CITY OF RICHMOND, MICHIGAN

WATER SYSTEM

MASTER PLAN UPDATE

RELIABILITY STUDY
and
GENERAL PLAN

July 2022

CONTENTS

APPENDICES

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

SUMMARY AND CONCLUSIONS

The City of Richmond currently supplies residents with water from seven sequencing supply wells. One elevated storage tank exists on the northwest part of the City. The existing distribution system consists of approximately 36.3 miles of water main.

This study updates the 2016 Water System Master Plan, prepared by Tetra Tech for the addition of an asset management plan and associated documents. The purpose of the study was to update growth projections and future improvements needed, while considering recent improvements completed by the City.

A hydraulic model for the distribution system was updated using infrastructure, well supply, and fire flow information provided by the City. Results of the model indicate that residual pressures are adequate for peak hour demands. Available fire flow requirements are currently adequate at most locations; however, the service life of the existing water mains, future system expansion requirements, and adequacy of supply wells are issues that should be addressed.

Available fire flows in the existing system may be improved by replacing the water mains along Main Street, and installing a new main from Grove Street to Forest Avenue behind the high school (along the extended Beier Street right-of-way). The existing water mains for these locations measure 8 inches or less in diameter; therefore, lower pressures occur in the southern portions of the City. Larger water mains (12 inches) would provide increased fire flow as well as a transmission loop for future expansion. The following table summarizes the opinion of costs for these internal improvements.

Improvement	Opinion of Cost
Internal Improvements for Existing Deficiencies	$4,254,000*
Internal Improvements for Future Service	$1,443,000
Internal Improvements for Age/Maintenance	$2,575,000
Total	$8,027,000

* Cost opinion does not include Project 3, which is not planned within the next 25 years.

In addition to the above improvements, the City should consider other long-term improvements including:

- Replace 4-inch-diameter mains with 8-inch or larger diameter mains.
- Provide looping for dead end mains.
- Provide transmission system improvements along Main Street.

These long-term improvements will provide improved system hydraulics and improved service to customers. The improvements could be completed when street improvements are planned or when required by significant future development.

The history of well development in Richmond shows that the City has continuously added wells to meet water supply needs. The low yield of the individual wells currently in use requires the City to maintain a minimum of five to six wells; more will be required if the community continues to grow as projected. Well water resource exploration should be conducted on a continuing basis to identify alternate well locations in advance of actual need. This study projects that additional well capacity and storage volume will be needed as the community grows.

INTRODUCTION

The City of Richmond contracted Tetra Tech to prepare an update to the 2016 Water System Master Plan. This report describes the analysis of the water distribution system including an updated assessment of the existing system to meet system demands, and an evaluation and recommendation of alternative improvements to supply future service populations.

The following list summarizes the issues addressed in this analysis:

- Update the evaluation of the current system performance and identify necessary improvements to meet current needs.
- Update the current service areas and projections for future service areas.
- Update the projected future demands including potential service areas outside the current City limits.
- Re-evaluate the ability of existing facilities to meet future demands and identify necessary improvements to meet projected future needs.
- Re-evaluate and prepare a least-cost solution of improvements to meet existing and future system needs.
- Update system mapping.

The analysis of these issues, as presented in subsequent sections of this report, was performed with the aid of the InfoWater computer model.

EXISTING CONDITIONS

SERVICE AREA

The City of Richmond is located in Macomb County, northeast of the City of Detroit. The topography is relatively flat with ground elevations ranging from 724 to 752. The City covers approximately 2,534 acres and is supplied by a water distribution network consisting of pipes ranging from 1 inch to 12 inches in diameter. A plan view of the water supply service area and distribution network is presented in Map 1.

The distribution network services approximately 6,000 customers thru 2,474 service connections.

DISTRIBUTION SYSTEM INFRASTRUCTURE

This analysis considers the water system infrastructure of the City of Richmond. The updated infrastructure list and updates to the base maps were provided to Tetra Tech by the City. Table 1 is a summary of the current water distribution system pipe length information.

Table 1

Existing Water Main Sizes and Lengths in the City of Richmond

Water Main Diameter (inches)	Approximate Water Main Length (feet)
1	950
2	2,570
4	18,873
6	38,283
8	92,290
10	2,896
12	35,758
Total	**191,620**

WATER SUPPLY

The existing water system is supplied by seven production wells dispersed throughout the City. Since 1982, several improvements have been made to the well system to supply an increasing service population and to replace low-capacity wells. Production well Number 10 was placed in service in February 1986 in the northwest corner of the City. In October 1986, production well Number 4 was abandoned and was subsequently replaced by well Number 4A in April 1987. To serve additional populations, production well Number 11 was added in February 1993 and well Number 14 was added in November 2003. Well Number 12 was abandoned due to iron bacteria. Well Number 14 was drilled 100 feet north of well Number 12 and was put into operation March 2006. Table 2 shows pertinent data on the existing production wells.

Table 2

Production Well Data

Well No.	Location	Diameter (inches)	Depth (feet)	Design Capacity (gpm)	Current Capacity * (gpm)
3A	Near Public Works	10	142.5	205	211
4A	Near Public Works	16	144.5	215	211
8	1,200 feet north of Madison / Main Intersection	10	206.5	110	110
9	1,200 feet north of CN RR and Division	10	252.0	244	281
10	600 feet west and 300 feet south of Clay Road / Memphis Road Intersection	16	196.8	205	220
11	1,200 feet east and 600 feet south of 32 Mile Road/Howard St. Intersection	20	140.1	530	516
14	Northwest of the intersection of 33 Mile Road and Lowe Plank Road	8	270	350 (approx.)	300
Total Firm Capacity (with largest well out of service)				1,122 (1.62 mgd)	

* Well 3A is within the cone of influence of Well 4A and is therefore not included in the estimate for firm capacity.

ELEVATED STORAGE TANK

A 400,000-gallon elevated storage tank is located in the northwest part of the City near 33 Mile Road. In April of 2007, Utility Service Co. prepared a report regarding the water tower conditions and recommended improvements. The tank was inspected and the following recommendations were made:

- Exterior Renovation – properly prepare existing coating system and over-coat with two coats in year one.
- Interior Renovation – properly remove existing coating system and reline with a two part epoxy coating system.
- Remove the existing cage around the leg ladder.
- Extend the leg ladder 20 feet.
- Install a cable type safety climbing device on leg and bowl ladders.
- Install a locking ladder gate onto the leg ladder.
- Install a new hatch on top of the bowl.
- Install a new 24-inch primary access hatch at the riser.
- Weld down the bowl ladder to the tank.
- Extend the overflow pipe 3 feet and install a flapper and protective screen.
- Install a new 24 inch insect and freeze proof vent.
- Install an interior wet access ladder.
- Install a mid-rail on the balcony.
- Coat the foundation with epoxy to prevent freeze/thaw damage.
- Caulk/grout the damaged foundation.
- Conduct an exterior inspection annually.
- Conduct an interior inspection and cleaning every two years.
- Perform interior/exterior painting every ten years.

The city has since implemented these improvements and has executed a maintenance contract for the tower.

SYSTEM DEMANDS

The available water usage records for the City of Richmond spanned the years 1997 to 2021 and listed various production wells for supply. Table 3 summarizes the well pumping records.

Table 3

Well Pumping Records

Fiscal Year	Total Volume Pumped (million gallons)	Average Day		Maximum Day	
		(mgd)	(gpm)	(mgd)	(gpm)
1997	178.8	0.49	342	1.03	717
1998	207.6	0.55	380	1.18	824
1999	190.8	0.53	361	0.67	465
2000	182.9	0.50	347	0.63	437
2001	192.7	0.53	368	0.70	486
2002	195.4	0.54	375	0.70	486
2003	198.1	0.54	377	0.75	521
2004	201.2	0.55	383	1.16	804
2005	198.5	0.54	378	1.13	794
2006	196.3	0.54	374	1.13	794
2007	193.4	0.53	368	1.11	773
2008	195.0	0.53	371	1.11	773
2009	190.6	0.52	361	1.09	756
2010	178.7	0.49	340	1.01	701
2011	180.5	0.49	340	0.99	688
2012	172.4	0.47	326	1.04	720
2013	164.2	0.45	312	1.02	710
2014	165.0	0.45	312	1.10	762
2015	165.0	0.45	314	0.95	656
2015	173.7	0.48	330	1.00	700
2017	169.5	0.46	322	0.97	670
2018	164.6	0.45	313	0.95	656
2019	158.7	0.43	302	0.91	634
2020	160.0	0.44	304	0.92	639
2021	162.3	0.44	309	0.93	648

Based on Table 3, the average daily flow has been decreasing slightly over the past few years and is currently estimated to be approximately 0.51 mgd. Past modeling efforts used an average of 0.65 mgd. For modeling purposes, the maximum day demand is estimated to be 2.1 times the average day demand based on pumping records. A multiplier of 4.0 times the average was used to obtain peak hour demands.

In recent years, the City has been able to account for approximately 7% of unbilled water. The unaccounted water can be accounted for through flushing hydrants, arsenic plant backwashing and water leaks that leave total unaccounted water for FY 20/21 at 7.90%.

Table 4

Past Billing Records

A	B	C	D	E	F	G	H
Fiscal Year	Annual Pumpage (Thousands)	Annual Sales (Thousands)	Difference Pump -Sales (Thousands)	Unaccounted D/B %	Other Totals (Thousands)	Unaccounted D-F (Thousands)	Unaccounted G/B %
FY 03/04	198,144.30	164,560.57	33,583.73	16.95%	6,380.82	27,202.91	13.73%
FY 04/05	201,184.25	168,938.75	32,245.50	16.03%	4,762.40	27,483.10	13.66%
FY 05/06	198,499.28	168,027.66	30,471.62	15.35%	5,052.60	25,419.02	12.81%
FY 06/07	196,311.74	168,143.76	28,167.98	14.35%	4,237.07	23,930.91	12.19%
FY 07/08	193,420.79	163,127.97	30,292.82	15.66%	5,794.72	24,498.10	12.67%
FY 08/09	195,013.54	157,835.49	37,178.05	19.06%	13,145.38	24,032.67	12.32%
FY 09/10	190,578.87	156,484.83	34,094.04	17.89%	13,547.85	20,546.19	10.78%
FY 10/11	178,683.20	149,770.57	28,912.63	16.18%	7,703.25	21,209.38	11.87%
FY 11/12	180,534.34	153,434.33	27,100.01	15.01%	7,329.32	19,770.69	10.95%
FY 12/13	172,381.83	135,188.10	37,193.73	21.58%	7,464.23	29,729.50	17.25%
FY 13/14	164,485.29	131,876.51	32,608.78	19.82%	6,879.52	25,729.26	15.64%
FY 14/15	165,029.81	145,289.66	19,740.15	11.96%	5,328.73	14,411.42	8.73%
FY 15/16	173,678.00	143,396.36	30,281.64	17.44%	4,644.98	25,636.66	14.76%
FY 16/17	169,450.00	141,768.05	27,681.95	16.34%	5,815.14	21,866.54	12.90%
FY 17/18	164,613.00	147,380.05	17,322.95	10.47%	6,459.35	10,773.60	6.54%
FY 18/19	158,692.00	142,897.37	15,794.63	9.95%	7,219.06	8,575.57	5.40%
FY 19/20	160,001.00	147,346.74	12,654.26	7.91%	4,706.69	7,947.58	4.97%
FY 20/21	162,330.00	143,355.66	18,974.34	11.69%	6,158.23	12,816.12	7.90%
			Average	15.20%		Average	11.39%

The distribution of the total demand for existing conditions considered industrial activities and highly populated locations in the City. Since the nodal distribution in the system is somewhat consistent and no industry is a significant user, the demands have been distributed equally to the nodes throughout the system.

HYDRAULIC ANALYSIS

The previous Cybernet Water Distribution System Model, Version 2, was converted to InfoWater, Version 6, to aid in the hydraulic analysis of the water supply system. Model input consisted of lengths, sizes, and roughness factors (Hazen-Williams coefficients) for pipes, and ground elevations and water demands at each node.

The model includes all transmission and distribution water mains as presented on maps provided by the City and as listed in the infrastructure list. The demand at each node was estimated based on distributing the historic flows as discussed above under the heading "System Demands."

MODEL CALIBRATION

The Richmond distribution system model was calibrated using flow and pressure data obtained from field tests conducted November 23-25, 2009, by Tetra Tech and City of Richmond crews, as presented in Table 5. The hydrant tests were performed at thirty-three (33) selected locations throughout the water distribution system as specified in the table (Test Nos. 1-34). An additional hydrant test was conducted in April 2015 (i.e. Test No. 35); this test data was compared to the model results but not used to recalibrate the model.

Table 5

Hydrant Test Results (November 23-25, 2009)

Test No.	Type District	Test Location	Flow (gpm)	Pressure (psi)	
				Static	Residual
1	Commercial	NW Corner 31 Mile & County Line Road	1151	68	50
2	Commercial	E Dr to Kroger off County Line	1175	68	54
3	Commercial	Rite Aid, south of 31 Mile Rd	1062	67	53
4	Commercial	Speedway, on Gratiot Avenue	1175	66	56
5	Commercial	First State Bank, Main St. west of Gratiot Avenue	1075	61	49
6	Commercial	Behind K-mart, north of Main Street and Muttonville Ln.	1034	62	50
7	Residential	68072 Lake Angela Dr.	1823	59	42
8	Residential	36590 Heritage Drive-3rd hydrant south	1062	61	43
9	--	Deleted (due to construction)	0	0	0
10	Residential	Dow Street at Rosewood Lane	1034	60	52
11	Residential	36421 Priestap St at Beech St	700	58	52
12	Commercial	Gleason Street at O.W. Street	870	56	38
13	Residential	Gleason Street at Chaskey St	1007	56	38
14	Residential	67600 Forest – N of Diane Lane	1007	56	40
15	Residential	67845 Joe Wood Drive – on Woodside	1488	56	26
16	Commercial	68339 Forest – Lee school near curve	1007	54	42
17	Commercial	69245 Burke Drive – near Power Equip.	1175	56	54
18	Commercial	Skinner Drive – 2nd hydrant east of curve	1075	58	50
19	Residential	36451 Bernard – west of Emma-Trailer Ct.	751	56	24
20	Commercial	Beebe Street at Water Street	964	56	52
21	Residential	Applewood and Quince	1062	56	50
22	Residential	North end of Chaucer	1075	56	47
23	Residential	Crystal dead end n/Pierce	1113	57	50

Test No.	Type District	Test Location	Flow (gpm)	Pressure (psi)	
				Static	Residual
24	Residential	Main St. 300′ n of Pound Rd	1062	45	43
25	Residential	South end of Sunnybrook Lane	1007	45	40
26	Residential	Pheasant Ridge and Meadowlark	1048	45	41
27	Residential	Churchill and Grove	1021	47	42
28	Commercial	NW corner of Division and Grove	1138	52	44
29	Commercial	South end of Stoecker Lane	949	56	40
30	Residential	Division Rd @ western most hydrant	1101	52	46
31	Commercial	Main Street at Monroe Street	856	50	45
32	Commercial	Main Street at Oak	888	54	42
33	Commercial	Forest and Friday	816	55	42
34	Commercial	Madison and Ferguson	859	50	50
35*	Commercial	31 Mile Rd btw Gratiot Ave and County Line Rd	1088	62	50

* Test No. 35 was performed in April 2015

The Richmond model was calibrated based on estimated use and pumpage conditions at the time of these tests (actual conditions are not known). Demands were assumed, and the pumps were assumed to be operating as indicated by the daily report the day of hydrant testing. Static pressures in the model vary slightly from observed values; however, they were within 5 psi of the test results at all locations.

Most of the transmission mains in the City of Richmond were built in the early to mid-1900s. The system has been gradually expanded since then to meet the growing needs. Initially, to calibrate the model, the pipes which were constructed prior to 1970 were assumed to have a Hazen Williams roughness of 100, while the water mains built since 1970 were assumed to have a Hazen Williams roughness of 130. Adjustments were subsequently made from these values so the modeled results better match the measured values.

Using the above assumptions, the model can reasonably match hydrant test results. Table 6 compares the calibrated model results, completed in 2009, at the nearest node to the ISO test hydrant.

Table 6

Comparison of Calibrated Model to Field Test Pressures

Test Number	Test Location	Flow (gpm)	Measured Pressure (psi)		Δ Pressure	Predicted Pressure (psi)		Δ Pressure	Δ Measured - Δ Predicted
			Static	Residual	(psi)	Static	Residual	(psi)	(psi)
1	NW Corner 31 Mile & County Line Road	1151	68	50	18	68	44	24	-6
2	E Dr to Kroger off County Line	1175	68	54	14	67	50	17	-3
3	Rite Aid, south of 31 Mile Rd	1062	67	53	14	65	49	16	-2
4	Speedway, on Gratiot Avenue	1175	66	56	10	65	50	15	-5
5	First State Bank, Main St. west of Gratiot Avenue	1075	61	49	12	62	44	18	-6
6	Behind K-mart, north of Main Street and Muttonville	1034	62	50	12	58	41	17	-5
7	68072 Lake Angela Dr.	1823	59	42	17	58	17	41	-24
8	36590 Heritage Drive-3rd hydrant south	1062	61	43	19	61	42	19	0
9	Deleted	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	Dow Street at Rosewood Lane	1034	60	52	8	59	52	7	1
11	36421 Priestap St at Beech St	700	58	52	6	58	53	5	1
12	Gleason Street at O.W. Street	870	56	38	18	55	42	13	5
13	Gleason Street at Chaskey St	1007	56	38	18	55	39	16	2
14	67600 Forest – N of Diane Lane	1007	56	40	16	55	40	15	1
15	67845 Joe Wood Drive – on Woodside	1488	56	26	30	56	31	25	5
16	68339 Forest – Lee school near curve	1007	54	42	12	55	46	9	3
17	69245 Burke Drive – near Power	1175	56	54	2	57	52	5	-3

Test Number	Test Location	Flow (gpm)	Measured Pressure (psi)		Δ Pressure (psi)	Predicted Pressure (psi)		Δ Pressure (psi)	Δ Measured - Δ Predicted (psi)
			Static	Residual		Static	Residual		
	Equip.								
18	Skinner Drive – 2nd hydrant east of curve	1075	58	50	8	58	49	9	-1
19	36451 Bernard – west of Emma-Trailer Ct.	751	56	24	32	57	NEG	--	--
20	Beebe Street at Water Street	964	56	52	4	55	49	6	-2
21	Applewood and Quince	1062	56	50	6	52	44	8	-2
22	North end of Chaucer	1075	56	47	9	55	44	11	-2
23	Crystal dead end n/Pierce	1113	57	50	7	55	44	11	-4
24	Main St. 300′ n of Pound Rd	1062	45	43	2	48	46	2	0
25	South end of Sunnybrook Lane	1007	45	40	5	45	43	2	3
26	Pheasant Ridge and Meadowlark	1048	45	41	4	47	41	6	-2
27	Churchill and Grove	1021	47	42	5	47	41	6	-1
28	NW corner of Division and Grove	1138	52	44	8	53	46	7	1
29	South end of Stoecker Lane	949	56	40	16	56	40	16	0
30	Division Rd @ western most hydrant	1101	52	46	6	52	43	9	-3
31	Main Street at Monroe Street	856	50	45	5	49	42	7	-2
32	Main Street at Oak	888	54	42	12	53	41	12	0
33	Forest and Friday	816	55	42	13	55	49	6	7
34	Madison and Ferguson	859	50	50	0	50	47	3	-3

As indicated in Table 6, the model provides a reasonable prediction of residual pressures at all locations except test 7. A possible explanation for the difference is that recorded system conditions (based on SCADA data) could be inconsistent with actual conditions at the time of the hydrant tests (such as well pumps on) or a recording error could have been made by the crew conducting the hydrant testing. In general, the calibrated model results are consistent with the test results.

MODEL RESULTS

The calibrated model was used to predict existing flows and pressures throughout the system. Maps 2 and 3 show peak hour pressure and available fire flows for the existing system, respectively. Table 7 provides a summary of the residual pressures at specified locations throughout the system for various demand conditions as well as available fire flows.

Table 7

Model Results for Existing Conditions

Location (Model node number in parentheses)	Residual Pressure		Available Fire Flows at 20 psi Residual Pressure (gpm) [3]
	Max. Day Demands [1]	Peak Hour Demands [2]	
Diane Lane and Forest Ave. (156)	61	59	2,450
Beier and Forest Ave. (121)	56	55	2,250
Main and Muttonville (175)	66	64	2,150
Howard and Main (136)	58	56	2,100
Park and Parker (72)	53	53	1,050
Division Rd. at east City limits (112)	66	65	2,650
Lake Angela behind Kmart (172)	61	60	2,150
Pound Road and Crystal (54)	58	57	400
Lake Angela Dr. and Main St. (163)	64	63	2,150
Gratiot Ave. and 31 Mile Rd. (181)	69	67	1,700

Note: [1] Results based on Pump 4 operating and a filled tank. Similar values are obtained for any one pump operating and a filled tank.

(2) Results based on all pumps, except Pump 11, operating (Pump 3, 4, 8, 9, 10, and 14) and a filled tank. Pressures in the system are in the range of 47 to 69 psi.

(3) Available fire flow based on a 20 psi residual pressure and maximum day demands, all pumps operating (Pump 3, 4, 8, 9, 10, and 14) except Pump 11, and a filled tank.

To get maximum fire suppression insurance credits for residents, ISO standards call for 2,000 gpm and 3,000 gpm for residential and commercial properties, respectively. However, target fire flows selected by the City are 1,500 gpm for residential and 2,500 gpm for commercial, industrial, and multiple residential areas.

Table 7 and Map 3 indicate that some deficiencies may exist in the system. For the available fire flows with the tank at mid-level, pressures could be approximately 5 psi less than shown and available fire flows approximately 90 percent of that shown. Locations of low fire suppression exist primarily in areas of small diameter or at dead end mains. Specific areas of low fire suppression under existing conditions are:

- 31 Mile Road at the City Limits
- Jolaine Court
- Richwood Lane (mid-block)

Peak hour demand conditions do not, as shown in Table 7, cause pressure drops below 35 psi anywhere in the system. While the pressures above are approximately 5 psi less for a mid-level tank, the normal daily demands can be met without stressing the system.

Some water mains within the City, however, should be replaced due to the age of many of the transmission mains and lower fire flows and pressures.

FUTURE CONDITIONS

SERVICE AREA

The future service areas expand on the existing service area significantly, as shown on Map 4. Total service area size has increased since the 1999 and 2004 studies due to changes in the City's growth plans. The expansion includes predominantly residential and industrial, but also commercial growth. Table 8 summarizes the future land use areas.

Table 8

Future Service Area for Various Land Uses

Land Use	Area (acres)
Low Density Residential	120
Mixed Residential	163
Industrial	547
Commercial	288
Total	1,118

WATER SUPPLY

The history of well development in Richmond shows that the City has continuously added wells to meet water supply needs. The low yield of the individual wells currently in use requires the City to maintain a minimum of five to six wells; more if the community continues to grow. Because the City anticipates growth over the next decade, it is important to assure a reliable and adequate water supply.

If the City chooses to serve new development with groundwater supply, groundwater explorations should be conducted on a continuing basis, and alternate well locations identified before actual need. The City has installed well Number 14, which is in use starting March 2006, and has investigated future well sites. In addition, a wellhead protection program has been implemented to prevent the loss of any wells from contamination and to

ensure the availability of future sites that will satisfy the permitting requirements of the Michigan Department of Environmental Quality (MDEQ).

Layne-Northern reviewed and summarized local well log data in the 1990 Ground Water Investigation report. This study was completed in an attempt to determine the distribution of geologic materials and to identify the local aquifer systems. Because most of the well logs available were for shallow wells, this well log data was only marginally suitable for evaluating aquifer units deeper than 100 feet below grade (the Richmond City wells are completed to depths ranging from about 140 to 250 feet below grade). However, based on the well log data, Layne-Northern identified two areas that they considered suitable for further investigation: "Exploration Area - A," to the west-northwest of the City, and "Exploration Area - B," to the east of the City. Layne-Northern conducted limited electrical resistivity surveys along three transects in each of these areas: along 33 Mile Road (west of the City), along Lowe Plank Road (north and west of the City), and along Gratiot Avenue (south and east of the City). The electrical resistivity surveys identified the area near the intersection of 33 Mile Road and Lowe Plank Road (Station No. 2) as a potential area of high resistivity (saturated sand/gravel).

The Layne-Northern report made no mention of the area northeast of the City. The approximate shape of the "draw-down cone" associated with the pumping well field is elongated in the northeast-southwest direction. Elliptical or elongated draw-down patterns typically reflect trends in permeability. In this case, the shape of the draw-down cone may suggest higher yielding sediments to the northeast or southwest of the City center. The area northeast of town is accessible, and the planned land use is low-density residential. A deep (200 plus feet) exploration test boring, perhaps near the end of the distribution system on Pound Road, may provide inexpensive information that could yield significant returns.

In general, the Layne-Northern report is adequate for identifying some general locations for exploratory drilling. It is not sufficient to identify, with any certainty, specific areas where groundwater exploration will be successful. However, the City of Richmond has already identified the location for a proposed new well.

As an alternative to the well supply, the City may explore other options. Although not currently considered feasible, connecting to the Detroit public water system could be considered as a future alternative if the Detroit Water and Sewerage Department (DWSD) increases their distribution system capabilities.

FUTURE GROWTH

Several areas within the City limits are scheduled to change land use classification. The following is a summary of the expected growth in various parts of the City. These areas are shown on Map 4.

Northwest

To the west of the Swan Creek development, an area of approximately 118 acres of open space (Subareas 11A, 11B, and 12) is assumed to become mixed residential. In addition, approximately 44 acres to the south of the Swan Creek development (Subarea 13) are also planned to be mixed residential. These are shown on Map 4.

East

In the southeast part of town, some land which is classified open space will become low and mixed density residential (Subarea 29 and 29A). The Lake Angela Estates development, with approximately 255 single family units, is located in this area (Subarea 29). Approximately 120 of these units are now serviced.

Several landowners have expressed an interest to annex into the City, specifically in St. Clair County to the east. One such area (Subarea 21) is located east of the City, between Gratiot

Avenue, Pound Road, and the St. Clair County border. This area of approximately 121 acres is proposed industrial land use. This will significantly increase the service area and system demands.

Northeast

Northeast of the city limits, growth is expected south of Pound Road, north of Division Road, on both east and west sides of the railroad tracks (Subareas 23, 26, 31, and 32). This area of approximately 365 acres, as shown on Map 4, is assumed to be industrial and mixed residential. This growth was not previously projected in 2004, and will impact system demands.

Southeast

Southeast of the city limits, growth is expected south of Division Road, east of County Line Road (Subareas 24, 33, and 34). This area of approximately 270 acres is assumed to be commercial land use. This will significantly increase the service area and demand; which was not previously projected in 2004.

Central

Just west of the CN Railroad, on the north side of the City, approximately 48 acres of industrial land use is projected for growth (Subarea 19).

SYSTEM DEMANDS

Since the completion of the 2004 Water System Master Plan, additional projected land developments are now being considered for future water demands. As a result, the projected demands are higher than those in the previous study. Table 9 summarizes average day system demands that were used in the City of Richmond water distribution model.

Table 9

Average Day System Demands

Land Use	Existing Demands (gpm)	Additional Future Demands at Build-out (gpm) 5 Year	Additional Future Demands at Build-out (gpm) 20 Year	Total Future Demands at Build-out (gpm)
Low Density Residential	245	5	45	295
Mixed Residential	41	14	121	176
Commercial	32	20	180	232
Industrial	1	38	343	382
Public	6	0	0	6
Unaccounted	50	8	71	129
Total	375	85 (0.12mgd)	760	1,220 (1.75 mgd)

Note: Based on 1,000 gallons per acre per day for commercial, industrial, and high-density residential areas, 1,200 gallons per acre per day for mixed residential, and 600 gallons per acre per day for low-density residential.

. For the purpose of this report, we have assumed the build-out conditions correspond to a 20-year time frame. We suggest that perhaps 10% of the growth of 845 gpm will occur, or about 85 gpm. This yields on average daily flow of (0.12 mgd) for the 5 year planning period.

The demands in Table 9 are distributed to all nodes in areas designated by the corresponding land use. Peaking factors of 1.5 and 3.0 are used for maximum day and peak hour demands, respectively, when development is complete. These are reduced from the existing factors of 2.1 and 4.0 due to attenuation of demands.

It can be expected that the future build-out maximum day demand will be approximately 1.5 times 1.75 mgd, or 2.63 mgd. This compares to the present firm capacity of 1.62 mgd. So, the City of Richmond will need additional capacity to meet future supply requirements if future growth occurs as projected.

