398	0.76	0.000	0.000	0.000	0.071	0.071	0.093
KR-2/KR-2	SW271234	SW271424	8	0.00498	0.85	0.000	0.000	0.000	0.177	0.177	0.207
KR-2/KR-2	SW271240	SE271167	8	0.01066	1.24	0.000	0.000	0.000	0.424	0.424	0.339
KR-2/KR-2	SW271400	SW271240	8	0.01812	1.62	0.000	0.000	0.000	0.353	0.353	0.217
KR-2/KR-2	SW271424	SW271400	8	0.00432	0.79	0.000	0.000	0.000	0.247	0.247	0.310
KR-3/KR-3	NE251128	NE251130	18	0.00388	6.54	0.000	0.000	0.000	0.953	0.953	0.145
KR-3/KR-3	NE251129	NE251246	18	0.00434	6.92	0.000	0.000	0.000	0.989	0.989	0.142
KR-3/KR-3	NE251130	NE251129	18	0.00245	5.20	0.000	0.000	0.000	0.953	0.953	0.183
KR-3/KR-3	NE251132	NE251143	18	0.00222	4.95	0.000	0.000	0.000	1.059	1.059	0.213
KR-3/KR-3	NE251141	NE251166	18	0.00166	4.28	0.000	0.000	0.000	1.130	1.130	0.263
KR-3/KR-3	NE251142	NE251141	18	0.00200	4.69	0.000	0.000	0.000	1.095	1.095	0.233
KR-3/KR-3	NE251143	NE251142	18	0.00364	6.34	0.000	0.000	0.000	1.059	1.059	0.167
KR-3/KR-3	NE251163	NE251162	30	0.00099	12.95	0.000	0.000	0.000	7.945	7.945	0.613
KR-3/KR-3	NE251164	NE251163	18	0.00503	7.45	0.000	0.000	0.000	1.165	1.165	0.156
KR-3/KR-3	NE251165	NE251164	18	0.00202	4.73	0.000	0.000	0.000	1.130	1.130	0.238
KR-3/KR-3	NE251166	NE251165	18	0.00213	4.84	0.000	0.000	0.000	1.130	1.130	0.233
KR-3/KR-3	NE251246	NE251132	18	0.00258	5.33	0.000	0.000	0.000	1.024	1.024	0.191
KR-3/KR-3	SE251235	SW251078	12	0.05160	8.09	0.000	0.000	0.000	0.565	0.565	0.069

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
KR-3/KR-3	SE261300	SE261346	12	0.01475	4.32	0.000	0.000	0.000	0.459	0.459	0.106
KR-3/KR-3	SE261301	SE261300	8	0.06665	3.12	0.000	0.000	0.000	0.424	0.424	0.135
KR-3/KR-3	SE261302	SE261301	8	0.05675	2.87	0.000	0.000	0.000	0.388	0.388	0.134
KR-3/KR-3	SE261303	SE261302	8	0.05698	2.88	0.000	0.000	0.000	0.353	0.353	0.122
KR-3/KR-3	SE261304	SE261303	8	0.07302	3.26	0.000	0.000	0.000	0.282	0.282	0.086
KR-3/KR-3	SE261305	SE261304	12	0.01680	4.61	0.000	0.000	0.000	0.247	0.247	0.053
KR-3/KR-3	SE261306	SE261305	10	0.02147	3.21	0.000	0.000	0.000	0.212	0.212	0.066
KR-3/KR-3	SE261317	SE261306	10	0.00756	1.90	0.000	0.000	0.000	0.177	0.177	0.092
KR-3/KR-3	SE261318	SE261317	10	0.01010	2.20	0.000	0.000	0.000	0.141	0.141	0.064
KR-3/KR-3	SE261319	SE261318	10	0.00898	2.07	0.000	0.000	0.000	0.071	0.071	0.034
KR-3/KR-3	SE261320	SE261319	10	0.01000	2.19	0.000	0.000	0.000	0.035	0.035	0.016
KR-3/KR-3	SE261345	SW25178A	12	0.01420	4.24	0.000	0.000	0.000	0.565	0.565	0.133
KR-3/KR-3	SE261346	SE261345	12	0.01488	4.34	0.000	0.000	0.000	0.530	0.530	0.121
KR-3/KR-3	SW25072A	SW25071A	15	0.01162	6.96	0.000	0.000	0.000	0.671	0.671	0.096
KR-3/KR-3	SW251019	SW251022	10	0.00873	2.04	0.000	0.000	0.000	0.212	0.212	0.103
KR-3/KR-3	SW251022	SW251234	10	0.00323	1.24	0.000	0.000	0.000	0.282	0.282	0.226
KR-3/KR-3	SW251025	SW251031	10	0.01058	2.25	0.000	0.000	0.000	0.353	0.353	0.156
KR-3/KR-3	SW251031	SW251042	10	0.03846	4.29	0.000	0.000	0.000	0.388	0.388	0.090
KR-3/KR-3	SW251042	SW251043	10	0.00381	1.35	0.000	0.000	0.000	0.424	0.424	0.313
KR-3/KR-3	SW251043	SW251044	10	0.00609	1.71	0.000	0.000	0.000	0.459	0.459	0.268
KR-3/KR-3	SW251044	SW251047	10	0.00414	1.41	0.000	0.000	0.000	0.494	0.494	0.350
KR-3/KR-3	SW251047	SW251053	10	0.00330	1.26	0.000	0.000	0.000	0.530	0.530	0.420
KR-3/KR-3	SW251053	SW251054	10	0.00379	1.34	0.000	0.000	0.000	0.565	0.565	0.418
KR-3/KR-3	SW251054	SW251060	8	0.00294	0.65	0.000	0.000	0.000	0.600	0.600	0.914
KR-3/KR-3	SW251060	SW251065	8	0.00660	0.98	0.000	0.000	0.000	0.600	0.600	0.611
KR-3/KR-3	SW251065	SW25072A	8	0.02105	1.75	0.000	0.000	0.000	0.636	0.636	0.362
KR-3/KR-3	SW251078	SW25179A	12	0.00232	1.71	0.000	0.000	0.000	0.600	0.600	0.349
KR-3/KR-3	SW251080	SE251235	12	0.01700	4.64	0.000	0.000	0.000	0.530	0.530	0.114
KR-3/KR-3	SW251081	SW251080	12	0.01700	4.64	0.000	0.000	0.000	0.494	0.494	0.106
KR-3/KR-3	SW251082	SW251081	12	0.01697	4.64	0.000	0.000	0.000	0.459	0.459	0.098

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
KR-3/KR-3	SW251099	SW251119	12	0.01696	4.64	0.000	0.000	0.000	0.812	0.812	0.175
KR-3/KR-3	SW251119	SW251120	12	0.01635	4.55	0.000	0.000	0.000	0.847	0.847	0.185
KR-3/KR-3	SW251120	SW251125	12	0.00615	2.79	0.000	0.000	0.000	0.883	0.883	0.315
KR-3/KR-3	SW251125	NE251128	12	0.00994	3.55	0.000	0.000	0.000	0.918	0.918	0.258
KR-3/KR-3	SW251234	SW251025	10	0.01204	2.40	0.000	0.000	0.000	0.318	0.318	0.132
KR-3/KR-3	SW25170A	SW251099	12	0.01561	4.45	0.000	0.000	0.000	0.777	0.777	0.174
KR-3/KR-3	SW25171A	SW25170A	12	0.02262	5.35	0.000	0.000	0.000	0.742	0.742	0.138
KR-3/KR-3	SW25172A	SW25171A	12	0.01821	4.80	0.000	0.000	0.000	0.706	0.706	0.146
KR-3/KR-3	SW25173A	SW25172A	12	0.01488	4.34	0.000	0.000	0.000	0.671	0.671	0.154
KR-3/KR-3	SW25178A	SW251082	12	0.03178	6.35	0.000	0.000	0.000	0.424	0.424	0.066
KR-3/KR-3	SW25178A	SW251019	10	0.00584	1.67	0.000	0.000	0.000	0.177	0.177	0.105
KR-3/KR-3	SW25179A	SW25173A	12	0.02352	5.46	0.000	0.000	0.000	0.636	0.636	0.116
KR-4/KR-4	NE251157	NE251158	30	0.00190	17.88	0.000	0.000	0.000	7.980	7.980	0.446
KR-4/KR-4	NE251158	NE251172	30	0.00119	14.19	0.000	0.000	0.000	7.980	7.980	0.562
KR-4/KR-4	NE251159	NE251157	30	0.00150	15.93	0.000	0.000	0.000	7.980	7.980	0.500
KR-4/KR-4	NE251160	NE251159	30	0.00294	22.24	0.000	0.000	0.000	7.980	7.980	0.358
KR-4/KR-4	NE251161	NE251160	30	0.00129	14.77	0.000	0.000	0.000	7.980	7.980	0.540
KR-4/KR-4	NE251162	NE251161	30	0.00125	14.50	0.000	0.000	0.000	7.945	7.945	0.547
KR-4/KR-4	NE251172	NE251218	30	0.00120	14.21	0.000	0.000	0.000	7.980	7.980	0.561
KR-4/KR-4	NE251212	NE251213	30	0.00115	13.95	0.000	0.000	0.000	13.241	13.241	0.949
KR-4/KR-4	NE251213	NE251214	30	0.00116	14.01	0.000	0.000	0.000	13.135	13.135	0.937
KR-4/KR-4	NE251214	NE251215	30	0.00117	14.07	0.000	0.000	0.000	13.065	13.065	0.928
KR-4/KR-4	NE251215	NE251216	30	0.00118	14.14	0.000	0.000	0.000	12.959	12.959	0.916
KR-4/KR-4	NE251216	NE251217	30	0.00017	5.48	0.000	0.000	0.000	12.888	12.888	2.348
KR-4/KR-4	NE251217	SE251099	30	0.00132	14.91	0.000	0.000	0.000	12.818	12.818	0.859
KR-4/KR-4	NE251218	SE251219	30	0.00118	14.11	0.000	0.000	0.000	7.980	7.980	0.565
KR-4/KR-4	NE361004	NE361122	12	0.04273	7.36	0.000	0.000	0.000	0.918	0.918	0.124
KR-4/KR-4	NE361009	NE361225	12	0.07986	10.06	0.000	0.000	0.000	1.448	1.448	0.143
KR-4/KR-4	NE361012	NW36109A	12	0.00755	3.09	0.000	0.000	0.000	1.306	1.306	0.421
KR-4/KR-4	NE361030	NE361031	8	0.00675	0.99	0.000	0.000	0.000	0.141	0.141	0.142

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-4/KR-4	NE361031	NE361034	8	0.00676	0.99	0.000	0.000	0.000	0.247	0.247	0.248
KR-4/KR-4	NE361034	NE361036	8	0.00678	0.99	0.000	0.000	0.000	0.388	0.388	0.389
KR-4/KR-4	NE361036	NE361039	8	0.00666	0.98	0.000	0.000	0.000	0.530	0.530	0.537
KR-4/KR-4	NE361039	NW312002	8	0.00685	1.00	0.000	0.000	0.000	0.671	0.671	0.670
KR-4/KR-4	NE361121	NE361012	12	0.02149	5.22	0.000	0.000	0.000	1.201	1.201	0.229
KR-4/KR-4	NE361122	NE361121	12	0.02327	5.43	0.000	0.000	0.000	1.059	1.059	0.194
KR-4/KR-4	NE361225	NE361004	12	0.03785	6.93	0.000	0.000	0.000	0.777	0.777	0.112
KR-4/KR-4	NW36109A	SW251189	12	0.01243	3.97	0.000	0.000	0.000	1.448	1.448	0.364
KR-4/KR-4	NW361100	NW36112A	12	0.01002	3.56	0.000	0.000	0.000	1.059	1.059	0.296
KR-4/KR-4	NW361101	NW361100	12	0.01062	3.67	0.000	0.000	0.000	0.918	0.918	0.249
KR-4/KR-4	NW361102	NW361101	12	0.03106	6.28	0.000	0.000	0.000	0.388	0.388	0.061
KR-4/KR-4	NW361103	NW361102	12	0.01376	4.18	0.000	0.000	0.000	0.247	0.247	0.059
KR-4/KR-4	NW361104	NW361103	12	0.01378	4.18	0.000	0.000	0.000	0.141	0.141	0.033
KR-4/KR-4	NW361114	NW361101	12	0.08227	10.22	0.000	0.000	0.000	0.388	0.388	0.038
KR-4/KR-4	NW361115	NW361114	12	0.01769	4.74	0.000	0.000	0.000	0.247	0.247	0.052
KR-4/KR-4	NW361124	NE361009	12	0.01938	4.96	0.000	0.000	0.000	1.306	1.306	0.263
KR-4/KR-4	NW36112A	NW361124	12	0.01356	4.15	0.000	0.000	0.000	1.201	1.201	0.289
KR-4/KR-5	PS_16	NW312056	16	-.02293	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-4/KR-4	SE25-057	SE251056	10	0.00389	1.36	0.000	0.000	0.000	0.530	0.530	0.387
KR-4/KR-4	SE251016	SE251017	8	0.01792	1.61	0.000	0.000	0.000	0.141	0.141	0.087
KR-4/KR-4	SE251017	SE251018	10	0.05280	5.03	0.000	0.000	0.000	0.247	0.247	0.049
KR-4/KR-4	SE251018	SE25-057	10	0.00444	1.46	0.000	0.000	0.000	0.388	0.388	0.265
KR-4/KR-4	SE251022	SE251024	15	0.00409	4.13	0.000	0.000	0.000	2.719	2.719	0.657
KR-4/KR-4	SE251024	SE251065	15	0.00388	4.02	0.000	0.000	0.000	2.789	2.789	0.692
KR-4/KR-4	SE251045	SE251114	10	0.01106	2.30	0.000	0.000	0.000	1.589	1.589	0.689
KR-4/KR-4	SE251046	SE251045	10	0.01200	2.40	0.000	0.000	0.000	1.448	1.448	0.603
KR-4/KR-4	SE251047	SE251046	10	0.00215	1.01	0.000	0.000	0.000	1.342	1.342	1.319
KR-4/KR-4	SE251048	SE251047	10	0.00319	1.23	0.000	0.000	0.000	1.201	1.201	0.970
KR-4/KR-4	SE251049	SE251048	10	0.00453	1.47	0.000	0.000	0.000	1.165	1.165	0.789
KR-4/KR-4	SE251051	SE251049	10	0.00303	1.20	0.000	0.000	0.000	1.024	1.024	0.848

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-4/KR-4	SE251053	SE251051	10	0.00314	1.22	0.000	0.000	0.000	0.918	0.918	0.747
KR-4/KR-4	SE251054	SE251053	10	0.00324	1.24	0.000	0.000	0.000	0.777	0.777	0.623
KR-4/KR-4	SE251056	SE251054	10	0.02127	3.19	0.000	0.000	0.000	0.671	0.671	0.210
KR-4/KR-4	SE251065	SE251066	15	0.01665	8.33	0.000	0.000	0.000	2.825	2.825	0.338
KR-4/KR-4	SE251066	SE251067	15	0.01665	8.33	0.000	0.000	0.000	2.860	2.860	0.343
KR-4/KR-4	SE251067	SE251073	15	0.01665	8.33	0.000	0.000	0.000	2.931	2.931	0.351
KR-4/KR-4	SE251073	SE251085	15	0.00856	5.97	0.000	0.000	0.000	3.001	3.001	0.502
KR-4/KR-4	SE251081	SW302171	18	0.00833	9.59	0.000	0.000	0.000	4.237	4.237	0.441
KR-4/KR-4	SE251081	SE251242	8	0.01250	1.35	0.000	0.000	0.000	-1.095	-1.095	0.000
KR-4/KR-4	SE251085	SE251228	18	0.00857	9.72	0.000	0.000	0.000	3.037	3.037	0.312
KR-4/KR-4	SE251099	SW302098	30	0.00135	15.10	0.000	0.000	0.000	12.712	12.712	0.841
KR-4/KR-4	SE251110	SE251242	10	0.00612	1.71	0.000	0.000	0.000	1.871	1.871	1.091
KR-4/KR-4	SE251114	SE251244	10	0.00815	1.97	0.000	0.000	0.000	1.695	1.695	0.856
KR-4/KR-4	SE251219	SE251221	30	0.00108	13.48	0.000	0.000	0.000	7.945	7.945	0.589
KR-4/KR-4	SE251221	SW302198	30	0.00071	10.98	0.000	0.000	0.000	7.980	7.980	0.726
KR-4/KR-4	SE251228	SE251081	18	0.00850	9.68	0.000	0.000	0.000	3.107	3.107	0.320
KR-4/KR-4	SE251242	SE251243	10	0.02000	3.09	0.000	0.000	0.000	1.059	1.059	0.341
KR-4/KR-4	SE251243	SE251254	10	0.00275	1.15	0.000	0.000	0.000	1.165	1.165	1.013
KR-4/KR-4	SE251244	SE251110	10	0.00482	1.52	0.000	0.000	0.000	1.801	1.801	1.183
KR-4/KR-4	SE251254	SE302105	10	0.00299	1.19	0.000	0.000	0.000	1.201	1.201	1.001
KR-4/KR-4	SE302105	SW302132	10	0.00172	0.91	0.000	0.000	0.000	1.306	1.306	1.435
KR-4/KR-4	SW25071A	SW251069	15	0.00420	4.18	0.000	0.000	0.000	0.777	0.777	0.185
KR-4/KR-4	SW251069	SE251022	15	0.01203	7.08	0.000	0.000	0.000	0.918	0.918	0.129
KR-4/KR-4	SW251188	SE251022	15	0.00737	5.54	0.000	0.000	0.000	1.730	1.730	0.311
KR-4/KR-4	SW251188	SE251016	8	0.02564	1.93	0.000	0.000	0.000	0.000	0.000	0.000
KR-4/KR-4	SW251189	SW251188	12	0.01259	3.99	0.000	0.000	0.000	1.589	1.589	0.397
KR-4/KR-4	SW302092	SW302133	18	0.00251	5.27	0.000	0.000	0.000	4.273	4.273	0.810
KR-4/KR-4	SW302095	SW302134	30	0.00119	14.18	0.000	0.000	0.000	12.676	12.676	0.893
KR-4/KR-4	SW302096	SW302095	30	0.00134	15.05	0.000	0.000	0.000	12.676	12.676	0.841
KR-4/KR-4	SW302098	SW30297A	30	0.00129	14.77	0.000	0.000	0.000	12.712	12.712	0.860

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
KR-4/KR-4	SW302131	SW302132	9	0.00909	1.57	0.000	0.000	0.000	0.141	0.141	0.089
KR-4/KR-4	SW302132	SW302150	12	0.03105	6.27	0.000	0.000	0.000	1.554	1.554	0.247
KR-4/KR-4	SW302133	SW302150	18	0.00130	3.79	0.000	0.000	0.000	4.273	4.273	1.126
KR-4/KR-4	SW302134	SW302136	30	0.00150	15.90	0.000	0.000	0.000	14.265	14.265	0.897
KR-4/KR-4	SW302135	SW302017	12	0.00269	1.84	0.000	0.000	0.000	0.141	0.141	0.076
KR-4/KR-4	SW302136	SW302141	30	0.01867	56.06	0.000	0.000	0.000	14.265	14.265	0.254
KR-4/KR-4	SW302137	SW302138	30	0.00148	15.78	0.000	0.000	0.000	7.980	7.980	0.505
KR-4/KR-4	SW302138	SW302139	30	0.00092	12.50	0.000	0.000	0.000	8.015	8.015	0.641
KR-4/KR-4	SW302139	SW302140	30	0.00198	18.26	0.000	0.000	0.000	8.015	8.015	0.438
KR-4/KR-4	SW302140	SW302141	30	0.01328	47.28	0.000	0.000	0.000	8.051	8.051	0.170
KR-4/KR-4	SW302141	SW302142	60	0.00800	232.97	0.000	0.000	0.000	22.316	22.316	0.095
KR-4/KR-4	SW302142	PS_16	60	0.00448	174.40	0.000	0.000	0.000	22.457	22.457	0.128
KR-4/KR-4	SW302150	SW302135	12	0.00304	1.96	0.000	0.000	0.000	0.000	0.000	0.000
KR-4/KR-4	SW302150	SW302134	24	0.07884	63.52	0.000	0.000	0.000	5.791	5.791	0.091
KR-4/KR-4	SW302171	SW302092	18	0.00269	5.45	0.000	0.000	0.000	4.273	4.273	0.783
KR-4/KR-4	SW302195	SW302137	30	0.00130	14.82	0.000	0.000	0.000	7.980	7.980	0.538
KR-4/KR-4	SW302196	SW302195	30	0.00129	14.75	0.000	0.000	0.000	7.980	7.980	0.540
KR-4/KR-4	SW302197	SW302196	30	0.00095	12.65	0.000	0.000	0.000	7.980	7.980	0.630
KR-4/KR-4	SW302198	SW302197	30	0.00078	11.52	0.000	0.000	0.000	7.980	7.980	0.692
KR-4/KR-4	SW30297A	SW302096	30	0.00128	14.69	0.000	0.000	0.000	12.676	12.676	0.862
KR-4/KR-4	SW36145A	NW361115	12	0.07670	9.86	0.000	0.000	0.000	0.141	0.141	0.014
KR-5/KR-5	NE062001	SE312034	24	0.00209	10.35	0.000	0.000	0.000	13.100	13.100	1.265
KR-5/KR-5	NE062002	NE062001	24	0.00543	16.68	0.000	0.000	0.000	13.135	13.135	0.787
KR-5/KR-5	NE062003	NE062002	24	0.00313	12.66	0.000	0.000	0.000	13.100	13.100	1.034
KR-5/KR-5	NE062007	NE062003	24	0.00386	14.06	0.000	0.000	0.000	13.100	13.100	0.931
KR-5/KR-5	NE062016	NE062007	24	0.00333	13.06	0.000	0.000	0.000	13.065	13.065	1.000
KR-5/KR-5	NE062018	NE062016	24	0.00292	12.24	0.000	0.000	0.000	13.065	13.065	1.067
KR-5/KR-5	NE062019	NE062018	24	0.00297	12.33	0.000	0.000	0.000	13.100	13.100	1.062
KR-5/KR-5	NE062026	NE062019	24	0.01415	26.92	0.000	0.000	0.000	13.100	13.100	0.486
KR-5/KR-5	NE062028	NE062026	24	0.00318	12.76	0.000	0.000	0.000	13.100	13.100	1.026

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	NE062029	NE062150	27	0.00754	26.90	0.000	0.000	0.000	17.019	17.019	0.632
KR-5/KR-5	NE062029	NE062028	24	0.00754	19.65	0.000	0.000	0.000	13.135	13.135	0.668
KR-5/KR-5	NE062030	NE062029	27	0.00800	27.70	0.000	0.000	0.000	18.043	18.043	0.651
KR-5/KR-5	NE062090	NE062091	27	0.01204	33.99	0.000	0.000	0.000	17.055	17.055	0.501
KR-5/KR-5	NE062091	NE062092	27	0.00414	19.94	0.000	0.000	0.000	17.055	17.055	0.855
KR-5/KR-5	NE062092	NE062093	27	0.00409	19.81	0.000	0.000	0.000	17.019	17.019	0.858
KR-5/KR-5	NE062093	NE062094	27	0.00400	19.58	0.000	0.000	0.000	17.019	17.019	0.868
KR-5/KR-5	NE062094	NE062095	27	0.00290	16.68	0.000	0.000	0.000	17.019	17.019	1.020
KR-5/KR-5	NE062095	SE312082	30	0.00411	26.30	0.000	0.000	0.000	16.984	16.984	0.645
KR-5/KR-5	NE062110	NE062112	15	0.00250	3.23	0.000	0.000	0.000	0.388	0.388	0.120
KR-5/KR-5	NE062111	NE062110	12	0.00320	2.01	0.000	0.000	0.000	0.177	0.177	0.087
KR-5/KR-5	NE062112	NE062113	15	0.00686	5.35	0.000	0.000	0.000	0.565	0.565	0.105
KR-5/KR-5	NE062113	NE062114	15	0.00684	5.34	0.000	0.000	0.000	0.742	0.742	0.138
KR-5/KR-5	NE062114	NE062115	24	0.00613	17.71	0.000	0.000	0.000	5.861	5.861	0.330
KR-5/KR-5	NE062115	NE062116	24	0.00609	17.66	0.000	0.000	0.000	5.861	5.861	0.331
KR-5/KR-5	NE062116	NE06295A	24	0.00607	17.63	0.000	0.000	0.000	5.897	5.897	0.334
KR-5/KR-5	NE062144	NE062030	27	0.00895	29.31	0.000	0.000	0.000	18.043	18.043	0.615
KR-5/KR-5	NE062145	NE062151	24	0.01157	24.34	0.000	0.000	0.000	5.544	5.544	0.227
KR-5/KR-5	NE062150	NE062090	27	0.00758	26.96	0.000	0.000	0.000	17.055	17.055	0.632
KR-5/KR-5	NE062151	NE062152	24	0.01198	24.77	0.000	0.000	0.000	5.579	5.579	0.225
KR-5/KR-5	NE062152	NE062153	24	0.01000	22.62	0.000	0.000	0.000	5.614	5.614	0.248
KR-5/KR-5	NE062153	NE062114	24	0.00606	17.62	0.000	0.000	0.000	5.650	5.650	0.320
KR-5/KR-5	NE062159	SE312120	24	0.00292	12.23	0.000	0.000	0.000	5.967	5.967	0.487
KR-5/KR-5	NE062160	SE312080	15	0.01000	6.46	0.000	0.000	0.000	0.177	0.177	0.027
KR-5/KR-5	NE06295A	NE062159	24	0.00274	11.85	0.000	0.000	0.000	5.932	5.932	0.500
KR-5/KR-5	NE072001	SE062051	10	0.00279	1.15	0.000	0.000	0.000	0.918	0.918	0.792
KR-5/KR-5	NE072002	NE072001	10	0.00256	1.11	0.000	0.000	0.000	0.742	0.742	0.668
KR-5/KR-5	NE072003	NE072002	10	0.00174	0.91	0.000	0.000	0.000	0.565	0.565	0.618
KR-5/KR-5	NE072004	NE072003	10	0.00238	1.07	0.000	0.000	0.000	0.388	0.388	0.362
KR-5/KR-5	NE072005	NE072004	10	0.00430	1.43	0.000	0.000	0.000	0.177	0.177	0.123

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	NE072010	SE062049	24	0.01233	25.13	0.000	0.000	0.000	22.916	22.916	0.911
KR-5/KR-5	NE072011	NE072010	24	0.01336	26.15	0.000	0.000	0.000	22.881	22.881	0.874
KR-5/KR-5	NE312016	NE312089	12	0.00126	1.26	0.000	0.000	0.000	2.401	2.401	1.898
KR-5/KR-5	NE312017	NE312016	12	0.00123	1.25	0.000	0.000	0.000	2.260	2.260	1.803
KR-5/KR-5	NE312020	NE312017	12	0.00649	2.87	0.000	0.000	0.000	2.083	2.083	0.725
KR-5/KR-5	NE312021	NE312020	12	0.00123	1.25	0.000	0.000	0.000	2.013	2.013	1.607
KR-5/KR-5	NE312022	NE312021	12	0.00140	1.33	0.000	0.000	0.000	1.977	1.977	1.483
KR-5/KR-5	NE312023	NE312026	30	0.00465	27.99	0.000	0.000	0.000	9.746	9.746	0.348
KR-5/KR-5	NE312026	NE312028	30	0.00466	28.00	0.000	0.000	0.000	9.781	9.781	0.349
KR-5/KR-5	NE312028	NW322029	30	0.00463	27.92	0.000	0.000	0.000	9.816	9.816	0.351
KR-5/KR-5	NE312036	NW322011	27	0.01971	43.49	0.000	0.000	0.000	14.724	14.724	0.338
KR-5/KR-5	NE312037	NE312036	27	0.00368	18.79	0.000	0.000	0.000	14.760	14.760	0.785
KR-5/KR-5	NE312038	NE312120	21	0.00681	13.08	0.000	0.000	0.000	10.205	10.205	0.780
KR-5/KR-5	NE312074	NE312100	34	0.00596	44.25	0.000	0.000	0.000	10.734	10.734	0.242
KR-5/KR-5	NE312075	NE312074	34	0.00828	52.13	0.000	0.000	0.000	10.699	10.699	0.205
KR-5/KR-5	NE312076	NE312075	34	0.00628	45.41	0.000	0.000	0.000	9.004	9.004	0.198
KR-5/KR-5	NE312077	NE312076	24	0.00628	17.93	0.000	0.000	0.000	4.732	4.732	0.263
KR-5/KR-5	NE312081	SE302102	24	0.02416	35.17	0.000	0.000	0.000	24.117	24.117	0.685
KR-5/KR-5	NE312082	NE312083	27	0.00392	19.39	0.000	0.000	0.000	15.077	15.077	0.777
KR-5/KR-5	NE312083	NE312084	27	0.00371	18.86	0.000	0.000	0.000	15.077	15.077	0.799
KR-5/KR-5	NE312084	NE312085	27	0.00378	19.06	0.000	0.000	0.000	15.007	15.007	0.787
KR-5/KR-5	NE312085	NE312037	27	0.00370	18.85	0.000	0.000	0.000	14.901	14.901	0.790
KR-5/KR-5	NE312087	NE312038	21	0.00382	9.79	0.000	0.000	0.000	10.205	10.205	1.041
KR-5/KR-5	NE312087	NE312107	21	0.00850	14.61	0.000	0.000	0.000	11.017	11.017	0.754
KR-5/KR-5	NE312088	NE312122	34	0.00842	52.55	0.000	0.000	0.000	7.486	7.486	0.142
KR-5/KR-5	NE312088	NE312123	21	0.00198	7.05	0.000	0.000	0.000	5.438	5.438	0.770
KR-5/KR-5	NE312089	NE312088	34	0.00692	47.65	0.000	0.000	0.000	12.923	12.923	0.271
KR-5/KR-5	NE312090	NE312089	34	0.00592	44.08	0.000	0.000	0.000	10.911	10.911	0.247
KR-5/KR-5	NE312092	NE312090	34	0.00512	41.00	0.000	0.000	0.000	10.875	10.875	0.265
KR-5/KR-5	NE312093	NE312092	34	0.00647	46.07	0.000	0.000	0.000	10.840	10.840	0.235

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	NE312099	NE312093	34	0.00871	53.46	0.000	0.000	0.000	10.805	10.805	0.202
KR-5/KR-5	NE312100	NE312099	34	0.00651	46.23	0.000	0.000	0.000	10.770	10.770	0.233
KR-5/KR-5	NE312104	NE312105	21	0.00189	6.89	0.000	0.000	0.000	9.004	9.004	1.305
KR-5/KR-5	NE312105	NE312123	21	0.00618	12.45	0.000	0.000	0.000	9.039	9.039	0.725
KR-5/KR-5	NE312107	NE312108	21	0.00347	9.34	0.000	0.000	0.000	10.981	10.981	1.175
KR-5/KR-5	NE312108	NW322109	21	0.00347	9.34	0.000	0.000	0.000	11.017	11.017	1.179
KR-5/KR-5	NE312109	NE312110	36	0.00468	45.65	0.000	0.000	0.000	18.891	18.891	0.413
KR-5/KR-5	NE312110	NE312111	36	0.00458	45.14	0.000	0.000	0.000	18.926	18.926	0.419
KR-5/KR-5	NE312111	NE312112	36	0.00460	45.27	0.000	0.000	0.000	18.926	18.926	0.418
KR-5/KR-5	NE312112	NE312113	36	0.00462	45.38	0.000	0.000	0.000	18.961	18.961	0.417
KR-5/KR-5	NE312113	NW322105	36	0.00462	45.35	0.000	0.000	0.000	18.961	18.961	0.418
KR-5/KR-5	NE312120	NW322035	21	0.00685	13.12	0.000	0.000	0.000	10.240	10.240	0.780
KR-5/KR-5	NE312122	NE312087	21	0.00146	6.06	0.000	0.000	0.000	7.486	7.486	1.233
KR-5/KR-5	NE312123	NE312087	21	0.00833	14.46	0.000	0.000	0.000	13.806	13.806	0.954
KR-5/KR-5	NE361066	NE361072	10	0.03044	3.82	0.000	0.000	0.000	1.236	1.236	0.323
KR-5/KR-5	NE361067	NE361066	10	0.00612	1.71	0.000	0.000	0.000	1.024	1.024	0.597
KR-5/KR-5	NE361072	NE361075	10	0.01667	2.83	0.000	0.000	0.000	1.412	1.412	0.498
KR-5/KR-5	NE361075	NE361082	24	0.00860	20.99	0.000	0.000	0.000	2.330	2.330	0.111
KR-5/KR-5	NE361076	NE361075	18	0.00125	3.72	0.000	0.000	0.000	0.742	0.742	0.199
KR-5/KR-5	NE361077	NE361076	18	0.00731	8.98	0.000	0.000	0.000	0.565	0.565	0.062
KR-5/KR-5	NE361079	NE361077	18	0.01068	10.85	0.000	0.000	0.000	0.388	0.388	0.035
KR-5/KR-5	NE361080	NE361079	18	0.00260	5.35	0.000	0.000	0.000	0.177	0.177	0.033
KR-5/KR-5	NE361082	NE361085	24	0.03162	40.23	0.000	0.000	0.000	2.507	2.507	0.062
KR-5/KR-5	NE361085	NE361090	24	0.04240	46.59	0.000	0.000	0.000	2.719	2.719	0.058
KR-5/KR-5	NE361089	NE361107	24	0.05145	51.32	0.000	0.000	0.000	3.072	3.072	0.059
KR-5/KR-5	NE361090	NE361089	24	0.04947	50.32	0.000	0.000	0.000	2.895	2.895	0.057
KR-5/KR-5	NE361107	NE361230	24	0.01021	22.86	0.000	0.000	0.000	3.249	3.249	0.142
KR-5/KR-5	NE361225	NE361067	12	0.04306	7.39	0.000	0.000	0.000	0.847	0.847	0.114
KR-5/KR-5	NE361230	NW312005	24	0.00478	15.65	0.000	0.000	0.000	3.425	3.425	0.218
KR-5/KR-5	NW062004	NW062203	12	0.10000	11.26	0.000	0.000	0.000	0.177	0.177	0.015

MODELED PEAK WASTEWATER FLOWS

Pipe Data: | Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	NW062005	NW062006	12	0.07060	9.46	0.000	0.000	0.000	0.742	0.742	0.078
KR-5/KR-5	NW062006	NW062007	12	0.07007	9.43	0.000	0.000	0.000	0.953	0.953	0.101
KR-5/KR-5	NW062007	NW062008	12	0.07058	9.46	0.000	0.000	0.000	1.130	1.130	0.119
KR-5/KR-5	NW062008	NW062009	12	0.07057	9.46	0.000	0.000	0.000	1.306	1.306	0.138
KR-5/KR-5	NW062009	NW062017	12	0.00847	3.27	0.000	0.000	0.000	1.695	1.695	0.516
KR-5/KR-5	NW062011	NW062009	12	0.01888	4.89	0.000	0.000	0.000	0.177	0.177	0.036
KR-5/KR-5	NW062017	NW062206	12	0.00850	3.28	0.000	0.000	0.000	1.871	1.871	0.569
KR-5/KR-5	NW062024	NW062049	12	0.00135	1.31	0.000	0.000	0.000	2.013	2.013	1.532
KR-5/KR-5	NW062034	NW062070	12	0.00652	2.87	0.000	0.000	0.000	1.624	1.624	0.564
KR-5/KR-5	NW062035	NW062034	12	0.00701	2.98	0.000	0.000	0.000	1.483	1.483	0.496
KR-5/KR-5	NW062036	NW062035	12	0.00709	3.00	0.000	0.000	0.000	1.342	1.342	0.447
KR-5/KR-5	NW062037	NW062036	12	0.00247	1.77	0.000	0.000	0.000	1.236	1.236	0.697
KR-5/KR-5	NW062049	NW062050	8	0.00348	0.71	0.000	0.000	0.000	2.225	2.225	3.120
KR-5/KR-5	NW062050	NW062053	8	0.01193	1.32	0.000	0.000	0.000	2.366	2.366	1.792
KR-5/KR-5	NW062053	NW062071	10	0.00110	0.72	0.000	0.000	0.000	2.507	2.507	3.443
KR-5/KR-5	NW062064	NW062076	12	0.00588	2.73	0.000	0.000	0.000	2.119	2.119	0.775
KR-5/KR-5	NW062065	NW062064	12	0.00789	3.16	0.000	0.000	0.000	1.977	1.977	0.624
KR-5/KR-5	NW062066	NW062065	12	0.00678	2.93	0.000	0.000	0.000	1.836	1.836	0.625
KR-5/KR-5	NW062070	NW062066	12	0.00658	2.89	0.000	0.000	0.000	1.730	1.730	0.598
KR-5/KR-5	NW062071	NW062072	10	0.00206	0.99	0.000	0.000	0.000	2.472	2.472	2.484
KR-5/KR-5	NW062072	SW312069	10	0.00446	1.46	0.000	0.000	0.000	1.095	1.095	0.748
KR-5/KR-5	NW062072	NW062207	10	0.00750	1.89	0.000	0.000	0.000	1.412	1.412	0.743
KR-5	NW062076	SE312006	12	0.00901	3.38	0.000	0.000	0.000	3.319	3.319	0.981
KR-5/KR-5	NW062077	NW062076	12	0.03750	6.90	0.000	0.000	0.000	0.388	0.388	0.056
KR-5/KR-5	NW062078	NW062076	12	0.00281	1.89	0.000	0.000	0.000	1.271	1.271	0.672
KR-5/KR-5	NW062079	NW062078	12	0.00338	2.07	0.000	0.000	0.000	1.095	1.095	0.528
KR-5/KR-5	NW062080	NW062079	12	0.00314	1.99	0.000	0.000	0.000	0.918	0.918	0.459
KR-5/KR-5	NW062081	NW062080	12	0.00202	1.60	0.000	0.000	0.000	0.742	0.742	0.462
KR-5/KR-5	NW062084	NW062081	12	0.00402	2.25	0.000	0.000	0.000	0.565	0.565	0.250
KR-5/KR-5	NW062087	NW062084	12	0.00219	1.66	0.000	0.000	0.000	0.388	0.388	0.232

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Flow Data: Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	NW062089	NW062087	12	0.00355	2.12	0.000	0.000	0.000	0.177	0.177	0.083
KR-5/KR-5	NW062203	NW062204	12	0.07096	9.49	0.000	0.000	0.000	0.388	0.388	0.040
KR-5/KR-5	NW062204	NW062005	12	0.07033	9.44	0.000	0.000	0.000	0.565	0.565	0.059
KR-5/KR-5	NW062205	NW062077	12	0.03375	6.54	0.000	0.000	0.000	0.177	0.177	0.027
KR-5/KR-5	NW062206	NW062211	12	0.00840	3.26	0.000	0.000	0.000	2.048	2.048	0.626
KR-5/KR-5	NW062207	SW312064	10	0.00238	1.07	0.000	0.000	0.000	1.412	1.412	1.318
KR-5/KR-5	NW062208	NW062037	12	0.00136	1.31	0.000	0.000	0.000	1.130	1.130	0.858
KR-5/KR-5	NW062209	NW062208	12	0.00699	2.98	0.000	0.000	0.000	0.953	0.953	0.319
KR-5/KR-5	NW062211	NW062212	12	0.00507	2.53	0.000	0.000	0.000	2.260	2.260	0.890
KR-5/KR-5	NW062212	NW062213	12	0.00538	2.61	0.000	0.000	0.000	2.436	2.436	0.931
KR-5/KR-5	NW062213	NW062209	12	0.00051	0.81	0.000	0.000	0.000	0.777	0.777	0.958
KR-5/KR-5	NW062213	NW062024	12	0.00751	3.08	0.000	0.000	0.000	1.871	1.871	0.605
KR-5/KR-5	NW312002	NW312014	8	0.02595	1.94	0.000	0.000	0.000	0.847	0.847	0.435
KR-5/KR-5	NW312005	NW312011	24	0.00606	17.61	0.000	0.000	0.000	3.602	3.602	0.204
KR-5/KR-5	NW312011	NW312022	24	0.00653	18.29	0.000	0.000	0.000	3.743	3.743	0.204
KR-5/KR-5	NW312014	NW312019	8	0.01344	1.40	0.000	0.000	0.000	1.024	1.024	0.730
KR-5/KR-5	NW312019	NW312020	15	0.00111	2.15	0.000	0.000	0.000	1.483	1.483	0.688
KR-5/KR-5	NW312020	NW312043	15	0.00156	2.56	0.000	0.000	0.000	1.695	1.695	0.662
KR-5/KR-5	NW312021	NW312020	15	0.02849	10.90	0.000	0.000	0.000	0.177	0.177	0.016
KR-5/KR-5	NW312022	NW312031	24	0.00627	17.91	0.000	0.000	0.000	3.849	3.849	0.214
KR-5/KR-5	NW312031	NW312045	24	0.00937	21.91	0.000	0.000	0.000	3.955	3.955	0.180
KR-5/KR-5	NW312043	NW312060	15	0.00096	2.00	0.000	0.000	0.000	1.695	1.695	0.844
KR-5/KR-5	NW312045	NW312051	24	0.01049	23.18	0.000	0.000	0.000	4.061	4.061	0.175
KR-5/KR-5	NW312051	NW312061	24	0.00618	17.78	0.000	0.000	0.000	4.131	4.131	0.232
KR-5/KR-5	NW312056	NW312069	24	0.03051	39.52	0.000	0.000	0.000	24.081	24.081	0.609
KR-5/KR-5	NW312060	NE312075	15	0.00448	4.32	0.000	0.000	0.000	1.730	1.730	0.399
KR-5/KR-5	NW312061	NW312067	24	0.01181	24.59	0.000	0.000	0.000	4.202	4.202	0.170
KR-5/KR-5	NW312067	NE312076	26	0.00993	27.92	0.000	0.000	0.000	4.273	4.273	0.153
KR-5/KR-5	NW312069	NE312081	24	0.02907	38.57	0.000	0.000	0.000	24.117	24.117	0.625
KR-5/WR-6	NW322002	WWTP	54	0.00466	134.35	0.000	0.000	0.000	86.615	86.615	0.644

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	NW322003	NW322002	48	0.00136	53.05	0.000	0.000	0.000	56.461	56.461	1.064
KR-5/KR-5	NW322004	NW322002	36	0.00761	58.19	0.000	0.000	0.000	23.199	23.199	0.398
KR-5/KR-5	NW322005	NW322071	18	0.00266	5.42	0.000	0.000	0.000	4.484	4.484	0.826
KR-5/KR-5	NW322010	NW32236A	30	0.00357	24.51	0.000	0.000	0.000	12.323	12.323	0.502
KR-5/KR-5	NW322011	NW322012	36	0.00033	12.26	0.000	0.000	0.000	-2.260	-2.260	0.000
KR-5/KR-5	NW322011	NW32236C	36	0.00278	35.18	0.000	0.000	0.000	11.511	11.511	0.327
KR-5/KR-5	NW322012	NW322010	30	0.00356	24.50	0.000	0.000	0.000	12.394	12.394	0.505
KR-5/KR-5	NW322013	NW322034	36	0.00230	32.04	0.000	0.000	0.000	19.032	19.032	0.593
KR-5/KR-5	NW322023	NW322025	21	0.00485	11.04	0.000	0.000	0.000	7.027	7.027	0.636
KR-5/KR-5	NW322025	NW322027	21	0.00488	11.08	0.000	0.000	0.000	7.097	7.097	0.640
KR-5/KR-5	NW322027	NW322029	21	0.00487	11.06	0.000	0.000	0.000	7.133	7.133	0.644
KR-5/KR-5	NW322029	NW322107	30	0.00500	29.00	0.000	0.000	0.000	9.675	9.675	0.333
KR-5/KR-5	NW322029	NW322031	21	0.00611	12.38	0.000	0.000	0.000	7.309	7.309	0.590
KR-5/KR-5	NW322031	NW322034	21	0.00463	10.79	0.000	0.000	0.000	7.344	7.344	0.680
KR-5/KR-5	NW322033	NW322003	48	0.00309	79.97	0.000	0.000	0.000	36.016	36.016	0.450
KR-5/KR-5	NW322033	NW322110	48	0.00292	77.64	0.000	0.000	0.000	-0.071	-0.071	0.000
KR-5/KR-5	NW322034	NW322033	48	0.00153	56.34	0.000	0.000	0.000	26.235	26.235	0.465
KR-5/KR-5	NW322034	NW322109	21	0.00354	9.43	0.000	0.000	0.000	0.000	0.000	0.000
KR-5/KR-5	NW322035	NW322012	30	0.00750	35.52	0.000	0.000	0.000	14.336	14.336	0.403
KR-5/KR-5	NW322070	NW322003	48	0.00467	98.20	0.000	0.000	0.000	18.997	18.997	0.193
KR-5/KR-5	NW322071	NW322004	36	0.00023	10.31	0.000	0.000	0.000	23.269	23.269	2.256
KR-5/KR-5	NW322105	NW322013	36	0.00461	45.31	0.000	0.000	0.000	18.997	18.997	0.419
KR-5/KR-5	NW322107	NW322108	30	0.00480	28.42	0.000	0.000	0.000	9.746	9.746	0.342
KR-5/KR-5	NW322108	NW322033	30	0.00489	28.70	0.000	0.000	0.000	9.781	9.781	0.340
KR-5/KR-5	NW322109	NW322035	21	0.00728	13.52	0.000	0.000	0.000	4.167	4.167	0.308
KR-5/KR-5	NW322109	NW322110	21	0.04214	32.53	0.000	0.000	0.000	7.062	7.062	0.217
KR-5/KR-5	NW322110	NW322011	36	0.00058	16.09	0.000	0.000	0.000	-2.366	-2.366	0.000
KR-5/KR-5	NW322110	NW322111	36	0.00349	39.42	0.000	0.000	0.000	8.898	8.898	0.225
KR-5/KR-5	NW322111	NW322070	48	0.00257	72.84	0.000	0.000	0.000	18.997	18.997	0.260
KR-5/KR-5	NW32230A		24	0.00500	15.99	0.000	0.000	0.000	0.000	0.000	0.000

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
KR-5/KR-5	NW32236A	NW32236B	36	0.00384	41.36	0.000	0.000	0.000	12.429	12.429	0.300
KR-5/KR-5	NW32236A	WEIR	24	0.00388	14.10	0.000	0.000	0.000	-0.177	-0.177	0.000
KR-5/KR-5	NW32236B	NW32236D	24	0.00312	12.64	0.000	0.000	0.000	14.301	14.301	1.130
KR-5/KR-5	NW32236C	NW32248A	24	0.00300	12.39	0.000	0.000	0.000	10.134	10.134	0.817
KR-5/KR-5	NW32236C	NW32236B	24	0.03666	43.32	0.000	0.000	0.000	2.401	2.401	0.055
KR-5/KR-5	NW32236D	NW322071	24	0.00350	13.39	0.000	0.000	0.000	14.336	14.336	1.070
KR-5/KR-5	NW32248A	NW322111	48	0.00307	79.69	0.000	0.000	0.000	10.169	10.169	0.127
KR-5/KR-5	PS_04	NW322071	12	0.00006	0.28	0.000	0.000	0.000	0.000	0.000	0.000
KR-5/KR-5	SE062031	NE062144	27	0.00931	29.89	0.000	0.000	0.000	18.008	18.008	0.602
KR-5/KR-5	SE062034	SE062031	27	0.00321	17.57	0.000	0.000	0.000	18.043	18.043	1.026
KR-5/KR-5	SE062035	SE062034	27	0.00664	25.25	0.000	0.000	0.000	18.149	18.149	0.718
KR-5/KR-5	SE062046	SE062035	27	0.00916	29.64	0.000	0.000	0.000	12.959	12.959	0.437
KR-5/KR-5	SE062047	SE062046	27	0.00256	15.68	0.000	0.000	0.000	13.029	13.029	0.830
KR-5/KR-5	SE062048	SE06247A	27	0.00255	15.65	0.000	0.000	0.000	13.135	13.135	0.839
KR-5/KR-5	SE062049	SE06249A	24	0.00169	9.31	0.000	0.000	0.000	12.323	12.323	1.323
KR-5/KR-5	SE062050	SE062049	27	0.00083	8.96	0.000	0.000	0.000	-10.981	-10.981	0.000
KR-5/KR-5	SE062050	SE062048	27	0.00279	16.36	0.000	0.000	0.000	13.347	13.347	0.815
KR-5/KR-5	SE062051	SE062050	24	0.00288	12.15	0.000	0.000	0.000	4.273	4.273	0.351
KR-5/KR-5	SE062052	SE062051	10	0.01274	2.47	0.000	0.000	0.000	0.742	0.742	0.300
KR-5/KR-5	SE062057	SE062052	10	0.01040	2.23	0.000	0.000	0.000	0.565	0.565	0.252
KR-5/KR-5	SE062058	SE062057	10	0.00300	1.20	0.000	0.000	0.000	0.388	0.388	0.323
KR-5/KR-5	SE062085	SE062086	24	0.00250	11.31	0.000	0.000	0.000	12.005	12.005	1.061
KR-5/KR-5	SE062086	SE062087	24	0.00242	11.15	0.000	0.000	0.000	12.005	12.005	1.076
KR-5/KR-5	SE062087	SE062088	24	0.00759	19.71	0.000	0.000	0.000	12.041	12.041	0.610
KR-5/KR-5	SE062088	SE06288A	24	0.01598	28.60	0.000	0.000	0.000	12.041	12.041	0.421
KR-5/KR-5	SE062140	SE062035	18	0.00598	8.12	0.000	0.000	0.000	5.297	5.297	0.651
KR-5/KR-5	SE06247A	SE062047	27	0.00259	15.77	0.000	0.000	0.000	13.135	13.135	0.832
KR-5/KR-5	SE06249A	SE062085	24	0.00335	13.10	0.000	0.000	0.000	12.076	12.076	0.921
KR-5/KR-5	SE06288A	SE06289A	24	0.01595	28.57	0.000	0.000	0.000	12.076	12.076	0.422
KR-5/KR-5	SE06289A	NE062029	24	0.00949	22.04	0.000	0.000	0.000	12.111	12.111	0.549

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	SE302102	NE312082	27	0.00174	12.92	0.000	0.000	0.000	15.113	15.113	1.169
KR-5/KR-5	SE302102	SE302103	21	0.01180	17.21	0.000	0.000	0.000	9.004	9.004	0.523
KR-5/KR-5	SE302103	NE312104	21	0.00189	6.89	0.000	0.000	0.000	9.004	9.004	1.306
KR-5/KR-5	SE312003	SE312007	12	0.00576	2.70	0.000	0.000	0.000	3.178	3.178	1.174
KR-5/KR-5	SE312005	SE312003	12	0.00787	3.16	0.000	0.000	0.000	3.072	3.072	0.971
KR-5/KR-5	SE312006	SE312005	12	0.00684	2.94	0.000	0.000	0.000	2.966	2.966	1.005
KR-5/KR-5	SE312007	SE312014	12	0.00798	3.18	0.000	0.000	0.000	3.143	3.143	0.987
KR-5/KR-5	SE312014	SE312022	12	0.00328	2.04	0.000	0.000	0.000	2.966	2.966	1.453
KR-5/KR-5	SE312022	SE31239A	12	0.00320	2.01	0.000	0.000	0.000	3.072	3.072	1.523
KR-5/KR-5	SE312030	SE312063	30	0.01578	51.54	0.000	0.000	0.000	3.037	3.037	0.058
KR-5/KR-5	SE312031	SE312064	18	0.01803	14.10	0.000	0.000	0.000	1.236	1.236	0.087
KR-5/KR-5	SE312032	SE312031	18	0.00265	5.40	0.000	0.000	0.000	1.236	1.236	0.228
KR-5/KR-5	SE312033	SE312085	24	0.00422	14.70	0.000	0.000	0.000	13.135	13.135	0.893
KR-5/KR-5	SE312034	SE312033	24	0.00431	14.85	0.000	0.000	0.000	13.100	13.100	0.881
KR-5/KR-5	SE312036	SE312125	15	0.01071	6.68	0.000	0.000	0.000	3.249	3.249	0.485
KR-5/KR-5	SE312038	SE312036	12	0.01059	3.66	0.000	0.000	0.000	3.178	3.178	0.866
KR-5/KR-5	SE312039	SE312038	12	0.01068	3.68	0.000	0.000	0.000	3.143	3.143	0.853
KR-5/KR-5	SE312052	NE312077	24	0.00693	18.84	0.000	0.000	0.000	4.696	4.696	0.249
KR-5/KR-5	SE312054	SE312052	24	0.00307	12.54	0.000	0.000	0.000	4.025	4.025	0.320
KR-5/KR-5	SE312057	SE312054	24	0.00384	14.02	0.000	0.000	0.000	3.990	3.990	0.284
KR-5/KR-5	SE312058	SW322220	24	0.00163	9.14	0.000	0.000	0.000	11.158	11.158	1.220
KR-5/KR-5	SE312059	SE312130	24	0.00043	4.72	0.000	0.000	0.000	10.063	10.063	2.130
KR-5/KR-5	SE312059	SE312058	24	0.00167	9.25	0.000	0.000	0.000	11.158	11.158	1.205
KR-5/KR-5	SE312060	SE312061	30	0.00246	20.37	0.000	0.000	0.000	4.308	4.308	0.211
KR-5/KR-5	SE312061	SW322218	30	0.00238	20.01	0.000	0.000	0.000	4.343	4.343	0.217
KR-5/KR-5	SE312062	SE312060	30	0.01111	43.24	0.000	0.000	0.000	3.037	3.037	0.070
KR-5/KR-5	SE312063	SE312062	30	0.00070	10.85	0.000	0.000	0.000	3.037	3.037	0.279
KR-5/KR-5	SE312064	SE312060	18	0.00102	3.36	0.000	0.000	0.000	1.271	1.271	0.377
KR-5/KR-5	SE312065	SE312128	12	0.01040	3.63	0.000	0.000	0.000	8.757	8.757	2.409
KR-5/KR-5	SE312065	SE312127	12	0.00030	0.61	0.000	0.000	0.000	1.871	1.871	3.032

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	SE312067	SE312151	12	0.00126	1.26	0.000	0.000	0.000	1.942	1.942	1.535
KR-5/KR-5	SE312080	SE312081	15	0.01000	6.46	0.000	0.000	0.000	0.388	0.388	0.060
KR-5/KR-5	SE312081	SE312123	15	0.09400	19.80	0.000	0.000	0.000	0.565	0.565	0.028
KR-5/KR-5	SE312082	SE312083	30	0.00413	26.38	0.000	0.000	0.000	16.984	16.984	0.643
KR-5/KR-5	SE312083	SE312086	30	0.00465	27.97	0.000	0.000	0.000	17.019	17.019	0.608
KR-5/KR-5	SE312084	SE312065	18	0.00603	8.16	0.000	0.000	0.000	10.593	10.593	1.298
KR-5/KR-5	SE312084	SE312086	18	0.00431	6.89	0.000	0.000	0.000	-7.662	-7.662	0.000
KR-5/KR-5	SE312085	SE312501	24	0.00481	15.70	0.000	0.000	0.000	20.868	20.868	1.328
KR-5/KR-5	SE312086	SE312085	18	0.00764	9.18	0.000	0.000	0.000	10.275	10.275	1.118
KR-5/KR-5	SE312086	SE312126	30	0.00294	22.24	0.000	0.000	0.000	4.202	4.202	0.188
KR-5/KR-5	SE312120	SE312121	24	0.00299	12.38	0.000	0.000	0.000	6.003	6.003	0.484
KR-5/KR-5	SE312121	SE312122	24	0.00302	12.43	0.000	0.000	0.000	6.038	6.038	0.485
KR-5/KR-5	SE312122	SE312123	24	0.00272	11.81	0.000	0.000	0.000	6.073	6.073	0.514
KR-5/KR-5	SE312123	SE312124	24	0.00301	12.42	0.000	0.000	0.000	6.179	6.179	0.497
KR-5/KR-5	SE312124	SE312084	24	0.00298	12.35	0.000	0.000	0.000	6.215	6.215	0.502
KR-5/KR-5	SE312125	SE312084	18	0.01083	10.93	0.000	0.000	0.000	3.319	3.319	0.303
KR-5/KR-5	SE312126	SE312032	18	0.00333	6.06	0.000	0.000	0.000	1.201	1.201	0.198
KR-5/KR-5	SE312126	SE312030	30	0.01580	51.56	0.000	0.000	0.000	3.001	3.001	0.058
KR-5/KR-5	SE312127	SE312067	12	0.00124	1.25	0.000	0.000	0.000	1.907	1.907	1.517
KR-5/KR-5	SE312128	SE312129	30	0.00300	22.49	0.000	0.000	0.000	8.757	8.757	0.389
KR-5/KR-5	SE312129	SE312130	30	0.00290	22.10	0.000	0.000	0.000	8.757	8.757	0.396
KR-5/KR-5	SE312130	SE312150	36	0.00150	25.90	0.000	0.000	0.000	18.820	18.820	0.726
KR-5/KR-5	SE312150	SE312152	36	0.00147	25.65	0.000	0.000	0.000	18.820	18.820	0.733
KR-5/KR-5	SE312151	NE312022	12	0.00125	1.26	0.000	0.000	0.000	1.942	1.942	1.541
KR-5/KR-5	SE312152	SE312154	36	0.00578	50.74	0.000	0.000	0.000	18.856	18.856	0.371
KR-5/KR-5	SE312154	NE312109	36	0.00578	50.75	0.000	0.000	0.000	18.891	18.891	0.372
KR-5/KR-5	SE31239A	SE312039	12	0.00955	3.48	0.000	0.000	0.000	3.178	3.178	0.912
KR-5/KR-5	SE312501	SE312059	24	0.00481	15.70	0.000	0.000	0.000	20.904	20.904	1.331
KR-5/KR-5	SW052059	SE062058	10	0.00296	1.19	0.000	0.000	0.000	0.177	0.177	0.148
KR-5/KR-5	SW302017	NW312019	15	0.00203	2.91	0.000	0.000	0.000	0.318	0.318	0.109

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	SW312036	SW312039	10	0.01941	3.05	0.000	0.000	0.000	0.177	0.177	0.058
KR-5/KR-5	SW312039	SW31243A	10	0.01725	2.87	0.000	0.000	0.000	0.388	0.388	0.134
KR-5/KR-5	SW312046	SW312049	12	0.01853	4.85	0.000	0.000	0.000	0.742	0.742	0.153
KR-5/KR-5	SW312049	SE312052	12	0.02773	5.93	0.000	0.000	0.000	0.953	0.953	0.160
KR-5/KR-5	SW312058	SE312057	24	0.00536	16.57	0.000	0.000	0.000	3.849	3.849	0.232
KR-5/KR-5	SW312061	SW312058	12	0.00710	3.00	0.000	0.000	0.000	3.778	3.778	1.258
KR-5/KR-5	SW312063	SW312061	12	0.00442	2.37	0.000	0.000	0.000	3.637	3.637	1.534
KR-5/KR-5	SW312064	SW312063	10	0.00388	1.36	0.000	0.000	0.000	2.613	2.613	1.914
KR-5/KR-5	SW312065	SW312063	10	0.02339	3.35	0.000	0.000	0.000	1.130	1.130	0.337
KR-5/KR-5	SW312067	SW312064	10	0.00448	1.46	0.000	0.000	0.000	1.236	1.236	0.842
KR-5/KR-5	SW312069	SW312067	10	0.00596	1.69	0.000	0.000	0.000	1.130	1.130	0.667
KR-5/KR-5	SW312070	SW312065	10	0.02888	3.72	0.000	0.000	0.000	0.953	0.953	0.255
KR-5/KR-5	SW312076	SW312100	10	0.02260	3.29	0.000	0.000	0.000	0.565	0.565	0.171
KR-5/KR-5	SW312077	SW312076	10	0.02514	3.47	0.000	0.000	0.000	0.388	0.388	0.111
KR-5/KR-5	SW312100	SW312070	10	0.03148	3.88	0.000	0.000	0.000	0.742	0.742	0.190
KR-5/KR-5	SW312103	SW312077	10	0.00424	1.42	0.000	0.000	0.000	0.177	0.177	0.124
KR-5/KR-5	SW31243A	SW312046	10	0.01801	2.94	0.000	0.000	0.000	0.565	0.565	0.192
KR-5/KR-5	SW322001	SW322215	30	0.00514	29.41	0.000	0.000	0.000	7.486	7.486	0.254
KR-5/KR-5	SW322002	SW322001	30	0.00488	28.67	0.000	0.000	0.000	7.450	7.450	0.259
KR-5/KR-5	SW322003	SW322002	30	0.00486	28.61	0.000	0.000	0.000	7.450	7.450	0.260
KR-5/KR-5	SW322004	SW322003	21	0.00485	11.03	0.000	0.000	0.000	3.813	3.813	0.345
KR-5/KR-5	SW322215	NE312023	30	0.00500	29.00	0.000	0.000	0.000	9.675	9.675	0.333
KR-5/KR-5	SW322215	NW322023	21	0.00500	11.20	0.000	0.000	0.000	6.956	6.956	0.620
KR-5/KR-5	SW322216	SW322217	30	0.00250	20.51	0.000	0.000	0.000	4.378	4.378	0.213
KR-5/KR-5	SW322217	SW322003	30	0.01000	41.02	0.000	0.000	0.000	6.285	6.285	0.153
KR-5/KR-5	SW322218	SW322216	30	0.00285	21.92	0.000	0.000	0.000	4.343	4.343	0.198
KR-5/KR-5	SW322220	SW322x69	24	0.00142	8.55	0.000	0.000	0.000	11.158	11.158	1.304
KR-5/KR-5	SW32256A	SW322215	21	0.00507	11.28	0.000	0.000	0.000	9.110	9.110	0.807
KR-5/KR-5	SW322x69	SW322217	21	0.00500	11.20	0.000	0.000	0.000	0.000	0.000	0.000
KR-5/KR-5	SW322x69	SW32256A	21	0.00165	6.45	0.000	0.000	0.000	0.000	0.000	0.000

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-5/KR-5	WEIR	NW32230A	24	0.02400	35.05	0.000	0.000	0.000	0.000	0.000	0.000
KR-5/WR-6	WWTP		54	0.00800	175.91	0.000	0.000	0.000	0.000	0.000	0.000
KR-6/KR-6	NE092004	SE042015	8	0.03419	2.23	0.000	0.000	0.000	0.388	0.388	0.173
KR-6/KR-6	NE092005	NE092004	8	0.00461	0.82	0.000	0.000	0.000	0.247	0.247	0.300
KR-6/KR-6	NE092021	NE092005	8	0.01774	1.61	0.000	0.000	0.000	0.141	0.141	0.087
KR-6/KR-6	NW052003	SW322069	10	0.00484	1.52	0.000	0.000	0.000	0.918	0.918	0.602
KR-6/KR-6	NW052005	NW052008	15	0.00377	3.97	0.000	0.000	0.000	1.306	1.306	0.328
KR-6/KR-6	NW052008	SW322070	8	0.02833	2.03	0.000	0.000	0.000	1.448	1.448	0.711
KR-6/KR-6	NW052010	NW052003	10	0.00216	1.01	0.000	0.000	0.000	0.777	0.777	0.762
KR-6/KR-6	NW052011	NW052010	10	0.00673	1.79	0.000	0.000	0.000	0.671	0.671	0.373
KR-6/KR-6	NW052012	NW052011	10	0.00334	1.26	0.000	0.000	0.000	0.530	0.530	0.418
KR-6/KR-6	NW052013	NW052046	15	0.00614	5.06	0.000	0.000	0.000	1.059	1.059	0.209
KR-6/KR-6	NW052036	NW052037	10	0.01618	2.78	0.000	0.000	0.000	0.141	0.141	0.050
KR-6/KR-6	NW052037	NW052038	10	0.00367	1.32	0.000	0.000	0.000	0.247	0.247	0.186
KR-6/KR-6	NW052038	NW052012	10	0.00395	1.37	0.000	0.000	0.000	0.388	0.388	0.281
KR-6/KR-6	NW052046	NW052005	15	0.00397	4.07	0.000	0.000	0.000	1.165	1.165	0.286
KR-6/KR-6	NW052057	NW052013	15	0.00635	5.14	0.000	0.000	0.000	0.918	0.918	0.178
KR-6/KR-6	NW052058	NW052057	15	0.00635	5.14	0.000	0.000	0.000	0.777	0.777	0.150
KR-6/KR-6	NW052059	NW052058	15	0.00402	4.10	0.000	0.000	0.000	0.671	0.671	0.163
KR-6/KR-6	NW052060	NW052059	15	0.00481	4.48	0.000	0.000	0.000	0.530	0.530	0.118
KR-6/KR-6	NW052061	NW052060	15	0.00387	4.02	0.000	0.000	0.000	0.388	0.388	0.096
KR-6/KR-6	NW052166	NW052167	15	0.00792	5.75	0.000	0.000	0.000	0.141	0.141	0.024
KR-6/KR-6	NW052167	NW052061	15	0.00821	5.85	0.000	0.000	0.000	0.247	0.247	0.042
KR-6/KR-5	PS_25	NW322002	10	-.02562	0.00	0.000	0.000	0.000	0.000	0.000	0.000
KR-6/KR-6	SE042002	SE042003	8	0.00887	1.13	0.000	0.000	0.000	0.671	0.671	0.589
KR-6/KR-6	SE042003	SE042004	8	0.00068	0.31	0.000	0.000	0.000	0.777	0.777	2.451
KR-6/KR-6	SE042004	SE042006	8	0.01620	1.53	0.000	0.000	0.000	0.918	0.918	0.596
KR-6/KR-6	SE042006	SE042008	8	0.00897	1.14	0.000	0.000	0.000	1.024	1.024	0.894
KR-6/KR-6	SE042008	SE042009	8	0.01367	1.41	0.000	0.000	0.000	1.165	1.165	0.824
KR-6/KR-6	SE042009	SE042011	8	0.01812	1.62	0.000	0.000	0.000	1.271	1.271	0.781

LAWRENCE, KS 2002: FUTURE 2025

Model Name: 2025cip

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
KR-6/KR-6	SE042011	SE042013	18	0.01398	12.42	0.000	0.000	0.000	1.412	1.412	0.113
KR-6/KR-6	SE042013	SE042014	18	0.01461	12.70	0.000	0.000	0.000	1.518	1.518	0.119
KR-6/KR-6	SE042014	SW032002	18	0.02083	15.16	0.000	0.000	0.000	1.624	1.624	0.107
KR-6/KR-6	SE042015	SE042002	8	0.01410	1.43	0.000	0.000	0.000	0.530	0.530	0.369
KR-6/KR-6	SW032001	PS_25	18	0.34850	62.01	0.000	0.000	0.000	6.850	6.850	0.110
KR-6/KR-6-1	SW032002	SW032015	18	0.00446	7.02	0.000	0.000	0.000	7.027	7.027	1.000
KR-6/KR-6-1	SW032003	SW032002	18	0.00080	2.98	0.000	0.000	0.000	6.250	6.250	2.093
KR-6/KR-6	SW032004	SW032003	18	0.00225	4.99	0.000	0.000	0.000	0.883	0.883	0.176
KR-6/KR-6	SW032005	SW032004	18	0.00265	5.40	0.000	0.000	0.000	0.777	0.777	0.143
KR-6/KR-6	SW032006	SW032005	18	0.00237	5.11	0.000	0.000	0.000	0.671	0.671	0.131
KR-6/KR-6	SW032007	SW032006	18	0.00307	5.82	0.000	0.000	0.000	0.530	0.530	0.091
KR-6/KR-6	SW032008	SW032011	18	0.00211	4.83	0.000	0.000	0.000	0.247	0.247	0.051
KR-6/KR-6	SW032009	SW032008	18	0.00423	6.83	0.000	0.000	0.000	0.141	0.141	0.020
KR-6/KR-6	SW032011	SW032007	18	0.00040	2.11	0.000	0.000	0.000	0.388	0.388	0.183
KR-6/KR-6-1	SW032015	SW032001	18	0.00197	4.66	0.000	0.000	0.000	6.956	6.956	1.491
KR-6/KR-6	SW322008	SW322004	21	0.00483	11.02	0.000	0.000	0.000	3.778	3.778	0.342
KR-6/KR-6	SW322013	SW322008	21	0.00155	6.24	0.000	0.000	0.000	3.778	3.778	0.605
KR-6/KR-6	SW322015	SW322013	21	0.00154	6.23	0.000	0.000	0.000	3.778	3.778	0.606
KR-6/KR-6	SW322023	SW322025	15	0.01666	8.34	0.000	0.000	0.000	2.754	2.754	0.330
KR-6/KR-6	SW322025	SW322026	15	0.00403	4.10	0.000	0.000	0.000	2.860	2.860	0.697
KR-6/KR-6	SW322026	SW322027	15	0.01193	7.05	0.000	0.000	0.000	2.966	2.966	0.420
KR-6/KR-6	SW322027	SW322028	15	0.01183	7.03	0.000	0.000	0.000	3.107	3.107	0.442
KR-6/KR-6	SW322028	SW322029	15	0.01190	7.05	0.000	0.000	0.000	3.213	3.213	0.455
KR-6/KR-6	SW322029	SW322030	21	0.00133	5.78	0.000	0.000	0.000	3.319	3.319	0.573
KR-6/KR-6	SW322030	SW322015	21	0.00152	6.19	0.000	0.000	0.000	3.813	3.813	0.615
KR-6/KR-6	SW322031	SW322030	15	0.00353	3.84	0.000	0.000	0.000	0.388	0.388	0.101
KR-6/KR-6	SW322034	SW322031	15	0.00290	3.48	0.000	0.000	0.000	0.282	0.282	0.081
KR-6/KR-6	SW322035	SW322034	15	0.00274	3.38	0.000	0.000	0.000	0.141	0.141	0.041
KR-6/KR-6	SW322069	SW322070	10	0.00511	1.56	0.000	0.000	0.000	1.059	1.059	0.675
KR-6/KR-6	SW322070	SW322023	10	0.01577	2.75	0.000	0.000	0.000	2.613	2.613	0.949