Recent maximum day flows were approximately 1.2 mgd. The firm pumping capacity of the City's well system is 1.62 mgd. Therefore, the City can grow by approximately 0.42 mgd maximum day flow, or approximately 0.20 mgd average daily demand. In approximate numbers, 0.20 mgd average day flow corresponds to 2,000 people, which is equivalent to 320 acres of low density residential development.

STORAGE

Currently, the City has a 400,000-gallon elevated storage tank. At present, this provides equalization storage but minimal fire flow storage. With the operation of well Number 14, however, the City could provide up to 3,000 gpm fire flow for 90 minutes. This considers that Well 3A and 4A cannot operate simultaneously due to effects on the cone of influence.

Future demands are significant and will require additional well supply and potentially elevated storage. Based on the existing firm well capacity and projected demands, the City could need more than 1 million gallons in additional storage for equalization and fire flow. Storage requirements are very dependent on projected demands and additional well capacity. Thus, storage requirements relative to supply should be planned for in the upcoming years. Due to the topography, the location of any additional elevated storage must also be carefully considered. It may be desirable to install new storage near the eastern city limits to accommodate the growth that is projected in that location.

SYSTEM CONCERNS

Service Life

As described in the Existing Conditions section of this report, many of the mains in the Richmond water distribution system were installed in the early 1900s. Because water mains 70 to 80 years old are subject to tuberculation, causing higher resistance to flowing water, the capacity of these lines is lowered. In addition, pipe of this age is typically considered to have reached its design service life, thus breaks can be more frequent. Due to these factors, a schedule for water system pipe replacement should be developed. Pipe sizes for this replacement should be consistent with the proposed improvements presented below.

Supply Quantity

As mentioned in the Future Conditions Water Supply section, the City of Richmond may have difficulty balancing growth goals with available water demand and may encounter serious problems in the future if sufficient reserves or alternatives are not identified early. As newer wells are installed and placed on-line, older wells continue to demonstrate head losses and increased well interference, which could reduce total production. As a result, water well investigations should be conducted on a continuing basis to identify and develop new well locations in advance of actual need.

System Operation and Monitoring

Current system operation and monitoring facilities appear to be adequate for meeting water needs for the community. As the system continues to expand, updated or modified instrumentation and controls may be warranted. Monitoring points and operational software may need to be modified, and should be included as part of the system as improvements are made. New regulatory initiatives may warrant consideration of monitoring water quality in the system in addition to quantity data, such as well pumpage rates and water levels in the storage tank.

ASSET MANAGEMENT

Water systems are made up of assets. These are the physical components of the system and include: pipe, valves, hydrants, wells, and an elevated tank. The assets that make up a water system lose value over time as the system ages and deteriorates. The approach to managing the assets of the system that can assist the utility with making better decisions on caring for these aging assets is called asset management. Asset management is meeting a required level of service in the most cost-effective way through the creation, acquisition, operation, maintenance, rehabilitation, and disposal of assets to provide for present and future customers. The intent of asset management is to ensure long-term sustainability of the water utility. Asset management is a set of procedures to manage assets through their life cycles, based on principles of life cycle costing. These procedures, to be effective, must be implemented in a programmatic way.

CORE COMPONENTS OF AN ASSET MANAGEMENT SYSTEM

- Asset Inventory
- Level of Service
- Critical Assets
- Revenue Structure
- Capital Improvement Project Plan

ASSET MANAGEMENT MISSION STATEMENT

To commit to improve and maintain the public health protection and performance of our drinking water wells and distribution system assets, while minimizing the long-term cost of operating those assets. To strive to make the most cost-effective renewal and replacement investments and provide the highest quality customer service possible.

ASSET MANAGEMENT TEAM

Name: Jim Goetzinger
Title: Public Service Director
Role: Oversee day-to-day operations, rate schedule recommendations, budget preparation, and capital improvement plan preparation
Email: richmonddpw@comcast.net

Name: Angel Hatfield
Title: Finance Director
Role: Annual Audit assistance, oversee fund balance
Email: ahatfield@cityofrichmond.net

Name: Jon Moore
Title: City Manager
Role: Oversight of all departments, liaison between departments and City Council
Email: jmoore@cityofrichmond.net

Name: John Barber, Tetra Tech
Title: City Engineer
Role: Provide technical assistance
Email: john.barber@tetratech.com

ASSET INVENTORY

The City of Richmond maintains a list of all capital assets owned by the City of Richmond that are part of the Public Water Supply. The City of Richmond's water system includes seven wells, two arsenic plants, one 400,000 gallon elevated storage tank, and 36 miles of water main ranging from 1" to 12". The City of Richmond's asset inventory is broken down by major assets only. Each well asset includes the building, well, pump, motor, chemical feed pumps, and all related items. Water main assets include all appurtenances such as valves, hydrants, and service lines. The City's water tower and arsenic plants are included on the asset inventory. This inventory is updated as assets change. A copy of the inventory is attached to this report as Appendix C.

CRITICALITY ASSESSMENT

All capital assets are rated for condition, probability of failure, and consequences of failure. This assessment is included on the Asset Inventory attached as Appendix C. The ratings are assigned based on the following tables.

Condition Assessment

Fixed Assets are rated based on their overall condition. This assessment is used as an aid to determine the Probability of Failure for the asset. The City rated all assets on a scale from 1 to 5 with 5 being the worst. For example, a water main averaging one or two breaks per year would be rated a 3. More than two main breaks would be rated a 4. Water mains with no break history, or very infrequent may be rated a 2 if over 30 years old. A well is operational, but needs updates would be rated a 3.

Table 10

Condition Assessment

Condition Rating	Description
5	Asset Unserviceable – Over 50% of asset requires replacement
4	Significant Deterioration – Significant renewal/upgrade required (20-40%)
3	Moderate Deterioration – Significant maintenance required (10-20%)
2	Minor Deterioration – Minor maintenance required (5%)
1	New or Excellent Condition – Only normal maintenance required

Probability of Failure

Most water system assets will require some maintenance during the life of the component. Wells require cleaning and pump replacement. Water mains may need experience breaks. The probability of failure is assigned based on age, current condition, failure history, and experience. For example, a water main with a break history of one per year would be rated a

3. Water mains with no break history, or very infrequent may be rated a 2 if over 30 years old. A well that is operational, but that has not been inspected recently would be rated a 3.

Table 11

Probability of Failure

Condition Rating	Description
5	Imminent – Likely to occur in the life of the item – Continuously experienced
4	Probable – Will occur several times in the life of an item – Will occur frequently
3	Occasional – Likely to occur sometime in the life of an item – Will occur a few times
2	Remote – Unlikely, but can be reasonably expect to occur
1	Improbable – Unlikely to occur in the life of the time, but possible

Consequence of Failure

Consequence of failure is independent of the likelihood of failure. Redundancy, replacement costs, restoration (i.e. road repairs), and customers impacted are all factors in assigning a consequence of failure. For example, the City has one water tower. Loss of the water tower would put the entire system at risk during peak demand so the water tower is rated a 5. A water main on a major street would have a higher consequence of failure on a residential street. A high producing well may be rated a 4 when a lower producer is rated a 2. Both wells are important to the system, but redundancy allows operation without them.

Table 12

Consequence of Failure

Condition Rating	Description
5	Catastrophic Disruption – Massive system failure, severe health affect, persistent and extensive damage
4	Major disruption – Major loss of system capacity, major health effects, major costs, important LOS compromised
3	Moderate disruption – Moderate loss of system capacity, moderate health effects, moderate costs, important LOS still achieved
2	Minor disruption – Minor loss of system capacity, minor health effects, minor costs
1	Insignificant disruption – Slight loss of system capacity, slight health effects

Criticality Factor

The assets are then assigned a Criticality Factor (1 to 25). This factor is used to help prioritize repairs and capital improvement projects. A criticality Factor is calculated by the multiplication of the Probability of Failure by the Consequence of Failure. An abandoned water main in poor condition will have a lower criticality factor than an important well that is in good condition.

Table 13

Criticality Factor

Criticality Range	Description
1 to 8	**Not critical**
9 to 16	**Important, but not critical**
17 to 25	**Critical**

LEVEL OF SERVICE

Above all else, the City of Richmond, strives to consistently provide safe drinking water to its customers. Customers must be able to trust the water they drink. The City of Richmond requires water operators to be properly certified thru the State of Michigan and provides sufficient training to ensure operators are competent and knowledgeable to maintain the water system and remain in compliance with State regulations. The level of service goals set by the Department of Public Works (DPW) are a direct reflection of the expectations given by the Richmond City Council and the water customers. The department strives to provide a timely response to all public inquiries.

- Limit service interruptions to four hours.
    - Water main and water service breaks are given first priority over other DPW operations.
- Make initial contact with customer within one hour of water quality complaint.
    - Begin to investigate problem and provide available information to customer.
- Properly train operators to maintain system.
    - Multiple operators will be certified thru the MDEQ.
    - All DPW staff, including operators, will be trained in proper construction techniques for maintenance and repairs to physical assets.
- Consistently review rate structure for fiscal responsibility
    - Save for capital improvement projects to minimize the need to bond projects.
    - Maintain a fund balance to cover six months of operating costs.
    - Budget for non-recurring equipment maintenance costs independent of capital improvement funds.

REVENUE STRUCTURE / CAPITAL IMPROVEMENT PLAN

The City maintains a 20-year budget/capital improvement plan. This document is updated quarterly to compare actual revenues and expenses with budges figures. Historical data is utilized to anticipate operation and maintenance costs as well as estimate cost increases. The fund balance is separated into operating costs, equipment maintenance, and capital improvements to ensure funds for infrequent charges such as water main replacements and equipment repairs/replacement. Tracking historical costs and budgeting for future expenses allows the City to evaluate user fees to ensure an appropriate fund balance now and in the future. A 5-year capital improvement plan is presented to City Council annually for approval. Rate adjustments are also presented to City Council for approval annually (if necessary). Section 93-34 of the City of Richmond's Code of Ordinances provides authority for the Richmond City Council to establish water rates. The 20-year budget is attached to this report as Appendix D and is the rate methodology document used to propose rate increases. All rates and rate changes are included in the City's Fee Schedule (Appendix E). The fee schedule is adopted by the Richmond City Council in conjunction with adoption of the annual budget. Minutes showing adoption of the fee schedule are attached as Appendix F.

IMPROVEMENT ALTERNATIVES

The previous sections have presented the need for system improvements in selected areas of the City and surrounding areas. Various improvement alternatives are available to ensure the system will provide adequate fire flow capability. These improvements can be separated into three categories: improvements associated with existing deficiencies, improvements to meet future expansion, and improvements associated with system age/maintenance. These were determined by considering future conditions including demands and assumed water main locations. This section will present a discussion of the recommended improvements. Map 5 represents all proposed improvements.

INTERNAL IMPROVEMENTS ASSOCIATED WITH EXISTING DEFICIENCIES

These improvements are based on existing model results and on the age of the mains. The southwest portion of the City of Richmond has lower fire flows available. In addition, many of the transmission mains are old and may be near the end of their service life.

To improve existing fire protection, a 12-inch water main should replace the existing 6-inch and 8-inch mains located on Main Street from Ridge Road to Gratiot Avenue (Projects 1-4). This will increase the fire flow available while improving the transmission of water to future expansion areas. The City plans to replace the water main along Main Street from Division Road to the CN Railroad in fiscal year 2025/26 (Project 1), from Division Road to Ridge Road in fiscal year 2033/34 (Project 4), from the CN Railroad to Howard Street in fiscal year 2034/2035 (Project 2A), and from Howard Street to Gratiot Avenue in fiscal year 2045/46 (Project 3).

The 6-inch pipe on Oak Street should be extended by 8-inch pipe from the CN Railroad to Bartell Street (Project 5); currently there are no improvements scheduled along Oak Street.

INTERNAL IMPROVEMENTS ASSOCIATED WITH FUTURE EXPANSION

These improvements are suggested to ensure the transmission of water to the extremities of the system. The suggested improvement (Project 7) is to provide a 12-inch water main 2,300 feet east to Forest Avenue along Beier Street to Grove Street.

It is also suggested to add 12-inch pipe, parallel to the existing 12-inch pipe, along Main Street from Pound Road to the elevated tank (Project 8). Additionally, 1,200 feet of 12-inch pipe from Pound Road and the City limits south along Crystal Drive to Pierce Drive is suggested (Project 10).

The dead ends at Jolaine Court and Clarkston Lane have low available fire flows, but due to insufficient easements and rights-of-way, there is no good alternative to correct this problem.

We suggest discussions be held with property owners at the western ends of the cul-de-sacs to seek easements to route a pipe between the two streets or to a future development to the west.

IMPROVEMENTS IN AREAS EXTERNAL TO THE EXISTING SYSTEM

These improvements include those in locations outside the current service area. Such improvements should be paid for primarily by developers who request expansion of the service area. The sizes suggested here are critical to ensure adequate supply to the extremities of the system; however, some variance from the existing locations may be acceptable.

The transmission mains shown in Map 5 do not include all water mains that would likely be constructed. Some additional transmission mains may be warranted to better loop the system, and many distribution mains will be necessary to provide service within the future growth areas. The location of these distribution mains are left to the developer, with City review, to locate.

The 12-inch loop around the City limits and future expansion areas should be completed with the following additions (Projects 11 through 22):

- 8,050 feet - Extension of Madison Street from the City limits 6,200 feet east and 1,850 feet south to 32 Mile Road extension (Project 11). This water main is presented as an example only. Developers may wish to connect transmission improvements to the 12-inch pipe at Division Road, in lieu of the 12-inch pipe along the northern property boundary. The same comment is valid for the following seven proposed projects:
- 2,300 feet - Gratiot Avenue, from Cottonwood Pointe extension northeast to 32 Mile Road extension (Project 12).
- 3,300 feet - Lowe Plank Road, from 33 Mile Road to 32 Mile Road and east on 32 Mile Road, connecting to the existing 12-inch pipe (Project 14).

- 1,400 feet – Forest Avenue, from CN Railroad to 31 Mile Road, replace existing pipe with 12-inch pipe (Project 16).
- 2,350 feet – 31 Mile Road extension from Forest Avenue east to the existing 10-inch pipe (Project 17).

The 8-inch pipe on Cottonwood Pointe should be connected with the proposed 12-inch loop on Gratiot Avenue with 1,330 feet of 12-inch pipe (Project 18). We also recommend the addition of 1,750 feet of 8-inch pipe (Project 19), followed by 1,640 feet of 10-inch pipe (Project 20), connecting the southwest end of Circle Lane with the proposed 12-inch loop on Lowe Plank Road. Extend the 10-inch pipe on Nature's Way 570 feet south to the new 8- and 10-inch pipes (Project 21). Also, replace the 6-inch pipe with 8-inch pipe on Circle Lane when Area 13 connects to the system (Project 22).

IMPROVEMENTS DUE TO WATER SYSTEM AGE/MAINTENANCE

These improvements are suggested based on Capital Improvement Projects for water main scheduled by the City:

- Replace the 12-inch water main along Grove Street, from Division Road to Ridge Street, with new 12-inch main (Project #23).
- Replace the 6-inch water main along Park Street, from Forest Avenue to Stone Street, with 8-inch main (Project #24).
- Replace the 6-inch water main along Forest Avenue, from Park Street to the north end, with 8-inch main (Project #25).
- Replace the 4-inch water main along Stone Street, from Division Road to Jefferson Street, with 8-inch main (Project #26).
- Replace the 6- and 8-inch water mains along Gierk Street, from Gleason Avenue to George Drive, with new 8-inch main (Project #27).
- Replace the 4-inch water main along Howard Street, from Main Street to Division Road, with 8-inch main (Project #28).

MODEL RESULTS

Table 14 summarizes the available fire flows with the Main Street improvement alternative identified above. Map 6 shows the projected system pressures during peak hour demands. The available fire flow for the entire future service area is shown on Map 7.

Table 14

Fire Flows for Proposed Internal Improvements,

Existing Conditions Maximum Daily Flows

Location (Model node numbers in parentheses)	Available Fire Flows (gpm)	
	Existing Conditions	Existing Conditions: Main Street Water Main Replacement
Diane Lane and Forest Ave. (156)	2,450	2,500
Beier and Forest Ave. (121)	2,250	2,550
Main and Muttonville (175)	2,150	2,850
Howard and Main (136)	2,100	2,650
Park and Parker (72)	1,050	1,050
Division Rd. at east City limits (112)	2,650	2,900
Lake Angela behind Kmart (172)	2,150	2,550
Pound Road and Crystal (54)	400	400
Lake Angela Dr. and Main St. (163)	2,150	2,800
Gratiot Ave. and 31 Mile Rd. (181)	1,700	1,700

Note: Available fire flow based on a 20 psi residual pressure, projected maximum day demands, all pumps (Pump 3, 4, 8, 9, 10, 14) operating, except pump 11 and a filled tank.

Table 14 indicates the improved level of fire protection associated with internal improvements to the system. The water main along Main Street is old (pre-1950) and should be replaced when street improvements are planned, or when significant future development requires. A 12-inch main is recommended to provide improved transmission on Main Street for future system demands.

Future system demands require the construction of a 12-inch water main to the locations outside the current City limits. Developers are expected to provide this water main which will loop nearly the entire City. Map 7 shows the fire flow contours for future developed conditions. Table 15 shows the improved available fire flow with proposed improvements within the City and to projected areas of development.

Table 15

Available Fire Flows for All Improvements

Location (Model node numbers in parentheses)	Fire Flows (gpm)	
	Existing Conditions	Future Conditions All Improvements
Diane Lane and Forest Ave. (156)	2,450	3,200
Beier and Forest Ave. (121)	2,250	3,100
Main and Muttonville (175)	2,150	3,300
Howard and Main (136)	2,100	3,100
Park and Parker (72)	1,050	2,150
Division Rd. at east City limits (112)	2,650	3,350
Lake Angela behind Kmart (172)	2,150	2,800
Pound Road and Crystal (54)	400	2,950
Lake Angela Dr. and Main St. (163)	2,150	3,250
Gratiot Ave. and 31 Mile Rd. (181)	1,700	2,950

Note: Available fire flow based on a 20 psi residual pressure, projected maximum day demands, and a filled elevated storage tank.

Additional simulations were performed assuming a mid-level elevated storage tank. Results indicated that available fire flows for a mid-level water elevation in the storage tank are approximately 90 percent of the available fire flows for a full elevated storage tank.

COSTS

Construction cost opinions have been computed for the various alternatives. These have been estimated assuming hydrants spaced every 450 feet, gate valves every 1,000 feet, and connections to the existing system. Cost opinions prepared for water mains constructed

under the roadway are shown in Table 16. Construction costs do not include costs for easement acquisition, surveying, land assessment, or engineering fees.

Table 16

Cost Opinion for Capacity Improvements

Project Number	Location	Pipe Length (feet)	Diameter (inch)	Purpose	Within City Limits	Opinion of Cost	City Scheduled Project Year	Opinion of Cost (in Year of Project)
1	Main St., from Division Rd. to CN Railroad	2,640	12	Existing demands / Age	Yes	$1,292,000	FY 2025/26	$1,412,000
2 (A)	Main St., from CN Railroad to Howard St.	670	12	Existing demands / Age	Yes	$555,000	FY 2034/35	$792,000
2 (B)	Gleason Ave., from Main St. to O.W. St.	400	12	Existing demands	Yes			
3	Main St., from Howard St. to Gratiot Ave.	4,250	12	Existing demands / Age	Yes	TBD*	FY 2045/46	TBD*
4	Main St., from Division Rd. to Ridge St.	2,600	12	Existing demands / Age	Yes	$1,408,000	FY 2033/34	$1,949,000
5	Oak St., from Bartell St. to CN Railroad	200	8	Existing demands	Yes	$84,000	2028/29	$101,000
6	Grove St. between 32 Mile Rd. and Beier St.	1,250	12	Future demands	Yes	$295,000	NA	TBD**
7	Beier St., between Grove St. and Forest Ave.	2,300	12	Future demands	Yes	$559,000	NA	TBD**
8	Main St., from Pound Rd. to the elevated storage	1,650	16	Future demands	Yes	$592,000	NA	TBD**
9	31 Mile Rd., from Gratiot Ave. west to existing 10-in watermain	1,200	8	Future demands	Yes	-	Completed	-

Project Number	Location	Pipe Length (feet)	Diameter (inch)	Purpose	Within City Limits	Opinion of Cost	City Scheduled Project Year	Opinion of Cost (in Year of Project)
10	Crystal Dr., from Pound Rd. south to Pierce Dr.	1,200	12	Future demands	Yes	$490,000	NA	TBD**
11	Extension from Madison St., 6,200 feet east and 1,850 feet south to 32 Mile Rd. extension	8,050	12	Future demands	No	Developer	NA	Developer
12	Gratiot Ave., from Cottonwood Pointe extension to 32 Mile Rd. Extension	2,300	12	Future demands	No	Developer	NA	Developer
13	32 Mile Rd. extension from City limits east to Gratiot Ave.	2,200	12	Future demands	No	-	Completed	-
14	Lowe Plank Rd. from 33 Mile Rd. to 32 Mile Rd.	3,300	12	Future demands	Yes	Developer	NA	Developer
15	Grove St., from 1,500 feet south of 32 Mile Rd., 2,250 feet south, and 450 feet east to Diane Lane	2,700	12	Future demands	Yes	-	Completed	-
16	Forest Ave., from CN Railroad to 31 Mile Rd.	1,400	12	Future demands	No	Developer	NA	Developer
17	31 Mile Rd., from Forest Ave., 2,350 feet east to existing 10-inch pipe	2,350	12	Future demands	No	Developer	NA	Developer
18	Cottonwood Pt., from Lost Forest Dr. to Gratiot Ave.	1,330	12	Future demands	No	Developer	NA	Developer
19	Circle Lane extension	1,750	8	Future demands	Yes	Developer	NA	Developer
20	Circle Lane extension	1,640	10	Future demands	Yes	Developer	NA	Developer
21	Nature's Way extension	570	10	Future demands	Yes	Developer	NA	Developer
22	Circle Lane	960	8	Future demands	Yes	Developer	26/27	Developer

Project Number	Location	Pipe Length (feet)	Diameter (inch)	Purpose	Within City Limits	Opinion of Cost	City Scheduled Project Year	Opinion of Cost (in Year of Project)
23	Grove St., from Division Rd. to Churchill St.	1600	12	Age	Yes	$467,000	FY 2028/29	$557,000
24	Park St., from Forest Ave. to Stone St.	350	8	Age	Yes	$95,000	FY 2024/25	$101,000
25	Forest Ave., from Park St. to north end	175	8	Age	Yes	$60,000	FY 2024/25	$64,000
26	Stone St., from Division Rd. to Jefferson St.	2400	8	Age	Yes	$614,000	FY 2022/23	$632,000
27	Gierk St., from Gleason St. to George Dr.	1190	8	Age	Yes	$296,000	FY 2026/27	$333,000
28	Howard St., from Main St. to Division Rd.	2783	8	Age	Yes	$701,000	FY 2030/31	$888,000

Notes: Detail cost opinion estimates are included in Appendix B.

NA = Not available

* Cost opinions were provided for projects scheduled within the next 25 years.

** Cost opinion in year of project is to be determined because project year not yet established.

In addition to these proposed projects and estimated costs, costs will be incurred for system expansion, including distribution water mains and some additional transmission mains.

So that costs may be estimated for these projects in the future, a table has been developed which includes escalation factors through the year 2033. The factors in Table 17 may be used only as an approximation since future conditions cannot be guaranteed. The cost escalation table is based on 3 percent increases in the ENR index each year. Over the past three years, the actual annual increases have been 2 to 3 percent.

Table 17

Cost Escalation

Year	Escalation Factor
2022	1.00
2023	1.03
2024	1.06
2025	1.09
2026	1.13
2027	1.16
2028	1.19
2029	1.23
2030	1.27
2031	1.30
2032	1.34
2033	1.38

RECOMMENDATIONS

Current plans are for the City of Richmond to eventually expand the service area of the water supply and distribution system as shown in Map 4. To accomplish this goal, some internal improvements to the infrastructure are necessary as well as extensions to the system. All improvements are summarized in Table 18. Improvements have been assigned a construction year corresponding to plans to reconstruct the streets.

Table 18

20-year Plan Recommendations Schedule

Year	Project Number	Project Location	Opinion of Cost	Opinion of Cost (in Year of Project)
2022	26	Stone St., from Division Rd. to Jefferson St.	$614,000	$632,000
2023	24	Park St., from Forest Ave. to Stone St.	$95,000	$101,000
2024	25	Forest Ave., from Park St. to north end	$60,000	$64,000
2025	1	Main St., from Division to CN Railroad	$1,292,000	$1,412,000
2026	27	Gierk St., from Gleason St. to George Dr.	$296,000	$333,000
2028	23	Grove St., from Division Rd. to Churchill St.	$467,000	$557,000
2030	28	Howard St., from Main St. to Division Rd.	$701,000	$888,000
2033	4	Main St., from Division to Ridge	$1,408,000	$1,949,000
NA	2, 3, 5, 6, 7, 8, 10	Projects within the City limits. No street improvements scheduled within 20 years.	TBD* >$2,575,000	TBD**
NA	14, 19, 20, 21, 22	Projects within the City limits that are needed for development.	Developer	Developer
NA	11, 12, 16, 17, 18	Projects outside the City limits that are needed for development.	Developer	Developer

*Cost opinion for Project 3 to be determined. Cost opinion indicated reflects Projects 2, 5, 7, 8, 10 only.
** Cost opinion in year of project is to be determined because project year not yet established.

Currently, the southeastern portions of the City have lower available fire flow. Since the water mains along Main Street are nearing the end of their service life, they should be

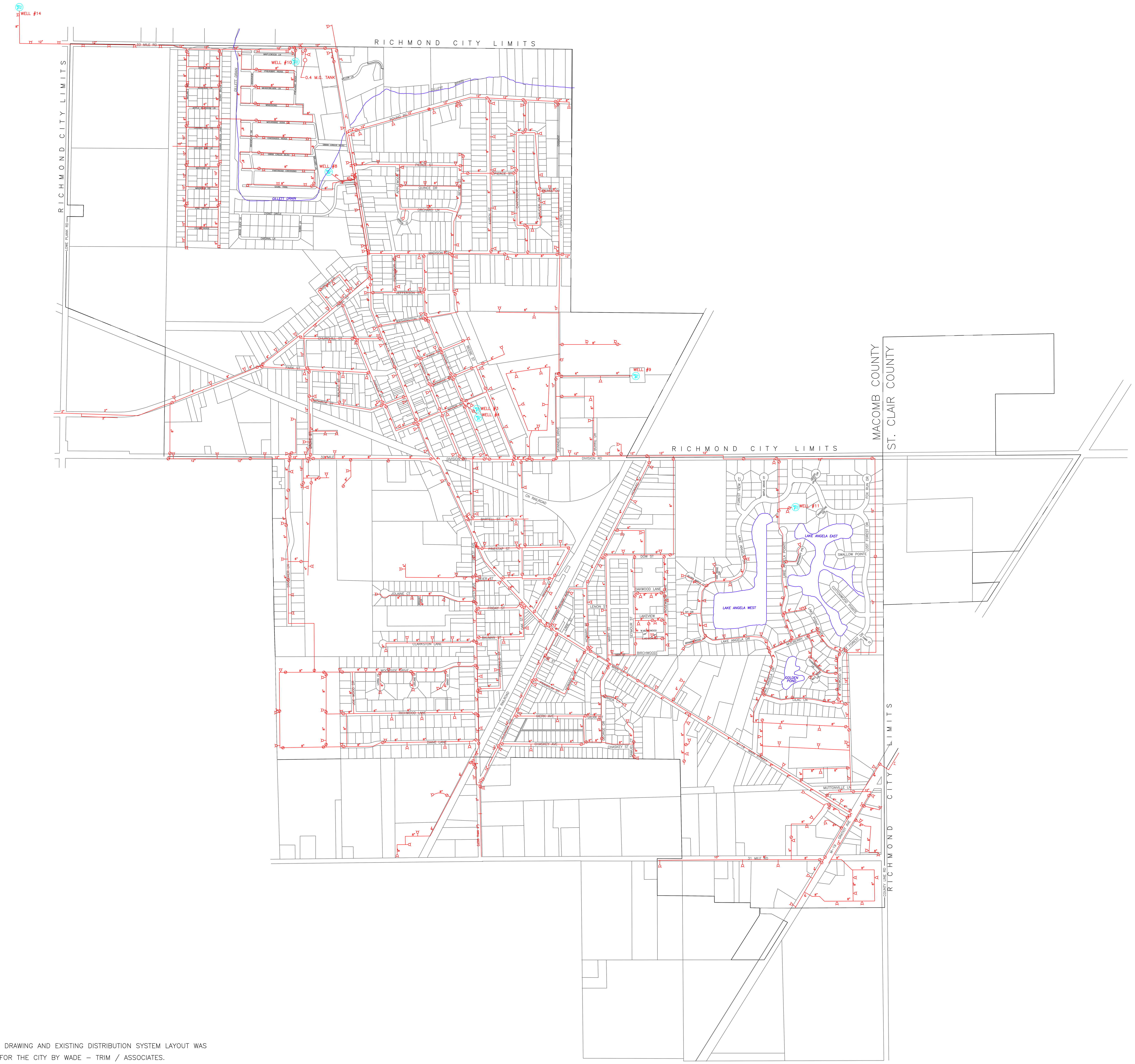
replaced with 12-inch water main. This will increase the existing available fire flows and pressures in the system, as well as provide the transmission main for future growth. The following recommendations would also improve the existing conditions: replace the water mains along Gleason Avenue, and connection of the dead ends on Oak Street and Forest Avenue.