MODELED PEAK WASTEWATER FLOWS

Pipe Data: | Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
NL-1/NL-1	NE192001	NE192002	12	0.00115	1.21	0.000	0.000	0.000	0.106	0.106	0.087
NL-1/NL-1	NE192002	NE192004	12	0.00202	1.60	0.000	0.000	0.000	0.212	0.212	0.132
NL-1/NL-1	NE192004	NE192005	12	0.00188	1.54	0.000	0.000	0.000	0.282	0.282	0.182
NL-1/NL-1	NE192005	NE192006	12	0.00220	1.67	0.000	0.000	0.000	0.388	0.388	0.231
NL-1/NL-1	NE192006	NE192007	12	0.00198	1.58	0.000	0.000	0.000	0.494	0.494	0.310
NL-1/NL-1	NE192007	PS_12	12	0.01351	4.14	0.000	0.000	0.000	0.565	0.565	0.136
NL-1/NL-1	NE302081	NE302082	10	0.00200	0.98	0.000	0.000	0.000	0.282	0.282	0.287
NL-1/NL-1	NE302082	NE302083	10	0.00198	0.97	0.000	0.000	0.000	0.388	0.388	0.397
NL-1/NL-1	NE302083	NE302084	10	0.00153	0.85	0.000	0.000	0.000	0.494	0.494	0.575
NL-1/NL-1	NE302084	NE302114	10	0.00198	0.97	0.000	0.000	0.000	0.565	0.565	0.578
NL-1/NL-1-2	NE302096	NE302097	8	0.00400	0.76	0.000	0.000	0.000	3.743	3.743	4.899
NL-1/NL-1-2	NE302097	SE192098	8	0.00400	0.76	0.000	0.000	0.000	2.436	2.436	3.188
NL-1/NL-1	NE302113	NE302135	10	0.00410	1.40	0.000	0.000	0.000	0.777	0.777	0.553
NL-1/NL-1	NE302114	NE302241	10	0.01280	2.47	0.000	0.000	0.000	0.636	0.636	0.256
NL-1/NL-1	NE302133	NW292157	10	0.00402	1.39	0.000	0.000	0.000	0.847	0.847	0.609
NL-1/NL-1	NE302135	NE302133	10	0.00461	1.48	0.000	0.000	0.000	0.847	0.847	0.569
NL-1/NL-1	NE302241	NE302113	10	0.00007	0.18	0.000	0.000	0.000	0.706	0.706	3.816
NL-1/NL-1	NW292076	NW292200	18	0.00180	4.46	0.000	0.000	0.000	3.672	3.672	0.823
NL-1/NL-1	NW292099	NW292169	15	0.00398	4.08	0.000	0.000	0.000	3.849	3.849	0.943
NL-1	NW292099	NW292101	8	0.02083	1.74	0.000	0.000	0.000	0.000	0.000	0.000
NL-1	NW292101	NW292168	8	0.00307	0.67	0.000	0.000	0.000	0.106	0.106	0.158
NL-1/NL-1	NW292137	NW292138	10	0.00300	1.20	0.000	0.000	0.000	1.518	1.518	1.265
NL-1/NL-1	NW292138	NW292139	10	0.00500	1.54	0.000	0.000	0.000	1.554	1.554	1.003
NL-1/NL-1	NW292139	NW292180	10	0.16666	8.94	0.000	0.000	0.000	1.624	1.624	0.181
NL-1/NL-1	NW292140	SW292141	10	0.00022	0.32	0.000	0.000	0.000	0.106	0.106	0.324
NL-1/NL-1	NW292146	NW292147	10	0.00301	1.20	0.000	0.000	0.000	0.106	0.106	0.088
NL-1/NL-1	NW292147	NW292179	10	0.00780	1.93	0.000	0.000	0.000	0.212	0.212	0.109
NL-1/NL-1	NW292157	NW292137	10	0.00289	1.18	0.000	0.000	0.000	1.448	1.448	1.227
NL-1	NW292158	NW292157	8	0.00151	0.47	0.000	0.000	0.000	0.636	0.636	1.353
NL-1	NW292159	NW292158	8	0.00151	0.47	0.000	0.000	0.000	0.530	0.530	1.125

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
NL-1	NW292163	NW292159	8	0.00208	0.55	0.000	0.000	0.000	0.565	0.565	1.023
NL-1	NW292164	NW292172	8	0.00632	0.96	0.000	0.000	0.000	0.282	0.282	0.293
NL-1	NW292168	NW292164	8	0.00303	0.66	0.000	0.000	0.000	0.212	0.212	0.318
NL-1/NL-1	NW292169	NW292170	15	0.00400	4.08	0.000	0.000	0.000	3.884	3.884	0.950
NL-1/NL-1	NW292170	NW292172	15	0.00380	3.98	0.000	0.000	0.000	3.884	3.884	0.973
NL-1/NL-1	NW292172	NW292173	15	0.00181	2.75	0.000	0.000	0.000	3.602	3.602	1.307
NL-1	NW292172	NW292163	8	0.00187	0.52	0.000	0.000	0.000	0.530	0.530	1.011
NL-1/NL-1	NW292173	NW292174	15	0.00439	4.28	0.000	0.000	0.000	3.637	3.637	0.849
NL-1/NL-1	NW292174	NW292175	15	0.00452	4.34	0.000	0.000	0.000	3.672	3.672	0.845
NL-1/NL-1	NW292175	NW292076	18	0.00217	4.89	0.000	0.000	0.000	3.672	3.672	0.749
NL-1/NL-1	NW292178	NW292179	21	0.00060	3.88	0.000	0.000	0.000	3.743	3.743	0.962
NL-1/NL-1	NW292179	NW292180	21	0.07720	44.02	0.000	0.000	0.000	3.813	3.813	0.086
NL-1/NL-1	NW292180	PS_03	21	0.00084	4.60	0.000	0.000	0.000	5.367	5.367	1.165
NL-1/NL-1	NW292200	NW292178	21	0.00246	7.87	0.000	0.000	0.000	3.708	3.708	0.470
NL-1/NL-1	NW302001	PS_01	12	0.00125	1.26	0.000	0.000	0.000	1.801	1.801	1.429
NL-1/NL-1	NW302004	NW302038	10	0.00331	1.26	0.000	0.000	0.000	0.212	0.212	0.168
NL-1/NL-1	NW302037	NW302001	10	0.01637	2.80	0.000	0.000	0.000	0.388	0.388	0.138
NL-1/NL-1	NW302038	NW302037	10	0.00398	1.38	0.000	0.000	0.000	0.282	0.282	0.203
NL-1/NL-1	NW302039	NW302004	10	0.00571	1.65	0.000	0.000	0.000	0.106	0.106	0.064
NL-1/NL-1	NW302061	NW302080	10	0.04341	4.56	0.000	0.000	0.000	0.106	0.106	0.023
NL-1/NL-1	NW302080	NE302081	10	0.00198	0.97	0.000	0.000	0.000	0.212	0.212	0.217
NL-1/NL-1	PS_01	NE302096	8	-.01514	0.00	0.000	0.000	0.000	0.000	0.000	0.000
NL-1/NL-1	PS_02	SE302001	6	-.10785	0.00	0.000	0.000	0.000	0.000	0.000	0.000
NL-1/NL-1	PS_03	SW292059	12	-.00093	0.00	0.000	0.000	0.000	0.000	0.000	0.000
NL-1/NL-1	PS_12	SW192019	6	-.01196	0.00	0.000	0.000	0.000	0.000	0.000	0.000
NL-1/NL-1-2	SE192098	NW292099	8	0.00398	0.76	0.000	0.000	0.000	2.260	2.260	2.962
NL-1/NL-1-1	SE202002	SE302003	8	0.00473	0.83	0.000	0.000	0.000	1.977	1.977	2.376
NL-1/NL-1	SE202021	SE302155	15	0.00421	4.19	0.000	0.000	0.000	0.671	0.671	0.160
NL-1/NL-1-1	SE292051	SW292050	8	0.00560	0.90	0.000	0.000	0.000	1.624	1.624	1.796
NL-1/NL-1-1	SE292052	SE292051	8	0.00500	0.85	0.000	0.000	0.000	1.554	1.554	1.817

MODELED PEAK WASTEWATER FLOWS

Pipe Data: | Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
NL-1/NL-1-1	SE292053	SE292052	8	0.00500	0.85	0.000	0.000	0.000	1.554	1.554	1.817
NL-1/NL-1-1	SE292054	SE292053	8	0.00553	0.89	0.000	0.000	0.000	1.589	1.589	1.767
NL-1/NL-1-1	SE302001	SE202002	8	0.00896	1.14	0.000	0.000	0.000	2.295	2.295	2.006
NL-1/NL-1-1	SE302003	SE292054	8	0.00505	0.85	0.000	0.000	0.000	1.660	1.660	1.932
NL-1/NL-1	SE302006	SE302007	8	0.00483	0.84	0.000	0.000	0.000	0.106	0.106	0.126
NL-1/NL-1	SE302007	SE302008	8	0.00487	0.84	0.000	0.000	0.000	0.212	0.212	0.251
NL-1/NL-1	SE302008	SE302019	15	0.00276	3.39	0.000	0.000	0.000	0.494	0.494	0.145
NL-1/NL-1	SE302010	SE302008	15	0.00280	3.41	0.000	0.000	0.000	0.212	0.212	0.062
NL-1/NL-1	SE302019	SE202021	15	0.00228	3.08	0.000	0.000	0.000	0.600	0.600	0.194
NL-1/NL-1	SE302128	SE302010	15	0.00317	3.63	0.000	0.000	0.000	0.106	0.106	0.029
NL-1/NL-1	SE302155	SE302158	8	0.01190	1.31	0.000	0.000	0.000	0.777	0.777	0.589
NL-1/NL-1	SE302158	PS_02	8	0.01190	1.31	0.000	0.000	0.000	0.883	0.883	0.669
NL-1/NL-1	SW192019	SW192020	12	0.00167	1.45	0.000	0.000	0.000	1.412	1.412	0.969
NL-1/NL-1	SW192020	SW192021	12	0.00219	1.67	0.000	0.000	0.000	1.130	1.130	0.676
NL-1/NL-1	SW192021	SW192022	12	0.00260	1.81	0.000	0.000	0.000	1.095	1.095	0.602
NL-1/NL-1	SW192022	SW192025	12	0.01123	3.77	0.000	0.000	0.000	1.059	1.059	0.280
NL-1/NL-1	SW192025	SW192034	12	0.00132	1.29	0.000	0.000	0.000	1.201	1.201	0.925
NL-1/NL-1	SW192026	SW192025	12	0.00411	2.28	0.000	0.000	0.000	0.106	0.106	0.046
NL-1/NL-1	SW192034	SW192035	12	0.00152	1.39	0.000	0.000	0.000	1.271	1.271	0.913
NL-1/NL-1	SW192035	NW302001	12	0.00561	2.66	0.000	0.000	0.000	1.342	1.342	0.502
NL-1/NL-1	SW292010	SW292058	12	0.00603	2.76	0.000	0.000	0.000	2.225	2.225	0.803
NL-1/NL-1	SW292020	SW292050	12	0.00160	1.42	0.000	0.000	0.000	0.812	0.812	0.568
NL-1/NL-1	SW292021	SW292020	12	0.00100	1.12	0.000	0.000	0.000	0.953	0.953	0.845
NL-1/NL-1	SW292031	SW292021	12	0.00585	2.72	0.000	0.000	0.000	0.883	0.883	0.323
NL-1/NL-1	SW292033	SW292031	12	0.00205	1.61	0.000	0.000	0.000	0.777	0.777	0.480
NL-1/NL-1	SW292034	SW292033	12	0.00175	1.49	0.000	0.000	0.000	0.706	0.706	0.473
NL-1/NL-1	SW292039	SW292040	12	0.00493	2.50	0.000	0.000	0.000	0.212	0.212	0.084
NL-1/NL-1	SW292040	SW292041	12	0.00960	3.49	0.000	0.000	0.000	0.318	0.318	0.091
NL-1/NL-1	SW292041	SW292042	12	0.00720	3.02	0.000	0.000	0.000	0.388	0.388	0.128
NL-1/NL-1	SW292042	SW292043	12	0.00839	3.26	0.000	0.000	0.000	0.494	0.494	0.151

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
NL-1/NL-1	SW292043	SW292034	12	0.00200	1.59	0.000	0.000	0.000	0.600	0.600	0.376
NL-1/NL-1	SW292050	SW292010	12	0.00138	1.32	0.000	0.000	0.000	2.225	2.225	1.675
NL-1/NL-1	SW292056	SW292059	12	0.00569	2.68	0.000	0.000	0.000	2.578	2.578	0.958
NL-1/NL-1	SW292057	SW292056	12	0.00464	2.42	0.000	0.000	0.000	2.401	2.401	0.989
NL-1/NL-1	SW292058	SW292057	12	0.00605	2.77	0.000	0.000	0.000	2.260	2.260	0.815
NL-1/NL-1	SW292059	SW292101	12	0.00391	2.22	0.000	0.000	0.000	8.439	8.439	3.786
NL-1/NL-1	SW292101	PS_04	12	0.00384	2.21	0.000	0.000	0.000	8.404	8.404	3.802
NL-1/NL-1	SW292141	SW292039	10	0.00384	1.35	0.000	0.000	0.000	0.106	0.106	0.078
NL-2	NL2001	NW292099	15	0.00398	4.07	0.000	0.000	0.000	1.836	1.836	0.450
NL-3	NL3001	NL3PS1	15	0.00400	4.08	0.000	0.000	0.000	2.472	2.472	0.605
NL-3	NL3002	NL3001	12	0.00400	2.25	0.000	0.000	0.000	1.660	1.660	0.736
NL-3	NL3003	NL3002	10	0.00401	1.38	0.000	0.000	0.000	0.812	0.812	0.585
PUMPS	NL3PS1	NL2001	10	-.00271	0.00	0.000	0.000	0.000	0.000	0.000	0.000
ROUTE	MH01	SE121511	24	0.00279	11.96	0.000	0.000	0.000	7.874	7.874	0.657
ROUTE	MH12	MH01	24	0.00226	10.75	0.000	0.000	0.000	7.804	7.804	0.725
ROUTE	MH13	MH12	24	0.00192	9.91	0.000	0.000	0.000	7.980	7.980	0.804
ROUTE	MH14	MH13	24	0.00203	10.21	0.000	0.000	0.000	8.157	8.157	0.798
ROUTE	MH15	MH14	24	0.00231	10.89	0.000	0.000	0.000	8.263	8.263	0.758
ROUTE	MH16	MH15	24	0.00377	13.90	0.000	0.000	0.000	8.298	8.298	0.596
ROUTE	MH17	MH16	24	0.00293	12.25	0.000	0.000	0.000	8.333	8.333	0.680
ROUTE	MH18	MH17	24	0.00292	12.23	0.000	0.000	0.000	8.404	8.404	0.686
ROUTE	MH19	MH18	24	0.00292	12.24	0.000	0.000	0.000	8.439	8.439	0.689
ROUTE	MH20	MH19	24	0.00292	12.24	0.000	0.000	0.000	8.510	8.510	0.695
ROUTE	MH21	MH20	24	0.00293	12.25	0.000	0.000	0.000	8.580	8.580	0.700
ROUTE	MH22	MH21	24	0.00292	12.24	0.000	0.000	0.000	8.686	8.686	0.709
ROUTE	MH23	MH22	24	0.00293	12.25	0.000	0.000	0.000	8.792	8.792	0.717
ROUTE	MH24	MH23	24	0.00293	12.24	0.000	0.000	0.000	8.898	8.898	0.726
WR-1/WR-1	WR1001	NW141003	8	0.00344	0.71	0.000	0.000	0.000	2.048	2.048	2.884
WR-2/WR-5	HB1	HB2	36	0.01500	81.69	0.000	0.000	0.000	0.953	0.953	0.011
WR-2/WR-5	HB2	PS_09SC	30	0.01111	43.24	0.000	0.000	0.000	-0.847	-0.847	0.000

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-2/WR-2	NE041038	NW031295	10	0.00533	1.60	0.000	0.000	0.000	1.801	1.801	1.125
WR-2/WR-2	NE041039	NE041038	10	0.00595	1.69	0.000	0.000	0.000	1.766	1.766	1.044
WR-2/WR-2	NE041040	NE041039	10	0.01907	3.02	0.000	0.000	0.000	1.660	1.660	0.548
WR-2/WR-2	NE041041	NE041040	10	0.01278	2.47	0.000	0.000	0.000	1.518	1.518	0.612
WR-2/WR-2	NE041042	NE041041	10	0.00461	1.48	0.000	0.000	0.000	1.377	1.377	0.924
WR-2/WR-2	NE041043	NE041042	10	0.00925	2.10	0.000	0.000	0.000	1.236	1.236	0.586
WR-2/WR-2	NE041044	NE041043	10	0.00866	2.03	0.000	0.000	0.000	1.095	1.095	0.537
WR-2/WR-2	NE041045	NE041044	10	0.00555	1.63	0.000	0.000	0.000	0.953	0.953	0.583
WR-2/WR-2	NE041046	NE041045	10	0.00493	1.54	0.000	0.000	0.000	0.812	0.812	0.527
WR-2/WR-2	NE041047	NE041046	10	0.00484	1.52	0.000	0.000	0.000	0.706	0.706	0.463
WR-2/WR-2	NE041080	NE041081	18	0.00575	7.97	0.000	0.000	0.000	6.744	6.744	0.846
WR-2/WR-2	NE041081	NW031269	18	0.00376	6.44	0.000	0.000	0.000	6.674	6.674	1.034
WR-2/WR-2	NE041099	SE331101	10	0.03100	3.85	0.000	0.000	0.000	0.424	0.424	0.109
WR-2/WR-2	NE041100	NE041099	10	0.01490	2.67	0.000	0.000	0.000	0.282	0.282	0.105
WR-2/WR-2	NE041111	SE041110	10	0.00735	1.87	0.000	0.000	0.000	0.282	0.282	0.150
WR-2/WR-2	NE041207	NE041080	18	0.00486	7.32	0.000	0.000	0.000	6.709	6.709	0.915
WR-2/WR-2	NE101054	SE101311	12	0.00252	1.79	0.000	0.000	0.000	0.282	0.282	0.157
WR-2/WR-2	NE101145	SE101062	24	0.00280	11.97	0.000	0.000	0.000	10.946	10.946	0.914
WR-2/WR-2	NE101310	NE101054	12	0.05167	8.10	0.000	0.000	0.000	0.141	0.141	0.017
WR-2/WR-2	NE331001	SE33155A	10	0.00918	2.10	0.000	0.000	0.000	2.754	2.754	1.311
WR-2/WR-2	NE331002	NE331001	10	0.01198	2.39	0.000	0.000	0.000	2.613	2.613	1.089
WR-2/WR-2	NE331003	NE331002	10	0.01819	2.95	0.000	0.000	0.000	2.578	2.578	0.872
WR-2/WR-2	NE331004	NE331003	10	0.02150	3.21	0.000	0.000	0.000	2.542	2.542	0.791
WR-2/WR-2	NE331005	NE331004	10	0.02071	3.15	0.000	0.000	0.000	2.507	2.507	0.794
WR-2/WR-2	NW031007	NW031008	18	0.00206	4.77	0.000	0.000	0.000	6.674	6.674	1.396
WR-2/WR-2	NW031008	NW031009	18	0.00369	6.38	0.000	0.000	0.000	6.709	6.709	1.050
WR-2/WR-2	NW031009	NW031010	18	0.00837	9.61	0.000	0.000	0.000	6.744	6.744	0.701
WR-2/WR-2	NW031010	NW031011	18	0.00839	9.62	0.000	0.000	0.000	8.969	8.969	0.931
WR-2/WR-2	NW031011	NW031013	18	0.00838	9.61	0.000	0.000	0.000	9.004	9.004	0.936
WR-2/WR-2	NW031013	SW031012	18	0.00840	9.62	0.000	0.000	0.000	9.004	9.004	0.935

MODELED PEAK WASTEWATER FLOWS

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WR-2/WR-2	NW031269	NW031007	18	0.00395	6.60	0.000	0.000	0.000	6.638	6.638	1.005
WR-2/WR-2	NW031290	NW031010	10	0.03076	3.84	0.000	0.000	0.000	2.401	2.401	0.624
WR-2/WR-2	NW031291	NW031290	10	0.00443	1.46	0.000	0.000	0.000	2.260	2.260	1.547
WR-2/WR-2	NW031292	NW031291	10	0.13725	8.11	0.000	0.000	0.000	2.154	2.154	0.265
WR-2/WR-2	NW031294	NW031292	10	0.05218	5.00	0.000	0.000	0.000	2.013	2.013	0.402
WR-2/WR-2	NW031295	NW031294	10	0.00587	1.68	0.000	0.000	0.000	1.907	1.907	1.135
WR-2/WR-2	NW041101	NE041100	10	0.00738	1.88	0.000	0.000	0.000	0.141	0.141	0.074
WR-2/WR-2	NW101146	NW101308	24	0.00280	11.98	0.000	0.000	0.000	10.946	10.946	0.913
WR-2/WR-2	NW101147	NW101304	21	0.00370	9.64	0.000	0.000	0.000	10.911	10.911	1.130
WR-2/WR-2	NW101148	NW101147	21	0.00213	7.31	0.000	0.000	0.000	10.875	10.875	1.487
WR-2/WR-2	NW101149	NW101148	21	0.00281	8.41	0.000	0.000	0.000	10.911	10.911	1.297
WR-2/WR-2	NW101304	NW101146	21	0.00369	9.63	0.000	0.000	0.000	10.911	10.911	1.132
WR-2/WR-2	NW101308	NE101145	24	0.00279	11.95	0.000	0.000	0.000	10.946	10.946	0.915
WR-2/WR-2	NW31168A	NW33167A	8	0.00399	0.76	0.000	0.000	0.000	2.154	2.154	2.819
WR-2/WR-2	NW331001	NE331005	10	0.04089	4.43	0.000	0.000	0.000	2.472	2.472	0.557
WR-2/WR-2	NW331002	NW331001	8	0.00421	0.78	0.000	0.000	0.000	2.401	2.401	3.062
WR-2/WR-2	NW331005	NW331002	8	0.00506	0.86	0.000	0.000	0.000	2.366	2.366	2.751
WR-2/WR-2	NW33125A	NW331005	8	0.01500	1.48	0.000	0.000	0.000	2.330	2.330	1.574
WR-2/WR-2	NW33126A	NW33125A	8	0.02481	1.90	0.000	0.000	0.000	2.260	2.260	1.187
WR-2/WR-2	NW33167A	NW33126A	8	0.02053	1.73	0.000	0.000	0.000	2.225	2.225	1.284
WR-2/WR-5	PS_09	WRS_WWTP	20	0.00171	5.76	0.000	0.000	0.000	0.000	0.000	0.000
WR-2/WR-5	PS_09SC	PS_09	36	0.11931	230.41	0.000	0.000	0.000	19.774	19.774	0.085
WR-2/WR-2	PS_18	SE281001	6	-.02569	0.00	0.000	0.000	0.000	0.000	0.000	0.000
WR-2/WR-2	PS_33	SE041041	8	-.04475	0.00	0.000	0.000	0.000	0.000	0.000	0.000
WR-2/WR-2	PS_40	SE281016	4	0.01604	0.24	0.000	0.000	0.000	0.000	0.000	0.000
WR-2/WR-2	RL219L2	SW111325	24	0.00557	16.88	0.000	0.000	0.000	0.247	0.247	0.014
WR-2/WR-2	SE041041	SE041042	8	0.01572	1.51	0.000	0.000	0.000	1.059	1.059	0.699
WR-2/WR-2	SE041042	SE041043	8	0.02995	2.09	0.000	0.000	0.000	1.201	1.201	0.574
WR-2/WR-2	SE041043	SE041048	8	0.06297	3.03	0.000	0.000	0.000	1.342	1.342	0.442
WR-2/WR-2	SE041048	SE041050	8	0.02912	2.06	0.000	0.000	0.000	1.483	1.483	0.718

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-2/WR-2	SE041050	SE041051	8	0.03318	2.20	0.000	0.000	0.000	1.589	1.589	0.721
WR-2/WR-2	SE041051	SE041052	8	0.02296	1.83	0.000	0.000	0.000	1.730	1.730	0.944
WR-2/WR-2	SE041052	SW031266	10	0.00924	2.10	0.000	0.000	0.000	1.871	1.871	0.888
WR-2/WR-2	SE041109	NE041047	10	0.01722	2.87	0.000	0.000	0.000	0.565	0.565	0.196
WR-2/WR-2	SE041110	SE041109	10	0.00193	0.96	0.000	0.000	0.000	0.424	0.424	0.439
WR-2/WR-2	SE041159	PS_33	8	0.00402	0.76	0.000	0.000	0.000	0.565	0.565	0.737
WR-2/WR-2	SE041160	SE041159	8	0.04880	2.67	0.000	0.000	0.000	0.424	0.424	0.158
WR-2/WR-2	SE041161	SE041160	8	0.04459	2.55	0.000	0.000	0.000	0.282	0.282	0.110
WR-2/WR-2	SE041162	SE041161	8	0.01867	1.65	0.000	0.000	0.000	0.141	0.141	0.085
WR-2/WR-2	SE101055	SE101056	12	0.00253	1.79	0.000	0.000	0.000	0.565	0.565	0.314
WR-2/WR-2	SE101056	SE101057	12	0.00176	1.49	0.000	0.000	0.000	0.706	0.706	0.471
WR-2/WR-2	SE101057	PS_09SC	12	0.01073	3.69	0.000	0.000	0.000	0.812	0.812	0.220
WR-2/WR-2	SE101058	PS_09SC	30	0.00576	31.15	0.000	0.000	0.000	38.029	38.029	1.220
WR-2/WR-2	SE101059	SE101317	24	0.00280	11.97	0.000	0.000	0.000	10.946	10.946	0.914
WR-2/WR-2	SE101060	SE101059	24	0.00281	11.99	0.000	0.000	0.000	10.946	10.946	0.912
WR-2/WR-2	SE101061	SE101060	24	0.00280	11.98	0.000	0.000	0.000	10.946	10.946	0.913
WR-2/WR-2	SE101062	SE101061	24	0.00280	11.98	0.000	0.000	0.000	10.946	10.946	0.913
WR-2/WR-2	SE101150	SE101058	27	0.00250	15.48	0.000	0.000	0.000	29.590	29.590	1.910
WR-2/WR-2	SE101151	SE101150	27	0.00206	14.08	0.000	0.000	0.000	29.484	29.484	2.093
WR-2/WR-2	SE101152	SE101151	27	0.00513	22.19	0.000	0.000	0.000	29.484	29.484	1.328
WR-2/WR-2	SE101311	SE101055	12	0.00250	1.78	0.000	0.000	0.000	0.424	0.424	0.237
WR-2/WR-2	SE101313	SE101314	24	0.00368	13.72	0.000	0.000	0.000	0.530	0.530	0.038
WR-2/WR-2	SE101314	SE101316	24	0.00377	13.89	0.000	0.000	0.000	0.671	0.671	0.048
WR-2/WR-2	SE101316	SE101318	24	0.00341	13.22	0.000	0.000	0.000	0.812	0.812	0.061
WR-2/WR-2	SE101317	SE101058	24	0.00401	14.32	0.000	0.000	0.000	10.981	10.981	0.766
WR-2/WR-2	SE101318	SE101320	24	0.00370	13.76	0.000	0.000	0.000	0.918	0.918	0.066
WR-2/WR-2	SE101319	HB2	24	0.00500	15.99	0.000	0.000	0.000	1.201	1.201	0.075
WR-2/WR-2	SE101320	SE101319	24	0.01025	22.91	0.000	0.000	0.000	1.059	1.059	0.046
WR-2/WR-2	SE281001	SW281001	8	0.00398	0.76	0.000	0.000	0.000	1.871	1.871	2.452
WR-2/WR-2	SE281016	SE281025	8	0.00500	0.85	0.000	0.000	0.000	0.388	0.388	0.453

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-2/WR-2	SE281017	PS_18	8	0.05916	2.94	0.000	0.000	0.000	0.883	0.883	0.300
WR-2/WR-2	SE281018	SE281017	8	0.04675	2.61	0.000	0.000	0.000	0.742	0.742	0.284
WR-2/WR-2	SE281019	SE281018	8	0.01854	1.64	0.000	0.000	0.000	0.636	0.636	0.386
WR-2/WR-2	SE281025	SE281019	8	0.00500	0.85	0.000	0.000	0.000	0.494	0.494	0.577
WR-2/WR-2	SE331001	SE331002	10	0.02448	3.42	0.000	0.000	0.000	3.001	3.001	0.875
WR-2/WR-2	SE331002	SE331003	10	0.02027	3.12	0.000	0.000	0.000	3.143	3.143	1.007
WR-2/WR-2	SE331003	SE331010	12	0.01988	5.02	0.000	0.000	0.000	3.531	3.531	0.702
WR-2/WR-2	SE331004	SE331003	10	0.02655	3.57	0.000	0.000	0.000	0.282	0.282	0.079
WR-2/WR-2	SE331005	SE331004	10	0.03802	4.27	0.000	0.000	0.000	0.141	0.141	0.033
WR-2/WR-2	SE331010	SE331014	12	0.01643	4.56	0.000	0.000	0.000	3.637	3.637	0.796
WR-2/WR-2	SE331014	SE331019	12	0.02528	5.66	0.000	0.000	0.000	3.743	3.743	0.660
WR-2/WR-2	SE331019	SE331027	12	0.00392	2.23	0.000	0.000	0.000	3.637	3.637	1.628
WR-2/WR-2	SE331027	SE331028	12	0.00450	2.39	0.000	0.000	0.000	3.672	3.672	1.536
WR-2/WR-2	SE331028	SE331033	12	0.00833	3.25	0.000	0.000	0.000	3.743	3.743	1.150
WR-2/WR-2	SE331033	SE331036	12	0.01828	4.81	0.000	0.000	0.000	3.778	3.778	0.784
WR-2/WR-2	SE331036	SE331081	15	0.02460	10.13	0.000	0.000	0.000	4.837	4.837	0.477
WR-2/WR-2	SE331037	SE331036	12	0.00477	2.46	0.000	0.000	0.000	1.095	1.095	0.444
WR-2/WR-2	SE331038	SE331037	12	0.00684	2.94	0.000	0.000	0.000	0.953	0.953	0.323
WR-2/WR-2	SE331039	SE331038	12	0.00768	3.12	0.000	0.000	0.000	0.812	0.812	0.259
WR-2/WR-2	SE331040	SE331039	12	0.02488	5.62	0.000	0.000	0.000	0.706	0.706	0.125
WR-2/WR-2	SE331041	SE331040	12	0.00635	2.84	0.000	0.000	0.000	0.565	0.565	0.198
WR-2/WR-2	SE331042	SE331041	12	0.00748	3.08	0.000	0.000	0.000	0.424	0.424	0.137
WR-2/WR-2	SE331043	SE331042	12	0.00500	2.51	0.000	0.000	0.000	0.282	0.282	0.111
WR-2/WR-2	SE331044	SE331043	12	0.01463	4.31	0.000	0.000	0.000	0.141	0.141	0.032
WR-2/WR-2	SE331081	SE331089	15	0.03579	12.22	0.000	0.000	0.000	6.426	6.426	0.525
WR-2/WR-2	SE331089	SE331090	16	0.01860	10.46	0.000	0.000	0.000	6.497	6.497	0.620
WR-2/WR-2	SE331090	NE041207	16	0.00402	4.86	0.000	0.000	0.000	6.603	6.603	1.356
WR-2/WR-2	SE331092	SE331081	10	0.01241	2.44	0.000	0.000	0.000	1.518	1.518	0.621
WR-2/WR-2	SE331093	SE331092	10	0.06236	5.47	0.000	0.000	0.000	1.377	1.377	0.251
WR-2/WR-2	SE331094	SE331093	10	0.01201	2.40	0.000	0.000	0.000	1.236	1.236	0.514

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-2/WR-2	SE331095	SE331094	10	0.02158	3.21	0.000	0.000	0.000	1.095	1.095	0.340
WR-2/WR-2	SE331096	SE331095	10	0.02640	3.56	0.000	0.000	0.000	0.953	0.953	0.267
WR-2/WR-2	SE331097	SE331096	10	0.03852	4.30	0.000	0.000	0.000	0.812	0.812	0.188
WR-2/WR-2	SE331100	SE331097	10	0.01253	2.45	0.000	0.000	0.000	0.706	0.706	0.287
WR-2/WR-2	SE331101	SE331100	10	0.04438	4.61	0.000	0.000	0.000	0.565	0.565	0.122
WR-2/WR-2	SE33155A	SE331001	10	0.00706	1.84	0.000	0.000	0.000	2.860	2.860	1.552
WR-2/WR-2	SW031012	SW031314	18	0.00840	9.62	0.000	0.000	0.000	9.039	9.039	0.938
WR-2/WR-2	SW031017	SW031018	18	0.00840	9.62	0.000	0.000	0.000	9.110	9.110	0.946
WR-2/WR-2	SW031018	SW031022	18	0.00630	8.33	0.000	0.000	0.000	8.863	8.863	1.063
WR-2/WR-2	SW031022	SW031400	18	0.00560	7.86	0.000	0.000	0.000	8.898	8.898	1.131
WR-2/WR-2	SW031023	SW031403	21	0.00504	11.25	0.000	0.000	0.000	10.875	10.875	0.965
WR-2/WR-2	SW031024	SW031023	12	0.02669	5.82	0.000	0.000	0.000	2.895	2.895	0.497
WR-2/WR-2	SW031032	SW031024	12	0.02676	5.83	0.000	0.000	0.000	2.825	2.825	0.484
WR-2/WR-2	SW031037	SW031032	12	0.01009	3.58	0.000	0.000	0.000	2.719	2.719	0.759
WR-2/WR-2	SW031038	SW031037	10	0.01579	2.75	0.000	0.000	0.000	2.648	2.648	0.961
WR-2/WR-2	SW031041	SW031038	10	0.03516	4.10	0.000	0.000	0.000	2.507	2.507	0.610
WR-2/WR-2	SW031042	SW031041	10	0.00984	2.17	0.000	0.000	0.000	2.401	2.401	1.103
WR-2/WR-2	SW031266	SW031267	10	0.00963	2.15	0.000	0.000	0.000	2.013	2.013	0.935
WR-2/WR-2	SW031267	SW031268	10	0.00983	2.17	0.000	0.000	0.000	2.154	2.154	0.991
WR-2/WR-2	SW031268	SW031042	10	0.03640	4.18	0.000	0.000	0.000	2.295	2.295	0.549
WR-2/WR-2	SW031312	SW031017	18	0.01976	14.76	0.000	0.000	0.000	9.110	9.110	0.616
WR-2/WR-2	SW031314	SW031312	18	0.01633	13.42	0.000	0.000	0.000	9.075	9.075	0.675
WR-2/WR-2	SW031400	SW031023	21	0.00775	13.95	0.000	0.000	0.000	8.933	8.933	0.640
WR-2/WR-2	SW031403	NW101149	21	0.00400	10.02	0.000	0.000	0.000	10.911	10.911	1.088
WR-2/WR-2	SW041015	NE041111	10	0.02011	3.10	0.000	0.000	0.000	0.141	0.141	0.045
WR-2/WR-2	SW101153	SE101152	27	0.00171	12.83	0.000	0.000	0.000	29.484	29.484	2.297
WR-2/WR-2	SW111325	SE101313	24	0.00382	13.99	0.000	0.000	0.000	0.388	0.388	0.027
WR-2/WR-2	SW281001	NW31168A	8	0.00964	1.18	0.000	0.000	0.000	2.013	2.013	1.695
WR-3/WR-3	NE031087	SE031080	15	0.00804	5.79	0.000	0.000	0.000	6.426	6.426	1.109
WR-3/WR-3	NE031088	NE031087	15	0.01600	8.17	0.000	0.000	0.000	6.250	6.250	0.764

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-3/WR-3	NE031089	NE031088	15	0.00800	5.77	0.000	0.000	0.000	6.038	6.038	1.045
WR-3/WR-3	NE031126	NE031089	15	0.00494	4.54	0.000	0.000	0.000	5.826	5.826	1.282
WR-3/WR-3	NE031156	NE031126	15	0.01293	7.34	0.000	0.000	0.000	5.579	5.579	0.759
WR-3/WR-3	NE031157	NE031156	15	0.01300	7.36	0.000	0.000	0.000	5.297	5.297	0.719
WR-3/WR-3	NE031158	NE031157	15	0.01290	7.34	0.000	0.000	0.000	5.014	5.014	0.683
WR-3/WR-3	NE031165	NE031234	12	0.00845	3.27	0.000	0.000	0.000	4.202	4.202	1.282
WR-3/WR-3	NE031178	NE031233	12	0.01291	4.05	0.000	0.000	0.000	3.637	3.637	0.898
WR-3/WR-3	NE031233	NE031165	12	0.00971	3.51	0.000	0.000	0.000	3.919	3.919	1.115
WR-3/WR-3	NE031234	NE031302	12	0.00900	3.38	0.000	0.000	0.000	4.484	4.484	1.326
WR-3/WR-3	NE031302	NE031158	12	0.01300	4.06	0.000	0.000	0.000	4.732	4.732	1.164
WR-3/WR-3	NE101142	NE101155	24	0.00082	6.49	0.000	0.000	0.000	7.203	7.203	1.109
WR-3/WR-3	NE101143	NE101142	24	0.00079	6.37	0.000	0.000	0.000	7.203	7.203	1.129
WR-3/WR-3	NE101144	NE101143	24	0.00055	5.34	0.000	0.000	0.000	7.239	7.239	1.355
WR-3/WR-3	NE101155	NE101157	24	0.00080	6.41	0.000	0.000	0.000	7.239	7.239	1.128
WR-3/WR-3	NE101157	NE101258	24	0.00082	6.50	0.000	0.000	0.000	7.274	7.274	1.118
WR-3/WR-3	NE101258	NW111050	24	0.00020	3.20	0.000	0.000	0.000	7.309	7.309	2.284
WR-3/WR-3	NE341098	SE341097	10	0.03571	4.14	0.000	0.000	0.000	0.282	0.282	0.068
WR-3/WR-3	NW111003	NW111004	24	0.00094	6.95	0.000	0.000	0.000	7.380	7.380	1.061
WR-3/WR-3	NW111004	NW111005	24	0.00083	6.53	0.000	0.000	0.000	7.380	7.380	1.130
WR-3/WR-3	NW111005	NW111010	24	0.00090	6.82	0.000	0.000	0.000	7.450	7.450	1.092
WR-3/WR-3	NW111010	NW111016	24	0.00092	6.87	0.000	0.000	0.000	7.486	7.486	1.089
WR-3/WR-3	NW111050	NW111003	24	0.00093	6.93	0.000	0.000	0.000	7.344	7.344	1.059
WR-3/WR-3	SE031070	SE031077	15	0.00783	5.71	0.000	0.000	0.000	7.274	7.274	1.271
WR-3/WR-3	SE031071	SE031283	24	0.00158	9.00	0.000	0.000	0.000	7.309	7.309	0.811
WR-3/WR-3	SE031077	SE031071	21	0.00136	5.85	0.000	0.000	0.000	7.415	7.415	1.266
WR-3/WR-3	SE031078	SE031070	15	0.00800	5.77	0.000	0.000	0.000	7.097	7.097	1.228
WR-3/WR-3	SE031079	SE031078	15	0.00802	5.78	0.000	0.000	0.000	6.885	6.885	1.189
WR-3/WR-3	SE031080	SE031079	15	0.00797	5.77	0.000	0.000	0.000	6.674	6.674	1.156
WR-3/WR-3	SE031283	SE031288	24	0.00154	8.88	0.000	0.000	0.000	7.203	7.203	0.811
WR-3/WR-3	SE031288	NE101144	24	0.00156	8.96	0.000	0.000	0.000	7.203	7.203	0.803

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WR-3/WR-3	SE341089	SE341179	12	0.02970	6.14	0.000	0.000	0.000	3.072	3.072	0.500
WR-3/WR-3	SE341090	SE341089	10	0.02201	3.25	0.000	0.000	0.000	2.789	2.789	0.857
WR-3/WR-3	SE341091	SE341090	10	0.00393	1.37	0.000	0.000	0.000	2.542	2.542	1.848
WR-3/WR-3	SE341093	SE341516	10	0.00675	1.80	0.000	0.000	0.000	1.695	1.695	0.940
WR-3/WR-3	SE341094	SE341093	10	0.01140	2.34	0.000	0.000	0.000	1.412	1.412	0.603
WR-3/WR-3	SE341095	SE341094	10	0.02176	3.23	0.000	0.000	0.000	1.130	1.130	0.349
WR-3/WR-3	SE341096	SE341095	10	0.00394	1.37	0.000	0.000	0.000	0.847	0.847	0.615
WR-3/WR-3	SE341097	SE341096	10	0.02526	3.48	0.000	0.000	0.000	0.565	0.565	0.162
WR-3/WR-3	SE341179	NE031178	12	0.00849	3.28	0.000	0.000	0.000	3.354	3.354	1.021
WR-3/WR-3	SE341516	SE341517	10	0.00316	1.23	0.000	0.000	0.000	1.977	1.977	1.603
WR-3/WR-3	SE341517	SE341091	10	0.00549	1.62	0.000	0.000	0.000	2.260	2.260	1.391
WR-4/WR-4	NE021072	NW021071	12	0.02819	5.98	0.000	0.000	0.000	0.282	0.282	0.047
WR-4/WR-4	NE021073	NE021072	12	0.03061	6.23	0.000	0.000	0.000	0.177	0.177	0.028
WR-4/WR-4	NE021074	NE021073	12	0.02901	6.06	0.000	0.000	0.000	0.106	0.106	0.017
WR-4/WR-4	NE021080	NW021079	12	0.01816	4.80	0.000	0.000	0.000	0.636	0.636	0.132
WR-4/WR-4	NE021081	NE021080	12	0.01782	4.75	0.000	0.000	0.000	0.565	0.565	0.118
WR-4/WR-4	NE021082	NE021081	12	0.01748	4.71	0.000	0.000	0.000	0.459	0.459	0.097
WR-4/WR-4	NE021100	NE021082	12	0.01754	4.71	0.000	0.000	0.000	0.353	0.353	0.074
WR-4/WR-4	NW021066	SW021064	18	0.05642	24.95	0.000	0.000	0.000	3.531	3.531	0.141
WR-4/WR-4	NW021068	NW021066	18	0.00662	8.55	0.000	0.000	0.000	3.496	3.496	0.408
WR-4/WR-4	NW021069	NW021097	12	0.02128	5.19	0.000	0.000	0.000	0.565	0.565	0.108
WR-4/WR-4	NW021070	NW021069	12	0.02620	5.76	0.000	0.000	0.000	0.459	0.459	0.079
WR-4/WR-4	NW021071	NW021070	12	0.02719	5.87	0.000	0.000	0.000	0.353	0.353	0.060
WR-4/WR-4	NW021075	NW021068	18	0.00602	8.15	0.000	0.000	0.000	3.496	3.496	0.428
WR-4/WR-4	NW021076	NW021075	18	0.00503	7.45	0.000	0.000	0.000	3.496	3.496	0.468
WR-4/WR-4	NW021077	NW021076	15	0.01563	8.07	0.000	0.000	0.000	0.918	0.918	0.113
WR-4/WR-4	NW021078	NW021077	15	0.01119	6.83	0.000	0.000	0.000	0.812	0.812	0.118
WR-4/WR-4	NW021079	NW021078	15	0.01097	6.76	0.000	0.000	0.000	0.742	0.742	0.109
WR-4/WR-4	NW021083	NW021076	15	0.00650	5.21	0.000	0.000	0.000	2.648	2.648	0.508
WR-4/WR-4	NW021095	SW021074	18	0.00246	5.22	0.000	0.000	0.000	2.931	2.931	0.561

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Flow Data: Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-4/WR-4	NW021096	NW021095	18	0.00277	5.53	0.000	0.000	0.000	2.895	2.895	0.522
WR-4/WR-4	NW021097	NW021096	18	0.00287	5.63	0.000	0.000	0.000	2.895	2.895	0.513
WR-4/WR-4	NW021098	NW021097	18	0.00558	7.85	0.000	0.000	0.000	2.366	2.366	0.301
WR-4/WR-4	NW021099	NW021098	18	0.00720	8.92	0.000	0.000	0.000	2.330	2.330	0.261
WR-4/WR-4	NW021100	NW021099	18	0.00571	7.94	0.000	0.000	0.000	2.295	2.295	0.288
WR-4/WR-4	NW021101	NW021100	18	0.00656	8.50	0.000	0.000	0.000	2.295	2.295	0.269
WR-4/WR-4	NW021102	NW021101	18	0.00672	8.61	0.000	0.000	0.000	2.260	2.260	0.262
WR-4/WR-4	NW021103	NW021102	18	0.00677	8.64	0.000	0.000	0.000	2.225	2.225	0.257
WR-4/WR-4	NW351000	NW351315	12	0.03091	6.26	0.000	0.000	0.000	0.353	0.353	0.056
WR-4/WR-4	NW351112	NW351314	10	0.02010	3.10	0.000	0.000	0.000	0.177	0.177	0.057
WR-4/WR-4	NW351113	NW351202	18	0.01179	11.41	0.000	0.000	0.000	1.095	1.095	0.096
WR-4/WR-4	NW351202	NW351318	18	0.01608	13.32	0.000	0.000	0.000	1.201	1.201	0.090
WR-4/WR-4	NW351208	NW351307	12	0.02173	5.25	0.000	0.000	0.000	0.742	0.742	0.141
WR-4/WR-4	NW351277	SW351130	12	0.00161	1.43	0.000	0.000	0.000	0.565	0.565	0.394
WR-4/WR-4	NW351301	NW351302	12	0.06202	8.87	0.000	0.000	0.000	0.282	0.282	0.031
WR-4/WR-4	NW351302	NW351399	12	0.03006	6.17	0.000	0.000	0.000	0.353	0.353	0.057
WR-4/WR-4	NW351303	NW351305	12	0.02086	5.14	0.000	0.000	0.000	0.565	0.565	0.109
WR-4/WR-4	NW351305	NW351208	12	0.01500	4.36	0.000	0.000	0.000	0.636	0.636	0.145
WR-4/WR-4	NW351307	NW351308	12	0.02802	5.96	0.000	0.000	0.000	0.812	0.812	0.136
WR-4/WR-4	NW351308	NW351311	18	0.02935	17.99	0.000	0.000	0.000	0.918	0.918	0.051
WR-4/WR-4	NW351310	NW351112	10	0.03353	4.01	0.000	0.000	0.000	0.106	0.106	0.026
WR-4/WR-4	NW351311	NW351113	18	0.01737	13.84	0.000	0.000	0.000	0.989	0.989	0.071
WR-4/WR-4	NW351314	NW351000	10	0.00939	2.12	0.000	0.000	0.000	0.282	0.282	0.132
WR-4/WR-4	NW351315	NW351277	12	0.00600	2.76	0.000	0.000	0.000	0.459	0.459	0.166
WR-4/WR-4	NW351318	SW351263	18	0.01733	13.83	0.000	0.000	0.000	1.271	1.271	0.091
WR-4/WR-4	NW351399	NW351303	12	0.01569	4.46	0.000	0.000	0.000	0.459	0.459	0.102
WR-4/WR-4	SE021085	SW021041	12	0.00927	3.43	0.000	0.000	0.000	0.742	0.742	0.216
WR-4/WR-4	SE021086	SE021085	12	0.00975	3.51	0.000	0.000	0.000	0.636	0.636	0.180
WR-4/WR-4	SE021087	SE021086	12	0.01853	4.85	0.000	0.000	0.000	0.565	0.565	0.116
WR-4/WR-4	SE021088	SE021087	12	0.00783	3.15	0.000	0.000	0.000	0.459	0.459	0.145

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-4/WR-4	SE021089	SE021088	12	0.01891	4.90	0.000	0.000	0.000	0.353	0.353	0.072
WR-4/WR-4	SE021090	SE021089	12	0.04377	7.45	0.000	0.000	0.000	0.282	0.282	0.037
WR-4/WR-4	SE021091	SE021090	12	0.00629	2.82	0.000	0.000	0.000	0.177	0.177	0.062
WR-4/WR-4	SE021092	SE021091	12	0.02886	6.05	0.000	0.000	0.000	0.106	0.106	0.017
WR-4/WR-4	SE351044	SE351045	12	0.01588	4.49	0.000	0.000	0.000	0.106	0.106	0.023
WR-4/WR-4	SE351045	SE351052	12	0.07520	9.77	0.000	0.000	0.000	0.177	0.177	0.018
WR-4/WR-4	SE351052	NE021100	12	0.01732	4.69	0.000	0.000	0.000	0.282	0.282	0.060
WR-4/WR-4	SE351152	SW351151	12	0.00487	2.48	0.000	0.000	0.000	0.812	0.812	0.326
WR-4/WR-4	SE351160	SE351152	12	0.00718	3.02	0.000	0.000	0.000	0.742	0.742	0.245
WR-4/WR-4	SE351161	SE351160	12	0.00142	1.34	0.000	0.000	0.000	0.636	0.636	0.472
WR-4/WR-4	SE351164	SE351161	12	0.00283	1.89	0.000	0.000	0.000	0.565	0.565	0.297
WR-4/WR-4	SE351165	SE351304	12	0.01785	4.76	0.000	0.000	0.000	0.353	0.353	0.074
WR-4/WR-4	SE351167	SE351165	12	0.01934	4.95	0.000	0.000	0.000	0.282	0.282	0.056
WR-4/WR-4	SE351168	SE351167	12	0.02718	5.87	0.000	0.000	0.000	0.177	0.177	0.030
WR-4/WR-4	SE351169	SE351168	12	0.02930	6.09	0.000	0.000	0.000	0.106	0.106	0.017
WR-4/WR-4	SE351250	NW021083	15	0.00621	5.09	0.000	0.000	0.000	2.648	2.648	0.519
WR-4/WR-4	SE351304	SE351164	12	0.02820	5.98	0.000	0.000	0.000	0.459	0.459	0.076
WR-4/WR-4	SW021015	SW021016	21	0.00393	9.93	0.000	0.000	0.000	5.120	5.120	0.515
WR-4/WR-4	SW021016	SW021017	21	0.00301	8.70	0.000	0.000	0.000	5.155	5.155	0.592
WR-4/WR-4	SW021026	SW021118	12	0.00495	2.50	0.000	0.000	0.000	1.059	1.059	0.422
WR-4/WR-4	SW021027	SW021026	12	0.00524	2.58	0.000	0.000	0.000	0.989	0.989	0.383
WR-4/WR-4	SW021028	SW021027	12	0.00364	2.15	0.000	0.000	0.000	0.918	0.918	0.426
WR-4/WR-4	SW021041	SW021028	12	0.00544	2.63	0.000	0.000	0.000	0.812	0.812	0.308
WR-4/WR-4	SW021048	SW021015	21	0.00351	9.39	0.000	0.000	0.000	5.085	5.085	0.541
WR-4/WR-4	SW021049	SW021048	21	0.00398	10.00	0.000	0.000	0.000	5.085	5.085	0.508
WR-4/WR-4	SW021050	SW021049	18	0.04518	22.33	0.000	0.000	0.000	5.049	5.049	0.226
WR-4/WR-4	SW021051	SW021050	18	0.00030	1.82	0.000	0.000	0.000	3.637	3.637	1.995
WR-4/WR-4	SW021063	SW021202	18	0.03953	20.88	0.000	0.000	0.000	3.566	3.566	0.170
WR-4/WR-4	SW021064	SW021063	18	0.00357	6.27	0.000	0.000	0.000	3.566	3.566	0.568
WR-4/WR-4	SW021074	SW021123	18	0.00390	6.56	0.000	0.000	0.000	2.931	2.931	0.446

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-4/WR-4	SW021085	SW021122	10	0.00224	1.03	0.000	0.000	0.000	0.282	0.282	0.271
WR-4/WR-4	SW021086	SW021085	10	0.00758	1.90	0.000	0.000	0.000	0.177	0.177	0.092
WR-4/WR-4	SW021087	SW021086	10	0.00805	1.96	0.000	0.000	0.000	0.106	0.106	0.053
WR-4/WR-4	SW021118	SW021017	12	0.00475	2.45	0.000	0.000	0.000	1.130	1.130	0.459
WR-4/WR-4	SW021119	SW021017	21	0.11086	52.76	0.000	0.000	0.000	1.801	1.801	0.034
WR-4/WR-4	SW021120	SW021200	21	0.00407	10.11	0.000	0.000	0.000	1.730	1.730	0.171
WR-4/WR-4	SW021121	SW021120	21	0.00326	9.05	0.000	0.000	0.000	1.695	1.695	0.187
WR-4/WR-4	SW021122	SW021121	18	0.02916	17.94	0.000	0.000	0.000	1.695	1.695	0.094
WR-4/WR-4	SW021122	SW021050	10	0.04250	4.51	0.000	0.000	0.000	1.483	1.483	0.328
WR-4/WR-4	SW021123	SW021122	18	0.00404	6.68	0.000	0.000	0.000	2.966	2.966	0.443
WR-4/WR-4	SW021200	SW021119	21	0.00387	9.86	0.000	0.000	0.000	1.766	1.766	0.178
WR-4/WR-4	SW021202	SW021051	18	0.00488	7.34	0.000	0.000	0.000	3.602	3.602	0.490
WR-4/WR-4	SW261090	NW351301	12	0.00993	3.55	0.000	0.000	0.000	0.177	0.177	0.049
WR-4/WR-4	SW261091	SW261090	12	0.00889	3.36	0.000	0.000	0.000	0.106	0.106	0.031
WR-4/WR-4	SW351115	SW351194	15	0.01414	7.68	0.000	0.000	0.000	2.542	2.542	0.330
WR-4/WR-4	SW351116	SW351115	15	0.01096	6.76	0.000	0.000	0.000	2.472	2.472	0.365
WR-4/WR-4	SW351117	SW351116	12	0.01839	4.83	0.000	0.000	0.000	2.401	2.401	0.496
WR-4/WR-4	SW351118	SW351117	12	0.00076	0.98	0.000	0.000	0.000	2.330	2.330	2.365
WR-4/WR-4	SW351119	SW351118	12	0.01796	4.77	0.000	0.000	0.000	2.260	2.260	0.473
WR-4/WR-4	SW351125	SW351221	18	0.00733	8.99	0.000	0.000	0.000	1.730	1.730	0.192
WR-4/WR-4	SW351126	SW351125	18	0.01535	13.01	0.000	0.000	0.000	1.624	1.624	0.124
WR-4/WR-4	SW351127	SW351260	12	0.00720	3.02	0.000	0.000	0.000	0.812	0.812	0.268
WR-4/WR-4	SW351128	SW351127	12	0.00598	2.75	0.000	0.000	0.000	0.742	0.742	0.269
WR-4/WR-4	SW351130	SW351128	12	0.01819	4.80	0.000	0.000	0.000	0.636	0.636	0.132
WR-4/WR-4	SW351132	SW351260	12	0.00624	2.81	0.000	0.000	0.000	1.201	1.201	0.426
WR-4/WR-4	SW351135	SW351132	12	0.02840	6.00	0.000	0.000	0.000	1.095	1.095	0.182
WR-4/WR-4	SW351149	SW351135	12	0.01890	4.89	0.000	0.000	0.000	0.989	0.989	0.201
WR-4/WR-4	SW351151	SW351149	12	0.00279	1.88	0.000	0.000	0.000	0.918	0.918	0.487
WR-4/WR-4	SW351194	SE351250	15	0.00753	5.60	0.000	0.000	0.000	2.578	2.578	0.459
WR-4/WR-4	SW351221	SW351257	18	0.00890	9.91	0.000	0.000	0.000	1.801	1.801	0.181

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-4/WR-4	SW351251	NW021103	18	0.01289	11.92	0.000	0.000	0.000	2.189	2.189	0.183
WR-4/WR-4	SW351252	SW351251	18	0.00095	3.24	0.000	0.000	0.000	2.154	2.154	0.664
WR-4/WR-4	SW351253	SW351252	18	0.00732	8.98	0.000	0.000	0.000	2.119	2.119	0.235
WR-4/WR-4	SW351254	SW351253	18	0.00737	9.02	0.000	0.000	0.000	2.048	2.048	0.227
WR-4/WR-4	SW351255	SW351254	18	0.00570	7.93	0.000	0.000	0.000	2.013	2.013	0.253
WR-4/WR-4	SW351256	SW351255	18	0.00691	8.73	0.000	0.000	0.000	1.942	1.942	0.222
WR-4/WR-4	SW351257	SW351256	18	0.00690	8.73	0.000	0.000	0.000	1.871	1.871	0.214
WR-4/WR-4	SW351258	SW351119	12	0.00886	3.35	0.000	0.000	0.000	2.189	2.189	0.652
WR-4/WR-4	SW351260	SW351258	12	0.01596	4.50	0.000	0.000	0.000	2.083	2.083	0.462
WR-4/WR-4	SW351261	SW351126	18	0.00718	8.90	0.000	0.000	0.000	1.554	1.554	0.174
WR-4/WR-4	SW351262	SW351261	18	0.00738	9.02	0.000	0.000	0.000	1.448	1.448	0.160
WR-4/WR-4	SW351263	SW351262	18	0.01037	10.70	0.000	0.000	0.000	1.377	1.377	0.128
WR-5/WR-5	NW111016	NW11116A	24	0.00009	2.15	0.000	0.000	0.000	5.402	5.402	2.503
WR-5/WR-5	NW111016	NW111017	24	0.00045	4.85	0.000	0.000	0.000	2.189	2.189	0.451
WR-5/WR-5	NW111017	SW021018	24	0.00061	5.63	0.000	0.000	0.000	2.154	2.154	0.382
WR-5/WR-5	NW111018	NW111019	24	0.00102	7.23	0.000	0.000	0.000	2.578	2.578	0.356
WR-5/WR-5	NW111018	NW11116A	24	0.00700	18.92	0.000	0.000	0.000	6.885	6.885	0.363
WR-5/WR-5	NW111019	NW111020	24	0.00100	7.16	0.000	0.000	0.000	2.578	2.578	0.359
WR-5/WR-5	NW111020	NW111021	24	0.00102	7.24	0.000	0.000	0.000	2.578	2.578	0.356
WR-5/WR-5	NW111021	NW111022	24	0.00071	6.04	0.000	0.000	0.000	2.578	2.578	0.426
WR-5/WR-5	NW111022	NW111023	24	0.00103	7.26	0.000	0.000	0.000	2.613	2.613	0.359
WR-5/WR-5	NW111023	NW111024	24	0.00100	7.15	0.000	0.000	0.000	2.613	2.613	0.365
WR-5/WR-5	NW111024	NW111025	24	0.00098	7.11	0.000	0.000	0.000	2.613	2.613	0.367
WR-5/WR-5	NW111025	NW111027	24	0.00100	7.16	0.000	0.000	0.000	2.613	2.613	0.364
WR-5/WR-5	NW111027	NW111028	24	0.00097	7.07	0.000	0.000	0.000	2.613	2.613	0.369
WR-5/WR-5	NW111028	NW111029	24	0.00090	6.78	0.000	0.000	0.000	2.613	2.613	0.385
WR-5/WR-5	NW111029	SW111033	24	0.00006	1.83	0.000	0.000	0.000	2.648	2.648	1.440
WR-5/WR-5	NW111030	PS_24	8	0.01156	1.30	0.000	0.000	0.000	0.071	0.071	0.054
WR-5/WR-5	NW111031	NW111030	8	0.00528	0.87	0.000	0.000	0.000	0.035	0.035	0.039
WR-5/WR-5	NW11116A	NW111188	36	0.00180	28.37	0.000	0.000	0.000	12.288	12.288	0.433

MODELED PEAK WASTEWATER FLOWS

Pipe Data: | Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-5/WR-5	NW111184	SW111165	36	0.00051	15.19	0.000	0.000	0.000	11.758	11.758	0.773
WR-5/WR-5	NW111185	NW111184	36	0.00052	15.21	0.000	0.000	0.000	11.970	11.970	0.786
WR-5/WR-5	NW111186	NW111185	36	0.00052	15.22	0.000	0.000	0.000	12.041	12.041	0.790
WR-5/WR-5	NW111187	NW111186	36	0.00185	28.75	0.000	0.000	0.000	12.182	12.182	0.423
WR-5/WR-5	NW111188	NW111187	36	0.00181	28.42	0.000	0.000	0.000	12.253	12.253	0.431
WR-5/WR-5	NW11118A	NW111018	24	0.00108	7.45	0.000	0.000	0.000	9.428	9.428	1.264
WR-5/WR-5	NW141501	SW111189	36	0.00469	45.70	0.000	0.000	0.000	0.035	0.035	0.000
WR-5/WR-5	PS_24	NW111029	4	-.00080	0.00	0.000	0.000	0.000	0.000	0.000	0.000
WR-5/WR-5	RL119L1	SW111ch1	24	0.00555	16.86	0.000	0.000	0.000	0.035	0.035	0.002
WR-5/WR-5	SW021017	NW11118A	24	0.00057	5.43	0.000	0.000	0.000	9.428	9.428	1.733
WR-5/WR-5	SW021018	SW021017	24	0.00219	10.60	0.000	0.000	0.000	2.295	2.295	0.216
WR-5/WR-5	SW111033	SW11133A	24	0.00096	7.03	0.000	0.000	0.000	2.648	2.648	0.376
WR-5/WR-5	SW111034	SW111039	24	0.00100	7.18	0.000	0.000	0.000	2.684	2.684	0.373
WR-5/WR-5	SW111039	SW111044	24	0.00084	6.56	0.000	0.000	0.000	2.684	2.684	0.408
WR-5/WR-5	SW111044	SW111072	24	0.00096	7.02	0.000	0.000	0.000	2.684	2.684	0.382
WR-5/WR-5	SW111072	SW111077	24	0.00100	7.17	0.000	0.000	0.000	2.684	2.684	0.374
WR-5/WR-5	SW111077	SW111078	24	0.00046	4.90	0.000	0.000	0.000	2.684	2.684	0.547
WR-5/WR-5	SW111078	SW111214	24	0.00045	4.83	0.000	0.000	0.000	2.684	2.684	0.555
WR-5/WR-5	SW111084	SW111215	24	0.00571	17.10	0.000	0.000	0.000	2.684	2.684	0.156
WR-5/WR-5	SW111084	SW111176	15	0.05516	15.17	0.000	0.000	0.000	0.000	0.000	0.000
WR-5/WR-5	SW111086	SW111087	24	0.00098	7.10	0.000	0.000	0.000	2.719	2.719	0.382
WR-5/WR-5	SW111087	SW111090	24	0.00083	6.51	0.000	0.000	0.000	2.719	2.719	0.417
WR-5/WR-5	SW111090	SW111091	24	0.00098	7.11	0.000	0.000	0.000	2.719	2.719	0.382
WR-5/WR-5	SW111091	NW141003	24	0.00067	5.88	0.000	0.000	0.000	2.719	2.719	0.461
WR-5/WR-5	SW111092	SW111093	36	0.00119	23.06	0.000	0.000	0.000	11.229	11.229	0.486
WR-5/WR-5	SW111165	SW111166	36	0.00053	15.35	0.000	0.000	0.000	11.546	11.546	0.751
WR-5/WR-5	SW111166	SW111168	36	0.00055	15.72	0.000	0.000	0.000	11.440	11.440	0.727
WR-5/WR-5	SW111168	SW111169	36	0.00052	15.32	0.000	0.000	0.000	11.405	11.405	0.744
WR-5/WR-5	SW111169	SW111170	36	0.00052	15.22	0.000	0.000	0.000	11.335	11.335	0.744
WR-5/WR-5	SW111170	SW111177	36	0.00101	21.24	0.000	0.000	0.000	11.264	11.264	0.530

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WR-5/WR-5	SW111170	RL119L1	24	0.04144	46.06	0.000	0.000	0.000	0.000	0.000	0.000
WR-5/WR-5	SW111176	SW111170	15	0.01364	7.54	0.000	0.000	0.000	0.035	0.035	0.004
WR-5/WR-5	SW111177	SW111178	36	0.00127	23.78	0.000	0.000	0.000	11.264	11.264	0.473
WR-5/WR-5	SW111178	SW11190A	36	0.00215	30.98	0.000	0.000	0.000	11.264	11.264	0.363
WR-5/WR-5	SW111180	SW111086	24	0.00102	7.24	0.000	0.000	0.000	2.719	2.719	0.375
WR-5/WR-5	SW111189	SW111092	36	0.00896	63.17	0.000	0.000	0.000	11.229	11.229	0.177
WR-5/WR-5	SW111214	SW111084	24	0.00104	7.32	0.000	0.000	0.000	2.684	2.684	0.366
WR-5/WR-5	SW111215	SW111180	24	0.00057	5.40	0.000	0.000	0.000	2.684	2.684	0.496
WR-5/WR-5	SW11133A	SW111034	24	0.00102	7.25	0.000	0.000	0.000	2.648	2.648	0.365
WR-5/WR-5	SW11190A	SW111189	36	0.00122	23.31	0.000	0.000	0.000	11.229	11.229	0.481
WR-5/WR-5	SW111ch1	SW111ch2	24	0.00566	17.03	0.000	0.000	0.000	0.000	0.000	0.000
WR-5/WR-5	SW111ch2	RL219L2	24	0.00555	16.85	0.000	0.000	0.000	0.000	0.000	0.000
WR-6/WR-6	NE111060	NE111064	10	0.00989	2.18	0.000	0.000	0.000	0.353	0.353	0.161
WR-6/WR-6	NE111064	NE111065	10	0.00428	1.43	0.000	0.000	0.000	0.706	0.706	0.492
WR-6/WR-6	NE111065	NE111066	10	0.00400	1.38	0.000	0.000	0.000	1.059	1.059	0.764
WR-6/WR-6	NE111066	NE111067	10	0.00401	1.38	0.000	0.000	0.000	1.412	1.412	1.017
WR-6/WR-6	NE111067	NE111068	12	0.00400	2.25	0.000	0.000	0.000	1.766	1.766	0.783
WR-6/WR-6	NE111068	NE111069	12	0.00399	2.25	0.000	0.000	0.000	2.119	2.119	0.941
WR-6/WR-6	NE111069	SE111072	12	0.00410	2.28	0.000	0.000	0.000	2.366	2.366	1.035
WR-6/WR-6	NE121113	NW121112	15	0.00400	4.08	0.000	0.000	0.000	1.412	1.412	0.345
WR-6/WR-6	NE121114	NE121113	15	0.00381	3.99	0.000	0.000	0.000	1.059	1.059	0.265
WR-6/WR-6	NE121115	NE121114	15	0.00379	3.98	0.000	0.000	0.000	0.706	0.706	0.177
WR-6/WR-6	NE121116	NE121115	15	0.00389	4.03	0.000	0.000	0.000	0.353	0.353	0.087
WR-6/WR-6	NE12135D	SE121091	8	0.05304	2.78	0.000	0.000	0.000	1.201	1.201	0.431
WR-6/WR-6	NE131126	SE121116	24	0.00094	6.96	0.000	0.000	0.000	6.320	6.320	0.907
WR-6/WR-6	NE131127	NE131126	24	0.00057	5.40	0.000	0.000	0.000	6.285	6.285	1.162
WR-6/WR-6	NE131128	NE131127	24	0.00049	5.03	0.000	0.000	0.000	6.285	6.285	1.248
WR-6/WR-6	NE131129	NE131128	24	0.00121	7.87	0.000	0.000	0.000	6.250	6.250	0.793
WR-6/WR-6	NE131130	NE131129	24	0.00099	7.13	0.000	0.000	0.000	6.250	6.250	0.876
WR-6/WR-6	NE131131	NE131130	24	0.00103	7.28	0.000	0.000	0.000	6.250	6.250	0.858