As future expansion begins, we recommend the addition of a second 12-inch pipe along the existing 12-inch on Main Street between Pound Road and the elevated storage tank, the addition of 12-inch pipe south of Pound Road, and the extension of the water main on Beier Street crossing Main Street.

In addition to the internal improvements, water mains outside the City limits will be necessary to service the extended service area. These water mains will mainly be constructed and paid for by developers; 12-inch transmission mains looping the entire system would be necessary to provide adequate service. Developers are also expected to provide transmission and distribution within each service area.

As development occurs, additional well capacity and storage capacity will be desirable. As these improvements are mostly needed to support the proposed growth, we suggest the City of Richmond recover the costs for these facilities from the developments.

Appendix A
Maps



NOTE:

1. THE BASEMAP DRAWING AND EXISTING DISTRIBUTION SYSTEM LAYOUT WAS PREPARED FOR THE CITY BY WADE – TRIM / ASSOCIATES.

TETRA TECH

LEGEND

VALVE

HYDRANT

8" WATER MAIN AND DIAMETER

SUPPLY WELL & PUMP

N

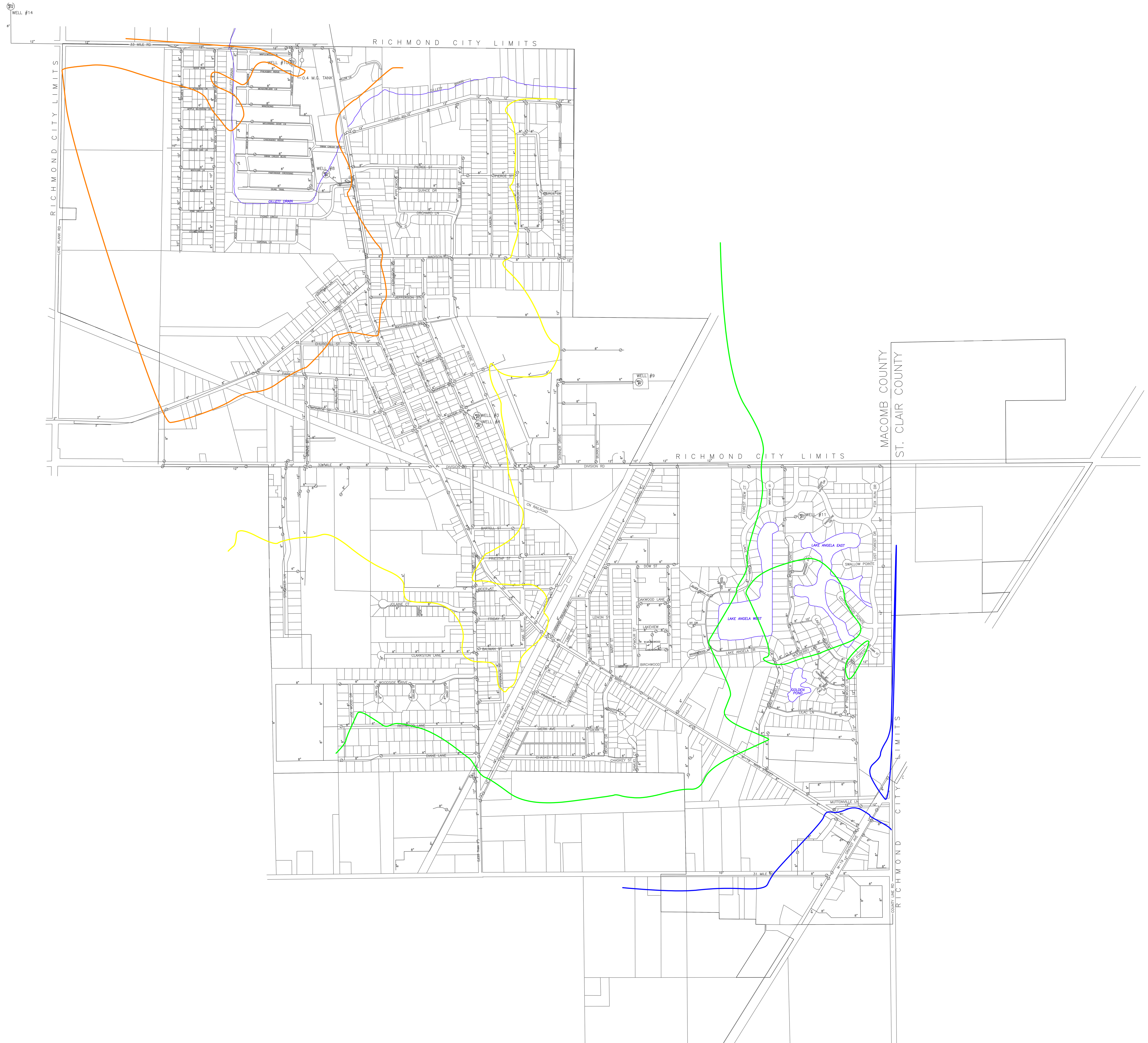
500' 250' 0 500' 1000'

SCALE: 1" = 500'

CITY OF RICHMOND, MACOMB COUNTY, MICHIGAN
WATER SYSTEM MASTER PLAN UPDATE
JUNE 2022

MAP 1
LAYOUT OF EXISTING
WATER DISTRIBUTION SYSTEM

\\TT.LOCAL\IER\PROJECTS\PT HURON\IER\12751\200-12751-20004\DOCS\REPORTS\2022 MSTR PLAN UPDATES\WATER\APPENDIX\SOURCE\MAP-1.DWG



NOTE:

1. THE BASEMAP DRAWING AND EXISTING DISTRIBUTION SYSTEM LAYOUT WAS PREPARED FOR THE CITY BY WADE – TRIM / ASSOCIATES.

TETRA TECH

LEGEND

⊘	VALVE
8"	WATER MAIN AND DIAMETER
(WELL)	SUPPLY WELL & PUMP

PRESSURE (psi)

red line	45
orange line	50
yellow line	55
green line	60
blue line	65

N

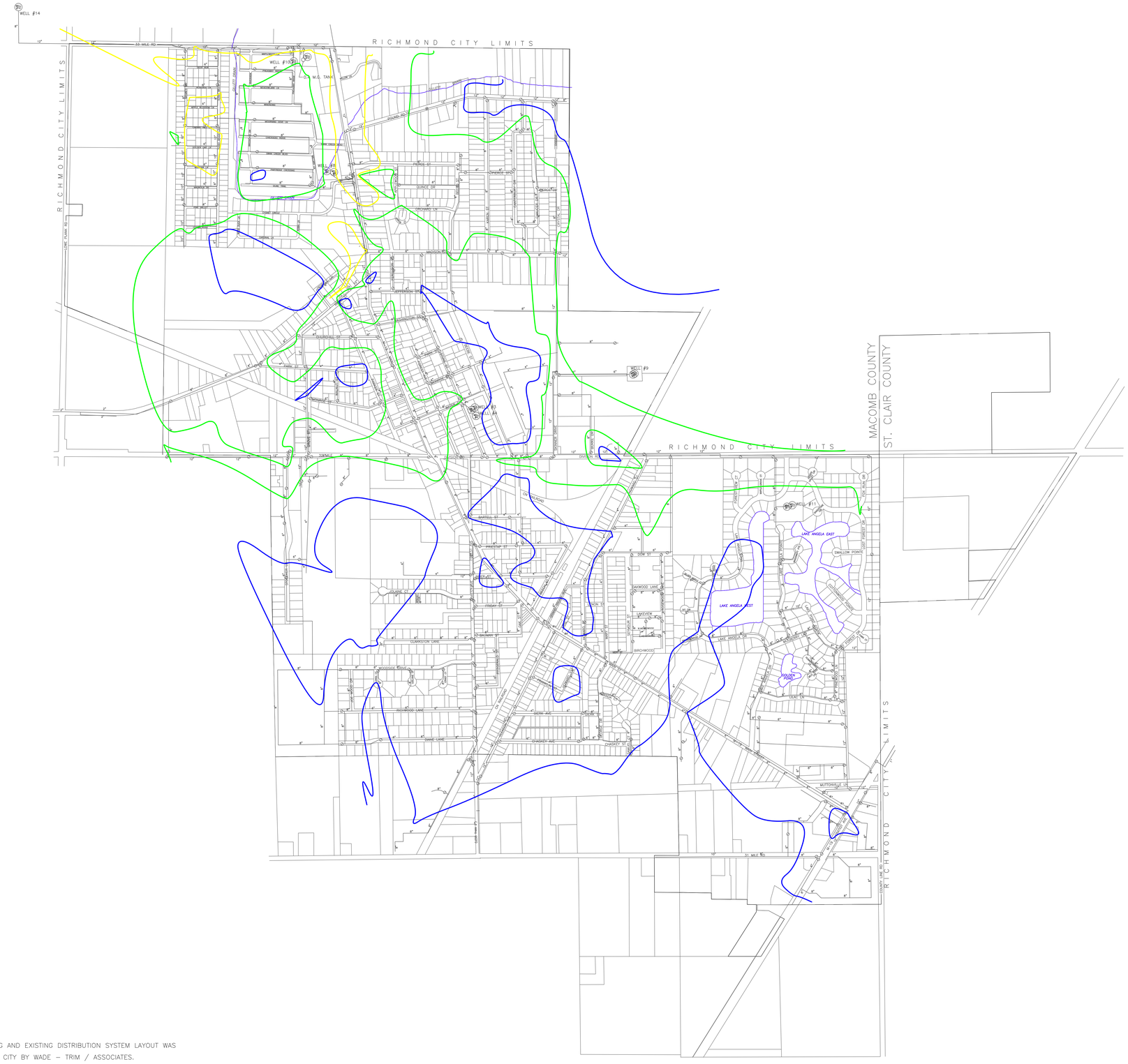
500' 250' 0 500' 1000'

SCALE: 1" = 500'

CITY OF RICHMOND, MACOMB COUNTY, MICHIGAN
WATER SYSTEM MASTER PLAN UPDATE
JUNE 2022

MAP 2
EXISTING PRESSURES AT PEAK DAILY FLOWS

O:\Projects\Pt Huron\IER\12751\200-12751-20004\Docs\Reports\2022 Mstr Plan Updates\Water\Appendix\Source\MAP-2.DWG



NOTE:

1. THE BASEMAP DRAWING AND EXISTING DISTRIBUTION SYSTEM LAYOUT WAS PREPARED FOR THE CITY BY WADE – TRIM / ASSOCIATES.

TETRA TECH

LEGEND

- VALVE
- 8" WATER MAIN AND DIAMETER
- SUPPLY WELL & PUMP

AVAILABLE FIRE FLOW (GPM)

- 5500
- 4500
- 3500
- 2500
- 1500

N

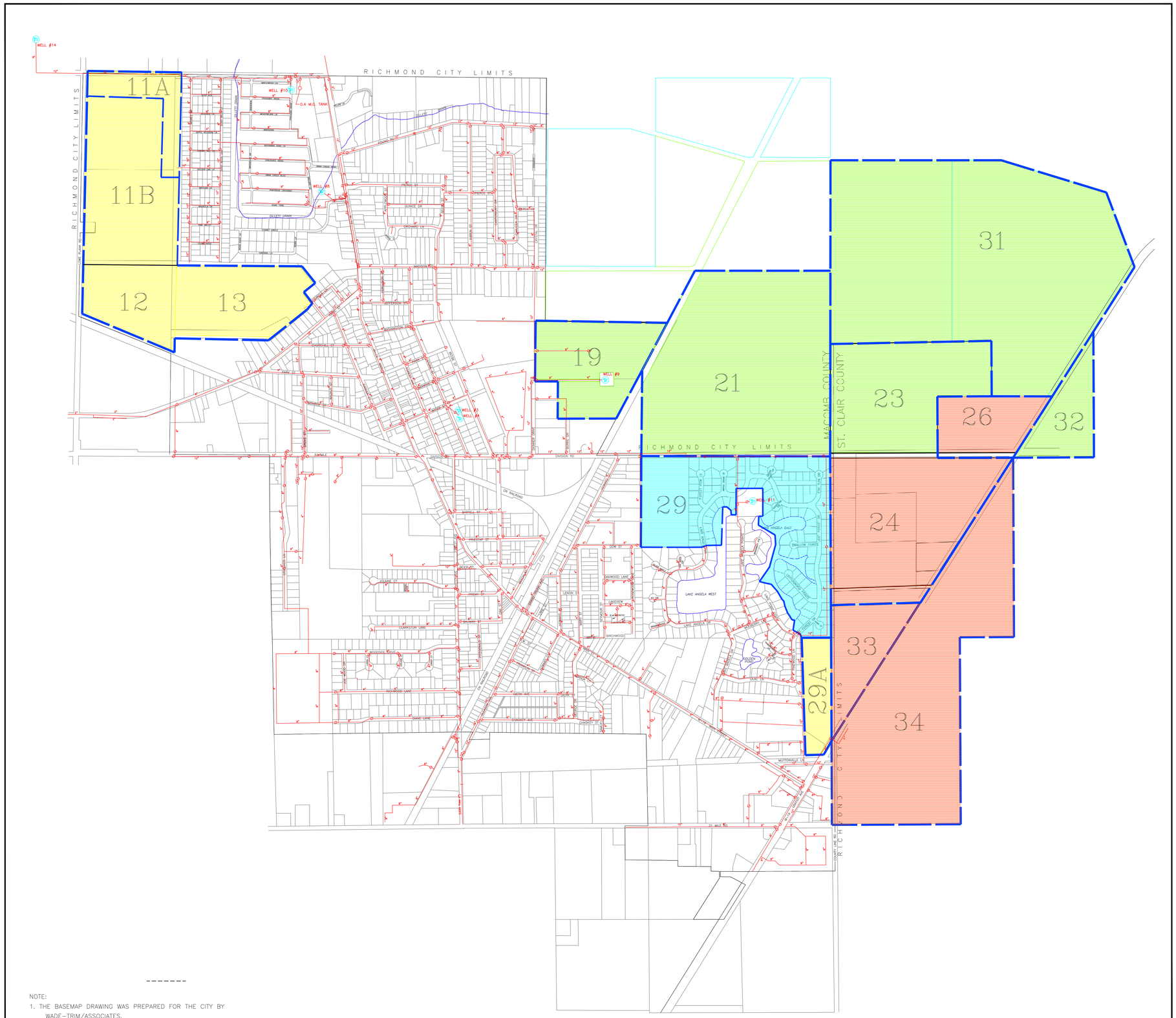
500' 250' 0 500' 1000'

SCALE: 1" = 500'

CITY OF RICHMOND, MACOMB COUNTY, MICHIGAN
WATER SYSTEM MASTER PLAN UPDATE
JUNE 2022

MAP 3
AVAILABLE FIRE FLOWS
EXISTING CONDITIONS

O:\Projects\Pt Huron\ER\12751\200-12751-20004\Docs\Reports\2022 Mstr Plan Updates\Water\Appendix\Source\MAP-3.DWG

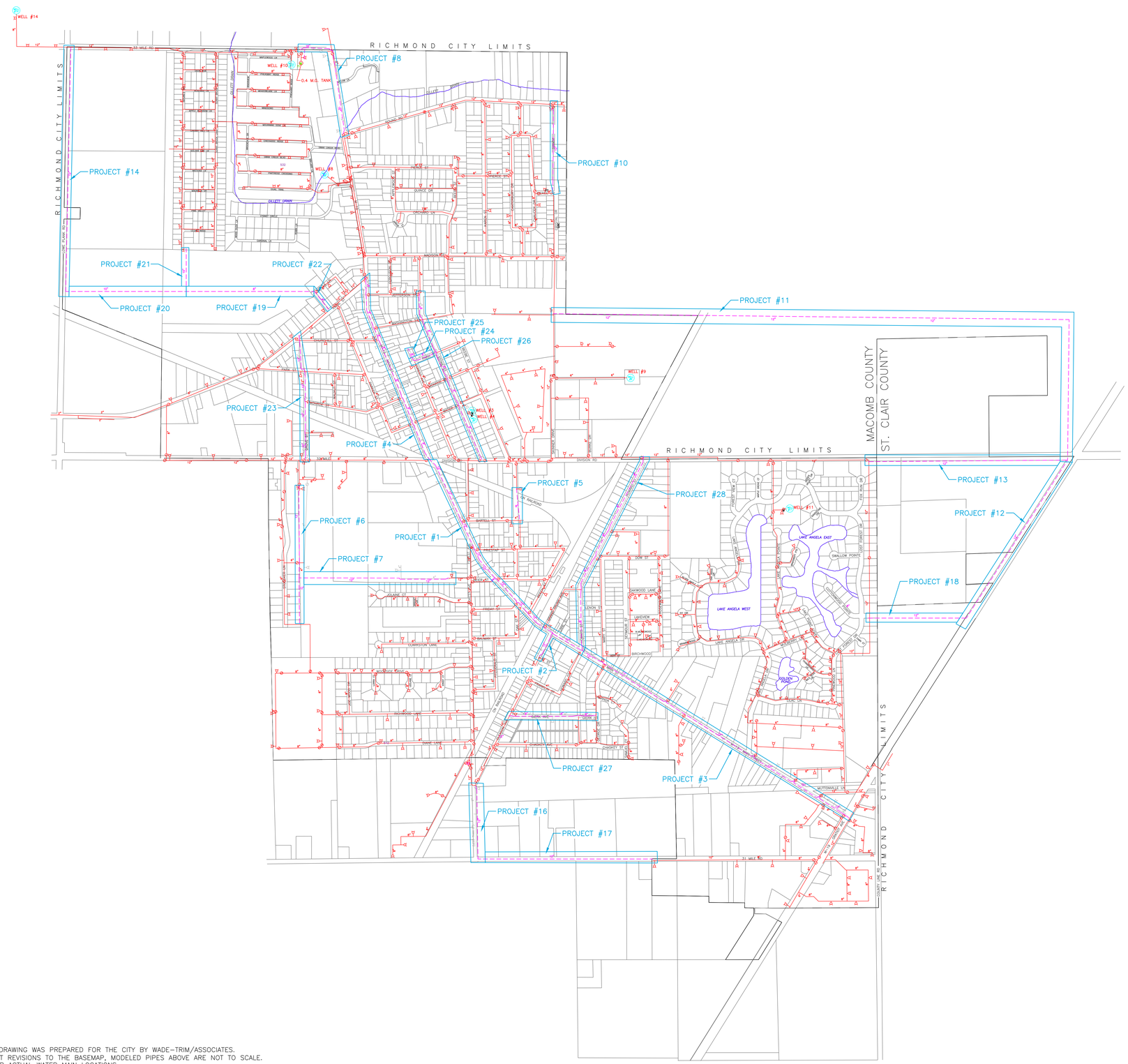


TETRA TECH

CITY OF RICHMOND, MACOMB COUNTY, MICHIGAN
WATER SYSTEM MASTER PLAN UPDATE
JUNE 2022

MAP 4
PROJECTED FUTURE EXPANSION OF SERVICE AREA

O:\Projects\Pt Huron\ER\12751\200-12751-20004\Docs\Reports\2022 Mstr Plan Updates\Water\Appendix\Source\MAP-4.DWG



NOTES:

1. THE BASEMAP DRAWING WAS PREPARED FOR THE CITY BY WADE-TRIM/ASSOCIATES.
2. DUE TO RECENT REVISIONS TO THE BASEMAP, MODELED PIPES ABOVE ARE NOT TO SCALE. SEE MAP 7 FOR ACTUAL WATER MAIN LOCATIONS.

TETRA TECH

LEGEND

- VALVE
- HYDRANT
- 8" EXISTING WATER MAIN
- STORAGE TANK
- SUPPLY WELL & PUMP
- 8" PROPOSED WATER MAIN

N

500' 250' 0 500' 1000'

SCALE: 1" = 500'

CITY OF RICHMOND, MACOMB COUNTY, MICHIGAN
WATER SYSTEM MASTER PLAN UPDATE
JUNE 2022

MAP 5
LAYOUT OF NETWORK MODEL WITH PROPOSED CAPACITY IMPROVEMENTS

\\ierannfs2\projects\IER\12751\200-12751-00000\CAD\ModelFiles\Water Main\MAP-4.DWG

NOTES:

1. THE BASEMAP DRAWING WAS PREPARED FOR THE CITY BY WADE-TRIM/ASSOCIATES.
2. DUE TO RECENT REVISIONS TO THE BASEMAP, MODELED PIPES ABOVE ARE NOT TO SCALE. SEE MAP 1 FOR ACTUAL WATER MAIN LOCATIONS.

TETRA TECH

LEGEND

- VALVE
- 8" WATER MAIN AND DIAMETER
- SUPPLY WELL & PUMP
- 8" EXISTING WATER MAIN
- PROPOSED WATER MAIN

PRESSURE (psi)

- 45
- 50
- 55
- 60
- 65

N

500' 250' 0 500' 1000'

SCALE: 1" = 500'

CITY OF RICHMOND, MACOMB COUNTY, MICHIGAN
WATER SYSTEM MASTER PLAN UPDATE
JUNE 2022

MAP 6
PROJECTED SYSTEM PRESSURES DURING PEAK HOUR DEMANDS WITH IMPROVEMENTS

O:\Projects\Pt Huron\IER\12751\200-12751-20004\Docs\Reports\2022 Mstr Plan Updates\Water\Appendix\Source\MAP-6.DWG

NOTES:
1. REFER TO APPENDIX B FOR MODEL RESULTS AT JUNCTION AND PIPE NUMBERS SHOWN ABOVE.
2. THE BASEMAP DRAWING WAS PREPARED FOR THE CITY BY WADE-TRIM/ASSOCIATES.
3. DUE TO RECENT REVISIONS TO THE BASEMAP, MODELED PIPES ABOVE ARE NOT TO SCALE. SEE MAP 1 FOR ACTUAL WATER MAIN LOCATIONS.

TETRA TECH

LEGEND

- VALVE
- 8" WATER MAIN AND DIAMETER
- SUPPLY WELL & PUMP
- 8" EXISTING WATER MAIN
- PROPOSED WATER MAIN

PROJECTED FIRE FLOW (GPM)

- 5500
- 4500
- 3500
- 2500
- 1500

N

500' 250' 0 500' 1000'

SCALE: 1" = 500'

CITY OF RICHMOND, MACOMB COUNTY, MICHIGAN
WATER SYSTEM MASTER PLAN UPDATE
JUNE 2022

MAP 7
PROJECTED FIRE FLOWS WITH IMPROVEMENTS

O:\Projects\Pt Huron\ER\12751\200-12751-20004\Docs\Reports\2022 Mstr Plan Updates\Water\Appendix\Source\MAP-7.DWG

Appendix B
Opinions of Probable Cost

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 **Telephone: (734) 665-6000** **FAX: (734) 665-2570**

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**7/11/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-10002**
		CURRENT ENR:	**13004**

ASSUMPTIONS AND COST ESCALATION TABLE

ASSUMPTIONS:

1 WATER MAIN LOCATED UNDER ROADWAY, REQUIRING COMPACTED CLASS II BACKFILL.

2 GATE VALVE LOCATED AT BRANCH CONNECTIONS AND 800' MAXIMUM SPACING.

3 HYDRANT SPACING 500' MAXIMUM.

4 SERVICE CONNECTIONS WERE COUNTED. WHERE INSUFFICIENT DETAIL WAS AVAILABLE, ASSUMED 1 CONNECTION EVERY 40 FEET. CONNECTION INCLUDES 1" TAP AT MAIN, 1" CORP. STOP, 30 LF 1" COPPER SERVICE, AND 1" CURB STOP WITH BOX.

6 CONNECTION TO EXISTING WATER MAIN ASSUMED TO BE WITH TAPPING SLEEVE AND VALVE.

7 BITUMINOUS PAVEMENT RESTORATION INCLUDES 1 LANE, 4" BITUMINOUS WITH 10" GRAVEL BASE.

8 GRAVEL ROAD REPLACEMENT INCLUDES 1 LANE, 12" THICK.

9 CURB AND GUTTER REPLACEMENT, ASSUMED 50% OF PAVEMENT RESTORATION LENGTH.

10 LANDSCAPE RESTORATION INCLUDES TREE REPLACEMENT, SEEDING, SOD AND SIDEWALK REPLACEMENT AS REQUIRED.

11 CONSTRUCTION COSTS DO NOT INCLUDE COSTS FOR EASEMENT ACQUISITION, SURVEYING, LAND ASSESSMENT, AND ENGINEERING FEES.

COST ESCALATION TABLE

CONSTRUCTION YEAR	ESCALATION FACTOR
2022	1.00
2023	1.03
2024	1.06
2025	1.09
2026	1.13
2027	1.16
2028	1.19
2029	1.23
2030	1.27
2031	1.30
2032	1.34
2033	1.38

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST
TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	RICHMOND WATER SYSTEM STUDY UPDATE	DATE:	7/11/2022
LOCATION:	RICHMOND, MICHIGAN	PROJECT NO.	200-12751-20004
BASIS FOR ESTIMATE:	[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL	ESTIMATOR:	JG
WORK:	PROJECT 1 - MAIN ST. FROM DIVISION TO CN RAILROAD	CHECKED BY:	
	12" water main construction by directional drilling - parking Lane - MDOT est. 2022 for mill/overlay. Existing is 8" CIP installed in 1916. Consider putting outside of roadway. Contact MDOT to coordinate w/ overlay.	CURRENT ENR:	13004
		PROJECT YEAR:	2025

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 30,000.00	$30,000.00
2.	Audiovisual Tape Coverage	1	LS	$ 1,300.00	$1,300.00
3.	Soil Erosion and Sediment Control Measures	1	LS	$ 1,300.00	$1,300.00
4.	Minor Traf Divices	1	LS	$ 6,000.00	$6,000.00
5.	Sign, Type B, Temp	1000	Sft	$ 5.00	$5,000.00
6.	Plastic Drum, High Intensity, Lighted, Furn	100	EA	$ 25.00	$2,500.00
7.	Plastic Drum, High Intensity, Lighted, Oper	100	EA	$ 1.00	$100.00
8.	Barricade, Type III, High Intensity, Lighted, Furn	3	EA	$ 100.00	$300.00
9.	Barricade, Type III, High Intensity, Lighted, Oper	3	EA	$ 10.00	$30.00
10.	Lighted Arrow, Type B, Furn	2	EA	$ 400.00	$800.00
11.	Lighted Arrow, Type B, Oper	2	EA	$ 70.00	$140.00
ROAD PAY ITEMS					
12.	Pavt, Rem	350	SYD	$ 20.00	$7,000.00
13.	Pavt for Butt Joint, Rem	100	SYD	$ 25.00	$2,500.00
14.	Sidewalk, Rem	1300	SFT	$ 1.50	$1,950.00
15.	Driveway, Rem	500	SFT	$ 2.00	$1,000.00
16.	Curb and Gutter, Rem	250	FT	$ 10.00	$2,500.00
17.	Conc Base Cse, Non-Reinf, 8 inch	300	SYD	$ 40.00	$12,000.00
18.	Lane Tie, Epoxy Anchored	50	EA	$ 20.00	$1,000.00
19.	Driveway, Nonreinf Conc, 6 inch	500	SFT	$ 10.00	$5,000.00
20.	Sidewalk, Conc, 4 inch	1300	SFT	$ 5.00	$6,500.00
21.	Curb and Gutter, Conc, Det F4	250	FT	$ 25.00	$6,250.00
22.	HMA, 4C, Hand Patch	65	TON	$ 140.00	$9,100.00
23.	Aggregate Base, 10 inch	350	SYD	$ 18.00	$6,300.00
24.	Slope Restoration, Modified	2000	SYD	$ 4.00	$8,000.00
WATER PAY ITEMS					
25.	Water Main, HDPE, 12 inch, Directionally Drilled	2640	FT	$ 250.00	$660,000.00
26.	Water Main, Ductile Iron, 12 inch, City Tr Det	100	FT	$ 160.00	$16,000.00
27.	Water Main, Ductile Iron, 8 inch, Directionally Drilled	210	FT	$ 200.00	$42,000.00
28.	Water Main, Ductile Iron, 8 inch, City Tr Det	70	FT	$ 125.00	$8,750.00
29.	Gate Valve and Box, 12 inch	7	Ea	$ 3,500.00	$24,500.00
30.	Gate Valve and Box, 8 inch	7	Ea	$ 2,500.00	$17,500.00
31.	Connect to Existing Water Main	10	Ea	$ 1,000.00	$10,000.00
32.	Fire Hydrant, 6 inch	7	Ea	$ 6,000.00	$42,000.00
33.	Water Service, Copper, 3/4 inch	500	Ft	$ 25.00	$12,500.00
34.	Water Service, Copper, 3/4 inch, Directionally Drilled	850	Ft	$ 50.00	$42,500.00
35.	Curb Stop and Box	42	Ea	$ 315.00	$13,230.00
36.	Reconnect Water Service	42	Ea	$ 400.00	$16,800.00
37.	Relocate Existing Water Service	5	Ea	$ 250.00	$1,250.00
38.	Hydrant, Rem	7	Ea	$ 750.00	$5,250.00
39.	Abandon Water Main	6	Block	$ 750.00	$4,500.00
	SUBTOTAL CONSTRUCTION COST				**$1,033,400.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$258,400.00**
	TOTAL PROJECT COST (CURRENT)				**$1,291,800.00**
	INFLATION	3%	Yr	3	**$119,800.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$1,412,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	RICHMOND WATER SYSTEM STUDY UPDATE	DATE:	5/20/2022
LOCATION:	RICHMOND, MICHIGAN	PROJECT NO.	200-12751-20004
BASIS FOR ESTIMATE:	[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL	ESTIMATOR:	JG
WORK:	PROJECT 2 - MAIN ST. FROM CN RAILROAD TO HOWARD	CHECKED BY:	
	Inlcudes Gleason from Main to O.W. Street. 12" water main construction by directional drilling. Existing is 8" CIP installed in 1916. Consider putting outside of roadway. Contact MDOT to coordinate w/ overlay.	CURRENT ENR:	13004
		PROJECT YEAR:	2034