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-6/WR-6	NE131132	NE131131	24	0.00099	7.14	0.000	0.000	0.000	6.250	6.250	0.875
WR-6/WR-6	NE131135	SE121136	36	0.00097	20.85	0.000	0.000	0.000	11.264	11.264	0.540
WR-6/WR-6	NE131142	NE131135	36	0.00097	20.85	0.000	0.000	0.000	11.264	11.264	0.540
WR-6/WR-6	NE131143	NE131142	36	0.00098	20.93	0.000	0.000	0.000	11.299	11.299	0.539
WR-6/WR-6	NE141002	NE141050	36	0.00085	19.51	0.000	0.000	0.000	11.476	11.476	0.588
WR-6/WR-6	NE141011	NE141002	36	0.00097	20.79	0.000	0.000	0.000	11.546	11.546	0.555
WR-6/WR-6	NE141014	SE111284	12	-.00590	0.00	0.000	0.000	0.000	0.000	0.000	0.000
WR-6/WR-6	NE141015	NE141063	24	0.00109	7.48	0.000	0.000	0.000	5.120	5.120	0.684
WR-6/WR-6	NE141015	NE141014	12	-.00481	0.00	0.000	0.000	0.000	-0.318	-0.318	0.000
WR-6/WR-6	NE141016	NE141017	24	0.00100	7.15	0.000	0.000	0.000	5.579	5.579	0.779
WR-6/WR-6	NE141017	NE141018	24	0.00100	7.15	0.000	0.000	0.000	5.508	5.508	0.769
WR-6/WR-6	NE141018	SE141001	24	0.00124	7.97	0.000	0.000	0.000	5.508	5.508	0.690
WR-6/WR-6	NE141019	NE141015	24	0.00196	10.02	0.000	0.000	0.000	4.767	4.767	0.475
WR-6/WR-6	NE141021	NW131043	24	0.00108	7.43	0.000	0.000	0.000	5.756	5.756	0.773
WR-6/WR-6	NE141050	NW131087	36	0.00122	23.32	0.000	0.000	0.000	11.476	11.476	0.491
WR-6/WR-6	NE141060	NE141016	24	0.00104	7.30	0.000	0.000	0.000	5.367	5.367	0.734
WR-6/WR-6	NE141063	NE141060	24	0.00098	7.09	0.000	0.000	0.000	5.332	5.332	0.752
WR-6/WR-6	NW121104	SW121076	15	0.00478	4.47	0.000	0.000	0.000	3.778	3.778	0.845
WR-6/WR-6	NW121105	NW121104	15	0.00130	2.33	0.000	0.000	0.000	3.460	3.460	1.479
WR-6/WR-6	NW121106	NW121105	15	0.00312	3.61	0.000	0.000	0.000	3.143	3.143	0.870
WR-6/WR-6	NW121110	NW121512	15	0.00376	3.96	0.000	0.000	0.000	2.436	2.436	0.614
WR-6/WR-6	NW121111	NW121110	15	0.00383	4.00	0.000	0.000	0.000	2.119	2.119	0.529
WR-6/WR-6	NW121112	NW121111	15	0.00406	4.12	0.000	0.000	0.000	1.766	1.766	0.428
WR-6/WR-6	NW121512	NW121106	15	0.00591	4.96	0.000	0.000	0.000	2.789	2.789	0.561
WR-6/WR-6	NW131043	SW131048	24	0.00108	7.46	0.000	0.000	0.000	5.791	5.791	0.776
WR-6/WR-6	NW131084	NW131085	24	0.00090	6.80	0.000	0.000	0.000	6.038	6.038	0.887
WR-6/WR-6	NW131085	NW131086	24	0.00093	6.90	0.000	0.000	0.000	6.073	6.073	0.879
WR-6/WR-6	NW131086	SW131087	24	0.00081	6.43	0.000	0.000	0.000	6.109	6.109	0.948
WR-6/WR-6	NW131087	NW131088	36	0.00099	21.05	0.000	0.000	0.000	11.440	11.440	0.543
WR-6/WR-6	NW131088	NW131089	36	0.00098	20.96	0.000	0.000	0.000	11.440	11.440	0.545

MODELED PEAK WASTEWATER FLOWS

Pipe Data: | Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-6/WR-6	NW131089	NW131090	36	0.00100	21.09	0.000	0.000	0.000	11.440	11.440	0.542
WR-6/WR-6	NW131090	NW131091	36	0.00097	20.85	0.000	0.000	0.000	11.440	11.440	0.548
WR-6/WR-6	NW131091	NW131092	36	0.00120	23.19	0.000	0.000	0.000	11.440	11.440	0.493
WR-6/WR-6	NW131092	NW131093	36	0.00098	20.95	0.000	0.000	0.000	11.405	11.405	0.544
WR-6/WR-6	NW131093	NW131094	36	0.00098	20.91	0.000	0.000	0.000	11.405	11.405	0.545
WR-6/WR-6	NW131094	NW131095	36	0.00095	20.58	0.000	0.000	0.000	11.370	11.370	0.552
WR-6/WR-6	NW131095	NW131144	36	0.00100	21.15	0.000	0.000	0.000	11.335	11.335	0.535
WR-6/WR-6	NW131144	NE131143	36	0.00096	20.69	0.000	0.000	0.000	11.299	11.299	0.546
WR-6/WR-6	NW141001	NE141019	24	0.00100	7.18	0.000	0.000	0.000	4.696	4.696	0.653
WR-6/WR-6	NW141002	NW141001	24	0.00100	7.15	0.000	0.000	0.000	4.590	4.590	0.641
WR-6/WR-6	NW141003	NW141005	24	0.00099	7.14	0.000	0.000	0.000	3.849	3.849	0.538
WR-6/WR-6	NW141004	NW141002	24	0.00101	7.22	0.000	0.000	0.000	4.378	4.378	0.606
WR-6/WR-6	NW141005	NW141004	24	0.00097	7.05	0.000	0.000	0.000	4.061	4.061	0.576
WR-6/KR-5	PS_05A	SE062140	18	-.01171	0.00	0.000	0.000	0.000	21.716	21.716	0.000
WR-6/KR-5	PS_05B	NE072011	18	-.01522	0.00	0.000	0.000	0.000	0.000	0.000	0.000
WR-6/WR-6	PS_07	NE12135D	4	0.00697	0.15	0.000	0.000	0.000	0.000	0.000	0.000
WR-6/WR-6	SE072095	SE072096	24	0.00054	5.27	0.000	0.000	0.000	4.590	4.590	0.869
WR-6/WR-6	SE072096	SE072097	24	0.00105	7.35	0.000	0.000	0.000	4.661	4.661	0.633
WR-6/WR-6	SE072097	SE072156	24	0.00098	7.10	0.000	0.000	0.000	4.732	4.732	0.666
WR-6/WR-6	SE072103	SE072104	48	0.00032	26.05	0.000	0.000	0.000	25.847	25.847	0.991
WR-6/WR-6	SE072104	SE072105	48	0.00032	25.93	0.000	0.000	0.000	24.646	24.646	0.950
WR-6/KR-5	SE072105	SE072106	48	0.00053	33.26	0.000	0.000	0.000	28.707	28.707	0.863
WR-6/KR-5	SE072106	PS_05A	48	0.00250	71.83	0.000	0.000	0.000	27.047	27.047	0.376
WR-6/KR-5	SE072156	SE072157	24	0.00098	7.11	0.000	0.000	0.000	3.496	3.496	0.491
WR-6/KR-5	SE072156	SE072105	24	0.06760	58.82	0.000	0.000	0.000	6.744	6.744	0.114
WR-6/KR-5	SE072157	PS_05B	24	0.00208	10.32	0.000	0.000	0.000	3.496	3.496	0.338
WR-6/WR-6	SE111007	SE111270	10	0.00783	1.94	0.000	0.000	0.000	0.353	0.353	0.182
WR-6/WR-6	SE111008	SE111013	10	0.00718	1.85	0.000	0.000	0.000	1.059	1.059	0.570
WR-6/WR-6	SE111013	SE111014	10	0.00750	1.89	0.000	0.000	0.000	1.448	1.448	0.762
WR-6/WR-6	SE111014	SE111018	10	0.00666	1.78	0.000	0.000	0.000	1.695	1.695	0.947

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-6/WR-6	SE111018	SE111019	12	0.00239	1.74	0.000	0.000	0.000	2.013	2.013	1.154
WR-6/WR-6	SE111019	SE111020	12	0.00239	1.74	0.000	0.000	0.000	2.330	2.330	1.337
WR-6/WR-6	SE111020	SE111282	12	0.00233	1.72	0.000	0.000	0.000	2.684	2.684	1.559
WR-6/WR-6	SE111072	SE111073	12	0.00402	2.25	0.000	0.000	0.000	2.648	2.648	1.172
WR-6/WR-6	SE111073	SW121008	12	0.00989	3.54	0.000	0.000	0.000	2.966	2.966	0.836
WR-6/WR-6	SE111095	SE111096	36	0.00055	15.77	0.000	0.000	0.000	11.158	11.158	0.707
WR-6/WR-6	SE111096	SE111283	36	0.00134	24.47	0.000	0.000	0.000	11.158	11.158	0.455
WR-6/WR-6	SE111270	SE111008	10	0.00668	1.79	0.000	0.000	0.000	0.706	0.706	0.394
WR-6/WR-6	SE111282	SE111284	12	0.11162	11.90	0.000	0.000	0.000	3.037	3.037	0.255
WR-6/WR-6	SE111283	SE111284	36	0.00217	31.10	0.000	0.000	0.000	11.158	11.158	0.358
WR-6/WR-6	SE111284	NE141011	36	0.00369	40.57	0.000	0.000	0.000	11.511	11.511	0.283
WR-6/WR-6	SE12104A	SE121120	24	0.00100	7.18	0.000	0.000	0.000	12.818	12.818	1.784
WR-6/WR-6	SE121058	SE121059	24	0.00100	7.15	0.000	0.000	0.000	0.353	0.353	0.049
WR-6/WR-6	SE121059	SE121141	24	0.18142	96.36	0.000	0.000	0.000	12.394	12.394	0.128
WR-6/WR-6	SE121060	SE121059	24	0.00154	8.89	0.000	0.000	0.000	12.253	12.253	1.377
WR-6/WR-6	SE121091	SE12135F	12	0.02714	5.87	0.000	0.000	0.000	1.412	1.412	0.240
WR-6/WR-6	SE121092	SE12135F	12	0.00256	1.80	0.000	0.000	0.000	0.318	0.318	0.176
WR-6/WR-6	SE121093	SE121094	12	0.00281	1.89	0.000	0.000	0.000	1.977	1.977	1.045
WR-6/WR-6	SE121094	SE121100	12	0.00278	1.88	0.000	0.000	0.000	2.295	2.295	1.220
WR-6/WR-6	SE121100	SE121105	12	0.00279	1.88	0.000	0.000	0.000	2.578	2.578	1.368
WR-6/WR-6	SE121105	SE121106	12	0.00287	1.91	0.000	0.000	0.000	2.895	2.895	1.514
WR-6/WR-6	SE121106	SE121109	12	0.00277	1.87	0.000	0.000	0.000	3.213	3.213	1.710
WR-6/WR-6	SE121109	SE121112	12	0.00279	1.88	0.000	0.000	0.000	3.566	3.566	1.892
WR-6/WR-6	SE121112	SE121113	12	0.04435	7.50	0.000	0.000	0.000	3.919	3.919	0.522
WR-6/WR-6	SE121113	SW072098	48	0.00064	36.51	0.000	0.000	0.000	28.884	28.884	0.791
WR-6/WR-6	SE121113	SE12159A	12	0.00378	2.19	0.000	0.000	0.000	-1.518	-1.518	0.000
WR-6/WR-6	SE121114	SE12159A	24	0.00438	14.97	0.000	0.000	0.000	5.861	5.861	0.391
WR-6/WR-6	SE121115	SE121114	24	0.00099	7.12	0.000	0.000	0.000	6.391	6.391	0.896
WR-6/WR-6	SE121116	SE121115	24	0.00081	6.45	0.000	0.000	0.000	6.356	6.356	0.985
WR-6/WR-6	SE121117	SE121060	24	0.00104	7.30	0.000	0.000	0.000	12.288	12.288	1.682

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Flow Data: Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WR-6/WR-6	SE121118	SE121117	24	0.00095	6.99	0.000	0.000	0.000	12.500	12.500	1.786
WR-6/WR-6	SE121119	SE121118	24	0.00099	7.14	0.000	0.000	0.000	12.818	12.818	1.793
WR-6/WR-6	SE121120	SE121119	24	0.00098	7.09	0.000	0.000	0.000	12.747	12.747	1.797
WR-6/WR-6	SE121136	SE121137	36	0.00160	26.68	0.000	0.000	0.000	11.264	11.264	0.422
WR-6/WR-6	SE121137	SE121138	36	0.00099	20.99	0.000	0.000	0.000	11.264	11.264	0.536
WR-6/WR-6	SE121138	SE121139	36	0.00099	20.98	0.000	0.000	0.000	11.264	11.264	0.536
WR-6/WR-6	SE121139	SE121140	36	0.00099	20.98	0.000	0.000	0.000	11.264	11.264	0.536
WR-6/WR-6	SE121140	SE121141	36	0.00493	46.83	0.000	0.000	0.000	11.299	11.299	0.241
WR-6/WR-6	SE121141	SE121511	48	0.00092	43.62	0.000	0.000	0.000	21.363	21.363	0.489
WR-6/WR-6	SE121141	SE121114	48	0.00180	61.10	0.000	0.000	0.000	-0.565	-0.565	0.000
WR-6/WR-6	SE12135F	SE121093	12	0.00107	1.16	0.000	0.000	0.000	1.730	1.730	1.483
WR-6/WR-6	SE121511	SE121113	48	0.00068	37.68	0.000	0.000	0.000	26.059	26.059	0.691
WR-6/WR-6	SE12159A	SW072091	24	0.00277	11.92	0.000	0.000	0.000	4.378	4.378	0.367
WR-6/WR-6	SE131133	NE131132	24	0.00100	7.15	0.000	0.000	0.000	6.215	6.215	0.868
WR-6/WR-6	SE131134	SE131133	24	0.00099	7.13	0.000	0.000	0.000	6.179	6.179	0.865
WR-6/WR-6	SE141001	SE141002	24	0.00108	7.46	0.000	0.000	0.000	5.579	5.579	0.747
WR-6/WR-6	SE141002	SE141003	24	0.00109	7.49	0.000	0.000	0.000	5.614	5.614	0.749
WR-6/WR-6	SE141003	SE141004	24	0.00108	7.45	0.000	0.000	0.000	5.650	5.650	0.757
WR-6/WR-6	SE141004	NE141021	24	0.00108	7.46	0.000	0.000	0.000	5.685	5.685	0.761
WR-6/WR-6	SW072091	SW072092	24	0.00099	7.12	0.000	0.000	0.000	4.414	4.414	0.619
WR-6/WR-6	SW072092	SW072093	24	0.00099	7.14	0.000	0.000	0.000	4.449	4.449	0.622
WR-6/WR-6	SW072093	SW072094	24	0.00101	7.20	0.000	0.000	0.000	4.520	4.520	0.627
WR-6/WR-6	SW072094	SE072095	24	0.00100	7.16	0.000	0.000	0.000	4.555	4.555	0.636
WR-6/WR-6	SW072098	SW072099	48	0.00087	42.54	0.000	0.000	0.000	28.636	28.636	0.673
WR-6/WR-6	SW072099	SW072100	48	0.00086	42.25	0.000	0.000	0.000	28.389	28.389	0.671
WR-6/WR-6	SW072100	SW072101	48	0.00091	43.43	0.000	0.000	0.000	28.036	28.036	0.645
WR-6/WR-6	SW072101	SW072102	48	0.00060	35.21	0.000	0.000	0.000	27.542	27.542	0.782
WR-6/WR-6	SW072102	SE072103	48	0.00069	37.90	0.000	0.000	0.000	26.694	26.694	0.704
WR-6/WR-6	SW111093	SW111094	36	0.00129	23.98	0.000	0.000	0.000	11.229	11.229	0.468
WR-6/WR-6	SW111094	SE111095	36	0.00181	28.39	0.000	0.000	0.000	11.193	11.193	0.394

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WR-6/WR-6	SW121006	SW121010	12	0.00400	2.25	0.000	0.000	0.000	3.637	3.637	1.614
WR-6/WR-6	SW121007	SW121006	12	0.01439	4.27	0.000	0.000	0.000	3.354	3.354	0.784
WR-6/WR-6	SW121008	SW121007	12	0.01440	4.27	0.000	0.000	0.000	3.143	3.143	0.735
WR-6/WR-6	SW121010	SW121011	12	0.00402	2.26	0.000	0.000	0.000	3.955	3.955	1.750
WR-6/WR-6	SW121011	SW121013	12	0.01319	4.09	0.000	0.000	0.000	4.273	4.273	1.043
WR-6/WR-6	SW121013	SW121014	12	0.02200	5.28	0.000	0.000	0.000	4.590	4.590	0.868
WR-6/WR-6	SW121014	SW121026	12	0.00600	2.76	0.000	0.000	0.000	4.873	4.873	1.765
WR-6/WR-6	SW121026	SW121027	12	0.00640	2.85	0.000	0.000	0.000	5.191	5.191	1.821
WR-6/WR-6	SW121027	SW121028	12	0.00600	2.76	0.000	0.000	0.000	5.508	5.508	1.995
WR-6/WR-6	SW121028	SW121032	12	0.00598	2.75	0.000	0.000	0.000	5.756	5.756	2.088
WR-6/WR-6	SW121032	SW121050	12	0.00600	2.76	0.000	0.000	0.000	6.709	6.709	2.429
WR-6/WR-6	SW121033	SW121032	12	0.00234	1.72	0.000	0.000	0.000	0.706	0.706	0.408
WR-6/WR-6	SW121034	SW121033	12	0.00220	1.67	0.000	0.000	0.000	0.353	0.353	0.211
WR-6/WR-6	SW121050	SW121051	12	0.01644	4.56	0.000	0.000	0.000	6.991	6.991	1.530
WR-6/WR-6	SW121051	SE12104A	24	0.00098	7.11	0.000	0.000	0.000	12.888	12.888	1.811
WR-6/WR-6	SW121052	SW121051	21	0.00427	10.36	0.000	0.000	0.000	5.720	5.720	0.552
WR-6/WR-6	SW121056	SW121052	21	0.00200	7.08	0.000	0.000	0.000	5.544	5.544	0.782
WR-6/WR-6	SW121061	SW121056	21	0.00200	7.08	0.000	0.000	0.000	5.332	5.332	0.752
WR-6/WR-6	SW121067	SW121061	21	0.00200	7.08	0.000	0.000	0.000	5.085	5.085	0.717
WR-6/WR-6	SW121075	SW121503	21	0.00454	10.68	0.000	0.000	0.000	4.449	4.449	0.416
WR-6/WR-6	SW121076	SW121075	21	0.00407	10.11	0.000	0.000	0.000	4.096	4.096	0.404
WR-6/WR-6	SW121503	SW121067	21	0.00200	7.08	0.000	0.000	0.000	4.767	4.767	0.672
WR-6/WR-6	SW131048	SW131049	24	0.00108	7.47	0.000	0.000	0.000	5.826	5.826	0.779
WR-6/WR-6	SW131049	SW131081	24	0.00110	7.50	0.000	0.000	0.000	5.897	5.897	0.785
WR-6/WR-6	SW131081	SW131082	24	0.00102	7.23	0.000	0.000	0.000	5.932	5.932	0.820
WR-6/WR-6	SW131082	SW131083	24	0.00101	7.20	0.000	0.000	0.000	5.967	5.967	0.828
WR-6/WR-6	SW131083	NW131084	24	0.00100	7.18	0.000	0.000	0.000	6.003	6.003	0.835
WR-6/WR-6	SW131087	SE131134	24	0.00111	7.55	0.000	0.000	0.000	6.144	6.144	0.813
WRS-1/WRS-1	WRS1001	WRS2018	12	0.00090	1.06	0.000	0.000	0.000	0.636	0.636	0.594
WRS-1/WRS-1	WRS1002	WRS1001	12	0.00090	1.07	0.000	0.000	0.000	0.636	0.636	0.592

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WRS-1/WRS-1	WRS1003	WRS1002	12	0.00090	1.06	0.000	0.000	0.000	0.636	0.636	0.594
WRS-1/WRS-1	WRS1004	WRS1003	12	0.00090	1.07	0.000	0.000	0.000	0.671	0.671	0.624
WRS-1/WRS-1	WRS1005	WRS1004	12	0.00089	1.06	0.000	0.000	0.000	0.671	0.671	0.630
WRS-1/WRS-1	WRS1006	WRS1005	10	0.00706	1.84	0.000	0.000	0.000	0.530	0.530	0.287
WRS-1/WRS-1	WRS1007	WRS1006	10	0.00671	1.79	0.000	0.000	0.000	0.494	0.494	0.275
WRS-1/WRS-1	WRS1008	WRS1007	8	0.00358	0.72	0.000	0.000	0.000	0.282	0.282	0.390
WRS-1/WRS-1	WRS1009	WRS1008	8	0.00854	1.11	0.000	0.000	0.000	0.282	0.282	0.252
WRS-1/WRS-1	WRS1010	WRS1009	8	0.03565	2.28	0.000	0.000	0.000	0.247	0.247	0.108
WRS-1/WRS-1	WRS1011	WRS1010	8	0.09042	3.63	0.000	0.000	0.000	0.212	0.212	0.058
WRS-1/WRS-1	WRS1012	WRS1011	8	0.04601	2.59	0.000	0.000	0.000	0.177	0.177	0.068
WRS-1/WRS-1	WRS1013	WRS1012	8	0.04000	2.41	0.000	0.000	0.000	0.177	0.177	0.073
WRS-1/WRS-1	WRS1014	WRS1013	8	0.00377	0.74	0.000	0.000	0.000	0.141	0.141	0.189
WRS-1/WRS-1	WRS1015	WRS1014	8	0.01767	1.60	0.000	0.000	0.000	0.106	0.106	0.066
WRS-1/WRS-1	WRS1016	WRS1015	8	0.00800	1.08	0.000	0.000	0.000	0.071	0.071	0.065
WRS-1/WRS-1	WRS1017	WRS1016	8	0.01150	1.29	0.000	0.000	0.000	0.035	0.035	0.027
WRS-1/WRS-1	WRS1018	WRS1005	10	0.00199	0.97	0.000	0.000	0.000	0.177	0.177	0.180
WRS-1/WRS-1	WRS1019	WRS1018	10	0.00200	0.98	0.000	0.000	0.000	0.141	0.141	0.143
WRS-1/WRS-1	WRS1020	WRS1019	10	0.00200	0.98	0.000	0.000	0.000	0.141	0.141	0.143
WRS-1/WRS-1	WRS1021	WRS1020	10	0.00200	0.98	0.000	0.000	0.000	0.141	0.141	0.143
WRS-1/WRS-1	WRS1022	WRS1021	10	0.00202	0.98	0.000	0.000	0.000	0.141	0.141	0.143
WRS-1/WRS-1	WRS1023	WRS1022	10	0.00200	0.98	0.000	0.000	0.000	0.106	0.106	0.108
WRS-1/WRS-1	WRS1024	WRS1023	8	0.00200	0.54	0.000	0.000	0.000	0.106	0.106	0.196
WRS-1/WRS-1	WRS1025	WRS1024	8	0.00200	0.54	0.000	0.000	0.000	0.071	0.071	0.131
WRS-1/WRS-1	WRS1026	WRS1025	8	0.00300	0.66	0.000	0.000	0.000	0.035	0.035	0.052
WRS-1/WRS-1	WRS1027	WRS1007	8	0.01755	1.60	0.000	0.000	0.000	0.212	0.212	0.132
WRS-1/WRS-1	WRS1028	WRS1027	8	0.00867	1.12	0.000	0.000	0.000	0.212	0.212	0.188
WRS-1/WRS-1	WRS1029	WRS1028	8	0.02014	1.71	0.000	0.000	0.000	0.177	0.177	0.103
WRS-1/WRS-1	WRS1030	WRS1029	8	0.01214	1.33	0.000	0.000	0.000	0.141	0.141	0.105
WRS-1/WRS-1	WRS1031	WRS1030	8	0.00841	1.10	0.000	0.000	0.000	0.106	0.106	0.095
WRS-1/WRS-1	WRS1032	WRS1031	8	0.02018	1.71	0.000	0.000	0.000	0.071	0.071	0.041

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WRS-1/WRS-1	WRS1033	WRS1032	8	0.04000	2.41	0.000	0.000	0.000	0.035	0.035	0.014
WRS-2/WRS-2	WRS1034	WRS2102	8	0.03951	2.40	0.000	0.000	0.000	0.247	0.247	0.102
WRS-2/WRS-2	WRS1035	WRS1034	8	0.00340	0.70	0.000	0.000	0.000	0.212	0.212	0.300
WRS-2/WRS-2	WRS1036	WRS1035	8	0.01863	1.65	0.000	0.000	0.000	0.141	0.141	0.085
WRS-2/WRS-2	WRS1037	WRS1036	8	0.02269	1.82	0.000	0.000	0.000	0.106	0.106	0.058
WRS-2/WRS-2	WRS1038	WRS1037	8	0.03665	2.31	0.000	0.000	0.000	0.035	0.035	0.015
WRS-2/WRS-2	WRS2001	WRS2PS1	18	0.00244	5.19	0.000	0.000	0.000	2.401	2.401	0.462
WRS-2/WRS-2	WRS2002	WRS2001	18	0.00089	3.14	0.000	0.000	0.000	2.295	2.295	0.729
WRS-2/WRS-2	WRS2003	WRS2002	18	0.00090	3.15	0.000	0.000	0.000	2.295	2.295	0.728
WRS-2/WRS-2	WRS2004	WRS2003	18	0.00090	3.15	0.000	0.000	0.000	2.295	2.295	0.728
WRS-2/WRS-2	WRS2005	WRS2004	18	0.00090	3.15	0.000	0.000	0.000	2.295	2.295	0.728
WRS-2/WRS-2	WRS2006	WRS2005	18	0.00090	3.15	0.000	0.000	0.000	2.295	2.295	0.728
WRS-2/WRS-2	WRS2007	WRS2006	18	0.00090	3.15	0.000	0.000	0.000	2.295	2.295	0.728
WRS-2/WRS-2	WRS2008	WRS2007	18	0.00090	3.15	0.000	0.000	0.000	2.330	2.330	0.738
WRS-2/WRS-2	WRS2009	WRS2008	18	0.00090	3.15	0.000	0.000	0.000	2.330	2.330	0.738
WRS-2/WRS-2	WRS2010	WRS2009	18	0.00090	3.15	0.000	0.000	0.000	2.330	2.330	0.739
WRS-2/WRS-2	WRS2011	WRS2010	18	0.00090	3.16	0.000	0.000	0.000	2.330	2.330	0.737
WRS-2/WRS-2	WRS2012	WRS2011	18	0.00091	3.17	0.000	0.000	0.000	2.330	2.330	0.734
WRS-2/WRS-2	WRS2013	WRS2012	18	0.00090	3.15	0.000	0.000	0.000	2.366	2.366	0.749
WRS-2/WRS-2	WRS2014	WRS2013	12	0.00090	1.07	0.000	0.000	0.000	0.600	0.600	0.559
WRS-2/WRS-2	WRS2015	WRS2014	12	0.00090	1.06	0.000	0.000	0.000	0.600	0.600	0.561
WRS-2/WRS-2	WRS2016	WRS2015	12	0.00090	1.06	0.000	0.000	0.000	0.636	0.636	0.594
WRS-2/WRS-2	WRS2017	WRS2016	12	0.00090	1.06	0.000	0.000	0.000	0.636	0.636	0.594
WRS-2/WRS-2	WRS2018	WRS2017	12	0.00090	1.06	0.000	0.000	0.000	0.636	0.636	0.594
WRS-2/WRS-2	WRS2019	WRS2001	8	0.05764	2.90	0.000	0.000	0.000	0.388	0.388	0.133
WRS-2/WRS-2	WRS2020	WRS2019	8	0.00800	1.08	0.000	0.000	0.000	0.388	0.388	0.358
WRS-2/WRS-2	WRS2021	WRS2020	8	0.00482	0.84	0.000	0.000	0.000	0.353	0.353	0.420
WRS-2/WRS-2	WRS2022	WRS2021	8	0.01486	1.47	0.000	0.000	0.000	0.318	0.318	0.215
WRS-2/WRS-2	WRS2023	WRS2022	8	0.02242	1.81	0.000	0.000	0.000	0.247	0.247	0.136
WRS-2/WRS-2	WRS2024	WRS2023	8	0.01184	1.31	0.000	0.000	0.000	0.212	0.212	0.161

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WRS-2/WRS-2	WRS2025	WRS2024	8	0.00644	0.97	0.000	0.000	0.000	0.141	0.141	0.145
WRS-2/WRS-2	WRS2026	WRS2025	8	0.03474	2.25	0.000	0.000	0.000	0.106	0.106	0.047
WRS-2/WRS-2	WRS2027	WRS2026	8	0.02526	1.92	0.000	0.000	0.000	0.035	0.035	0.018
WRS-2/WRS-2	WRS2028	WRS2013	18	0.00176	4.42	0.000	0.000	0.000	1.801	1.801	0.407
WRS-2/WRS-2	WRS2029	WRS2028	18	0.00104	3.39	0.000	0.000	0.000	1.801	1.801	0.531
WRS-2/WRS-2	WRS2030	WRS2029	18	0.00185	4.52	0.000	0.000	0.000	1.801	1.801	0.398
WRS-2/WRS-2	WRS2031	WRS2030	15	0.00200	2.89	0.000	0.000	0.000	1.801	1.801	0.622
WRS-2/WRS-2	WRS2032	WRS2031	15	0.00199	2.88	0.000	0.000	0.000	1.766	1.766	0.612
WRS-2/WRS-2	WRS2033	WRS2032	15	0.00200	2.89	0.000	0.000	0.000	1.766	1.766	0.610
WRS-2/WRS-2	WRS2034	WRS2033	15	0.00199	2.88	0.000	0.000	0.000	1.766	1.766	0.611
WRS-2/WRS-2	WRS2035	WRS2034	15	0.00199	2.88	0.000	0.000	0.000	1.766	1.766	0.612
WRS-2/WRS-2	WRS2036	WRS2035	15	0.00200	2.89	0.000	0.000	0.000	1.766	1.766	0.610
WRS-2/WRS-2	WRS2037	WRS2036	15	0.00200	2.89	0.000	0.000	0.000	1.766	1.766	0.610
WRS-2/WRS-2	WRS2038	WRS2037	15	0.00199	2.88	0.000	0.000	0.000	1.730	1.730	0.600
WRS-2/WRS-2	WRS2039	WRS2038	15	0.00199	2.88	0.000	0.000	0.000	1.730	1.730	0.599
WRS-2/WRS-2	WRS2040	WRS2039	15	0.00137	2.39	0.000	0.000	0.000	1.130	1.130	0.472
WRS-2/WRS-2	WRS2041	WRS2040	15	0.00151	2.51	0.000	0.000	0.000	1.130	1.130	0.448
WRS-2/WRS-2	WRS2042	WRS2041	12	0.00150	1.38	0.000	0.000	0.000	0.742	0.742	0.537
WRS-2/WRS-2	WRS2043	WRS2042	12	0.00203	1.60	0.000	0.000	0.000	0.742	0.742	0.461
WRS-2/WRS-2	WRS2044	WRS2043	12	0.00234	1.72	0.000	0.000	0.000	0.742	0.742	0.429
WRS-2/WRS-2	WRS2045	WRS2044	8	0.00174	0.50	0.000	0.000	0.000	0.177	0.177	0.351
WRS-2/WRS-2	WRS2046	WRS2045	8	0.00200	0.54	0.000	0.000	0.000	0.141	0.141	0.260
WRS-2/WRS-2	WRS2047	WRS2046	8	0.01200	1.32	0.000	0.000	0.000	0.106	0.106	0.080
WRS-2/WRS-2	WRS2048	WRS2047	8	0.00200	0.54	0.000	0.000	0.000	0.035	0.035	0.064
WRS-2/WRS-2	WRS2049	WRS2039	10	0.00301	1.20	0.000	0.000	0.000	0.706	0.706	0.586
WRS-2/WRS-2	WRS2050	WRS2049	10	0.00308	1.21	0.000	0.000	0.000	0.706	0.706	0.580
WRS-2/WRS-2	WRS2051	WRS2050	10	0.00259	1.11	0.000	0.000	0.000	0.706	0.706	0.632
WRS-2/WRS-2	WRS2052	WRS2051	8	0.00351	0.71	0.000	0.000	0.000	0.671	0.671	0.937
WRS-2/WRS-2	WRS2053	WRS2052	8	0.00350	0.71	0.000	0.000	0.000	0.671	0.671	0.938
WRS-2/WRS-2	WRS2054	WRS2053	8	0.00351	0.71	0.000	0.000	0.000	0.671	0.671	0.937

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Flow Data: Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WRS-2/WRS-2	WRS2055	WRS2054	8	0.00354	0.72	0.000	0.000	0.000	0.671	0.671	0.931
WRS-2/WRS-2	WRS2056	WRS2055	8	0.00350	0.71	0.000	0.000	0.000	0.671	0.671	0.938
WRS-2/WRS-2	WRS2057	WRS2056	8	0.00600	0.93	0.000	0.000	0.000	0.636	0.636	0.679
WRS-2/WRS-2	WRS2058	WRS2057	8	0.00600	0.93	0.000	0.000	0.000	0.636	0.636	0.679
WRS-2/WRS-2	WRS2059	WRS2058	8	0.00625	0.95	0.000	0.000	0.000	0.636	0.636	0.666
WRS-2/WRS-2	WRS2060	WRS2059	8	0.00600	0.93	0.000	0.000	0.000	0.636	0.636	0.679
WRS-2/WRS-2	WRS2061	WRS2060	8	0.00606	0.94	0.000	0.000	0.000	0.600	0.600	0.637
WRS-2/WRS-2	WRS2062	WRS2061	8	0.01207	1.32	0.000	0.000	0.000	0.600	0.600	0.451
WRS-2/WRS-2	WRS2063	WRS2062	8	0.00355	0.72	0.000	0.000	0.000	0.282	0.282	0.391
WRS-2/WRS-2	WRS2064	WRS2063	8	0.01836	1.63	0.000	0.000	0.000	0.247	0.247	0.150
WRS-2/WRS-2	WRS2065	WRS2064	8	0.01828	1.63	0.000	0.000	0.000	0.212	0.212	0.129
WRS-2/WRS-2	WRS2066	WRS2065	8	0.00168	0.49	0.000	0.000	0.000	0.141	0.141	0.284
WRS-2/WRS-2	WRS2067	WRS2066	8	0.02603	1.95	0.000	0.000	0.000	0.106	0.106	0.054
WRS-2/WRS-2	WRS2068	WRS2067	8	0.02108	1.75	0.000	0.000	0.000	0.035	0.035	0.019
WRS-2/WRS-2	WRS2069	WRS2062	8	0.00667	0.98	0.000	0.000	0.000	0.318	0.318	0.322
WRS-2/WRS-2	WRS2070	WRS2069	8	0.00961	1.18	0.000	0.000	0.000	0.282	0.282	0.238
WRS-2/WRS-2	WRS2071	WRS2070	8	0.00105	0.39	0.000	0.000	0.000	0.247	0.247	0.628
WRS-2/WRS-2	WRS2072	WRS2071	8	0.00813	1.09	0.000	0.000	0.000	0.212	0.212	0.194
WRS-2/WRS-2	WRS2073	WRS2072	8	0.01950	1.68	0.000	0.000	0.000	0.141	0.141	0.083
WRS-2/WRS-2	WRS2074	WRS2073	8	0.03272	2.18	0.000	0.000	0.000	0.106	0.106	0.048
WRS-2/WRS-2	WRS2075	WRS2074	8	0.01972	1.69	0.000	0.000	0.000	0.035	0.035	0.020
WRS-2/WRS-2	WRS2076	WRS2041	8	0.01121	1.28	0.000	0.000	0.000	0.424	0.424	0.331
WRS-2/WRS-2	WRS2077	WRS2076	8	0.00600	0.93	0.000	0.000	0.000	0.424	0.424	0.453
WRS-2/WRS-2	WRS2078	WRS2077	8	0.01250	1.35	0.000	0.000	0.000	0.388	0.388	0.287
WRS-2/WRS-2	WRS2079	WRS2078	8	0.01412	1.43	0.000	0.000	0.000	0.353	0.353	0.245
WRS-2/WRS-2	WRS2080	WRS2079	8	0.00588	0.92	0.000	0.000	0.000	0.353	0.353	0.380
WRS-2/WRS-2	WRS2081	WRS2080	8	0.02208	1.79	0.000	0.000	0.000	0.282	0.282	0.157
WRS-2/WRS-2	WRS2082	WRS2081	8	0.00638	0.96	0.000	0.000	0.000	0.247	0.247	0.256
WRS-2/WRS-2	WRS2083	WRS2082	8	0.01362	1.41	0.000	0.000	0.000	0.212	0.212	0.150
WRS-2/WRS-2	WRS2084	WRS2083	8	0.00703	1.01	0.000	0.000	0.000	0.141	0.141	0.139

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WRS-2/WRS-2	WRS2085	WRS2084	8	0.01502	1.48	0.000	0.000	0.000	0.106	0.106	0.071
WRS-2/WRS-2	WRS2086	WRS2085	8	0.02625	1.95	0.000	0.000	0.000	0.035	0.035	0.017
WRS-2/WRS-2	WRS2087	WRS2044	8	0.01064	1.24	0.000	0.000	0.000	0.565	0.565	0.453
WRS-2/WRS-2	WRS2088	WRS2087	8	0.00306	0.66	0.000	0.000	0.000	0.565	0.565	0.844
WRS-2/WRS-2	WRS2089	WRS2088	8	0.00403	0.76	0.000	0.000	0.000	0.565	0.565	0.736
WRS-2/WRS-2	WRS2090	WRS2089	8	0.00403	0.76	0.000	0.000	0.000	0.565	0.565	0.736
WRS-2/WRS-2	WRS2091	WRS2090	8	0.01402	1.43	0.000	0.000	0.000	0.530	0.530	0.370
WRS-2/WRS-2	WRS2092	WRS2091	8	0.00811	1.08	0.000	0.000	0.000	0.530	0.530	0.486
WRS-2/WRS-2	WRS2093	WRS2092	8	0.02000	1.70	0.000	0.000	0.000	0.494	0.494	0.289
WRS-2/WRS-2	WRS2094	WRS2093	8	0.01986	1.70	0.000	0.000	0.000	0.494	0.494	0.290
WRS-2/WRS-2	WRS2095	WRS2094	8	0.00348	0.71	0.000	0.000	0.000	0.494	0.494	0.691
WRS-2/WRS-2	WRS2096	WRS2095	8	0.01668	1.56	0.000	0.000	0.000	0.459	0.459	0.294
WRS-2/WRS-2	WRS2097	WRS2096	8	0.00745	1.04	0.000	0.000	0.000	0.424	0.424	0.406
WRS-2/WRS-2	WRS2098	WRS2097	8	0.00910	1.15	0.000	0.000	0.000	0.424	0.424	0.367
WRS-2/WRS-2	WRS2099	WRS2098	8	0.00363	0.72	0.000	0.000	0.000	0.388	0.388	0.532
WRS-2/WRS-2	WRS2100	WRS2099	8	0.02038	1.72	0.000	0.000	0.000	0.388	0.388	0.224
WRS-2/WRS-2	WRS2101	WRS2100	8	0.01284	1.36	0.000	0.000	0.000	0.353	0.353	0.257
WRS-2/WRS-2	WRS2102	WRS2101	8	0.00766	1.05	0.000	0.000	0.000	0.318	0.318	0.300
WRS-2/WRS-2	WRS2104	WRS2001	8	0.00100	0.38	0.000	0.000	0.000	0.106	0.106	0.276
WRS-2/WRS-2	WRS2105	WRS2104	8	0.00099	0.38	0.000	0.000	0.000	0.106	0.106	0.278
WRS-2/WRS-2	WRS2106	WRS2105	8	0.00100	0.38	0.000	0.000	0.000	0.106	0.106	0.276
WRS-2/WRS-2	WRS2107	WRS2106	8	0.00100	0.38	0.000	0.000	0.000	0.035	0.035	0.091
WRS-2	WRS2PS1	WRS3001	10	-.00296	0.00	0.000	0.000	0.000	0.000	0.000	0.000
WRS-3/WRS-3	WRS3001	WRS4024	21	0.00194	6.99	0.000	0.000	0.000	4.273	4.273	0.611
WRS-3/WRS-3	WRS3002	WRS3001	15	0.00366	3.91	0.000	0.000	0.000	2.260	2.260	0.578
WRS-3/WRS-3	WRS3003	WRS3002	15	0.00400	4.09	0.000	0.000	0.000	2.189	2.189	0.535
WRS-3/WRS-3	WRS3004	WRS3003	15	0.00446	4.31	0.000	0.000	0.000	2.119	2.119	0.491
WRS-3/WRS-3	WRS3005	WRS3004	12	0.02791	5.95	0.000	0.000	0.000	1.377	1.377	0.231
WRS-3/WRS-3	WRS3006	WRS3005	12	0.00601	2.76	0.000	0.000	0.000	1.306	1.306	0.472
WRS-3/WRS-3	WRS3007	WRS3006	12	0.00400	2.25	0.000	0.000	0.000	1.236	1.236	0.547

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WRS-3/WRS-3	WRS3008	WRS3007	12	0.00405	2.26	0.000	0.000	0.000	1.095	1.095	0.482
WRS-3/WRS-3	WRS3009	WRS3008	12	0.00400	2.25	0.000	0.000	0.000	0.953	0.953	0.422
WRS-3/WRS-3	WRS3010	WRS3009	10	0.00424	1.42	0.000	0.000	0.000	0.812	0.812	0.568
WRS-3/WRS-3	WRS3011	WRS3010	8	0.01404	1.43	0.000	0.000	0.000	0.636	0.636	0.444
WRS-3/WRS-3	WRS3012	WRS3011	8	0.01474	1.46	0.000	0.000	0.000	0.494	0.494	0.336
WRS-3/WRS-3	WRS3013	WRS3012	8	0.03110	2.13	0.000	0.000	0.000	0.318	0.318	0.149
WRS-3/WRS-3	WRS3014	WRS3013	8	0.00718	1.02	0.000	0.000	0.000	0.177	0.177	0.172
WRS-3/WRS-3	WRS3015	WRS3004	10	0.03152	3.89	0.000	0.000	0.000	0.636	0.636	0.163
WRS-3/WRS-3	WRS3016	WRS3015	10	0.02978	3.78	0.000	0.000	0.000	0.494	0.494	0.130
WRS-3/WRS-3	WRS3017	WRS3016	10	0.03633	4.17	0.000	0.000	0.000	0.318	0.318	0.076
WRS-3/WRS-3	WRS3018	WRS3017	10	0.05182	4.98	0.000	0.000	0.000	0.177	0.177	0.035
WRS-4/WRS-4	WRS4002	WRS4003	21	0.00108	5.22	0.000	0.000	0.000	3.708	3.708	0.709
WRS-4/WRS-4	WRS4003	WRS4004	21	0.00863	14.72	0.000	0.000	0.000	3.743	3.743	0.254
WRS-4/WRS-4	WRS4004	WRS4005	33	0.00096	16.41	0.000	0.000	0.000	7.909	7.909	0.481
WRS-4/WRS-4	WRS4005	WRS5001	33	0.00094	16.29	0.000	0.000	0.000	7.874	7.874	0.483
WRS-4/WRS-4	WRS4006	WRS4004	27	0.00244	15.31	0.000	0.000	0.000	4.732	4.732	0.309
WRS-4/WRS-4	WRS4007	WRS4006	27	0.00150	11.99	0.000	0.000	0.000	4.661	4.661	0.388
WRS-4/WRS-4	WRS4008	WRS4007	24	0.00250	11.31	0.000	0.000	0.000	4.626	4.626	0.408
WRS-4/WRS-4	WRS4009	WRS4008	21	0.00700	13.25	0.000	0.000	0.000	4.590	4.590	0.346
WRS-4/WRS-4	WRS4010	WRS4009	21	0.00400	10.02	0.000	0.000	0.000	4.520	4.520	0.451
WRS-4/WRS-4	WRS4011	WRS4010	21	0.00400	10.02	0.000	0.000	0.000	4.484	4.484	0.447
WRS-4/WRS-4	WRS4012	WRS4011	15	0.00600	5.00	0.000	0.000	0.000	2.225	2.225	0.444
WRS-4/WRS-4	WRS4013	WRS4012	15	0.00480	4.47	0.000	0.000	0.000	2.154	2.154	0.481
WRS-4/WRS-4	WRS4014	WRS4013	15	0.00521	4.66	0.000	0.000	0.000	2.083	2.083	0.446
WRS-4/WRS-4	WRS4015	WRS4014	15	0.00421	4.19	0.000	0.000	0.000	1.942	1.942	0.462
WRS-4/WRS-4	WRS4016	WRS4015	15	0.00454	4.35	0.000	0.000	0.000	1.766	1.766	0.405
WRS-4/WRS-4	WRS4017	WRS4016	15	0.00428	4.22	0.000	0.000	0.000	1.554	1.554	0.367
WRS-4/WRS-4	WRS4018	WRS4017	15	0.00454	4.35	0.000	0.000	0.000	1.342	1.342	0.308
WRS-4/WRS-4	WRS4019	WRS4018	15	0.00516	4.64	0.000	0.000	0.000	1.130	1.130	0.243
WRS-4/WRS-4	WRS4020	WRS4019	8	0.01527	1.49	0.000	0.000	0.000	0.883	0.883	0.591

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WRS-4/WRS-4	WRS4021	WRS4020	8	0.03507	2.26	0.000	0.000	0.000	0.671	0.671	0.296
WRS-4/WRS-4	WRS4022	WRS4021	8	0.02945	2.07	0.000	0.000	0.000	0.459	0.459	0.221
WRS-4/WRS-4	WRS4023	WRS4022	8	0.03631	2.30	0.000	0.000	0.000	0.212	0.212	0.092
WRS-4/WRS-4	WRS4024	WRS4002	21	0.00123	5.56	0.000	0.000	0.000	3.708	3.708	0.666
WRS-4/WRS-4	WRS4030	WRS4011	15	0.00612	5.05	0.000	0.000	0.000	2.189	2.189	0.433
WRS-4/WRS-4	WRS4031	WRS4030	15	0.00600	5.00	0.000	0.000	0.000	2.083	2.083	0.416
WRS-4/WRS-4	WRS4032	WRS4031	15	0.00496	4.55	0.000	0.000	0.000	1.977	1.977	0.434
WRS-4/WRS-4	WRS4033	WRS4032	15	0.00424	4.21	0.000	0.000	0.000	1.871	1.871	0.444
WRS-4/WRS-4	WRS4034	WRS4033	15	0.00431	4.24	0.000	0.000	0.000	1.730	1.730	0.407
WRS-4/WRS-4	WRS4035	WRS4034	15	0.00321	3.66	0.000	0.000	0.000	1.554	1.554	0.424
WRS-4/WRS-4	WRS4036	WRS4035	15	0.00260	3.30	0.000	0.000	0.000	1.342	1.342	0.406
WRS-4/WRS-4	WRS4037	WRS4036	15	0.00304	3.56	0.000	0.000	0.000	1.130	1.130	0.316
WRS-4/WRS-4	WRS4038	WRS4037	10	0.01186	2.38	0.000	0.000	0.000	0.883	0.883	0.369
WRS-4/WRS-4	WRS4039	WRS4038	8	0.08818	3.58	0.000	0.000	0.000	0.671	0.671	0.187
WRS-4/WRS-4	WRS4040	WRS4039	8	0.02024	1.71	0.000	0.000	0.000	0.459	0.459	0.267
WRS-4/WRS-4	WRS4041	WRS4040	8	0.02000	1.70	0.000	0.000	0.000	0.212	0.212	0.124
WRS-5/WRS-5	WRS5001	WRS5002	33	0.00084	15.38	0.000	0.000	0.000	7.839	7.839	0.509
WRS-5/WRS-5	WRS5002	WRS5003	33	0.00092	16.07	0.000	0.000	0.000	7.768	7.768	0.483
WRS-5/WRS-5	WRS5003	WRS5026	33	0.00127	18.89	0.000	0.000	0.000	9.710	9.710	0.513
WRS-5/WRS-5	WRS5004	WRS5003	15	0.00401	4.09	0.000	0.000	0.000	2.295	2.295	0.560
WRS-5/WRS-5	WRS5005	WRS5004	15	0.00410	4.14	0.000	0.000	0.000	2.260	2.260	0.545
WRS-5/WRS-5	WRS5006	WRS5005	15	0.00404	4.10	0.000	0.000	0.000	2.225	2.225	0.541
WRS-5/WRS-5	WRS5007	WRS5006	15	0.00400	4.09	0.000	0.000	0.000	2.154	2.154	0.526
WRS-5/WRS-5	WRS5008	WRS5007	15	0.00402	4.09	0.000	0.000	0.000	2.119	2.119	0.517
WRS-5/WRS-5	WRS5009	WRS5008	15	0.00403	4.10	0.000	0.000	0.000	2.083	2.083	0.507
WRS-5/WRS-5	WRS5010	WRS5009	15	0.00400	4.09	0.000	0.000	0.000	2.013	2.013	0.492
WRS-5/WRS-5	WRS5011	WRS5010	15	0.00403	4.10	0.000	0.000	0.000	1.977	1.977	0.482
WRS-5/WRS-5	WRS5012	WRS5011	15	0.00425	4.21	0.000	0.000	0.000	1.907	1.907	0.452
WRS-5/WRS-5	WRS5013	WRS5012	15	0.00420	4.18	0.000	0.000	0.000	1.801	1.801	0.430
WRS-5/WRS-5	WRS5014	WRS5013	15	0.00404	4.11	0.000	0.000	0.000	1.695	1.695	0.412

MODELED PEAK WASTEWATER FLOWS

Pipe Data: | Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WRS-5/WRS-5	WRS5015	WRS5014	12	0.00800	3.18	0.000	0.000	0.000	1.589	1.589	0.498
WRS-5/WRS-5	WRS5016	WRS5015	12	0.01004	3.57	0.000	0.000	0.000	1.448	1.448	0.405
WRS-5/WRS-5	WRS5017	WRS5016	10	0.01002	2.19	0.000	0.000	0.000	1.306	1.306	0.595
WRS-5/WRS-5	WRS5018	WRS5017	10	0.01450	2.63	0.000	0.000	0.000	1.130	1.130	0.428
WRS-5/WRS-5	WRS5019	WRS5018	10	0.00930	2.11	0.000	0.000	0.000	0.953	0.953	0.451
WRS-5/WRS-5	WRS5020	WRS5019	10	0.00357	1.31	0.000	0.000	0.000	0.777	0.777	0.593
WRS-5/WRS-5	WRS5021	WRS5020	8	0.00973	1.19	0.000	0.000	0.000	0.600	0.600	0.502
WRS-5/WRS-5	WRS5022	WRS5021	8	0.00317	0.68	0.000	0.000	0.000	0.388	0.388	0.569
WRS-5/WRS-5	WRS5023	WRS5022	8	0.01686	1.56	0.000	0.000	0.000	0.212	0.212	0.135
WRS-5/WRS-5	WRS5026	WRS5027	33	0.00104	17.07	0.000	0.000	0.000	9.710	9.710	0.568
WRS-5/WRS-5	WRS5027	WRS5028	33	0.00113	17.85	0.000	0.000	0.000	9.675	9.675	0.542
WRS-5/WRS-5	WRS5028	WRS5029	33	0.00118	18.20	0.000	0.000	0.000	9.675	9.675	0.531
WRS-5/WRS-5	WRS5029	WRS_WWTP	33	0.00093	16.13	0.000	0.000	0.000	9.675	9.675	0.599
WRS-5/WRS-5	WRS5031	WRS_WWTP	30	0.00206	18.64	0.000	0.000	0.000	13.736	13.736	0.736
WRS-5/WRS-5	WRS5032	WRS5031	30	0.00200	18.36	0.000	0.000	0.000	13.736	13.736	0.748
WRS-5/WRS-5	WRS5033	WRS5032	30	0.00200	18.34	0.000	0.000	0.000	13.736	13.736	0.748
WRS-5/WRS-5	WRS5034	WRS5033	30	0.00200	18.34	0.000	0.000	0.000	13.736	13.736	0.748
WRS-5/WRS-5	WRS5035	WRS5034	30	0.00200	18.34	0.000	0.000	0.000	13.700	13.700	0.746
WRS-5/WRS-5	WRS5036	WRS5035	30	0.00200	18.34	0.000	0.000	0.000	13.700	13.700	0.746
WRS-5/WRS-5	WRS5037	WRS5036	30	0.00200	18.34	0.000	0.000	0.000	13.700	13.700	0.746
WRS-5/WRS-5	WRS5038	WRS5037	30	0.00200	18.34	0.000	0.000	0.000	12.464	12.464	0.679
WRS-5/WRS-5	WRS5039	WRS5038	30	0.00200	18.34	0.000	0.000	0.000	12.464	12.464	0.679
WRS-5/WRS-5	WRS5040	WRS5037	18	0.01039	10.71	0.000	0.000	0.000	3.425	3.425	0.319
WRS-5/WRS-5	WRS5041	WRS5040	18	0.01600	13.28	0.000	0.000	0.000	3.354	3.354	0.252
WRS-5/WRS-5	WRS5042	WRS5041	18	0.00914	10.04	0.000	0.000	0.000	3.319	3.319	0.330
WRS-5/WRS-5	WRS5043	WRS5042	18	0.02002	14.86	0.000	0.000	0.000	3.284	3.284	0.220
WRS-5/WRS-5	WRS5044	WRS5043	18	0.01484	12.79	0.000	0.000	0.000	3.249	3.249	0.253
WRS-5/WRS-5	WRS5045	WRS5044	18	0.00600	8.13	0.000	0.000	0.000	3.178	3.178	0.390
WRS-5/WRS-5	WRS5046	WRS5045	18	0.00400	6.64	0.000	0.000	0.000	3.143	3.143	0.473
WRS-5/WRS-5	WRS5047	WRS5046	18	0.00400	6.64	0.000	0.000	0.000	3.107	3.107	0.467

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WRS-5/WRS-5	WRS5048	WRS5047	18	0.00414	6.76	0.000	0.000	0.000	3.037	3.037	0.448
WRS-5/WRS-5	WRS5049	WRS5048	18	0.00404	6.67	0.000	0.000	0.000	2.966	2.966	0.444
WRS-5/WRS-5	WRS5050	WRS5049	18	0.00280	5.56	0.000	0.000	0.000	2.860	2.860	0.513
WRS-5/WRS-5	WRS5051	WRS5050	15	0.00373	3.95	0.000	0.000	0.000	1.801	1.801	0.455
WRS-5/WRS-5	WRS5052	WRS5051	15	0.00425	4.21	0.000	0.000	0.000	1.695	1.695	0.402
WRS-5/WRS-5	WRS5053	WRS5052	12	0.00845	3.27	0.000	0.000	0.000	1.589	1.589	0.485
WRS-5/WRS-5	WRS5054	WRS5053	12	0.01419	4.24	0.000	0.000	0.000	1.448	1.448	0.341
WRS-5/WRS-5	WRS5055	WRS5054	12	0.01346	4.13	0.000	0.000	0.000	1.306	1.306	0.315
WRS-5/WRS-5	WRS5056	WRS5055	12	0.00612	2.78	0.000	0.000	0.000	1.130	1.130	0.405
WRS-5/WRS-5	WRS5057	WRS5056	12	0.00250	1.78	0.000	0.000	0.000	0.953	0.953	0.534
WRS-5/WRS-5	WRS5058	WRS5057	10	0.00958	2.14	0.000	0.000	0.000	0.777	0.777	0.362
WRS-5/WRS-5	WRS5059	WRS5058	10	0.00204	0.99	0.000	0.000	0.000	0.600	0.600	0.606
WRS-5/WRS-5	WRS5060	WRS5059	8	0.02770	2.01	0.000	0.000	0.000	0.388	0.388	0.192
WRS-5/WRS-5	WRS5061	WRS5060	8	0.04789	2.64	0.000	0.000	0.000	0.212	0.212	0.080
WRS-5/WRS-5	WRS5062	WRS5050	10	0.02991	3.79	0.000	0.000	0.000	0.989	0.989	0.261
WRS-5/WRS-5	WRS5063	WRS5062	10	0.03126	3.87	0.000	0.000	0.000	0.777	0.777	0.200
WRS-5/WRS-5	WRS5064	WRS5063	10	0.03822	4.28	0.000	0.000	0.000	0.600	0.600	0.140
WRS-5/WRS-5	WRS5065	WRS5064	10	0.06322	5.50	0.000	0.000	0.000	0.388	0.388	0.070
WRS-5/WRS-5	WRS5066	WRS5065	10	0.08086	6.23	0.000	0.000	0.000	0.212	0.212	0.034
WRS-5/WRS-5	WRS_WWTP		30	1.00000	410.21	0.000	0.000	0.000	0.000	0.000	0.000
WRS-6/WRS-6	WRS6001	WRS5039	30	0.00200	18.34	0.000	0.000	0.000	12.500	12.500	0.681
WRS-6/WRS-6	WRS6002	WRS6001	30	0.00200	18.34	0.000	0.000	0.000	12.464	12.464	0.679
WRS-6/WRS-6	WRS6003	WRS6002	30	0.00200	18.34	0.000	0.000	0.000	12.464	12.464	0.679
WRS-6/WRS-6	WRS6004	WRS6003	30	0.00200	18.34	0.000	0.000	0.000	12.464	12.464	0.679
WRS-6/WRS-6	WRS6005	WRS6004	30	0.00200	18.34	0.000	0.000	0.000	12.464	12.464	0.679
WRS-6/WRS-6	WRS6006	WRS6037	30	0.00200	18.34	0.000	0.000	0.000	12.147	12.147	0.662
WRS-6/WRS-6	WRS6007	WRS6006	30	0.00199	18.30	0.000	0.000	0.000	12.147	12.147	0.663
WRS-6/WRS-6	WRS6008	WRS6007	30	0.00200	18.38	0.000	0.000	0.000	12.111	12.111	0.658
WRS-6/WRS-6	WRS6009	WRS6008	30	0.00200	18.34	0.000	0.000	0.000	12.111	12.111	0.660
WRS-6/WRS-6	WRS6010	WRS6009	30	0.00200	18.34	0.000	0.000	0.000	12.111	12.111	0.660

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WRS-6/WRS-6	WRS6011	WRS6010	30	0.00200	18.34	0.000	0.000	0.000	12.111	12.111	0.660
WRS-6/WRS-6	WRS6012	WRS6011	30	0.00200	18.34	0.000	0.000	0.000	12.076	12.076	0.658
WRS-6/WRS-6	WRS6013	WRS6012	30	0.00200	18.34	0.000	0.000	0.000	12.076	12.076	0.658
WRS-6/WRS-6	WRS6014	WRS6013	30	0.00200	18.36	0.000	0.000	0.000	12.076	12.076	0.657
WRS-6/WRS-6	WRS6015	WRS6014	30	0.00200	18.34	0.000	0.000	0.000	12.076	12.076	0.658
WRS-6/WRS-6	WRS6016	WRS6015	30	0.00200	18.38	0.000	0.000	0.000	12.041	12.041	0.655
WRS-6/WRS-6	WRS6017	WRS6016	30	0.00200	18.34	0.000	0.000	0.000	12.041	12.041	0.656
WRS-6/WRS-6	WRS6018	WRS6017	27	0.00264	15.91	0.000	0.000	0.000	9.216	9.216	0.579
WRS-6/WRS-6	WRS6019	WRS6018	27	0.01394	36.57	0.000	0.000	0.000	9.145	9.145	0.250
WRS-6/WRS-6	WRS6020	WRS6019	27	0.00320	17.52	0.000	0.000	0.000	9.075	9.075	0.518
WRS-6/WRS-6	WRS6021	WRS6020	27	0.00200	13.85	0.000	0.000	0.000	9.075	9.075	0.655
WRS-6/WRS-6	WRS6022	WRS6021	27	0.00202	13.93	0.000	0.000	0.000	9.039	9.039	0.648
WRS-6/WRS-6	WRS6023	WRS6022	27	0.00210	14.19	0.000	0.000	0.000	9.039	9.039	0.636
WRS-6/WRS-6	WRS6024	WRS6023	27	0.00224	14.66	0.000	0.000	0.000	9.004	9.004	0.613
WRS-6/WRS-6	WRS6025	WRS6024	27	0.00227	14.78	0.000	0.000	0.000	8.969	8.969	0.606
WRS-6/WRS-6	WRS6026	WRS6025	27	0.00235	15.02	0.000	0.000	0.000	8.933	8.933	0.594
WRS-6/WRS-6	WRS6027	WRS6026	27	0.00199	13.83	0.000	0.000	0.000	8.863	8.863	0.640
WRS-6/WRS-6	WRS6028	WRS6027	12	0.01598	4.50	0.000	0.000	0.000	2.860	2.860	0.634
WRS-6/WRS-6	WRS6029	WRS6028	12	0.02790	5.95	0.000	0.000	0.000	2.542	2.542	0.427
WRS-6/WRS-6	WRS6030	WRS6029	12	0.01566	4.45	0.000	0.000	0.000	2.225	2.225	0.499
WRS-6/WRS-6	WRS6031	WRS6030	10	0.01958	3.06	0.000	0.000	0.000	1.907	1.907	0.622
WRS-6/WRS-6	WRS6032	WRS6031	10	0.01520	2.70	0.000	0.000	0.000	1.589	1.589	0.588
WRS-6/WRS-6	WRS6033	WRS6032	8	0.02911	2.06	0.000	0.000	0.000	1.271	1.271	0.616
WRS-6/WRS-6	WRS6034	WRS6033	8	0.02707	1.98	0.000	0.000	0.000	0.953	0.953	0.479
WRS-6/WRS-6	WRS6035	WRS6034	8	0.04210	2.48	0.000	0.000	0.000	0.636	0.636	0.256
WRS-6/WRS-6	WRS6036	WRS6035	8	0.05306	2.78	0.000	0.000	0.000	0.318	0.318	0.114
WRS-6/WRS-6	WRS6037	WRS6005	30	0.00200	18.34	0.000	0.000	0.000	12.429	12.429	0.677
WRS-6/WRS-6	WRS6038	WRS6037	12	0.00300	1.95	0.000	0.000	0.000	1.589	1.589	0.814
WRS-6/WRS-6	WRS6039	WRS6038	8	0.02000	1.70	0.000	0.000	0.000	1.271	1.271	0.743
WRS-6/WRS-6	WRS6040	WRS6039	8	0.01200	1.32	0.000	0.000	0.000	0.953	0.953	0.719

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WRS-6/WRS-6	WRS6041	WRS6040	8	0.00400	0.76	0.000	0.000	0.000	0.636	0.636	0.832
WRS-6/WRS-6	WRS6042	WRS6041	8	0.00566	0.90	0.000	0.000	0.000	0.318	0.318	0.349
WRS-6/WRS-6	WRS6043	WRS6017	18	0.00507	7.48	0.000	0.000	0.000	3.213	3.213	0.429
WRS-6/WRS-6	WRS6044	WRS6043	18	0.00803	9.41	0.000	0.000	0.000	3.072	3.072	0.326
WRS-6/WRS-6	WRS6045	WRS6044	18	0.00216	4.88	0.000	0.000	0.000	3.037	3.037	0.621
WRS-6/WRS-6	WRS6046	WRS6045	18	0.00657	8.52	0.000	0.000	0.000	2.860	2.860	0.335
WRS-7/WRS-7	WRS7001	WRS6046	18	0.00268	5.44	0.000	0.000	0.000	2.719	2.719	0.499
WRS-7/WRS-7	WRS7002	WRS7001	18	0.00329	6.03	0.000	0.000	0.000	2.613	2.613	0.433
WRS-7/WRS-7	WRS7003	WRS7002	18	0.00227	5.00	0.000	0.000	0.000	2.472	2.472	0.493
WRS-7/WRS-7	WRS7004	WRS7003	8	0.01954	1.69	0.000	0.000	0.000	1.130	1.130	0.668
WRS-7/WRS-7	WRS7005	WRS7004	8	0.02020	1.71	0.000	0.000	0.000	0.883	0.883	0.514
WRS-7/WRS-7	WRS7006	WRS7005	8	0.02632	1.96	0.000	0.000	0.000	0.671	0.671	0.342
WRS-7/WRS-7	WRS7007	WRS7006	8	0.05426	2.81	0.000	0.000	0.000	0.459	0.459	0.163
WRS-7/WRS-7	WRS7008	WRS7007	8	0.04048	2.43	0.000	0.000	0.000	0.212	0.212	0.087
WRS-7/WRS-7	WRS7009	WRS7003	15	0.00123	2.26	0.000	0.000	0.000	1.271	1.271	0.560
WRS-7/WRS-7	WRS7010	WRS7009	15	0.00218	3.02	0.000	0.000	0.000	1.095	1.095	0.362
WRS-7/WRS-7	WRS7011	WRS7010	12	0.01059	3.66	0.000	0.000	0.000	0.883	0.883	0.240
WRS-7/WRS-7	WRS7012	WRS7011	12	0.00406	2.27	0.000	0.000	0.000	0.671	0.671	0.295
WRS-7/WRS-7	WRS7013	WRS7012	8	0.00401	0.76	0.000	0.000	0.000	0.459	0.459	0.599
WRS-7/WRS-7	WRS7014	WRS7013	8	0.00202	0.54	0.000	0.000	0.000	0.212	0.212	0.390
WRS-8/WRS-8	WRS8001	WRS6027	24	0.01561	28.27	0.000	0.000	0.000	6.603	6.603	0.233
WRS-8/WRS-8	WRS8002	WRS8001	24	0.01354	26.32	0.000	0.000	0.000	6.532	6.532	0.248
WRS-8/WRS-8	WRS8003	WRS8002	24	0.01337	26.16	0.000	0.000	0.000	6.462	6.462	0.247
WRS-8/WRS-8	WRS8004	WRS8003	24	0.00302	12.43	0.000	0.000	0.000	6.391	6.391	0.514
WRS-8/WRS-8	WRS8005	WRS8004	24	0.00300	12.39	0.000	0.000	0.000	6.356	6.356	0.512
WRS-8/WRS-8	WRS8006	WRS8005	24	0.00308	12.55	0.000	0.000	0.000	6.285	6.285	0.500
WRS-8/WRS-8	WRS8007	WRS8006	24	0.00313	12.67	0.000	0.000	0.000	6.215	6.215	0.490
WRS-8/WRS-8	WRS8008	WRS8007	24	0.00309	12.58	0.000	0.000	0.000	6.144	6.144	0.488
WRS-8/WRS-8	WRS8009	WRS8008	24	0.00274	11.85	0.000	0.000	0.000	6.073	6.073	0.512
WRS-8/WRS-8	WRS8010	WRS8009	24	0.00274	11.84	0.000	0.000	0.000	6.003	6.003	0.506

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
WRS-8/WRS-8	WRS8011	WRS8010	24	0.00349	13.37	0.000	0.000	0.000	5.932	5.932	0.443
WRS-8/WRS-8	WRS8012	WRS8011	24	0.00253	11.38	0.000	0.000	0.000	5.861	5.861	0.514
WRS-8/WRS-8	WRS8013	WRS8012	24	0.00218	10.57	0.000	0.000	0.000	5.791	5.791	0.547
WRS-8/WRS-8	WRS8014	WRS8013	24	0.00214	10.48	0.000	0.000	0.000	5.685	5.685	0.542
WRS-8/WRS-8	WRS8015	WRS8014	24	0.00214	10.47	0.000	0.000	0.000	5.650	5.650	0.539
WRS-8/WRS-8	WRS8016	WRS8015	24	0.00103	7.28	0.000	0.000	0.000	5.579	5.579	0.766
WRS-8/WRS-8	WRS8017	WRS8016	24	0.00157	8.98	0.000	0.000	0.000	5.508	5.508	0.612
WRS-8/WRS-8	WRS8018	WRS8017	21	0.00263	8.13	0.000	0.000	0.000	5.438	5.438	0.668
WRS-8/WRS-8	WRS8019	WRS8018	21	0.00208	7.24	0.000	0.000	0.000	5.332	5.332	0.736
WRS-8/WRS-8	WRS8020	WRS8019	18	0.00432	6.90	0.000	0.000	0.000	4.096	4.096	0.593
WRS-8/WRS-8	WRS8021	WRS8020	18	0.00431	6.90	0.000	0.000	0.000	3.849	3.849	0.557
WRS-8/WRS-8	WRS8022	WRS8021	18	0.00909	10.01	0.000	0.000	0.000	3.566	3.566	0.356
WRS-8/WRS-8	WRS8023	WRS8022	18	0.03387	19.33	0.000	0.000	0.000	3.213	3.213	0.166
WRS-8/WRS-8	WRS8024	WRS8023	18	0.00460	7.13	0.000	0.000	0.000	2.895	2.895	0.406
WRS-8/WRS-8	WRS8025	WRS8024	15	0.00413	4.15	0.000	0.000	0.000	2.542	2.542	0.611
WRS-8/WRS-8	WRS8026	WRS8025	15	0.00595	4.98	0.000	0.000	0.000	2.189	2.189	0.439
WRS-8/WRS-8	WRS8027	WRS8026	8	0.04172	2.46	0.000	0.000	0.000	1.801	1.801	0.729
WRS-8/WRS-8	WRS8028	WRS8027	8	0.09527	3.73	0.000	0.000	0.000	1.448	1.448	0.388
WRS-8/WRS-8	WRS8029	WRS8028	8	0.02341	1.84	0.000	0.000	0.000	1.095	1.095	0.592
WRS-8/WRS-8	WRS8030	WRS8029	8	0.00950	1.17	0.000	0.000	0.000	0.742	0.742	0.629
WRS-8/WRS-8	WRS8031	WRS8030	8	0.00800	1.08	0.000	0.000	0.000	0.353	0.353	0.326
WRS-8/WRS-8	WRS8033	WRS8019	15	0.00237	3.14	0.000	0.000	0.000	1.448	1.448	0.459
WRS-8/WRS-8	WRS8034	WRS8033	15	0.00216	3.00	0.000	0.000	0.000	1.201	1.201	0.399
WRS-9/WRS-9	WRS9001	WRS8034	12	0.00200	1.59	0.000	0.000	0.000	0.953	0.953	0.596
WRS-9/WRS-9	WRS9002	WRS9001	12	0.00201	1.60	0.000	0.000	0.000	0.918	0.918	0.573
WRS-9/WRS-9	WRS9003	WRS9002	12	0.00214	1.64	0.000	0.000	0.000	0.918	0.918	0.556
WRS-9/WRS-9	WRS9004	WRS9003	12	0.00205	1.61	0.000	0.000	0.000	0.847	0.847	0.524
WRS-9/WRS-9	WRS9005	WRS9004	12	0.00405	2.26	0.000	0.000	0.000	0.742	0.742	0.327
WRS-9/WRS-9	WRS9006	WRS9005	8	0.01660	1.55	0.000	0.000	0.000	0.600	0.600	0.385
WRS-9/WRS-9	WRS9007	WRS9006	8	0.03470	2.25	0.000	0.000	0.000	0.494	0.494	0.219

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
WRS-9/WRS-9	WRS9008	WRS9007	8	0.01035	1.23	0.000	0.000	0.000	0.353	0.353	0.287
WRS-9/WRS-9	WRS9009	WRS9008	8	0.06466	3.07	0.000	0.000	0.000	0.247	0.247	0.080
WRS-9/WRS-9	WRS9010	WRS9009	8	0.09016	3.62	0.000	0.000	0.000	0.106	0.106	0.029
YTC-1/YTC-1	NE091005	SE091004	27	0.00154	12.16	0.000	0.000	0.000	29.802	29.802	2.450
YTC-1/YTC-1	NW091001	NE091005	24	0.00290	12.19	0.000	0.000	0.000	29.837	29.837	2.446
YTC-1/YTC-1	NW091002	NW091001	24	0.00243	11.16	0.000	0.000	0.000	29.802	29.802	2.670
YTC-1/YTC-1	NW091003	NW091002	24	0.00250	11.31	0.000	0.000	0.000	29.766	29.766	2.631
YTC-1/YTC-1	NW091004	NW091003	24	0.00250	11.31	0.000	0.000	0.000	29.660	29.660	2.622
YTC-1/YTC-1	NW091005	NW091004	24	0.00250	11.31	0.000	0.000	0.000	29.625	29.625	2.618
YTC-1/YTC-1	NW091006	NW091005	24	0.00250	11.31	0.000	0.000	0.000	29.625	29.625	2.618
YTC-1/YTC-1	NW091007	NW091006	24	0.00250	11.31	0.000	0.000	0.000	29.519	29.519	2.609
YTC-1/YTC-1	NW091501	NW091007	24	0.00113	7.62	0.000	0.000	0.000	29.413	29.413	3.856
YTC-1/YTC-1	NW091502	NW091501	24	0.00141	8.51	0.000	0.000	0.000	29.343	29.343	3.446
YTC-1/YTC-1	SE051001	SE05101A	24	0.01372	26.50	0.000	0.000	0.000	29.201	29.201	1.101
YTC-1/YTC-1	SE05101A	NW091502	24	0.00243	11.17	0.000	0.000	0.000	29.343	29.343	2.626
YTC-1/YTC-1	SE091001	SE091500	27	0.00171	12.83	0.000	0.000	0.000	29.590	29.590	2.305
YTC-1/YTC-1	SE091002	SE091001	27	0.00155	12.19	0.000	0.000	0.000	29.625	29.625	2.429
YTC-1/YTC-1	SE091003	SE091002	27	0.00153	12.12	0.000	0.000	0.000	29.660	29.660	2.445
YTC-1/YTC-1	SE091004	SE091003	27	0.00153	12.14	0.000	0.000	0.000	29.731	29.731	2.448
YTC-1/YTC-1	SE091500	SW101155	27	0.00170	12.77	0.000	0.000	0.000	29.590	29.590	2.317
YTC-1/YTC-1	SW101154	SW101153	27	0.00170	12.77	0.000	0.000	0.000	29.554	29.554	2.314
YTC-1/YTC-1	SW101155	SW101154	27	0.00171	12.83	0.000	0.000	0.000	29.554	29.554	2.302
YTC-2/YTC-2	NE051009	SE051008	18	0.00112	3.52	0.000	0.000	0.000	17.726	17.726	5.030
YTC-2/YTC-2	NE051010	NE051009	12	0.01293	4.05	0.000	0.000	0.000	17.655	17.655	4.357
YTC-2/YTC-2	NE051011	NE051010	12	0.00428	2.33	0.000	0.000	0.000	17.549	17.549	7.522
YTC-2/YTC-2	NE051012	NE051011	12	0.00430	2.33	0.000	0.000	0.000	17.443	17.443	7.463
YTC-2/YTC-2	NE051013	NE051012	12	0.00431	2.34	0.000	0.000	0.000	17.337	17.337	7.405
YTC-2/YTC-2	NE051014	NE051013	12	0.00429	2.33	0.000	0.000	0.000	17.231	17.231	7.379
YTC-2/YTC-2	NE051015	NE051014	12	0.00429	2.33	0.000	0.000	0.000	17.090	17.090	7.319
YTC-2/YTC-2	NE32-001	SE32-018	24	0.01000	22.62	0.000	0.000	0.000	12.641	12.641	0.558

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
YTC-2/YTC-2	NE32-002	NE32-001	24	0.04245	46.61	0.000	0.000	0.000	12.147	12.147	0.260
YTC-2/YTC-2	NE32-003	NE32-002	24	0.01000	22.62	0.000	0.000	0.000	11.652	11.652	0.515
YTC-2/YTC-2	NE32-004	NE32-003	24	0.01328	26.07	0.000	0.000	0.000	11.123	11.123	0.426
YTC-2/YTC-2	NE32-005	NE32-004	24	0.01328	26.07	0.000	0.000	0.000	10.628	10.628	0.407
YTC-2/YTC-2	NE32-006	NE32-005	24	0.00395	14.23	0.000	0.000	0.000	10.134	10.134	0.712
YTC-2/YTC-2	NE32-007	NE32-006	18	0.03000	18.19	0.000	0.000	0.000	9.604	9.604	0.527
YTC-2/YTC-2	NE32-008	NE32-007	18	0.02000	14.85	0.000	0.000	0.000	9.110	9.110	0.613
YTC-2/YTC-2	NE32-009	NE32-008	18	0.02000	14.85	0.000	0.000	0.000	8.616	8.616	0.579
YTC-2/YTC-2	NE32-010	NE32-009	18	0.01636	13.44	0.000	0.000	0.000	8.086	8.086	0.601
YTC-2/YTC-2	NE32-011	NE32-010	18	0.03417	19.42	0.000	0.000	0.000	7.592	7.592	0.390
YTC-2/YTC-2	NE32-012	NE32-011	18	0.04314	21.82	0.000	0.000	0.000	7.062	7.062	0.323
YTC-2/YTC-2	NE32-013	NE32-012	18	0.07828	29.39	0.000	0.000	0.000	6.568	6.568	0.223
YTC-2/YTC-2	NE32-014	NE32-013	18	0.01238	11.69	0.000	0.000	0.000	6.215	6.215	0.531
YTC-2/YTC-2	NE32-015	NE32-014	18	0.06204	26.16	0.000	0.000	0.000	5.967	5.967	0.228
YTC-2/YTC-2	NE32-016	NE32-015	18	0.01498	12.86	0.000	0.000	0.000	5.756	5.756	0.447
YTC-2/YTC-2	NE32-017	NE32-016	15	0.02000	9.13	0.000	0.000	0.000	5.473	5.473	0.599
YTC-2/YTC-2	SE051002	SE051001	18	0.01830	14.21	0.000	0.000	0.000	17.761	17.761	1.249
YTC-2/YTC-2	SE051003	SE051002	18	0.00583	8.02	0.000	0.000	0.000	17.690	17.690	2.204
YTC-2/YTC-2	SE051004	SE051003	18	0.03344	19.21	0.000	0.000	0.000	17.584	17.584	0.915
YTC-2/YTC-2	SE051005	SE051004	18	0.00174	4.38	0.000	0.000	0.000	17.514	17.514	3.991
YTC-2/YTC-2	SE051006	SE051005	18	0.00140	3.93	0.000	0.000	0.000	17.478	17.478	4.446
YTC-2/YTC-2	SE051007	SE051006	18	0.00140	3.93	0.000	0.000	0.000	17.514	17.514	4.455
YTC-2/YTC-2	SE051008	SE051007	18	0.00087	3.10	0.000	0.000	0.000	17.620	17.620	5.669
YTC-2/YTC-2	SE32-007	SE321006	24	0.01423	26.99	0.000	0.000	0.000	16.101	16.101	0.596
YTC-2/YTC-2	SE32-008	SE32-007	24	0.01417	26.94	0.000	0.000	0.000	15.678	15.678	0.582
YTC-2/YTC-2	SE32-009	SE32-008	24	0.01439	27.14	0.000	0.000	0.000	15.183	15.183	0.559
YTC-2/YTC-2	SE32-010	SE32-009	24	0.01460	27.33	0.000	0.000	0.000	14.689	14.689	0.537
YTC-2/YTC-2	SE32-011	SE32-010	24	0.01460	27.33	0.000	0.000	0.000	14.195	14.195	0.519
YTC-2/YTC-2	SE32-012	SE32-011	24	0.01407	26.84	0.000	0.000	0.000	13.665	13.665	0.509
YTC-2/YTC-2	SE32-018	SE32-012	24	0.01500	27.70	0.000	0.000	0.000	13.171	13.171	0.475

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
YTC-2/YTC-2	SE321001	NE051015	12	0.00573	2.69	0.000	0.000	0.000	16.913	16.913	6.266
YTC-2/YTC-2	SE321005	SE321001	24	0.00795	20.18	0.000	0.000	0.000	16.702	16.702	0.827
YTC-2/YTC-2	SE321006	SE321005	24	0.00817	20.45	0.000	0.000	0.000	16.454	16.454	0.804
YTC-3/YTC-3	NW051024	SW051023	18	0.00396	6.61	0.000	0.000	0.000	11.617	11.617	1.757
YTC-3/YTC-3	NW051025	NW051024	18	0.00423	6.83	0.000	0.000	0.000	11.617	11.617	1.699
YTC-3/YTC-3	NW051026	NW051025	15	0.00830	5.88	0.000	0.000	0.000	11.546	11.546	1.961
YTC-3/YTC-3	NW051027	NW051026	15	0.00830	5.88	0.000	0.000	0.000	11.511	11.511	1.955
YTC-3/YTC-3	NW051028	NW051027	15	0.00781	5.71	0.000	0.000	0.000	11.440	11.440	2.003
YTC-3/YTC-3	NW051029	NW051028	12	0.01072	3.69	0.000	0.000	0.000	11.405	11.405	3.090
YTC-3/YTC-3	NW051030	NW051029	12	0.01165	3.84	0.000	0.000	0.000	11.335	11.335	2.947
YTC-3/YTC-3	NW051031	NW051030	12	0.01181	3.87	0.000	0.000	0.000	11.264	11.264	2.908
YTC-3/YTC-3	NW051032	NW051031	12	0.01182	3.87	0.000	0.000	0.000	11.229	11.229	2.897
YTC-3/YTC-3	SE051015	SE051001	15	0.01542	8.02	0.000	0.000	0.000	11.899	11.899	1.483
YTC-3/YTC-3	SE051016	SE051015	15	0.01509	7.93	0.000	0.000	0.000	11.864	11.864	1.495
YTC-3/YTC-3	SE051017	SE051016	16	0.01149	8.22	0.000	0.000	0.000	11.794	11.794	1.433
YTC-3/YTC-3	SE051018	SE051017	21	0.00162	6.38	0.000	0.000	0.000	11.758	11.758	1.842
YTC-3/YTC-3	SE051019	SE051018	21	0.00165	6.44	0.000	0.000	0.000	11.723	11.723	1.818
YTC-3/YTC-3	SE051020	SE051019	21	0.00160	6.34	0.000	0.000	0.000	11.758	11.758	1.854
YTC-3/YTC-3	SE051021	SE051020	21	0.00163	6.41	0.000	0.000	0.000	11.758	11.758	1.832
YTC-3/YTC-3	SW051022	SE051021	18	0.00420	6.81	0.000	0.000	0.000	11.723	11.723	1.720
YTC-3/YTC-3	SW051023	SW051022	18	0.00423	6.83	0.000	0.000	0.000	11.652	11.652	1.705
YTC-3/YTC-3	SW321013	NW051032	12	0.01105	3.74	0.000	0.000	0.000	11.193	11.193	2.988
YTC-3/YTC-3	SW321016	SW321013	10	0.01450	2.63	0.000	0.000	0.000	11.087	11.087	4.202
YTC-3/YTC-3	SW321017	SW321016	10	0.03236	3.94	0.000	0.000	0.000	11.017	11.017	2.794
YTC-3/YTC-3	SW321018	SW321017	10	0.00400	1.38	0.000	0.000	0.000	11.017	11.017	7.948
YTC-3/YTC-3	YTC3001	SW321018	18	0.00445	7.01	0.000	0.000	0.000	1.871	1.871	0.266
YTC-3/YTC-3	YTC3002	YTC3001	12	0.01822	4.81	0.000	0.000	0.000	1.624	1.624	0.337
YTC-3/YTC-3	YTC3003	YTC3002	12	0.02416	5.53	0.000	0.000	0.000	1.342	1.342	0.242
YTC-3/YTC-3	YTC3004	YTC3003	12	0.01487	4.34	0.000	0.000	0.000	1.059	1.059	0.243
YTC-3/YTC-3	YTC3005	YTC3004	8	0.01694	1.57	0.000	0.000	0.000	0.812	0.812	0.516

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
YTC-3/YTC-3	YTC3006	YTC3005	8	0.05034	2.71	0.000	0.000	0.000	0.530	0.530	0.195
YTC-3/YTC-3	YTC3007	YTC3006	8	0.06065	2.97	0.000	0.000	0.000	0.282	0.282	0.094
YTC-3/YTC-3	YTC3008	SW321018	21	0.00562	11.88	0.000	0.000	0.000	10.452	10.452	0.879
YTC-3/YTC-3	YTC3009	YTC3008	21	0.01778	21.13	0.000	0.000	0.000	10.452	10.452	0.494
YTC-3/YTC-3	YTC3010	YTC3009	21	0.01983	22.31	0.000	0.000	0.000	10.416	10.416	0.466
YTC-3/YTC-3	YTC3011	YTC3010	21	0.01129	16.84	0.000	0.000	0.000	10.416	10.416	0.618
YTC-3/YTC-3	YTC3012	YTC3011	21	0.03251	28.57	0.000	0.000	0.000	10.346	10.346	0.362
YTC-3/YTC-3	YTC3013	YTC3012	21	0.03397	29.21	0.000	0.000	0.000	10.311	10.311	0.353
YTC-3/YTC-3	YTC3014	YTC3013	21	0.05232	36.24	0.000	0.000	0.000	10.240	10.240	0.282
YTC-3/YTC-3	YTC3015	YTC3014	21	0.02688	25.98	0.000	0.000	0.000	10.205	10.205	0.392
YTC-3/YTC-3	YTC3016	YTC3015	21	0.04901	35.08	0.000	0.000	0.000	10.134	10.134	0.288
YTC-3/YTC-3	YTC3017	YTC3016	21	0.00833	14.46	0.000	0.000	0.000	10.205	10.205	0.705
YTC-4/YTC-4	YTC4002	YTC4PS1	15	0.00359	3.87	0.000	0.000	0.000	2.401	2.401	0.619
YTC-4/YTC-4	YTC4003	YTC4002	15	0.00483	4.49	0.000	0.000	0.000	2.260	2.260	0.503
YTC-4/YTC-4	YTC4004	YTC4003	8	0.03788	2.35	0.000	0.000	0.000	0.494	0.494	0.210
YTC-4/YTC-4	YTC4005	YTC4004	8	0.04395	2.53	0.000	0.000	0.000	0.318	0.318	0.125
YTC-4/YTC-4	YTC4006	YTC4005	8	0.07180	3.23	0.000	0.000	0.000	0.177	0.177	0.054
YTC-4/YTC-4	YTC4007	YTC4003	10	0.01400	2.59	0.000	0.000	0.000	1.624	1.624	0.626
YTC-4/YTC-4	YTC4008	YTC4007	8	0.10604	3.93	0.000	0.000	0.000	0.812	0.812	0.206
YTC-4/YTC-4	YTC4009	YTC4008	8	0.06314	3.03	0.000	0.000	0.000	0.636	0.636	0.209
YTC-4/YTC-4	YTC4010	YTC4009	8	0.01076	1.25	0.000	0.000	0.000	0.494	0.494	0.393
YTC-4/YTC-4	YTC4011	YTC4010	8	0.02762	2.00	0.000	0.000	0.000	0.318	0.318	0.158
YTC-4/YTC-4	YTC4012	YTC4011	8	0.08380	3.49	0.000	0.000	0.000	0.177	0.177	0.050
YTC-4/YTC-4	YTC4013	YTC4007	8	0.03289	2.19	0.000	0.000	0.000	0.636	0.636	0.290
YTC-4/YTC-4	YTC4014	YTC4013	8	0.02923	2.06	0.000	0.000	0.000	0.494	0.494	0.239
YTC-4/YTC-4	YTC4015	YTC4014	8	0.03490	2.25	0.000	0.000	0.000	0.318	0.318	0.140
YTC-4/YTC-4	YTC4016	YTC4015	8	0.03180	2.15	0.000	0.000	0.000	0.177	0.177	0.082
YTC-4/YTC-4	YTC4102	YTC4PS2	18	0.00421	6.82	0.000	0.000	0.000	2.860	2.860	0.419
YTC-4/YTC-4	YTC4103	YTC4102	18	0.00364	6.34	0.000	0.000	0.000	2.860	2.860	0.450
YTC-4/YTC-4	YTC4104	YTC4103	8	0.02709	1.98	0.000	0.000	0.000	0.812	0.812	0.408

MODELED PEAK WASTEWATER FLOWS

Pipe Data: Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Flow Data: Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
YTC-4/YTC-4	YTC4105	YTC4104	8	0.01494	1.47	0.000	0.000	0.000	0.636	0.636	0.430
YTC-4/YTC-4	YTC4106	YTC4105	8	0.01564	1.51	0.000	0.000	0.000	0.494	0.494	0.326
YTC-4/YTC-4	YTC4107	YTC4106	8	0.04000	2.41	0.000	0.000	0.000	0.318	0.318	0.131
YTC-4/YTC-4	YTC4108	YTC4107	8	0.04167	2.46	0.000	0.000	0.000	0.177	0.177	0.071
YTC-4/YTC-4	YTC4109	YTC4103	15	0.01973	9.07	0.000	0.000	0.000	1.977	1.977	0.217
YTC-4/YTC-4	YTC4110	YTC4109	15	0.00448	4.32	0.000	0.000	0.000	1.942	1.942	0.449
YTC-4/YTC-4	YTC4111	YTC4110	10	0.02970	3.77	0.000	0.000	0.000	1.801	1.801	0.476
YTC-4/YTC-4	YTC4112	YTC4111	10	0.01416	2.60	0.000	0.000	0.000	1.624	1.624	0.622
YTC-4/YTC-4	YTC4113	YTC4112	8	0.02620	1.95	0.000	0.000	0.000	0.812	0.812	0.415
YTC-4/YTC-4	YTC4114	YTC4113	8	0.01653	1.55	0.000	0.000	0.000	0.636	0.636	0.409
YTC-4/YTC-4	YTC4115	YTC4114	8	0.04106	2.44	0.000	0.000	0.000	0.494	0.494	0.201
YTC-4/YTC-4	YTC4116	YTC4115	8	0.02506	1.91	0.000	0.000	0.000	0.318	0.318	0.166
YTC-4/YTC-4	YTC4117	YTC4116	8	0.02970	2.08	0.000	0.000	0.000	0.177	0.177	0.085
YTC-4/YTC-4	YTC4118	YTC4112	8	0.01773	1.61	0.000	0.000	0.000	0.636	0.636	0.395
YTC-4/YTC-4	YTC4119	YTC4118	8	0.01370	1.41	0.000	0.000	0.000	0.494	0.494	0.349
YTC-4/YTC-4	YTC4120	YTC4119	8	0.03012	2.09	0.000	0.000	0.000	0.318	0.318	0.151
YTC-4/YTC-4	YTC4121	YTC4120	8	0.01661	1.55	0.000	0.000	0.000	0.177	0.177	0.113
YTC-4/YTC-4	YTC4PS1	YTC3017	8	-.03165	0.00	0.000	0.000	0.000	0.000	0.000	0.000
YTC-4/YTC-4	YTC4PS2	YTC3017	8	-.02425	0.00	0.000	0.000	0.000	0.000	0.000	0.000
YTC-5/YTC-5	YTC5102	YTC5PS1	18	0.01046	10.74	0.000	0.000	0.000	3.001	3.001	0.279
YTC-5/YTC-5	YTC5103	YTC5102	18	0.00765	9.19	0.000	0.000	0.000	2.966	2.966	0.322
YTC-5/YTC-5	YTC5104	YTC5103	18	0.00305	5.80	0.000	0.000	0.000	2.931	2.931	0.504
YTC-5/YTC-5	YTC5105	YTC5104	8	0.00623	0.95	0.000	0.000	0.000	0.706	0.706	0.740
YTC-5/YTC-5	YTC5106	YTC5105	8	0.07974	3.41	0.000	0.000	0.000	0.530	0.530	0.155
YTC-5/YTC-5	YTC5107	YTC5106	8	0.05060	2.71	0.000	0.000	0.000	0.353	0.353	0.129
YTC-5/YTC-5	YTC5108	YTC5107	8	0.01719	1.58	0.000	0.000	0.000	0.177	0.177	0.111
YTC-5/YTC-5	YTC5109	YTC5104	15	0.00406	4.11	0.000	0.000	0.000	2.119	2.119	0.514
YTC-5/YTC-5	YTC5110	YTC5109	12	0.05331	8.22	0.000	0.000	0.000	1.942	1.942	0.236
YTC-5/YTC-5	YTC5111	YTC5110	12	0.00623	2.81	0.000	0.000	0.000	1.766	1.766	0.627
YTC-5/YTC-5	YTC5112	YTC5111	8	0.01104	1.27	0.000	0.000	0.000	0.706	0.706	0.555

MODELED PEAK WASTEWATER FLOWS

Pipe Data: / Flow Data:

Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam. (in)	Pipe Slope (ft/ft)	Pipe Cap. (cfs)	Peaking Factor	Peak Sanitary (cfs)	Total Infil. (cfs)	Storm Inflow (cfs)	Peak Total (cfs)	Util. Fac.
YTC-5/YTC-5	YTC5113	YTC5112	8	0.01522	1.49	0.000	0.000	0.000	0.530	0.530	0.355
YTC-5/YTC-5	YTC5114	YTC5113	8	0.05877	2.93	0.000	0.000	0.000	0.353	0.353	0.120
YTC-5/YTC-5	YTC5115	YTC5114	8	0.00583	0.92	0.000	0.000	0.000	0.177	0.177	0.191
YTC-5/YTC-5	YTC5116	YTC5111	8	0.02500	1.91	0.000	0.000	0.000	0.883	0.883	0.462
YTC-5/YTC-5	YTC5117	YTC5116	8	0.01786	1.61	0.000	0.000	0.000	0.706	0.706	0.437
YTC-5/YTC-5	YTC5118	YTC5117	8	0.04016	2.42	0.000	0.000	0.000	0.530	0.530	0.218
YTC-5/YTC-5	YTC5119	YTC5118	8	0.01857	1.64	0.000	0.000	0.000	0.353	0.353	0.214
YTC-5/YTC-5	YTC5120	YTC5119	8	0.02550	1.93	0.000	0.000	0.000	0.177	0.177	0.091
YTC-5/YTC-5	YTC5PS1	YTC3017	8	-.02507	0.00	0.000	0.000	0.000	0.000	0.000	0.000
YTC-6/YTC-6	YTC6002	YTC6PS1	12	0.00696	2.97	0.000	0.000	0.000	1.483	1.483	0.498
YTC-6/YTC-6	YTC6003	YTC6002	10	0.07503	6.00	0.000	0.000	0.000	1.483	1.483	0.247
YTC-6/YTC-6	YTC6004	YTC6003	10	0.00495	1.54	0.000	0.000	0.000	0.989	0.989	0.641
YTC-6/YTC-6	YTC6006	YTC6004	8	0.02908	2.06	0.000	0.000	0.000	0.318	0.318	0.154
YTC-6/YTC-6	YTC6007	YTC6006	8	0.00510	0.86	0.000	0.000	0.000	0.282	0.282	0.326
YTC-6/YTC-6	YTC6008	YTC6007	8	0.03625	2.30	0.000	0.000	0.000	0.247	0.247	0.107
YTC-6/YTC-6	YTC6009	YTC6008	8	0.00502	0.85	0.000	0.000	0.000	0.212	0.212	0.247
YTC-6/YTC-6	YTC6010	YTC6009	8	0.00542	0.89	0.000	0.000	0.000	0.141	0.141	0.158
YTC-6/YTC-6	YTC6011	YTC6010	8	0.01305	1.38	0.000	0.000	0.000	0.106	0.106	0.076
YTC-6/YTC-6	YTC6012	YTC6011	8	0.08429	3.50	0.000	0.000	0.000	0.035	0.035	0.010
YTC-6/YTC-6	YTC6013	YTC6004	8	0.01295	1.37	0.000	0.000	0.000	0.706	0.706	0.513
YTC-6/YTC-6	YTC6014	YTC6013	8	0.01384	1.42	0.000	0.000	0.000	0.671	0.671	0.471
YTC-6/YTC-6	YTC6015	YTC6014	8	0.02940	2.07	0.000	0.000	0.000	0.282	0.282	0.136
YTC-6/YTC-6	YTC6016	YTC6015	8	0.02278	1.82	0.000	0.000	0.000	0.247	0.247	0.135
YTC-6/YTC-6	YTC6017	YTC6016	8	0.10143	3.84	0.000	0.000	0.000	0.177	0.177	0.046
YTC-6/YTC-6	YTC6018	YTC6017	8	0.00546	0.89	0.000	0.000	0.000	0.141	0.141	0.157
YTC-6/YTC-6	YTC6019	YTC6018	8	0.02555	1.93	0.000	0.000	0.000	0.106	0.106	0.054
YTC-6/YTC-6	YTC6020	YTC6019	8	0.00420	0.78	0.000	0.000	0.000	0.035	0.035	0.044
YTC-6/YTC-6	YTC6021	YTC6014	8	0.00841	1.10	0.000	0.000	0.000	0.353	0.353	0.318
YTC-6/YTC-6	YTC6022	YTC6021	8	0.00411	0.77	0.000	0.000	0.000	0.353	0.353	0.455
YTC-6/YTC-6	YTC6023	YTC6022	8	0.03506	2.26	0.000	0.000	0.000	0.318	0.318	0.140

MODELED PEAK WASTEWATER FLOWS

Pipe Data:					Flow Data:						
Subsystem/Lateral	Upstream Manhole	Downstream Manhole	Pipe Diam.	Pipe Slope	Pipe Cap.	Peaking Factor	Peak Sanitary	Total Infil.	Storm Inflow	Peak Total	Util. Fac.
			(in)	(ft/ft)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	
YTC-6/YTC-6	YTC6024	YTC6023	8	0.01664	1.55	0.000	0.000	0.000	0.247	0.247	0.158
YTC-6/YTC-6	YTC6025	YTC6024	8	0.03068	2.11	0.000	0.000	0.000	0.212	0.212	0.100
YTC-6/YTC-6	YTC6026	YTC6025	8	0.01587	1.52	0.000	0.000	0.000	0.141	0.141	0.092
YTC-6/YTC-6	YTC6027	YTC6026	8	0.02695	1.98	0.000	0.000	0.000	0.106	0.106	0.053
YTC-6/YTC-6	YTC6028	YTC6027	8	0.02950	2.07	0.000	0.000	0.000	0.035	0.035	0.016
YTC-6/YTC-6	YTC6029	YTC6003	8	0.00610	0.94	0.000	0.000	0.000	0.530	0.530	0.561
YTC-6/YTC-6	YTC6030	YTC6029	8	0.00525	0.87	0.000	0.000	0.000	0.530	0.530	0.605
YTC-6/YTC-6	YTC6031	YTC6030	8	0.00821	1.09	0.000	0.000	0.000	0.530	0.530	0.484
YTC-6/YTC-6	YTC6032	YTC6031	8	0.01740	1.59	0.000	0.000	0.000	0.247	0.247	0.155
YTC-6/YTC-6	YTC6033	YTC6032	8	0.00488	0.84	0.000	0.000	0.000	0.247	0.247	0.292
YTC-6/YTC-6	YTC6034	YTC6033	8	0.03337	2.20	0.000	0.000	0.000	0.212	0.212	0.096
YTC-6/YTC-6	YTC6035	YTC6034	8	0.01153	1.29	0.000	0.000	0.000	0.141	0.141	0.108
YTC-6/YTC-6	YTC6036	YTC6035	8	0.00418	0.78	0.000	0.000	0.000	0.106	0.106	0.135
YTC-6/YTC-6	YTC6037	YTC6036	8	0.02312	1.83	0.000	0.000	0.000	0.035	0.035	0.019
YTC-6/YTC-6	YTC6038	YTC6031	8	0.03110	2.13	0.000	0.000	0.000	0.247	0.247	0.115
YTC-6/YTC-6	YTC6039	YTC6038	8	0.03958	2.40	0.000	0.000	0.000	0.212	0.212	0.088
YTC-6/YTC-6	YTC6040	YTC6039	8	0.06345	3.04	0.000	0.000	0.000	0.177	0.177	0.058
YTC-6/YTC-6	YTC6041	YTC6040	8	0.00496	0.85	0.000	0.000	0.000	0.141	0.141	0.165
YTC-6/YTC-6	YTC6042	YTC6041	8	0.00208	0.55	0.000	0.000	0.000	0.141	0.141	0.255
YTC-6/YTC-6	YTC6043	YTC6042	8	0.00308	0.67	0.000	0.000	0.000	0.106	0.106	0.158
YTC-6/YTC-6	YTC6044	YTC6043	8	0.06250	3.02	0.000	0.000	0.000	0.035	0.035	0.011
YTC-6/YTC-6	YTC6PS1	YTC3017	8	-.02965	0.00	0.000	0.000	0.000	0.000	0.000	0.000

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
CIP Project: C-2-1													
C-2	SE011006	SW011090	310	0.00032	12	0.64	7.662	1,197.2	Replace	10.25	21	2.84	33,176
C-2	SE011021	PS_08	323	0.00399	15	4.08	8.263	202.4	Replace	15.19	21	10.01	46,999
C-2	SE011022	SE011021	90	0.00400	15	4.09	8.051	197.0	Replace	10.17	21	10.02	9,575
C-2	SE011023	SE011022	400	0.00395	15	4.06	7.909	194.8	Replace	7.92	21	9.95	42,028
C-2	SW011090	SE011023	375	0.00475	15	4.45	7.768	174.5	Replace	7.39	21	10.91	39,401
		Sub. Total:	1,498	(ft)								$	171,179
CIP Project: C-2-2													
C-2	NW011021	SW011018	217	0.00401	10	1.39	1.306	94.2	Replace	9.73	18	6.65	20,852
C-2	SW011010	SW011068	330	0.00400	10	1.39	2.931	211.5	Replace	9.07	18	6.64	31,710
C-2	SW011011	SW011010	325	0.01000	10	2.19	2.613	119.3	Replace	9.44	18	10.50	31,229
C-2	SW011016	SW011011	148	0.02020	10	3.11	2.260	72.6	Replace	8.18	18	14.93	14,222
C-2	SW011017	SW011016	53	0.01981	10	3.08	1.942	63.0	Replace	6.86	18	14.78	5,093
C-2	SW011018	SW011017	117	0.00402	10	1.39	1.624	116.9	Replace	6.50	18	6.65	11,242
C-2	SW011042	SW011071	330	0.00394	12	2.24	5.297	236.9	Replace	13.05	18	6.59	39,471
C-2	SW011044	SW011042	399	0.00990	12	3.55	5.014	141.4	Replace	11.28	18	10.45	42,279
C-2	SW011045	SW011044	337	0.00395	12	2.24	4.767	212.9	Replace	8.87	18	6.60	32,383
C-2	SW011051	SW011045	270	0.00859	10	2.03	4.484	220.8	Replace	6.69	18	9.73	25,945
C-2	SW011052	SW011051	415	0.00892	10	2.07	4.167	201.4	Replace	11.33	18	9.92	44,135
C-2	SW011057	SW011052	196	0.00469	10	1.50	3.849	256.4	Replace	14.22	18	7.19	25,212
C-2	SW011067	SW011057	123	0.00398	10	1.38	3.531	255.3	Replace	12.01	18	6.63	13,726
C-2	SW011068	SW011067	137	0.00423	10	1.43	3.213	225.3	Replace	9.72	18	6.83	13,165
C-2	SW011071	SE011006	330	0.02252	12	5.35	5.508	103.0	Replace	13.49	18	15.76	40,591
		Sub. Total:	3,727	(ft)								$	391,255
CIP Project: EL-1-1													
EL-1	NE082174	NE082254	190	0.00605	8	0.94	1.412	150.2	Replace	9.22	10	1.70	13,337
EL-1	NE082175	NE082174	223	0.01000	8	1.21	1.342	111.1	Replace	10.12	10	2.19	15,854
EL-1	NE082176	NE082175	37	0.00514	8	0.87	1.236	142.7	Replace	9.31	10	1.57	2,597
EL-1	NE082178	NE082176	367	0.00520	8	0.87	1.130	129.6	Replace	10.01	10	1.58	25,788
EL-1	NE082254	NE082255	23	0.01304	8	1.38	1.518	110.0	Replace	7.95	10	2.50	1,615

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
EL-1	NE082255	NW082025	655	0.00763	8	1.06	1.624	153.8	Replace	18.45	10	1.91	87,443
EL-1	NW082024	NW082023	349	0.01032	8	1.23	1.730	141.0	Replace	17.00	10	2.22	42,800
EL-1	NW082025	NW082024	342	0.00877	8	1.13	1.660	146.6	Replace	25.50	10	2.05	63,721
		Sub. Total:	2,186	(ft)								$	253,155
CIP Project:	KR-2-1												
KR-2	SW241001	SW24101A	19	0.05211	24	51.64	20.550	39.8	Replace	9.65	33	120.73	3,210
KR-2	SW241002	SW241001	330	0.00230	24	10.86	20.550	189.3	Replace	7.22	33	25.38	55,752
KR-2	SW241003	SW241002	233	0.00219	24	10.59	20.550	194.1	Replace	8.99	33	24.74	39,364
KR-2	SW241004	SW241003	98	0.00255	24	11.43	20.515	179.5	Replace	12.26	33	26.71	18,362
KR-2	SW241005	SW241004	314	0.00261	24	11.56	20.550	177.8	Replace	12.62	33	27.02	59,753
KR-2	SW241006	SW241005	453	0.00289	24	12.17	20.621	169.5	Replace	10.71	33	28.44	79,154
KR-2	SW24101A	NW251023	285	0.01123	27	32.82	9.781	29.8	Replace	10.29	33	56.04	48,823
		Sub. Total:	1,732	(ft)								$	304,418
CIP Project:	KR-2-2												
KR-2	NE261109	SE231048	402	0.00199	24	10.09	13.736	136.1	Replace	15.44	30	18.29	80,952
KR-2	NE271046	SW231140	122	0.02090	24	32.71	16.490	50.4	Replace	19.10	30	59.30	28,175
KR-2	SE231007	SE231010	224	0.03554	24	42.65	13.700	32.1	Replace	8.82	30	77.33	35,262
KR-2	SE231009	SE231007	323	0.00489	24	15.82	13.700	86.6	Replace	16.84	30	28.69	68,697
KR-2	SE231010	SW241006	95	0.00368	24	13.73	13.736	100.0	Replace	8.88	30	24.89	14,955
KR-2	SE231048	SE231110	451	0.00160	24	9.04	13.736	152.0	Replace	20.55	30	16.38	109,442
KR-2	SE231105	SE231107	269	0.00205	24	10.23	13.736	134.3	Replace	11.40	30	18.55	45,389
KR-2	SE231106	SE231105	428	0.00199	24	10.08	13.736	136.2	Replace	18.95	30	18.28	98,325
KR-2	SE231107	SE231108	205	0.00195	24	9.99	13.736	137.5	Replace	9.70	30	18.11	32,271
KR-2	SE231108	NE261109	202	0.00198	24	10.07	13.736	136.4	Replace	12.20	30	18.25	35,389
KR-2	SE231110	SE231009	339	0.00201	24	10.13	13.700	135.2	Replace	24.66	30	18.37	93,520
KR-2	SW231100	SE231106	306	0.00196	24	10.02	13.771	137.4	Replace	27.10	30	18.16	90,447
KR-2	SW231124	SW231100	294	0.00170	24	9.33	13.877	148.7	Replace	27.50	30	16.91	87,853
KR-2	SW231131	SW231124	221	0.00204	24	10.21	14.018	137.3	Replace	20.48	30	18.51	53,503
KR-2	SW231132	SW231131	273	0.00202	24	10.16	14.371	141.5	Replace	13.73	30	18.41	51,203
KR-2	SW231133	SW231132	193	0.00207	24	10.30	14.901	144.7	Replace	11.00	30	18.67	31,942
KR-2	SW231137	SW231133	411	0.00197	24	10.04	13.771	137.1	Replace	13.77	30	18.21	77,219

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
KR-2	SW231138	SW231137	396	0.00202	24	10.17	14.336	141.0	Replace	16.97	30	18.43	84,641
KR-2	SW231139	SW231138	403	0.00223	24	10.69	15.148	141.7	Replace	14.49	30	19.38	78,060
KR-2	SW231140	SW231139	380	0.00290	24	12.17	16.384	134.6	Replace	16.40	30	22.07	79,469
		Sub. Total:	5,937	(ft)								$	1,276,714
CIP Project:	KR-2-3												
KR-2	NE261001	NE261002	323	0.00161	15	2.59	5.402	208.4	Replace	12.94	21	6.35	41,337
KR-2	NE261002	NE261346	326	0.01347	15	7.50	5.402	72.1	Replace	5.75	21	18.38	34,253
KR-2	NE261049	NE261051	352	0.00398	15	4.07	5.508	135.2	Replace	18.10	21	9.99	59,201
KR-2	NE261051	NE261053	357	0.00535	15	4.73	5.508	116.6	Replace	20.91	21	11.59	67,858
KR-2	NE261053	SE231008	300	0.00400	15	4.09	5.508	134.8	Replace	15.66	21	10.02	44,751
KR-2	NE261346	NE261526	320	0.01953	15	9.03	5.438	60.2	Replace	4.28	21	22.14	33,622
KR-2	NE261525	NE261049	351	0.00399	15	4.08	5.473	134.1	Replace	12.70	21	10.00	44,263
KR-2	NE261526	NE261525	353	0.00397	15	4.07	5.473	134.5	Replace	7.40	21	9.98	37,089
KR-2	NW261149	NW261150	103	0.00155	15	2.55	5.367	210.8	Replace	8.18	21	6.24	10,822
KR-2	NW261150	NW261165	75	0.00240	15	3.17	5.402	170.7	Replace	9.80	21	7.76	7,880
KR-2	NW261163	NW261164	275	0.00160	15	2.58	5.402	209.1	Replace	19.63	21	6.33	49,528
KR-2	NW261164	NE261001	302	0.00159	15	2.58	5.402	209.8	Replace	20.89	21	6.31	57,356
KR-2	NW261165	NW261163	174	0.00126	15	2.30	5.402	235.2	Replace	13.25	21	5.63	22,689
KR-2	SE231008	SE231118	300	0.01807	15	8.68	5.544	63.8	Replace	7.92	21	21.30	31,521
KR-2	SE231100	SW241006	28	0.01750	15	8.55	5.579	65.3	Replace	7.76	21	20.96	2,941
KR-2	SE231118	SE231100	65	0.01954	15	9.03	5.579	61.8	Replace	6.02	21	22.15	6,829
		Sub. Total:	4,004	(ft)								$	551,940
CIP Project:	KR-5-1												
KR-5	SW312061	SW312058	328	0.00710	12	3.00	3.072	102.3	Replace	16.24	15	5.44	44,729
KR-5	SW312063	SW312061	165	0.00442	12	2.37	2.931	123.7	Replace	19.75	15	4.29	28,259
KR-5	SW312064	SW312063	667	0.00388	10	1.37	1.730	126.7	Replace	17.14	15	4.02	95,525
		Sub. Total:	1,160	(ft)								$	168,513
CIP Project:	KR-5-2												
KR-5	NW062053	NW062071	570	0.00111	10	0.73	1.236	169.8	Replace	13.11	15	2.14	64,158

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
KR-5	NW062071	NW062072	645	0.00206	10	1.00	1.412	141.9	Replace	11.96	15	2.93	66,958
KR-5	NW062049	NW062050	330	0.00349	8	0.71	0.989	138.7	Replace	13.87	15	3.81	35,173
KR-5	NW062050	NW062053	155	0.01194	8	1.32	1.095	83.0	Replace	13.21	15	7.05	0
		Sub. Total:	1,700	(ft)								$	166,289
CIP Project:	KR-6-1												
KR-6	SW032001	PS_25	40	0.34850	18	62.02	6.603	10.6	Replace	9.50	24	133.56	4,652
KR-6	SW032002	SW032015	94	0.00447	18	7.02	6.709	95.5	Replace	17.87	24	15.12	16,747
KR-6	SW032003	SW032002	99	0.00081	18	2.99	5.897	197.5	Replace	17.58	24	6.43	17,412
KR-6	SW032015	SW032001	350	0.00197	18	4.66	6.709	143.8	Replace	18.55	24	10.04	64,227
		Sub. Total:	583	(ft)								$	103,038
CIP Project:	NL-1-1												
NL-1	SW292050	SW292010	331	0.00139	12	1.33	2.578	194.1	Replace	11.11	12	1.32	28,351
NL-1	SE302001	SE202002	145	0.00897	8	1.14	2.295	200.6	Replace	9.19	12	3.37	11,199
NL-1	SE202002	SE302003	302	0.00474	8	0.83	1.977	237.6	Replace	8.50	12	2.45	23,325
NL-1	SE302003	SE292054	271	0.00506	8	0.86	1.624	189.1	Replace	9.32	12	2.53	20,931
NL-1	SE292054	SE292053	271	0.00554	8	0.90	1.518	168.9	Replace	10.00	12	2.65	20,931
NL-1	SE292053	SE292052	300	0.00500	8	0.86	1.518	177.5	Replace	10.00	12	2.51	23,171
NL-1	SE292052	SE292051	300	0.00500	8	0.86	1.554	181.8	Replace	10.00	12	2.51	23,171
NL-1	SE292051	SW292050	300	0.00560	8	0.90	1.589	175.8	Replace	9.44	12	2.66	23,171
		Sub. Total:	2,220	(ft)								$	174,250
CIP Project:	NL-1-2												
NL-1	NE302096	NE302097	410	0.00400	8	0.76	3.566	466.8	Replace	5.67	15	4.08	36,448
NL-1	NE302097	SE192098	400	0.00400	8	0.76	2.260	295.8	Replace	6.89	15	4.08	35,560
NL-1	NW292099	NW292169	331	0.00399	15	4.08	3.778	92.6	Replace	10.73	15	4.08	31,264
NL-1	SE192098	NW292099	409	0.00399	8	0.76	2.154	282.3	Replace	8.79	15	4.07	36,360
		Sub. Total:	1,550	(ft)								$	139,632
CIP Project:	WR-2-1												

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
WR-2	NW101147	NW101304	596	0.00371	21	9.65	11.652	120.8	Replace	11.88	24	13.77	78,120
WR-2	NW101148	NW101147	338	0.00213	21	7.31	11.652	159.3	Replace	12.71	24	10.44	46,508
WR-2	NW101149	NW101148	426	0.00282	21	8.41	11.688	139.0	Replace	13.25	24	12.00	60,425
WR-2	NW101304	NW101146	395	0.00370	21	9.63	11.688	121.3	Replace	11.01	24	13.75	49,074
WR-2	SW031023	SW031403	420	0.00505	21	11.26	11.652	103.5	Replace	13.44	24	16.07	60,202
WR-2	SW031403	NW101149	300	0.00400	21	10.02	11.688	116.6	Replace	13.05	24	14.30	42,081
		Sub. Total:	2,475	(ft)								$	336,410
CIP Project:	WR-2-2												
WR-2	NE331001	SE33155A	332	0.00919	10	2.10	2.754	131.1	Replace	8.60	12	3.41	25,642
WR-2	NE331002	NE331001	297	0.01199	10	2.40	2.613	108.9	Replace	8.37	12	3.90	22,939
WR-2	NE331003	NE331002	310	0.01819	10	2.96	2.578	87.2	Replace	9.52	12	4.80	23,943
WR-2	NE331004	NE331003	400	0.02150	10	3.21	2.542	79.1	Replace	9.80	12	5.22	30,894
WR-2	NE331005	NE331004	126	0.02071	10	3.15	2.507	79.5	Replace	9.70	12	5.12	9,731
WR-2	NW31168A	NW33167A	343	0.00399	8	0.76	2.154	281.9	Replace	9.25	12	2.25	26,491
WR-2	NW331001	NE331005	89	0.04090	10	4.43	2.472	55.8	Replace	9.72	12	7.20	6,874
WR-2	NW331002	NW331001	38	0.00421	8	0.78	2.436	310.7	Replace	9.73	12	2.31	2,935
WR-2	NW331005	NW331002	215	0.00507	8	0.86	2.401	279.2	Replace	9.80	12	2.53	16,605
WR-2	NW33125A	NW331005	300	0.01500	8	1.48	2.330	157.4	Replace	9.60	12	4.36	23,171
WR-2	NW33126A	NW33125A	274	0.02482	8	1.90	2.295	120.5	Replace	9.80	12	5.61	21,163
WR-2	NW33167A	NW33126A	445	0.02054	8	1.73	2.225	128.5	Replace	9.50	12	5.10	34,369
WR-2	SE281001	SW281001	113	0.00398	8	0.76	1.871	245.2	Replace	8.50	12	2.24	8,727
WR-2	SE331001	SE331002	98	0.02449	10	3.43	3.001	87.5	Replace	9.40	12	5.57	7,569
WR-2	SE331002	SE331003	397	0.02028	10	3.12	3.143	100.7	Replace	8.65	12	5.07	30,662
WR-2	SE33155A	SE331001	92	0.00707	10	1.84	2.860	155.3	Replace	8.95	12	2.99	7,106
WR-2	SW281001	NW31168A	113	0.00965	8	1.19	2.013	169.6	Replace	8.65	12	3.49	8,727
		Sub. Total:	3,982	(ft)								$	307,548
CIP Project:	WR-3-1												
WR-3	NE101142	NE101155	158	0.00082	24	6.49	7.097	109.3	Replace	24.27	30	11.76	43,090
WR-3	NE101143	NE101142	390	0.00080	24	6.38	7.097	111.3	Replace	20.45	30	11.56	94,324
WR-3	NE101144	NE101143	395	0.00056	24	5.34	7.133	133.6	Replace	11.08	30	9.68	65,627
WR-3	NE101155	NE101157	112	0.00080	24	6.42	7.133	111.2	Replace	22.48	30	11.63	28,925

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
WR-3	NE101157	NE101258	109	0.00083	24	6.50	7.168	110.2	Replace	22.67	30	11.79	28,316
WR-3	NE101258	NW111050	100	0.00020	24	3.20	7.239	226.2	Replace	22.82	30	5.80	26,100
WR-3	NW111003	NW111004	402	0.00095	24	6.96	7.274	104.6	Replace	18.27	30	12.61	90,144
WR-3	NW111004	NW111005	12	0.00083	24	6.53	7.309	111.9	Replace	13.47	30	11.84	2,226
WR-3	NW111005	NW111010	77	0.00091	24	6.82	7.380	108.2	Replace	10.51	30	12.36	12,439
WR-3	NW111010	NW111016	390	0.00092	24	6.87	7.415	107.9	Replace	6.72	30	12.46	61,394
WR-3	NW111050	NW111003	213	0.00094	24	6.93	7.274	104.9	Replace	22.98	30	12.57	55,871
		Sub. Total:	2,358	(ft)								$	508,456
CIP Project:	WR-3-2												
WR-3	SE031071	SE031283	600	0.00158	24	9.00	7.203	80.0	Replace	9.22	27	12.32	85,469
WR-3	SE031077	SE031071	572	0.00136	21	5.85	7.380	126.1	Replace	12.85	27	11.43	94,483
WR-3	SE031283	SE031288	266	0.00154	24	8.88	7.097	79.9	Replace	8.82	27	12.15	37,891
WR-3	SE031288	NE101144	204	0.00157	24	8.96	7.097	79.2	Replace	8.44	27	12.26	29,059
		Sub. Total:	1,642	(ft)								$	246,902
CIP Project:	WR-3-3												
WR-3	NE031087	SE031080	143	0.00804	15	5.79	6.391	110.3	Replace	18.73	18	9.42	23,367
WR-3	NE031088	NE031087	365	0.01600	15	8.17	6.215	76.1	Replace	17.93	18	13.28	57,392
WR-3	NE031089	NE031088	400	0.00800	15	5.78	6.003	103.9	Replace	16.34	18	9.39	57,992
WR-3	NE031126	NE031089	386	0.00495	15	4.54	5.826	128.2	Replace	14.80	18	7.39	51,378
WR-3	NE031156	NE031126	266	0.01293	15	7.35	5.544	75.5	Replace	12.88	18	11.94	31,467
WR-3	NE031157	NE031156	50	0.01300	15	7.37	5.297	71.9	Replace	12.14	18	11.97	5,630
WR-3	NE031158	NE031157	86	0.01291	15	7.34	5.014	68.3	Replace	13.26	18	11.93	10,426
WR-3	NE031165	NE031234	136	0.00846	12	3.28	4.202	128.3	Replace	15.08	18	9.66	18,395
WR-3	NE031178	NE031233	24	0.01292	12	4.05	3.637	89.8	Replace	14.66	18	11.94	3,168
WR-3	NE031233	NE031165	174	0.00971	12	3.51	3.919	111.6	Replace	15.41	18	10.35	23,977
WR-3	NE031234	NE031302	330	0.00900	12	3.38	4.484	132.7	Replace	13.89	18	9.96	41,609
WR-3	NE031302	NE031158	160	0.01300	12	4.06	4.732	116.5	Replace	14.16	18	11.97	20,507
WR-3	SE031070	SE031077	305	0.00784	15	5.72	7.239	126.6	Replace	15.55	18	9.29	42,360
WR-3	SE031078	SE031070	350	0.00800	15	5.78	7.062	122.2	Replace	14.98	18	9.39	47,073
WR-3	SE031079	SE031078	172	0.00802	15	5.79	6.850	118.4	Replace	16.34	18	9.41	24,936
WR-3	SE031080	SE031079	188	0.00798	15	5.77	6.638	115.0	Replace	18.40	18	9.38	30,243

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
WR-3	SE341089	SE341179	309	0.02971	12	6.14	3.072	50.0	Replace	16.31	18	18.10	44,726
WR-3	SE341090	SE341089	268	0.02202	10	3.25	2.789	85.8	Replace	10.37	18	15.58	26,517
WR-3	SE341091	SE341090	188	0.00394	10	1.38	2.542	184.9	Replace	9.54	18	6.59	18,066
WR-3	SE341179	NE031178	179	0.00849	12	3.28	3.354	102.2	Replace	17.74	18	9.68	27,884
WR-3	SE341516	SE341517	60	0.00317	10	1.23	1.977	160.3	Replace	10.28	18	5.91	5,894
WR-3	SE341517	SE341091	193	0.00549	10	1.62	2.260	139.2	Replace	9.79	18	7.78	18,545
		Sub. Total:	4,732	(ft)								$	631,552
CIP Project:	WR-6-1												
WR-6	SE12104A	SE121120	387	0.00101	24	7.18	13.277	184.8	Replace	6.68	36	21.17	69,843
WR-6	SE121059	SE121141	21	0.18143	24	96.37	12.747	13.2	Replace	9.21	36	284.13	3,790
WR-6	SE121060	SE121059	194	0.00155	24	8.90	12.606	141.7	Replace	6.73	36	26.22	35,012
WR-6	SE121117	SE121060	528	0.00104	24	7.30	12.676	173.6	Replace	7.24	36	21.53	95,289
WR-6	SE121118	SE121117	585	0.00096	24	7.00	12.888	184.1	Replace	7.61	36	20.63	105,576
WR-6	SE121119	SE121118	601	0.00100	24	7.15	13.241	185.3	Replace	7.03	36	21.07	108,465
WR-6	SE121120	SE121119	112	0.00098	24	7.09	13.206	186.3	Replace	6.58	36	20.90	20,213
WR-6	SW121051	SE12104A	364	0.00099	24	7.12	13.382	188.1	Replace	6.20	36	20.97	65,692
		Sub. Total:	2,792	(ft)								$	503,880
CIP Project:	WR-6-2												
WR-6	SW121014	SW121026	125	0.00600	12	2.76	5.438	197.0	Replace	9.44	18	8.13	12,011
WR-6	SW121026	SW121027	50	0.00640	12	2.85	5.756	202.0	Replace	10.07	18	8.40	4,832
WR-6	SW121027	SW121028	365	0.00600	12	2.76	6.109	221.3	Replace	10.43	18	8.13	36,284
WR-6	SW121028	SW121032	122	0.00598	12	2.76	6.356	230.6	Replace	9.94	18	8.12	11,723
WR-6	SW121032	SW121050	278	0.00601	12	2.76	7.309	264.6	Replace	11.19	18	8.14	29,264
WR-6	SW121050	SW121051	444	0.01644	12	4.57	7.521	164.6	Replace	9.27	18	13.47	42,664
		Sub. Total:	1,384	(ft)								$	136,778
CIP Project:	WR-6-3												
ROUTE	MH01	SE121511	193	0.00280	24	11.97	7.839	65.5	Replace	13.54	24	11.96	27,817
ROUTE	MH24	MH23	464	0.00293	24	12.25	8.828	72.1	Replace	18.44	24	12.24	84,746
ROUTE	MH23	MH22	600	0.00293	24	12.25	8.722	71.2	Replace	17.25	24	12.25	103,972

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
ROUTE	MH22	MH21	762	0.00293	24	12.24	8.616	70.4	Replace	12.75	24	12.24	105,090
ROUTE	MH21	MH20	685	0.00293	24	12.26	8.510	69.4	Replace	9.87	24	12.25	79,664
ROUTE	MH20	MH19	502	0.00293	24	12.24	8.439	68.9	Replace	9.86	24	12.24	58,381
ROUTE	MH19	MH18	611	0.00293	24	12.25	8.368	68.3	Replace	9.49	24	12.24	71,057
ROUTE	MH18	MH17	636	0.00293	24	12.24	8.298	67.8	Replace	7.06	24	12.23	73,964
ROUTE	MH17	MH16	249	0.00293	24	12.25	8.263	67.4	Replace	6.86	24	12.25	28,958
ROUTE	MH16	MH15	355	0.00378	24	13.90	8.227	59.2	Replace	7.39	24	13.90	41,286
ROUTE	MH15	MH14	677	0.00232	24	10.90	8.192	75.2	Replace	8.35	24	10.89	78,732
ROUTE	MH14	MH13	770	0.00204	24	10.22	8.086	79.2	Replace	10.42	24	10.21	92,091
ROUTE	MH13	MH12	687	0.00192	24	9.92	7.909	79.8	Replace	10.86	24	9.91	84,539
ROUTE	MH12	MH01	553	0.00226	24	10.76	7.733	71.9	Replace	11.65	24	10.75	71,485
C-2	PS_08	MH24	344	0.00294	24	12.26	8.969	73.2	Replace	18.01	24	12.25	61,666
		Sub. Total:	8,088	(ft)								$	1,063,448
CIP Project:	YTC-1-1												
YTC-1	NE091005	SE091004	616	0.00154	27	12.16	29.696	244.2	Replace	14.85	42	39.51	164,945
YTC-1	NW091001	NE091005	578	0.00291	24	12.20	29.696	243.4	Replace	15.81	42	54.25	159,510
YTC-1	NW091002	NW091001	600	0.00243	24	11.16	29.660	265.8	Replace	13.09	42	49.63	151,642
YTC-1	NW091003	NW091002	600	0.00250	24	11.31	29.625	261.9	Replace	14.59	42	50.31	159,329
YTC-1	NW091004	NW091003	600	0.00250	24	11.31	29.554	261.3	Replace	14.02	42	50.31	156,408
YTC-1	NW091005	NW091004	600	0.00250	24	11.31	29.519	261.0	Replace	12.50	42	50.31	148,619
YTC-1	NW091006	NW091005	600	0.00250	24	11.31	29.484	260.6	Replace	13.35	42	50.31	152,974
YTC-1	NW091007	NW091006	240	0.00250	24	11.31	29.378	259.7	Replace	14.63	42	50.31	63,813
YTC-1	NW091501	NW091007	176	0.00114	24	7.63	29.307	384.3	Replace	14.46	42	33.91	46,542
YTC-1	NW091502	NW091501	346	0.00142	24	8.51	29.237	343.4	Replace	16.09	42	37.86	96,312
YTC-1	SE051001	SE05101A	169	0.01373	24	26.51	29.060	109.6	Replace	14.17	42	117.89	44,271
YTC-1	SE05101A	NW091502	443	0.00244	24	11.17	29.237	261.7	Replace	16.62	42	49.68	125,318
YTC-1	SE091001	SE091500	600	0.00172	27	12.83	29.519	230.0	Replace	9.32	42	41.69	135,808
YTC-1	SE091002	SE091001	600	0.00155	27	12.19	29.519	242.1	Replace	10.44	42	39.61	138,062
YTC-1	SE091003	SE091002	600	0.00153	27	12.13	29.590	244.0	Replace	10.66	42	39.39	139,189
YTC-1	SE091004	SE091003	605	0.00154	27	12.14	29.625	244.0	Replace	10.49	42	39.44	139,472
YTC-1	SE091500	SW101155	600	0.00170	27	12.77	29.484	230.9	Replace	9.34	42	41.48	135,808
WR-2	SE101058	PS_09SC	52	0.00577	30	31.16	37.181	119.3	Replace	17.00	42	76.42	14,880
WR-2	SE101150	SE101058	60	0.00250	27	15.49	29.449	190.2	Replace	17.18	42	50.31	17,260

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
WR-2	SE101151	SE101150	600	0.00207	27	14.08	29.378	208.6	Replace	16.68	42	45.74	170,039
WR-2	SE101152	SE101151	600	0.00513	27	22.19	29.378	132.4	Replace	14.47	42	72.09	158,714
WR-2	SW101153	SE101152	600	0.00172	27	12.83	29.413	229.2	Replace	12.42	42	41.69	148,208
YTC-1	SW101154	SW101153	600	0.00170	27	12.77	29.484	230.9	Replace	11.39	42	41.48	142,931
YTC-1	SW101155	SW101154	600	0.00172	27	12.83	29.484	229.7	Replace	10.37	42	41.69	137,704
		Sub. Total:	11,685	(ft)								$	2,947,758
CIP Project:	YTC-2-1												
YTC-2	NE051009	SE051008	400	0.00113	18	3.52	17.655	501.0	Replace	9.93	36	22.37	72,189
YTC-2	SE051002	SE051001	396	0.01831	18	14.21	17.620	124.0	Replace	9.86	36	90.25	71,468
YTC-2	SE051003	SE051002	600	0.00583	18	8.02	17.514	218.3	Replace	7.35	36	50.94	108,284
YTC-2	SE051004	SE051003	299	0.03345	18	19.21	17.443	90.8	Replace	13.00	36	121.99	61,333
YTC-2	SE051005	SE051004	384	0.00175	18	4.39	17.373	395.9	Replace	14.62	36	27.86	83,881
YTC-2	SE051006	SE051005	400	0.00140	18	3.93	17.373	441.9	Replace	11.45	36	24.95	76,955
YTC-2	SE051007	SE051006	400	0.00140	18	3.93	17.408	442.8	Replace	10.74	36	24.95	74,621
YTC-2	SE051008	SE051007	400	0.00088	18	3.11	17.549	564.6	Replace	10.58	36	19.73	74,096
		Sub. Total:	3,279	(ft)								$	622,827
CIP Project:	YTC-2-2												
YTC-2	NE051010	NE051009	402	0.01294	12	4.05	17.549	433.1	Replace	8.55	30	46.65	63,283
YTC-2	NE051011	NE051010	401	0.00429	12	2.33	17.443	747.7	Replace	7.69	30	26.86	63,126
YTC-2	NE051012	NE051011	402	0.00430	12	2.34	17.337	741.8	Replace	7.42	30	26.90	63,283
YTC-2	NE051013	NE051012	403	0.00432	12	2.34	17.267	737.6	Replace	8.73	30	26.95	63,441
YTC-2	NE051014	NE051013	403	0.00429	12	2.34	17.161	734.9	Replace	11.00	30	26.87	66,697
YTC-2	NE051015	NE051014	403	0.00429	12	2.34	17.019	728.9	Replace	11.44	30	26.87	68,130
YTC-2	SE321001	NE051015	401	0.00574	12	2.70	16.843	624.0	Replace	10.85	30	31.06	65,880
		Sub. Total:	2,815	(ft)								$	453,840
CIP Project:	YTC-3-1												
YTC-3	SE051015	SE051001	308	0.01542	15	8.02	11.935	148.8	Replace	13.51	30	50.94	57,220
YTC-3	SE051016	SE051015	222	0.01509	15	7.94	11.899	149.9	Replace	11.86	30	50.39	38,285
YTC-3	SE051017	SE051016	161	0.01149	16	8.23	11.829	143.8	Replace	13.08	30	43.97	29,351

Model Name: red2025

CIP RELIEF SEWER COST DETAIL

Sewer Segment			Existing Sewer Data						Relief Sewer Data				
Subsystem	Upstream Manhole	Downstream Manhole	Sewer Length	Slope	Existing Diameter	Existing Capacity	Design Flow	Percent Utilization	Relief Type	Average Depth	Pipe Diam	Pipe Capacity	Construction Cost
			(ft)	(ft/ft)	(in)	(cfs)	(cfs)	(Q_tot/cap)		(ft)	(in)	(cfs)	($)
YTC-3	SE051018	SE051017	487	0.00162	21	6.38	11.794	184.8	Replace	14.54	30	16.52	94,528
YTC-3	SE051019	SE051018	393	0.00165	21	6.45	11.758	182.4	Replace	13.18	30	16.68	71,964
YTC-3	SE051020	SE051019	606	0.00160	21	6.34	11.794	186.0	Replace	11.97	30	16.41	105,043
YTC-3	SE051021	SE051020	561	0.00164	21	6.42	11.794	183.8	Replace	9.87	30	16.61	88,313
		Sub. Total:	2,738	(ft)								$	484,704
CIP Project:	YTC-3-2												
YTC-3	NW051024	SW051023	404	0.00396	18	6.61	11.652	176.3	Replace	9.45	27	19.49	57,549
YTC-3	NW051025	NW051024	397	0.00423	18	6.83	11.652	170.5	Replace	9.37	27	20.14	56,552
YTC-3	SW051022	SE051021	397	0.00421	18	6.81	11.758	172.6	Replace	9.15	27	20.09	56,552
YTC-3	SW051023	SW051022	397	0.00423	18	6.83	11.723	171.5	Replace	9.19	27	20.14	56,552
		Sub. Total:	1,595	(ft)								$	227,205
CIP Project:	YTC-3-3												
YTC-3	NW051026	NW051025	400	0.00830	15	5.89	11.582	196.8	Replace	9.76	24	20.61	46,519
YTC-3	NW051027	NW051026	390	0.00831	15	5.89	11.546	196.1	Replace	11.21	24	20.62	49,065
YTC-3	NW051028	NW051027	402	0.00781	15	5.71	11.511	201.6	Replace	11.67	24	19.99	52,029
YTC-3	NW051029	NW051028	399	0.01073	12	3.69	11.440	310.0	Replace	9.44	24	23.43	46,402
YTC-3	NW051030	NW051029	224	0.01165	12	3.85	11.405	296.5	Replace	7.23	24	24.42	26,051
YTC-3	NW051031	NW051030	385	0.01182	12	3.87	11.370	293.6	Replace	6.85	24	24.59	44,775
YTC-3	NW051032	NW051031	383	0.01183	12	3.88	11.335	292.5	Replace	6.46	24	24.60	44,542
YTC-3	SW321013	NW051032	389	0.01105	12	3.75	11.335	302.6	Replace	6.70	24	23.78	45,239
YTC-3	SW321016	SW321013	400	0.01450	10	2.64	11.299	428.3	Replace	6.05	24	27.24	46,519
YTC-3	SW321017	SW321016	473	0.03237	10	3.94	11.264	285.7	Replace	6.05	24	40.70	55,009
YTC-3	SW321018	SW321017	350	0.00400	10	1.39	11.264	812.7	Replace	7.05	24	14.30	40,704
		Sub. Total:	4,195	(ft)								$	496,854
		Total:	80,057	(ft)								$	12,668,545

Executive Summary

1. Purpose

The purpose of this report is to present the results of a comprehensive wastewater master planning evaluation of the City of Lawrence wastewater system. The recommended improvements plan presented herein will serve as a master plan basis for the design, construction, and financing of facilities to meet anticipated regulatory requirements, residential and commercial growth, and system reliability needs for the design year of 2025. Implementation of the recommended improvements will provide an adequate and dependable wastewater system for the City of Lawrence through the year 2025.

2. Study Area and Scope

The Study Area for this investigation and report is shown in Figure I-1. The boundaries of the Study Area were delineated by the City of Lawrence Planning Department. The boundaries are as follows:

- Existing City Limits: City Limits of the City of Lawrence as of year 2000.
- Study Area Limits: The anticipated extent of the year 2025 Urban Growth Area (UGA) as established by the City for the *2025 Transportation Plan.*

The study period for this master plan investigation is from year 2000 through the year 2025. Detailed evaluations of the wastewater system were conducted for the design years 2000, 2010, and 2025.

The Principle elements of the study include the following:

- Review regulatory discharge limits for the Wakarusa River. Determine service area and wastewater flows for a possible wastewater treatment plant located at the Wakarusa River.
- Conduct wastewater treatment plant (WWTP) and collection system analysis to determine feasibility of expanding the Kansas River WWTP or implementing a new Wakarusa River WWTP.
- Review flow metering and rainfall monitoring data provided by the City to determine system flow characteristics.
- Create a trunk sewer inventory for modeling based on existing GIS data provided by the City.

- Develop and calibrate a HydroWorks computer model of the Lawrence sewer system using the trunk sewer inventory.

- Analyze the sewer system for current conditions.

- Define and evaluate alternatives to serve future growth as projected by the Lawrence-Douglas County Planning Office. Create hydraulic models for design years 2010 and 2025.

- Define and evaluate collection system alternatives to serve ultimate build-out conditions for the City of Lawrence.

- Recommend improvements for the collection system facilities and update the wastewater collection system improvements plan.

3. Population and Wastewater Flows

Estimated year 2000 and projected wastewater service population used for this report are summarized in Table ES-1. Population projections were developed by the Lawrence-Douglas County Metropolitan Planning Office.