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 12,000.00	$12,000.00
2.	Audiovisual Tape Coverage	1	LS	$ 1,300.00	$1,300.00
3.	Soil Erosion and Sediment Control Measures	1	LS	$ 1,300.00	$1,300.00
4.	Minor Traf Divices	1	LS	$ 6,000.00	$6,000.00
5.	Sign, Type B, Temp	1000	Sft	$ 5.00	$5,000.00
6.	Plastic Drum, High Intensity, Lighted, Furn	100	EA	$ 25.00	$2,500.00
7.	Plastic Drum, High Intensity, Lighted, Oper	100	EA	$ 1.00	$100.00
8.	Barricade, Type III, High Intensity, Lighted, Furn	3	EA	$ 100.00	$300.00
9.	Barricade, Type III, High Intensity, Lighted, Oper	3	EA	$ 10.00	$30.00
10.	Lighted Arrow, Type B, Furn	2	EA	$ 400.00	$800.00
11.	Lighted Arrow, Type B, Oper	2	EA	$ 70.00	$140.00
ROAD PAY ITEMS					
12.	Pavt, Rem	525	SYD	$ 20.00	$10,500.00
13.	Pavt for Butt Joint, Rem	67	SYD	$ 25.00	$1,675.00
14.	Sidewalk, Rem	1000	SFT	$ 1.50	$1,500.00
15.	Driveway, Rem	500	SFT	$ 2.00	$1,000.00
16.	Curb and Gutter, Rem	160	FT	$ 10.00	$1,600.00
17.	Conc Base Cse, Non-Reinf, 8 inch	167	SYD	$ 40.00	$6,680.00
18.	Lane Tie, Epoxy Anchored	50	EA	$ 20.00	$1,000.00
19.	Driveway, Nonreinf Conc, 6 inch	500	SFT	$ 10.00	$5,000.00
20.	Sidewalk, Conc, 4 inch	1000	SFT	$ 5.00	$5,000.00
21.	Curb and Gutter, Conc, Det F4	160	FT	$ 25.00	$4,000.00
22.	HMA, 4C, Hand Patch	140	TON	$ 140.00	$19,600.00
23.	Aggregate Base, 10 inch	167	SYD	$ 18.00	$3,006.00
24.	Slope Restoration, Modified	500	SYD	$ 4.00	$2,000.00
WATER PAY ITEMS					
25.	Water Main, HDPE, 12 inch, Directionally Drilled	670	FT	$ 250.00	$167,500.00
26.	Water Main, Ductile Iron, 12 inch, City Tr Det	400	FT	$ 160.00	$64,000.00
27.	Water Main, Ductile Iron, 8 inch, Directionally Drilled	50	FT	$ 200.00	$10,000.00
28.	Water Main, Ductile Iron, 8 inch, City Tr Det	30	FT	$ 125.00	$3,750.00
29.	Gate Valve and Box, 12 inch	4	Ea	$ 3,500.00	$14,000.00
30.	Gate Valve and Box, 8 inch	4	Ea	$ 2,500.00	$10,000.00
31.	Connect to Existing Water Main	8	Ea	$ 1,000.00	$8,000.00
32.	Fire Hydrant, 6 inch	4	Ea	$ 6,000.00	$24,000.00
33.	Water Service, Copper, 3/4 inch	250	Ft	$ 25.00	$6,250.00
34.	Water Service, Copper, 3/4 inch, Directionally Drilled	480	Ft	$ 50.00	$24,000.00
35.	Curb Stop and Box	20	Ea	$ 315.00	$6,300.00
36.	Reconnect Water Service	20	Ea	$ 400.00	$8,000.00
37.	Relocate Existing Water Service	2	Ea	$ 250.00	$500.00
38.	Hydrant, Rem	4	Ea	$ 750.00	$3,000.00
39.	Abandon Water Main	4	Block	$ 750.00	$3,000.00
	SUBTOTAL CONSTRUCTION COST				**$444,300.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$111,100.00**
	TOTAL PROJECT COST (CURRENT)				**$555,400.00**
	INFLATION	3%	Yr	12	**$236,500.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$792,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	RICHMOND WATER SYSTEM STUDY UPDATE	DATE:	5/20/2022
LOCATION:	RICHMOND, MICHIGAN	PROJECT NO.	200-12751-20004
BASIS FOR ESTIMATE:	[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL	ESTIMATOR:	JG
WORK:	PROJECT 4 - MAIN ST. FROM DIVISION TO RIDGE	CHECKED BY:	
	12" HDPE water main construction. Existing is 8" CIP installed in 1916. Consider putting outside of roadway. Contact MDOT to coordinate w/ overlay.	CURRENT ENR:	13004
		PROJECT YEAR:	2033

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 30,000.00	$30,000.00
2.	Audiovisual Tape Coverage	1	LS	$ 2,500.00	$2,500.00
3.	Soil Erosion and Sediment Control Measures	1	LS	$ 1,300.00	$1,300.00
4.	Minor Traf Divices	1	LS	$ 6,000.00	$6,000.00
5.	Sign, Type B, Temp	1000	Sft	$ 5.00	$5,000.00
6.	Plastic Drum, High Intensity, Lighted, Furn	100	EA	$ 25.00	$2,500.00
7.	Plastic Drum, High Intensity, Lighted, Oper	100	EA	$ 1.00	$100.00
8.	Barricade, Type III, High Intensity, Lighted, Furn	3	EA	$ 100.00	$300.00
9.	Barricade, Type III, High Intensity, Lighted, Oper	3	EA	$ 10.00	$30.00
10.	Lighted Arrow, Type B, Furn	2	EA	$ 400.00	$800.00
11.	Lighted Arrow, Type B, Oper	2	EA	$ 70.00	$140.00
ROAD PAY ITEMS					
12.	Pavt, Rem	400	SYD	$ 20.00	$8,000.00
13.	Pavt for Butt Joint, Rem	160	SYD	$ 25.00	$4,000.00
14.	Sidewalk, Rem	4000	SFT	$ 1.50	$6,000.00
15.	Driveway, Rem	1000	SFT	$ 2.00	$2,000.00
16.	Curb and Gutter, Rem	500	FT	$ 10.00	$5,000.00
17.	Conc Base Cse, Non-Reinf, 8 inch	400	SYD	$ 40.00	$16,000.00
18.	Lane Tie, Epoxy Anchored	240	EA	$ 20.00	$4,800.00
19.	Driveway, Nonreinf Conc, 6 inch	1000	SFT	$ 10.00	$10,000.00
20.	Sidewalk, Conc, 4 inch	4000	SFT	$ 5.00	$20,000.00
21.	Curb and Gutter, Conc, Det F4	500	FT	$ 25.00	$12,500.00
22.	HMA, 4C, Hand Patch	100	TON	$ 140.00	$14,000.00
23.	Aggregate Base, 10 inch	400	SYD	$ 18.00	$7,200.00
24.	Slope Restoration, Modified	500	SYD	$ 4.00	$2,000.00
WATER PAY ITEMS					
25.	Water Main, Ductile Iron, 12 inch, City Tr Det	380	FT	$ 160.00	$60,800.00
26.	Water Main, Ductile Iron, 12 inch, Directionally Drilled	2600	FT	$ 250.00	$650,000.00
27.	Gate Valve and Box, 8 inch	19	Ea	$ 2,500.00	$47,500.00
28.	Connect to Existing Water Main	14	Ea	$ 1,000.00	$14,000.00
29.	Fire Hydrant, 6 inch	7	Ea	$ 6,000.00	$42,000.00
30.	Water Service, Copper, 3/4 inch	600	Ft	$ 25.00	$15,000.00
31.	Water Service, Copper, 3/4 inch, Directionally Drilled	1500	Ft	$ 50.00	$75,000.00
32.	Curb Stop and Box	70	Ea	$ 315.00	$22,050.00
33.	Reconnect Water Service	70	Ea	$ 400.00	$28,000.00
34.	Relocate Existing Water Service	5	Ea	$ 250.00	$1,250.00
35.	Hydrant, Rem	7	Ea	$ 750.00	$5,250.00
36.	Abandon Water Main	7	Block	$ 750.00	$5,250.00
	SUBTOTAL CONSTRUCTION COST				**$1,126,300.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$281,600.00**
	TOTAL PROJECT COST (CURRENT)				**$1,407,900.00**
	INFLATION	3%	Yr	11	**$541,000.00**
	TOTAL PROJECT COST (IN PROJECT YEAR)				**$1,949,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 5 - OAK ST. FROM BARTELL ST. TO CN RAILROAD**	**CHECKED BY:**	
		CURRENT ENR:	**13004**
		PROJECT YEAR:	**2028**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1.	Mobilization (5% Max)	1	LS	$ 7,000.00	$7,000.00
2.	Audiovisual Tape Coverage	1	LS	$ 400.00	$400.00
3.	Traffic Control	1	LS	$ 1,000.00	$1,000.00
4.	8" DIP CL 52 Water Main (Under Pavement, 5' cover)	200	LF	$ 125.00	$25,000.00
5.	Granular Backfill, CL II	200	LF	$ 5.00	$1,000.00
6.	8" Gate Valve with Box	1	EA	$ 2,500.00	$2,500.00
7.	Fire Hydrant Assembly	1	EA	$ 6,000.00	$6,000.00
8.	Water Service Connection	2	EA	$ 900.00	$1,800.00
9.	Connection to Existing Water Main	2	EA	$ 3,000.00	$6,000.00
10.	Bituminous Pavement Replacement (4" bit, 10" gravel)	200	LF	$ 50.00	$10,000.00
11.	Concrete Curb & Gutter Replacement	200	LF	$ 25.00	$5,000.00
12.	Landscaping Restoration	200	LF	$ 7.00	$1,400.00
	SUBTOTAL CONSTRUCTION COST				**$67,100.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$16,800.00**
	TOTAL PROJECT COST (CURRENT)				**$83,900.00**
	INFLATION	3%	Yr	6	**$16,300.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$101,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	RICHMOND WATER SYSTEM STUDY UPDATE	**DATE:**	7/11/2022
LOCATION:	RICHMOND, MICHIGAN	**PROJECT NO.**	200-12751-20004
BASIS FOR ESTIMATE:	[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL	**ESTIMATOR:**	JLD
WORK:	PROJECT 6 - GROVE ST. FROM 32 MILE RD TO BEIER ST	**CHECKED BY:**	
		CURRENT ENR:	10337
		PROJECT YEAR:	TBD

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1.	Mobilization (5% Max)	1	LS	$ 8,000.00	$8,000.00
2.	Audiovisual Tape Coverage	1	LS	$ 1,000.00	$1,000.00
3.	Traffic Control	1	LS	$ 1,500.00	$1,500.00
4.	12" DIP CL 52 Water Main (Under Pavement, 5' cover)	1250	LF	$ 160.00	$200,000.00
5.	Granular Backfill, CL II	250	LF	$ 5.00	$1,250.00
6.	12" Gate Valve with Box	2	EA	$ 3,500.00	$7,000.00
7.	Fire Hydrant Assembly	2	EA	$ 6,000.00	$12,000.00
8.	Water Service Connection	2	EA	$ 900.00	$1,800.00
9.	Connection to Existing Water Main	1	EA	$ 3,000.00	$3,000.00
	SUBTOTAL CONSTRUCTION COST				**$235,600.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$58,900.00**
	TOTAL PROJECT COST (CURRENT)				**$294,500.00**
	INFLATION	3%	Yr	TBD	**TBD**
TOTAL PROJECT COST (IN PROJECT YEAR)					**TBD**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 7 - BEIER ST. FROM GROVE ST TO FOREST AVE**	**CHECKED BY:**	
		CURRENT ENR:	**13004**
		PROJECT YEAR:	**TBD**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1.	Mobilization (5% Max)	1	LS	$ 19,000.00	$19,000.00
2.	Audiovisual Tape Coverage	1	LS	$ 1,000.00	$1,000.00
3.	Traffic Control	1	LS	$ 3,000.00	$3,000.00
4.	12" DIP CL 52 Water Main (Under Pavement, 5' cover)	2300	LF	$ 160.00	$368,000.00
5.	Granular Backfill, CL II	250	LF	$ 10.00	$2,500.00
6.	12" Gate Valve with Box	4	EA	$ 3,500.00	$14,000.00
7.	Fire Hydrant Assembly	4	EA	$ 6,000.00	$24,000.00
8.	Water Service Connection	2	EA	$ 900.00	$1,800.00
9.	Connection to Existing Water Main	1	EA	$ 3,000.00	$3,000.00
10.	Bituminous Pavement Replacement (4" bit, 10" gravel)	50	LF	$ 50.00	$2,500.00
11.	Concrete Curb & Gutter Replacement	50	LF	$ 25.00	$1,250.00
12.	Landscaping Restoration	1000	LF	$ 7.00	$7,000.00
	SUBTOTAL CONSTRUCTION COST				**$447,100.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$111,800.00**
	TOTAL PROJECT COST (CURRENT)				**$558,900.00**
	INFLATION	3%	Yr	TBD	**TBD**
TOTAL PROJECT COST (IN PROJECT YEAR)					**TBD**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 8 - MAIN ST. FROM POUND RD TO STORAGE TANK**	**CHECKED BY:**	
		CURRENT ENR:	**13004**
		PROJECT YEAR:	**TBD**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1.	Mobilization (5% Max)	1	LS	$ 26,600.00	$26,600.00
2.	Audiovisual Tape Coverage	1	LS	$ 1,400.00	$1,400.00
3.	Traffic Control	1	LS	$ 4,000.00	$4,000.00
4.	12" DIP CL 52 Water Main (Under Pavement, 5' cover)	1650	LF	$ 160.00	$264,000.00
5.	Granular Backfill, CL II	1650	LF	$ 10.00	$16,500.00
6.	12" Gate Valve with Box	5	EA	$ 3,500.00	$17,500.00
7.	Fire Hydrant Assembly	3	EA	$ 6,000.00	$18,000.00
8.	Water Service Connection	5	EA	$ 900.00	$4,500.00
9.	Connection to Existing Water Main	2	EA	$ 3,000.00	$6,000.00
10.	Bituminous Pavement Replacement (4" bit, 10" gravel)	1650	LF	$ 50.00	$82,500.00
11.	Concrete Curb & Gutter Replacement	825	LF	$ 25.00	$20,625.00
12.	Landscaping Restoration	1650	LF	$ 7.00	$11,550.00
	SUBTOTAL CONSTRUCTION COST				**$473,200.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$118,300.00**
	TOTAL PROJECT COST (CURRENT)				**$591,500.00**
	INFLATION	3%	Yr	TBD	**TBD**
TOTAL PROJECT COST (IN PROJECT YEAR)					**TBD**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 10 - CRYSTAL DR FROM POUND RD TO PIERCE DR**	**CHECKED BY:**	
		CURRENT ENR:	**13004**
		PROJECT YEAR:	**TBD**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1.	Mobilization (5% Max)	1	LS	$ 23,000.00	$23,000.00
2.	Audiovisual Tape Coverage	1	LS	$ 1,200.00	$1,200.00
3.	Traffic Control	1	LS	$ 4,000.00	$4,000.00
4.	12" DIP CL 52 Water Main (Under Pavement, 5' cover)	1200	LF	$ 160.00	$192,000.00
5.	Granular Backfill, CL II	1200	LF	$ 10.00	$12,000.00
6.	12" Gate Valve with Box	5	EA	$ 3,500.00	$17,500.00
7.	Fire Hydrant Assembly	6	EA	$ 6,000.00	$36,000.00
8.	Water Service Connection	22	EA	$ 900.00	$19,800.00
9.	Connection to Existing Water Main	1	EA	$ 3,000.00	$3,000.00
10.	Bituminous Pavement Replacement (4" bit, 10" gravel)	1200	LF	$ 50.00	$60,000.00
11.	Concrete Curb & Gutter Replacement	600	LF	$ 25.00	$15,000.00
12.	Landscaping Restoration	1200	LF	$ 7.00	$8,400.00
	SUBTOTAL CONSTRUCTION COST				**$391,900.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$98,000.00**
	TOTAL PROJECT COST (CURRENT)				**$489,900.00**
	INFLATION	3%	Yr	TBD	**TBD**
TOTAL PROJECT COST (IN PROJECT YEAR)					**TBD**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 23 - GROVE ST FROM DIVISION RD TO CHURHILL ST**	**CHECKED BY:**	
	12" ductile iron water main. Remember to reconnect A.B.C. 10" watermain, not shown on master plan. Existing is 4" CIP installed in 1916, 12" AC 1969. All restoration is included in road reonstruction estimate.	**CURRENT ENR:**	**13004**
		PROJECT YEAR:	**2028**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 15,000.00	$15,000.00
ROAD PAY ITEMS					
2.	All restoration to be included in STREET estimate				
WATER PAY ITEMS					
3.	Water Main, Ductile Iron, 12 inch, City Tr Det	1600	FT	$ 160.00	$256,000.00
4.	Connect to Existing Water Main	6	Ea	$ 4,000.00	$24,000.00
5.	Gate Valve and Box, 12 inch	6	Ea	$ 3,500.00	$21,000.00
6.	Gate Valve and Box, 8 inch	3	Ea	$ 2,500.00	$7,500.00
7.	Fire Hydrant, 6 inch	4	Ea	$ 6,000.00	$24,000.00
8.	Water Service, Copper, 3/4 inch	450	Ft	$ 25.00	$11,250.00
9.	Curb Stop and Box	13	Ea	$ 300.00	$3,900.00
10.	Reconnect Water Service	13	Ea	$ 400.00	$5,200.00
11.	Relocate Existing Water Service	2	Ea	$ 250.00	$500.00
12.	Hydrant, Rem	4	Ea	$ 750.00	$3,000.00
13.	Abandon Water Main	2	Block	$ 750.00	$1,500.00
	SUBTOTAL CONSTRUCTION COST				**$372,900.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$93,200.00**
	TOTAL PROJECT COST (CURRENT)				**$466,100.00**
	INFLATION	3%	Yr	6	**$90,400.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$557,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 24 - PARK ST FROM FOREST AVE TO STONE ST**	**CHECKED BY:**	
	8" ductile iron water main. Existing is 6" CIP installed in 1939. All restoration is included in the road reconstruction estimate.	**CURRENT ENR:**	**13004**
		PROJECT YEAR:	**2024**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 2,500.00	$2,500.00
ROAD PAY ITEMS					
2.	All restoration to be included in STREET estimate				
WATER PAY ITEMS					
3.	Water Main, Ductile Iron, 8 inch, City Tr Det	350	FT	$ 125.00	$43,750.00
4.	Connect to Existing Water Main	3	Ea	$ 4,000.00	$12,000.00
5.	Gate Valve and Box, 8 inch	2	Ea	$ 2,500.00	$5,000.00
6.	Fire Hydrant, 6 inch	1	Ea	$ 6,000.00	$6,000.00
7.	Water Service, Copper, 3/4 inch	120	Ft	$ 25.00	$3,000.00
8.	Curb Stop and Box	3	Ea	$ 300.00	$900.00
9.	Reconnect Water Service	3	Ea	$ 400.00	$1,200.00
10.	Relocate Existing Water Service	0	Ea	$ 250.00	
11.	Hydrant, Rem	1	Ea	$ 750.00	$750.00
12.	Abandon Water Main	1	Block	$ 750.00	$750.00
	SUBTOTAL CONSTRUCTION COST				**$75,900.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$19,000.00**
	TOTAL PROJECT COST (CURRENT)				**$94,900.00**
	INFLATION	3%	Yr	2	**$5,800.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$101,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 25 - FOREST AVE FROM PARK ST TO NORTH END**	**CHECKED BY:**	
	8" ductile iron water main. Existing is 4" CIP installed in 1960. All restoration is included in the road reconstruction estimate.	**CURRENT ENR:**	**13004**
		PROJECT YEAR:	**2024**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 2,500.00	$2,500.00
ROAD PAY ITEMS					
2.	All restoration to be included in STREET estimate				
WATER PAY ITEMS					
3.	Water Main, Ductile Iron, 8 inch, City Tr Det	175	FT	$ 125.00	$21,875.00
4.	Connect to Existing Water Main	1	Ea	$ 4,000.00	$4,000.00
5.	Gate Valve and Box, 8 inch	0	Ea	$ 2,500.00	
6.	Fire Hydrant, 6 inch	1	Ea	$ 6,000.00	$6,000.00
7.	Water Service, Copper, 3/4 inch	280	Ft	$ 25.00	$7,000.00
8.	Curb Stop and Box	7	Ea	$ 300.00	$2,100.00
9.	Reconnect Water Service	7	Ea	$ 400.00	$2,800.00
10.	Relocate Existing Water Service	1	Ea	$ 250.00	$250.00
11.	Hydrant, Rem	1	Ea	$ 750.00	$750.00
12.	Abandon Water Main	1	Block	$ 750.00	$750.00
	SUBTOTAL CONSTRUCTION COST				**$48,000.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$12,000.00**
	TOTAL PROJECT COST (CURRENT)				**$60,000.00**
	INFLATION	3%	Yr	2	**3700**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$64,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 26 - STONE ST FROM DIVISION RD TO JEFFERSON ST**	**CHECKED BY:**	
	8" ductile iron water main. Existing is 4" CIP installed in 1937. All restoration is included in the road reconstruction estimate.	**CURRENT ENR:**	**13004**
		PROJECT YEAR:	**2023**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 20,000.00	$20,000.00
ROAD PAY ITEMS					
2.	All restoration to be included in STREET estimate				
WATER PAY ITEMS					
3.	Water Main, Ductile Iron, 8 inch, City Tr Det	2400	FT	$ 125.00	$300,000.00
4.	Connect to Existing Water Main	10	Ea	$ 4,000.00	$40,000.00
5.	Gate Valve and Box, 8 inch	13	Ea	$ 2,500.00	$32,500.00
6.	Fire Hydrant, 6 inch	6	Ea	$ 6,000.00	$36,000.00
7.	Water Service, Copper, 3/4 inch	1110	Ft	$ 25.00	$27,750.00
8.	Curb Stop and Box	37	Ea	$ 300.00	$11,100.00
9.	Reconnect Water Service	37	Ea	$ 400.00	$14,800.00
10.	Relocate Existing Water Service	2	Ea	$ 250.00	$500.00
11.	Hydrant, Rem	6	Ea	$ 750.00	$4,500.00
12.	Abandon Water Main	5	Block	$ 750.00	$3,750.00
	SUBTOTAL CONSTRUCTION COST				**$490,900.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$122,700.00**
	TOTAL PROJECT COST (CURRENT)				**$613,600.00**
	INFLATION	3%	Yr	1	**$18,400.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$632,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 27 - GIERK ST FROM GLEASON ST TO GEORGE DR**	**CHECKED BY:**	
	8" ductile iron water main. Existing is 4" CIP installed in 1963, 6" CIP in 1967. All restoration is included in the road reconstruction estimate.	**CURRENT ENR:**	**13004**
		PROJECT YEAR:	**2026**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 10,000.00	$10,000.00
ROAD PAY ITEMS					
2.	All restoration to be included in STREET estimate				
WATER PAY ITEMS					
3.	Water Main, Ductile Iron, 8 inch, City Tr Det	1190	FT	$ 125.00	$148,750.00
4.	Connect to Existing Water Main	3	Ea	$ 4,000.00	$12,000.00
5.	Gate Valve and Box, 8 inch	3	Ea	$ 2,500.00	$7,500.00
6.	Fire Hydrant, 6 inch	3	Ea	$ 6,000.00	$18,000.00
7.	Water Service, Copper, 3/4 inch	700	Ft	$ 25.00	$17,500.00
8.	Curb Stop and Box	20	Ea	$ 300.00	$6,000.00
9.	Reconnect Water Service	20	Ea	$ 400.00	$8,000.00
10.	Relocate Existing Water Service	2	Ea	$ 250.00	$500.00
11.	Hydrant, Rem	6	Ea	$ 750.00	$4,500.00
12.	Abandon Water Main	5	Block	$ 750.00	$3,750.00
	SUBTOTAL CONSTRUCTION COST				**$236,500.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$59,100.00**
	TOTAL PROJECT COST (CURRENT)				**$295,600.00**
	INFLATION	3%	Yr	4	**$37,100.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$333,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

OPINION OF PROBABLE CONSTRUCTION COST

TETRA TECH

710 Avis Drive Ann Arbor, Michigan 48108 Telephone: (734) 665-6000 FAX: (734) 665-2570

PROJECT:	**RICHMOND WATER SYSTEM STUDY UPDATE**	**DATE:**	**5/20/2022**
LOCATION:	**RICHMOND, MICHIGAN**	**PROJECT NO.**	**200-12751-20004**
BASIS FOR ESTIMATE:	**[X] CONCEPTUAL [ ] PRELIMINARY [ ] FINAL**	**ESTIMATOR:**	**JG**
WORK:	**PROJECT 28 - HOWARD ST FROM MAIN ST TO DIVISION RD**	**CHECKED BY:**	
	8" ductile iron water main. Existing is 4" CIP installed in 1916. All restoration is included in the road reconstruction estimate.	**CURRENT ENR:**	**13004**
		PROJECT YEAR:	**2030**

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT
GENERAL PAY ITEMS					
1.	Mobilization (5% Max)	1	LS	$ 25,000.00	$25,000.00
ROAD PAY ITEMS					
2.	All restoration to be included in STREET estimate				
WATER PAY ITEMS					
3.	Water Main, Ductile Iron, 8 inch, City Tr Det	2783	FT	$ 125.00	$347,875.00
4.	Connect to Existing Water Main	6	Ea	$ 4,000.00	$24,000.00
5.	Gate Valve and Box, 8 inch	7	Ea	$ 2,500.00	$17,500.00
6.	Fire Hydrant, 6 inch	7	Ea	$ 6,000.00	$42,000.00
7.	Water Service, Copper, 3/4 inch	2025	Ft	$ 25.00	$50,625.00
8.	Curb Stop and Box	61	Ea	$ 300.00	$18,300.00
9.	Reconnect Water Service	61	Ea	$ 400.00	$24,400.00
10.	Relocate Existing Water Service	10	Ea	$ 250.00	$2,500.00
11.	Hydrant, Rem	7	Ea	$ 750.00	$5,250.00
12.	Abandon Water Main	4	Block	$ 750.00	$3,000.00
	SUBTOTAL CONSTRUCTION COST				**$560,500.00**
	ENGINEERING, LEGAL AND CONTINGENCY (25%)				**$140,100.00**
	TOTAL PROJECT COST (CURRENT)				**$700,600.00**
	INFLATION	3%	Yr	8	**$186,900.00**
TOTAL PROJECT COST (IN PROJECT YEAR)					**$888,000.00**