Table ES-1
Wastewater Service Population

Year	Population	Population Growth	
		Persons	% (Annual)
2000	80,098(1)		
2010	99,600(2)	19,502	2.2
2025	149,278(3)	49,678	2.7
2050	244,906(4)	95,628	2.0

(1) U.S. Census Bureau population for City of Lawrence, Kansas
(2) Based on spatial analysis of population by TAZ provided by Lawrence-Douglas County Metropolitan Planning Office within assumed year 2010 retail water service limits and excluding population within wholesale water districts
(3) Projection by Lawrence-Douglas County Metropolitan Planning Office for UGA
(4) Projection developed for this report based on 2% per year growth rate from 2025 through 2050

The relative range of population growth by wastewater subbasin area is shown on Figures I-3 and I-4. Figure I-3 shows the difference in population from year 2000 to year 2010 and Figure I-4 shows the difference in population from year 2010 to 2025. As shown on these figures, the largest amount of population growth is projected in west Lawrence and south of the Wakarusa River.

The current annual average capacity of the Kansas River Wastewater Treatment Plant is 12.5 million gallons per day (mgd). The year 2025 annual average wastewater flow projected for two wastewater treatment plant (WWTP) scenarios is summarized as follows:

Scenario 1 - All Flow to Existing Kansas River WWTP

- Kansas River WWTP – 18.8 mgd

Scenario 2 - Flow to Wakarusa River and Kansas River WWTP's

- Wakarusa River WWTP – 6.9 mgd
- Kansas River WWTP – 11.9 mgd

4. Wastewater Collection and Treatment Alternatives

An evaluation was conducted to compare wastewater collection and treatment alternatives, based on wastewater treatment plant location, and recommend the best collection and treatment configuration for final basis of the Wastewater Master Plan. Three wastewater treatment plant (WWTP) locations were considered to determine the recommended wastewater system configuration. The evaluation was based on design year 2025 population and land use projections and includes all projected wastewater flows for the study area. Treatment systems were based on anticipated future regulatory requirements obtained from the Kansas Department of Health and Environment (KDHE).

Alternative 1, shown in Figure II-1, consists of routing all wastewater flow for the study area to the existing Kansas River WWTP. The existing WWTP would need to be upgraded and expanded to a capacity of 18.8 mgd. Alternative 2, shown in Figure II-2, is based on dividing the study area and conveying part of the flow to the existing Kansas River WWTP and the remaining flow to a proposed Wakarusa River WWTP (Site A). The plant capacities for the Kansas River and Wakarusa River WWTP's would be 11.9 mgd and 6.9 mgd, respectively. Alternative 3, shown in Figure II-3, is similar to Alternative 2, however, a different site (Site B) was used for the proposed Wakarusa River WWTP. The selection of two Wakarusa WWTP sites was made to allow consideration of differing project costs due to site location, however, a Wakarusa WWTP could be located in many different locations along the Wakarusa River.

Anticipated future regulatory requirements for the Kansas River and the Wakarusa River were received from KDHE. The requirements were based on the National Nutrient Strategy developed by the Environmental Protection Agency (EPA). The strategy presents recommended water quality on an Ecoregion basis, which for Region IX, includes the Kansas and Wakarusa Rivers. In order to meet the new EPA nutrient strategy, biological nutrient removal facilities will be required for wastewater treatment at both the Kansas and Wakarusa Rivers. In addition, the wastewater treatment requirements will be the same for discharges to either the Kansas River or the Wakarusa River. KDHE has indicated facilities for both the Kansas and Wakarusa Rivers must meet the following biological nutrient removal requirements:

Biological Nutrient Removal Requirements
Total Phosphorous < 1.5 mg/L
Total Nitrogen < 10.0 mg/L
Ammonia Nitrogen < 1.0 mg/L

An additional requirement for a Wakarusa River discharge is that an anti-degradation review process must be completed before a National Effluent Discharge Elimination (NPDES) permit is issued for the Wakarusa River. KDHE has indicated that this review process will most likely not prevent an NPDES permit from being issued to the City of Lawrence for the Wakarusa River. Therefore, it appears that wastewater treatment plant discharges to the Wakarusa River are viable from a regulatory standpoint.

Alternative 3 has the lowest capital cost and the lowest present worth as shown in the cost-effectiveness analysis, Appendix E. A distinct difference is shown for the present worth of the capital costs. The ranking of alternatives by present worth of capital costs is shown below.

Ranking by Present Worth of Capital Costs

Ranking	Alternative Description	Present Worth	Difference from Alt. 3
1	Alt. 3 – Wakarusa WWTP (Site B)	$48,400,000	
2	Alt. 2 – Wakarusa WWTP (Site A)	$52,000,000	7.4%
3	Alt. 1 – Kansas River WWTP	$56,600,000	16.9%

From a cost standpoint, master planning alternatives may be considered similar if the difference in present worth is less than 10 percent. Based on capital costs only, Alternative 1 is not equivalent to the Wakarusa Alternatives 2 and 3. Alternative 3 has the lowest capital cost, however, Alternative 2 should be given consideration since the capital cost difference is less than 10 percent.

Alternative 3 has the lowest total present worth considering both project and operation and maintenance costs. The ranking of alternatives by present worth cost of both capital and operation and maintenance costs is shown below:

Ranking by Present Worth of Capital and O&M Costs

Ranking	Alternative Description	Present Worth	Difference from Alt. 3
1	Alt. 3 – Wakarusa WWTP (Site B)	$74,300,000	
2	Alt. 2 – Wakarusa WWTP (Site A)	$78,200,000	5.3%
3	Alt. 1 – Kansas River WWTP	$82,000,000	10.4%

The difference in total present worth cost between Alternatives 1 and 3 is larger than 10 percent, so Alternative 1 would still not be considered similar to Alternative 3. The difference in present worth between Alternatives 2 and 3, at 5.3 percent, is close enough that both plant locations should be given consideration, however, Alternative 3 is the best option from a cost standpoint.

Alternative 3 – Wakarusa WWTP (Site B) is the most cost-effective option for the City of Lawrence and, at present, does not appear to have any fatal flaws with respect to additional issues presented in Table II-5.

Consideration should also be given to the long-term expansion of the City wastewater system. After the year 2025, further expansion of the Kansas River WWTP beyond that shown for Alternative 1 would be extremely difficult. Additional space for expansion within the existing plant layout would not be available, therefore, any future expansion after 2025 would likely require a separate treatment plant located adjacent to the existing plant. The collection system would also need to be expanded with parallel pipelines in congested areas to route flow from west and south Lawrence to the existing plant.

In a similar fashion, consideration should also be given to the impact of implementing a Wakarusa River WWTP after 2025 if Alternative 1 – Kansas River WWTP is selected now. If a Wakarusa River WWTP is implemented after 2025, a significant amount of collection system infrastructure would be constructed for Alternative 1 that would not be needed after the year 2025. Alternative 1 collection system improvements that would be unused after 2025 include the 31st Street Relief Sewer, Wakarusa Pumping Station 5C and Force Main 5C, and most of the force main for Wakarusa South Pumping Station WRS-1. The capital cost for these collection system facilities which would not be used after 2025 is $19,200,000.

Based on capital and present worth costs, review of additional issues, and long-term wastewater expansion issues beyond 2025, the recommended plan is Alternative 3 – Wakarusa River WWTP (Site B). It is recommended that collection system improvements proceed on the basis of routing flow for part of the collection system to a future Wakarusa River WWTP. The Four Seasons Holding Basins should be used as a wet-weather handling facility for all Wakarusa River WWTP service area flow originating north of the Wakarusa River. It is also recommended that studies be conducted of the additional issues including environmental, cultural resource, and flood plain impact assessments to determine the best and most favorable location for a Wakarusa River WWTP site.

5. Collection System Findings and Recommendations

This section summarizes collection system findings and recommendations for the Wastewater Master Plan.

5.1 Summary

A sanitary sewer flow and rainfall monitoring program was conducted by the Lawrence Utility Department for portions of the existing Lawrence wastewater collection system. The flow and rainfall data provided by the City was used in this master planning effort to determine system flow rates, to evaluate the rates of infiltration and inflow (I/I), and to calibrate a computer model of the Lawrence wastewater system. Six open channel flow meters and four rain gauges were installed in the study area and monitored during April and May 2000.

The City provided Black & Veatch with GIS databases that contained information on trunk sewer lines and manholes within the City limits. The trunk sanitary sewer computer model consists of approximately 87.9 miles (464,000 feet) of sewer pipe ranging in size from 8 inches to 48 inches in diameter. The trunk sewer inventory data was imported into Black & Veatch's Sanitary Sewer Management System (SSMS) to create a computerized hydraulic model.

The existing model inventory and planned collection system and wastewater treatment improvements comprise the future model inventory. Hydraulic capacity analyses were performed to identify sewers, pump stations, and force mains with insufficient capacity for future growth peak flows. Projected future growth peak flows assume the successful completion of a 20 percent I/I removal program. The analyses were then used to develop an Implementation Plan to address improvements and the phasing of the improvements.

5.2 Findings

Flow and rainfall monitoring showed that the levels of I/I in the collection system during storms had decreased since the 1995 Wastewater Master Plan flow and rainfall monitoring program. Sewer rehabilitation efforts by the City have reduced the number of defects through the rehabilitation program. The 1995 Wastewater Master Plan called for 30 percent removal. After review and evaluation of the successful decrease in I/I, it was estimated that the goal should be revised to 20 percent I/I removal to reflect the improvements made with I/I removal.

The results of the hydraulic modeling indicate that the Alabama pump station (PS-8) is currently overloaded. This was confirmed in conversations with City Staff. Since space to expand this pump station is limited, the preferred alternative is to redirect flow from the pump station to another subbasin by a gravity sewer line.

Based on future growth patterns, the existing treatment plant capacity, and the hydraulic modeling undertaken for current and future planning years, three alternatives were evaluated for future collection system configurations. In one alternative, all wastewater is conveyed to the existing treatment plant. In the other two alternatives, most additional future flow is to be conveyed to the proposed Wakarusa River WWTP.

5.3 Recommendations

It is recommended that the Alabama Pump Station be abandoned and a gravity sewer line be installed to redirect this flow to another subbasin.

The City's current Infiltration and Inflow (I/I) removal program should be continued. Future improvements and alternatives assume that 20% of the I/I will be removed from the existing system.

It is recommend that most additional future flow be conveyed for treatment at a new Wakarusa River WWTP located south of the Wakarusa River. Flow from the Yankee Tank Creek Basin will be conveyed from the Four Seasons Pumping Station to the new WWTP via a new force main.

Recommended collection system improvement projects are shown in Table IV-4 and on Figure IV-1.

6. Wastewater Treatment Plant Findings and Recommendations

This section summarizes wastewater treatment plant findings and recommendations for the Wastewater Master Plan.

6.1 Kansas River WWTP Improvements

Several improvements will be required for the Kansas River WWTP to meet regulatory requirements and maintain system reliability. Capacity expansion is not required for liquid treatment because City growth requirements will be accommodated with the implementation of a new Wakarusa River WWTP in the year 2011. Capacity expansion is required for solids treatment because the existing anaerobic digester capacity will be exceeded. Anaerobic digester improvements will consist of converting the existing anaerobic digester storage tank to a secondary digester with gas mixers and a floating cover, expanding the gas control building, and upgrading the digester SCADA system to current City standards.

The existing dissolved air flotation (DAF) thickener is designed to normally operate on a continuous 24-hour basis without polymer addition to thicken waste activated sludge (WAS). The DAF was sized for an annual average flow capacity of 12.5 mgd to the treatment plant. With polymer addition, the DAF is sized to process maximum month WAS quantities at 12.5 mgd design within an 8 hour period per day. Without polymer addition, it is anticipated that the DAF thickener will reach its design capacity by the year 2009. However, with polymer addition, the

DAF should be capable of thickening WAS during the interim period of 2009 to 2011, prior to start-up of the new Wakarusa River WWTP in 2011. Once the Wakarusa River WWTP starts operation, the existing DAF will have capacity to thicken WAS on a 24-hour basis, without polymer addition, during the design period of 2012 to 2025.

It is anticipated that future regulations will require the addition of biological nutrient removal (BNR) facilities for total nitrogen removal and phosphorous removal. KDHE indicated the liquid treatment facilities will need to be upgraded to meet a total nitrogen limit of 10 mg/L, an ammonia limit of 1 mg/L, and a phosphorous limit of 1.5 mg/L. The timetable for these regulatory improvements has not been dictated by KDHE at this time; therefore, a speculative timeframe for BNR improvements at the Kansas River WWTP is approximately the year 2015. BNR improvements would consist of external BNR basins for Aeration Basin No.s 1 and 2, BNR modifications internal to Aeration Basin No.s 3 and 4, and a fermentor/gravity thickener for primary sludge to produce volatile fatty acids for the BNR process.

New facility improvements required for the Kansas River WWTP are as follows:

- Anaerobic Digester Improvements
- Roof for Dewatered Biosolids Storage Basin
- Vehicle and Equipment Storage Building
- Biological Nutrient Removal Facilities

6.2 Wakarusa River WWTP Improvements

It is recommended to implement a new Wakarusa River WWTP to meet the growth requirements for the City of Lawrence and effectively comply with future regulatory requirements. As described in the WWTP evaluation section of this Master Plan, it is the best and most cost-effective solution to implement a Wakarusa River WWTP rather than conveying and treating all wastewater flow at the Kansas River WWTP. The Wakarusa River WWTP would be designed to accommodate all flow from west Lawrence that is pumped from the Four Seasons Pumping Station and all flow conveyed from south of the Wakarusa River.

Based on population projections, it is projected that a 6.9 mgd (annual average) WWTP will be required to meet 2025 growth projections for the service area. The WWTP should be designed with BNR facilities and contain space in the hydraulic profile for filtration facilities, if required in the future. The Four Seasons Pumping Station will pump flow directly to the WWTP for the west Lawrence service area. It is anticipated the design capacity of the existing Kansas River WWTP will be reached in the year 2011, therefore, the new Wakarusa River WWTP should be constructed and in service by the year 2011. A septage receiving facility should be provided at the WWTP to serve residential and commercial customers located south of the Wakarusa River.

It is recommended that studies be conducted of plant site issues including environmental, cultural resource, and flood impact assessments to determine the best and most favorable location for a Wakarusa River WWTP site. These studies should commence immediately so that adequate time is allowed to study, identify, and purchase the land for the Wakarusa River WWTP site. Sufficient land should be procured to allow for future WWTP expansions and provide an adequate buffer zone to residential and commercial development.

6.3 Project Costs and Implementation Plan

All costs presented within this report are Opinions of Probable Project Cost and have been developed from previous Black & Veatch projects of similar size and scope. All collection system related improvements including pipelines, storage facilities and pumping stations include a 20 percent allowance for contingencies and 20 percent allowance for engineering, legal and administrative (ELA) costs. All wastewater treatment plant related improvements include a 25 percent allowance for contingencies and 20 percent allowance for engineering, legal and administrative costs.

The overall wastewater system capital costs, in 2003 dollars, for the 2025 planning period are summarized in Table ES-2. Wastewater treatment plant improvements indicated below include a new 6.9 mgd Wakarusa River WWTP, with biological nutrient removal and biological nutrient removal improvements for the existing 12.5 mgd Kansas River WWTP.

Capital Cost Summary of Implementation Plan
Table ES-2

	Capital Cost ($)
Gravity Sewers	$18,059,000
Pump Stations and Force Mains	$11,607,000
Sewer Extensions (City Developed) [1]	$7,079,000
I/I Reduction Program	$650,000
Wastewater Treatment Plant Improvements	$70,570,000
CMOM	$200,000
General Improvements	$1,500,000
Total	$109,665,000

[1]City developed sewer extensions only include extension projects E-WRS-3-01, E-WRS-4-01, E-WRS-5-01, E-WRS-5-05, E-WRS-6-01, E-NL3PS1, and E-FM-NL3.

A detailed wastewater system implementation plan containing capital costs by planning year is shown in Table IV-4.

SECTION I – GENERAL

1.0 Introduction

1.1 Purpose

The purpose of this report is to provide the City of Lawrence with a comprehensive master planning evaluation of the City's wastewater system. The recommended plan presented herein addresses the design, construction, and financing of facilities to meet anticipated regulatory requirements, residential and commercial growth, and system reliability needs for the City of Lawrence. Implementation of the recommended improvements will provide an adequate and dependable wastewater system for existing and future customers.

1.2 Study Area and Scope

The Study Area for this investigation and report is shown on Figure I-1. The boundaries of the Study Area were delineated by the City of Lawrence Planning Department. The boundaries are as follows:

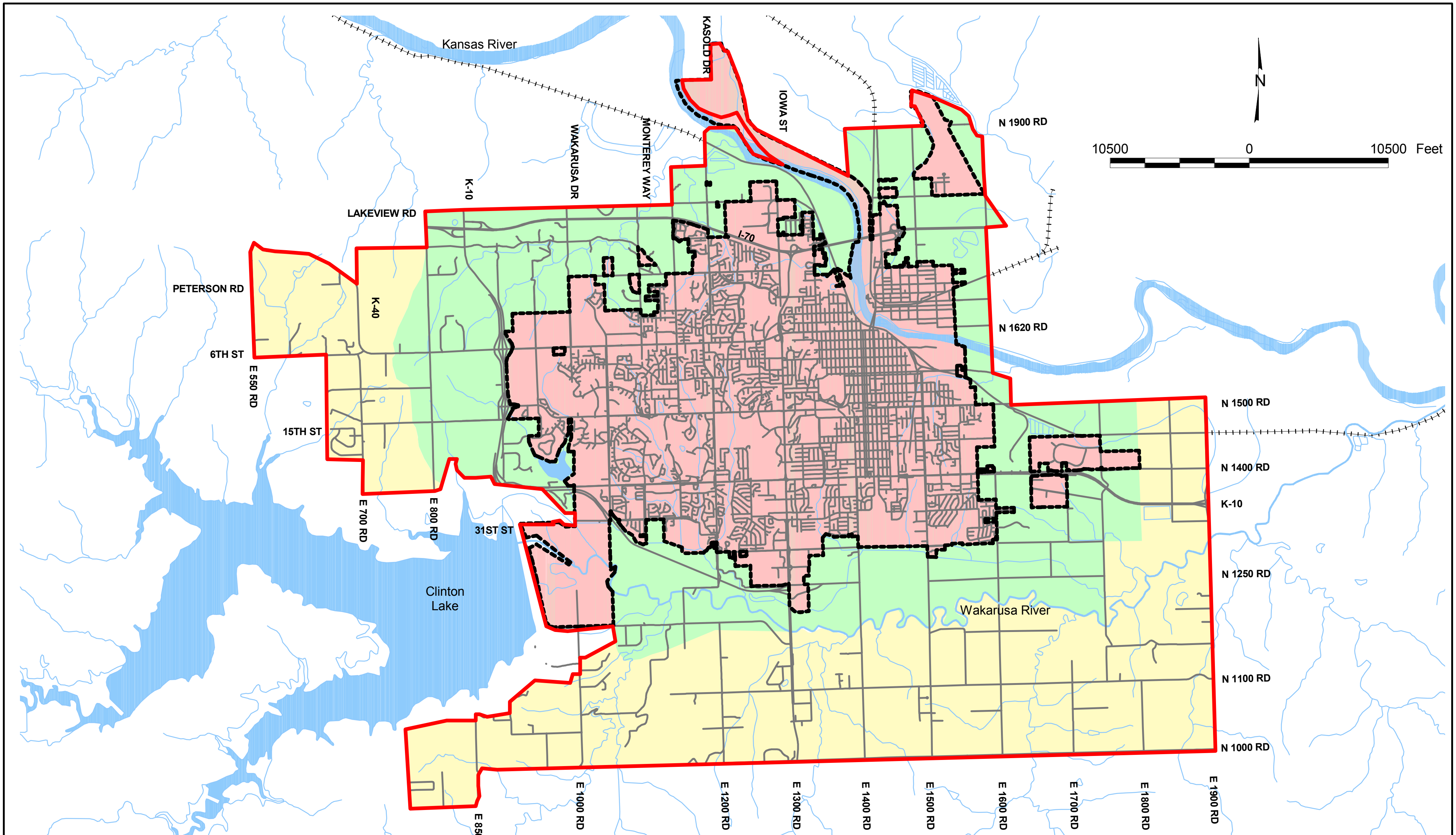
- Existing City Limits: City Limits of the City of Lawrence as of year 2000.
- Study Area Limits: The anticipated extent of the year 2025 Urban Growth Area (UGA) as established by the City for the *2025 Transportation Plan*.

The study period for this investigation is from year 2000 through the year 2025. Detailed evaluations of the wastewater system were conducted for year 2000, 2010, and 2025. Alternative collection system configurations were evaluated to serve future growth.

The principal elements of this study include the following:

- Review regulatory discharge limits for Wakarusa River. Determine service area and flows for a possible future wastewater treatment plant located at the Wakarusa River.
- Conduct wastewater treatment plant (WWTP) and collection system analysis to determine feasibility of expanding the Kansas River WWTP or implementing a new Wakarusa River WWTP.
- Analyze flow and rainfall data for the flow meters at six locations and determine average daily dry weather flow, average annual flow, infiltration and inflow rates, and total peak flow.
- Prepare flow projections for each subbasin based on future land use, population projections, and flow and rainfall evaluation.
- Create trunk sewer inventory for updating the 1995 Master Plan computer model.

- Develop and calibrate a Hydroworks computer model based on updated inventory and previous flow monitoring data.
- Analyze the existing system for the selected design condition using the updated model.
- Define and evaluate alternative collection system configurations for future growth and ultimate build-out of each subbasin including routing flow from the Alabama and Wakarusa Pumping Stations.
- Recommend size and capabilities for Wakarusa Pumping Station 5C and force main including schedule and phasing considerations.
- Update relief sewer improvement projects and some extensions, cost estimates for all recommended improvements, update on current status of I/I control program, and update of trunk sewer map.



Legend

Wastewater Service Limits

- Existing
- Year 2010
- Year 2025

Lawrence 2000 City Limits

Year 2025 Urban Growth Area

City of Lawrence, Kansas
Wastewater Master Plan
2003

STUDY AREA

Figure I - 1

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1.3 Abbreviations

The Abbreviations used in this report are as follows:

BAT	Best Available Technology
$CaCO_3$	Calcium carbonate
CIP	Capital Improvements Program
CPE	Comprehensive Performance Evaluation
DOC	Dissolved organic carbon
EPA	United States Environmental Protection Agency
ft	Feet
gals/sq ft	Gallons per square foot
GIS	Geographical Information System
gpcd	gallons per capita per day
gpm	gallons per minute
HGL	Hydraulic Grade Line
Hp	Horsepower
I/C/I	Industrial/Commercial/Institutional
I/I	Inflow and Infiltration
in	Inch
KDHE	Kansas Department of Health and Environment
L	Liter
Lawrence Planning Office	Lawrence-Douglas County Metropolitan Planning Office
MGal	Million gallons
mg/L	Milligrams per liter
mgd	Million gallons per day
pCi/L	Picocuries per liter
rpm	Revolutions per minute
SCADA	Supervisory Control and Data Acquisition
TAZ	Traffic Analysis Zone
UGA	(Year 2025) Urban Growth Area
USGS	United States Geological Survey
WWTP	Wastewater Treatment Plant

2.0 Population, Employment, and Land Use

2.1 General

Development of a comprehensive water system master plan begins with an evaluation of the area's historical population trends and projected growth patterns. To accurately predict future water demands, it is necessary to determine the magnitude, direction, and characteristics of future population growth.

The study years for this project include 2000 (existing), 2010, and 2025. In addition, ultimate build-out was considered in the extension watersheds.

2.2 Population

2.2.1 Historical Population

Historical population data for the City of Lawrence (City) was obtained from the U.S. Census Bureau and is summarized in Table I-2.

Table I-2
City of Lawrence Population

Year	Population (1)	Population Growth	
		Incremental Population Increase	Avg. per Year (%)
1960	32,858		
1970	45,698	12,840	3.9
1980	52,738	7,040	1.5
1990	65,608	12,870	2.4
2000	80,098	14,490	2.2

(1) U.S. Census Bureau population for the City of Lawrence, Kansas.

2.2.2 Wastewater Service Population

The City's wastewater service population is limited to the transportation 2025 plan growth boundary developed by the City. Areas outside the 2025 boundary limits are served by individual treatment systems.

Lawrence-Douglas County Metropolitan Planning Office (Lawrence Planning Office) provided the overall population projections and the housing unit counts and population per household data by traffic analysis zone (TAZ) for years 2000, 2010, and 2025 used in this report. Spatial distribution of population by subbasin and section for years 2000, 2010, and 2025 was based on this data. The estimated wastewater service population for existing and future years is presented in Table I-3 and shown graphically on Figure I-2.

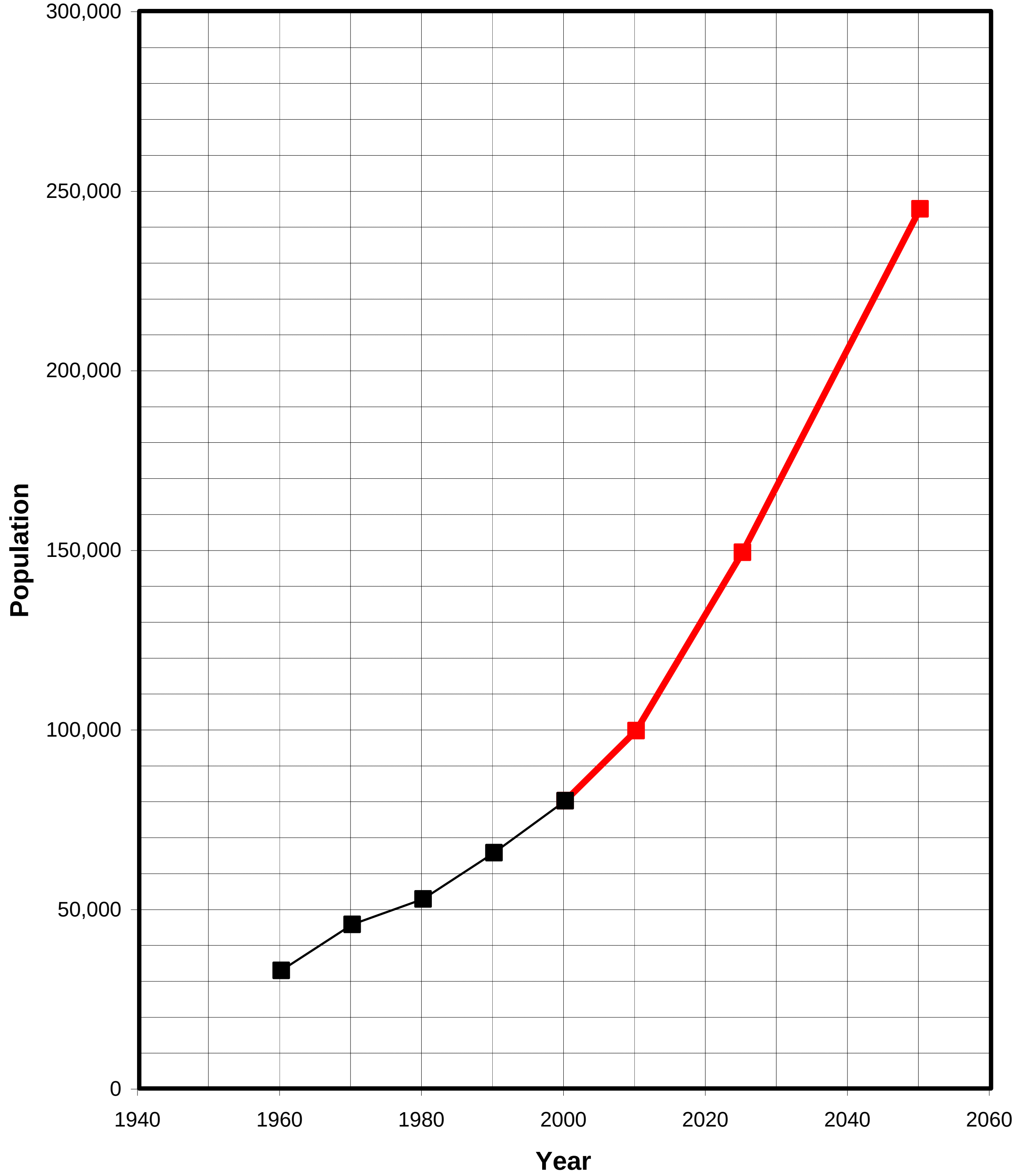
Table I-3 Wastewater Service Population			
Year	Population	Population Growth	
		Incremental Population Increase	(Annual) (%)
2000	79,817		
2010	99,600[(1)]	19,783	2.2%
2025	149,278[(2)]	49,678	2.7%
2050	244,906[(3)]	95,628	2.0%

[(1)] Based on spatial analysis of population by TAZ provided by Lawrence-Douglas County Metropolitan Planning Office within assumed year 2010 wastewater service limits.
[(2)] Projection by Lawrence-Douglas County Metropolitan Planning Office for UGA.
[(3)] Projection developed for this report based on 2% per year growth rate.

2.2.3 Population Distribution by Wastewater Subbasin

The study area was divided into 39 wastewater subbasins. This is 15 subbasins more than the 1995 City of Lawrence Wastewater Master Plan. The increase is due to new subbasins added for the new growth areas located south of the Wakarusa River and the west side of the City. For year 2000, populations by subbasin were calculated for the additional and existing subbasin boundaries. TAZ information provided by the City was used to determine the population for each subbasin. This was similarly done for planning years 2010 and 2025.

Table I-4 presents a summary of projected population for each wastewater subbasin for years 2000, 2010, and 2025. These population values were used as the basis for determining future wastewater flow projections.



City of Lawrence, Kansas
Wastewater Master Plan
2003

Historical and Future Population

Legend

Projected City Population
Historical City Population

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Figure I-2

Table I-4
Population Projections by Wastewater Subbasin

Subbasin	Base Year 2000		Design Year 2010		Design Year 2025	
	Total UGA	WW Service	Total UGA	WW Service	Total UGA	WW Service
Baldwin Creek Basin						
BC-1	250	250	3,376	3,376	7,369	7,369
BC-2	46	46	952	952	2,049	2,049
BC-3	146	146	958	958	2,041	2,041
BC-4	5	0	125	0	264	264
Subtotal	447	442	5,411	5,286	11,723	11,723
Central Basin						
C-1	4,265	4,265	4,714	4,714	5,034	5,034
C-2	4,846	4,846	4,974	4,974	5,216	5,216
C-3	1,266	1,266	1,266	1,266	1,266	1,266
Subtotal	10,377	10,377	10,954	10,954	11,516	11,516
East Lawrence Basin						
EL-1	3,712	3,712	3,812	3,812	3,929	3,929
EL-2	229	229	1,200	1,200	2,900	2,900
Subtotal	3,941	3,941	5,012	5,012	6,829	6,829
Kansas River Basin						
KR-1	396	396	1,082	1,082	1,939	1,939
KR-2	6,659	6,659	8,351	8,351	12,091	12,091
KR-3	2,849	2,849	2,877	2,877	2,905	2,905
KR-4	5,386	5,386	5,386	5,386	5,386	5,386
KR-5	12,311	12,311	12,348	12,348	12,805	12,805
KR-6	4,308	4,308	4,808	4,808	5,308	5,308
Subtotal	31,909	31,909	34,852	34,852	40,434	40,434
North Lawrence Basin						
NL-1	1,156	1,156	2,952	2,952	3,836	3,836
NL-2	17	17	90	90	161	161
NL-3	31	31	401	401	802	802
Subtotal	1,204	1,204	3,443	3,443	4,799	4,799
Wakarusa River Basin						
WR-1	289	289	738	738	1,395	1,395
WR-2	8,212	8,212	8,433	8,433	11,359	11,359
WR-3	4,369	4,369	4,623	4,623	5,036	5,036
WR-4	7,978	7,978	8,179	8,179	8,646	8,646
WR-5	2,027	2,027	2,027	2,027	2,027	2,027
WR-6	7,111	7,111	7,111	7,111	8,105	8,105
Subtotal	29,986	29,986	31,111	31,111	36,568	36,568
Wakarusa River South Basin						
WRS-1	111	0	200	0	400	400
WRS-2	225	0	1,009	0	2,094	2,094
WRS-3	111	0	678	0	1,472	1,472
WRS-4	308	0	1,566	0	3,392	3,392
WRS-5	282	0	1,347	0	3,399	3,399
WRS-6	281	0	1,545	1,545	3,428	3,428
WRS-7	91	0	724	0	1,434	1,434
WRS-8	141	0	1,800	0	3,894	3,894

Table I-4
Population Projections by Wastewater Subbasin

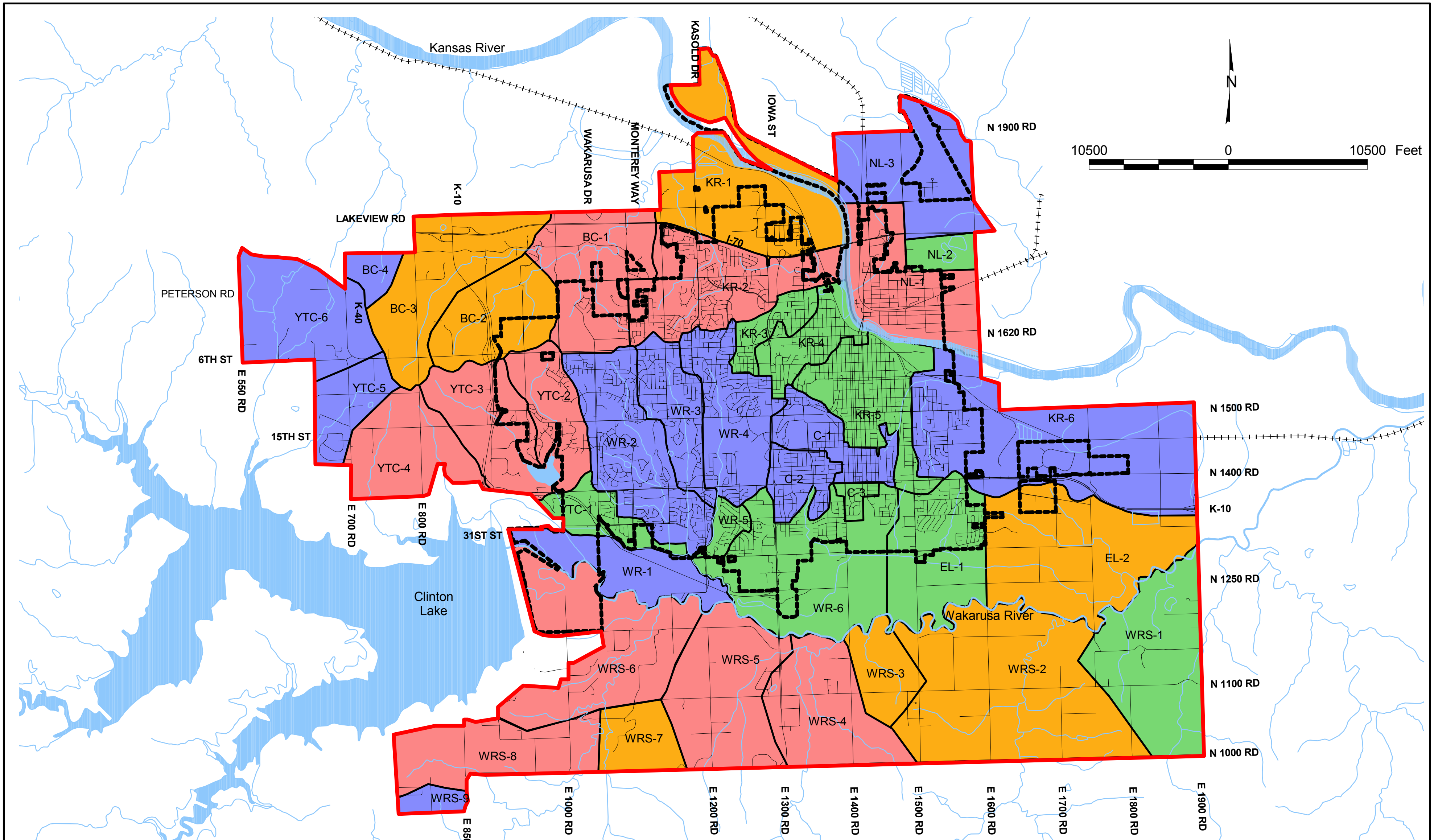
Subbasin	Base Year 2000		Design Year 2010		Design Year 2025	
	Total UGA	WW Service	Total UGA	WW Service	Total UGA	WW Service
WRS-9	17	0	264	0	564	564
Subtotal	1,567	0	9,133	1,545	20,077	20,077
Yankee Tank Creek Basin						
YTC-1	1,403	1,403	1,403	1,403	1,403	1,403
YTC-2	348	348	2,279	2,279	4,859	4,859
YTC-3	179	179	2,257	2,257	4,985	4,985
YTC-4	224	28	1,546	1,458	3,408	3,408
YTC-5	524	0	890	0	1,836	1,836
YTC-6	190	0	567	0	912	912
Subtotal	2,868	1,958	8,942	7,397	17,403	17,403
Total	**82,299**	**79,817**	**108,858**	**99,600**	**149,349**	**149,349**

The relative range of population growth by wastewater subbasin area is shown on Figures I-3 and I-4. Figure I-3 shows the difference in population from year 2000 to year 2010 and Figure I-4 shows the difference in population from year 2010 to 2025. As shown on these figures, the largest amount of population growth is projected to occur in west Lawrence and south of the Wakarusa River.

2.3 Employment

Employment data is used to estimate Industrial/Commercial/Institutional (ICI) wastewater flows. The Lawrence Planning Office provided employment data by TAZ within the UGA. This information was used to determine employment by wastewater subbasin for years 2000, 2010, and 2025 and is presented in Table I-5.

The relative range of employment growth by wastewater subbasin area is shown on Figure I-5 and I-6. Figure I-5 shows the difference in employment from year 2000 to year 2010. Figure I-6 shows the difference in employment for year 2010 to year 2025. The largest amount of employment growth is projected to occur in north Lawrence, the East Hills Business Park area, and along the 31st Street and Iowa Street corridors.



Legend

Population Difference (people)

- 0 - 100
- 100 - 500
- 500 - 1000
- 1000 - 5000

Lawrence 2000 City Limits

Year 2025 Urban Growth Area

City of Lawrence, Kansas
Wastewater Master Plan
2003

POPULATION INCREASE FROM 2000 TO 2010 BY SUBBASIN BOUNDARIES

Figure I - 3

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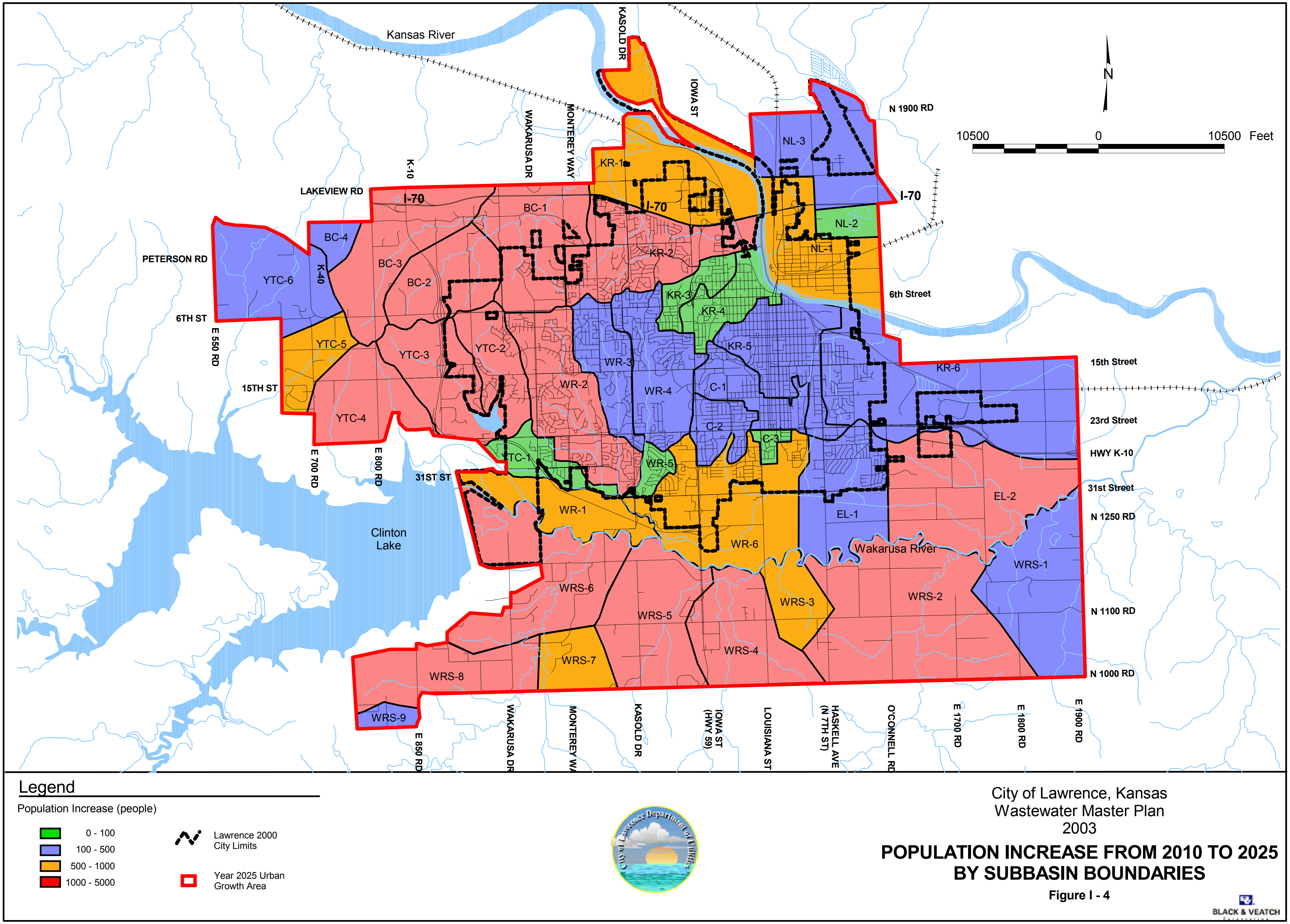

City of Lawrence, Kansas
Wastewater Master Plan
2003

POPULATION INCREASE FROM 2010 TO 2025 BY SUBBASIN BOUNDARIES

Figure I - 4

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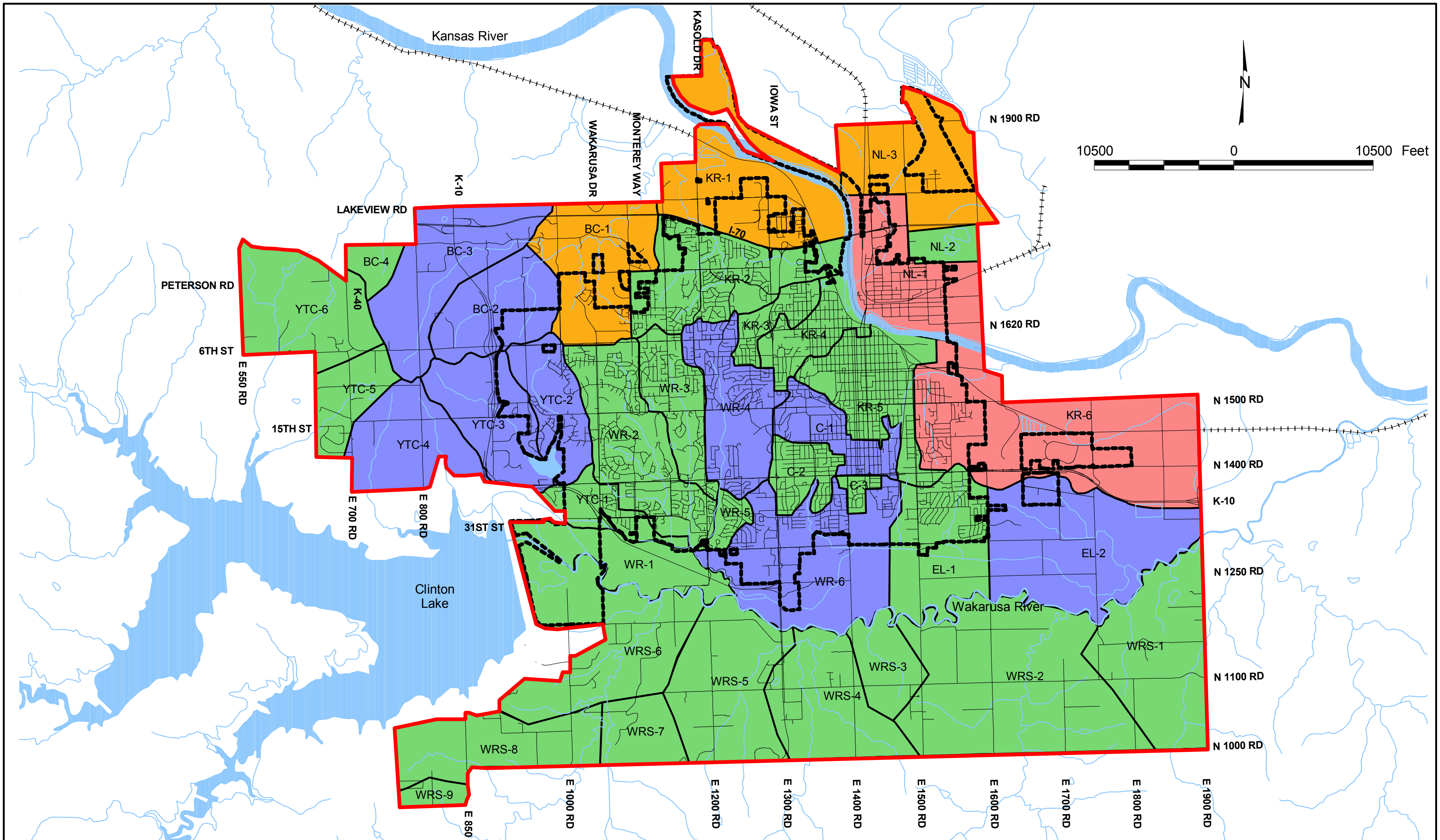
Table I-5
Employment Projections by Wastewater Subbas in

Subbasin	Base Year 2000		Design Year 2010		Design Year 2025	
	Total UGA	WW Service	Total UGA	WW Service	Total UGA	WW Service
Baldwin Creek Basin						
BC-1	206	206	724	724	1,424	1,424
BC-2	45	45	202	202	442	442
BC-3	4	0	155	155	308	308
BC-4	0	0	17	11	21	21
Subtotal	254	250	1,097	1,092	2,196	2,196
Central Basin						
C-1	3,776	3,776	4,087	4,087	4,247	4,247
C-2	2,596	2,596	2,612	2,612	2,673	2,673
C-3	610	610	610	610	610	610
Subtotal	6,981	6,981	7,308	7,308	7,530	7,530
East Lawrence Basin						
EL-1	1,809	1,809	1,809	1,809	2,204	2,204
EL-2	45	45	232	232	487	487
Subtotal	1,855	1,855	2,041	2,041	2,692	2,692
Kansas River Basin						
KR-1	1,831	1,831	2,606	2,606	3,574	3,574
KR-2	1,743	1,743	1,743	1,743	1,790	1,790
KR-3	2,612	2,612	2,671	2,671	2,740	2,740
KR-4	4,395	4,395	4,395	4,395	4,395	4,395
KR-5	9,242	9,242	9,312	9,312	9,703	9,703
KR-6	1,669	1,669	2,946	2,946	4,710	4,710
Subtotal	21,493	21,493	23,673	23,673	26,911	26,911
North Lawrence Basin						
NL-1	48	48	1,560	1,560	2,405	2,405
NL-2	1	1	27	27	41	41
NL-3	0	0	670	670	1,358	1,358
Subtotal	49	49	2,258	2,258	3,805	3,805
Wakarusa River Basin						
WR-1	17	17	48	48	95	95
WR-2	3,085	3,085	3,085	3,085	3,227	3,227
WR-3	1,190	1,190	1,273	1,273	1,404	1,404
WR-4	2,243	2,243	2,514	2,514	2,911	2,911
WR-5	104	104	104	104	104	104
WR-6	5,100	5,100	5,401	5,401	6,590	6,590
Subtotal	11,739	11,739	12,424	12,424	14,330	14,330

Table I-5 Employment Projections by Wastewater Subbas in						
Subbasin	Base Year 2000		Design Year 2010		Design Year 2025	
	Total UGA	WW Service	Total UGA	WW Service	Total UGA	WW Service
Wakarusa River South Basin						
WRS-1	19	0	38	0	66	66
WRS-2	74	0	102	0	161	161
WRS-3	308	0	308	0	308	308
WRS-4	21	0	77	0	156	156
WRS-5	45	0	45	0	45	45
WRS-6	37	0	37	37	37	37
WRS-7	23	0	23	0	23	23
WRS-8	7	0	8	0	10	10
WRS-9	0	0	1	0	1	1
Subtotal	534	0	637	37	806	806
Yankee Tank Creek Basin						
YTC-1	139	139	314	314	681	681
YTC-2	615	615	881	881	1,428	1,428
YTC-3	120	120	170	170	278	278
YTC-4	12	0	224	224	420	420
YTC-5	19	0	58	58	117	117
YTC-6	24	0	24	0	27	27
Subtotal	930	972	1,672	1,647	2,951	2,951
Total	**43,834**	**43,245**	**51,110**	**50,480**	**61,221**	**61,221**

The population is projected to increase by 69,251 or 86 percent from 2000 to 2025. This represents an average annual growth rate of 3.4 percent. Over the same period, employment is projected to increase by 17,976 or 42 percent. This represents an average annual growth rate of 1.7 percent.

For purposes of modeling, population and employment numbers are combined into a single number, population- equivalent. The population equivalent and developed acres for each subbasin is found in Appendix A, Population Equivalent and Developed Acres.



Legend

Employment Increase (people)

- 0 - 100
- 100 - 500
- 500 - 1000
- 1000 - 5000

Lawrence 2000 City Limits

Year 2025 Urban Growth Area

City of Lawrence, Kansas
Wastewater Master Plan
2003

EMPLOYMENT INCREASE FROM 2000 TO 2010 BY SUBBASIN BOUNDARIES

Figure I - 5

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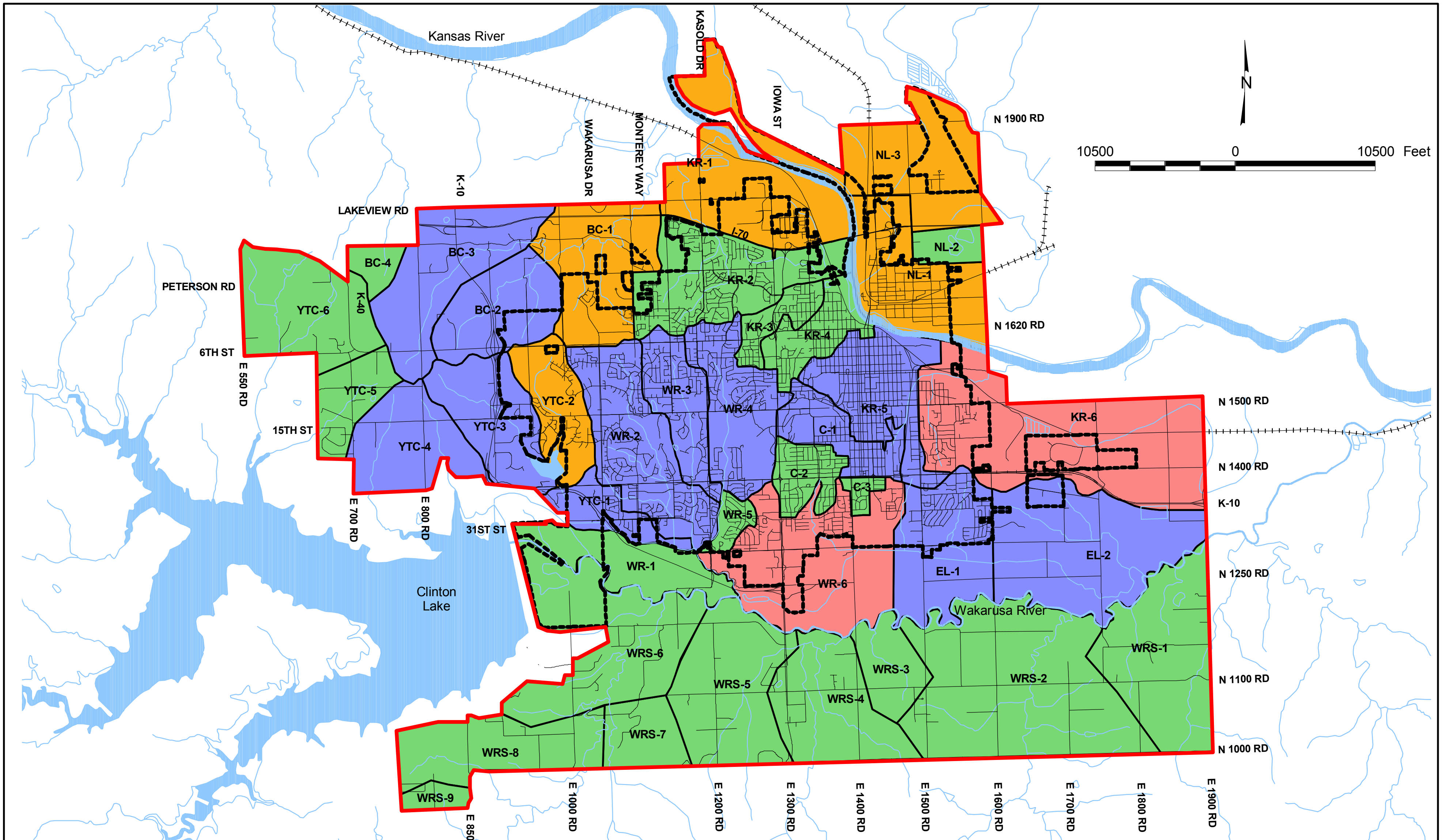

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Employment Increase (people)

- 0 - 100
- 100 - 500
- 500 - 1000
- 1000 - 5000

Lawrence 2000 City Limits

Year 2025 Urban Growth Area

City of Lawrence, Kansas
Wastewater Master Plan
2003

EMPLOYMENT INCREASE FROM 2010 TO 2025 BY SUBBASIN BOUNDARIES

Figure I - 6

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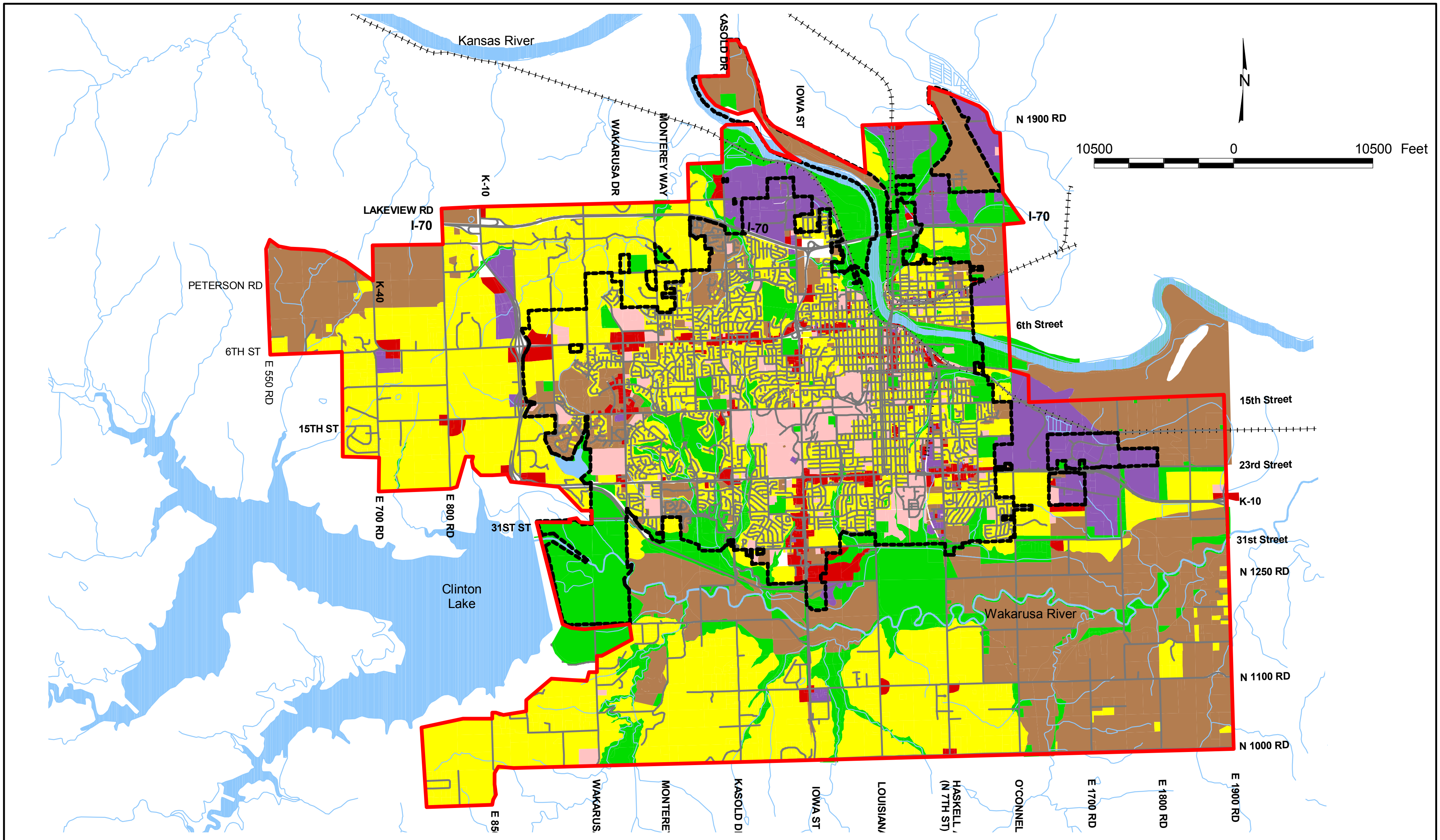
2.4 Land Use

The City land use plan for year 2025 was provided by the Lawrence Planning Office and is shown in Figure I-7, for information.



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Land Use Classifications

- Residential
- Commercial
- Public/Institutional
- Industrial
- Parks / Open Space
- Farm / Vacant
- Lawrence 2000 City Limits
- Year 2025 Urban Growth Area

City of Lawrence, Kansas
Wastewater Master Plan
2003

LAND USE 2025

Figure I - 7

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3.0 Wastewater Flows and Rainfall Analysis

3.1 Introduction

A sanitary sewer flow and rainfall monitoring program was conducted by the City of Lawrence Department of Utilities for portions of the existing Lawrence wastewater collection system. The flow and rainfall data provided by the City was used in this master planning effort to determine system flow rates, to evaluate the rates of infiltration and inflow (I/I), and to calibrate a computer model of the Lawrence wastewater system. Six open channel flow meters and four rain gauges were installed in the study area and monitored during April and May 2000. The flow meter and rain gauge locations are shown in Figure I-8.

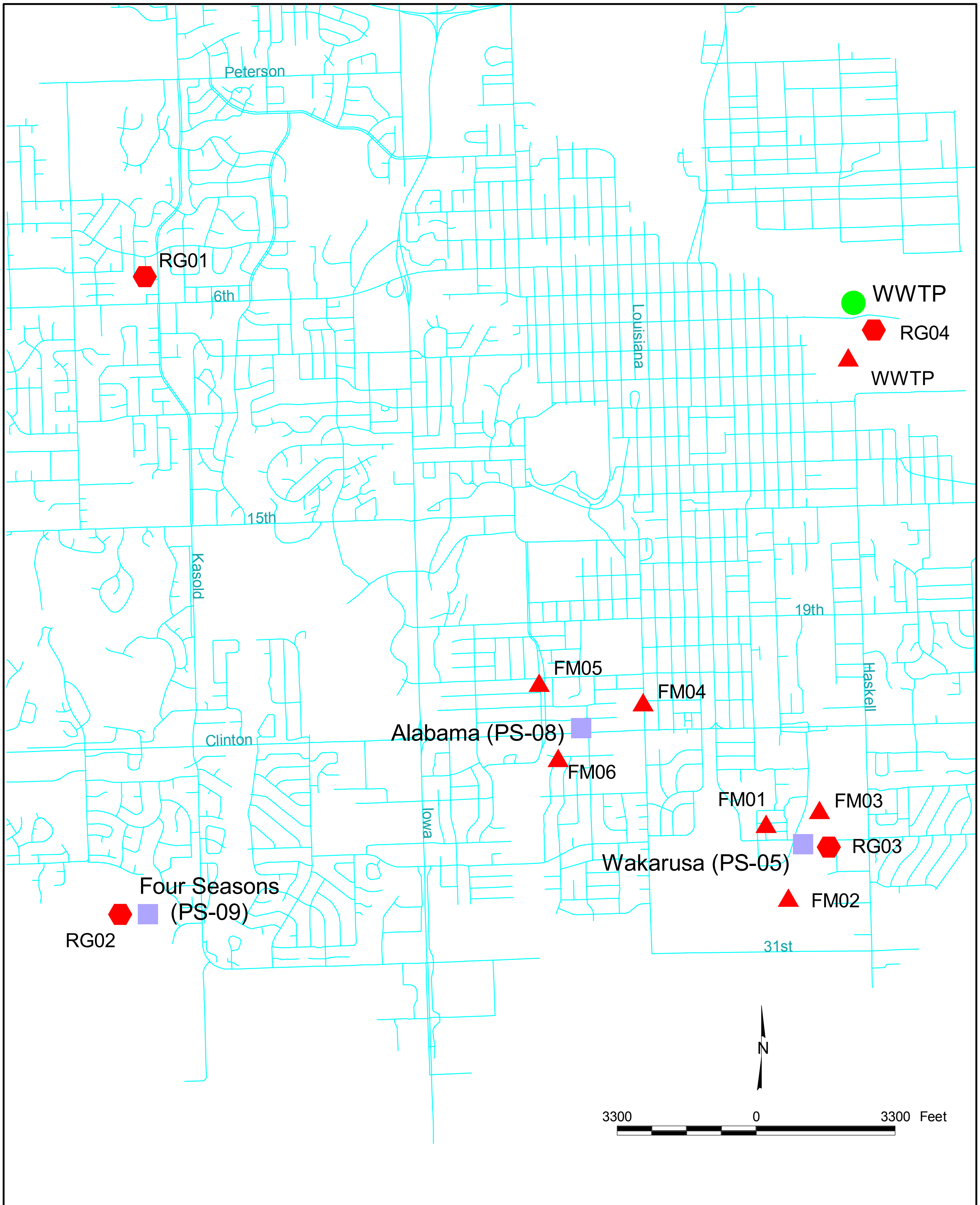
3.1.1 Rainfall Monitoring

Rainfall monitoring was performed to develop a correlation between wet weather system flows and rainfall. Data from four rainfall gauges were used in evaluating the relationship of rainfall and system flows. Rainfall gauges were installed in clear open spaces and were serviced at least weekly to ensure proper operation. The gauges are continuously recording, tipping-bucket type, with electronic recorders, which record each 0.01 inch increment of rainfall. The continuous data record was processed to define each rainfall event and to determine the amount of rainfall over 15-minute intervals.

Daily rainfall totals and distributions were developed for each gauge site and compared against the known rainfall intensity-duration-frequency relationship for the Lawrence study area to determine the return interval of each storm event. A Thiessen analysis was performed to relate the point rainfall recorded at the rain gauge locations to the average rainfall in the area tributary to each flow metering site.

3.1.2 Flow Metering

Flow metering was performed to obtain system flow rates during dry and wet weather conditions in an attempt to identify the portions of the wastewater system that may contribute significant amounts of I/I and to use the system flow rates to calibrate a computer model of the Lawrence wastewater system. The flow metering program was designed to monitor the flow exiting the Kansas and Wakarusa River Basins. In addition to the six temporary flow meters, data from the Lawrence Wastewater Treatment Plant influent flow meter was collected and used in the program.



Legend

Related Pump Stations

Rain Gauges

Flow Meters

City of Lawrence, Kansas
Wastewater Master Plan
2003

RAINFALL &
FLOW METERING SITES

Figure I - 8

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3.1.2.1 Flow Components

Definitions of the flow components used within the report are as follows. Wastewater production (WWP) is defined as wastewater exclusive of infiltration and inflow. The daily WWP flow rate can be approximated by using (1) winter month water consumption data or (2) direct measurement during dry weather/low groundwater conditions (average daily dry weather flow, ADDF). WWP flow rate can also be estimated by using a per capita flow rate. This per capita flow rate is usually about 100 gpcd. The WWP flow rate varies throughout the day, with the highest rate normally occurring between 8:00 and 11:00 a.m. The ratio of peak 60-minute flow to total average daily flow is defined as the WWP flow peaking factor.

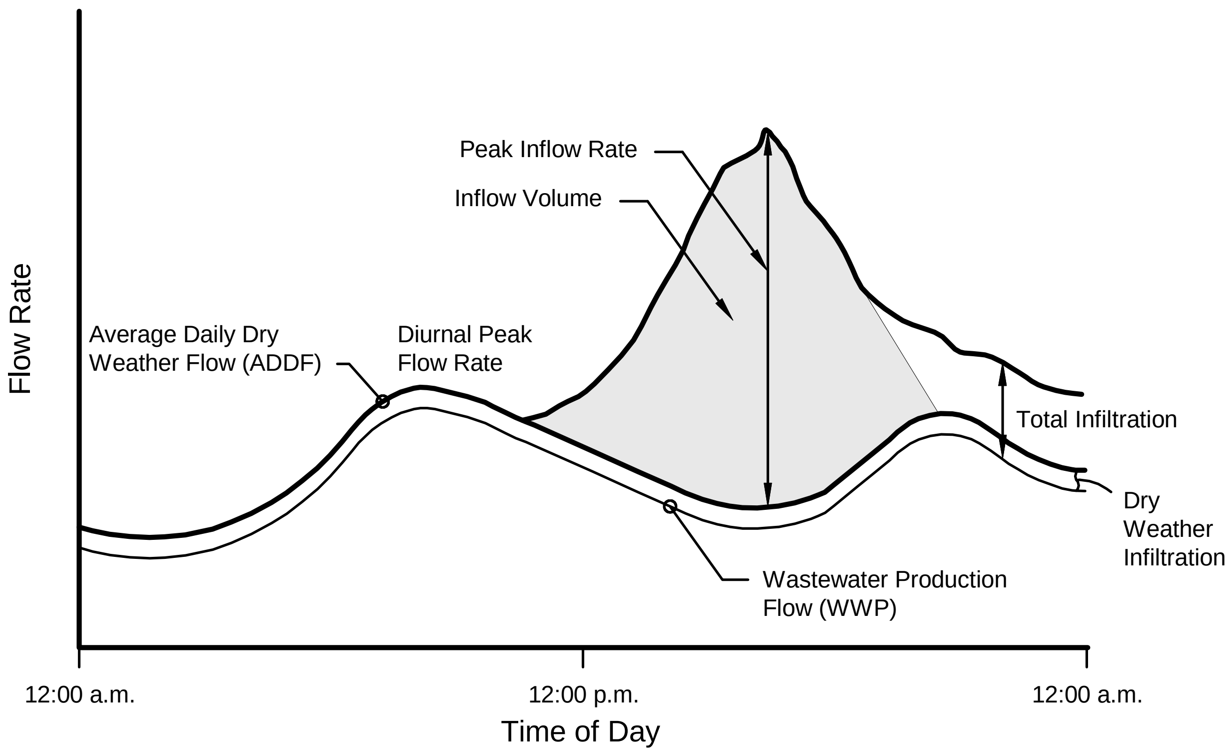
Infiltration is groundwater that enters the wastewater collection system and private building lines through defective pipes, pipe joints, and manhole structures below the manhole cone. The rate of infiltration depends on the depth of groundwater above the defect, the size of the defect, and the percentage of the collection system that is submerged. Groundwater levels and the associated infiltration vary seasonally and depend on weather. Dry weather infiltration occurs year-round and is measured during dry weather when the previous rainfall no longer has an effect on flows. High groundwater/dry weather infiltration is additional infiltration, which is caused by higher groundwater following rain events.

Inflow is rainfall-related water which enters the collection system from sources such as private sewer laterals, downspouts, foundation drains, yard and area drains, storm water sump pumps, manholes, defective piping, and cross-connections with storm drains. Inflow is directly influenced by the intensity and duration of a storm event, and therefore is not a fixed quantity.

Figure I-9 illustrates the flow components.

3.1.2.2 Equipment

Open channel flow for this project was measured with temporary flow meters at six locations. Each flow meter included sensors that measured depth and velocity. The depth of water was determined by pressure measurement, and the velocity was measured using an electromagnetic field. The sensors were mounted on an expandable aluminum ring installed in the sewer pipe, normally upstream from the manhole invert. The signal from the sensors was transmitted to the monitor through a communications cable.



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2003

Typical Flow Components
Figure I-9

The monitors were suspended from brackets mounted in the manhole wall near the top of each manhole and were set to collect and store depth of flow and velocity readings at 15-minute intervals. A 6-volt battery powers the meter. A backup battery permits servicing to the primary battery without data loss. Data from the meters were retrieved using a portable laptop computer.

The most representative days of data were selected for use in determining dry and wet weather flow parameters. Seven days, one for each day of the week, were identified for the analysis of dry weather flows. All of the days with rainfall that produced a measurable increase in wastewater flow were used for the I/I analysis.

Flow meters, their identification numbers, location, and metering periods are summarized in Table I-6. A detailed description of flow metering can be found in Appendix B, Flow Metering Methodology.

Table I-6
Metering Sites

Meter	Basin	Manhole Number	Meter Type[1]	Pipe Size at Meter (in)	Installation Date	Removal Date
FM01	Wakarusa	SW07-098	D/V	48	17-Apr-00	19-Jun-00
FM02	Wakarusa	SW07-091	D/V	24	17-Apr-00	19-Jun-00
FM03	Wakarusa	SE07-155	D/V	18	14-Apr-00	12-Jul-00
FM04	Kansas	SE01-018	D/V	10	14-Apr-00	12-Jul-00
FM05	Kansas	SE01-081A	D/V	12	14-Apr-00	12-Jul-00
FM06	Kansas	NE12-115	D/V	15	14-Apr-00	12-Jul-00
WWTP[2]	WWTP	-	Flow	48	-	-

(1) D/V = depth and velocity meter open channel.
(2) WWTP is the permanent flow meter at the Lawrence wastewater treatment plant.

3.2 Rainfall Data Analysis

3.2.1 Design Flow and Probability

The Design flow for a sewer is defined as the maximum flow that a specified structure can pass without exceeding selected loading criteria. Since a significant portion of the peak flow in sanitary sewers is inflow resulting from rainfall, the design flow that the sewer must convey is related to the probability of occurrence of a design storm event. Design flow for a selected rainfall event is the sum of three components: (1) wastewater production multiplied by the diurnal peaking factor; (2) infiltration; and (3) inflow. As presented later, inflow is a function of the local intensity-duration-frequency relationship for rainfall. This relationship adds a probability consideration to the design flow.

A summary of the probability that a storm event having a prescribed recurrence interval will not be equaled or exceeded during a specified period is given in Table I-7. For example, a design based on a 10-year storm event has a 59 percent chance of not being exceeded during a 5-year period.

Table I-7
Probability of Non-Exceedance

Design Storm (years)	Period, years							
	1	5	10	20	50	100	200	500
1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
2	0.50	0.03	0.01	(1)	(1)	(1)	(1)	(1)
5	0.80	0.33	0.12	0.01	(1)	(1)	(1)	(1)
10	0.90	0.59	0.35	0.12	(1)	(1)	(1)	(1)
50	0.98	0.90	0.82	0.67	0.36	0.13	0.02	(1)
100	0.99	0.95	0.90	0.78	0.61	0.37	0.13	0.01
200	0.995	.975	0.95	0.90	0.78	0.61	0.37	0.08
500	0.998	.989	0.98	0.96	0.90	0.82	0.67	0.37

(1) Values are near 0.

3.2.2 Analysis of Rainfall Data

The normal annual average rainfall for the Lawrence area is 39.28 inches. Historical data on average monthly rainfall amounts and rainfall intensity-duration relationships are presented in Tables I-8 and I-9 and shown graphically on Figure I-10 using the Lawrence, Kansas, area rainfall intensity-duration relationships. The annual and monthly normal rainfall values were obtained from the National Weather Service, San Francisco, based on 1961-1990 data for Lawrence, Kansas.

Rainfall intensities were evaluated to allow correlation of peak rain intensity to the peak flow rate in the sewers. The highest flow for a given storm event is generated when the storm duration has reached the travel time from the farthest point in the system to the flow meter location.

During the flow metering period of April 17, 2000 to June 14, 2000, the recorded total average rainfall was 6.66 inches, as shown in Table I-10. The actual rainfall that occurred during the monitoring period was much less than the historical Mid-April to Mid-June average of 9.60 inches. The importance of using a network of rainfall gauges is evidence of the varying amounts of total rainfall between gauges shown in Table I-10.

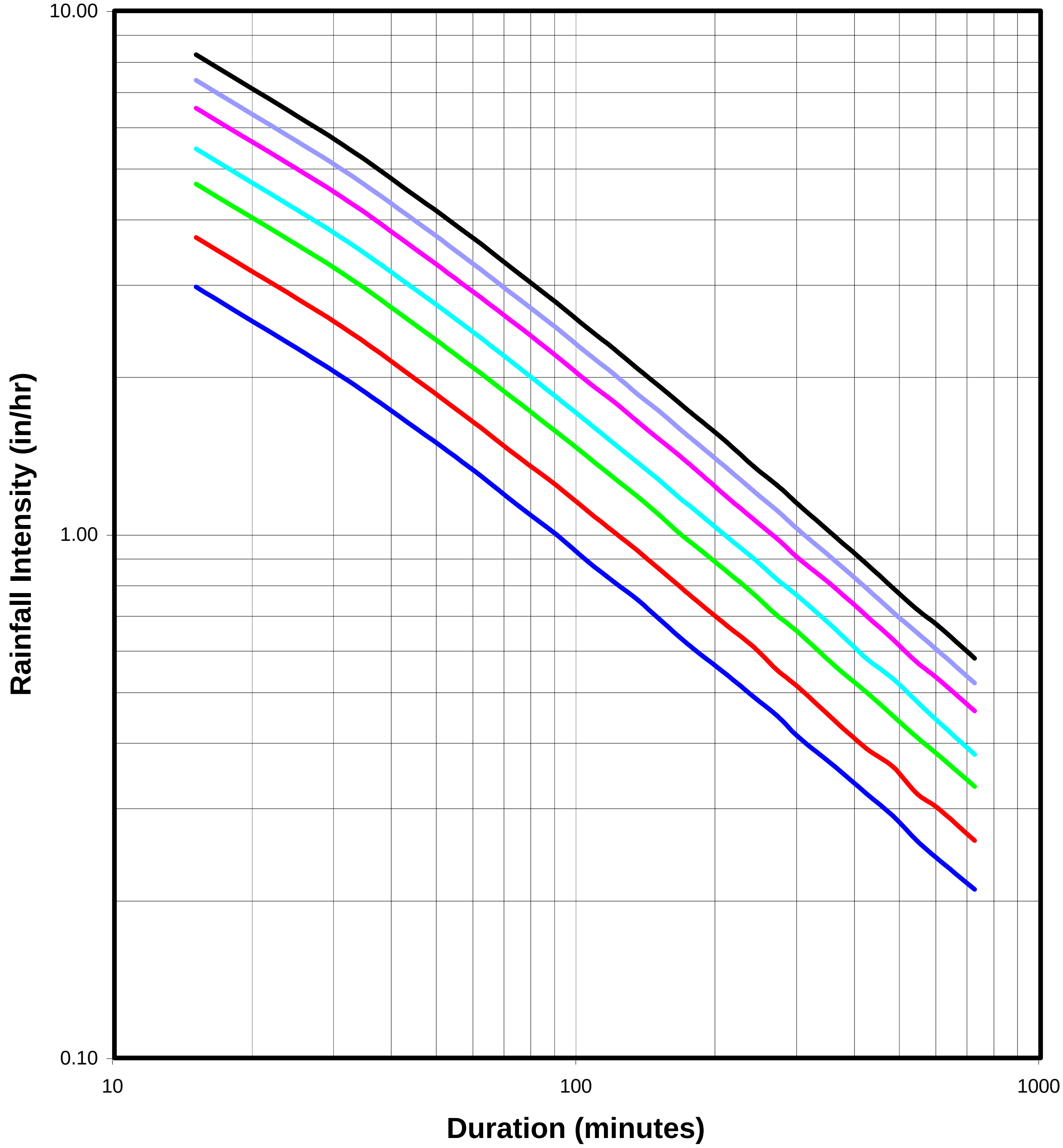
Rainfall was recorded on 19 of the 59 days in the monitoring period. A storm event was defined as continuous recorded rainfall separated by a minimum of four hours of no rain. During the eight-week monitoring period, 6 significant storm events occurred, with at least 0.40 inch total depth each. Three storms of approximately 1 inch of total depth occurred, plus one storm of more than 1.20 inches in depth. The events for which a definable flow response occurred were selected for flow analysis to determine inflow into the system.

Table I-8
Historical Average Rainfall
For the Lawrence, Kansas Area

Month	Average Precipitation (in)	Cumulative Precipitation (in)
January	1.24	1.24
February	1.12	2.36
March	2.80	5.16
April	3.46	8.62
May	4.96	13.58
June	5.82	19.40
July	3.97	23.37
August	4.06	27.43
September	4.52	31.95
October	3.35	35.30
November	2.24	37.54
December	1.74	39.28

Table I-9
Rainfall Depth-Duration-Frequency Relationship

Return Period Yrs	Total Rainfall (inches) for Duration Indicated				
	30 Min	60 Min	2 Hrs	3 Hrs	12 Hrs
1	1.02	1.32	1.63	1.81	2.50
2	1.27	1.63	2.02	2.25	3.10
5	1.61	2.07	2.56	2.85	3.93
10	1.88	2.42	2.99	3.33	4.58
25	2.24	2.89	3.57	3.98	5.48
50	2.54	3.27	4.04	4.50	6.20
100	2.84	3.66	4.52	5.04	6.93



Legend

Storm Frequency (years)

1
2
5
10
25
50
100

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2003

Rainfall Intensity Duration Curve

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Figure I-10

Table I-10 Total Monitoring Period Recorded Rainfall 4/17/00 – 6/14/00		
Rainfall Gauge No.	Gauge Location	Rainfall (inches)
RG01	6th and Wakarusa	6.91
RG02	31st and Kasold	6.04
RG03	Haskell INU	7.08
RG04	8th and Haskell	6.61
Average		6.66

For the analysis of inflow versus rainfall (Q vs. i relationship), it was necessary to determine the rainfall pattern for each rain event applicable to each flow meter's tributary area. Thiessen polygons were drawn around each rainfall gauge to indicate the areas most influenced by each gauge, and the percentage of the total area tributary to each metering site within each rainfall gauge polygon was determined. For each flow meter, these percentages were applied to the rainfall data recorded at each rainfall gauge. This procedure resulted in a rainfall pattern specific to each flow meter and each storm event, in 15-minute intervals, based on the data collected at the four rain gauges. Table I-11 shows the rainfall gauge allocations used in the Thiessen analysis. Each rainfall event was further analyzed to determine the return interval for the selected rainfall duration by comparing the recorded data with the rainfall intensity-duration-frequency curves for Lawrence.

Table I-11 Rain Gauge Allocation (Theissen Analysis)					
		Recorded Rainfall Assignment (%)			
Basin	Flow Meter	RG01	RG02	RG03	RG04
Wakarusa	FM01	41	41	18	-
Wakarusa	FM02	41	41	18	-
Wakarusa	FM03	-	-	100	-
Kansas	FM04	-	25	75	-
Kansas	FM05	-	25	75	-
Kansas	FM06	-	25	75	-
WWTP	WWTP	35	12	23	30

Summaries of the observed daily total rain at each rain gauge, and the rainfall depth/duration relationship during each storm event are given in Tables I-12 and I-13.

Table I-12
Monitored Daily Rainfall Totals

Rain Date	Total Rain at Rain Gauge (in)			
	RG01	RG02	RG03	RG04
17-Apr-00	0.00	0.00	0.01	0.00
20-Apr-00	0.09	0.06	0.06	0.06
23-Apr-00	0.30	0.32	0.43	0.44
25-Apr-00	0.36	0.48	0.97	0.21
26-Apr-00	0.01	0.01	0.01	0.01
30-Apr-00	0.14	0.15	0.09	0.11
1-May-00	0.01	0.05	0.00	0.00
2-May-00	0.04	0.08	0.00	0.00
9-May-00	0.55	0.40	0.55	0.52
17-May-00	0.00	0.01	0.00	0.00
21-May-00	0.05	0.14	0.10	0.12
24-May-00	0.14	0.10	0.13	0.14
26-May-00	1.30	1.31	1.62	1.67
27-May-00	0.07	0.07	0.14	0.06
1-Jun-00	0.46	0.32	0.91	0.85
2-Jun-00	0.03	0.02	0.02	0.03
11-Jun-00	0.01	0.28	0.47	0.22
13-Jun-00	2.85	1.82	1.09	1.72
14-Jun-00	0.50	0.42	0.48	0.45
TOTAL	**6.91**	**6.04**	**7.08**	**6.61**

Table I-13
Monitored Peak Rainfall Depth vs. Duration

Storm Event	Peak Rainfall Depth (in.) For Duration Indicated					
	30 (min)	60 (min)	120 (min)	180 (min)	240 (min)	600 (min)
Standard 1-Year Storm						
-	1.15	1.50	1.66	1.80	1.92	2.31
Observed Storm Events						
25-Apr-00	0.01	0.69	0.85	0.96	0.97	0.97
9-May-00	0.05	0.26	0.47	0.53	0.54	0.55
26-May-00	0.70	0.84	1.01	1.20	1.21	1.21
26-May-00	0.36	0.41	0.41	0.41	0.41	0.41
1-Jun-00	0.25	0.71	0.81	0.91	0.93	0.93
13-Jun-00	0.01	0.25	0.53	0.54	0.68	1.15

Note: Only the significant rain dates selected for the inflow analyses are listed. This table shows representative data for rain gauge RG03. Some rain events continued into the next date, but were considered one storm event. That is why some high rainfall dates are not included in this list. The actual rain distribution applied to the flow analysis for a given flow meter utilizes the data observed at the rain gauges assigned as listed in Table 2-6, Theissen Analysis.

3.3 Wastewater Flow Data Analysis

3.3.1 Service Area Background Information

3.3.1.1 Flow Metering Program and Distribution

Continuous flow metering was performed at 7 sites, including the WWTP flow meter. FM01, FM02, and FM03 collected the flow information for the area tributary to PS05, which is the Wakarusa River Basin area. FM04, FM05, and FM06 collected flow information for the area tributary to PS08, which is the Kansas River Basin area. In addition, flow data was collected at the WWTP for the same time period as the flow meters and rain gauges. Using the WWTP and tributary Wakarusa River Basin flow data, flows were calculated for the Kansas River Basin tributary area.

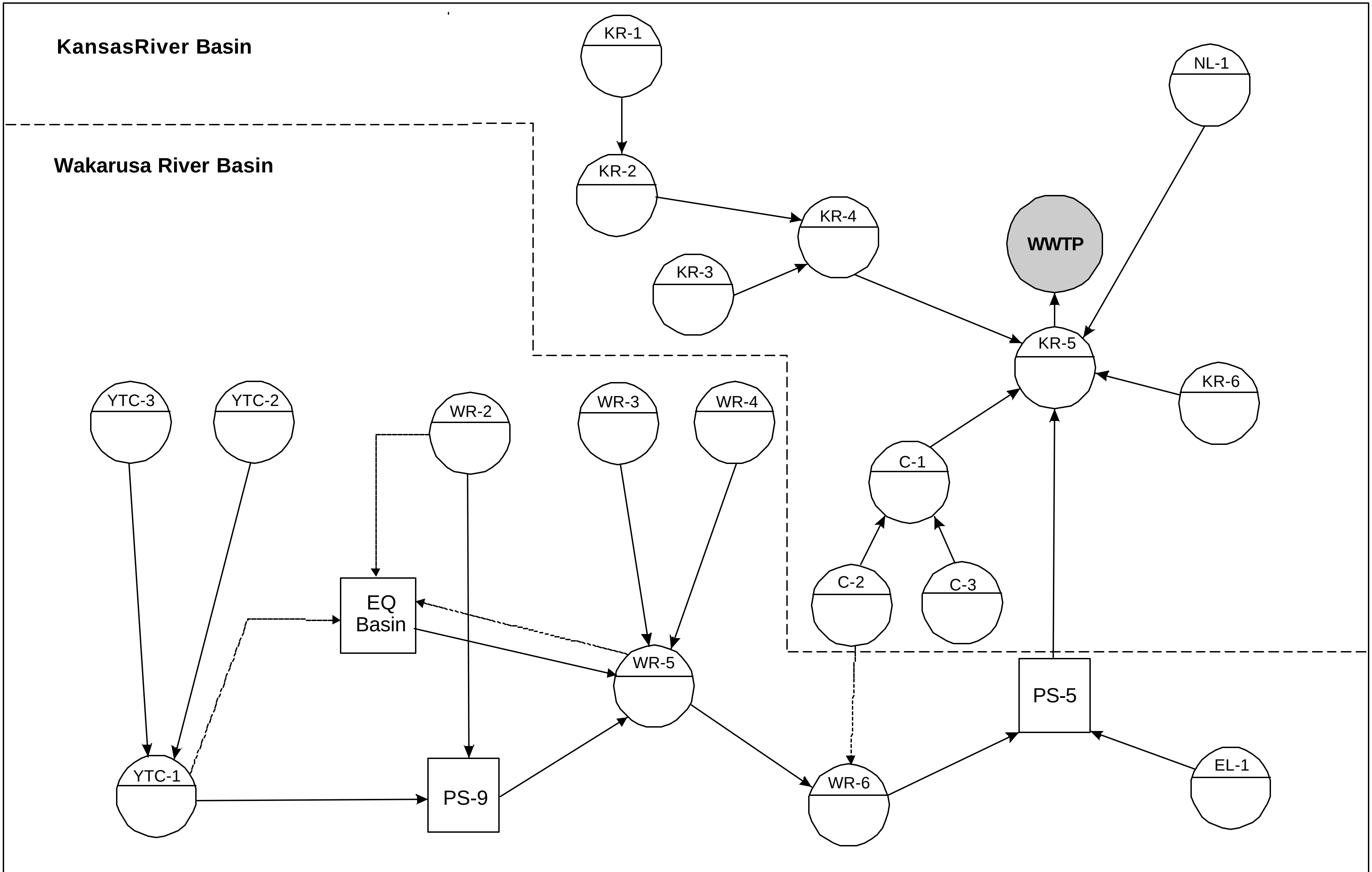
The flow meter data collected at PS05, PS08, and the WWTP was analyzed to determine the 2001 flows for the Kansas and Wakarusa River Basins. Using the new Basin flows, current subbasin information, and the 1994 Wastewater Master Plan flow distribution to subbasins, a new flow distribution was generated for the current subbasins. In the succeeding tables, cumulative KR-5 values reflect the flows that would be seen at the wastewater treatment plant (WWTP), since all subbasins are tributary to KR-5 and KR-5 is directly tributary to the wastewater treatment plant.

3.3.1.2 Area Data

The developed acreage for each subbasin was determined from the GIS data provided by the City. The developed acreage for allocated to each subbasin and to each basin is in Table I-14. The subbasin area is used to identify which subbasins contribute large amounts of I/I. Figure I-11 is a schematic drawing ("bubble diagram") of the relationship between the subbasins. The total developed area that is sewered by the City of Lawrence is 18,396 acres.

3.3.1.3 Population Data

The 2000 total population being served by sewer was estimated to be 79,817. The average number of persons per acre is 4.34.



Legend

YTC-3 **Subbasins**

Diversions

PS-9 **KeyFacilities**

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SUBBASIN FLOW SCHEMATIC

Figure I-11

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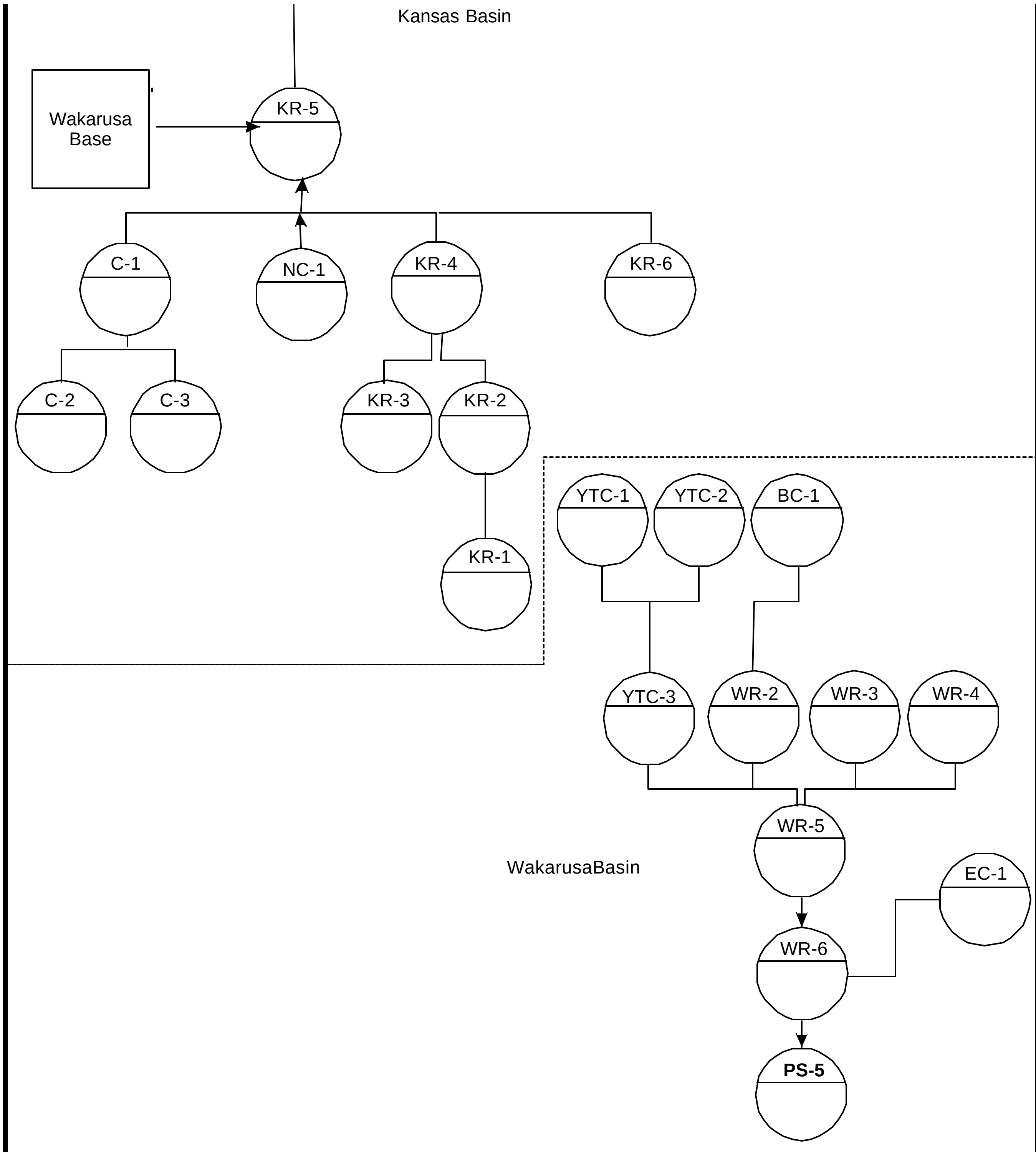
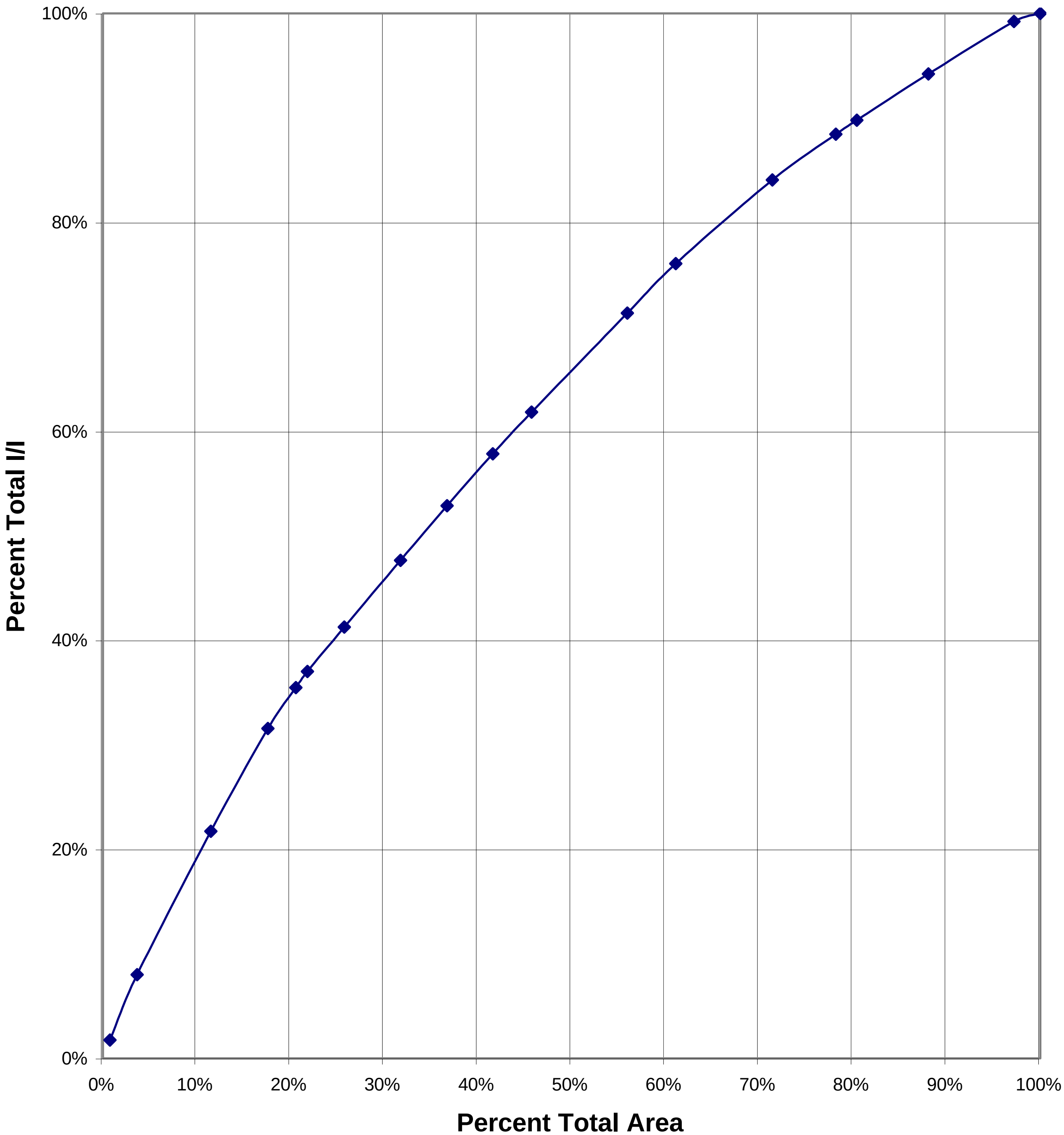

Kansas Basin
Wakarusa Base
KR-5
C-1
NC-1
KR-4
KR-6
C-2
C-3
KR-3
KR-2
KR-1
YTC-1
YTC-2
BC-1
YTC-3
WR-2
WR-3
WR-4
WR-5
WakarusaBasin
EC-1
WR-6
PS-5



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Percent I/I by Percent Area

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Figure I-12

Table I-14
Developed Area by Subbasin and Basin-Year 2000

Subbasin Designation	Subbasin Area (acres)	CumulativeTributary Area (acres)
C-1	763	1,432
C-2	534	534
C-3	135	135
EL-1	897	897
KR-1	517	517
KR-2	1,681	2,199
KR-3	412	412
KR-4	722	3,333
KR-5	1,447	18,396
KR-6	1,245	1,245
NL-1	1,118	1,118
WR-2	1,892	1,892
WR-3	913	913
WR-4	1,404	1,404
WR-5	226	7,046
WR-6	1,879	8,925
YTC-1	1,103	1,103
YTC-2	953	953
YTC-3	554	2,610
Total	**18,396**	
Basin	Tributary Area (acres)	
Wakarusa	9,822	
Kansas	8,574	
Total	18,396	

3.3.2 Determination of Average Daily Dry Weather Flow

Daily fluctuations in flow are attributable to variations in domestic, industrial, and commercial wastewater production. Average Daily Dry Weather Flow (ADDF) is measured directly by flow metering and includes wastewater production (WWP) plus the portion of total infiltration that occurs during low groundwater conditions. The ADDF for each monitoring location was determined using the average flow at the monitor for the selected 7 days. The days selected for determining the ADDF were preceded by several days of no significant rainfall.

A mass balance was performed using the ADDF recorded at each metering site. The mass balance is an accounting procedure for balancing flows recorded throughout the system. At the same time, flows were checked against the population tributary to each meter (to determine the per capita use rate (gpcd) for each subbasin. Any metering site for which unrealistic per capita rates were obtained from the preliminary data was rechecked.

Dry weather peaking factors (the ratio of the peak 60-minute flow to average daily flow measured during dry weather/low groundwater conditions) were determined for each basin as the average of the factors observed for each day of the selected period. The system-wide average dry weather peaking factor was 1.22, based on total ADDF and Peak Dry Weather Flow. Peaking factors for the individual subbasins were assigned based on the cumulative acres for that subbasin. A summary for the subbasin ADDF, dry weather flow peaking factor, and diurnal peak flow rate is given in Table I-15.

Table I-15
Subbasin ADDF and Peak Flow Summary

Subbasin	Subbasin ADDF (mgd)	Cumulative ADDF (mgd)	Peaking Factor[1] (Qp/Qa)	Diurnal Peak Flow Rate[2]	
				Subbasin (mgd)	Cumulative (mgd)
C-1	0.482	1.242	1.308	0.630	1.625
C-2	0.607	0.607	1.308	0.794	0.794
C-3	0.154	0.154	1.308	0.201	0.201
EL-1	0.197	0.197	1.381	0.272	0.272
KR-1	0.078	0.078	1.135	0.089	0.089
KR-2	0.632	0.710	1.135	0.717	0.806
KR-3	0.380	0.380	1.135	0.431	0.431
KR-4	0.711	1.801	1.135	0.808	2.044
KR-5	1.555	8.533	1.135	1.765	9.685
KR-6	0.172	0.172	1.135	0.195	0.195
NL-1	0.085	0.085	1.135	0.096	0.096
WR-2	0.934	0.934	1.308	1.222	1.222
WR-3	0.486	0.486	1.308	0.636	0.636
WR-4	0.890	0.890	1.308	1.164	1.164
WR-5	0.231	2.758	1.308	0.303	3.607
WR-6	0.724	3.482	1.308	0.947	4.554
YTC-1	0.017	0.017	1.308	0.022	0.022
YTC-2	0.040	0.040	1.308	0.053	0.053
YTC-3	0.158	0.215	1.308	0.206	0.281
TOTAL	**8.533**			**10.551**	

(1) Peaking factor is the ratio of peak flow rate to average flow rate.
(2) ADDF times peaking factor.

3.3.3 Determination of Infiltration

Infiltration consists of dry weather-low groundwater infiltration and dry weather-high groundwater infiltration (as indicated on Figure I-9). Infiltration during high groundwater is observed on the days after the end of significant rainfall events. The total flow measured during these periods includes WWP flow plus both base and high groundwater infiltration flows. High groundwater infiltration flow is determined from flow monitoring data by subtracting the minimum nighttime flow during dry weather/low groundwater periods from the minimum nighttime flow during high groundwater periods. Using night-time flow readings is the most reliable method for determining these infiltration flows. A summary of infiltration, including rankings based on this parameter are given in Table I-16.

The net system-wide infiltration flow rate for the area, which excludes WWP, is 1.267 mgd, which is equivalent to 68.8 gpd per acre. The subbasin infiltration rate ranged from 8.6 gpd per acre to 221.9 gpd per acre. Subbasins with high infiltration rates have higher priority for I/I removal.

Table I-16
Subbasin Infiltration Rate

Subbasin	Subbasin Area (acres)	Infiltration (mgd)	Subbasin Infiltration Rate (gpd/acre)	Rank[2]
C-1	763	0.048	63.0	12
C-2	534	0.053	100.0	9
C-3	135	0.030	221.9	1
EL-1	897	0.021	23.3	18
KR-1	517	0.063	121.8	3
KR-2	1,681	0.152	90.4	10
KR-3	412	0.045	108.9	5
KR-4	722	0.075	103.7	8
KR-5	1,447	0.158	109.3	4
KR-6	1,245	0.131	105.3	7
NL-1	1,118	0.096	85.6	11
WR-2	1,892	0.082	43.4	13
WR-3	913	0.039	43.0	15
WR-4	1,404	0.060	43.0	14
WR-5	226	0.024	107.4	6
WR-6	1,879	0.077	41.0	16
YTC-1	1,103	0.010	8.6	19
YTC-2	953	0.022	23.5	17
YTC-3	554	0.079	143.5	2
TOTAL	**18,396**	**1.267**		

(1) Total Infiltration is Wet Weather Infiltration + Dry Weather Infiltration
(2) Ranking from highest to lowest infiltration rate, with 1 being the highest rate.

3.3.4 Determination of Inflow

Inflow for a specific storm event includes all rainfall-induced flow, direct storm water inflow, and rapid infiltration. Inflow can be measured during wet weather as illustrated on Figure I-9. The flow data for each significant rainfall event were analyzed for inflow. The total peak flow measured during inflow periods includes wastewater production flow, infiltration, and inflow. Inflow for a particular rainfall event is determined by subtracting the wastewater production and infiltration flow from the measured peak flow. Normally, the wastewater production and infiltration flows at the time of peak inflow are estimated as the dry weather flow data 24 hours previous.

The magnitude of peak inflow depends on rainfall distribution, intensity, antecedent groundwater conditions, types and locations of inflow sources, and time of concentration of the system to the monitoring point. The time of concentration is the time from initiation of peak rainfall to the time of peak inflow. An inflow coefficient "K" was determined for each rainfall event for each metered basin. The inflow coefficient is an attempt to combine all system variables into a single parameter, and is analogous to the runoff coefficient in the rational formula for storm water flow. The cumulative inflow coefficient for each metered basin was determined by dividing the peak inflow rate by developed tributary land area and by the peak rainfall intensity corresponding to the system time of concentration as determined from field measurements. Inflow coefficients for the individual subbasins were based on the 1995 Master Plan information, developed in a similar way as the ADDF and peaking factors. Generally, the time of concentration increases as the total tributary area increases and the inflow coefficient increases with the age of the system.

A summary of inflow parameters is presented in Appendix C.

Cumulative inflows and subbasin inflows were determined for a ten-year storm event, as shown in Table I-17. A comparison of cumulative inflow and subbasin-generated inflow rates shows that the cumulative inflow for interior subbasins is less than the sum of individual subbasin-generated inflows. This is consistent with expected system dynamics and is critical for any comparison of projected I/I source flow with monitored flow.

Table I-19
City of Lawrence Design Curve

Future Flow Criteria										
Percent Zone	Zone Type	Description	Density (Units/ Acre)	Equivalent Capita/ Unit	Equivalent Capita/ Acre	Capita Usage (gpcd)	Average WWP (gapd)	Infil- tration (gpad)	Inflow Coeff. "K"
0%	1	Low Density Residential	1.0	2.3	2.3	100	230	500	0.0035
71%	2	Medium Density Residential	2.0	3.0	6.0	100	600	500	0.0050
0%	3	High Density Residential	6.0	2.3	13.8	100	1380	500	0.0050
9%	4	Office & Commercial	2.0	2.9	5.8	100	580	200	0.0030
2%	5	Light/Med Industry	1.0	10.0	10.0	100	1000	200	0.0030
0%	6	Heavy Industry	1.0	25.0	25.0	100	2500	200	0.0030
18%	7	Public	1.0	7.0	7.0	100	700	0	0.0005
0%	8	Agricultural/ Park	1.0	1.0	1.0	100	100	0	0.0005
100%		Average(weighted)	1.80	3.85	6.24	100.00	624.20	377.00	0.00397

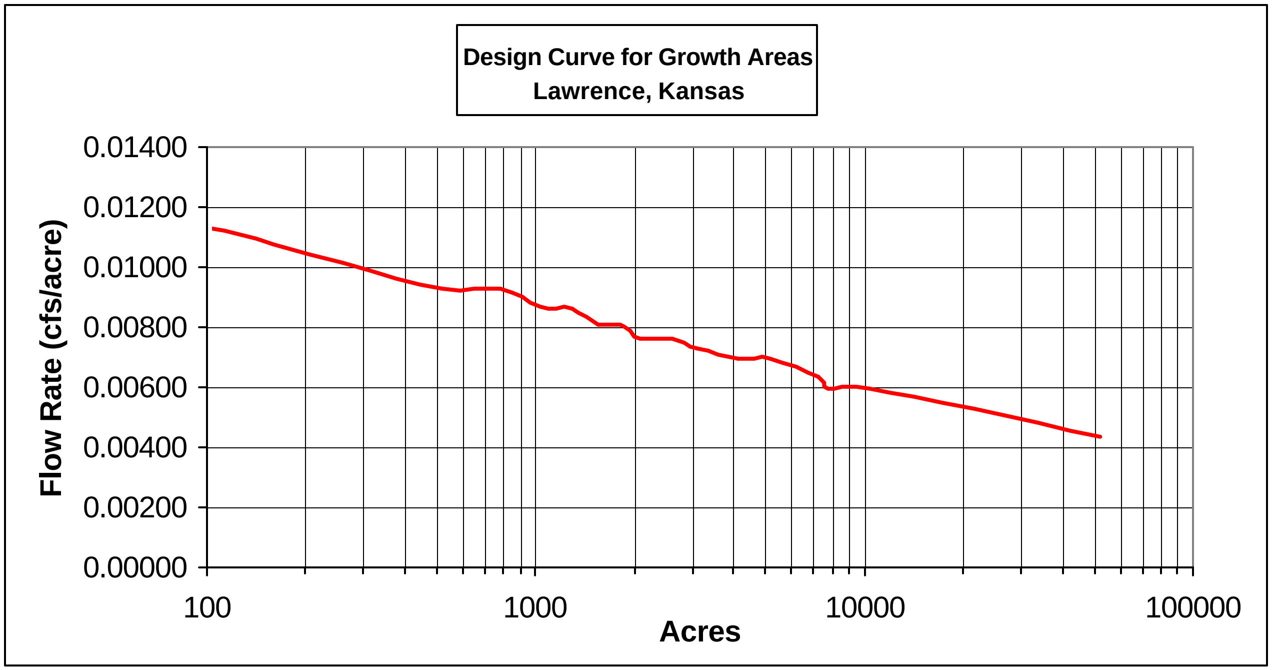


Table I-17
Inflow Summary

Subbasin	10-Yr. Inflow (mgd)		Cumulative Area (acres)	Subbasin 10-Yr. Inflow Rate (gpd/acre)	Ranking
	Subbasin	Cumulative			
C-1	3.36	7.83	1,432	5,470	4
C-2	5.29	5.20	534	9,730	2
C-3	1.46	1.46	135	10,830	1
EL-1	4.23	4.23	897	4,720	7
KR-1	0.59	0.59	517	1,140	19
KR-2	4.13	4.28	2,199	1,950	18
KR-3	1.10	1.10	412	2,660	14
KR-4	3.54	7.30	3,333	2,190	17
KR-5	11.54	45.37	18,396	2,470	16
KR-6	3.62	3.62	1,245	2,910	11
NL-1	8.32	8.32	1,118	7,440	3
WR-2	6.74	6.74	1,892	3,560	10
WR-3	4.40	4.40	913	4,820	6
WR-4	3.71	3.71	1,404	2,640	15
WR-5	1.30	18.99	7,046	2,700	13
WR-6	8.00	24.45	8,925	2,740	12
YTC-1	5.45	5.45	1,103	4,940	5
YTC-2	4.02	4.02	953	4,220	8
YTC-3	3.25	10.98	2,610	4,210	9

3.3.5 Subbasin Distribution of I / I

The distribution of I/I based on a 10-Year storm event is summarized in Table I-18. Figure I-12 is a graph of the calculated system I/I versus the total system acreage. Figure I-13 shows the I/I rate by subbasin. The data indicates that 52.9 percent of the total I/I is produced in 36.7 percent of the area. The City's efforts to reduce I/I has produced positive results. Many of the subbasins have shown a decrease in inflow and infiltration into the collections system during storm events. For future collection system analysis, the continuing efforts of the City to reduce I/I will be considered and the I/I reduction goal adjusted.

Table I-18
Subbasin Distribution of I / I

Subbasin	10-Yr. Storm I/I (mgd)	Area (acre)	10-Year I/I Rate (gpd/acre)	Percent Total I/I By Subbasin		Percent Total Size By Subbasin (acre)	
				Subbasin %	Cum. %	Subbasin %	Cum. %
C-3	1.49	135	11,050	1.8	1.8	0.7	
C-2	5.34	534	10,000	6.3	8.0	2.9	
KR-5	11.70	1,447	8,080	13.7	21.7	7.9	11.5
NL-1	8.41	1,118	7,530	9.9	31.6	6.1	17.6
YTC-3	3.33	554	6,020	3.9	35.5	3.0	20.6
WR-5	1.32	226	5,860	1.6	37.0	1.2	21.8
KR-4	3.62	722	5,010	4.2	41.3	3.9	25.7
YTC-1	5.46	1,103	4,950	6.4	47.7	6.0	31.7
WR-3	4.44	913	4,870	5.2	52.9	5.0	36.7
EL-1	4.25	897	4,740	5.0	57.9	4.9	41.6
C-1	3.41	763	4,470	4.0	61.9	4.1	45.7
WR-6	8.08	1,879	4,300	9.5	71.3	10.2	55.9
YTC-2	4.04	953	4,240	4.7	76.1	5.2	61.1
WR-2	6.83	1,892	3,610	8.0	84.1	10.3	71.4
KR-6	3.75	1,245	3,010	4.4	88.5	6.8	78.2
KR-3	1.14	412	2,770	1.3	89.8	2.2	80.4
WR-4	3.77	1,404	2,690	4.4	94.2	7.6	88.0
KR-2	4.29	1,681	2,550	5.0	99.2	9.1	97.2
KR-1	0.65	517	1,270	0.8	100.0	2.8	100.0
TOTAL	**85.34**	**18396**	**4,640**				

Note: Table sorted based on 10-year I/I rate.

3.3.6 Future Flows

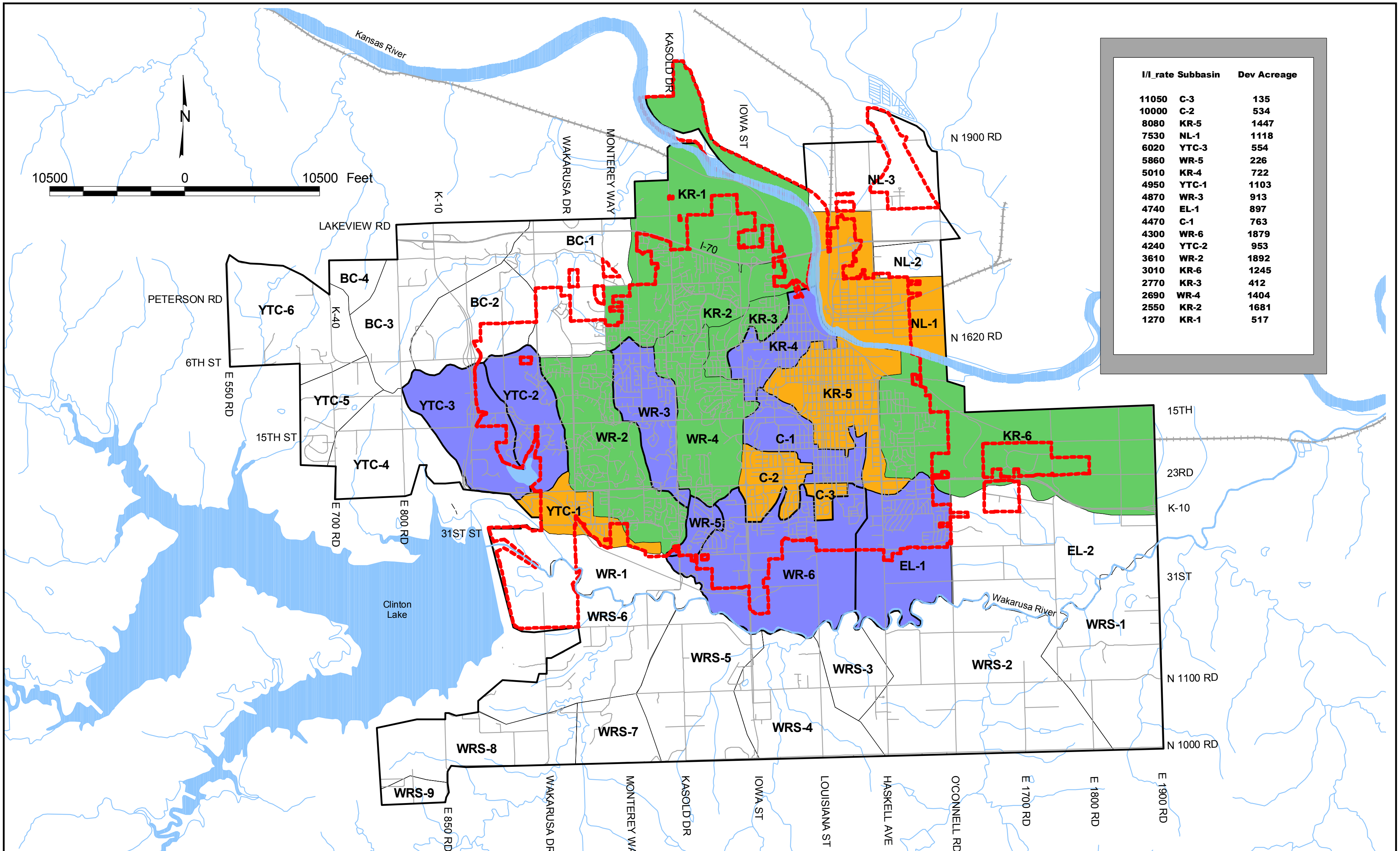
Future flows were derived from the City of Lawrence design curve using future projected developed area. The future flow criteria used, and City of Lawrence Design Curve for growth areas are presented in Table I-19. Table I-20 presents a summary of cumulative peak 10-year flows for years 2000, 2010, and 2025. The future average daily dry weather flows (ADDF) by subbasin are presented in Appendix D.

Table I-20
2000, 2010, and 2025 Cumulative Peak 10-year Flows

Basin / Subbasin	Year 2000						Cumulative Peak 10-yr flow (mgd)		
	ADDF (mgd)		Infiltration (mgd)		10-yr Inflow (mgd)				
	Subbasin	Cumulative	Subbasin	Cumulative	Subbasin	Cumulative	2000	2010	2025
Yankee Tank Creek Basin									
YTC-1	0.158	0.215	0.079	0.111	3.250	3.625	4.017	8.901	16.400
YTC-2	0.040	0.040	0.022	0.022	0.660	0.660	0.735	3.193	6.155
YTC-3	0.017	0.017	0.010	0.010	0.333	0.333	0.364	4.031	10.198
YTC-4								1.510	3.224
YTC-5								0.018	1.886
YTC-6									1.039
Wakarusa River Basin									
WR-1								0.570	1.270
WR-2	0.934	0.934	0.082	0.082	6.740	6.740	7.674	9.330	10.060
WR-3	0.486	0.486	0.039	0.039	4.400	4.400	4.886	6.060	6.210
WR-4	0.890	0.890	0.060	0.060	3.710	3.710	4.600	5.830	6.030
WR-5	0.231	2.758	0.024	0.234	1.300	18.990	21.748	11.160	11.540
WR-6	0.724	3.482	0.077	0.311	8.000	24.450	27.932	22.650	24.030
Baldwin Creek Basin									
BC-1								4.750	9.410
BC-2								1.080	2.120
BC-3								0.990	2.260
BC-4									0.350
Kansas River Basin									
KR-1	0.078	0.078	0.063	0.063	0.590	0.590	0.668	0.790	1.330
KR-2	0.632	0.710	0.152	0.215	4.130	4.280	4.990	9.800	15.410
KR-3	0.380	0.380	0.045	0.045	1.100	1.100	1.480	1.860	1.920
KR-4	0.711	1.801	0.075	0.335	3.540	7.300	9.101	14.310	20.460
KR-5	1.555	8.533	0.158	0.752	11.540	45.370	53.903	50.910	55.780
KR-6	0.172	0.172	0.131	0.131	3.620	3.620	3.792	5.350	5.160
Central Basin									
C-1	0.482	1.242	0.048	0.131	3.360	7.830	9.072	6.180	6.250
C-2	0.607	0.607	0.053	0.053	5.290	5.200	5.807	6.120	6.280
C-3	0.154	0.154	0.030	0.030	1.460	1.460	1.614	1.950	1.970
East Lawrence Basin									
EL-1	0.197	0.197	0.021	0.021	4.230	4.230	4.427	5.870	7.180
EL-2								1.190	2.800
North Lawrence Basin									
NL-1	0.085	0.085	0.096	0.096	8.320	8.320	8.405	5.200	6.110
NL-2								0.710	1.430
NL-3								0.620	1.250
New Wakarusa River Basin									
WRS-1									0.470
WRS-2									2.570
WRS-3									3.790

Table I-20 2000, 2010, and 2025 Cumulative Peak 10-year Flows									
Basin / Subbasin	Year 2000						Cumulative Peak 10-yr flow (mgd)		
	ADDF (mgd)		Infiltration (mgd)		10-yr Inflow (mgd)				
	Subbasin	Cumulative	Subbasin	Cumulative	Subbasin	Cumulative	2000	2010	2025
WRS-4									6.460
WRS-5								12.200	25.430
WRS-6								1.490	7.760
WRS-7									1.620
WRS-8									4.120
WRS-9									0.640

Figure I-12
Percent I/I by Percent Area



I/I_rate	Subbasin	Dev Acreage
11050	C-3	135
10000	C-2	534
8080	KR-5	1447
7530	NL-1	1118
6020	YTC-3	554
5860	WR-5	226
5010	KR-4	722
4950	YTC-1	1103
4870	WR-3	913
4740	EL-1	897
4470	C-1	763
4300	WR-6	1879
4240	YTC-2	953
3610	WR-2	1892
3010	KR-6	1245
2770	KR-3	412
2690	WR-4	1404
2550	KR-2	1681
1270	KR-1	517

Legend

Subbasin I/I (gpd/acre)

- No Sewer Service
- 1000 to 4000
- 4001 to 6000
- 6001 to 12500+
- Lawrence City Limits
- Roadways
- Waterbodies

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SUBBASIN I/I RATE

Figure I-13

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1.0 Description of Alternatives

1.1 Introduction

This section summarizes the comparison of wastewater collection and treatment alternatives, based on wastewater treatment plant location, and recommends the best collection and treatment configuration for final basis of the Wastewater Master Plan. Three wastewater treatment plant (WWTP) locations were considered for this evaluation to determine the recommended wastewater system configuration. The evaluation was based on design year 2025 population and land use projections and includes all projected wastewater flows for the study area. Treatment systems were based on anticipated future regulatory requirements obtained from the Kansas Department of Health and Environment (KDHE).

Alternative 1 consists of routing all wastewater flow for the study area to the existing Kansas River WWTP. Alternative 2 is based on dividing the study area and conveying part of the flow to the existing Kansas River WWTP and the remaining flow to a proposed Wakarusa River WWTP (Site A). Alternative 3 is similar to Alternative 2, however, a different site (Site B) was used for the proposed Wakarusa River WWTP. The selection of two Wakarusa WWTP sites was made to allow consideration of differing project costs due to site location, however, a Wakarusa WWTP could be located in many different locations along the Wakarusa River.

1.2 Alternative 1 – All Flow to Existing Kansas River WWTP

Alternative 1 consists of collecting and routing all wastewater flow to the existing Kansas River WWTP. Wastewater flow for west Lawrence would continue to be conveyed to Wakarusa Pumping Stations 5A and 5B and routed north through the Haskell Avenue corridor to the Kansas River WWTP. West Lawrence wastewater flow would be comprised of flow from the following subbasins: Part of Baldwin Creek (via new pumping stations BC-01 and BC-02), Yankee Tank, and Wakarusa River. East Lawrence flow would also be conveyed to the Wakarusa Pumping Stations and routed through a force main in the Haskell Avenue corridor. All existing and future growth areas south of the Wakarusa River would require wastewater flow to be collected and pumped directly to the Kansas River WWTP through a force main in the Haskell Avenue corridor. The remaining flow for central Lawrence, north Baldwin Creek, and all Kansas River Subbasins would be conveyed to the Kansas River WWTP through existing interceptor sewers.

The existing Kansas River WWTP would need to be upgraded and expanded to treat flow for the entire study area and meet all anticipated future regulatory requirements.

1.3 Alternative 2 – Wakarusa River WWTP (Site A) & Kansas River WWTP

Alternative 2 consists of dividing the study area and routing wastewater flow to both the existing Kansas River WWTP and a proposed Wakarusa River WWTP (Site A). Wastewater flow for west Lawrence would be pumped from the Four Seasons Pumping Station at south Kasold Street directly to a new interceptor sewer located south of the Wakarusa River. This west Lawrence flow includes flow from the following subbasins: Part of Baldwin Creek (via the new pumping stations BC-01 and BC-02), Yankee Tank, and Wakarusa River Subbasin 2. Flow for the Wakarusa South Subbasins and flow from the Four Seasons Pumping Station would be collected in an interceptor sewer located south and parallel to the Wakarusa River and pumped to a new Wakarusa River WWTP (Site A) through a large pumping station located near Louisiana Street. The new Wakarusa WWTP (Site A) would be located south of the Wakarusa River in the Coal Creek watershed. The remaining flow for central Lawrence, north Baldwin Creek, and all Kansas River Subbasins would be conveyed to the Kansas River WWTP through existing interceptor sewers.

The existing Kansas River WWTP would need to be upgraded to meet all anticipated future regulatory requirements. The Wakarusa River WWTP would meet all anticipated future regulatory requirements and account for all growth capacity in the study area that could not be handled by the existing Kansas River WWTP.

1.4 Alternative 3 – Wakarusa River WWTP (Site B) & Kansas River WWTP

Alternative 3 would consist of routing wastewater flow to both the existing Kansas River WWTP and a proposed Wakarusa River WWTP (Site B). Wastewater flow for west Lawrence would be pumped from the Four Seasons Pumping Station at south Kasold Street directly to a new Wakarusa River WWTP (Site B) located south of the Wakarusa River in the Highway 59 watershed. The west Lawrence area flow pumped from Four Seasons would be from the same subbasins described in Alternative 2. The Wakarusa South Subbasins flow would be collected in an interceptor sewer located south and parallel to the Wakarusa River and conveyed to a new Wakarusa River WWTP. The remaining flow for central Lawrence, north Baldwin Creek, and all Kansas River Subbasins would be conveyed to the Kansas River WWTP through existing interceptor sewers.

The existing Kansas River WWTP would need to be upgraded to meet all anticipated future regulatory requirements. The Wakarusa River WWTP would meet all anticipated future regulatory requirements and account for all growth capacity in the study area that could not be handled by the existing Kansas River WWTP.

2.0 Required Collection System Improvements

This section describes the significant wastewater collection system improvements as they relate to the differences between Alternatives 1, 2, and 3. This evaluation compares only the collection system differences between alternatives and does not consider the total scope of improvements required for the study area that are equivalent for each alternative. In subsequent figures herein, the collection system differences used for cost comparison are shown in red and collection system facilities that are equivalent for each alternative are shown in green or black. All alternatives are based on maintaining the Alabama Pumping Station and not diverting this flow south to the Wakarusa Pumping Stations.

2.1 Alternative 1 – All Flow to Existing Kansas River WWTP

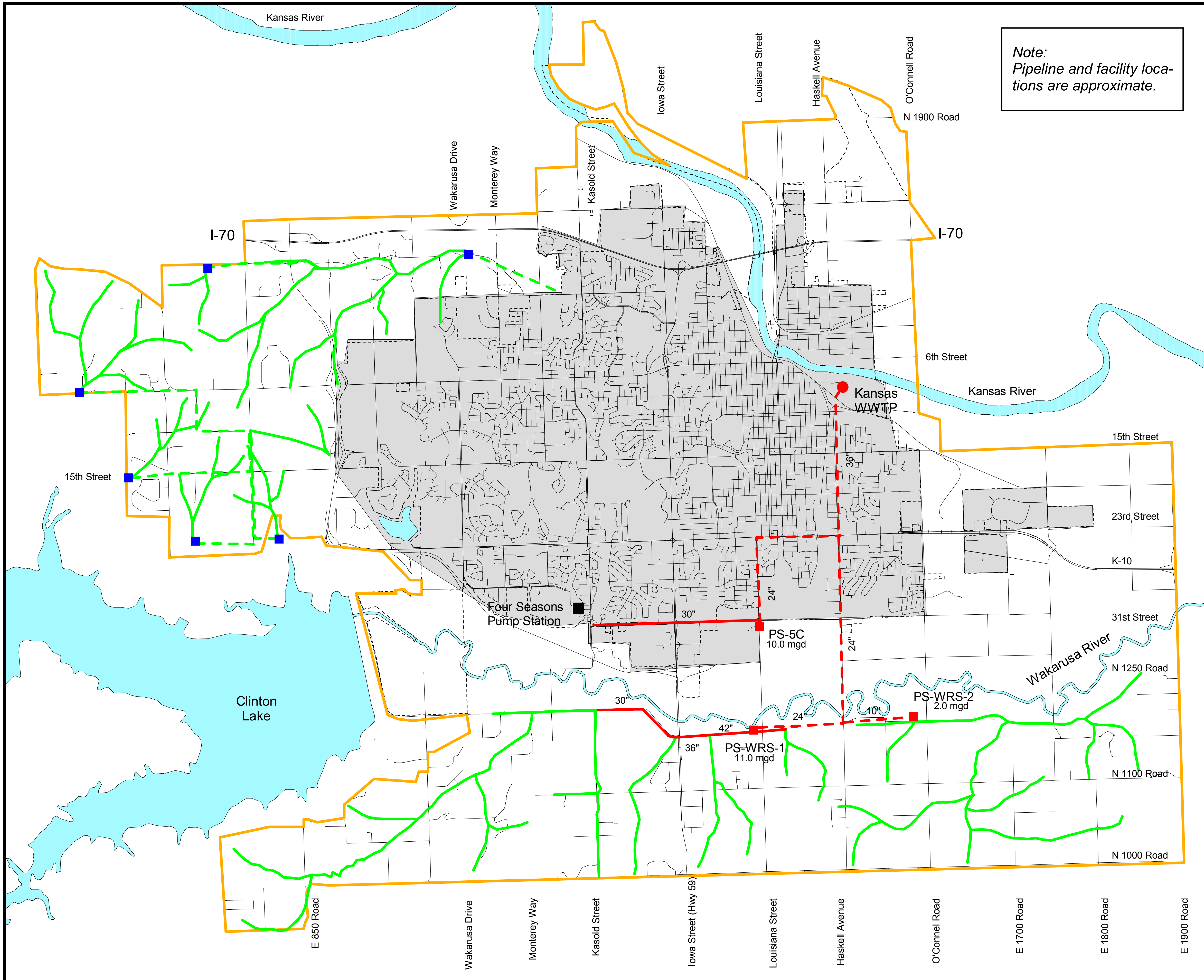
Collection system improvements required for Alternative 1 – All Flow to Existing Kansas River WWTP are shown in Figure II-1. Major new facility improvements used for differential cost comparison include the following:

<u>New Facilities to Convey West Lawrence Flow</u>

- 31st Street Relief Sewer (Kasold Street to Louisiana Street)
- Wakarusa Pumping Station 5C (Wet weather pumping station only)
- Wakarusa Pumping Station 5C Force Main (Wet weather force main only)

The 31st Street Relief Sewer would require difficult construction down an existing developed street. Wakarusa Pumping Station 5C (PS-5C) would have a firm capacity of 10.0 mgd and would serve as a wet-weather pumping station when the capacity of Wakarusa Pumping Stations 5A & 5B are exceeded. Site location requirements for this pumping station would be significant as it would be located near 31st Street and Louisiana Street adjacent to the Baker Wetlands, Haskell Indian Nations University, and the proposed South Lawrence Trafficway. As shown on Figure II-1, route location requirements for the 24-inch and 36-inch force main for Pumping Station 5C would also be significant as the alignment would be in the congested street routes of Louisiana Street, 23rd Street, and Haskell Avenue. The force main must be increased in size to 36-inches along Haskell Avenue from 23rd Street to the Kansas River WWTP to account for the additional flow from the force main serving areas south of the Wakarusa River. The 36-inch force main would have a downhill slope from 23rd Street to the Kansas River WWTP.

The 24-inch force main should not be routed along 31st Street between Louisiana Street and Haskell Avenue because Douglas County does not have right-of-way for the road in this area. The county only has a road easement which will revert back to Haskell Indian Nations University if 31st Street is relocated with the South Lawrence Trafficway extension.



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Alternative 1

Wastewater Flows to Kansas WWTP

Figure II-1

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New Facilities to Convey South Wakarusa Flow

- Wakarusa South Interceptor Sewer (Parallel to Wakarusa River)
- Wakarusa South Pumping Stations WRS-1 & WRS-2
- Wakarusa South Pumping Station Force Mains (Convey to PS-5C force main)

As shown in Figure II-1, a new interceptor sewer is required south of the Wakarusa River from Kasold Street to Louisiana Street to collect flow from trunk sewers (shown in green) in the Wakarusa South watershed. The interceptor sewer would range in size from 30-inches to 42-inches in diameter.

Additionally, two pumping stations would be required to convey flow from south of the Wakarusa River to the PS-5C force main connection point at 23rd Street and Haskell Avenue. Pumping Station WRS-1, with a firm capacity of 11.0 mgd, would serve the majority of the Wakarusa South area and would be located south of the Wakarusa River just west of Lousiana Street. A 24-inch diameter force main would convey flow from this pumping station east to Haskell Avenue and north along Haskell Avenue to the connection point at 23rd Street. Pumping Station WRS-2 would have a firm capacity of 2.0 mgd and would serve the area east of Haskell Avenue and south of the Wakarusa River. It would be located just west of O'Connell Road. The 10-inch force main from this pumping station would be connected to the 24-inch force main at Haskell Avenue. Both Wakarusa South pumping stations would require similar designs for pump system curves and headloss in order to use the same 24-inch pipe along Haskell Avenue. Construction for these pumping stations and force mains would not be difficult as these areas are not developed at this time and the force mains would not need to be constructed within streets.

2.2 Alternative 2 – Wakarusa River WWTP (Site A) & Kansas River WWTP

Collection system improvements required for Alternative 2 – Wakarusa River WWTP (Site A) and Kansas River WWTP are shown in Figure II-2. Major new facility improvements used for differential cost comparison include the following:

New Facilities to Convey West Lawrence Flow

- Four Seasons Force Main Extension (South along Kasold Street)

The 20-inch diameter Four Season Force Main would be extended south along Kasold Street to the Wakarusa South Interceptor located south of the Wakarusa River.

New Facilities to Convey South Wakarusa Flow

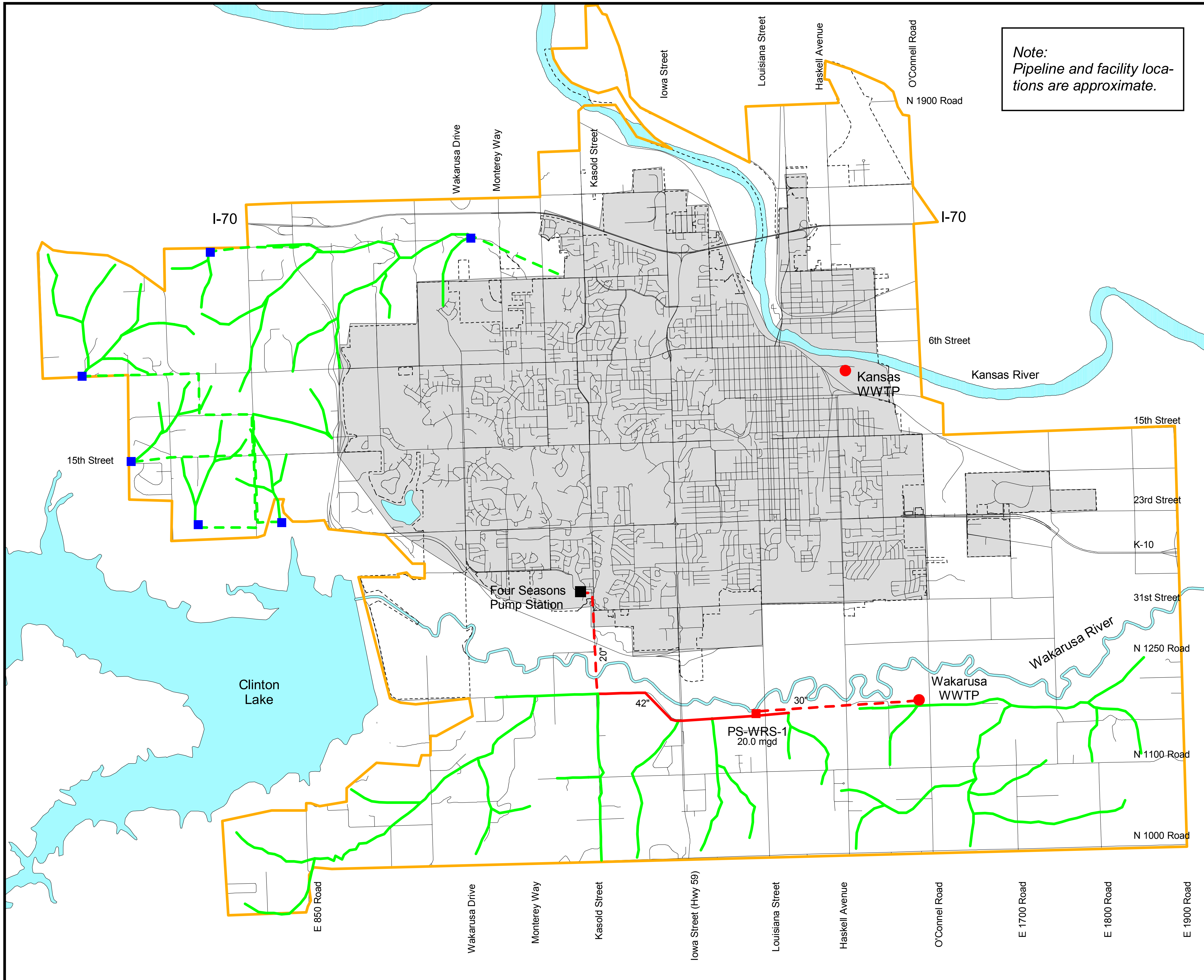
- Wakarusa South Interceptor Sewer (Parallel to Wakarusa River)

- Wakarusa South Pumping Station WRS-1
- Wakarusa South Pumping Station Force Main (Convey to Wakarusa River WWTP)

As shown in Figure II-1, a new interceptor sewer is required south of the Wakarusa River from Kasold Street to Louisiana Street to collect flow from trunk sewers (shown in green) in the Wakarusa South watershed. The interceptor sewer would be approximately 42-inches in diameter.

The interceptor sewer would convey flow to the Wakarusa South Pumping Station WRS-1 located just west of Louisiana Street. This pumping station would have a firm capacity of 20.0 mgd and would serve as an influent pumping station to the Wakarusa WWTP (Site A). The force main would consist of a 30-inch diameter pipeline extending from Louisiana Street to approximately O'Connell Road.

It should be noted that a gravity interceptor sewer option was studied in lieu of pumping to a Wakarusa River WWTP (Site A). This option was not cost-competitive because it would require a long sewer tunnel from just west of Haskell Avenue to half-way between Haskell Avenue and O'Connell Road, due to the depth of the sewer. The significant cost for this sewer tunnel could not be economically justified due to the small amount of additional area that could be served by this sewer during the study period.



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Legend

Facility Differences for Alternatives (Shown in Red)

- Future Force Mains
- Future Sewer Extensions
- WWTP Improvements
- New Pump Station

- Future Force Mains
- Future Sewer Extensions
- Existing Pump Station
- New Pump Station

- Urban Growth Boundary
- Existing City Limit
- Streets
- Existing Sewer Service Area

N

3000 0 3000 6000 Feet

Alternative 2

Wastewater Flows to Kansas WWTP and Wakarusa WWTP (Site A)

Figure II-2

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2.3 Alternative 3 – Wakarusa River WWTP (Site B) & Kansas River WWTP

Collection system improvements required for Alternative 3 – Wakarusa River WWTP (Site B) and Kansas River WWTP are shown in Figure II-3. Major new facility improvements used for differential cost comparison include the following:

New Facilities to Convey West Lawrence Flow

- Four Seasons Force Main Extension to West Wakarusa River WWTP

The 20-inch diameter Four Seasons Force Main would be extended south along Kasold Street directly to a Wakarusa River WWTP (Site B) located south of the Wakarusa River and west of Highway 59. The existing Four Seasons Pumping Station would serve as an influent pumping station to the Wakarusa River WWTP.