NOTE: COST ESCALATION FACTORS ARE BASED ON A 3.0 PERCENT PER YEAR INCREASE IN THE ENR INDEX

Appendix C
Asset Condition

CITY OF RICHMOND
WATER FUND
SYSTEM FIXED ASSETS

Current FY: **FY 2021 / 2022**

1ST FY IN SERVICE (i.e. FY1975/1976 written 1976)	DEP. TERM (YRS)	LAST FY OF DEP.	ITEM	TYPE	DESCRIPTION	ORIGINAL COST	YEARLY DEPRECIATION	FY 2021 /2022 DEPRECIATION	PIPE LENGTH (FEET)	PIPE SIZE (INCHES)	PIPE MATERIAL	DEP. (i.e. FY1995/1996 written 1996)	REPLACEMENT COST	CONDITION ASSESSMENT	PROBABILITY OF FAILURE	CONSEQUENCE OF FAILURE	CRITICALITY FACTOR
2004	50	FY 2053/2054	Arsenic removal plant for Well #10 - all associated costs	Building	Arsenic Removal Plant	$380,079.87	$7,601.60	$7,602.00				2054	$ 400,000	1	1	1	1
2004	50	FY 2053/2054	Arsenic removal plant for Wells #3 & #4 - all associated costs	Building	Arsenic Removal Plant	$350,512.69	$7,010.25	$7,010.00				2054	$ 400,000	1	1	1	1
1961	50	FY 2010/2011	Water Tower	Building	construction	$70,965.87	$1,419.32					2011	$ 1,000,000	1	1	5	5
2005	50	FY 2054/2055	Well # 14 & pump assembly -- contributed by Layne-Northern (C)	Building	drill/install well	$150,288.00	$3,005.76	$3,006.00				2055					0
2003	10	FY 2012/2013	Well #14 access drive	Building	driveway	$19,327.77	$1,932.78					2013					0
2021	10	FY 2030/2031	Well #14 Fence	Building	construction	$19,782.82	$1,978.28	$1,978.00				2031					0
1992	50	FY 2041/2042	Well #14 fencing & site work & engineering	Building	construction	$4,330.73	$86.61	$87.00				2042					0
2005	50	FY 2054/2055	Well #14 pump assembly -- City expense portion	Building	pump, pitless adapter	$23,957.00	$479.14	$479.00				2055					0
1986	50	FY 2035/2036	Well #9 Access Road - paved	Building	construction	$12,000.00	$240.00	$240.00				2036					0
1986	50	FY 2035/2036	Well House #10	Building	construction	$30,766.03	$615.32	$615.00				2036	$ 100,000	1	2	3	6
1992	50	FY 2041/2042	Well house #11, fence, site work & utility conduits	Building	construction	$194,778.56	$3,895.57	$3,896.00				2042	$ 100,000	1	2	4	8
2003	50	FY 2052/2053	Well house #14	Building		$283,314.60	$5,666.29	$5,666.00				2053	$ 100,000	1	2	3	6
1982	50	FY 2031/2032	Well House #3A	Building	construction	$44,120.00	$882.40	$882.00				2032	$ 100,000	2	2	2	4
1986	50	FY 2035/2036	Well House #4A	Building	construction	$11,837.00	$236.74	$237.00				2036	$ 100,000	2	2	2	4
1948	50	FY 1997/1998	Well House #8	Building	construction	$2,182.32	$43.65					1998	$ 100,000	3	3	2	6
1956	50	FY 2005/2006	Well House #9	Building	construction	$4,322.95	$86.46					2006	$ 100,000	2	2	3	6
2003	1	FY 2003/2004	2003 HP6122 Deskjet Printer	Equipment	printer	$179.00	$179.00					2004					0
1993	7	FY 1999/2000	Auto Transfer Switch	Equipment	Controls at DPW	$1,838.00	$262.57					2000					0
1989	5	FY 1993/1994	back up power supply for telemetry & controls	Equipment	battery back up	$1,198.00	$239.60					1994					0
1986	5	FY 1990/1991	building addition -- #8 well	Equipment	chlorine room	$2,632.50	$526.50					1991					0
1986	5	FY 1990/1991	building addition -- #9 well	Equipment	chlorine room	$2,632.50	$526.50					1991					0
2008	5	FY 2012/2013	City Hall server (40%)	Equipment	City Hall Server	$2,382.00	$476.40					2013					0
1999	1	FY 1999/2000	CPI Mod. TR-20 remote with desk mic S/N: 03168400	Equipment	radio at City Hall	$475.00	$475.00					2000					0
1999	1	FY 1999/2000	CPI Mod. TR-20 remote with desk mic S/N: 03168600	Equipment	radio at DPW	$475.00	$475.00					2000					0
1999	1	FY 1999/2000	Homelite Hydrant Pump Mod. AP-125 S/N: HS27418833	Equipment		$235.00	$235.00					2000					0
1995	5	FY 1999/2000	Metroteck Pipe & Cable Locator Mod. 480 S/N: 035415	Equipment	pipe locator	$540.00	$108.00					2000					0
2012	5	FY 2016/2017	Neptune meter reading instrument	Equipment	reading key pad	$5,107.00	$1,021.40					2017					0
1986	5	FY 1990/1991	portable generator for well	Equipment	Cummins	$16,614.00	$3,322.80					1991					0
1999	5	FY 2003/2004	Rammer Model S25 hydraulic breaker S/N: 25AAA0539	Equipment	hyd.breaker	$14,220.00	$2,844.00					2004					0
1999	1	FY 1999/2000	Schonstedt Magnetic Locator Mod. GA-52CX S/N: 155137	Equipment		$695.00	$695.00					2000					0
2009	5	FY 2013/2014	Sensus model SS4001meter reading instrument	Equipment	reading key pad	$5,200.00	$1,040.00					2014					0
1986	50	FY 2035/2036	Telemetry & Control Instrumentation - wells 3A, 4A, 8, 9 & 10	Equipment	equipment purchase	$48,691.75	$973.84	$974.00				2036					0
1986	50	FY 2035/2036	Well #10	Equipment	installation	$32,251.37	$645.03	$645.00				2036					0
1992	50	FY 2041/2042	Well #11	Equipment	installation	$50,485.67	$1,009.71	$1,010.00				2042					0
2003	10	FY 2012/2013	Well #11 generator	Equipment	backup power	$50,860.34	$5,086.03					2013					0
2003	10	FY 2012/2013	Well #14 generator	Equipment	backup power	$31,450.00	$3,145.00					2013					0
2003	10	FY 2012/2013	Well #14 telemetry	Equipment	operating control	$2,500.00	$250.00					2013					0
1982	50	FY 2031/2032	Well #3A	Equipment	installation	$28,634.38	$572.69	$573.00				2032					0
1986	50	FY 2035/2036	Well #4A	Equipment	installation	$37,897.00	$757.94	$758.00				2036					0
1948	50	FY 1997/1998	Well #8	Equipment	installation	$7,796.00	$155.92					1998					0
1956	50	FY 2005/2006	Well #9	Equipment	installation	$9,400.00	$188.00					2006					0
2003	10	FY 2012/2013	Well telemetry system (77.8%)	Equipment	operating system	$48,700.14	$4,870.01					2013					0
2018	10	FY 2027/2028	Well telemetry system (SCADA) software upgrades (50%)	Equipment	operating system	$10,634.24	$1,063.42	$1,063.00				2028					0
2020	50	FY 2069/2070	31 Mile Rd - Across Gratiot Avenue	Infrastructure	214' of 8" HDPE	$25,680.00	$513.60	$514.00	214	8	HDPE	2070	$ 32,100	1	2	2	4
1995	50	FY 2044/2045	31 Mile Rd -- from a point 1,060' west of Gratiot, west, to the City Limits ($35,000 HUD)	Infrastructure	1,069' of 10" DIP	$55,123.26	$1,102.47	$1,102.00	1069	10	Ductile Iron	2045	$ 179,592	1	2	3	6
2020	50	FY 2069/2070	31 Mile Rd - From Gratiot to 1087' West of Gratiot (Huvaere's Driveway)	Infrastructure	1087' of 8" DIP	$114,756.00	$2,295.12	$2,295.00	1087	8	DIP	2070	$ 163,050	1	2	2	4
2003	50	FY 2052/2053	33 Mi -- from a point 220' west of Natures Way, west, to the west side of Lowe Plank Rd, thence north to the north side of 33-Mile Rd, thence west to a point 761' west of Lowe Plank (well #12 access drive)	Infrastructure	2,168' of 12" DIP	$140,109.94	$2,802.20	$2,802.00	2168	12	Ductile Iron	2053	$ 364,224	1	2	3	6
1960	50	FY 2009/2010	33 Mi --feed line from water tower, north, to 33 Mile	Infrastructure	116' of 12" CIP	$1,045.16	$20.90		116	12	Cast Iron	2010	$ 19,488	2	2	3	6
1985	50	FY 2034/2035	33 Mile -- from tower feed line, west, to well #10 feed line	Infrastructure	88' of 12" DIP	$2,640.00	$52.80	$53.00	88	12	Ductile Iron	2035	$ 14,784	2	2	3	6
1985	50	FY 2034/2035	33 Mile -- from well #10, north, to Clay Rd.	Infrastructure	118' of 12" DIP	$3,540.00	$70.80	$71.00	118	12	Ductile Iron	2035	$ 19,824	2	2	3	6
1996	50	FY 2045/2046	33 Mile Rd -- from 1,233' west of Main St (in line with the west end of Maplewood Ln, west, to a point 220' west of Natures Way	Infrastructure	945' of 12" DIP	$24,471.00	$489.42	$489.00	945	12	Ductile Iron	2046	$ 158,760	1	2	3	6
1994	50	FY 2043/2044	33 Mile Rd. -- from 403' west of Main St., west 190', thence 30' south, thence 640' west (in line with west end of Maplewood Lane)	Infrastructure	860' of 12" DIP	$45,124.20	$902.48	$902.00	860	12	Ductile Iron	2044	$ 144,480	1	2	3	6
1960	50	FY 2009/2010	33 Mile Rd. -- water tower to Main St.	Infrastructure	315' of 12" CIP	$2,838.15	$56.76		315	12	Cast Iron	2010	$ 52,920	2	2	5	10
1994	50	FY 2043/2044	33 Mile Rd. (near west end of Maplewood Ln.), south, to west end of Pheasant Ridge	Infrastructure	235' of 8" DIP	$9,174.40	$183.49	$183.00	235	8	Ductile Iron	2044	$ 35,250	1	2	3	6
1997	50	FY 2046/2047	Amanda Ct. -- from George Dr., south, to south end	Infrastructure	312' of 8" DIP	$10,932.48	$218.65	$219.00	312	8	Ductile Iron	2047	$ 46,800	1	2	2	4
1996	50	FY 2045/2046	Apple Blossom Ln -- from Natures Way to Sunny Brook Ln	Infrastructure	445' of 6" DIP	$7,969.95	$159.40	$159.00	445	6	Ductile Iron	2046	$ 66,750	1	2	2	4
1999	50	FY 2048/2049	Applewood St — from Pierce, south, 172'	Infrastructure	172' of 8" DIP	$9,912.00	$198.24	$198.00	172	8	Ductile Iron	2049	$ 25,800	1	2	2	4
2003	50	FY 2052/2053	Applewood St. -- from a point 172' south of Pierce to a point 15' north of Orchard Ln.	Infrastructure	410' of 8" DIP	$8,450.10	$169.00	$169.00	410	8	Ductile Iron	2053	$ 61,500	1	2	2	4
1985	50	FY 2034/2035	approx. 1,300' east of Lowe Plank -- between Ridge & Division	Infrastructure	692' of 8" DIP	$38,219.16	$764.38	$764.00	692	8	Ductile Iron	2035	$ 103,800	2	2	2	4
2004	50	FY 2053/2054	Arbor Ct. -- from Orchard Ln, south	Infrastructure	165' of 8" DIP	$7,331.70	$146.63	$147.00	165	8	Ductile Iron	2054	$ 24,750	1	2	2	4
2019	50	FY 2068/2069	Ashley Dr - From Diane Lane to Woodside Dr	Infrastructure	1075' of 8" DIP	$64,500.00	$1,290.00	$1,290.00	1075	8	Ductile Iron	2069	$ 161,250	1	2	2	4
1946	50	FY 1995/1996	Bartell -- from 367' east of Main St. to Oak	Infrastructure	433' of 4" CIP	$1,428.90	$28.58		433	4	Cast Iron	1996	$ 64,950	2	2	2	4
1940	50	FY 1989/1990	Bartell -- from Main St., east	Infrastructure	367' of 4" CIP	$822.08	$16.44		367	4	Cast Iron	1990	$ 55,050	3	3	2	6
1985	50	FY 2034/2035	Bauman -- Oak to Forest	Infrastructure	668' of 8" DIP	$36,893.64	$737.87	$738.00	668	8	Ductile Iron	2035	$ 100,200	2	2	2	4
1985	50	FY 2034/2035	Beebe -- Jefferson to Washington	Infrastructure	290' of 6" DIP	$15,254.00	$305.08	$305.00	290	6	Ductile Iron	2035	$ 43,500	2	2	2	4
1994	50	FY 2043/2044	Beebe -- Madison to Jefferson	Infrastructure	525' of 6" DIP	$18,737.25	$374.75	$375.00	525	6	Ductile Iron	2044	$ 78,750	1	2	2	4
1970	50	FY 2019/2020	Beebe -- Water to Division	Infrastructure	900' of 6" CIP	$14,085.00	$281.70		900	6	Cast Iron	2020	$ 135,000	2	2	2	4
2003	50	FY 2052/2053	Beebe St. -- from Madison, north, to Quince Dr.	Infrastructure	948' of 8" DIP	$32,455.00	$649.10	$649.00	948	8	Ductile Iron	2053	$ 142,200	1	2	2	4
1976	50	FY 2025/2026	Beebe St. -- from Pierce (N. leg) to Pierce (S. leg).	Infrastructure	115' of 8" CIP	$3,478.75	$69.58	$70.00	115	8	Cast Iron	2026	$ 17,250	2	2	2	4

CITY OF RICHMOND
WATER FUND
SYSTEM FIXED ASSETS

Current FY: **FY 2021 / 2022**

1ST FY IN SERVICE (i.e. FY1975/1976 written 1976)	DEP. TERM (YRS)	LAST FY OF DEP.	ITEM	TYPE	DESCRIPTION	ORIGINAL COST	YEARLY DEPRECIATION	FY 2021 /2022 DEPRECIATION	PIPE LENGTH (FEET)	PIPE SIZE (INCHES)	PIPE MATERIAL	DEP. (i.e. FY1995/1996 written 1996)	REPLACEMENT COST	CONDITION ASSESSMENT	PROBABILITY OF FAILURE	CONSEQUENCE OF FAILURE	CRITICALITY FACTOR
1999	50	FY 2048/2049	Beebe St. -- from Pierce (N. leg), north, to north end	Infrastructure	110' of 8" DIP	$4,950.00	$99.00	$99.00	110	8	Ductile Iron	2049	$ 16,500	1	2	2	4
1999	50	FY 2048/2049	Beebe St. -- from Quince Dr, north, to Pierce St (S. leg)	Infrastructure	175' of 8" DIP	$4,175.00	$83.50	$84.00	175	8	Ductile Iron	2049	$ 26,250	1	2	2	4
1939	50	FY 1988/1989	Beech -- Beier to Main	Infrastructure	550' of 4" CIP	$1,199.00	$23.98		550	4	Cast Iron	1989	$ 82,500	2	2	2	4
1985	50	FY 2034/2035	Beech -- Beier to Priestap	Infrastructure	472' of 6" DIP	$24,827.20	$496.54	$497.00	472	6	Ductile Iron	2035	$ 70,800	2	2	2	4
1939	50	FY 1988/1989	Beier -- Beech to Oak	Infrastructure	415' of 4" CIP	$904.70	$18.09		415	4	Cast Iron	1989	$ 62,250	2	2	2	4
1946	50	FY 1995/1996	Beier -- Forest to Main St.	Infrastructure	270' of 4" CIP	$891.00	$17.82		270	4	Cast Iron	1996	$ 40,500	2	2	2	4
1985	50	FY 2034/2035	Beier -- Main St. to Oak (HUD)	Infrastructure	308' of 6" DIP	$21,720.00	$434.40	$434.00	308	6	Ductile Iron	2035	$ 46,200	2	2	2	4
1954	50	FY 2003/2004	Beier & Forest -- from Forest to Lee School	Infrastructure	600' of 4" CIP	$3,858.00	$77.16		600	4	Cast Iron	2004	$ 90,000	2	2	2	4
2007	50	FY 2056/2057	Beier St (school roadway) -- from S. Forest, west, to curve	Infrastructure	314' of 12" DIP	$34,660.44	$693.21	$693.00	312	12	Ductile Iron	2057	$ 52,416	1	2	3	6
1997	50	FY 2046/2047	Bramblewood Dr. -- from Lake Angela Dr., west, to west end (C)	Infrastructure	313' of 8" DIP	$7,289.77	$145.80	$146.00	313	8	Ductile Iron	2047	$ 46,950	1	2	2	4
2016	50	FY 2065/2066	Burke Dr. - from a point 520' north of Division Rd., relocate around building expansion at 45 deg angle	Infrastructure	150' of 8" DIP	$22,800.00	$456.00	$456.00	150	8	Ductile Iron	2066	$ 22,500	1	2	2	4
1985	50	FY 2034/2035	Burke Drive -- from Division, north (HUD)	Infrastructure	520' of 8" DIP	$12,882.00	$257.64	$258.00	520	8	Ductile Iron	2035	$ 78,000	2	2	3	6
1976	50	FY 2025/2026	Canterbury -- from Madison, north (C)	Infrastructure	354' of 6" CIP	$9,685.44	$193.71	$194.00	354	6	Cast Iron	2026	$ 53,100	2	2	2	4
1976	50	FY 2025/2026	Canterbury -- from Pound, south (C)	Infrastructure	413' of 6" CIP	$11,299.68	$225.99	$226.00	413	6	Cast Iron	2026	$ 61,950	2	2	2	4
1976	50	FY 2025/2026	Canterbury Drive -- inside subdivision (C)	Infrastructure	1,565' of 8" CIP	$47,341.25	$946.83	$947.00	1565	8	Cast Iron	2026	$ 234,750	2	2	2	4
2001	50	FY 2050/2051	Cedar Ridge — from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$8,455.00	$169.10	$169.00	445	6	Ductile Iron	2051	$ 66,750	1	2	2	4
1994	50	FY 2043/2044	Chaskey -- from GH r.o.w., east (C)	Infrastructure	100' of 6" DIP	$3,569.00	$71.38	$71.00	100	6	Ductile Iron	2044	$ 15,000	1	2	2	4
1991	50	FY 2040/2041	Chaskey -- from Gleason to GH r.o.w.	Infrastructure	1,140' of 6" DIP	$37,405.85	$748.12	$748.00	1140	6	Ductile Iron	2041	$ 171,000	1	2	2	4
1997	50	FY 2046/2047	Chaskey St. -- from a point 100' east of G.H. Street r.o.w., east, to Samual Ct. (C)	Infrastructure	560' of 8" DIP	$19,622.40	$392.45	$392.00	560	8	Ductile Iron	2047	$ 84,000	1	2	2	4
1976	50	FY 2025/2026	Chaucer Drive -- end to end (C)	Infrastructure	1,760' of 8" CIP	$53,240.00	$1,064.80	$1,065.00	1760	8	Cast Iron	2026	$ 264,000	2	2	2	4
1996	50	FY 2045/2046	Cherry Hill Ln -- from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$7,969.95	$159.40	$159.00	445	6	Ductile Iron	2046	$ 66,750	1	2	2	4
1996	50	FY 2045/2046	Chickadee Ridge -- from west end, east, 666' (C)	Infrastructure	666' of 8" DIP	$16,243.74	$324.87	$325.00	666	8	Ductile Iron	2046	$ 99,900	1	2	2	4
2002	50	FY 2051/2052	Churchill -- from 71' east of Grove, west, to Grove	Infrastructure	71' of 8" DIP	$5,335.29	$106.71	$107.00	71	8	Ductile Iron	2052	$ 10,650	1	2	2	4
2009	50	FY 2058/2059	Churchill St -- from 71' east of Grove, east, to Main Street	Infrastructure	1,063' of 8" DIP	$113,910.69	$2,278.21	$2,278.00	1063	8	Ductile Iron	2059	$ 159,450	1	2	2	4
1985	50	FY 2034/2035	Circle Lane -- easterly N-S leg & north E-W leg	Infrastructure	655' of 6" DIP	$34,453.00	$689.06	$689.00	655	6	Ductile Iron	2035	$ 98,250	2	2	2	4
1961	50	FY 2010/2011	Circle Lane; westerly N-S leg -- from Ridge, north	Infrastructure	300' of 4" CIP	$2,637.00	$52.74		300	4	Cast Iron	2011	$ 45,000	2	2	2	4
1989	50	FY 2038/2039	Clarkston Lane -- from forest, west (C)	Infrastructure	1,226' of 8" DIP	$74,479.50	$1,489.59	$1,490.00	1226	8	Ductile Iron	2039	$ 183,900	1	2	3	6
2002	50	FY 2051/2052	Crystal Drive -- from Pierce, north, to north end (C)	Infrastructure	145' of 8" DIP	$8,326.00	$166.52	$167.00	145	8	Ductile Iron	2052	$ 21,750	1	2	2	4
1981	50	FY 2030/2031	Crystal Drive (named 2002) -- Pierce to Madison (C)	Infrastructure	919' of 8" DIP	$16,220.35	$324.41	$324.00	919	8	Ductile Iron	2031	$ 137,850	2	2	2	4
2009	50	FY 2058/2059	CVS -- from Gratiot, west, from a point 202' south of Main Street, under main driveway between the buildings	Infrastructure	248' of 8" DIP	$21,765.15	$435.30	$435.00	248	8	Ductile Iron	2059	$ 37,200	1	2	2	4
2009	50	FY 2058/2059	CVS -- from Gratiot, west, parallel to Main on north side of property	Infrastructure	318' of 8" DIP	$27,908.54	$558.17	$558.00	318	8	Ductile Iron	2059	$ 47,700	1	2	2	4
2001	50	FY 2050/2051	Cygnet Circle — from Main Street, west 230', then south 100', then west 231' to Mallard Lane	Infrastructure	561' of 8" DIP	$11,781.00	$235.62	$236.00	561	8	Ductile Iron	2051	$ 84,150	1	2	2	4
1996	50	FY 2045/2046	Deer Run -- from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$7,969.95	$159.40	$159.00	445	6	Ductile Iron	2046	$ 66,750	1	2	2	4
2019	50	FY 2068/2069	Diane Lane - From Ashley Ave to Madeline St	Infrastructure	280' of 8" HDPE	$16,800.00	$336.00	$336.00	280	8	HDPE	2069	$ 42,000	1	2	2	4
2019	50	FY 2068/2069	Diane Lane - From Madeline St to previous limits	Infrastructure	264' of 8" DIP	$15,840.00	$316.80	$317.00	770	8	Ductile Iron	2069	$ 115,500	1	2	2	4
1987	50	FY 2036/2037	Diane Ln -- from Forest, west (C)	Infrastructure	1,025' of 8" DIP	$59,306.50	$1,186.13	$1,186.00	1025	8	Ductile Iron	2037	$ 153,750	1	2	2	4
2003	50	FY 2052/2053	Diane Ln. -- from a point 1,295' west of Forest, west (C)	Infrastructure	539' of 8" DIP	$17,527.62	$350.55	$351.00	539	8	Ductile Iron	2053	$ 80,850	1	2	2	4
1985	50	FY 2034/2035	Division Rd -- Forest to Skinner	Infrastructure	1,290' of 8" DIP	$71,246.70	$1,424.93	$1,425.00	1290	8	Ductile Iron	2035	$ 193,500	2	2	3	6
1992	50	FY 2041/2042	Division Rd -- from Division Rd., south, to well house #11	Infrastructure	779' of 8" DIP	$32,999.80	$660.00	$660.00	779	8	Ductile Iron	2042	$ 116,850	1	2	3	6
1999	50	FY 2048/2049	Division Rd -- from Grove, east, to Main St.	Infrastructure	1,560' of 8" DIP	$84,361.84	$1,687.24	$1,687.00	1560	8	Ductile Iron	2049	$ 234,000	1	2	3	6
1999	50	FY 2048/2049	Division Rd -- from West City limits, east, to 90' west of Grove	Infrastructure	1,740' of 12" DIP	$118,595.17	$2,371.90	$2,372.00	1740	12	Ductile Iron	2049	$ 292,320	1	2	3	6
1981	50	FY 2030/2031	Division Rd -- Skinner Dr., east, to St. Clair/Macomb Line (C)	Infrastructure	3,772' of 12" DIP	$88,830.60	$1,776.61	$1,777.00	3772	12	Ductile Iron	2031	$ 633,696	2	2	3	6
1998	50	FY 2047/2048	Division Rd. -- from Grove St., west 90' (C)	Infrastructure	90' of 12" DIP	$5,961.60	$119.23	$119.00	90	12	Ductile Iron	2048	$ 15,120	1	2	3	6
1998	50	FY 2047/2048	Division Rd. -- west of the Library from Division Rd., south 368' (C)	Infrastructure	368' of 12" DIP	$24,376.32	$487.53	$488.00	368	12	Ductile Iron	2048	$ 61,824	1	2	3	6
1979	50	FY 2028/2029	Dow -- from Howard, east	Infrastructure	780' of 6" DIP	$28,633.80	$572.68	$573.00	780	6	Ductile Iron	2029	$ 117,000	2	2	2	4
1979	50	FY 2028/2029	Dow Street -- 560' east of Howard in easement to the north	Infrastructure	344' of 6" DIP	$12,628.24	$252.56	$253.00	344	6	Ductile Iron	2029	$ 51,600	2	2	2	4
1994	50	FY 2043/2044	E & W Meadowood--from 230' W. of Rosewood, west to Seymour (C)	Infrastructure	230' of 8" DIP	$8,979.20	$179.58	$180.00	230	8	Ductile Iron	2044	$ 34,500	1	2	2	4
1992	50	FY 2041/2042	E. Meadowood -- from Rosewood Ln., west 230', then north 275' to Lakeview	Infrastructure	505' of 8" DIP	$21,391.80	$427.84	$428.00	505	8	Ductile Iron	2042	$ 75,750	1	2	2	4
1999	50	FY 2048/2049	Ernst Ct. — from Woodside Dr., south, to south end (C)	Infrastructure	258' of 8" DIP	$13,827.10	$276.54	$277.00	258	8	Ductile Iron	2049	$ 38,700	1	2	2	4
1985	50	FY 2034/2035	Ferguson -- Madison to Jefferson	Infrastructure	516' of 12" DIP	$34,762.92	$695.26	$695.00	516	12	Ductile Iron	2035	$ 86,688	2	2	3	6
2003	50	FY 2052/2053	Festival Dr. -- from a point approx. 490' east of Beebe, east 824' to 12" main	Infrastructure	842' of 6" DIP	$24,898.21	$497.96	$498.00	842	6	Ductile Iron	2053	$ 126,300	1	2	2	4
1985	50	FY 2034/2035	Fitzgerald -- 283' south of Bauman to 90' north of curve	Infrastructure	285' of 6" DIP	$14,991.00	$299.82	$300.00	285	6	Ductile Iron	2035	$ 42,750	2	2	2	4
1937	50	FY 1986/1987	Fitzgerald -- 90' north of bend to Forest	Infrastructure	410' of 6" CIP	$885.60	$17.71		410	6	Cast Iron	1987	$ 61,500	2	2	2	4
1937	50	FY 1986/1987	Fitzgerald -- from Bauman, south	Infrastructure	283' of 4" CIP	$580.15	$11.60		283	4	Cast Iron	1987	$ 42,450	2	2	2	4
1986	50	FY 2035/2036	Forest -- from a point 990' south of the RR crossing on S. Forest, located on the west side of and in the RR R.O.W. adjacent to the east side of the WWTP property, west 330'to the	Infrastructure	885' of 8" DIP	$17,443.35	$348.87	$349.00	885	8	Ductile Iron	2036	$ 132,750	1	2	3	6
2008	50	FY 2057/2058	Forest -- from Gleason, north, to connection under RR tracks	Infrastructure	252' of 12" DIP	$25,328.73	$506.57	$507.00	252	12	Ductile Iron	2058	$ 42,336	1	2	3	6
2007	50	FY 2056/2057	Forest -- from Main Street, south, to casing under the RR tracks where the WWTP and Forest Road/Gleason Street connection is, and all associated costs for side street tie-ins, service leads, valves and fire hydrants.	Infrastructure	2,954' of 12" DIP	$359,260.15	$7,185.20	$7,185.00	2954	12	Ductile Iron	2057	$ 496,272	1	2	3	6
1960	50	FY 2009/2010	Forest -- from Park St., north	Infrastructure	150' of 4" CIP	$1,282.50	$25.65		150	4	Cast Iron	2010	$ 22,500	3	3	2	6
1986	50	FY 2035/2036	Forest -- from the south side of the RR crossing on S. Forest, south, along and located in the west side of the RR R.O.W. adjacent to the east side of the WWTP property	Infrastructure	990' of 8" DIP	$19,508.00	$390.16	$390.00	990	8	Ductile Iron	2036	$ 148,500	1	2	2	4
2022	50	FY 2071/2072	Forest - Gleason to 31 Mile Rd	Infrastructure	950' of 1" Plastic/Cop	$9,500.00	$190.00	$190.00	950	1	Plastic	2072	$ 142,500	1	2	1	2
1949	50	FY 1998/1999	Forest -- Park St. to Division	Infrastructure	1,425' of 6" CIP	$7,196.25	$143.93		1425	6	Cast Iron	1999	$ 213,750	3	3	2	6
2007	50	FY 2056/2057	Forest -- under railroad tracks between Forest & WWTP main connection.	Infrastructure	93' of 12" DIP	$25,562.72	$511.25	$511.00	93	12	Ductile Iron	2057	$ 15,624	1	2	3	6
2010	50	FY 2059/2060	Forest St -- from Bartell to Division	Infrastructure	815' of 8" DIP	$84,788.97	$1,695.78	$1,696.00	815	8	Ductile Iron	2060	$ 122,250	1	2	2	4
1961	50	FY 2010/2011	Franklin -- Howard to Gleason	Infrastructure	475' of 4" CIP	$4,175.20	$83.50		475	4	Cast Iron	2011	$ 71,250	2	2	2	4