New Facilities to Convey South Wakarusa Flow

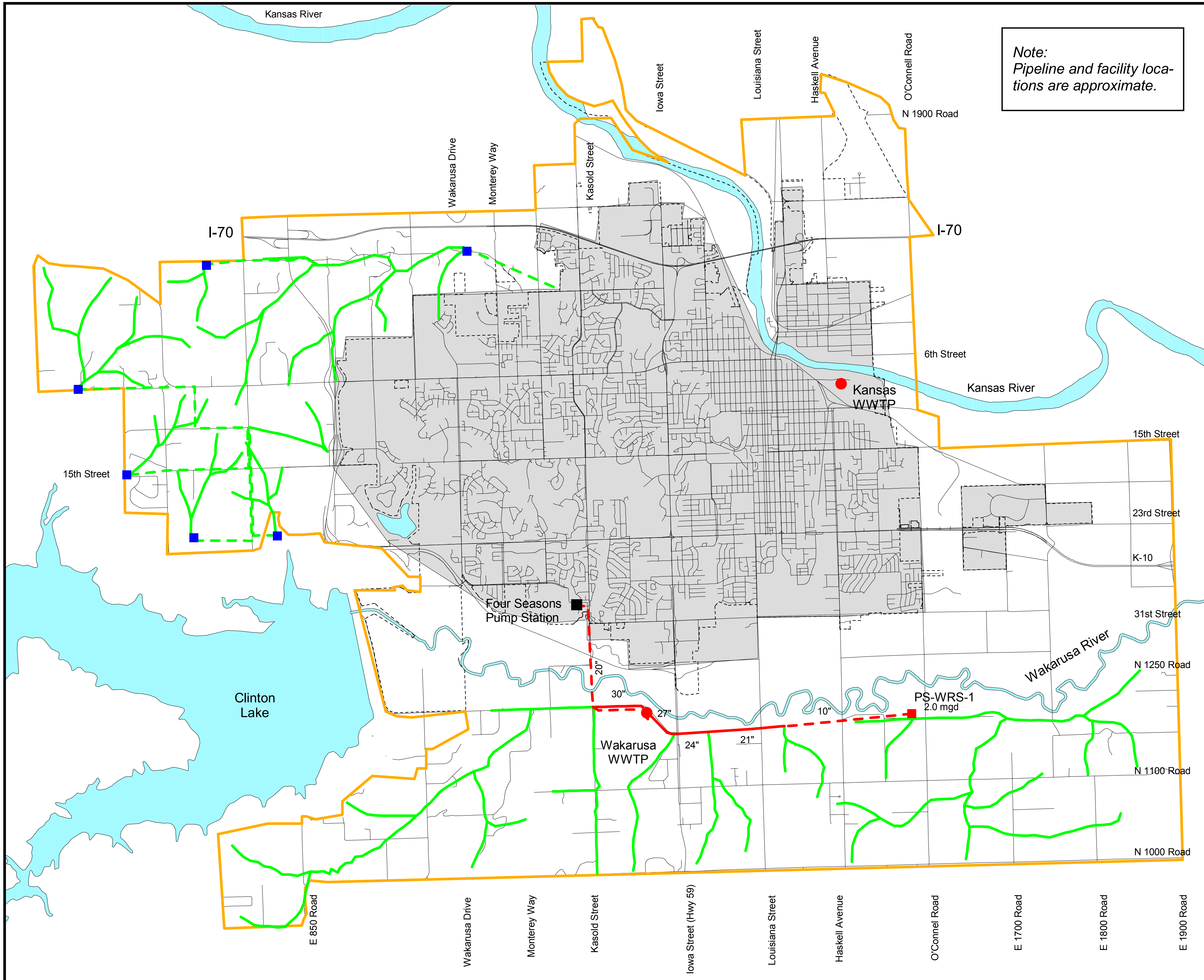
- Wakarusa South Interceptor Sewer (Parallel to Wakarusa River)
- Wakarusa South Pumping Station WRS-1 (For small eastern area)
- Wakarusa South Pumping Station Force Main (Convey to interceptor sewer)

As shown in Figure III-3, new west and east interceptor sewers are required south of the Wakarusa River to convey flow to a new Wakarusa River WWTP (Site B) located just west of Highway 59. The 30-inch diameter west interceptor would convey trunk line flow east to the WWTP. The east interceptor (21 to 27 inches in diameter) would convey trunk line flow west to the WWTP.

Wakarusa South Pumping Station WRS-1 would have a firm capacity of 2.0 mgd and serve the small eastern area south of the Wakarusa River. The flow would be conveyed through a 10-inch force main to the Wakarusa South Interceptor.

2.4 Four Seasons Excess Flow Holding Basins

All three alternatives require effective use of the Four Seasons Excess Flow Holding Basins. The evaluation is based on use of the holding basins to reduce peak flow that must be transported to the WWTP's in all alternatives. The Four Seasons Pumping Station and Holding Basins comprise a very important lynch pin to the collection system and it is anticipated that these facilities will need to be expanded in the future. The expansions are equivalent for each alternative and are not included in the cost evaluation.



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2003

City of Lawrence Department of Utilities

Legend

Facility Differences for Alternatives (Shown in Red)

- Future Force Mains
- Future Sewer Extensions
- WWTP Improvements
- New Pump Station

- Future Force Mains
- Future Sewer Extensions
- Existing Pump Station
- New Pump Station

- Urban Growth Boundary
- Existing City Limit
- Streets
- Existing Sewer Service Area

N

3000 0 3000 6000 Feet

Alternative 3

Wastewater Flows to Kansas WWTP and Wakarusa WWTP (Site B)

Figure II-3

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2.5 Detailed Summary of Collection System Alternatives

A detailed summary of the major collection system differences between alternatives is shown in Table II-1. Table II-1 does not list all facility improvements required to implement a system-wide capital improvements plan, just the facilities improvements that differ between alternatives. The completion year indicated below is the year each facility should be completed and ready for service and is based on population projections for the study area. Table II-1 lists pumping station firm capacities as well as the size and length of interceptor sewers and force mains. A pumping station and force main requested by City Staff has also been indicated for each alternative to serve the Wakarusa South area for initial development requirements.

Table II-1 Detailed Summary of Collection System Alternatives				
Description	Station Capacity (mgd)	Pipe Size (in)	Length (ft)	Completion Year
Alternative 1 – Kansas River WWTP				
31st Street Relief Sewer	-	30	12,000	2007
Wakarusa PS-5C	10.0	-	-	2006
Wakarusa PS-5C Force Main	-	24 & 36	21,300	2006
Wakarusa South Interceptor	-	30 to 42	12,100	2005
Wakarusa South PS-WRS-1	11.0	-	-	2011
Wakarusa South PS-WRS-1 FM	-	24	18,500	2011
Wakarusa South PS-WRS-2	2.0	-	-	2015
Wakarusa South PS-WRS-2 FM	-	10	4,700	2015
Initial Pumping Station and FM for Wakarusa South Area	0.65	6	7,400	2005
Alternative 2 – East Wakarusa River WWTP				
Four Seasons Force Main Extension	-	20	7,000	2011
Wakarusa South Interceptor	-	42	10,400	2005
Wakarusa South PS-WRS-1	20.0	-	-	2011
Wakarusa South PS-WRS-1 FM	-	30	11,400	2011
Initial Pumping Station and FM for Wakarusa South Area	0.65	6	7,400	2004
Description	Station Capacity	Pipe Size	Length	Completion Year
	(mgd)	(in)	(ft)	
Alternative 3 – West Wakarusa River WWTP				
Four Seasons Force Main Extension	-	20	11,300	2011
West Wakarusa South Interceptor	-	30	4,300	2005
East Wakarusa South Interceptor	-	21 to 27	9,000	2005
Wakarusa South PS-WRS-1	2.0	-	-	2015
Wakarusa South PS-WRS-1 FM	-	10	9,600	2015
Initial Pumping Station and FM for Wakarusa South Area	0.65	6	7,400	2005

3.0 Required Wastewater Treatment Plant Improvements

This section describes the primary wastewater treatment plant improvements required for alternatives 1, 2, and 3. The improvements include facilities to meet capacity expansion for growth as well as anticipated future regulatory requirements. All alternatives are based on 2025 population and land use projections for the study area. A 2025 population of 150,000 people was used as the basis of design for the study area. The design population for the existing Kansas River WWTP, including the expansion currently under construction, is 100,000 people.

Anticipated future regulatory requirements for the Kansas River and the Wakarusa River were received from KDHE. The requirements were based on the National Nutrient Strategy developed by the Environmental Protection Agency (EPA). The strategy presents recommended water quality on an Ecoregion basis, which for Region IX, includes the Kansas and Wakarusa Rivers. In order to meet the new EPA nutrient strategy, biological nutrient removal facilities will be required for wastewater treatment at both the Kansas and Wakarusa Rivers. In addition, the wastewater treatment requirements will be the same for discharges to either the Kansas River or the Wakarusa River. KDHE has indicated facilities for both the Kansas and Wakarusa Rivers must meet the following biological nutrient removal requirements:

Biological Nutrient Removal Requirements
Total Phosphorous < 1.5 mg/L
Total Nitrogen < 10.0 mg/L
Ammonia Nitrogen < 1.0 mg/L

An additional requirement for a Wakarusa River discharge is that an anti-degradation review process must be completed before a National Effluent Discharge Elimination (NPDES) permit is issued for the Wakarusa River. KDHE has indicated that this review process will most likely not prevent an NPDES permit from being issued to the City of Lawrence for the Wakarusa River. Therefore, it appears that wastewater treatment plant discharges to the Wakarusa River are viable from a regulatory standpoint.

3.1 Alternative 1 – All Flow to Existing Kansas River WWTP

All wastewater flow for the entire study area would be conveyed to the existing Kansas River WWTP for Alternative 1. The current design population and average flow capacity for the WWTP are 100,000 people and 12.5 mgd. The 2025 design population for Alternative 1 is 150,000 people, and therefore, would involve a capacity expansion as well as a biological nutrient removal (BNR) upgrade. Proposed design criteria for Alternative 1 are as follows:

Design Criteria for Alternative 1

- Design population = 150,000
- Average flow = 18.8 mgd
- Max month flow = 26.3 mgd
- Peak hydraulic flow = 37.6 mgd
- Provide capacity expansion
- Upgrade for BNR per KDHE limits

A summary of wastewater treatment process improvements required for Alternative 1 is shown in Table II-2

Table II-2
Alternative 1 Process Improvements at Kansas River WWTP

WWTP Modification	Alternative 1 – All flow to Kansas River WWTP	
	Circular Aeration Basin Train	Rectangular Aeration Basin Trains
New Primary Clarifier	Add 1 @ 100 ft. dia.	
Modify Flow Split to Process Trains	25% of total flow (1 train)	75% of total flow (3 trains)
New BNR Basins	1 basin per existing circular aeration basin (includes pre-anoxic, anaerobic, and anoxic zones). Total volume of each BNR basin = 36,560 cf.	1 basin w/ 3 trains to serve all rectangular AB's (includes pre-anoxic and anaerobic zones, total vol. = 137,080 cf) Anoxic zone incorporated into AB's, vol. ea. AB = 27,420 cf.
New Aeration Basin (AB)	N.A.	1 identical to existing rectangular (189,000 cf). Anoxic zone included, as above.
New Final Clarifier	N.A.	Add 1 @ 110' dia.
MLSS recycle	Provide flexibility for 2-4 Q	Provide flexibility for 2-4 Q
New Anaerobic Digesters	Use existing 80' primary and 55' secondary as primary digesters and add 1 primary @ 50 ft. dia. (51,375 cf). Convert 55' sludge storage basin to a secondary digester.	
New Fermentation Basin	1 @ 55' dia.	
Additional chlorine contact volume	Add 1 basin (17,000 cf)	
Additional dechlorination volume	Add 1 basin (1,500 cf)	

Note: AB = Aeration basin, Q = Ave. WWTP flow, N.A. = Not applicable

The BNR treatment zones were sized for the following detention times:

- 15 minutes for pre-anoxic zone
- 60 minutes for anaerobic zone
- 45 minutes for anoxic zone

Wastewater treatment plant improvements required for Alternative 1 – All Flow to Existing Kansas River WWTP are shown in Figure II-4.

3.2 Alternative 2 – Wakarusa River WWTP (Site A) and Kansas River WWTP

Alternative 2 involves dividing the study area and conveying part of the flow to the Kansas River WWTP and the remaining flow to a proposed Wakarusa River WWTP (Site A). Proposed design criteria and plant improvements for each WWTP are summarized below.

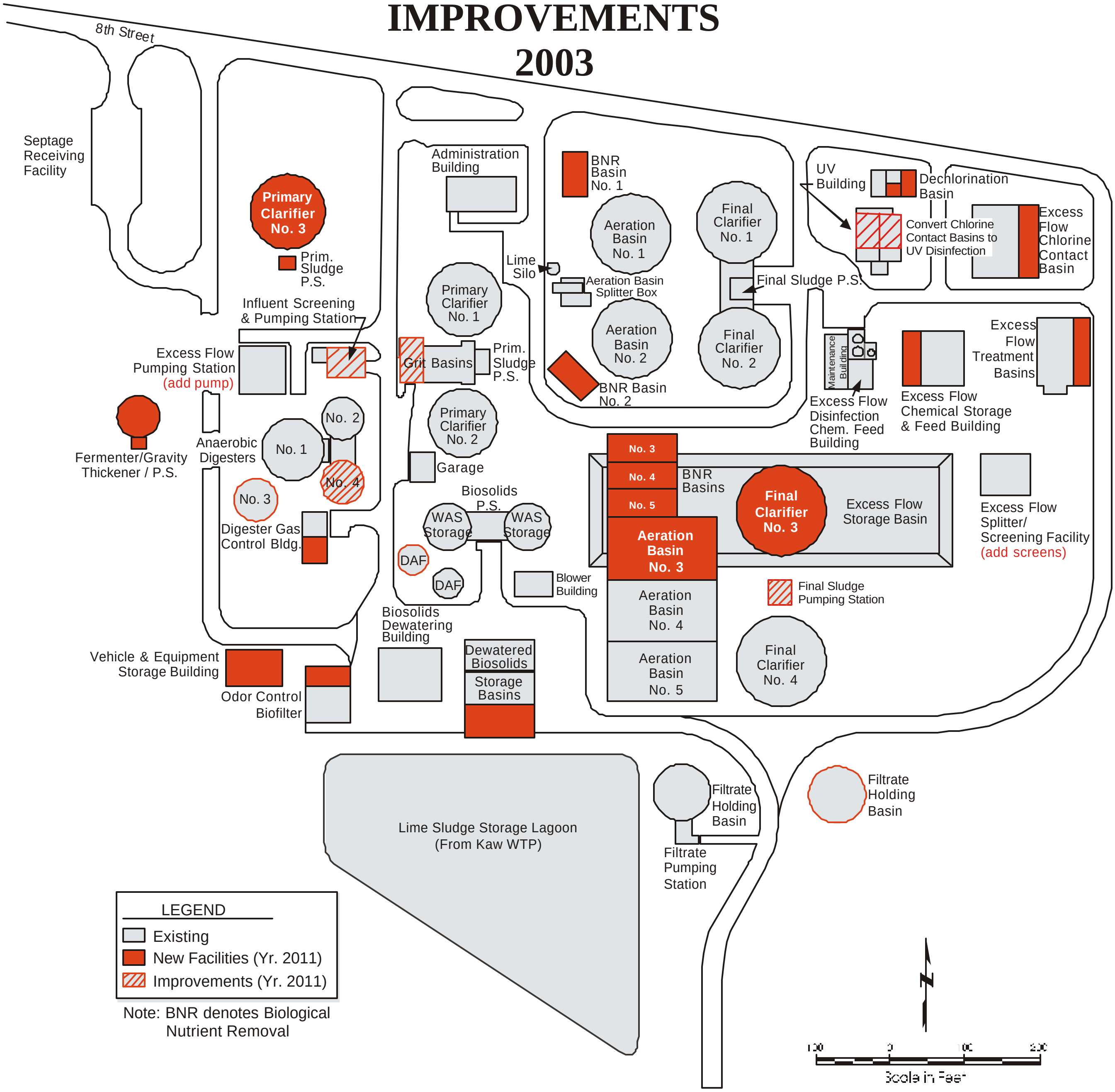
<u>Kansas River WWTP Design Criteria and Improvements</u>
Proposed design criteria for the Kansas River WWTP would be as follows:

<u>Alternative 2 Design Criteria at Kansas River WWTP</u>

- Design population = 95,000
- Average flow = 11.9 mgd
- Max month flow = 16.6 mgd
- Peak hydraulic flow = 23.8 mgd
- Upgrade for BNR per KDHE limits
- Capacity expansion is not required
- Remaining flow is to Wakarusa River WWTP

A summary of Kansas River wastewater treatment process improvements required for Alternative 2 is shown in Table II-3.

LAWRENCE, KANSAS
KANSAS RIVER WASTEWATER TREATMENT PLANT IMPROVEMENTS
2003



BLACK & VEATCH Corporation

Alternative 1
City of Lawrence, Kansas
Utilities Department
Figure II-4

Table II-3
Alternative 2 Process Improvements at KS River WWTP

WWTP Modification	Alternative 2 – Partial flow to Kansas River WWTP	
	Circular Aeration Basin Train	Rectangular Aeration Basin Trains
New Primary Clarifier	N.A.	N.A.
Modify Flow Split to Process Trains	Stays at 40% of total flow (1 train)	Stays at 60% of total flow (2 trains)
New BNR Basins	1 basin per existing circular aeration basin (includes pre-anoxic, anaerobic, and anoxic zones). Total volume of each BNR basin = 36,990 cf.	BNR vol. (pre-anoxic, anaerobic, and anoxic zones) incorporated into existing AB's. Total BNR vol. per AB = 55,480 cf.
New Aeration Basin (AB)	N.A.	N.A.
New Final Clarifier	N.A.	N.A.
MLSS recycle	Provide flexibility for 2-4 Q	Provide flexibility for 2-4 Q
New Anaerobic Digesters	Use existing 80' primary and 55' secondary as primary digesters. Convert 55' sludge storage basin to a secondary digester.	
New Fermentation Basin	1 @ 45' dia.	
Additional chlorine contact volume	N.A.	
Additional dechlorination volume	N.A.	

AB = Aeration Basin, N.A. = Not applicable, Q = Ave. WWTP flow

Wastewater treatment plant improvements required for the Kansas River WWTP with Alternative 2 are shown in Figure II-5.

Wakarusa River WWTP Design Criteria and Improvements

Proposed design criteria for the Wakarusa River WWTP would be as follows:

Alternative 2 Design Criteria at Wakarusa River WWTP

- Design population = 55,000
- Average flow = 6.9 mgd
- Max month flow = 9.7 mgd
- Peak hydraulic flow = 13.8 mgd
- Provide BNR per KDHE limits
- Allow for future filtration

The Wakarusa River WWTP would include the following treatment units and support facilities:

- Influent pumping and screening
- Grit removal
- Primary clarification
- Aeration and biological nutrient removal
- Secondary clarification
- Effluent disinfection
- Excess flow handling facilities
- Fermentation basin
- Anaerobic digestion facilities
- Biosolids dewatering facilities
- Administration building

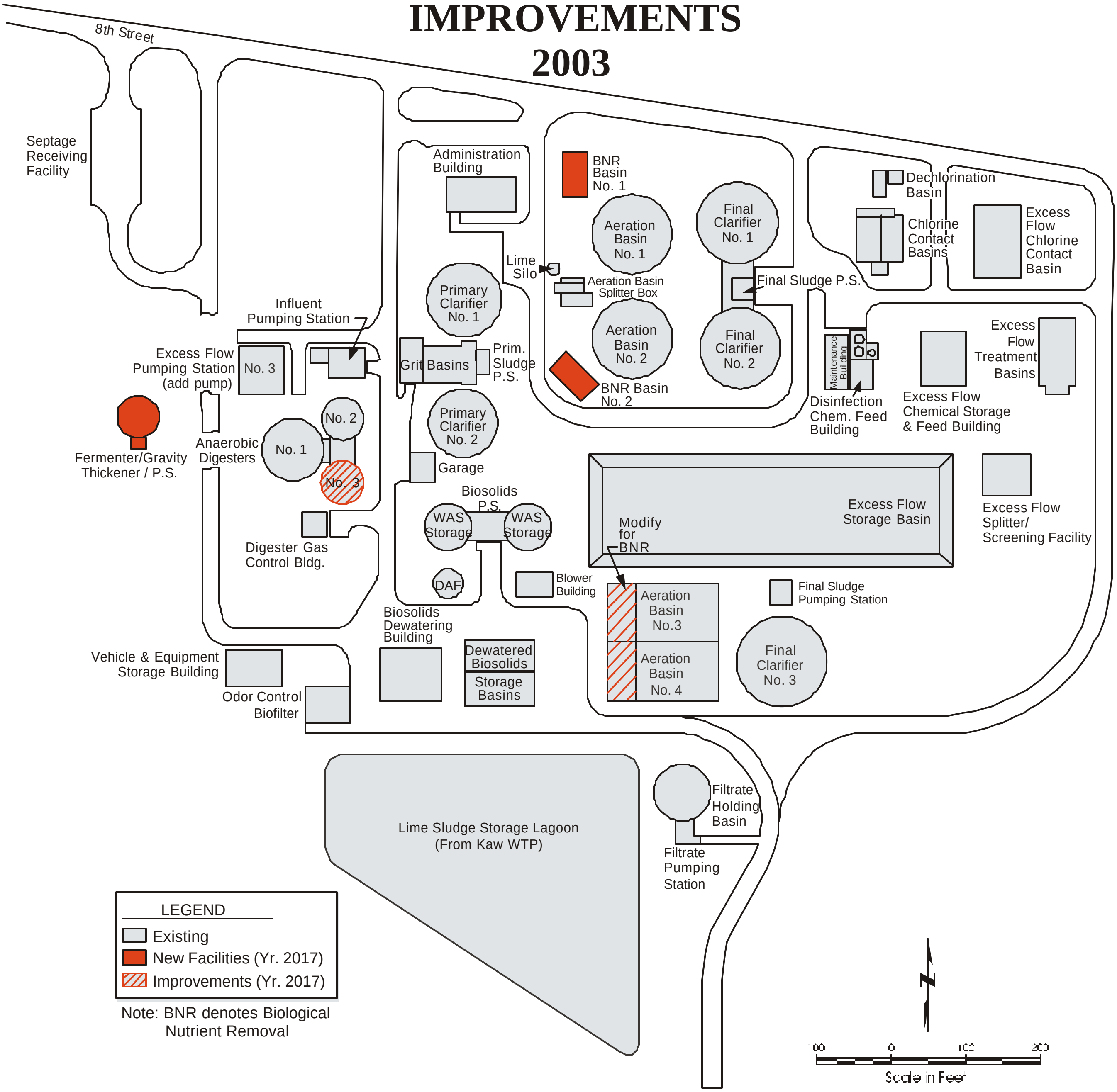
3.3 Alternative 3 - Wakarusa River WWTP (Site B) and Kansas River WWTP

Wastewater flow for the study area with Alternative 3 would be conveyed to both the Kansas River WWTP and a proposed Wakarusa River WWTP (Site B), similar to Alternative 2. Proposed design criteria and plant improvements for each treatment plant would be identical to Alternative 2 with the exception of the following:

- The influent pumping station for the Wakarusa WWTP (Site B) would be larger than the influent pumping station for Wakarusa WWTP (Site A). This is due to less flow being pumped to the Site B plant by a remote pumping station than would be pumped to the Site A plant. (Refer to collection system figures.)

- More provisions for future odor control facilities would likely be included with Wakarusa WWTP (Site B) than with Wakarusa WWTP (Site A) due to the probable proximity to future City development.

LAWRENCE, KANSAS
KANSAS RIVER WASTEWATER TREATMENT PLANT IMPROVEMENTS
2003



Alternatives 2 & 3
City of Lawrence, Kansas
Utilities Department
Figure II-5

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4.0 Cost-Effectiveness Evaluation

4.1 Basis of Evaluation

Each alternative was evaluated for the planning period from January 1, 2003 to December 31, 2025. Capital costs for wastewater treatment and collection were based on data from previous projects and cost curves developed by Black & Veatch. All previous project costs were indexed to 4th quarter 2002 dollars using Engineering News Record indexes. Operation and maintenance costs were developed from City Utilities Department data for wastewater treatment and Black & Veatch data for wastewater collection.

Capital costs for the cost-effectiveness evaluation are based on year 2002 dollars and do not include allowances for inflation. Capital costs include costs for construction, a 20 percent service factor for collection system contingencies, a 25 percent service factor for treatment system contingencies, and a 20 percent service factor for engineering and administration. A discount rate of 5 7/8 percent was used for present worth calculations.

4.2 Cost-Effectiveness Analysis

A cost-effectiveness analysis was performed to compare the life cycle costs of the three alternatives during the planning period. The present worth of capital and operation and maintenance costs for the alternative differences shown in “red” in the collection and treatment system figures was calculated to determine the most cost-effective alternative for the planning period. The analysis does not include the majority of the collection system improvements that are identical to each alternative. A full capital improvements plan for the entire collection system is provided in a subsequent chapter of the Master Plan based on the selected wastewater system alternative.

The present worth of capital and operation and maintenance costs for the three collection and treatment system alternatives is summarized in Table II-4.

Table II-4
Cost-Effectiveness Analysis
Design Year 2025

Present Worth	Alternative 1 All Flow to Kansas River WWTP	Alternative 2 Wakarusa River WWTP (Site A)	Alternative 3 Wakarusa River WWTP (Site B)
Capital Costs: WWTP and Collection	$56,600,000	$52,000,000	$48,400,000
O&M Costs: WWTP and Collection	$25,400,000	$26,200,000	$25,900,000
Total Present Worth	**$82,000,000**	**$78,200,000**	**$74,300,000**

A detailed summary of the cost-effectiveness analysis showing individual project capital costs, project implementation year, operation and maintenance costs, and present worth for each alternative is shown in Appendix E, Cost Effectiveness Analysis.

5.0 Consideration of Additional Issues

A review of additional issues relating to the collection and treatment system alternatives was also considered. The lowest present worth alternative may not always be the best option or the best fit based on extenuating additional issues in the study area. Criteria were selected for consideration relating to additional local issues that may affect implementation of future wastewater system alternatives.

The topics presented herein provide an initial global look at additional issues to be considered by City staff and the City Commission in evaluating the alternatives. The topics are not all-inclusive and should only be used as a starting point for discussion purposes. Detailed studies of these additional issues should be conducted as necessary for major treatment plant facilities and pumping stations or pipelines in sensitive locations. The review of additional issues for each alternative included the following criteria:

- Environmental Issues – Potential adverse impacts or beneficial effects may result from the alternatives under consideration. Issues for consideration include wetlands, protected lands, federally listed species, state or other federal sensitive species, wildlife, aquatic life, and existing hazardous wastes or contaminated soil. An Environmental Impact Assessment would be required to provide a detailed assessment of these issues.

- Cultural Issues – Cultural resources may impact the feasibility of acquiring land or easements for wastewater facilities or pipelines. Both pre-historic and historic sites would need to be researched, documented, and evaluated in a detailed study.

- Socio-Economic Issues – Social and economic diversity is typically a major issue with water reservoir projects, however, some adverse impacts or beneficial effects may result from major wastewater system facilities. Issues for consideration include tourism, recreation, industrial and commercial development, residential development, and agricultural interests.

- Initial Permitting and Regulatory Issues – Initial permitting and regulatory issues must be met for the following agencies: EPA, KDHE, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Kansas Division of Water Resources, and City of Lawrence (zoning and flood plain development restrictions).

- Long-Term Wastewater Regulatory Issues – Wastewater regulatory issues beyond the 2025 planning year should be considered relative to the impacts on existing or proposed treatment facilities. The existing Kansas River WWTP is limited by facility site constraints and an existing hydraulic profile with regards to addition of new process units for long-term regulatory requirements.

- Long-Term Capacity Expansion Issues – Wastewater treatment plant capacity expansion beyond the 2025 planning year is a long-term feasibility consideration that could affect future costs. A long-term view of space requirements for additional treatment units and support facilities on the plant site and hydraulic profile availability should be conducted.

- Plant Access Roadways – Adequate access roadways to wastewater treatment facilities are necessary for safe and efficient delivery of chemicals and supplies, efficient access for plant personnel and solids disposal trucks, and quick access for fire and medical vehicles. The most favorable access roadways are paved major arterial streets and paved highways. Possible future roadways such as the South Lawrence Trafficway extension and the Eastern Parkway should be considered.

- Public Perception and Acceptance – The public's perception and acceptance of an alternative is based on the inherent community value system that exists in the area. The extent of the community boundary may be defined by the study area or extend well beyond the 2025 urban growth area boundary. Public perception and acceptance are often influenced by issues such as public health and welfare, safety, land-use development, property values, odor potential, truck traffic, and aesthetics.

- A matrix was developed to summarize the review of additional issues considered for each alternative. The matrix is shown in Table II-5 and includes commentary for each alternative relating to each particular issue. As indicated previously, the matrix of additional issues is not all-inclusive and is only intended as a beginning point of consideration of additional issues by City staff and the City Commission. Detailed studies of these additional issues should be conducted as necessary for major treatment plant facilities and pumping stations or pipelines in sensitive locations.

Wastewater Master Plan
Consideration of Additional Issues for Alternatives

Issue	Alternative 1 - Kansas River WWTP	Alternative 2 - Wakarusa WWTP (Site A)	Alternative 3 - Wakarusa WWTP (Site B)
Environmental	1. Wetlands may be an issue for PS - 5C and pipeline routes. 2. PS-5C route extends through congested City streets. 3. Protected lands or species may be an issue for PS-5C. 4. Environmental issues are better known for existing WWTP. 5. Quantity of contaminated soil and landfill debris to be removed at existing WWTP is unknown.	1. Wetlands data must be obtained for new WWTP site and pipeline routes south of the Wakarusa River. 2. Protected lands and species must be determined for new WWTP site and pipeline routes south of Wakarusa River. 3. Requires an environmental impact assessment. 4. No fatal flaws observed at present.	1. Wetlands data must be obtained for new WWTP site and pipeline routes south of the Wakarusa River. 2. Protected lands and species must be determined for new WWTP site and pipeline routes south of Wakarusa River. 3. Requires an environmental impact assessment. 4. No fatal flaws observed at present.
Cultural	1. Existing plant site is zoned and has no known cultural impacts. 2. Pipeline routes are in City R/W and should not have cultural impacts. 3. PS-5C must be located on a site that does not adversely impact Haskell University or Broken Arrow Park. 4. Cultural issues south of the Wakarusa River must be determined.	1. Cultural data for Wakarusa plant site is unknown. A cultural resources assessment must be conducted. 2. Wakarusa plant site must be zoned. 3. Cultural issues for pipelines south of the Wakarusa River must be determined. 4. No fatal flaws observed at present.	1. Cultural data for Wakarusa plant site is unknown. A cultural resources assessment must be conducted. 2. Wakarusa plant site must be zoned. 3. Cultural issues for pipelines south of the Wakarusa River must be determined. 4. No fatal flaws observed at present.
Socio-Economic	1. WWTP capacity expansion is positive for City development and City economic expansion. 2. Minimal impact to social and recreation interests. 3. Temporary disruption to City businesses and residential areas may be realized with pipelines constructed in City streets.	1. WWTP capacity expansion is positive for City development and City economic expansion. 2. Minimal impact to social and recreation interests. 3. Agricultural land must be obtained and used for WWTP site.	1. WWTP capacity expansion is positive for City development and City economic expansion. 2. Minimal impact to social and recreation interests. 3. Agricultural land must be obtained and used for WWTP site.
Initial Permitting and Regulatory	1. NPDES, Corps of Engineers, and other permits easily obtained. 2. An antidegradation review is not required to expand to the existing WWTP. 3. New City flood plain regulations must be met. May cause problems in adding site fill to raise the plant site for flood protection.	1. NPDES, Corps of Engineers, and other permits readily obtained. 2. An antidegradation review is required for a discharge to the Wakarusa River. KDHE indicates the review will likely allow an NPDES permit to be issued. 3. New City flood plain regulations must be met. May cause problems in adding site fill to raise the plant site for flood protection.	1. NPDES, Corps of Engineers, and other permits readily obtained. 2. An antidegradation review is required for a discharge to the Wakarusa River. KDHE indicates the review will likely allow an NPDES permit to be issued. 3. New City flood plain regulations must be met. May cause problems in adding site fill to raise the plant site for flood protection.
Long-Term Wastewater Regulatory (Beyond Year 2025)	1. Existing plant hydraulic profile cannot accommodate future process units such as filtration for increased treatment. 2. Future regulatory requirements would require significant plant upgrades such as intermediate pumping due to lack of available hydraulic profile and lack of space on site.	1. New WWTP hydraulic profile would be designed to allow for future process units such as filtration. 2. Future regulatory requirements would not adversely impact the plant and could be added with minimal difficulty.	1. New WWTP hydraulic profile would be designed to allow for future process units such as filtration. 2. Future regulatory requirements would not adversely impact the plant and could be added with minimal difficulty.
Long-Term Capacity Expansion (Beyond Year 2025)	1. Existing plant does not have space to accommodate future process units for capacity expansion. 2. A new WWTP adjacent to the existing WWTP would be required for a capacity expansion beyond 2025. 3. Collection facilities may be under-utilized if a 2nd WWTP is added.	1. New Wakarusa WWTP would have space to allow for additional process units for future capacity expansion. 2. Long-term wastewater system expansion beyond the year 2025 is optimized with the use of two WWTP sites.	1. New Wakarusa WWTP would have space to allow for additional process units for future capacity expansion. 2. Long-term wastewater system expansion beyond the year 2025 is optimized with the use of two WWTP sites.
Plant Access Roadways	1. Good access roadway surface with new paved 8th Street roadway. 2. Good secondary access from 11th Street paved roadway. 3. Truck access to WWTP through neighborhoods is a negative. Existing primary access is not a major street or highway.	1. O'Connell Road is currently not a good access road (gravel road), however, it can be upgraded as required. 2. Haskell Ave. provides good paved access to the area. 3. No access through neighborhoods is needed at present.	1. Highway 59 is an excellent, major paved access road to the area. 2. N. 1200 Road is a good paved truck access route to the area. 3. No access through neighborhoods is needed at present. 4. No access through neighborhoods will be needed in the future.
Public Perception and Acceptance	1. Public acceptance of expanding the existing WWTP would be similar to acceptance of previous WWTP expansions (good). 2. Public acceptance of building PS-5C near Haskell Univ., Broken Arrow Park, and the Baker Wetlands may not be good. 3. Public perception of disruption to commercial and residential areas from pipeline construction in streets may not be good.	1. Public would likely perceive a WWTP in the east area as being better than a WWTP site in a more visually apparent location in the west area. 2. Public may perceive an expansion of the existing WWTP as better than a Wakarusa WWTP in the east area.	1. Public would likely perceive a WWTP in the east area as being better than a WWTP site in a more visually apparent location in the west area. 2. Public may perceive an expansion of the existing WWTP as better than a Wakarusa WWTP in the west area.

6.0 Recommendations

6.1 Cost Factors

Alternative 3 has the lowest capital cost and the lowest present worth as shown in the cost-effectiveness analysis. A distinct difference is shown for the present worth of the capital costs. The ranking of alternatives by present worth of capital costs is shown below.

Ranking by Present Worth of Capital Costs

Ranking	Alternative Description	Present Worth	Difference from Alt. 3
1	Alt. 3 – Wakarusa WWTP (Site B)	$48,400,000	
2	Alt. 2 – Wakarusa WWTP (Site A)	$52,000,000	7.4%
3	Alt. 1 – Kansas River WWTP	$56,600,000	16.9%

From a cost standpoint, master planning alternatives may be considered similar if the difference in present worth is less than 10 percent. Based on capital costs only, Alternative 1 is not equivalent to the Wakarusa Alternatives 2 and 3. Alternative 3 has the lowest capital cost, however, Alternative 2 should be given consideration since the capital cost difference is less than 10 percent.

Alternative 3 has the lowest total present worth considering both capital and operation and maintenance costs. The ranking of alternatives by present worth cost of both capital and operation and maintenance costs is shown below:

Ranking by Present Worth of Capital and O&M Costs

Ranking	Alternative Description	Present Worth	Difference from Alt. 3
1	Alt. 3 – Wakarusa WWTP (Site B)	$74,300,000	
2	Alt. 2 – Wakarusa WWTP (Site A)	$78,200,000	5.3%
3	Alt. 1 – Kansas River WWTP	$82,000,000	10.4%

The difference in total present worth cost between Alternatives 1 and 3 is larger than 10 percent, so Alternative 1 would still not be considered similar to Alternative 3. The difference in present worth between Alternatives 2 and 3, at 5.3 percent, is close enough that both plant locations should be given consideration, however, Alternative 3 is the best option from a cost standpoint.

6.2 Additional Issues

The present worth analysis indicates the cost of Alternatives 2 and 3 is similar. With this in mind, consideration of additional issues may aid in the ultimate selection of an alternative.

If Alternative 1 is screened out due to cost reasons, a review of Alternatives 2 and 3 may provide some differences that may influence the selected location of a Wakarusa WWTP. As shown in the issues matrix, the two Wakarusa River WWTP alternatives have similar requirements relating to the evaluation and study of environmental, cultural, protected species, and flood plain issues. Wakarusa River WWTP (Site B) would have the benefit of better plant access roadways than would Site A. Public perception and acceptance of a Wakarusa River WWTP location should be evaluated and studied in more detail to provide input for selecting a site for a Wakarusa River WWTP.

Based on this initial review, the overall impact of additional issues is similar for both Wakarusa plant locations. Further study of the additional issues for potential Wakarusa River WWTP locations will provide more insight into the most favorable plant site.

6.3 Recommended Alternative

Alternative 3 – Wakarusa WWTP (Site B) is the most cost-effective option for the City of Lawrence and, at present, does not appear to have any fatal flaws with respect to additional issues.

Consideration should also be given to the long-term expansion of the City wastewater system. After the year 2025, further expansion of the Kansas River WWTP beyond that shown for Alternative 1 would be extremely difficult. Additional space for expansion within the existing plant layout would not be available, therefore, any future expansion after 2025 would likely require a separate treatment plant located adjacent to the existing plant. The collection system would also need to be expanded with parallel pipelines in congested areas to route flow from west and south Lawrence to the existing plant.

In a similar fashion, consideration should also be given to the impact of implementing a Wakarusa River WWTP after 2025 if Alternative 1 – Kansas River WWTP is selected now. If a Wakarusa River WWTP is implemented after 2025, a significant amount of collection system infrastructure would be constructed for Alternative 1 that would not be needed after the year 2025. Alternative 1 collection system improvements that would be unused after 2025 include the 31st Street Relief Sewer, Wakarusa Pumping Station 5C and Force Main 5C, and most of the force main for Wakarusa South Pumping Station WRS-1. The capital cost for these collection system facilities which would not be used after 2025 is $19,200,000.

Based on capital and present worth costs, review of additional issues, and long-term wastewater expansion issues beyond 2025, the recommended plan is Alternative 3 – Wakarusa River WWTP (Site B). It is recommended that collection system improvements proceed on the basis of routing flow for part of the collection system to a future Wakarusa River WWTP. The Four Seasons Holding Basins should be used as a wet-weather handling facility for all Wakarusa River WWTP service area flow originating north of the Wakarusa River. It is also recommended that studies be conducted of the additional issues including environmental, cultural resource, and flood plain impact assessments to determine the best and most favorable location for a Wakarusa River WWTP site.

SECTION III – COLLECTION SYSTEM EVALUATION

1.0 Existing Collection System

1.1 General Description of Collection System

The existing collection system includes sanitary sewers, pumping stations, force mains, and a wet weather holding basin. The Lawrence collection system consists of lines ranging in size from 6 to 48 inches in diameter and some lines constructed as early as 1886. A general description of the collection system is given in the following sections.

1.1.1 Trunk Sewer Inventory

The system is constructed primarily of vitrified clay pipe (VCP), plastic (PVC), reinforced concrete pipe (RCP), and cast iron pipe with some older pipe joints consisting of poured mortar and wiped cement. Older manholes were typically constructed of brick and mortar with newer manholes typically made of pre-cast concrete riser sections with rubber o-ring gaskets.

The City provided Black & Veatch with GIS databases that contained information on every sewer line and manhole within the City limits. However for purposes of this wastewater master plan, only the trunk sewers, which range in size from 10 inch to 48 inch, and 8 inch lines connecting pump stations to the system, were analyzed. The trunk sewer inventory data was imported into Black & Veatch's Sanitary Sewer Management System (SSMS) to create a computerized hydraulic model. SSMS also has built-in quality control measures to check the integrity of the data entered. Sewer information from the 1995 Wastewater Master Plan was used where gaps in the City's current GIS databases existed.

The trunk sanitary sewer collection system computer model consists of approximately 87.9 miles (464,000 feet) of sewer pipe ranging in size from 8 to 48 inches in diameter. The average depth of the gravity lines is approximately 10 feet. Table III-1 shows the trunk sewer length used in the computer model and total sewer length by basin for the City of Lawrence.

Table III-1

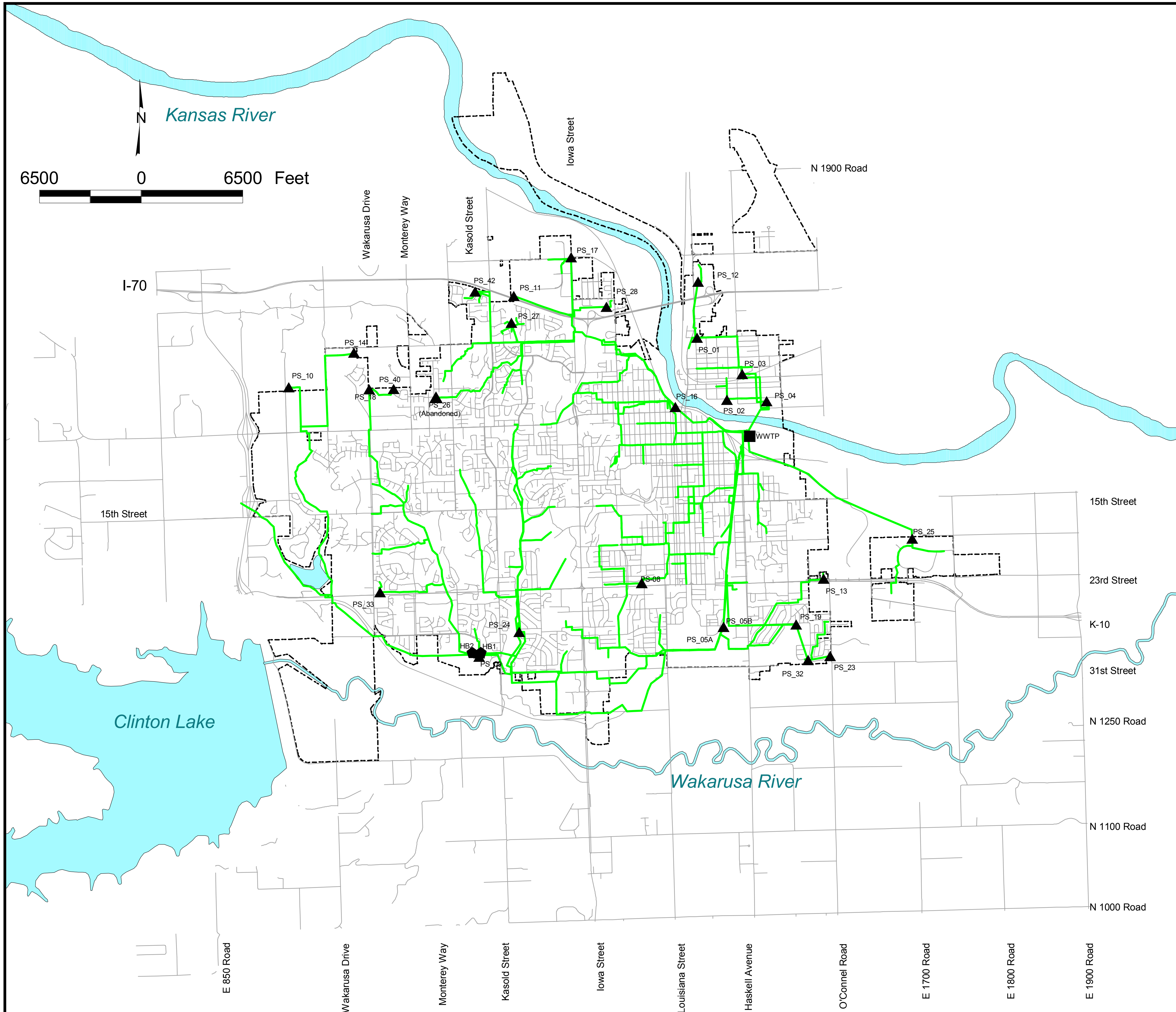
Summary of Existing Trunk Sewer and Related Data by Basin

Basin Name	Trunk Sewer Length[1] (ft)	Total Length in GIS (ft)	Largest Diameter (in)	No. of Pumping Stations	Gross Tributary Area[2] (acres)	Current Developed Area (acres)
Yankee Tank Creek	25,196	107,509	27	0	2,794	697
Wakarusa River	154,669	694,528	48	7	8,465	6,868
Kansas River	206,449	696,759	48	17	9,434	5,678
Central	28,814	184,795	18	2	1,430	1,430
East Lawrence	21,624	95,489	18	7	3,765	897
North Lawrence	27,917	93,067	15	5	1,680	450
Baldwin Creek	-	13,260	8	4	5,048	-
Total	**464,669**	**1,885,407**	**-**	**42**	**32,616**	**16,020**
Total (mi)	**88.0**	**357.1**	**-**	**-**	**-**	

(1) Length of trunk sewer in hydraulic model.

(2) Gross area based on natural watershed boundaries.

Figure III-1 shows the existing system modeled trunk sewer inventory for the City of Lawrence.



City of Lawrence, Kansas Wastewater Master Plan 2003

Legend

- Existing Pipes

Existing Facilities

- Holding Basins
- Lift Station
- WWTP

- Streets
- Existing City Limit
- Waterway

Existing Trunk Sewers In Model

Figure III-1

BLACK & VEATCH Corporation

1.1.2 Pumping Stations and Force Mains

The sanitary sewer system includes 42 wastewater pumping stations. Seventeen of these stations are located in the Kansas River Basin, seven in the Wakarusa Basin, two in the Central Basin, seven in the East Lawrence Basin, five in the North Lawrence Basin, and four in the Baldwin Creek Basin. These facilities were constructed to pump wastewater across watershed boundaries as the City grew, or to allow development in areas that were located long distances from existing gravity sewers. A summary of pumping stations and force main data is presented in Table III-2.

Table III-2
Pumping Station and Forcemain Summary

Subbasin	Pump Station Name	Pump Station Ref.	Total Capacity (mgd)	Firm Capacity (mgd)	Forcemain size (in)	Forcemain length (ft)
North Lawrence Basin						
NL-1	North St.	PS_01	0.58	0.29	8	1,349
NL-1	Walnut St.	PS_02	0.58	0.29	6	2,487
NL-1	Grant St.	PS_03	1.73	0.86	8	3,300
NL-1	Oak St.	PS_04	2.02	1.01	18	1,300
NL-1	North 3rd St.	PS_12	0.86	0.43	6	2,171
Wakarusa River Basin						
WR-6	Wakarusa Old	PS_05A	7.20	4.32	12	2,472
WR-6	Wakarusa New	PS_05B	15.56	10.37	24	2,704
WR-2	Four Seasons	PS_09	8.85	4.42	20	10,969
			4.63	0.00	20	310
WR-5	Maple St.	PS_24	0.29	0.14	4	220
WR-2	Clinton Pkwy.	PS_33	0.23	0.12	4	529
Central Basin						
C-2	Alabama St.	PS_08	3.46	2.31	12	1,878
Baldwin Creek Basin						
BC-2		PS_10	0.86		8	3,210
			0.86		8	3,210
BC-1		PS_14	0.90		10	16,495
			0.90		10	16,495
BC-1		PS_18	no data	no data	6	2,582
BC-1		PS_40	no data	no data	4	495
Kansas River Basin						
KR-1	Harris Ind. Park	PS_11	0.86	0.43	6	1,220
KR-6	Knights of Columbus	PS_13	0.23	0.12	4	353
KR-4	Kentucky St.	PS_16	11.53	7.93	24	1,638
KR-1	Santa Fe St.	PS_17	2.31	1.15	10	1,095
KR-6	East Hills Business Park	PS_25	2.93	1.95	8	11,000
KR-2	Sherwood Dr.	PS_27	0.86	0.43	6	1,479
KR-1	River Ridge Rd.	PS_28	0.23	0.12	6	1,596
KR-2		PS_42	no data	no data	8	523
East Lawrence Basin						
EL-1		PS_19	3.89	1.94	12	7,133
EL-1		PS_23	no data	no data	4	508
EL-1	Prairie Park	PS_32	1.30	0.65	6	3,505

1.1.3 Wet Weather Holding Facility

A 3.75 million gallon wet weather holding facility is located adjacent to the Four Seasons Pumping Station (PS-9). Wastewater can be diverted to the holding facility by gravity or through the Four Seasons Pumping Station. During high flows, wastewater is diverted from the 24-inch and 36-inch Lawrence Avenue sewers into the facility on the upstream side of the pumping station. Flow is returned to the pumping station by gravity after peak flows have subsided. Odor control is provided for the holding basin with diffused aeration and ferrous chloride facilities.

1.2 Description of Sewered Drainage Basins

This Master Plan addresses the entire City wastewater service area and incorporates data from the 1995 Wastewater Master Plan prepared by Black & Veatch and new data collected as part of this project. The City wastewater service area is divided into sewered drainage basins. These sewered drainage basins are further divided into subbasins.

The current sewered drainage basins for the City of Lawrence are as follows:

- Baldwin Creek Basin
- Central Basin
- East Lawrence Basin
- Kansas River Basin
- North Lawrence Basin
- Wakarusa River Basin
- Yankee Tank Creek Basin

Existing collection system facilities and drainage basins for the current wastewater service area are shown on Figure III-2.

A general description of each basin is presented in the following paragraphs.

1.2.1 Baldwin Creek Basin

The Baldwin Creek Basin consists of four subbasins (BC-1 through BC-4). This basin serves Northwest Lawrence. The Basin contains 13,260 feet of sewer at present, but significant growth is expected in this basin by 2025.

1.2.2 Central Basin

The Central Basin consists of three subbasins (C-l through C-3) and contains the area for the main campus of the University of Kansas. The basin serves areas tributary to the Alabama Street Pumping Station (PS-8, firm capacity = 1600 gpm), Massachusetts Street Pumping Station (PS-6, firm capacity = 350 gpm), and the majority of flows from the University of Kansas. The largest pumping station is the Alabama Street Pumping Station, which serves residential areas and a portion of the University. Flows may be diverted from the Central Basin by means of an overflow weir in the 15-inch sewer that extends to the Alabama station and conveyed by gravity to the 15-inch Naismith relief line in the Wakarusa Basin. Flow diversion occurs during rainstorm events if the peak flows exceed the capacity of this pumping station and upstream sewer.

1.2.3 East Lawrence Basin

The East Lawrence Basin is divided into two subbasins (EL-1 and EL-2) and serves the area south of 23rd Street and generally east of Haskell Avenue. PS-19 pumps to the Kansas River Basin, while other flows from the East Lawrence Basin are received at the Wakarusa Pumping Station (PS-5A and PS-5B). Pumping stations in the East Lawrence Basin that have a firm capacity of 200 gpm or less include Knights of Columbus (PS-13) and 31st St. (PS-22). Prairie Park (PS-32) and Anderson Acres (PS-19) have firm capacities greater than 200 gpm.

1.2.4 Kansas River Basin

The north region, historic district, downtown, and parts of central and east Lawrence are served by the Kansas River Basin which consists of six subbasins (KR-1 through KR-6). The Basin currently receives flow at the wastewater treatment plant from all other basins in the service area. Flows from the Northwest Relief Sewer are tributary to the Kentucky Street Pumping Station (PS-16, firm capacity = 6900 gpm). Flows from the Wakarusa Pumping Stations (PS-5A, PS-5B), Alabama Street Pumping Station (PS-8), Massachusetts Street Pumping Station (PS-6), and the area generally east of Massachusetts Street are tributary to the East Lawrence Relief Sewer. Six of the eleven pumping stations in the Kansas River Basin have a firm capacity of 100 gpm or less: Woodcreek (PS-15), Graystone Apts. (PS-20), Armory (PS-21), Trail Rd. (PS-26), River Ridge Rd. (PS-28), and Kimos Circle (PS-29). The remaining four pumping stations have a firm capacity of 800 gpm or less: Harris Industrial Park (PS-11), Rockledge Apts. (PS-14), Santa Fe St. (PS-17), and Sherwood Dr. (PS- 27).

1.2.5 North Lawrence Basin

The North Lawrence Basin (NL-l, NL-2, and NL-3) serves the areas north of the Kansas River. The Oak Street Pumping Station (PS-4) is the largest station, serving all areas in North Lawrence except for the area served by the Walnut Street Pumping Station (PS-2). These two stations pump wastewater to the wastewater treatment plant through parallel 8-inch and 18-inch force mains. The 18-inch force main has deteriorated and is currently being rehabilitated by the installation of a 16.5-inch inside diameter CIPP (cured-in-place pipe) lining.

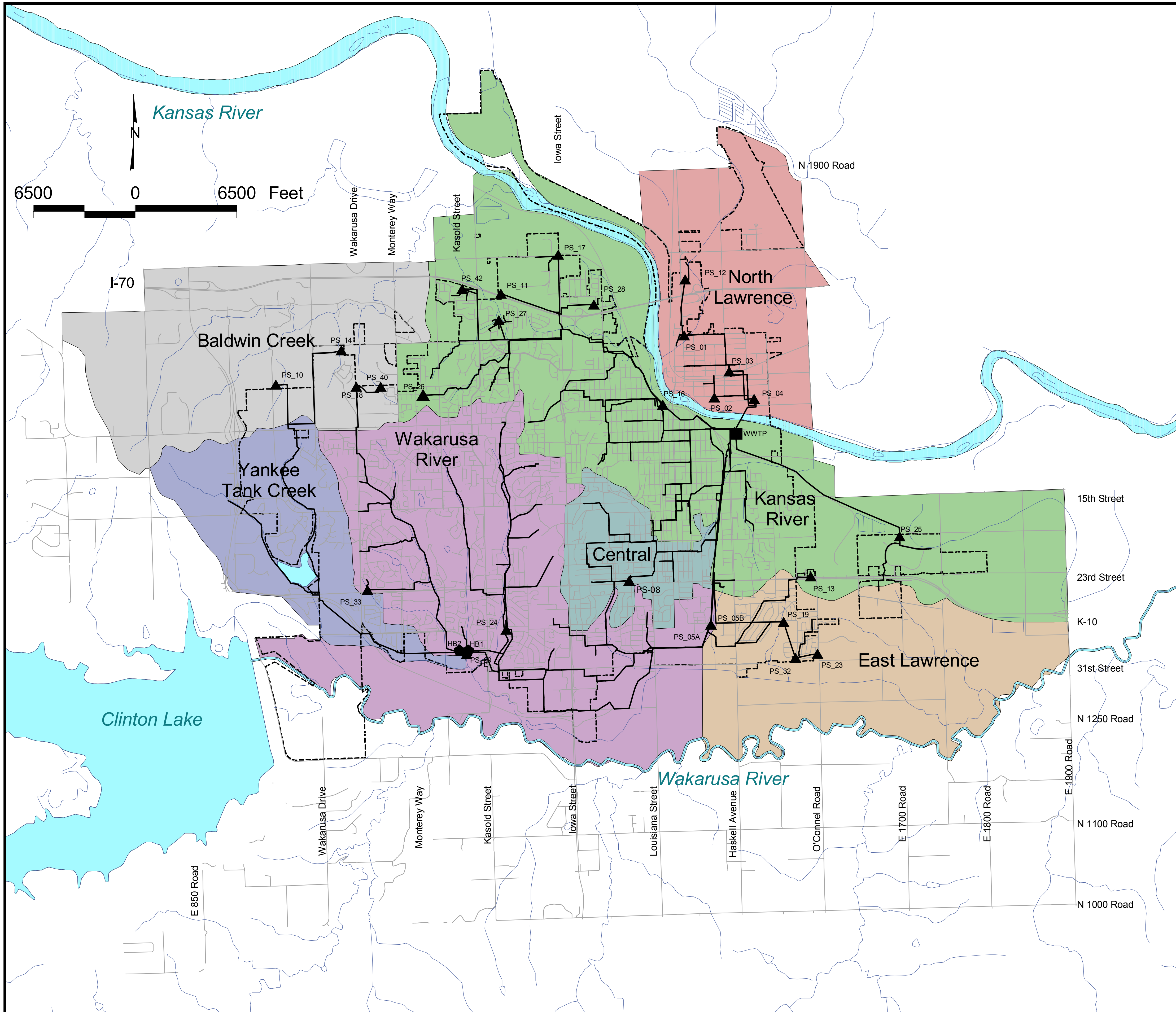
1.2.6 Wakarusa River Basin

The Wakarusa River Basin contains six subbasins (WR-l through WR-6) and serves south Lawrence and the portion of west Lawrence that is not included in the Yankee Tank Creek Basin. There are two main sewers in this basin which are both tributary to the Wakarusa Pumping

Station: the 24-inch Lawrence Avenue sewer which is continued as the 24-inch Lower Wakarusa Sewer, and the 36-inch Lawrence Avenue Sewer which is continued as the 36-inch Upper Wakarusa Sewer. The 36- inch Upper Wakarusa Sewer increases in size to 48 inches about 5000 feet before discharging into the wet well of the Wakarusa Pumping Station. All wastewater flow in this basin is tributary to the Wakarusa Pumping Stations (PS-5A and PS-5B). Pumping Stations 5A and 5B have firm capacities of 3420 gpm and 7000 gpm, respectively. Flow from Pumping Stations 5A and 5B is discharged through 12-inch and 24-inch force mains, respectively, to the Kansas River Basin. A 3.75 million gallon wet-weather holding facility is located at the Four-Seasons Pumping Station (PS-9). PS-9 has a dry weather firm capacity of 3070 gpm, which pumps wastewater from the Yankee Tank Creek basin into the Wakarusa Basin. PS-9 also has a wet weather total capacity of 3210 gpm, which diverts flow from the Yankee Tank Creek Basin in to the wet weather holding facility. There are three other pumping stations in the Wakarusa River Basin which have a firm capacity of 350 gpm or less: Maple St. (PS-24), Somerset Ct. (PS-30), and Kasold St. (PS-31).

1.2.7 Yankee Tank Creek Basin

The Yankee Tank Creek Basin contains three sewered subbasins (YTC-1 through YTC-3) and serves west and southwest Lawrence, in the area generally west of Wakarusa Drive. The 27-inch trunk line serving this area, generally referred to as the Yankee Tank Sewer, is tributary to the Four Seasons Pumping Station (PS-9). All flow from this basin is pumped by PS-9 to the 24-inch Lawrence Avenue sewer located in the Wakarusa River Basin. The Yankee Tank Creek Basin currently serves 697 developed acres, and is expected to experience significant population growth in the future.



City of Lawrence, Kansas
Wastewater Master Plan
2003

Legend

- Existing Pipes
- Existing Facilities
  - Holding Basins
  - Lift Station
  - WWTP
- Basins
  - BC-Baldwin Creek
  - C-Central
  - EL-East Lawrence
  - KR-Kansas River
  - NL-North Lawrence
  - WR-Wakarusa River
  - YTC-Yankee Tank Creek
- Streets
- Existing City Limit
- Waterway

Existing Collection System Facilities and Drainage Basins

Figure III-2

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1.3 Hydraulic Model Description and Calibration

1.3.1 Description of Hydraulic Model

Hydraulic models are valuable tools for conducting system-wide master planning studies such as the City of Lawrence's Wastewater Master Plan. A dynamic hydraulic model was used for this project to evaluate the collection system for current and future conditions. A dynamic model is capable of simulating unsteady state flow conditions under both open channel and surcharged conditions for varying time periods. Additionally, dynamic models allow simulation of both looped and dendritic networks, backwater profiles, flow reversals, pumps, weirs, siphons, gates, orifices, parallel pipes, and other diversion structures necessary to simulate a large and complex collection system such as the City of Lawrence.

The computerized capacity model of the sanitary sewer system was developed utilizing sewer network data, flow data, and a hydraulic modeling program. The model incorporated system parameters such as ADDF, population, developed acres, and rainfall duration and intensity to determine system peak flows. The model was developed using the HydroWorks hydraulic modeling software. Sewer system data was processed using Sanitary Sewer Management System (SSMS) support modules developed by Black & Veatch to write data to and read from HydroWorks.

Flows can be generated externally and directly loaded into the model or can be internally generated by the software using monitored data. For this project, flows were generated internally by the model. Data required by the model for internal flow generation include rainfall hyetographs, basin area, percent pervious and impervious surfaces, infiltration flows, and dry weather flows.

The drainage areas tributary to each monitoring point in the system, and developed acres for each drainage area were obtained from a GIS analysis of the sewered areas in the basins, crosschecked with the developed acres from the 1995 Wastewater Facility Master Plan. The ADDF determined by the flow monitoring was input to the model as a monitored diurnal flow variation observed at each flow meter.

Infiltration was input to the hydraulic model as a constant flow, as observed infiltration flows were relatively constant over several days.

The inflow flow component is highly variable over short periods, requiring dynamic analysis and modeling for accurate measurement and simulation. The inflow component was input to the model in a manner reflecting the dynamic nature of the flow. Data required to generate the inflow includes the following:

- Subbasin inflow parameters determined from flow monitoring data.
- Developed acres for each basin area.
- A design rainfall event.

1.3.2 Model Inventory

Trunk sewer and pump station inventory was provided by the City in shapefile format. Differences between this inventory and the 1995 Master Plan inventory were corrected after consultation with the City. The existing modeled sewer inventory includes trunk sewers modeled in the 1995 Master Plan and sewer lines that had been constructed prior to commencement of work on this Master Plan. Appendix F, Network Inventory, is a complete listing of all existing pipes in the computer model Appendix F is located in a separate binder.

1.3.3 Model Calibration

Model calibration was performed using peak flow projections developed from monitored data. Parameters used in model calibration included unit per capita dry weather flow rates, infiltration rates, and area for pervious and impervious soil as a surrogate for inflow.

The model was calibrated against the projected 1-year peak flows determined from flow monitoring data. The hydraulic model peak flows were also checked against flow data from actual rainfall events that occurred during the flow monitoring period. Hydraulic model calibration showed most modeled peak flows within 10% of projected 1-year peak flows as shown in Table III-3.

Table III-3 Model Calibration Results			
Subbasin	Projected Peak 1-yr Flow (mgd)	Modeled Peak 1-yr Flow (mgd)	Difference (%)
Yankee Tank Creek Basin			
YTC-1	2.18	2.10	-3.5
YTC-2	0.44	0.44	0.7
YTC-3	0.21	0.21	-1.4
Wakarusa River Basin			
WR-2	4.84	4.98	2.9
WR-3	2.99	3.04	1.9
WR-4	3.17	3.36	6.1
WR-5	12.62	12.12	-4.0
WR-6	14.81	14.32	-3.3
Kansas River Basin			
KR-1	0.28	0.34	21.8
KR-2	3.27	3.51	7.2
KR-3	1.07	1.00	-6.3
KR-4	6.07	5.80	-4.4
KR-5 (WWTP)	31.53	31.14	-1.2
KR-6	2.22	2.13	-4.3
Central Basin			
C-1	5.85	5.87	0.4
C-2	3.66	3.76	2.7
C-3	1.04	1.03	-1.0
East Lawrence Basin			
El-1	2.53	2.52	-0.3
North Lawrence Basin			
NL-1	2.65	2.57	-3.1

1.3.4 Collection System Improvement Criteria

The collection system improvement criteria, including the parameters used in the model for peak flow analyses, are included in Appendix G, Sewer Design Criteria. The model improvement criteria include evaluation of information on existing sewers, relief sewers, force-mains and pumping stations. Replacement relief sewers were sized and costs assigned for all pipes with a peak flow greater than 100 percent of the pipe capacity. Proposed replacement relief sewers less than 18-inches in diameter were sized for a design flow-to-capacity ratio of 0.65. Proposed relief sewers 18-inches in diameter or larger were sized for a design flow-to-capacity ratio of 0.78. All improvements were sized as replacement relief sewers. The improvement cost basis information is presented in Appendix H, Construction Cost Basis.

1.4 Adequacy of Existing Collection System

1.4.1 Current Design Conditions

The number of overloaded sewers is determined based on the selected level of system protection for a design storm event. The lower the level of protection, the greater the risk of sewer overloading and subsequent sewage bypassing or basement flooding. Selection of a design storm is a balance between an acceptable level of protection and acceptable cost. A 10-year storm event level of protection has been selected by the City of Lawrence and was used for analysis.

System analyses were performed to evaluate sewer line and pumping station capacity against peak flow rates for current design conditions (2002, 10-year rainfall event). Analyses were performed for existing conditions without removal of any infiltration and inflow (I/I). An evaluation of the existing City of Lawrence collection system shows that relatively high levels of I/I are experienced during wet weather conditions. The average ratio of average daily dry weather flow (ADDF) to peak 10-year flow within the City's system is about 10 with a range of 2.40 to 32.55. High ratios indicate the presence of excessive I/I. The highest ratios are in the East Lawrence and North Lawrence Basins, although it should be noted that ratios greater than typical design norms exist throughout the system. Table III-4 shows the ratio of the existing peak flow to ADDF by subbasin.

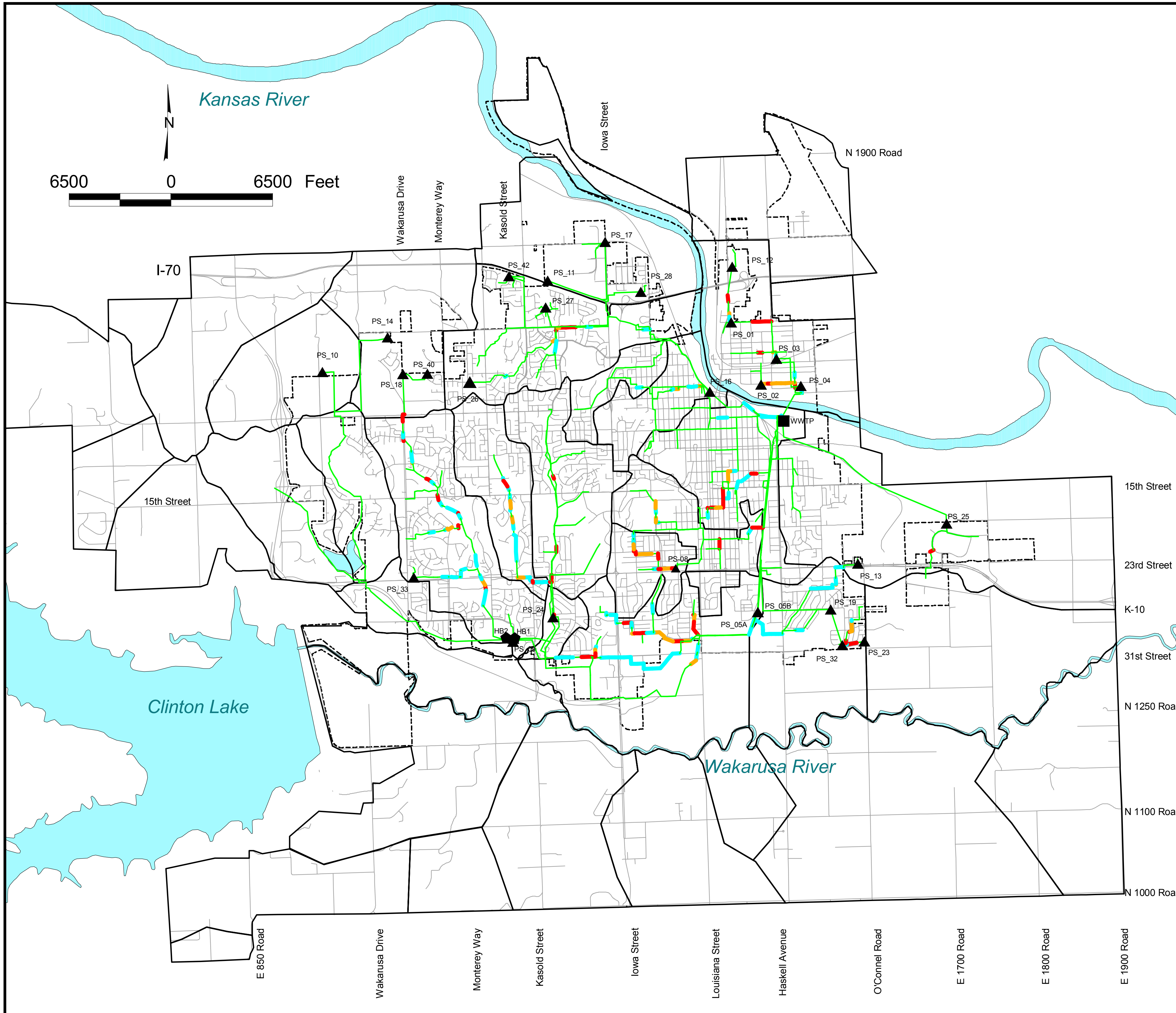
Table III-4 Ratio of Existing Peak Flow to ADDF			
2002, 10-year rainfall event			
Existing Subbasin	Peak Flow (mgd)	ADDF (mgd)	Ratio Peak Flow/ADDF
C-1	8.82	1.37	6.44
C-2	6.47	0.66	9.80
C-3	1.75	0.18	9.72
EL-1	4.63	0.22	21.05
KR-1	0.40	0.14	2.86
KR-2	5.76	0.93	6.19
KR-3	1.50	0.42	3.57
KR-4	9.41	2.14	4.40
KR-5 (WWTP)	53.51	9.80	5.46
KR-6	3.76	0.30	12.53
NL-1	4.65	0.18	25.83
WR-2	8.27	1.02	8.11
WR-3	5.39	0.53	10.17
WR-4	5.38	0.95	5.66
WR-5	18.54	3.08	6.02
WR-6	24.82	3.88	6.40
YTC-1	3.92	0.33	11.88
YTC-2	0.83	0.06	13.83
YTC-3	0.31	0.03	10.33

Based on the results of the analyses, the existing collection system has adequate capacity to convey dry weather flow. During peak flow conditions (10-year rainfall event) 24 percent of the trunk system is overloaded, but using the total system length of 1,885,407 ft, only 6% of the total system is overloaded. Trunk sewers are more likely to overload than collector sewers, so this is considered a reasonable estimate of the actual overloading during peak flow conditions. Table III-5 shows the length and number of overloaded pipes for a 1-year and a 10-year rainfall event.

Table III-5 Design Event Comparison – Overloaded Trunk Sewer Pipe						
Design Event	Length of Overloaded Pipe (feet)	Model Length of Pipe (feet)	Percent of Overloaded Pipes Based on Length %	Number of Overloaded Pipes	No. of Modeled Pipes	Percent of Overloaded Pipes Based on No. of Modeled Pipes %
DW/HG	1,129	464,669	0.2	4	1,618	0.2
1-year	48,225	464,669	10.3	171	1,618	10.6
10-year	111,168	464,669	23.9	392	1,618	24.2
DW/HG - Dry Weather, High Groundwater						

The lengths of existing overloaded sewer lines by drainage basin are summarized in Table III-6 and shown on Figure III-3.

Table III-6 Length of existing (2002) Overloaded Sewers by Subbasin - 10-Year Event					
Subbasin	Length of Overloaded Pipe (ft)	Total Number of Sewer Segments	Number of Overloaded Segments	Subbasin Percent of Pipes Overloaded (%)	Total System Percent of Pipes Overloaded (%)
C-1	7,236	69	28	40.6	7.1
C-2	5,736	32	20	62.5	5.1
C-3	0	1	0	0.0	0.0
EL-1	13,824	77	53	68.8	13.5
KR-1	0	31	0	0.0	0.0
KR-2	3,909	195	15	7.7	3.8
KR-3	339	55	1	1.8	0.3
KR-4	1,832	98	9	9.2	2.3
KR-5	27,005	320	87	27.2	22.2
KR-6	247	57	1	1.8	0.3
NL-1	6,885	90	27	30.0	6.9
WR-2	15,111	147	50	34.0	12.7
WR-3	6,497	43	29	67.4	7.4
WR-4	562	121	2	1.7	0.5
WR-5	1,218	63	5	7.9	1.3
WR-6	20,767	161	65	40.4	16.6
YTC-1	0	19	0	0.0	0.0
YTC-2	0	17	0	0.0	0.0
YTC-3	0	22	0	0.0	0.0
Total	**111,168**	**1618**	**392**		**100.0**



City of Lawrence, Kansas Wastewater Master Plan 2003

Legend

Percentage Utilization
- 0 - 100
- 100 - 125
- 125 - 150
- > 150

Existing Facilities
- Holding Basins
- Lift Station
- WWTP

- Streets
- Existing City Limit
- Waterway

Existing Overloaded Sewers 10-Year Storm Event

Figure III-3

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Key observations from the computer analyses for 2002 peak flows are summarized in the following paragraphs.

1.4.2 Central Basin

The Alabama (PS-8) Pumping Station is overloaded. Sewer lines upstream and immediately downstream of the Alabama Pumping Station are also overloaded.

1.4.3 Kansas River Basin

PS-13, PS-16, PS-25, and PS-27 are overloaded.

1.4.4 North Lawrence Basin

The North Street (PS-1), Walnut Street (PS-2), and Grand Street (PS-3) Pumping Stations are overloaded. Most sewer lines immediately upstream and downstream of Pumping Stations 1, 3, and 4 are also overloaded.

1.4.5 Wakarusa River Basin

The Wakarusa (PS-5A & 5B) Pumping Station is overloaded. The 24 inch diameter Lower Wakarusa interceptor is overloaded. Segments upstream and downstream of the Four Seasons Pumping Station are overloaded. Clinton Parkway (PS-33) Pumping Station is also overloaded.

The major trunk line in the WR-3 subbasin is overloaded, as is the major trunk line in the WR-2 subbasin.

1.4.6 Yankee Tank Creek Basin

There are no significant reaches of sewer that are overloaded.

2.0 Future Collection System Evaluation

2.1 Future Design Conditions

The existing model inventory, planned improvements, and future wastewater service extension sewers comprise the future model inventory. Hydraulic capacity analyses were performed to identify sewers, pump stations, and force mains with insufficient capacity for future growth peak flows. Projected future growth peak flows assume the successful completion of a 20 percent I/I removal program. The analyses were then used to develop a Capital Improvement Plan to address these hydraulic concerns.

Projected future growth peak flows comprise growth within existing subbasins and growth which is tributary to the existing subbasins and the existing wastewater collection system. The growth areas which are tributary to the existing subbasin are called extension areas. Sewers were preliminarily placed in extension areas, based on topography, so costs can be estimated for providing sewer service to these areas.

The hydraulic analyses highlighted areas where pipes are overloaded at future growth conditions. Where the degree of overloading is small (existing pipe capacity is exceeded by 15 percent or less) or the length of overloaded pipe is small and isolated, these sections of sewer were placed on a Wastewater Collection Sewer Watch List. The sewers on the Watch List should be monitored for deterioration, backups, and overloading. The Wastewater Collection System Watch List is presented in Appendix I.

2.2 Year 2010 Hydraulic Capacity Evaluation

The year 2010 sewer network inventory includes sewer improvements which are currently in design or near to construction completion and the sewer extensions needed to serve 2010 projected growth. It should be noted that the new Wakarusa River WWTP will not be operational until 2011. Table III-7 shows the trunk sewer inventory by basin for year 2010. Table III-8 shows the additional pump stations and their force mains needed by 2010 to serve the extension areas.

Table III-7
Summary of 2010 Collection System Facilities and Related Data by Basin

Basin Name	Trunk Sewer Length[1] (ft)	Largest Diameter (in)	No. of Pumping Stations	Gross Tributary Area[2] (acres)	2010 Developed Area (acres)
Yankee Tank Creek	67,852	27	2	4152	1597
Wakarusa River	160,691	48	7	7058	6400
Kansas River	206,449	60	17	10741	6026
Central	28,613	24	2	1430	1430
East Lawrence	22,323	18	8	4325	1076
North Lawrence	30,754	21	6	3803	549
Baldwin Creek	88,674	27	5	4786	810
Wakarusa River South	32,842	30	0	2426	204
Total	**638,198**			**38,721**	**18,092**
Total (mi)		-	-	-	

[1] Length of trunk sewer in hydraulic model.
[2] Gross area based on natural watershed boundaries.

Table III-8
2010 New Pumping Stations and Associated Force Mains

Subbasin	Pump Station Name	Firm Capacity (mgd)	Forcemain size (in)	Forcemain length (ft)
North Lawrence Basin				
NL-3	NL3PS1	2.00	10	5,174
Baldwin Creek Basin				
BC-1	BC1PS1	10.00	10	6,750
Yankee Tank Creek Basin				
YTC-4	YTC4PS1	2.00	10	8,181
YTC-4	YTC4PS2	3.00	10	10,742
East Lawrence Basin				
YTC-6	YTC6PS1	2.00	8	13,403

2.2.1 Yankee Tank Creek Basin

Two additional subbasins (YTC-4 and 5) are included in the 2010 planning year analysis. The sewers have been sized to adequately convey peak 10 year flows for year 2025 and therefore there is no predicted sewer overloading for the 2010 planning year analysis.

Significant growth is expected through year 2010 in subbasins YTC-3, YTC-2, and YTC-4.

The existing Yankee Tank Sewer tributary to the Four Seasons Pumping Station (PS-09) is shown to be overloaded for the 2010 planning year analysis. The degree of overloading is larger in the upper reaches of subbasins YTC-2 and 3, where the sewers are shown to be overloaded by 150 percent or more for the 2010 year analysis.

2.2.2 Wakarusa River Basin

The Wakarusa River Basin does not incorporate additional subbasins in the future 2010 year analysis. The only future growth predicted for this basin is in subbasin WR-1. There are three subbasins (WR-2, WR-3, and WR-6) which show overloading for the 2010 planning year. The majority of overloaded sewers are overloaded by up to 125 percent, although there are several isolated segments of sewer with up to 150 percent overloading or more.

2.2.3 Baldwin Creek Basin

There are three additional subbasins (BC-1 through 3) included in the future 2010 planning year analysis. The 2010 future year analysis indicates that there are no pipe overloading problems in this basin.

2.2.4 Kansas River Basin

The future 2010 planning year analysis incorporates future growth within subbasins KR-1, KR-2, and KR-6.

KR-4 has a few isolated sewer overloads of 150 percent or more. Sewers along Peterson Road in subbasin KR-2 are shown to be overloaded by up to 150 percent. Several segments of this sewer are at 150 percent utilization or more.

2.2.5 Central Basin

There is no future growth predicted for this basin. Of the three subbasins that comprise the Central Basin, two show minor isolated segments of overloaded sewers. Subbasin C-2 shows significant segments of sewer to be overloaded by more than 150 percent.

2.2.6 East Lawrence Basin

There is one additional subbasin (EL-2) included in the future 2010 planning year analysis. Subbasin EL-1 shows overloading upstream of the Prairie Park Pump Station (PS-32).

2.2.7 North Lawrence Basin

Two additional subbasins (NL-2 and 3) are included in the future 2010 planning year analysis. All future growth identified is within these two subbasins. Subbasin NL-1 shows sewers to be overloaded by up to 150 percent in isolated areas south of I-70.

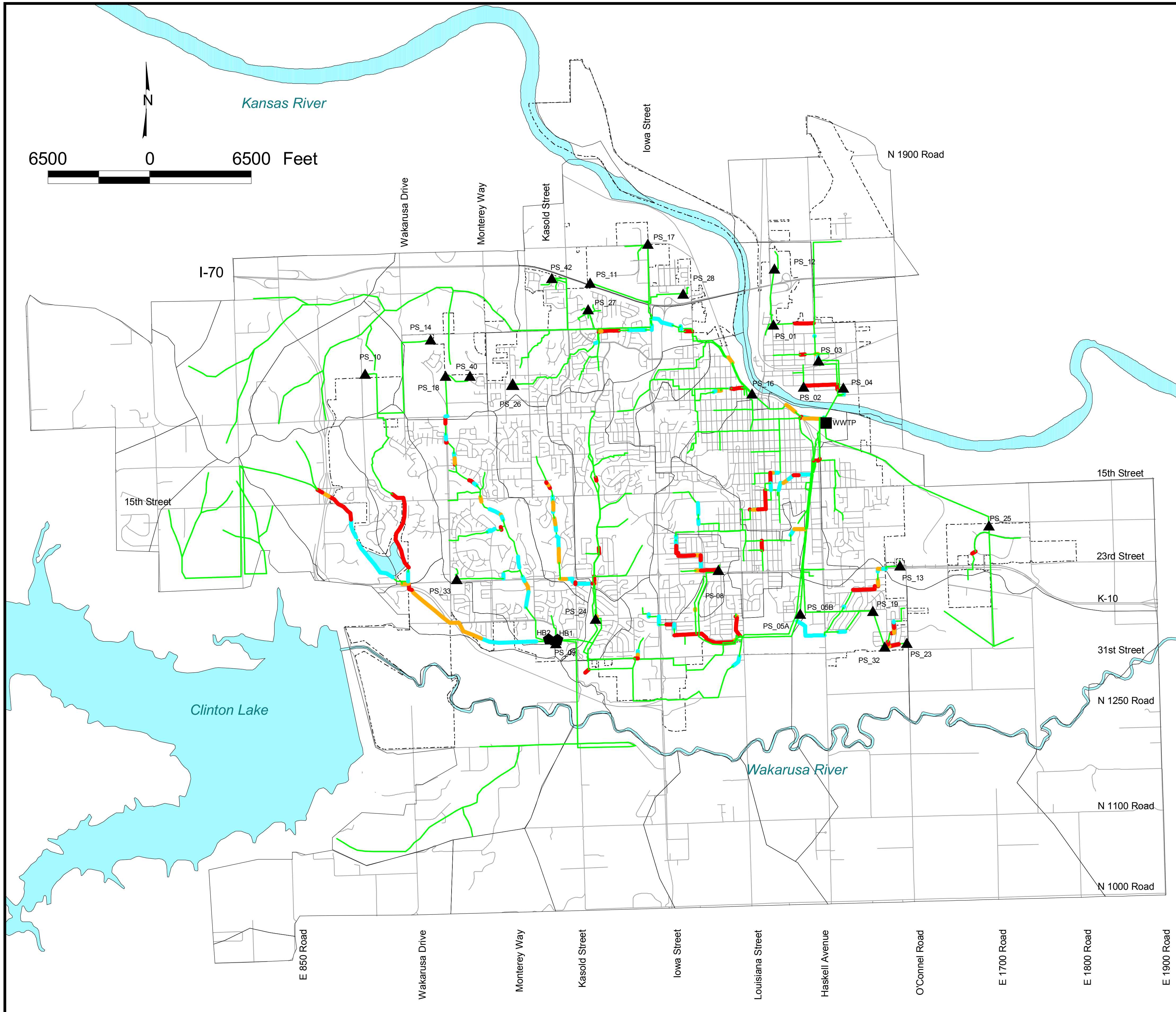
2.2.8 Wakarusa River South Basin

This is a new basin for areas of future extensions. The proposed sewer sizes have been sized to adequately convey peak 10 year flows for the basin. Therefore there is no predicted sewer overloading for the 2010 planning year analysis.

Figure III-4 presents the overloaded sewers for the design year of 2010. Table III-9 is a summary of the 2010 overloaded sewers.

Table III-9
2010 Overloaded Sewers – 10 Year Event

Basin Name	Sewer Pipes Modeled	Length of Pipes Modeled (ft)	Number of Pipes Overloaded	Length of Overloaded Pipes (ft)	Percent Overloaded by Length (%)
Yankee Tank Creek	112	67,852	51	23,244	34
Wakarusa River	535	160,691	97	25,306	16
Kansas River	756	206,449	86	24,842	12
Central	103	28,613	26	7,921	28
East Lawrence	78	22,323	32	7,924	35
North Lawrence	100	30,754	23	5,567	18
Baldwin Creek	75	88,674	0	0	0
Wakarusa South River	68	32,842	0	0	0
Total	**1,827**	**638,198**	**315**	**94,804**	15



City of Lawrence, Kansas
Wastewater Master Plan
2003

Legend

Percentage Utilization
- 0 - 100
- 100 - 125
- 125 - 150
- > 150

Existing Facilities
- Holding Basins
- Lift Station
- WWTP

- Streets
- Existing City Limit
- Waterway

2010 Overloaded Collection Facilities

Figure III-4

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2.3 Year 2025 Hydraulic Capacity Evaluation

The year 2025 sewer network inventory includes sewer improvements that were in the 2010 sewer network inventory and sewer extensions needed for 2025 projected growth. Table III-10 shows the trunk sewer inventory by Basin for year 2025. Table III-11 shows the additional pump stations and their force mains needed by 2025 to serve the extension areas added from 2010 to 2025. A sewer capacity analysis is presented in Appendix J, and a pump station and force main capacity analysis is presented in Appendix K. Peak flows generated by the model are presented in Appendix L, Modeled Peak Wastewater Flows. Appendix L is located in a separate binder.

Table III-10
Summary of 2025 Collection System Facilities and Related Data by Basin

Basin Name	Trunk Sewer Length[1] (ft)	Largest Diameter (in)	No. of Pumping Stations	Gross Tributary Area[2] (acres)	2025 Developed Area (acres)
Yankee Tank Creek	124,489	27	4	6,506	3,255
Wakarusa River	176,621	48	7	8,123	6,714
Kansas River	198,174	60	17	10,741	6,522
Central	26,867	24	2	1,430	1,432
East Lawrence	36,048	18	8	4,325	1,393
North Lawrence	35,795	21	6	3,803	653
Baldwin Creek	99,703	27	6	5,048	1,886
Wakarusa River South	190,811	33	1	15,053	3,205
Total	**888,508**		**51**	**55,029**	**25,060**
Total (mi)		-	-	-	

(1) Length of trunk sewer in hydraulic model.
(2) Gross area based on natural watershed boundaries.

Table III-11
2025 Additional Pumping Stations and Associated Force Mains

Subbasin	Pump Station Name	Firm Capacity (mgd)	Forcemain size (in)	Forcemain length (ft)
Wakarusa River South Basin				
WRS-2	WRS2PS1	2.00	10	8,081
Baldwin Creek Basin				
BC-4	BC4PS1	1.00	4	7,411
Yankee Tank Creek				
YTC-5	YTC5PS1	3.00	10	10,153
YTC-6	YTC6PS1	2.00	8	13,403

2.3.1 Yankee Tank Creek Basin

Three additional subbasins are included in the future 2025 planning year analysis (YTC-4 through 6) serving West Lawrence between E 550 Road and E 800 Road. The existing Yankee Tank Sewer tributary to the Four Seasons Pumping Station (PS-09) is shown to be overloaded by 150 percent or more for the 2025 planning year.

There are no overloaded sewers in subbasins YTC-4 through 6. These subbasins are for areas of future extensions. The sewers have been sized to adequately convey peak 10 year flows for year 2025 and therefore there is no predicted sewer overloading for the 2025 planning year analysis.

2.3.2 Wakarusa River Basin

The Wakarusa River Basin does not incorporate additional subbasins in the future 2025 year analysis. All future growth is within the existing six subbasins (WR-1 through WR-6). There are three subbasins (WR-2, WR-3, and WR-6) which show overloading for the 2025 planning year. The majority of overloaded sewers are overloaded by up to 150 percent.

2.3.3 Baldwin Creek Basin

The future 2025 planning year analysis incorporates future growth within all existing subbasins. Significant growth is expected within subbasins BC-3 and BC-4. The 2025 future year analysis indicates that there are no pipe overloading problems in this basin.

2.3.4 Kansas River Basin

The future 2025 planning year analysis incorporates future growth within all existing subbasins. Significant growth is expected within all subbasins. KR-4 has a few isolated sewer overloading.

Sewers along Peterson Road in subbasin KR-2 are shown to be overloaded by up to 150 percent.

2.3.5 Central Basin

The future 2025 planning year analysis incorporates future growth within all existing subbasins. The Alabama pump station (PS_08) is abandoned. Of the three subbasins that comprise the Central Basin, two show minor isolated segments of overloaded sewers. Subbasin C-2 shows significant segments of sewer to be overloaded by more than 150 percent.

2.3.6 East Lawrence Basin

The future 2025 planning year analysis incorporates future growth within all existing subbasins. Subbasin EL-1 shows overloading upstream of the Prairie Park Pump Station (PS-32).

2.3.7 North Lawrence Basin

The future 2025 planning year analysis incorporates future growth within all existing subbasins. Subbasin NL-1 shows sewers to be overloaded by up to 150 percent in isolated areas south of I-70.

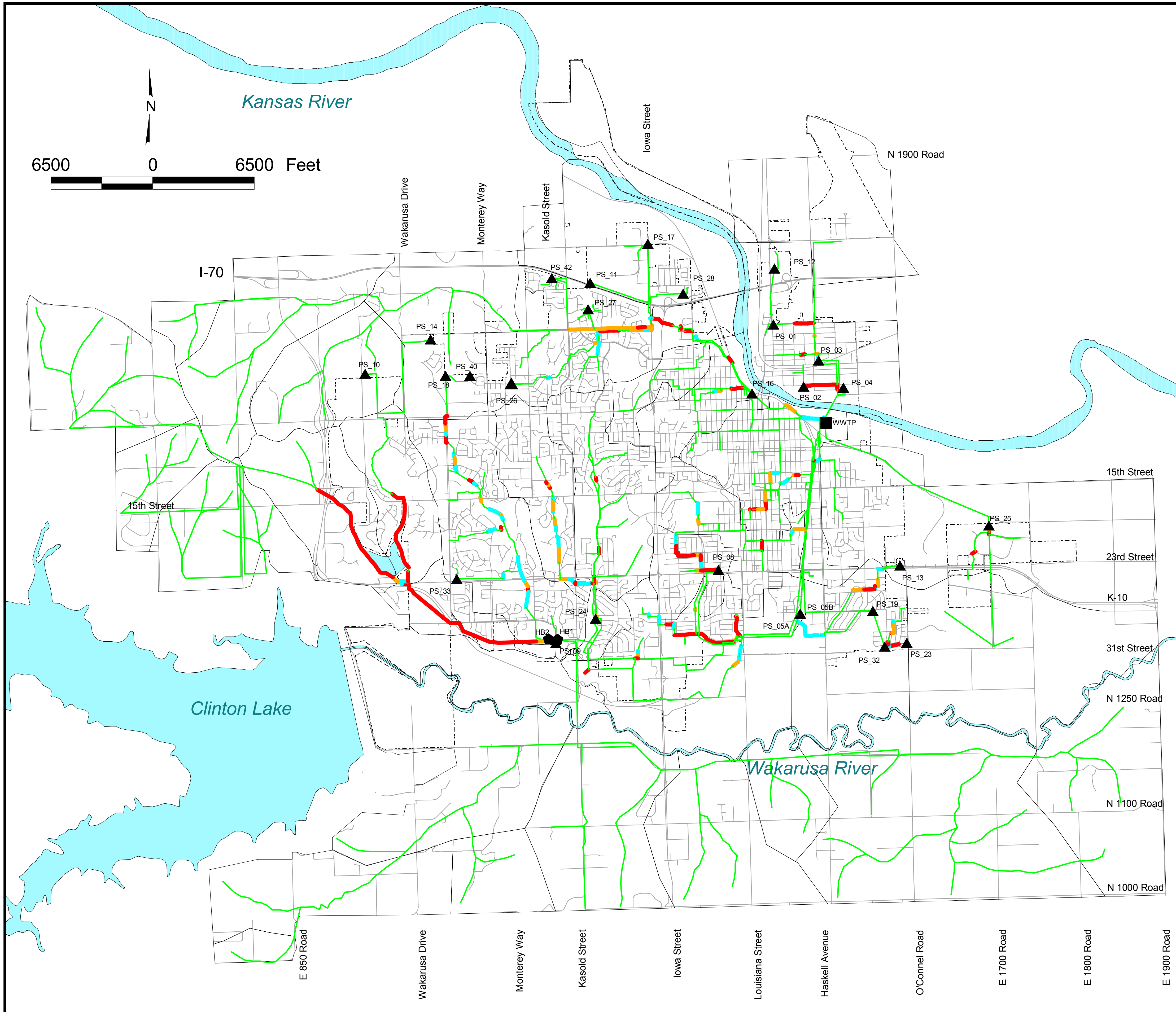
2.3.8 Wakarusa River South Basin

This is a new basin for areas of future extensions. The sewer sizes have been sized to adequately convey peak 10 year flows for the basin. Therefore there is no predicted sewer overloading for the 2025 planning year analysis.

Figure III-5 presents the overloaded sewers for the design year of 2025. Table III-12 is a summary of the 2025 overloaded sewers.

Table III-12
2025 Overloaded Sewers – 10 Year Event

Basin Name	Sewer Pipes Modeled	Length of Pipes Modeled (ft)	Number of Pipes Overloaded	Length of Overloaded Pipes (ft)	Percent Overloaded by Length (%)
Yankee Tank Creek	199	124,489	57	24,897	20
Wakarusa River	555	176,621	106	28,171	16
Kansas River	749	198,174	105	30,643	15
Central	102	26,867	26	7,921	29
East Lawrence	82	36,048	27	6,906	19
North Lawrence	103	35,795	23	5,567	16
Baldwin Creek	87	99,703	0	0	0
Wakarusa River South	365	190,811	0	0	0
Total	**2242**	**888,508**	**344**	**104,105**	12



City of Lawrence, Kansas
Wastewater Master Plan
2003

Legend

Percentage Utilization
- 0 - 100
- 100 - 125
- 125 - 150
- > 150

Existing Facilities
- Holding Basins
- Lift Station
- WWTP

- Streets
- Existing City Limit
- Waterway

2025 Overloaded
Collection Facilities

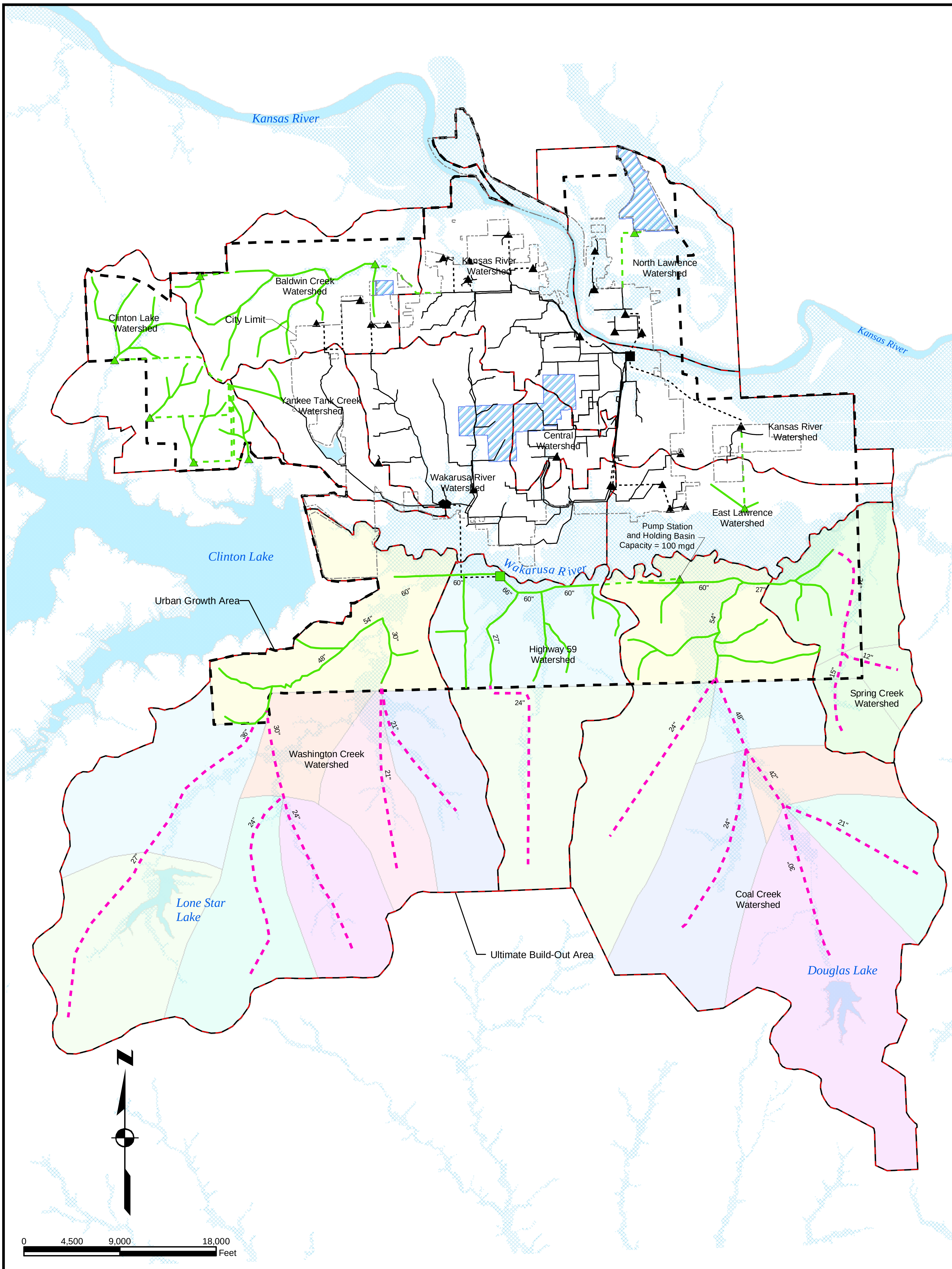
Figure III-5

BLACK & VEATCH Corporation

2.4 Ultimate Buildout

With the City of Lawrence expected to grow by 96,000 people in the next 50 years, it is reasonable to determine the growth expansion boundaries of the City. This ultimate buildout boundary provides the City a general road map of the direction in which the City's growth and development will occur.

Figure III-6 presents the results of the ultimate build-out analysis. The ultimate trunk sewer and pumping station sizes and potential routes were identified to allow the City to conduct long-range collection system planning. The trunk sewers were sized to adequately convey flow during a 10-year storm event based on the flow design curve. As shown on the figure, some extension sewer pipes installed by 2025 will have to be upsized to adequately convey the ultimate build-out flow. The ultimate buildout trunk sewers and pump stations were not considered for improvements by 2025, therefore, costs were not considered as part of this project scope.



Legend

Ultimate Buildout Pipe Sewer
Extension and Diameter

2025 Buildout
Extension
Force Main

2025 Buildout Facilities
Lift Station
WWTP

Existing Pipe
Main
Force Main

Existing Facilities
Lift Station
WWTP
Holding Basins

Miscellaneous
Proposed Urban Growth Area
100-Year Floodplain
Water
City Limit
Watershed Boundary

City of Lawrence Department of Utilities

City of Lawrence, Kansas
Wastewater Master Plan
2003

ULTIMATE BUILD-OUT WATERSHED BOUNDARIES 10-YEAR STORM

Figure III-6

BLACK & VEATCH Corporation

SECTION IV - RECOMMENDED IMPROVEMENTS AND PROBABLE COST

1.0 Recommended Improvements

1.1 Introduction

An implementation plan and schedule of the recommended improvements was prepared using information from the flow monitoring, existing and future collection system inventory, growth and development projections from the City, and from hydraulic modeling results. The recommended improvements for the City of Lawrence wastewater system include the following:

- Remove I/I sources to achieve 20 percent reduction in peak storm flows
- Collection system relief and pumping station improvements to meet existing and future capacity requirements of a 10-Year rain event
- Additional wastewater treatment capacity to meet future growth wastewater treatment needs

In addition to the recommended improvements to the wastewater system the Implementation Plan also includes:

- Conduct and develop a Capacity, Management, Operations, and Maintenance (CMOM) Audit and Program.
- Continue general improvements to the collection system.

1.2 Collection System

1.2.1 Cost-Effective Infiltration and Inflow Removal

The City of Lawrence has been undertaking an effective infiltration and inflow (I/I) removal program since the 1995 Master Plan. The 1995 Master Plan recommended a target I/I removal of 30 percent; because of the progress made to date the I/I removal target for this project has been revised to 20 percent removal. This revised goal takes into account the progress made, and represents a reasonable target for future I/I removal. However, it is recommended that the City maintain budgetary funding for their I/I removal program at current levels. The following recommended collection system improvements assume the successful completion of the City's I/I removal program.

1.2.2 Relief Sewer and Pumping Station Improvements

The hydraulic computer model indicates that there are 27 gravity relief sewer improvement projects required as summarized in Table IV-1. The capital costs shown in Table IV-1 are shown by planning year. The relief improvements will be phased in the final Implementation Plan schedule. Wastewater service extension lines are required to service future developed area but are considered development costs and not City improvement cost.

A total of 12 existing pumping stations and four force mains are identified for upgrade in various years with an estimated cost of $12 million. Lift station and force main improvements are presented in Table IV-2.

A detailed listing of each relief improvement is presented in Appendix M.

Table IV-1
Gravity Sewer Improvement Summary(1)

Improvement Name	Existing Size (in)	Improvement Size (in)	Total Pipe Length (ft.)	Improvement Type	Construction Cost ($)	Capital Cost ($)	Planning Year Needed
Central							
C-2-1	12-15	21	1,498	Replacement	$171,000	$240,000	2000
C-2-2	10-12	18	3,727	Replacement	$391,000	$548,000	2000
				Subtotal	$562,000	$788,000	
East Lawrence							
EL-1-1	8	10	2,186	Replacement	$253,000	$354,000	2000
				Subtotal	$253,000	$354,000	
Kansas River							
KR-2-1	24-27	33	1,732	Replacement	$304,000	$426,000	2025
KR-2-2	24	30	5,937	Replacement	$1,277,000	$1,787,000	2025
KR-2-3	15	21	4,004	Replacement	$552,000	$773,000	2025
KR-4-1	8	8	778	Replacement	$52,000	$73,000	2000
KR-4-2	8	8	1,431	Replacement	$179,000	$250,000	2000
KR-5-1	10-12	15	1,160	Replacement	$169,000	$236,000	2000
KR-5-2	8-12	15	1,700	Replacement	$166,000	$233,000	2000
KR-6-1	18	24	583	Replacement	$103,000	$144,000	2025
				Subtotal	$2,802,000	$3,922,000	
North Lawrence							
NL-1-1	8-12	12	2,220	Replacement	$174,000	$244,000	2025
NL-1-2	8-15	15	1,550	Replacement	$140,000	$195,000	2025
				Subtotal	$314,000	$439,000	
Wakarusa River							
WR-2-1	21	24	2,475	Replacement	$336,000	$471,000	2000
WR-2-2	8-10	12	3,982	Replacement	$308,000	$431,000	2000
WR-3-1	24	30	2,358	Replacement	$508,000	$712,000	2000
WR-3-2	21-24	27	1,642	Replacement	$247,000	$346,000	2025
WR-3-3	10-15	18	4,732	Replacement	$632,000	$884,000	2000
WR-6-1	24	36	2,792	Replacement	$504,000	$705,000	2000
WR-6-2	12	18	1,384	Replacement	$137,000	$191,000	2000
WR-6-3	24	24	8,088	Replacement	$1,063,000	$1,489,000	2000
				Subtotal	$3,735,000	$5,229,000	
Yankee Tank Creek							
YTC-1-1	24-30	42	11,685	Replacement	$2,948,000	$4,127,000	2025
YTC-2-1	18	36	3,279	Replacement	$623,000	$872,000	2025
YTC-2-2	12	30	2,815	Replacement	$454,000	$635,000	2010
YTC-3-1	15-21	30	2,738	Replacement	$485,000	$679,000	2025
YTC-3-2	18	27	1,595	Replacement	$227,000	$318,000	2025
YTC-3-3	10-15	24	4,195	Replacement	$497,000	$696,000	2010
				Subtotal	$5,234,000	$7,327,000	
				Total	**$12,900,000**	**$18,059,000**	

(1) All costs are Year 2003 costs.

Table IV-2
Pump Station and Force Main Improvement Summary

Improvement Name	Facility Type	Improvement Type	Existing Size (in) or Firm Capacity (mgd)	Improvement Size (in) or (mgd)	Construction Cost [1] ($)	Capital Cost ($)	Planning Year Needed
East Lawrence							
PS_32	Pump Station	Expansion	0.65	1.00	$196,000	$274,000	2025
FM-PS_32	Force Main	Replacement	6	8	$93,000	$130,000	2000
				Subtotal	$289,000	$404,000	
Kansas River							
PS_16	Pump Station	Expansion	7.93	10.00	$1,001,000	$1,401,000	2000
PS_25	Pump Station	Expansion	1.95	4.00	$552,000	$773,000	2010
FM-PS_25	Force Main	Parallel	8	12	$444,000	$622,000	2025
PS_26, PS_33	Pump Station	Improve or Replace	0.23, 0.12	0	$357,000	$500,000	2000
PS_27	Pump Station	Expansion	0.43	1.00	$196,000	$274,000	2000
PS_28	Pump Station	Replacement	0.12	1.00	$392,000	$549,000	2010
				Subtotal	$2,942,000	$4,119,000	
North Lawrence							
PS_01	Pump Station	Replacement	0.29	2.00	$678,000	$949,000	2025
PS_02	Pump Station	Expansion	0.29	0.50	$117,000	$164,000	2025
PS_03	Pump Station	Expansion	0.86	3.00	$474,000	$664,000	2025
FM-PS_03	Force Main	Replacement	8	12	$115,000	$162,000	2025
				Subtotal	$1,384,000	$1,939,000	
Wakarusa River							
PS_08	Pump Station	Abandon	2.31	0	$143,000	$200,000	2000
PS-09 (HB3)	Holding Basin	Expansion	0	2.5 MG	$1,428,000	$2,000,000	2025
PS_09A	Pump Station	Expansion	4.42	5.00	$616,000	$862,000	2010
FM-PS_09	Force Main	Reroute	20	24	$872,000	$1,221,000	2010
PS_09B	Pump Station	Expansion	0.00	5.00	$616,000	$862,000	2025
				Subtotal	$3,675,000	$5,145,000	
				Total	**$8,290,000**	**$11,607,000**	

[1] All costs are Year 2003 costs.

The new trunk sewers, pumping stations, and force mains identified for extension areas in Year 2025 and build-out are summarized in Table IV-3. The costs shown are not included in the overall improvement costs. Extension costs are normally funded by developers or benefit districts. If an extension project is built depends on the growth in that particular area.

Table IV-3
Extension Improvement Plan Summary(1)

Improvement Name	Facility Type	Improvement Type	Improvement Size (in) or (mgd)	Development Construction Cost ($)	Development Capital Cost ($)	Planning Year Needed
Baldwin Creek						
E-BC-1-01	Pipe	Extension	8-18	$428,000	$599,000	2010
E-BC-1-02	Pipe	Extension	18-27	$837,000	$1,172,000	2010
E-BC-2-01	Pipe	Extension	8	$212,000	$297,000	2010
E-BC-2-02	Pipe	Extension	15	$597,000	$835,000	2010
E-BC-2-03	Pipe	Extension	8	$205,000	$287,000	2010
E-BC-2-04	Pipe	Extension	8	$311,000	$436,000	2010
E-BC-3-01	Pipe	Extension	15-18	$1,027,000	$1,437,000	2010
E-BC-3-02	Pipe	Extension	8	$244,000	$342,000	2010
E-BC-3-03	Pipe	Extension	8-10	$330,000	$462,000	2010
E-BC-3-04	Pipe	Extension	8-12	$420,000	$587,000	2010
E-BC-4-01	Pipe	Extension	8	$187,000	$261,000	2025
E-BC-4-02	Pipe	Extension	8	$202,000	$283,000	2025
E-BC1PS1	Pump Station	Extension	10.00	$1,001,000	$1,402,000	2010
E-BC4PS1	Pump Station	Extension	1.00	$196,000	$274,000	2025
E-FM-BC1	Force Main	Extension	20	$451,000	$632,000	2010
E-FM-BC4	Force Main	Extension	4	$120,000	$167,000	2025
			Subtotal	$6,768,000	$9,473,000	
East Lawrence						
E-EL-2-01	Pipe	Extension	15-18	$194,000	$272,000	2010
E-EL2PS1	Pump Station	Extension	5.00	$616,000	$862,000	2010
E-FM-EL2	Force Main	Extension	16	$249,000	$348,000	2010
			Subtotal	$1,059,000	$1,482,000	
North Lawrence						
E-NL-2-01	Pipe	Extension	15	$13,000	$18,000	2010
E-NL-3-01	Pipe	Extension	10-15	$45,000	$63,000	2010
			Subtotal	$58,000	$81,000	
Wakarusa River South						
E-WRS-1-01	Pipe	Extension	10-12	$500,000	$700,000	2025
E-WRS-1-02	Pipe	Extension	8-10	$384,000	$538,000	2025
E-WRS-1-03	Pipe	Extension	8	$231,000	$323,000	2025
E-WRS-1-04	Pipe	Extension	8	$338,000	$473,000	2025
E-WRS-1-05	Pipe	Extension	8	$159,000	$223,000	2025
E-WRS-2-01	Pipe	Extension	18	$1,278,000	$1,789,000	2025
E-WRS-2-02	Pipe	Extension	12	$454,000	$635,000	2025
E-WRS-2-03	Pipe	Extension	15-18	$755,000	$1,057,000	2025
E-WRS-2-04	Pipe	Extension	8-15	$331,000	$463,000	2025
E-WRS-2-05	Pipe	Extension	8	$361,000	$506,000	2025
E-WRS-2-06	Pipe	Extension	8	$838,000	$1,173,000	2025
E-WRS-2-07	Pipe	Extension	8-10	$721,000	$1,010,000	2025
E-WRS-2-08	Pipe	Extension	8	$237,000	$332,000	2025
E-WRS-2-09	Pipe	Extension	8	$327,000	$458,000	2025
E-WRS-2-10	Pipe	Extension	8	$342,000	$478,000	2025
E-WRS-3-01	Pipe	Extension	21	$390,000	$546,000	2025
E-WRS-3-02	Pipe	Extension	10-15	$247,000	$346,000	2025
E-WRS-3-03	Pipe	Extension	8-12	$461,000	$646,000	2025

Table IV-3
Extension Improvement Plan Summary(1)

Improvement Name	Facility Type	Improvement Type	Improvement Size (in) or (mgd)	Development Construction Cost ($)	Development Capital Cost ($)	Planning Year Needed
E-WRS-4-01	Pipe	Extension	21-33	$393,000	$550,000	2025
E-WRS-4-02	Pipe	Extension	21-27	$360,000	$504,000	2025
E-WRS-4-03	Pipe	Extension	8-15	$497,000	$696,000	2025
E-WRS-4-04	Pipe	Extension	8-15	$477,000	$668,000	2025
E-WRS-5-01	Pipe	Extension	30	$1,002,000	$1,404,000	2010
E-WRS-5-02	Pipe	Extension	18	$688,000	$963,000	2025
E-WRS-5-03	Pipe	Extension	10	$193,000	$270,000	2025
E-WRS-5-04	Pipe	Extension	8-15	$411,000	$575,000	2025
E-WRS-5-05	Pipe	Extension	33	$732,000	$1,025,000	2025
E-WRS-5-06	Pipe	Extension	15	$824,000	$1,153,000	2025
E-WRS-5-07	Pipe	Extension	8-12	$392,000	$549,000	2025
E-WRS-6-01	Pipe	Extension	30	$1,682,000	$2,354,000	2010
E-WRS-6-02	Pipe	Extension	8-12	$222,000	$310,000	2010
E-WRS-6-03	Pipe	Extension	18	$189,000	$264,000	2010
E-WRS-6-04	Pipe	Extension	8-27	$995,000	$1,393,000	2010
E-WRS-7-01	Pipe	Extension	8-18	$369,000	$517,000	2025
E-WRS-7-02	Pipe	Extension	8	$166,000	$233,000	2025
E-WRS-8-01	Pipe	Extension	24	$622,000	$871,000	2025
E-WRS-8-02	Pipe	Extension	21-24	$496,000	$694,000	2025
E-WRS-8-03	Pipe	Extension	12	$158,000	$221,000	2025
E-WRS-8-04	Pipe	Extension	8-18	$453,000	$634,000	2025
E-WRS-9-01	Pipe	Extension	8-12	$332,000	$465,000	2025
E-WRS2PS1	Pump Station	Extension	2.00	$339,000	$475,000	2025
E-FM-WRS2	Force Main	Extension	10	$279,000	$391,000	2025
			Subtotal	$20,625,000	$28,875,000	
			Yankee Tank Creek			
E-YTC-3-01	Pipe	Extension	8-18	$256,000	$358,000	2010
E-YTC-3-02	Pipe	Extension	21	$560,000	$784,000	2010
E-YTC-4-01	Pipe	Extension	8-15	$357,000	$499,000	2010
E-YTC-4-02	Pipe	Extension	8-10	$176,000	$247,000	2010
E-YTC-4-03	Pipe	Extension	8	$252,000	$353,000	2010
E-YTC-4-04	Pipe	Extension	8-18	$339,000	$474,000	2010
E-YTC-4-05	Pipe	Extension	8-15	$415,000	$580,000	2010
E-YTC-4-06	Pipe	Extension	8	$168,000	$236,000	2010
E-YTC-5-01	Pipe	Extension	8-18	$369,000	$517,000	2025
E-YTC-5-02	Pipe	Extension	8-15	$289,000	$405,000	2025
E-YTC-5-03	Pipe	Extension	8	$199,000	$279,000	2025
E-YTC-6-01	Pipe	Extension	8-12	$338,000	$473,000	2025
E-YTC-6-02	Pipe	Extension	8	$365,000	$511,000	2025
E-YTC-6-03	Pipe	Extension	8	$315,000	$442,000	2025
E-YTC-6-04	Pipe	Extension	8	$463,000	$648,000	2025
E-YTC-6-05	Pipe	Extension	8	$390,000	$546,000	2025
E-YTC4PS1	Pump Station	Extension	2.00	$339,000	$475,000	2010
E-YTC4PS2	Pump Station	Extension	3.00	$474,000	$663,000	2010
E-YTC5PS1	Pump Station	Extension	3.00	$474,000	$663,000	2025
E-YTC6PS1	Pump Station	Extension	2.00	$339,000	$475,000	2025
E-FM-YTC4-1	Force Main	Extension	10	$283,000	$396,000	2010
E-FM-YTC4-2	Force Main	Extension	10	$371,000	$520,000	2010
E-FM-YTC5	Force Main	Extension	10	$351,000	$491,000	2025
E-FM-YTC6	Force Main	Extension	8	$355,000	$497,000	2025
			Subtotal	$8,237,000	$11,532,000	
			Total	**$36,747,000**	**$51,443,000**	

(1) All costs are Year 2003 costs.

1.3 Wastewater Treatment System

1.3.1 Kansas River WWTP Improvements

Several improvements will be required for the Kansas River WWTP to meet regulatory requirements and maintain system reliability. Capacity expansion is not required for liquid treatment because City growth requirements will be accommodated with the implementation of a new Wakarusa River WWTP in the year 2011. Capacity expansion is required for solids treatment because the existing anaerobic digester capacity will be exceeded. Anaerobic digester improvements will consist of converting the existing anaerobic digester storage tank to a secondary digester with gas mixers and a floating cover, expanding the gas control building, and upgrading the digester SCADA system to current City standards.

The existing dissolved air flotation (DAF) thickener is designed to normally operate on a continuous 24-hour basis without polymer addition to thicken waste activated sludge (WAS). The DAF was sized for an annual average flow capacity of 12.5 mgd to the treatment plant. With polymer addition, the DAF is sized to process maximum month WAS quantities at 12.5 mgd design within an 8 hour period per day. Without polymer addition, it is anticipated that the DAF thickener will reach its design capacity by the year 2009. However, with polymer addition, the DAF should be capable of thickening WAS during the interim period of 2009 to 2011, prior to start-up of the new Wakarusa River WWTP in 2011. The existing DAF will have capacity to thicken WAS on a 24-hour basis, without polymer addition, during the design period of 2012 to 2025.

It is anticipated that future regulations will require the addition of biological nutrient removal (BNR) facilities for total nitrogen removal and phosphorous removal. KDHE indicated the liquid treatment facilities will need to be upgraded to meet a total nitrogen limit of 10 mg/L, an ammonia limit of 1 mg/L, and a phosphorous limit of 1.5 mg/L. The timetable for these regulatory improvements has not been dictated by KDHE at this time, therefore, a speculative timeframe for BNR improvements at the Kansas River WWTP is approximately the year 2015. BNR improvements would consist of external BNR basins for Aeration Basin No.s 1 and 2, BNR modifications internal to Aeration Basin No.s 3 and 4, and a fermentor/gravity thickener for primary sludge to produce volatile fatty acids for the BNR process.

New facility improvements required for the Kansas River WWTP are as follows:

- Anaerobic Digester Improvements
- Roof for Dewatered Biosolids Storage Basin
- Vehicle and Equipment Storage Building
- Biological Nutrient Removal Facilities

1.3.2 Wakarusa River WWTP Improvements

It is recommended to implement a new Wakarusa River WWTP to meet the growth requirements for the City of Lawrence and effectively comply with future regulatory requirements. As described in the WWTP evaluation section of this Master Plan, it is the best and most cost-effective solution to implement a Wakarusa River WWTP rather than conveying and treating all wastewater flow at the Kansas River WWTP. The Wakarusa River WWTP would be designed to accommodate all flow from west Lawrence that is pumped from the Four Seasons Pumping Station and all flow conveyed from south of the Wakarusa River.

Based on population projections, it is projected that a 6.9 mgd (annual average) WWTP will be required to meet 2025 growth projections for the service area. The WWTP should be designed with BNR facilities and contain space in the hydraulic profile for filtration facilities, if required in the future. The Four Seasons Pumping Station will pump flow directly to the WWTP for the west Lawrence service area. It is anticipated the design capacity of the existing Kansas River WWTP will be reached in the year 2011, therefore, the new Wakarusa River WWTP should be constructed and in service by the year 2011.

It is recommended that studies be conducted of plant site issues including environmental, cultural resource, and flood impact assessments to determine the best and most favorable location for a Wakarusa River WWTP site. These studies should commence immediately so that adequate time is allowed to study, identify, and purchase the land for the Wakarusa River WWTP site. Sufficient land should be procured to allow for future WWTP expansions and provide an adequate buffer zone to residential and commercial development.

1.4 Additional Implementation Plan Items

1.4.1 CMOM Audit and Program

Currently there is a proposal by the EPA, in legislation, that is intended to clarify and expand the National Discharge Elimination System (NPDES) permit requirements. The proposal addresses permit conditions on capacity, management, operations, and maintenance (CMOM); prohibiting overflows (Sanitary Sewer Overflows –SSOs); public notification; and recordkeeping. A CMOM audit and program will focus on preparing the City of Lawrence for pending regulation requirements by establishing a program that focuses on reducing the number of overflows in the system and providing an acceptable level of service to customers. In particular, the CMOM Program will focus on the following items:

- Capacity – Evaluate pipe relief sizes for current and future needs (20-Year Plan)
- Management – Implement a Management Information System (MIS) so as to become GASB 34 compliant. The MIS system should also be used to generate work orders and track those work orders.
- Operations and Maintenance – Establish operation and maintenance performance goals that allow the City to become proactive in preventing SSO's eg. establish a pipe cleaning routine that cleans 30 percent of the system yearly.

1.4.2 Collection System Improvements

The City currently maintains a budget for general collection system improvements that is not detailed in the 1995 Wastewater Master Plan. A budget of the general collection system improvements is included in the Implementation Plan costs and schedule.

1.5 Collection System Implementation Plan and Cost Summary

The Collection System Implementation Plan combines the gravity sewer improvements, pump station and force main improvements, and special items identified as part of this study.

The special items include continuation of the City's I/I reduction program, wastewater treatment plant upgrades, and continuation of the City's CMOM program.

The Collection System Implementation Plan for these items is presented in Table IV-4.

Table IV-5 presents a cost summary of recommendations.

Wastewater System Facility Project Name	Reason for Improvement	Year 2003 Project Cost: Short Term 2004 -2011	Long Range Through 2025	Project Cost by Year Including 4% Annual Inflation (1): 2004 ($)	2005 ($)	2006 ($)	2007 ($)	2008 ($)	2009 ($)	2010 ($)	2011 ($)	2015 ($)	2020 ($)	2025 ($)
Collection System Improvements														
C-2-1 - Pipe Project - Central Basin	(C)	$240,000		$250,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
C-2-2 - Pipe Project - Central Basin	(C)	$548,000		$570,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
EL-1-1 - Pipe Project - East Lawrence Basin	(C)	$354,000		$369,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
KR-2-1 - Pipe Project - Kansas River Basin	(C)		$426,000	$0	$0	$0	$0	$0	$0	$0	$0	$683,000	$0	$0
KR-2-2 - Pipe Project - Kansas River Basin	(C)		$1,787,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,862,000	$0	$0
KR-2-3 - Pipe Project - Kansas River Basin	(C)		$773,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,238,000	$0	$0
KR-4-1 - Pipe Project - Kansas River Basin	(C)	$73,000		$76,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
KR-4-2 - Pipe Project - Kansas River Basin	(C)	$250,000		$87,000	$91,000	$94,000	$0	$0	$0	$0	$0	$0	$0	$0
KR-5-1 - Pipe Project - Kansas River Basin	(C)	$236,000		$246,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
KR-5-2 - Pipe Project - Kansas River Basin	(C)	$233,000		$243,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
KR-6-1 - Pipe Project - Kansas River Basin	(C)		$144,000	$0	$0	$0	$0	$0	$0	$0	$0	$231,000	$0	$0
NL-1-1 - Pipe Project - North Lawrence Basin	(C)		$244,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$579,000
NL-1-2 - Pipe Project - North Lawrence Basin	(C)		$195,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$463,000
WR-2-1 - Pipe Project - Wakarusa River Basin	(C)	$471,000		$490,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WR-2-2 - Pipe Project - Wakarusa River Basin	(C)	$431,000		$449,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WR-3-1 - Pipe Project - Wakarusa River Basin	(C)	$712,000		$0	$771,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
WR-3-2 - Pipe Project - Wakarusa River Basin	(C)		$346,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$820,000
WR-3-3 - Pipe Project - Wakarusa River Basin	(C)	$884,000		$0	$957,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
WR-6-1 - Pipe Project - Wakarusa River Basin	(C)	$705,000		$0	$763,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
WR-6-2 - Pipe Project - Wakarusa River Basin	(C)	$191,000		$0	$207,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
WR-6-3 - Pipe Project - Wakarusa River Basin	(C)	$1,489,000		$0	$0	$1,675,000	$0	$0	$0	$0	$0	$0	$0	$0
YTC-1-1 - Pipe Project - Yankee Tank Creek Basin	(C)		$4,127,000	$0	$0	$0	$0	$0	$0	$0	$0	$6,608,000	$0	$0
YTC-2-1 - Pipe Project - Yankee Tank Creek Basin	(C)		$872,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,699,000	$0
YTC-2-2 - Pipe Project - Yankee Tank Creek Basin	(C)	$635,000		$0	$0	$0	$0	$0	$804,000	$0	$0	$0	$0	$0
YTC-3-1 - Pipe Project - Yankee Tank Creek Basin	(C)		$679,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,323,000	$0
YTC-3-2 - Pipe Project - Yankee Tank Creek Basin	(C)		$318,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$620,000	$0
YTC-3-3 - Pipe Project - Yankee Tank Creek Basin	(C)	$696,000		$0	$0	$0	$0	$0	$881,000	$0	$0	$0	$0	$0
PS_01 - Pump Station Project - North Lawrence Basin	(C)		$949,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,250,000
PS_02 - Pump Station Project - North Lawrence Basin	(C)		$164,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$389,000
PS_03 - Pump Station Project - North Lawrence Basin	(C)		$664,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,574,000
FM-PS_03 - Force Main Project - North Lawrence Basin	(C)		$162,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$384,000
PS_08 - Pump Station Project - Wakarusa River Basin (Abandon Pump Station)	(C)	$200,000		$0	$0	$225,000	$0	$0	$0	$0	$0	$0	$0	$0
PS_09 - Holding Basin #3 - Wakarusa River Basin	(C)		$2,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,740,000
PS_09A - Pump Station Project - Wakarusa River Basin	(C)	$862,000		$0	$0	$0	$0	$0	$0	$1,135,000	$0	$0	$0	$0
PS_09B - Pump Station Project - Wakarusa River Basin	(C)		$862,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,381,000	$0	$0
FM-PS_09 - Force Main Project - Wakarusa River Basin	(C)	$1,221,000		$0	$0	$0	$0	$0	$0	$1,607,000	$0	$0	$0	$0
PS_16 - Pump Station Project - Kansas River Basin	(C)	$1,401,000		$0	$0	$0	$1,639,000	$0	$0	$0	$0	$0	$0	$0
PS_25 - Pump Station Project - Kansas River Basin	(C)	$773,000		$0	$0	$0	$0	$941,000	$0	$0	$0	$0	$0	$0
FM-PS_25 - Force Main Project - Kansas River Basin	(C)	$622,000		$0	$0	$0	$0	$0	$788,000	$0	$0	$0	$0	$0
PS_26 - Pump Station Project - Kansas River Basin (Remove if possible)	(C)	$250,000		$260,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
PS_27 - Pump Station Project - Kansas River Basin	(C)	$274,000		$0	$0	$0	$321,000	$0	$0	$0	$0	$0	$0	$0
PS_28 - Pump Station Project - Kansas River Basin	(C)	$549,000		$0	$0	$0	$0	$0	$695,000	$0	$0	$0	$0	$0
PS_32 - Pump Station Project - East Lawrence Basin	(C)		$274,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$534,000	$0
FM-PS_32 - Force Main Project - East Lawrence Basin	(C)		$130,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$254,000	$0
PS_33 - Pump Station Project - Wakarusa River Basin (Remove if possible)	(C)	$250,000		$260,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
E-NL3PS1 - Pump Station Project - North Lawrence	(A)	$950,000		$0	$0	$0	$0	$0	$0	$1,251,000	$0	$0	$0	$0
E-FM-NL3 - Pump Station Project - North Lawrence	(A)	$250,000		$0	$0	$0	$0	$0	$0	$329,000	$0	$0	$0	$0
E-WRS-3-01 - Pipe Extension Project - Wakarusa River South Basin	(A)		$546,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,064,000	$0
E-WRS-4-01 - Pipe Extension Project - Wakarusa River South Basin	(A)	$550,000		$0	$0	$0	$0	$0	$0	$0	$753,000	$0	$0	$0
E-WRS-5-01 - Pipe Extension Project - Wakarusa River South Basin	(A)	$1,404,000		$0	$0	$0	$0	$0	$0	$0	$1,922,000	$0	$0	$0
E-WRS-5-05 - Pipe Extension Project - Wakarusa River South Basin	(A)	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$1,403,000	$0	$0	$0
E-WRS-6-01 - Pipe Extension Project - Wakarusa River South Basin	(A)	$2,354,000		$0	$0	$0	$0	$0	$0	$0	$3,222,000	$0	$0	$0
Subtotal Collection System Improvements		$21,083,000	$15,662,000	$3,300,000	$2,789,000	$1,994,000	$1,960,000	$941,000	$3,168,000	$4,322,000	$7,300,000	$13,003,000	$5,494,000	$11,199,000
Wastewater Treatment Plant Improvements														
Kansas River WWTP Improvements														
Upgrade WWTP for BNR	(B)		$6,200,000	$0	$0	$0	$0	$0	$0	$0	$0	$9,927,000	$0	$0
Add Roof to Dewatering Biosolids Storage Basin	(C)	$420,000		$437,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Vehicle and Equipment Storage Building	(C)	$450,000		$0	$487,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Anaerobic Digester Improvements	(A)	$2,400,000		$0	$0	$2,700,000	$0	$0	$0	$0	$0	$0	$0	$0
Wakarusa River WWTP Improvements				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Acquire WWTP Site / Siting & Environmental Studies	(A)	$1,500,000		$520,000	$541,000	$563,000	$0	$0	$0	$0	$0	$0	$0	$0
6.9 mgd WWTP with BNR & Solids Processing	(A)	$52,500,000		$0	$0	$0	$5,499,000	$5,719,000	$54,536,000	$0	$0	$0	$0	$0
WWTP Excess Flow Handling Facility	(A)	$5,100,000		$0	$0	$0	$0	$1,095,000	$5,315,000	$0	$0	$0	$0	$0
Second Electrical Power Feed to WWTP	(A)	$500,000		$0	$0	$0	$0	$110,000	$519,000	$0	$0	$0	$0	$0
Flood Protection and WWTP Site Fill	(A)	$1,500,000		$0	$0	$0	$0	$329,000	$1,557,000	$0	$0	$0	$0	$0
Subtotal Wastewater Treatment Plant Improvements		$64,370,000	$6,200,000	$957,000	$1,028,000	$3,263,000	$5,499,000	$7,253,000	$61,927,000	$0	$0	$9,927,000	$0	$0
Additional Projects & Improvements														
Collection System Field Operations Building	(C)	$500,000		$0	$0	$0	$0	$0	$0	$658,000	$0	$0	$0	$0
I/I Removal	(C)	$650,000		$676,000	$704,000	$732,000	$761,000	$791,000	$823,000	$856,000	$890,000	$4,163,000	$6,331,000	$7,703,000
CMOM (Capacity, Management, Operations, and Maintenance)	(B)	$200,000		$208,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
General Sanitary Sewer Improvements	(C)	$600,000		$624,000	$649,000	$675,000	$702,000	$730,000	$760,000	$790,000	$822,000	$3,843,000	$5,844,000	$7,110,000
General Pumping Station Improvements	(C)	$200,000		$208,000	$217,000	$225,000	$234,000	$244,000	$254,000	$264,000	$274,000	$1,281,000	$1,948,000	$2,370,000
General WWTP Improvements	(C)	$200,000		$208,000	$217,000	$225,000	$234,000	$244,000	$254,000	$264,000	$274,000	$1,281,000	$1,948,000	$2,370,000
Subtotal Wastewater Treatment Plant Improvements	(C)	$2,350,000	$0	$1,924,000	$1,787,000	$1,857,000	$1,931,000	$2,009,000	$2,091,000	$2,174,000	$2,260,000	$10,568,000	$16,071,000	$19,553,000
Total (Recommended Plan) (3)		**$87,803,000**	**$21,862,000**	**$6,181,000**	**$5,604,000**	**$7,114,000**	**$9,390,000**	**$10,203,000**	**$67,186,000**	**$6,496,000**	**$9,560,000**	**$33,498,000**	**$21,565,000**	**$30,752,000**

(1) Project Costs include construction costs plus a service factor for contingencies, engineeering, legal, and admininstration as noted in report text.
(2) Collection System Improvements in growth areas are to be funded by developers and are not included in this Implemenation Plan.
(3) Costs do not include bond or financing costs.
(4) Exact timing of improvements is uncertain and will be dependent on City funding availability and physical condition of equipment.
(5) Capital Costs for Planning years include 4 percent inflation per year.
(6) Project Costs identified in this table are identified also as capital costs throughout report text.

Reason for Improvement
(A) - Growth Related Improvement
(B) - Regulatory related improvement.
(C) - Reliability related improvement.

City of Lawrence, Kansas
Wastewater System Master Plan - 2003

Implementation Plan

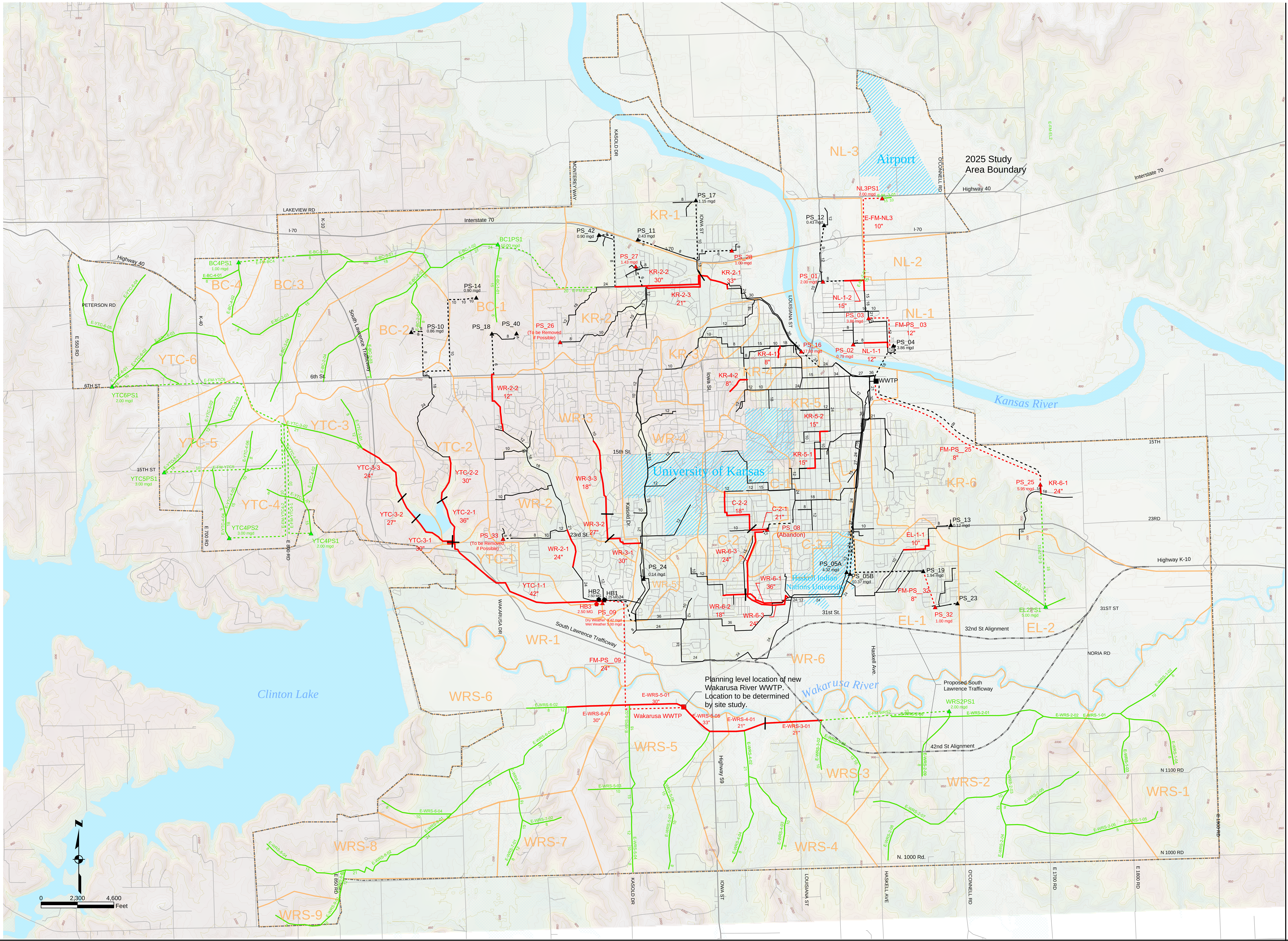
Table IV-4

The cost of future extension sewers is normally borne by developers and are not included in the Implementation Plan. However, there are several extension sewer projects which the City will be financing. These have been included in the collection system Implementation Plan and are as follows; E-WRS-3-01, E-WRS-4-01, E-WRS-5-01, E-WRS-5-05, and E-WRS-6-01.

Figure IV-1 presents relief improvements for planning years 2000, 2010, and 2025. Sewers indicated are trunk sewers. Small collector sewers are not shown. "Developer Pipelines" are sewers to be provided by developers and Benefit Districts.

Cost Summary of Implementation Plan
Table IV-5

	Capital Cost ($)
Gravity Sewers	$18,059,000
Pump Stations and Force Mains	$11,607,000
Extensions (City Developed) (1)	$7,079,000
I/I Reduction Program	$650,000
Wastewater Treatment Plant Improvements	$70,570,000
CMOM	$200,000
General Improvements	$1,500,000
Total	$109,665,000



City of Lawrence, Kansas
Wastewater Master Plan
2003

Legend

Project Pipeline

- 24" — Sewer (Relief Improvement Size)
- 10" — Force Main (Relief Improvement Size)

Benefit District or Developer Pipeline

- 10 — Sewer (Size)
- 24 — Force Main (Size)

Existing Pipeline

- 10 — Sewer (Size)
- 24 — Force Main (Size)

Developer Facilities

- 2.00 mgd — Pumping Station (Firm Capacity)

Facilities To Be Upgraded

- 1.00 mgd — Pumping Station (Firm Capacity)
- WWTP
- 2.5 MG — Holding Basins (Volume)

Existing Facilities

- 0.14 mgd — Pumping Station (Firm Capacity)
- WWTP
- 2.5 MG — Holding Basins (Volume)

Other

- 2025 Study Area Boundary
- 100-Year Floodplain
- Water

Drainage Basins

BC	Baldwin Creek
C	Central
EL	East Lawrence
KR	Kansas River
NL	North Lawrence
WR	Wakarusa River
WRS	Wakarusa River South
YTC	Yankee Tank Creek

Recommended Improvements

BLACK & VEATCH Corporation

Figure IV-1

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