CITY OF RICHMOND
WATER FUND
SYSTEM FIXED ASSETS

Current FY: **FY 2021 / 2022**

1ST FY IN SERVICE (i.e. FY1975/1976 written 1976)	DEP. TERM (YRS)	LAST FY OF DEP.	ITEM	TYPE	DESCRIPTION	ORIGINAL COST	YEARLY DEPRECIATION	FY 2021 /2022 DEPRECIATION	PIPE LENGTH (FEET)	PIPE SIZE (INCHES)	PIPE MATERIAL	DEP. (i.e. FY1995/1996 written 1996)	REPLACEMENT COST	CONDITION ASSESSMENT	PROBABILITY OF FAILURE	CONSEQUENCE OF FAILURE	CRITICALITY FACTOR
1916	50	FY 1965/1966	Friday -- Main St. to Forest	Infrastructure	720' of 4" CIP	$1,008.00	$20.16		720	4	Cast Iron	1966	$ 108,000	2	2	2	4
1948	50	FY 1997/1998	from Well #8 to Cygnet Circle	Infrastructure	120' of 6" CIP	$898.80	$17.98		120	6	Cast Iron	1998	$ 18,000	2	2	2	4
1983	50	FY 2032/2033	G.H. Street R.O.W. -- Chaskey to Geirk (HUD)	Infrastructure	355' of 6" DIP	$6,010.15	$120.20	$120.00	355	6	Ductile Iron	2033	$ 53,250	2	2	2	4
2004	50	FY 2053/2054	Garden Dr. -- from 12" water main, east 90.5'; thence north 457' (C)	Infrastructure	548' of 8" DIP	$15,456.00	$309.12	$309.00	548	8	Ductile Iron	2054	$ 82,200	1	2	2	4
2004	50	FY 2053/2054	Garden Dr. -- from Division Road, north 38', to 8" water main (C)	Infrastructure	38' of 12" DIP	$1,292.00	$25.84	$26.00	38	12	Ductile Iron	2054	$ 6,384	1	2	3	6
1997	50	FY 2046/2047	George Dr. -- from Main Street, south, to Chaskey St. (C)	Infrastructure	1,096' of 8" DIP	$38,403.84	$768.08	$768.00	1096	8	Ductile Iron	2047	$ 164,400	1	2	2	4
1967	50	FY 2016/2017	Gierk -- 410' east of Gleason, east	Infrastructure	500' of 6" CIP	$5,900.00	$118.00		500	6	Cast Iron	2017	$ 75,000	3	3	2	6
1994	50	FY 2043/2044	Gierk -- from GH r.o.w., east (C)	Infrastructure	100' of 6" DIP	$3,569.00	$71.38	$71.00	100	6	Ductile Iron	2044	$ 15,000	1	2	2	4
1963	50	FY 2012/2013	Gierk -- from Gleason, east	Infrastructure	410' of 4" CIP	$3,845.80	$76.92		410	4	Cast Iron	2013	$ 61,500	3	3	2	6
1997	50	FY 2046/2047	Gierk St. -- from a point 100' east of G.H. Street r.o.w., east, to George Dr. (C)	Infrastructure	135' of 8" DIP	$4,730.40	$94.61	$95.00	135	8	Ductile Iron	2047	$ 20,250	1	2	2	4
1916	50	FY 1965/1966	Gleason -- from Main Street, west	Infrastructure	315' of 4" CIP	$441.00	$8.82		315	4	Cast Iron	1966	$ 47,250	2	2	3	6
2008	50	FY 2057/2058	Gleason St -- from S.Forest connection to O.W. Street	Infrastructure	2,012' of 12" DIP	$202,227.79	$4,044.56	$4,045.00	2012	12	Ductile Iron	2058	$ 338,016	1	2	3	6
1998	50	FY 2047/2048	Golden Oak Ln -- from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$9,790.00	$195.80	$196.00	445	6	Ductile Iron	2048	$ 66,750	1	2	2	4
1916	50	FY 1965/1966	Grand Trunk Ave. -- from bend, east, to Howard	Infrastructure	200' of 4" CIP	$280.00	$5.60		200	4	Cast Iron	1966	$ 30,000	2	2	2	4
1916	50	FY 1965/1966	Grand Trunk Ave. -- Main St., north, to bend	Infrastructure	620' of 6" CIP	$911.40	$18.23		620	6	Cast Iron	1966	$ 93,000	2	2	2	4
2006	50	FY 2055/2056	Gratiot -- (from a point 220' north of Gratiot at Main Street Posio tap), from Gratiot, east 230 feet ©	Infrastructure	230' of 8" DIP	$9,890.00	$197.80	$198.00	230	8	Ductile Iron	2056	$ 34,500	1	2	3	6
1997	50	FY 2046/2047	Gratiot -- from 190' south of 31-Mile Rd, south, 570' (C)	Infrastructure	570' of 6" DIP	$13,275.30	$265.51	$266.00	570	6	Ductile Iron	2047	$ 85,500	1	2	3	6
2001	50	FY 2050/2051	Gratiot — from Lenox Square, south, into and through the Kroger development to the 12" main at Gratiot & 31-Mile Road ©	Infrastructure	2,056' of 8" DIP	$61,680.00	$1,233.60	$1,234.00	2056	8	Ductile Iron	2051	$ 308,400	1	2	3	6
1967	50	FY 2016/2017	Gratiot -- from Main St., south, to 190' south of 31 Mile Rd.	Infrastructure	950' of 6" CIP	$11,210.00	$224.20		950	6	Cast Iron	2017	$ 142,500	2	2	3	6
2001	50	FY 2050/2051	Gratiot -- from Muttonville Lane, north to City Limits	Infrastructure	335' of 8" DIP	$54,172.16	$1,083.44	$1,083.00	335	8	Ductile Iron	2051	$ 50,250	1	2	3	6
1997	50	FY 2046/2047	Gratiot -- from the west side of Gratiot at Main Street, north, to Muttonville Ln.	Infrastructure	360' of 12" DIP	$23,846.40	$476.93	$477.00	360	12	Ductile Iron	2047	$ 60,480	1	2	3	6
2001	50	FY 2050/2051	Gratiot -- from the west side of Gratiot at Main Street,south, to the south side of 31-Mile Road	Infrastructure	682' of 12" DIP	$28,644.00	$572.88	$573.00	682	12	Ductile Iron	2051	$ 114,576	1	2	3	6
2006	50	FY 2055/2056	Gratiot (at Main St) -- from Gratiot, east 242 feet; thence south 351 feet; thence east 125 feet (Posios Richmond Center) (C)	Infrastructure	718' of 8" DIP	$30,874.00	$617.48	$617.00	718	8	Ductile Iron	2056	$ 107,700	1	2	3	6
1969	50	FY 2018/2019	Grove -- from 146' south of Ridge to Division	Infrastructure	1,424' of 12" AC	$32,937.12	$658.74		1424	12	Asbestos Cement	2019	$ 239,232	2	2	3	6
1916	50	FY 1965/1966	Grove -- from 276' north of Division to Park St.	Infrastructure	874' of 4" CIP	$1,223.60	$24.47		874	4	Cast Iron	1966	$ 131,100	3	3	2	6
1940	50	FY 1989/1990	Grove -- from Division, north	Infrastructure	276' of 4" CIP	$618.24	$12.36		276	4	Cast Iron	1990	$ 41,400	2	2	2	4
2002	50	FY 2051/2052	Grove -- from Ridge, south, 150'	Infrastructure	150' of 12" DIP	$11,151.80	$223.04	$223.00	150	12	Ductile Iron	2052	$ 25,200	1	2	3	6
2005	50	FY 2054/2055	Heritage Dr--from a point 350 feet south of Main Street, east, 82 feet to hydrant(C)	Infrastructure	82' of 8" DIP	$3,516.98	$70.34	$70.00	82	8	Ductile Iron	2055	$ 12,300	1	2	2	4
2005	50	FY 2054/2055	Heritage Dr--from Main Street, south, 638 feet (C)	Infrastructure	638' of 8" DIP	$27,363.82	$547.28	$547.00	638	8	Ductile Iron	2055	$ 95,700	1	2	2	4
1979	50	FY 2028/2029	Howard -- 340' north of Dow in easement to the east	Infrastructure	420' of 6" DIP	$15,418.20	$308.36	$308.00	420	6	Ductile Iron	2029	$ 63,000	2	2	3	6
1916	50	FY 1965/1966	Howard -- Division to 225' south of Lenon	Infrastructure	2,475' of 4" CIP	$3,465.00	$69.30		2475	4	Cast Iron	1966	$ 371,250	3	3	3	9
1985	50	FY 2034/2035	Howard -- from 270' east of Franklin to Main St.	Infrastructure	412' of 6" DIP	$21,671.20	$433.42	$433.00	412	6	Ductile Iron	2035	$ 61,800	2	2	3	6
1961	50	FY 2010/2011	Howard -- from Franklin, east	Infrastructure	270' of 4" CIP	$2,373.30	$47.47		270	4	Cast Iron	2011	$ 40,500	2	2	3	6
1985	50	FY 2034/2035	Howard -- from Main St., north to 225' south of Lennon	Infrastructure	460' of 6" DIP	$24,196.00	$483.92	$484.00	460	6	Ductile Iron	2035	$ 69,000	2	2	3	6
1987	50	FY 2036/2037	Howard ESMT (E. of Howard)-- from Division, south to E. end of Dow	Infrastructure	1,400' of 8" DIP	$51,225.00	$1,024.50	$1,025.00	1400	8	Ductile Iron	2037	$ 210,000	1	2	2	4
1995	50	FY 2044/2045	Hummingbird Ln -- from Pinewood Ln, west 439', to the end of Hummingbird Ln, thence north 165', along the west P.L. of Lot 42 to Lot 38, and continuing north 178' along the eas P.L of Lot 38 to Mulberry Ln. (C)	Infrastructure	781' of 8" DIP	$15,508.00	$310.16	$310.00	781	8	Ductile Iron	2045	$ 117,150	1	2	2	4
2022	50	FY 2071/2072	Huvaere's Auto Dealership	Infrastructure	1700' of 8" DI		$0.00		1700	8	Ductile Iron	2072	$ 255,000	1	2	1	2
1985	50	FY 2034/2035	Industrial Park -- starting at a point 270' south of well #9 access drive on Skinner Dr. and	Infrastructure	467' of 8" DIP	$11,567.59	$231.35	$231.00	467	8	Ductile Iron	2035	$ 70,050	2	2	2	4
1981	50	FY 2030/2031	inside K-Mart/Kroeger Shopping Center (C)	Infrastructure	1,200' of 6" DIP	$20,340.00	$406.80	$407.00	1200	6	Ductile Iron	2031	$ 180,000	2	2	2	4
1981	50	FY 2030/2031	inside K-Mart/Kroeger Shopping Center (C)	Infrastructure	2,225' of 8" DIP	$39,271.25	$785.43	$785.00	2225	8	Ductile Iron	2031	$ 333,750	2	2	2	4
1997	50	FY 2046/2047	Ivy Circle -- from Lake Angela Dr., west, to west end (C)	Infrastructure	209' of 8" DIP	$4,867.61	$97.35	$97.00	209	8	Ductile Iron	2047	$ 31,350	1	2	2	4
1916	50	FY 1965/1966	Jefferson -- Main St. to Stone	Infrastructure	750' of 6" CIP	$1,102.50	$22.05		750	6	Cast Iron	1966	$ 112,500	2	2	2	4
2003	50	FY 2052/2053	Joewood Dr. -- from south side of Woodside, south, to the south side of Richwood Ln.	Infrastructure	579' of 8" DIP	$16,907.42	$338.15	$338.00	579	8	Ductile Iron	2053	$ 86,850	1	2	2	4
1997	50	FY 2046/2047	Jolaine Ct. -- from S. Forest, west 1,210', thence 69' north to the north side of cul-de-sac	Infrastructure	1,279' of 8" DIP	$60,642.75	$1,212.86	$1,213.00	1279	8	Ductile Iron	2047	$ 191,850	1	2	3	6
2011	50	FY 2060/2061	Karen St -- from Madison to Pound	Infrastructure	2,088' of 8" DIP/HDPE	$290,456.03	$5,809.12	$5,809.00	2088	8	HDPE	2061	$ 313,200	1	2	2	4
1995	50	FY 2044/2045	Lake Angela Dr -- from a point 465' north of Main St, west 80', thence north to Mulberry Ln	Infrastructure	957' of 8" DIP	$20,126.00	$402.52	$403.00	957	8	Ductile Iron	2045	$ 143,550	1	2	2	4
1997	50	FY 2046/2047	Lake Angela Dr. -- from Mulberry Ln., northerly, to the north line of lot #212 (68479 Lake Angela Dr.) (C)	Infrastructure	2,287' of 8" DIP	$53,264.23	$1,065.28	$1,065.00	2287	8	Ductile Iron	2047	$ 343,050	1	2	2	4
1981	50	FY 2030/2031	Lake Angela Estates - in Easement along the Co. Line -- Division to Muttonville Lane	Infrastructure	4,803' of 12" DIP	$113,110.65	$2,262.21	$2,262.00	4803	12	Ductile Iron	2031	$ 806,904	2	2	3	6
1995	50	FY 2044/2045	Lake Angela Pointe -- from Mulberry Ln, north 1,612', to the north P.L. of Lot 85, and continuing north 195', to the Well #11 feed main (C)	Infrastructure	1,807' of 8" DIP	$38,326.00	$766.52	$767.00	1807	8	Ductile Iron	2045	$ 271,050	1	2	2	4
1995	50	FY 2044/2045	Lake Pointe Cove -- from Pinewood Ln/Lost Forest Dr, north, to Mulberry Ln	Infrastructure	436' of 8" DIP	$9,298.00	$185.96	$186.00	436	8	Ductile Iron	2045	$ 65,400	1	2	2	4
1995	50	FY 2044/2045	Lake Pointe Cove -- from the north end of the street, west along the south P.L. of Lots 104 & 97, to Lake Angela Pointe (C)	Infrastructure	300' of 8" DIP	$6,850.00	$137.00	$137.00	300	8	Ductile Iron	2045	$ 45,000	1	2	2	4
1994	50	FY 2043/2044	Lakeview -- from 250' west of Rosewood, west to Seymour (C)	Infrastructure	180' of 8" DIP	$7,027.20	$140.54	$141.00	180	8	Ductile Iron	2044	$ 27,000	1	2	2	4
1988	50	FY 2037/2038	Lakewiew -- from Rosewood Ln., west (C)	Infrastructure	250' of 8" DIP	$10,892.50	$217.85	$218.00	250	8	Ductile Iron	2038	$ 37,500	1	2	2	4
1999	50	FY 2048/2049	Leelane Ct. — from Woodside Dr, south, to south end (C)	Infrastructure	215' of 8" DIP	$7,041.75	$140.84	$141.00	215	8	Ductile Iron	2049	$ 32,250	1	2	2	4
1995	50	FY 2044/2045	Lilac Ln -- from Lake Angela Dr, east, to the 12" water main from Division Rd	Infrastructure	1,184' of 8" DIP	$24,212.00	$484.24	$484.00	1184	8	Ductile Iron	2045	$ 177,600	1	2	2	4
1999	50	FY 2048/2049	Lorra Ct. — from Woodside Dr., south, to south end (C)	Infrastructure	246' of 8" DIP	$11,925.70	$238.51	$239.00	246	8	Ductile Iron	2049	$ 36,900	1	2	2	4
2019	50	FY 2068/2069	Madeline St - From Diane Lane to Woodside Dr	Infrastructure	1008' of 8" DIP	$60,480.00	$1,209.60	$1,210.00	1008	8	Ductile Iron	2069	$ 151,200	1	2	2	4
1994	50	FY 2043/2044	Madison -- from Main St., east, 1,850'	Infrastructure	1,850' of 6" DIP	$66,026.50	$1,320.53	$1,321.00	1850	6	Ductile Iron	2044	$ 277,500	1	2	3	6
2005	50	FY 2054/2055	Madison St -- from 200' east of Karen to Crystal Drive	Infrastructure	705' of 8" DIP	$67,624.00	$1,352.48	$1,352.00	705	8	Ductile Iron	2055	$ 105,750	1	2	3	6
2005	50	FY 2054/2055	Madison St -- from Crystal Drive, east 150'	Infrastructure	150' of 12" DIP	$25,526.45	$510.53	$511.00	150	12	Ductile Iron	2055	$ 25,200	1	2	3	6
2001	50	FY 2050/2051	Magnolia Dr — from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$8,455.00	$169.10	$169.00	445	6	Ductile Iron	2051	$ 66,750	1	2	2	4
1967	50	FY 2016/2017	Main St. -- 33 Mile Rd. to Ridge	Infrastructure	2,849' of 12" CIP	$25,669.49	$513.39		2849	12	Cast Iron	2017	$ 478,632	2	2	5	10

CITY OF RICHMOND
WATER FUND
SYSTEM FIXED ASSETS

Current FY: **FY 2021 / 2022**

1ST FY IN SERVICE (i.e. FY1975/1976 written 1976)	DEP. TERM (YRS)	LAST FY OF DEP.	ITEM	TYPE	DESCRIPTION	ORIGINAL COST	YEARLY DEPRECIATION	FY 2021 /2022 DEPRECIATION	PIPE LENGTH (FEET)	PIPE SIZE (INCHES)	PIPE MATERIAL	DEP. (i.e. FY1995/1996 written 1996)	REPLACEMENT COST	CONDITION ASSESSMENT	PROBABILITY OF FAILURE	CONSEQUENCE OF FAILURE	CRITICALITY FACTOR
1947	50	FY 1996/1997	Main St. -- from 750' east of Mary to Gratiot	Infrastructure	3,100' of 6" AC	$13,361.00	$267.22		3100	6	Asbestos Cement	1997	$ 465,000	2	2	4	8
1947	50	FY 1996/1997	Main St. -- from Mary, east	Infrastructure	750' of 6" CIP	$3,232.50	$64.65		750	6	Cast Iron	1997	$ 112,500	3	3	4	12
1916	50	FY 1965/1966	Main St. -- Grand Trunk Avenue to Howard	Infrastructure	640' of 6" CIP	$940.80	$18.82		640	6	Cast Iron	1966	$ 96,000	3	3	4	12
1985	50	FY 2034/2035	Main St. -- Mary to Howard	Infrastructure	268' of 8" DIP	$14,801.64	$296.03	$296.00	268	8	Ductile Iron	2035	$ 40,200	2	2	4	8
1916	50	FY 1965/1966	Main St. -- Pound to Ridge	Infrastructure	1,900' of 6" CIP	$2,793.00	$55.86		1900	6	Cast Iron	1966	$ 285,000	2	2	3	6
1916	50	FY 1965/1966	Main St. -- Ridge to Grand Trunk Avenue	Infrastructure	5,200' of 8" CIP	$8,112.00	$162.24		5200	8	Cast Iron	1966	$ 780,000	3	3	4	12
1963	50	FY 2012/2013	Main St. (east side) -- from 33 Mile Rd., south	Infrastructure	430' of 2" K-COP	$2,150.00	$43.00		430	2	Copper	2013	$ 64,500	2	2	1	2
2000	50	FY 2049/2050	Mallard Lane — from Partridge Crossing, south 230', to Quail Trail	Infrastructure	230' of 8" DIP	$5,750.00	$115.00	$115.00	230	8	Ductile Iron	2050	$ 34,500	1	2	2	4
1947	50	FY 1996/1997	Mary -- Main to Dow	Infrastructure	1,357' of 4" AC	$5,550.13	$111.00		1357	4	Asbestos Cement	1997	$ 203,550	2	2	2	4
1994	50	FY 2043/2044	Meadowlark Ln. -- from east end to west end (C)	Infrastructure	690' of 8" DIP	$26,937.60	$538.75	$539.00	690	8	Ductile Iron	2044	$ 103,500	1	2	2	4
1995	50	FY 2044/2045	Mert St -- from Seymour St, east, to Mary St	Infrastructure	336' of 8" DIP	$12,568.00	$251.36	$251.00	336	8	Ductile Iron	2045	$ 50,400	1	2	2	4
1967	50	FY 2016/2017	Monroe -- Beebe to Stone	Infrastructure	360' of 6" CIP	$4,248.00	$84.96		360	6	Cast Iron	2017	$ 54,000	2	2	2	4
1949	50	FY 1998/1999	Monroe -- Main St. to Parker	Infrastructure	370' of 4" CIP	$1,868.50	$37.37		370	4	Cast Iron	1999	$ 55,500	2	2	2	4
1961	50	FY 2010/2011	Monroe -- Parker to Grove	Infrastructure	1,005' of 6" CIP	$9,296.25	$185.93		1005	6	Cast Iron	2011	$ 150,750	2	2	2	4
1961	50	FY 2010/2011	Monroe -- Stone to Forest	Infrastructure	305' of 6" CIP	$2,821.25	$56.43		305	6	Cast Iron	2011	$ 45,750	2	2	2	4
1967	50	FY 2016/2017	Monroe St. R.O.W. -- from swimming pool to Beebe St.	Infrastructure	370' of 4" CIP	$4,147.70	$82.95		370	4	Cast Iron	2017	$ 55,500	2	2	2	4
1996	50	FY 2045/2046	Mourning Dove Ln -- from east end to west end (C)	Infrastructure	976' of 8" DIP	$23,804.64	$476.09	$476.00	976	8	Ductile Iron	2046	$ 146,400	1	2	2	4
1996	50	FY 2045/2046	Mourning Dove Ln -- from the west end of Mourning Dove Ln, south, to the west end of Chickadee Ridge (C)	Infrastructure	215' of 8" DIP	$5,243.85	$104.88	$105.00	215	8	Ductile Iron	2046	$ 32,250	1	2	2	4
1996	50	FY 2045/2046	Mourning Dove Ln -- from the west end of Mourning Dove Ln, west, to Sunny Brook Ln	Infrastructure	302' of 8" DIP	$7,365.78	$147.32	$147.00	302	8	Ductile Iron	2046	$ 45,300	1	2	2	4
1995	50	FY 2044/2045	Mulberry Ln -- from Lake Angela Pointe, east, to Lake Pointe Cove	Infrastructure	688' of 8" DIP	$13,834.00	$276.68	$277.00	688	8	Ductile Iron	2045	$ 103,200	1	2	2	4
2001	50	FY 2050/2051	Muttonville Lane -- from 406' east of Main St., to Gratiot	Infrastructure	265' of 12" DIP	$39,221.34	$784.43	$784.00	265	12	Ductile Iron	2051	$ 44,520	1	2	3	6
1981	50	FY 2030/2031	Muttonville Lane -- from Main St., east (C)	Infrastructure	406' of 12" DIP	$9,561.13	$191.22	$191.00	406	12	Ductile Iron	2031	$ 68,208	2	2	3	6
1996	50	FY 2045/2046	Natures Way -- from 33-Mile Rd, south, to a point 37' south of the center line of Cherry Hill Ln (C)	Infrastructure	1,087' of 8" DIP	$26,511.93	$530.24	$530.00	1087	8	Ductile Iron	2046	$ 163,050	1	2	2	4
2001	50	FY 2050/2051	Natures Way -- from a point 165' south of the center line of Wisteria Ln, south, to the south end of Natures Way (C)	Infrastructure	920' of 10" DIP	$22,080.00	$441.60	$442.00	920	10	Ductile Iron	2051	$ 154,560	1	2	3	6
1998	50	FY 2047/2048	Natures Way -- from a point 37' south of the center line of Cherry Hill Ln., south, to a point 165' south of the center line of Wisteria Ln. (C)	Infrastructure	670' of 10" DIP	$18,760.00	$375.20	$375.00	670	10	Ductile Iron	2048	$ 112,560	1	2	3	6
1998	50	FY 2047/2048	Natures Way -- from Natures Way at a point 8' south of the center line of Golden Oak Ln, west, 237' (C)	Infrastructure	237' of 10" DIP	$6,636.00	$132.72	$133.00	237	10	Ductile Iron	2048	$ 39,816	1	2	3	6
1983	50	FY 2032/2033	Oak -- Bartell to Priestap (HUD)	Infrastructure	385' of 6" DIP	$6,518.05	$130.36	$130.00	385	6	Ductile Iron	2033	$ 57,750	2	2	2	4
1990	50	FY 2039/2040	Oak -- from Division, south	Infrastructure	410' of 6" DIP	$15,662.26	$313.25	$313.00	410	6	Ductile Iron	2040	$ 61,500	1	2	2	4
1985	50	FY 2034/2035	Oak -- Main St. to Bauman	Infrastructure	433' of 8" DIP	$23,914.59	$478.29	$478.00	433	8	Ductile Iron	2035	$ 64,950	2	2	2	4
1916	50	FY 1965/1966	Oak -- Priestap to Beier	Infrastructure	400' of 4" CIP	$560.00	$11.20		400	4	Cast Iron	1966	$ 60,000	2	2	2	4
1997	50	FY 2046/2047	Oak Ridge Circle -- from Lake Angela Dr, north, to north end)(C)	Infrastructure	210' of 8" DIP	$4,890.90	$97.82	$98.00	210	8	Ductile Iron	2047	$ 31,500	1	2	2	4
1994	50	FY 2043/2044	Oakwood Ln. -- from 270' W. of Rosewood, west to Seymour (C)	Infrastructure	280' of 8" DIP	$10,931.20	$218.62	$219.00	280	8	Ductile Iron	2044	$ 42,000	1	2	2	4
1988	50	FY 2037/2038	Oakwood Ln. -- from Rosewood Ln., west (C)	Infrastructure	270' of 8" DIP	$11,763.90	$235.28	$235.00	270	8	Ductile Iron	2038	$ 40,500	1	2	2	4
2004	50	FY 2053/2054	Orchard Ln. -- from 25' west of Beebe, west to Applewood St (C)	Infrastructure	675' of 8" DIP	$23,091.56	$461.83	$462.00	675	8	Ductile Iron	2054	$ 101,250	1	2	2	4
2003	50	FY 2052/2053	Orchard Ln. -- from Beebe, west, to 25' west of Beebe (C)	Infrastructure	75' of 8" DIP	$3,147.40	$62.95	$63.00	75	8	Ductile Iron	2053	$ 11,250	1	2	2	4
2012	50	FY 2061/2062	Park St -- from west side of Beebe to east side of Beebe	Infrastructure	69' of 6" DIP	$11,563.75	$231.28	$231.00	69	6	Ductile Iron	2062	$ 10,350	1	2	2	4
1939	50	FY 1988/1989	Park St. -- Forest to Stone	Infrastructure	325' of 6" CIP	$747.50	$14.95		325	6	Cast Iron	1989	$ 48,750	3	3	2	6
1916	50	FY 1965/1966	Park St. -- Ridge to Parker	Infrastructure	1,500' of 4" CIP	$2,100.00	$42.00		1500	4	Cast Iron	1966	$ 225,000	2	2	2	4
1960	50	FY 2009/2010	Park St. -- Stone to Beebe	Infrastructure	325' of 6" CIP	$2,921.75	$58.44		325	6	Cast Iron	2010	$ 48,750	3	3	2	6
1975	50	FY 2024/2025	Parker -- Churchill to Park St.	Infrastructure	470' of 4" DIP	$11,754.70	$235.09	$235.00	470	4	Ductile Iron	2025	$ 70,500	2	2	2	4
1985	50	FY 2034/2035	Parker -- Monroe to Water	Infrastructure	515' of 6" DIP	$11,371.20	$227.42	$227.00	515	6	Ductile Iron	2035	$ 77,250	2	2	2	4
1916	50	FY 1965/1966	Parker -- Park St. to Monroe	Infrastructure	464' of 4" CIP	$649.60	$12.99		464	4	Cast Iron	1966	$ 69,600	2	2	2	4
1985	50	FY 2034/2035	Parker -- Ridge to Churchill	Infrastructure	515' of 6" DIP	$27,089.00	$541.78	$542.00	515	6	Ductile Iron	2035	$ 77,250	2	2	2	4
2000	50	FY 2049/2050	Partridge Crossing — from west end, east 900', to Mallard Lane	Infrastructure	900' of 8" DIP	$22,500.00	$450.00	$450.00	900	8	Ductile Iron	2050	$ 135,000	1	2	2	4
1994	50	FY 2043/2044	Pheasant Ridge -- from west end, east 690' to curve, thence south, 230', to the east end of Meadowlark Ln. (C)	Infrastructure	920' of 8" DIP	$35,916.80	$718.34	$718.00	920	8	Ductile Iron	2044	$ 138,000	1	2	2	4
1981	50	FY 2030/2031	Pierce -- 140' east of Chaucer to proposed Shakespear Dr. (C)	Infrastructure	173' of 8" DIP	$3,053.45	$61.07	$61.00	173	8	Ductile Iron	2031	$ 25,950	2	2	2	4
1976	50	FY 2025/2026	Pierce -- from Chaucer, east, to east end (C)	Infrastructure	140' of 8" CIP	$4,235.00	$84.70	$85.00	140	8	Cast Iron	2026	$ 21,000	2	2	2	4
1976	50	FY 2025/2026	Pierce St. -- Beebe St to Canterbury (C)	Infrastructure	757' of 8" CIP	$22,899.25	$457.99	$458.00	757	8	Cast Iron	2026	$ 113,550	2	2	2	4
1997	50	FY 2046/2047	Pierce St. -- Main St. to Beebe (C)	Infrastructure	1,353' of 8" CIP	$40,928.25	$818.57	$819.00	1353	8	Cast Iron	2047	$ 202,950	2	2	2	4
1999	50	FY 2048/2049	Pierce St. -- Main St. to Beebe -----cut in three fire hydrants (C)	Infrastructure	3 hydrants	$6,750.00	$135.00	$135.00				2049					0
2001	50	FY 2050/2051	Pine Valley — from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$8,455.00	$169.10	$169.00	445	6	Ductile Iron	2051	$ 66,750	1	2	2	4
1995	50	FY 2044/2045	Pinewood Ln -- from Lilac Ln, north 771', to Lake Pointe Cove/Lost Forest Dr, thence east 125', to the 12" water main from Division Rd (C)	Infrastructure	896' of 8" DIP	$19,028.00	$380.56	$381.00	896	8	Ductile Iron	2045	$ 134,400	1	2	2	4
2016	50	FY 2065/2066	Pound Rd -- 142' E of Main Street to East City Limits	Infrastructure	3,950' of 12" DIP	$233,730.00	$4,674.60	$4,675.00	3950	12	Ductile Iron	2066	$ 663,600	1	2	3	6
2016	50	FY 2065/2066	Pound Rd -- Main Street to 142' East	Infrastructure	142' of 12" HDPE	$38,650.98	$773.02	$773.00	142	12	HDPE	2066	$ 23,856	1	2	3	6
1916	50	FY 1965/1966	Priestap -- Oak to Beech	Infrastructure	627' of 4" CIP	$877.80	$17.56		627	4	Cast Iron	1966	$ 94,050	2	2	2	4
2004	50	FY 2053/2054	Priestap St--from Main Street to Oak Street	Infrastructure	573' of 8" DIP	$75,646.40	$1,512.93	$1,513.00	573	8	Ductile Iron	2054	$ 85,950	1	2	2	4
1981	50	FY 2030/2031	proposed Weeks St. R.O.W.--Madison to well #9 access road (C)	Infrastructure	1,598' of 12" DIP	$37,632.90	$752.66	$753.00	1598	12	Ductile Iron	2031	$ 268,464	2	2	3	6
2001	50	FY 2050/2051	Quail Trail — from Mallard Lane, west, to west end of Quail Trail (C)	Infrastructure	980' of 8" DIP	$20,580.00	$411.60	$412.00	980	8	Ductile Iron	2051	$ 147,000	1	2	2	4
2003	50	FY 2052/2053	Quince Dr. -- from Applewood, east, to Beebe (C)	Infrastructure	810' of 8" DIP	$23,466.98	$469.34	$469.00	810	8	Ductile Iron	2053	$ 121,500	1	2	2	4
2016	50	FY 2065/2066	Richmond Medical Center - Connecting to CVS Line and St. Peter's	Infrastructure	1220' of 8" DIP	$59,905.00	$1,198.10	$1,198.00	1220	8	Ductile Iron	2066	$ 183,000	1	2	2	4
2009	50	FY 2058/2059	Richmond School Blvd entrance -- from Division Road, south, 570 feet	Infrastructure	570' of 8" DIP	$66,747.00	$1,334.94	$1,335.00	570	8	Ductile Iron	2059	$ 85,500	1	2	2	4
1965	50	FY 2014/2015	Richwood Lane -- from Forest, west (to Joewood Drive-2003 adjustment)	Infrastructure	1,525' of 6" CIP	$16,256.50	$325.13		1525	6	Cast Iron	2015	$ 228,750	2	2	2	4
2019	50	FY 2068/2069	Richwood Lane - From Madeline St to 199' west of Joe Wood	Infrastructure	146' of 8" DIP	$8,760.00	$175.20	$175.00	146	8	Ductile Iron	2069	$ 21,900	1	2	2	4
2003	50	FY 2052/2053	Richwood Ln. -- from Richwood Ln. (53' west of west side of Joewood), cross lots south, to north side of Diane Ln. (C	Infrastructure	427' of 8" DIP	$12,782.76	$255.66	$256.00	427	8	Ductile Iron	2053	$ 64,050	1	2	2	4
2003	50	FY 2052/2053	Richwood Ln. -- from the east side of Joewood, west, to west end (C)	Infrastructure	221' of 8" DIP	$8,850.88	$177.02	$177.00	221	8	Ductile Iron	2053	$ 33,150	1	2	2	4
2002	50	FY 2051/2052	Ridge -- from Grove to Park St	Infrastructure	650' of 8" DIP	$34,790.49	$695.81	$696.00	650	8	Ductile Iron	2052	$ 97,500	1	2	3	6

CITY OF RICHMOND
WATER FUND
SYSTEM FIXED ASSETS

Current FY: **FY 2021 / 2022**

1ST FY IN SERVICE (i.e. FY1975/1976 written 1976)	DEP. TERM (YRS)	LAST FY OF DEP.	ITEM	TYPE	DESCRIPTION	ORIGINAL COST	YEARLY DEPRECIATION	FY 2021 /2022 DEPRECIATION	PIPE LENGTH (FEET)	PIPE SIZE (INCHES)	PIPE MATERIAL	DEP. (i.e. FY1995/1996 written 1996)	REPLACEMENT COST	CONDITION ASSESSMENT	PROBABILITY OF FAILURE	CONSEQUENCE OF FAILURE	CRITICALITY FACTOR
1937	50	FY 1986/1987	Ridge -- from Lowe Plank to City Limits (drain crossing replaced with 70' of 2" plastic)	Infrastructure	2,140' of 2" GAL	$3,210.00	$64.20		2140	2	Galvanized	1987	$ 321,000	4	4	1	4
2002	50	FY 2051/2052	Ridge -- from Main to Grove	Infrastructure	1,150' of 12" DIP	$83,475.23	$1,669.50	$1,670.00	1150	12	Ductile Iron	2052	$ 193,200	1	2	3	6
1985	50	FY 2034/2035	Ridge -- Park St. to City Limits	Infrastructure	1,315' of 8" DIP	$72,627.45	$1,452.55	$1,453.00	1315	8	Ductile Iron	2035	$ 197,250	2	2	3	6
1996	50	FY 2045/2046	Riverview -- from the west end of Meadowlark Ln, south, to the Windsong Ln	Infrastructure	229' of 8" DIP	$5,585.31	$111.71	$112.00	229	8	Ductile Iron	2046	$ 34,350	1	2	2	4
1996	50	FY 2045/2046	Rosebud Ln -- from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$7,969.95	$159.40	$159.00	445	6	Ductile Iron	2046	$ 66,750	1	2	2	4
1992	50	FY 2041/2042	Rosewood Ln. -- from 925' south of Dow St., south (C)	Infrastructure	370' of 8" DIP	$15,673.20	$313.46	$313.00	370	8	Ductile Iron	2042	$ 55,500	1	2	2	4
1988	50	FY 2037/2038	Rosewood Ln. -- from Dow Street, south (C)	Infrastructure	925' of 8" DIP	$40,302.25	$806.05	$806.00	925	8	Ductile Iron	2038	$ 138,750	1	2	2	4
1997	50	FY 2046/2047	Samual Ct. -- from north side of cul-de-sac, south, to a point approximately 118' south of Chaskey St. (C)	Infrastructure	496' of 8" DIP	$17,379.84	$347.60	$348.00	496	8	Ductile Iron	2047	$ 74,400	1	2	2	4
1968	50	FY 2017/2018	School Property -- from 368' south of Division Rd., south 1,532'	Infrastructure	1,532' of 4" CIP	$18,659.76	$373.20		1532	4	Cast Iron	2018	$ 229,800	2	2	2	4
1994	50	FY 2043/2044	Seymour St. -- from Dow to Mert (C)	Infrastructure	1,692' of 8" DIP	$66,055.68	$1,321.11	$1,321.00	1692	8	Ductile Iron	2044	$ 253,800	1	2	2	4
1997	50	FY 2046/2047	Silver Maple Ct. -- from Lake Angela Dr., west, to west end (C)	Infrastructure	287' of 8" DIP	$6,684.23	$133.68	$134.00	287	8	Ductile Iron	2047	$ 43,050	1	2	2	4
2008	50	FY 2057/2058	Skinner Dr -- from a point 520' north of well #9 roadway, east, 972' and all associated costs for tie-in, service leads, valves, and fire hydrants.	Infrastructure	972' of 8" DIP	$73,997.43	$1,479.95	$1,480.00	972	8	Ductile Iron	2058	$ 145,800	1	2	2	4
1985	50	FY 2034/2035	Skinner Dr. -- from a point 270' south of well #9 access drive on Skinner Dr., east (Industrial Park)	Infrastructure	370' of 8" DIP	$7,888.80	$157.78	$158.00	370	8	Ductile Iron	2035	$ 55,500	2	2	2	4
1981	50	FY 2030/2031	Skinner Dr. --from well #9 access road to Division (C)	Infrastructure	1,072' of 12" DIP	$25,245.60	$504.91	$505.00	1072	12	Ductile Iron	2031	$ 180,096	2	2	3	6
1981	50	FY 2030/2031	Stoecker Ln -- 860' S. of Division in easement east to middle school 4" main (C)	Infrastructure	505' of 8" DIP	$23,230.00	$464.60	$465.00	505	8	Ductile Iron	2031	$ 75,750	2	2	2	4
2009	50	FY 2058/2059	Stoecker Ln -- from Division Rd, south, 930'	Infrastructure	930' of 8" DIP	$105,834.85	$2,116.70	$2,117.00	930	8	Ductile Iron	2059	$ 139,500	1	2	2	4
2019	50	FY 2068/2069	Stoecker Ln -- From S. end of Stoecker Lane to Woodside Drive	Infrastructure	770' of 8" DIP	$51,000.00	$1,020.00	$1,020.00	770	8	Ductile Iron	2069	$ 115,500	1	2	2	4
1987	50	FY 2036/2037	Stoecker Ln. -- from 1,080' S. of Division, south, to end (C)	Infrastructure	870' of 6" DIP	$47,945.70	$958.91	$959.00	870	6	Ductile Iron	2037	$ 130,500	1	2	3	6
1981	50	FY 2030/2031	Stoecker Ln. -- from 930' S. of Division, south, 150' (C)	Infrastructure	150' of 8" DIP	$6,900.00	$138.00	$138.00	150	8	Ductile Iron	2031	$ 22,500	2	2	2	4
1937	50	FY 1986/1987	Stone St -- Jefferson to Division	Infrastructure	2,400' of 4" CIP	$4,920.00	$98.40		2400	4	Cast Iron	1987	$ 360,000	3	3	2	6
1985	50	FY 2034/2035	Stone St -- Madison to Jefferson	Infrastructure	512' of 6" DIP	$26,931.20	$538.62	$539.00	512	6	Ductile Iron	2035	$ 76,800	2	2	2	4
1996	50	FY 2045/2046	Sunny Brook Ln -- from 33-Mile Rd, south, to a point 37' south of the center line of Cherry Hill Ln (C)	Infrastructure	1,094' of 8" DIP	$26,682.66	$533.65	$534.00	1094	8	Ductile Iron	2046	$ 164,100	1	2	2	4
2001	50	FY 2050/2051	Sunny Brook Ln -- from a point 165' south of the center line of Wisteria Ln, south, to the south end of Sunny Brook (C)	Infrastructure	930' of 8" DIP	$19,530.00	$390.60	$391.00	930	8	Ductile Iron	2051	$ 139,500	1	2	2	4
1998	50	FY 2047/2048	Sunny Brook Ln -- from a point 37' south of the center line of Cherry Hill Ln., south, to a point 165' south of the center line of Wisteria Ln. (C)	Infrastructure	682' of 8" DIP	$19,096.00	$381.92	$382.00	682	8	Ductile Iron	2048	$ 102,300	1	2	2	4
2001	50	FY 2050/2051	Sunny Brook Ln -- from a point 60' north of Cedar Ridge on the west side of Sunny Brook, east 170', along the north P.L. of Lot #33	Infrastructure	170' of 8" DIP	$3,570.00	$71.40	$71.00	170	8	Ductile Iron	2051	$ 25,500	1	2	2	4
1998	50	FY 2047/2048	Swan Creek Blvd -- from the west end of Swan Creek Blvd., south, to the west end of Partridge Crossing (C)	Infrastructure	189' of 8" DIP	$4,725.00	$94.50	$95.00	189	8	Ductile Iron	2048	$ 28,350	1	2	2	4
1998	50	FY 2047/2048	Swan Creek Blvd. -- from Mallard Ln, west, to west end (C)	Infrastructure	980' of 8" DIP	$24,500.00	$490.00	$490.00	980	8	Ductile Iron	2048	$ 147,000	1	2	2	4
1961	50	FY 2010/2011	Walnut -- Park St. to Monroe	Infrastructure	442' of 6" CIP	$4,088.50	$81.77		442	6	Cast Iron	2011	$ 66,300	2	2	2	4
1985	50	FY 2034/2035	Washington -- Main St. to Beebe	Infrastructure	1,030' of 6" DIP	$54,178.00	$1,083.56	$1,084.00	1030	6	Ductile Iron	2035	$ 154,500	2	2	2	4
1963	50	FY 2012/2013	Water St -- Beebe to Stone	Infrastructure	300' of 6" CIP	$2,961.00	$59.22		300	6	Cast Iron	2013	$ 45,000	2	2	2	4
1985	50	FY 2034/2035	Water St -- Main St. to Parker	Infrastructure	305' of 6" DIP	$16,043.00	$320.86	$321.00	305	6	Ductile Iron	2035	$ 45,750	2	2	2	4
1916	50	FY 1965/1966	Water St -- Main Street to Stone Street	Infrastructure	650' of 8" CIP	$1,014.00	$20.28		650	8	Cast Iron	1966	$ 97,500	2	2	2	4
2005	50	FY 2054/2055	Well # 14 feed main -- contributed by Layne-Northern	Infrastructure	107' of 6" DIP-install	$4,500.00	$90.00	$90.00	107	6	Ductile Iron	2055	$ 16,050	1	2	2	4
2003	50	FY 2052/2053	Well #14 access drive -- from 33-Mile Rd, north, to well house #14	Infrastructure	383' of 8" DIP	$16,319.00	$326.38	$326.00	383	8	Ductile Iron	2053	$ 57,450	1	2	2	4
2005	50	FY 2054/2055	Well #14 feed main -- City expense portion	Infrastructure	107' of 6" DIP	$4,023.00	$80.46	$80.00	107	6	Ductile Iron	2055	$ 16,050	1	2	2	4
1956	50	FY 2005/2006	Well #9 access road -- from well to Skinner Dr.	Infrastructure	926' of 6" CIP	$6,935.74	$138.71		926	6	Cast Iron	2006	$ 138,900	2	2	2	4
1995	50	FY 2044/2045	Wild Rose Circle -- from Hummingbird Ln, south, to the south end of the street	Infrastructure	170' of 8" DIP	$4,510.00	$90.20	$90.00	170	8	Ductile Iron	2045	$ 25,500	1	2	2	4
1996	50	FY 2045/2046	Windsong Ln -- from the east end of Windsong Ln, south, 141', thence east 141', thence south 89', to the east end of Mourning Dove Ln (C)	Infrastructure	371' of 8" DIP	$9,048.69	$180.97	$181.00	371	8	Ductile Iron	2046	$ 55,650	1	2	2	4
1996	50	FY 2045/2046	Windsong Ln -- from west end to east end (C)	Infrastructure	812' of 8" DIP	$19,804.68	$396.09	$396.00	812	8	Ductile Iron	2046	$ 121,800	1	2	2	4
1995	50	FY 2044/2045	Windswept Pointe -- from Lake Angela Pointe, east & north, to the north end of the street	Infrastructure	420' of 8" DIP	$9,010.00	$180.20	$180.00	420	8	Ductile Iron	2045	$ 63,000	1	2	2	4
1998	50	FY 2047/2048	Wisteria Ln -- from Natures Way to Sunny Brook Ln (C)	Infrastructure	445' of 6" DIP	$9,790.00	$195.80	$196.00	445	6	Ductile Iron	2048	$ 66,750	1	2	2	4
1998	50	FY 2047/2048	Wisteria Ln -- from the east end of Chickadee Ridge, south, to the east end of the southern portion of Swan Creek Blvd. (C)	Infrastructure	216' of 8" DIP	$5,400.00	$108.00	$108.00	216	8	Ductile Iron	2048	$ 32,400	1	2	2	4
2019	50	FY 2068/2069	Woodside Dr. - From Ashley Ave to Madeline St	Infrastructure	288' of 8" HDPE	$17,280.00	$345.60	$346.00	288	8	HDPE	2069	$ 43,200	1	2	2	4
2019	50	FY 2068/2069	Woodside Dr. - From Madeline St to 199' west of Joe Wood	Infrastructure	301' of 8" DIP	$18,060.00	$361.20	$361.00	301	8	Ductile Iron	2069	$ 45,150	1	2	2	4
1999	50	FY 2048/2049	Woodside Dr. — from S. Forest, west, to a point 199' west of Joewood (C)	Infrastructure	1,867' of 8" DIP	$73,948.15	$1,478.96	$1,479.00	1867	8	Ductile Iron	2049	$ 280,050	1	2	2	4
2007	50	FY 2056/2057	WWTP wet weather detention tank water main extension & fire hydrant	Infrastructure	255' of 8" DIP	$34,490.20	$689.80	$690.00	255	8	Ductile Iron	2057	$ 38,250	1	2	2	4
1982			#3A Well Built On Property Owned By General Fund	Land	0.0 Acres	$0.00											0
1986			#4A Well Built On Property Owned By General Fund	Land	0.0 Acres	$0.00											0
1986			Land Purchase -- #10 Well	Land	0.534 Acres	$10,000.00											0
1992			Land Purchase -- #11 Well & Perm. Roadway & Utility Easement	Land	3.47 Acres	$72,040.00											0
2002			Land Purchase -- #13 Well & Non-Exclusive Road & Utility Easement	Land	3.358 Acres	$5,040.00											0
1992			Land Purchase -- #14 Well & Non-Exclusive Road & Utility Easement	Land	3.624 Acres	$37,610.00											0
1956			Land Purchase -- #9 Well & Permanent Roadway Easement	Land	1.556 Acres	$980.00											0
1961			Land Purchase -- Water Tower (C)	Land	1.190 Acres	$1.00											0
1948			Land Purchase-- #8 Well & Permanent Access Easement	Land	3.192 Acres	$1,661.50											0
																	0
																	0
			TOTALS -- BEING DEPRECIATED			**$8,893,617.51**		**$166,525.00**									

CITY OF RICHMOND
WATER FUND
SYSTEM FIXED ASSETS

Current FY: **FY 2021 / 2022**

1ST FY IN SERVICE (i.e. FY1975/1976 written 1976)	DEP. TERM (YRS)	LAST FY OF DEP.	ITEM	TYPE	DESCRIPTION	ORIGINAL COST	YEARLY DEPRECIATION	FY 2021 /2022 DEPRECIATION	PIPE LENGTH (FEET)	PIPE SIZE (INCHES)	PIPE MATERIAL	DEP. (i.e. FY1995/1996 written 1996)	REPLACEMENT COST	CONDITION ASSESSMENT	PROBABILITY OF FAILURE	CONSEQUENCE OF FAILURE	CRITICALITY FACTOR

	ORIGINAL COST	FY 2021 /2022 DEPRECIATION
Building	$1,602,566.21	$31,698.00
Equipment	$413,723.89	$5,023.00
Infrastructure	$6,749,994.91	$129,804.00
Land	$127,332.50	$0.00
	$8,893,617.51	**$166,525.00**

ADDITIONS / DELETIONS TO FIXED ASSETS FOR CURRENT FISCAL YEAR

1ST FY IN SERVICE (i.e. FY1975/1976 written 1976)	DEP. TERM (YRS)	LAST FY OF DEP.	ITEM	TYPE	DESCRIPTION	ORIGINAL COST	YEARLY DEPRECIATION	REASON
1937	50	FY 1986/1987	Forest -- Gleason to 31 Mile Rd.	Infrastructure	300' of 1" GAL	$450.00	$9.00	Abandoned
2022	50	FY 2071/2072	Forest - Gleason to 31 Mile Rd	Infrastructure	950' of 1" Plastic/Cop	$9,500.00	$190.00	New
2022	50	FY 2071/2072	Huvaere's Auto Dealership	Infrastructure	1700' of 8" DI			New

Appendix D

20 Year Budget

For: FY2021/ 2022 Revised: 2/22/2022

FUND No. 591 - WATER FUND

** Beginning CASH balance: BS&A GL Reports, Cash Summary by fund

591.001 REVENUES ACCOUNT	ACCOUNT NAME	ACTUAL FY 06/07	ACTUAL FY20/21	PROJECTED FY21/22	PROJECTED FY22/23	PROJECTED FY23/24	PROJECTED FY24/25	PROJECTED FY25/26	PROJECTED FY26/27	PROJECTED FY27/28	PROJECTED FY28/29	PROJECTED FY29/30	PROJECTED FY30/31	PROJECTED FY31/32	PROJECTED FY32/33	PROJECTED FY33/34	PROJECTED FY34/35	PROJECTED FY35/36	PROJECTED FY36/37
001.530.000	FEMA Grant Funding		$0	$0	$42,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
001.539.000	DEQ Grant Funding		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
001.631.000	Water Meter Services	$1,704	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
001.633.000	Hydrant Rental	$2,575	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500
	Est. Increase:				0.00%	3.00%	0.00%	3.00%	0.00%	3.00%	0.00%	2.00%	0.00%	2.00%	0.00%	2.00%	0.00%	2.00%	0.00%
	Usage Rates/1000 gallons:		**$4.39**	**$4.39**	**$4.39**	**$4.52**	**$4.52**	**$4.66**	**$4.66**	**$4.80**	**$4.80**	**$4.89**	**$4.89**	**$4.99**	**$4.99**	**$5.09**	**$5.09**	**$5.19**	**$5.19**
001.644.000	Usage Fees	$722,385	$630,871	$838,420	$609,000	$627,270	$627,270	$646,088	$646,088	$665,471	$665,471	$678,780	$678,780	$692,356	$692,356	$706,203	$706,203	$720,327	$720,327
	Est. Readiness to Serve/Qtr:		**$16.00**	**$20.00**	**$23.00**	**$23.00**	**$23.00**	**$23.00**	**$24.00**	**$24.00**	**$26.00**	**$26.00**	**$28.00**	**$28.00**	**$30.00**	**$30.00**	**$30.00**	**$30.00**	**$30.00**
	Current Units:		11458	11480															
001.644.000	Readiness To Serve		$181,441		$264,040	$264,040	$264,040	$264,040	$275,520	$275,520	$298,480	$298,480	$321,440	$321,440	$344,400	$344,400	$344,400	$344,400	$344,400
001.647.000	Tap Fees	$175	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
001.654.000	Penalties	$11,228	$12,619	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
001.665.000	Interest on Investments	$24,202	($682)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
001.670.000	Miscellaneous Revenues	$4,414	$8,607	$16,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
001.699.499	Trans. In: Capital Improvements	$150,000	$0	$0	$502,000	$50,000	$198,750	$964,000	$205,000	$50,000	$268,000	$0	$528,137	$0	$0	$1,103,801	$443,561	$0	$0
001.699.590	Trans. In: Sewer Fund	$19,740	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454	$22,454
001.699.999	Beginning CASH Balance	$347,710	$918,517	$963,056	$946,400	$812,395	$762,655	$731,458	$718,506	$700,345	$670,757	$685,198	$645,896	$598,377	$555,129	$515,407	$479,969	$444,835	$443,994
	O&M Fund	$347,710	$792,168	$800,800	$807,544	$698,539	$673,799	$640,952	$618,704	$599,603	$591,436	$590,043	$543,198	$510,429	$482,230	$467,858	$458,073	$438,898	$424,326
	Equipment Replacement Fund		$126,349	$162,256	$138,856	$113,856	$88,856	$90,506	$99,803	$100,742	$79,321	$95,156	$102,699	$87,948	$72,899	$47,549	$21,896	$5,937	$19,668
	Total Revenues	$1,284,133	$1,776,327	$1,852,430	$2,400,394	$1,790,659	$1,889,669	$2,642,540	$1,882,069	$1,728,290	$1,939,661	$1,699,413	$2,211,208	$1,649,127	$1,628,838	$2,706,765	$2,011,087	$1,546,516	$1,545,675
591 EXPENDITURES																			
ACTIVITY	ACTIVITY NAME																		
	Est. Admin. Exp. Increase:			**2.00%**															
200	Administrative	$101,910	$141,709	$163,216	$226,212	$154,911	$158,009	$161,169	$164,393	$167,681	$171,034	$174,455	$177,944	$181,503	$185,133	$188,836	$192,612	$196,465	$200,394
	Est. Oper. Exp. Increase:			**1.00%**															
538	Water Production	$173,729	$128,840	$168,768	$222,017	$224,237	$226,480	$228,744	$231,032	$233,342	$235,676	$238,032	$240,413	$242,817	$245,245	$247,697	$250,174	$252,676	$255,203
				Well #14	Well #9	#10	#14 (3yr)		#14 (3yr)	#4		#14 (3yr)	#11	#9	#14 (15yr)	#3 (15yr)	#10		
	Well Maint. (Equipment Repl. Exp.)		$0	$35,000	$35,000	$35,000	$8,000		$8,000	$30,000		$8,000	$30,000	$30,000	$40,000	$40,000	$30,000		
	Other Equipment Repl. Expenses		$4,093	$15,000	$15,000	$15,000	$15,150	$15,302	$15,455	$15,609	$15,765	$15,923	$16,082	$16,243	$16,405	$16,569	$16,735	$16,902	$17,071
	Est. Oper. Exp. Increase:			**1.00%**															
548	Water System Expense	$279,453	$288,996	$339,046	$308,570	$311,656	$314,772	$317,920	$321,099	$324,310	$327,553	$330,829	$334,137	$337,478	$340,853	$344,262	$347,704	$351,181	$354,693
	548 Total			$495,989	$475,088														
548.968.000	Depreciation			$156,943	$166,518														
	Water Meters			$13,400	$20,000	$20,000	$20,200	$20,402	$20,606	$20,812	$13,400	$13,534	$13,669	$13,806	$13,944	$14,084	$14,224	$14,367	$14,510
559	Wellhead Protection	$903	$0	$0	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200
					Stone St & Barn & Meters	Meters	Park & Forest & Meters & CH	Main St & Meters	Circle Ln & Meters	Meters	Grove St		Howard			Main St	Main St		
900	Capital Improvements	$27,743	$0	$0	$544,000	$50,000	$198,750	$964,000	$205,000	$50,000	$268,000		$528,137			$1,103,801	$ 443,561.00		
906	Debt Service	$113,048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
965	Transfers Out	$0	$200,000	$200,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000
965.999.499	Capital Improvement Fund		$200,000	$200,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000
	Equipment Replacement Fund		$40,000	$40,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000
	Total Expenditures	$696,786	$759,545	$906,030	$1,587,999	$1,028,004	$1,158,211	$1,924,034	$1,181,724	$1,057,533	$1,254,463	$1,053,516	$1,612,831	$1,093,998	$1,113,431	$2,226,796	$1,566,252	$1,102,522	$1,112,490
	Ending FUND Balance	**$587,347**	$1,016,782	$946,400	$812,395	$762,655	$731,458	$718,506	$700,345	$670,757	$685,198	$645,896	$598,377	$555,129	$515,407	$479,969	$444,835	$443,994	$433,185
	O&M Fund	$587,347	**$854,526**	**$807,544**	**$698,539**	**$673,799**	**$640,952**	**$618,704**	**$599,603**	**$591,436**	**$590,043**	**$543,198**	**$510,429**	**$482,230**	**$467,858**	**$458,073**	**$438,898**	**$424,326**	**$400,099**
	Equipment Replacement Fund		$162,256	$138,856	$113,856	$88,856	$90,506	$99,803	$100,742	$79,321	$95,156	$102,699	$87,948	$72,899	$47,549	$21,896	$5,937	$19,668	$33,086

FUND No. 499 - Capital Improvement Fund

499.001 REVENUES																			
648.000	Contributing Capital Charges		$21,975	$22,500	$6,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
665.000	Interest on Investments		($289)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
699.591	Trans. In: Water Fund		$200,000	$200,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000
699.999	Beginning CASH Balance		$444,333	$666,019	$888,519	$642,519	$842,519	$893,769	$179,769	$224,769	$424,769	$406,769	$706,769	$478,632	$778,632	$1,078,632	$274,831	$131,270	$431,270
	Total Revenues		$666,019	$888,519	$1,144,519	$892,519	$1,092,519	$1,143,769	$429,769	$474,769	$674,769	$706,769	$1,006,769	$778,632	$1,078,632	$1,378,632	$574,831	$431,270	$731,270
499 EXPENDITURES																			
ACTIVITY	ACTIVITY NAME																		
965	Transfers Out		$0	$0	$502,000	$50,000	$198,750	$964,000	$205,000	$50,000	$268,000	$0	$528,137	$0	$0	$1,103,801	$443,561	$0	$0
965.999.101	General Fund		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
965.999.591	Water Fund		$0	$0	$502,000	$50,000	$198,750	$964,000	$205,000	$50,000	$268,000	$0	$528,137	$0	$0	$1,103,801	$443,561	$0	$0
	Total Expenditures		$0	$0	$502,000	$50,000	$198,750	$964,000	$205,000	$50,000	$268,000	$0	$528,137	$0	$0	$1,103,801	$443,561	$0	$0
	Ending FUND Balance		**$666,019**	**$888,519**	**$642,519**	**$842,519**	**$893,769**	**$179,769**	**$224,769**	**$424,769**	**$406,769**	**$706,769**	**$478,632**	**$778,632**	**$1,078,632**	**$274,831**	**$131,270**	**$431,270**	**$731,270**

Appendix E

Fee Schedule

CITYOF RICHMOND
COUNTIES OF MACOMB AND ST. CLAIR
STATE OF MICHIGAN

FY 2022-23 FEE SCHEDULE
As adopted at the June 20, 2022 City Council Meeting

ADMINISTRATION

Attorney Services ..... Actual Cost
Auction Fees:
- Cash Bond ..... $2,000 when auctioning jewelry, precious metal items, or precious or semi-precious stones
- License Fee $5.00
- Auction Sale Permit Fee $5.00
- Auction Inspection Fee ..... $10.00 per each day of auction

Certifications, each $2.00
Fax Service ..... $2.00 first page; $1.00 each additional page
FOIA Fee ..... per FOIA Policy
Industrial Development/Plant Rehabilitation District Establishment Application Fee $500.00
Industrial Development/Plant Rehabilitation Tax Exemption Application Fee ..... 1/10 of 1% of total value of project to be subject to Industrial Facilities Exemption Certificate
Livestock Application/Permit Fee (non-refundable) $25.00
Notary Fee ……City of Richmond Residents or Organizations no charge, non-residents $10.00
Peddlers/Solicitors:
- Cash Bond $100.00
- License Fee $20.00

Photostatic Copies ..... $0.25 per one-sided sheet; $0.30 per two-sided sheet
Tape Recording Copies (video and audio), each $25.00
Voter Registry List ..... $0.01 per voter name
Voter Registry List (on CD) ..... $5.00 + $0.01 per voter name
Voter Registry Labels .....$5.00 + $0.01 per voter name

ADMINISTRATION – PLANS AND REPORTS

Business District Master Plan $25.00
City Audit Report $5.00
City Budget, as adopted with detail $10.00
City Budget, as amended – computer printout without detail $5.00
City Master Plan $35.00
Sanitary Sewer System Master Plan $50.00
Tax Increment Finance Authority Development and Financing Plan $25.00
Transportation Master Plan $25.00
Water System Master Plan $50.00
Zoning Ordinance $30.00

ASSESSING OFFICE

Lot Splits $105.00
Lot Combinations $55.00
Processing Labels ..... $0.02 per label ($10.00 deposit)
Property Field Sheets $1.00
Copy of Current Tax Roll on CD $500.00
All other document copies ..... $0.25 per one-sided page / $0.30 two-sided

BUILDING DEPARTMENT

General Fees

Board of Construction Code Appeals $250.00

Building Work

Minimum Permit Fee $75.00
Residential – New Construction:
Minimum fee (includes up to 7 inspections) ..... $380.00 + $0.32 per sq. ft.
Residential – Additions, Alterations, Attached Garages:
Minimum fee (includes up to 3 inspections) ..... $180.00 + $0.22 per sq. ft.
Residential – Detached Garages, Accessory Buildings, Sheds, Decks:
Minimum fee (includes up to 2 inspections) ..... $125.00 + $0.18 per sq. ft.
Residential – Manufactured Home:
Piers and Set up complete (includes up to 2 inspections) $175.00
Piers only (includes up to 2 inspections) $100.00
Set only (includes 1 inspection) $85.00
Commercial and Industrial – New Construction and Additions:
Minimum fee (does not incl. planning and engineering fees) . $375.00 + $0.27 per sq. ft.
Commercial and Industrial – Alterations:
Minimum fee (does not incl. planning and engineering fees) . $255.00 + $0.25 per sq. ft.
Construction Plan Review Deposit (applied towards permit and plan review fee):
Residential – New construction .....(minimum) $75.00
Commercial and Industrial ..... (minimum) $100.00
Construction Plan Review Fee:
Residential – New construction $50.00
Commercial and Industrial..... (.0013 X construction value, calculated with the most current version of the ICC Building Valuation Data with Regional Cost Modifier).
Demolition Permit (includes up to 2 inspections) $100.00
Additional Inspections (each) $65.00
Red Tag Fee, each $130.00
Administration Fee - projects started without permit $130.00
Cash Bonds Required on All Construction Projects:
New construction ..... $500.00 per building
Additions, alterations, garages, sheds, pools, ponds, decks $200.00

Temporary occupancy permits, paid as an additional bond:
Residential - New construction $500.00
Commercial & Industrial – Cost of work not completed with min fee of. $500.00
(Additional bonds for temporary occupancy refunded only if all work and codes are met within the time period set (usually 30 days)

Electrical Work

Permit Application Fee (non-refundable) $65.00
Service, subpanels:
Up to 200 AMP $15.00
Over 200 AMP. through 600 AMP $20.00
Over 600 AMP through 800 AMP $25.00
Over 800 AMP through 1200 AMP $30.00
Over 1200 AMP (GFI only) $50.00
Circuits
First 25 ..... $10.00
Each additional 25 ..... $5.00
Lighting Fixtures
First 25 ..... $10.00
Each additional 25 ..... $5.00
Dishwasher $6.00
Furnace – unit heater/reconnect $10.00
Electrical Heating Units (baseboard) $6.00
Power Outlets (electric ranges, ovens, dryers, water heaters, disposals, sump pumps, dishwashers, sub-panels, air conditioners, refrigeration, etc. $8.00
Signs:
Unit $10.00
Letter $15.00
Neon – each 25 feet $20.00
Feeders – bus ducts, etc. – per 50 feet $6.00
Mobile Home Park Site:
Setting mobile home in park - Application fee + site fee + feeder fee $6.00
Exhaust Fans $6.00
Wind, Solar, KVA, HP, Wind Turbines, EVSE[1], PV[2] Modules $35.00
Units up to 20 K.V.A. & H.P/per PV Module or Motor $6.00
Units 21 to 50 K.V.A. or H.P/per PV Module or Motor $10.00
Units 51 K.V.A. or H.P. and over/per PV Module or Motor $12.00
[1]Electric Vehicle Supply Equipment
[2]Photovoltaic
Fire Alarms – each device $5.00
Smoke Detectors $5.00
Sump pumps $6.00
Disposal $6.00
Swimming Pools $25.00
Hot Tubs $25.00

A/C Units	$18.00
Generators	$25.00
Geo-Thermal	$25.00
Special/Safety Inspection (includes certification fee)	$65.00
Additional Inspection	$65.00
Trench Inspection	$65.00
Final Inspection	$65.00
Registration Fee	$15.00

Mechanical Work

Permit Application Fee (non-refundable)	$65.00
Residential Heating System New House (includes duct and pipe)	$150.00
Furnace	$30.00
Boiler	$30.00
Water Heater Residential	$20.00
Water Heater Commercial	$30.00
Solid Fuel Equipment (includes chimney)	$30.00
Gas Burning Fireplace	$30.00
Chimney, Factory-built – installed separately	$25.00
Solar; set of 3 panels (includes piping)	$20.00
Gas Piping; Main up to 2” Diameter	$20.00
Gas Outlets	$5.00
Air Conditioning (includes split systems)	$30.00
Bath and Kitchen Exhaust	$5.00
Pool Heater (includes gas piping)	$55.00
Refrigeration - All Types (per conditioning unit)	$30.00
Commercial Clothes Dryer	$25.00
Gas Generator (includes gas piping)	$30.00
Humidifiers	$10.00
All Dampers (Fresh Air, Combustion, Vent)	$5.00
Duct Zone (Up to 4 Zones)	$10.00
Hydronic Baseboard	$20.00
Duct	$0.10 per foot (minimum $25.00)
HVAC Rooftop	$60.00
Air Handlers	$20.00
Spray Booth (Includes Duct and Exhaust Fan)	$90.00
Commercial Hoods (Includes Duct, Exhaust Fan, & Test)	$90.00
Heat Recovery Units	$10.00
V.A.V. Boxes	$10.00
Unit Ventilators	$10.00
Unit Heaters (terminal units)	$15.00
Fire Suppression/Protection	$0.75 per head (minimum $20.00)
Evaporator Coils	$30.00
Chiller	$30.00
Cooling Towers	$30.00

Compressor $30.00
Special / Safety Inspection (includes certification fee) $65.00
Additional Inspection $65.00
Underground Inspection $65.00
Final Inspection $65.00
Registration Fee $15.00

Plumbing Work

Permit Application Fee (non-refundable) $65.00
Mobile Home Park Site:
Setting mobile or modular home in park – App. fee + Mobile home park site $30.00
Fixtures, floor drains, special drains, water connected appliances, water heater – each $5.00
Stacks (soil, waste, vent, and conductor) – each $3.00
Sewage Ejectors and Sumps – each $5.00
Sub-soil Drains $5.00
Water Service:
Less than 2" $5.00
2" to 6" $25.00
Over 6" $50.00
Connection building drain – building sewers $5.00
Sewers (sanitary or storm):
Less than 6" $5.00
6" and over $25.00
Manholes and Catchbasins – each $5.00
Watering Distribution Pipe (system):
¾" Water Distribution Pipe $5.00
1" Water Distribution Pipe $10.00
1-¼" Water Distribution Pipe $15.00
1-½" Water Distribution Pipe $20.00
2" Water Distribution Pipe $25.00
Over 2" Water Distribution Pipe $30.00
Reduced Pressure Zone Back-flow Preventer – each $5.00
Domestic water treatment and filtering equipment only $5.00
Medical gas system $45.00
Special/Safety Inspection (includes certification fee) $65.00
Additional Inspection $65.00
Underground Inspection $65.00
Final Inspection $65.00
Registration Fee $15.00

CABLE TELEVISION SERVICES

Video Tape Recordings – copies:
All Programs (VHS or DVD) $10.00
Videotaping Services (non-city related with prior approval from City Manager):

ENG Style (operator, camcorder, tripod and microphone):
- Per hour $50.00
- Per half day (4 hours or less) $175.00
- Per full day (more than 4 hours up to 8 hours) $325.00

Video Editing Services (non-city related with prior approval from City Manager):
- Digital NLE (cuts only, no graphics, no music), per hour $75.00
- A/B roll with graphics and music, per hour $100.00

CEMETERY

Lot Purchase:
- Resident, single grave $500.00
- Non-resident, single grave $1,200.00
- Resident, Babyland grave $225.00
- Non-resident, Babyland grave $450.00

Grave Opening and Closing: (Includes Graveside Service Fees)

Single grave:
- Weekdays, resident $550.00
- Weekdays, non-resident $750.00
- Saturdays, resident $600.00
- Saturdays, non-resident $800.00
- Sundays and holidays, resident $650.00
- Sundays and holidays, non-resident $850.00

Infant/Child Grave (under one year):
- Weekdays, resident $175.00
- Weekdays, non-resident $200.00
- Saturdays, resident $200.00
- Saturdays, non-resident $225.00
- Sundays and holidays, resident $225.00
- Sundays and holidays, non-resident $250.00

Cremains (grave):
- Weekdays, resident $275
- Weekdays, non-resident $450
- Saturdays, resident $400
- Saturdays, non-resident $500
- Sundays and holidays, resident $450
- Sundays and holidays, non-resident $550

Mausoleum Crypt:
- Weekdays $350
- Saturdays $400
- Sundays and holidays $450

Columbarium Niche (includes Niche Headstones):
- Weekdays $150
- Saturdays $200
- Sundays and holidays $250

Weekend and Holiday burial orders given after 10 a.m. of the last regular work day:
Saturday opening ..... add $50.00 to Opening/Closing Fees
Sunday or Holiday opening ..... add $125.00 to Opening/Closing Fees

Winter Rates:
December 15 thru April 15 add $100.00 to opening/closing fees, except infants, Mausoleum, and Columbarium.

Chapel Service ..... add $25.00 to Opening/Closing Fee

Ownership/Title Transfer:
Mausoleum Crypt & Columbarian Niche $25.00
Lots:
Resident-to-resident $25.00
Non-resident-to-non-resident $25.00
Non-resident-to-resident $25.00
Resident-to-non-resident (difference in Lot Purchase + Transfer Fee) $725.00

Monument Foundation ..... $40.00 per cubic foot of concrete

CEMETERY - PET CEMETERY AREA

Lot Purchase:
Resident $300.00
Non-resident..... $500.00
Grave Opening and Closing:
Weekdays $100.00
Saturdays $145.00
Sundays & Holidays $190.00
Winter Rates ..... December 15 thru April 15 add $50.00 to opening/closing fees

Monument Foundation $75.00
Concrete Encasement *:
12”x24” or smaller casket..... $60.00
Greater than 12”x24” casket $100.00

*Burial Bags and non-biodegradable vaults/caskets do not require encasement.

EMERGENCY SERVICES

Emergency Medical Services Response ..... Actual Cost as Determined by Contractor

ENGINEERING SERVICES

Engineering Plan Review, Inspection, and Other Services ..... Actual Cost as Determined by Consultant

FIRE SERVICES

Alarm Systems:
- False Alarm Fees:
  - First alarm within 12-month period ..... No Charge
  - Second alarm within 12-month period $100.00
  - Third alarm and each thereafter within 12-month period $200.00

Fire Reports:
- First Page $10.00
- Each Additional Page $1.00

Photograph Prints (12, 24, or 36 exposures) ..... Actual developing cost + 15% admin. fee

D.U.I. Incident Fire Run and Extrication Cost Recovery:
- Fire Apparatus – per run $450.00
- Manpower costs – Regular/Overtime Wages ..... Actual Cost
- All Fringe Benefits ..... Actual Cost
- Materials ..... Actual Cost

Haz-Mat Response Run Cost Recovery:
- Fire Apparatus – per run $450.00
- Manpower costs – Regular/Overtime Wages ..... Actual Cost
- All Fringe Benefits ..... Actual Cost
- Materials ..... Actual Cost
- Contaminated Equipment ..... Actual Cost of Decontamination or Replacement
- County Haz-Mat Response Team Services ..... Actual Cost
- Containment Equipment ..... Actual Costs as Charged by Appropriate Agency

LIBRARY SERVICES

Fax Service ..... $2.00 first page; $1.00 each additional page

Non-Member Courtesy Card, per year $75.00

Non-Member Full-Access Library Card to Suburban Library Cooperative, per year $200.00

Overdue Fines:
- Audio Books ..... $0.20 per day ($25.00 maximum)
- Books ..... $0.20 per day ($10.00 maximum)
- DVDs ..... $1.00 per day ($10.00 maximum)
- Kindle ..... $1.00 per day ($25.00 maximum)
- Magazines ..... $0.20 per day ($5.00 maximum)
- Music Compact Discs ..... $0.20 per day ($10.00 maximum)
- Interlibrary Loans (outside of Cooperative) ..... Set by lending institution
- Interlibrary Loans (inside Cooperative) ..... Set by lending institution
- Wifi Hotspots .....$1.00 per day ($25 max)

Photo static Copies, per sheet $0.20

Printer Copies, per sheet $0.20
Replacement Fees ..... Actual cost + $5.00 processing
Replacement Library Card ..... First replacement free, $1 for each replacement thereafter

MAYOR

Marriages $10.00

PARKING VIOLATIONS BUREAU

Parking Fines ..... As set forth in Section 90-56 of City Code of Ordinances

PLANNING AND ZONING SERVICES

Fence Permit:
- Residential (excluding decorative fences) $75.00
- Commercial (excluding decorative fences) $75.00
- Decorative (as defined in the Zoning Code) $15.00

Subdivision Plat Reviews:
- County Filing and Recording Fee (required by Land Division Act) $20.00
- State Plat Review Fee (required by Land Division Act) ..... $150.00 + 15.00 for each lot over 4 lots (fee made payable to "State of Michigan")
- Tentative (Stage 1) Preliminary Plat Review ..... $300.00 + $6.00 per lot
- Final (Stage 2) Preliminary Plat Review ..... $300.00 + $3.00 per lot
- Final Plat Review ..... $100.00 + $3.00 per lot

Site Plan Reviews (does not include independent planning consultant or engineering review fees):
- Application Deposit (all site plans) $1,000.00
- Multiple Family or Mobile Home Park Development ..... $300.00 + $5.00 per unit
- Cluster Housing Development ..... $300.00 + $5.00 per unit
- Commercial Development ..... $300.00 + $50.00 per acre
- Industrial Development ..... $500.00 + $50.00 per acre
- Public or Semi-Public Uses ..... $200.00 + $20.00 per acre
- Planned Unit Development:
  - Preliminary Review ..... $300.00 + $10.00 per lot
  - Final Review $200.00
- Wireless Communications Support Facilities (including replacements) $500.00
- Wireless Communications Antenna (co-location) $250.00

Special Approval or Conditional Use $250.00
Rezoning Petition ..... $350.00+ $5.00 per acre
Variances – Dimensional:
- Commercial, each $250.00
- Residential, each $150.00

Preferred Class Designation of Non-Conforming Use $350.00
Appeal of Administrative Decision $150.00
Zoning Ordinance Text and Map Interpretation $150.00

Alley Vacations $200.00
Sign Review:
Planning Commission Approval Required $150.00
Administrative Approval Only $75.00
Administrative Approval Only – Temporary Signs $15.00
Site and Traffic Impact Analyses ..... Actual Cost
Special Meetings – Planning Commission, each $175.00
Special Meetings – Board of Zoning Appeals $175.00
Zoning Ordinance Text Amendment (not initiated by City) $350.00
Temporary Use $200.00
Tree Preservation:
Site Plans and Plats $200.00
Single Family Lot (one acre or less) $25.00
Single Family Lot (greater than one acre) $50.00
Reoccupancy (not including site plan revisions or changes in use) $100.00
Outdoor Display $150.00
Zoning Base Maps (color):
24 x 36, each $10.00
36 x 48, each $20.00
Zoning Verification Letter $50.00

POLICE DEPARTMENT

Audio 911 (wav.file) $25.00
Bicycle License ..... No Charge
Burning Permit ..... No Charge
Civil Infraction / Equipment Violation Sign-Offs $10.00
Civil Infraction / Equipment Violation Sign-Offs for non- residents $15.00
Crash Reports UD-10 ..... $10.00
Crash Report UD-10 for non-residents $15.00
Crash Reports Private Property $5.00
False Alarms (per ordinance)
1st Offence ..... No Charge
2nd Offence (within 12 month time period) ..... No Charge
3rd Offence (within 12 month time period) $50.00
Fingerprinting (Plus any applicable state & federal fees) $26.75
Fingerprinting non-resident (Plus any applicable state & federal fees) $31.75
Fingerprinting (Inked hard card) $30.00
FOIA Fee ..... Per FOIA Policy
Golf Cart Registration..... No Charge
Interview / Crime Scene DVD $40.00
In-Car DVD $25.00
O.W.I. Cost Recovery (in addition to Fire Department and EMS costs):
Administrative/Legal Fee $125.00
Hospital Expenses (blood samples and other services charged by provider) . Actual Cost
Manpower (regular/overtime wages, all fringe benefits) ..... Actual Cost

Digital/AFIS Mug Shot – per photograph $10.00
Transportation ..... Mileage fees based on current city mileage reimbursement rates
In-car audio/video equipment use $20.00
Parking Violations .....Per City Parking Ordinance
PBT Testing $15.00
Photo contact sheets or CD $25.00
Police Report (other than crash reports) $5.00
Video DVD copy (Building Security Cameras / Lockups) $30.00
Vehicle Impound Fee $30.00
Vehicle / VIN Inspection Fee $25.00

PUBLIC WORKS

Equipment Rate (also referred to as "Time") ..... MDOT Schedule "C" Rates
Labor Rate (also referred to as "Time") ..... Hourly wage rate + total fringe benefit costs
Late Fee ..... 10% of amount due and owing
Materials – sale to other governmental entities ..... Actual Cost
Overhead Fees ..... Determined by MDOT Trunkline Maintenance Contract

RECREATION

Camp Richmond:
Resident, Full Week $112.50
Non-Resident, Full Week $135.00
Resident, By the Day $25.00
Non-Resident, By the Day $28.00
Sitter Service .....$3.00 for am and $5.00 for pm
Late Pick-Ups (After 5:30 p.m.) $1.00/minute

Community Pool:
Daily Swim, per person per day $3.00
Pool Rental (1-3 hour block of time; includes lifeguards and exclusive access) .. $200.00
Seasonal Pass, per individual per season, resident $55.00
Seasonal Pass, per individual per season, non-resident $65.00
Seasonal Pass, per family per season, resident $130.00
Seasonal Pass, per family per season, non-resident $145.00
Seasonal Pass, Senior $45.00
Adult Aqua Fit ($6/class, $72 For a punch card of 13 pre-paid admissions) $48.00
Swim Lessons:
Level A Resident $30.00
Level A, Non-Resident $35.00
Level B/Preschool, Resident $40.00
Level B/Preschool, Non-Resident $45.00
Level 1-6, Resident $45.00
Level 1-6, Non Resident $50.00

Gazebo Rental (city residents) ..... $15.00 + $50.00 refundable deposit
Gazebo Rental (non-residents) ..... $25.00 + $50.00 refundable deposit
(Richmond Non-Profit Groups are not charged for Gazebo Rentals)
Pavilion Rental (city residents) ..... $40.00 + $50.00 refundable deposit
Pavilion Rental (non-residents) ..... $80.00 + $50.00 refundable deposit
Alcohol Permit in addition to Pavilion Rental $30.00
(Richmond Non-Profit Groups are not charged for Pavilion Rentals)
Seasonal/Special Programs ..... Established by separate resolution of the City Council
Community Center Full Room ..... $50.00/hour + $50.00 refundable deposit
Community Center Full Room, Non-Resident ..... $70.00/hour + $50.00 refundable deposit
Community Center Large Room ..... $30.00/hour + $50.00 refundable deposit
Community Center Large Room, Non-Resident ..... $50.00/hour + $50.00 refundable deposit
Community Center Small Room ..... $20.00/hour + $50.00 refundable deposit
Community Center Small Room, Non-Resident ..... $40.00/hour + $50.00 refundable deposit
Community Center Kitchen ..... $15.00/Flat Rate
Community Center Kitchen, Non-Resident (only renting kitchen) ..... $25.00/Flat Rate
(Richmond Non-Profit Groups are not charged for Community Center Rentals)

SANITARY SEWER SERVICE

Connection Fee ..... Time and Material (minimum $500 with $500 deposit required)

Capital Charges (In-City): (based on water meter size):

Water Meter Size	Meter Ratio	Charge
5/8" or 3/4"	1.0	$1,800.00
1”	1.4	$2,520.00
1-1/4”	1.6	$2,880.00
1-1/2”	1.8	$3,240.00
2”	2.9	$5,220.00
3”	11.0	$19,800.00
4”	14.0	$25,200.00
6”	21.0	$37,800.00
8”	29.0	$52,200.00

>8” to be calculated according to same mathematical proportion as above

Capital Charges (Out-of-City): ..... 1.5 times the In-City capital charges

Inspection/Permit Fee (residential) $35.00
Inspection/Permit Fee (commercial) $35.00
Inspection/Permit Fee (industrial waste producers) $45.00
Readiness-To-Serve Charge, per quarter $23.00
Use Charge (except that the two billing cycles falling in the summer are calculated with a 25% discount from the normal rate):
Metered: ..... Effective July 1, 2016 - $6.94 per 1,000 gallons
Non-Metered: ..... $114.51 per quarter (based on 16,500 gallons)

Surcharge for High Strength Waste Water:
For BOD in excess of 280 mg/l ..... $0.22 per pound of BOD
For SS in excess of 300 mg/l ..... $0.29 per pound of SS
For Phosphorus (P) in excess of 15 mg/l ..... $3.32 per pound of P
For Total Kjeldahl Nitrogen (TKN) in excess of 70 mg/l ..... $0.35 per pound of TKN
Bill Payment Late Fee ..... 10% of amount due and owing

STORM SEWER SERVICE

Connection Permit $200.00
Connection Fee ..... Time and Material (minimum $500 with $500 deposit required)
Inspection Fee $35.00

TREASURY DEPARTMENT

Property Tax Collection Fee ..... 1% of tax amount
Non-sufficient Funds (NSF) Fee $20.00
Credit/Debit Card Convenience Fee ..... 3% with a $2.00 minimum
E-Checks ..... $3.00 minimum up to $10,000, $10.00 over $10,000

WATER SERVICE

Connection Fee ..... Time and Material (minimum $500 with $500 deposit required)

Capital Charges (In-City):

Water Meter Size	Meter Ratio	Charge
5/8" or 3/4"	1.0	$1,800.00
1”	1.4	$2,520.00
1-1/4”	1.6	$2,880.00
1-1/2”	1.8	$3,240.00
2”	2.9	$5,220.00
3”	11.0	$19,800.00
4”	14.0	$25,200.00
6”	21.0	$37,800.00
8”	29.0	$52,200.00

>8” to be calculated according to same mathematical proportion as above

Capital Charges (Out-of-City): ..... 1.5 times the In-City capital charges

Meter Charges, each ..... Actual cost + 10% + $35.00 installation fee
Inspection/Permit Fee (residential) $35.00
Inspection/Permit Fee (commercial) $35.00
Inspection/Permit Fee (industrial) $45.00
Readiness-To-Serve Charge, per quarter $23.00
Removal / Replacement / Testing of Disputed Water Meter ..... Actual cost of labor & materials unless determined that meter is faulty

Use Charge:
- Metered: ..... Effective July 1, 2019 - $4.39 per 1,000 gallons
- Non-Metered: ..... $72.40 per quarter (based on 16,500 gallons)

Bill Payment Late Fee ..... 10% of amount due and owing

Account Name Change $10.00

Water Turn-Off Fee:
- Due to Non-Payment $40.00
- Saturdays for non-emergency $115.00
- Sundays and Holidays for non-emergency $150.00
- (There shall be no charge for emergencies due to a water leak or burst plumbing)

Fire Hydrant & Hydrant Meter Rental:
- Rental Fee ..... $50.00 per month (minimum 2 months)
- Water Usage Charge ..... Effective July 1, 2019 - $4.39 per 1,000 gallons
- Meter Security Deposit $1,200.00

Bacteriological (Coliform) Water Samples: ..... $20.00 per sample
- (Sample must be delivered to the Wastewater Treatment Plant)