DRAFT

Boone County Regional Sewer District Capital Improvements Plan

March 13, 2025
McClure Project No. 2022001400

Report For:
Boone County Regional Sewer District
1314 N. 7th St.
Columbia, MO 65201
Daniel Cunningham
dcunningham@bcrsd.org
573-443-2774

Prepared By:
McClure
2001 West Broadway
Columbia, MO 65203
Ellen Woltjen, PE
ewoltjen@mcclurevision.com
573-234-2641

McCLURE™
Your vision. Engineered here.

BCRSD Capital Improvements Plan

Boone County Regional Sewer District

March 2025

McClure Project No. 2022001400

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Missouri. Ellen E. Woltjen - License No. 2022033170 (Date) My license renewal date is December 31, 2026.

TABLE OF CONTENTS

LIST OF EXHIBITS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

0.0 EXECUTIVE SUMMARY

The Boone County Regional Sewer District (BCRSD or "District") has been providing sanitary sewer service across unincorporated Boone County since its establishment in 1973. BCRSD currently manages 22 active wastewater treatment facilities and associated collection systems, plus numerous gravity and pressure sewers that discharge to the City of Columbia sewer system. The treatment facilities managed by BCRSD primarily serve residential subdivisions and range in size from a 1,850 gallons per day (gpd) recirculating sand filter treatment plant to a 460,000 gpd oxidation ditch type mechanical treatment plant. Of the 22 treatment plants, 19 have permitted design capacities less than 100,000 gpd.

Over the past decade, new effluent limitations for ammonia and *Escherichia coli (E. coli)* have been promulgated by the Missouri Department of Natural Resources (MDNR). At the same time, above-average inflation in the construction industry has placed additional financial strain on the sewer sector. As a result of these and other contributing factors, the cost of providing wastewater treatment services to small, rural communities has risen considerably, a trend that is evident across the state. This Capital Improvements Plan (CIP) has been developed to outline a strategy for financing essential capital improvements that enable BCRSD to maintain cost-effective service.

Over the course of a year, McClure worked with BCRSD staff to identify issues affecting its wastewater infrastructure and develop planning level improvement recommendations to address changes in regulations, population growth, and aging facilities. Recommended improvements to BCRSD's wastewater collection and treatment infrastructure were divided into the following major categories:

1. Regulatory Compliance: Improvements essential for maintaining permit compliance.
2. Infrastructure Renewal: Improvements necessary to refurbish aging facilities or enhance functionality, focusing on condition improvement and system renewal.
3. Capacity Expansion: Improvements required to increase the overall treatment capacity of the system.
4. Collection System Upgrades: Improvements specifically targeting the collection system infrastructure.
5. Operational Enhancements: Improvements aimed at optimizing operations and maintenance processes.

The improvements were then categorized based on immediacy of need into the following implementation categories:

1. Phase 1: Improvements recommended for completion in 0-5 years.
2. Phase 2: Improvements recommended for completion in 6-10 years.
3. Phase 3: Improvements recommended for completion in 11-20 years.

The overall CIP developed for BCRSD's collection and treatment infrastructure is presented in Table 0.1 on the following page. Details regarding each recommended improvement are discussed in Sections 4.0, 5.0, and 6.0 of this report.

Table 0.1 BCRSD Capital Improvements Plan 2025

BCRSD Capital Improvements Plan 2025					
	Description	Phase 1 (0-5 YR)	Phase 2 (6-10 YR)	Phase 3 (11-20 YR)	Total
TREATMENT FACILITY PERMIT COMPLIANCE IMPROVEMENTS					
1	Rollingwood Plat 1 - Connect to Midway Crossing	-			-
2	Highfield Acres - Connect to City of Columbia	-			-
3	Brown Station WWTP - Connect to Rocky Fork	$ 4,096,300			$ 4,096,300
4	Richardson Acres WWTF - Connect to Rocky Fork	$ 1,956,900			$ 1,956,900
5	South Route K WWTP - New WWTP	$ 21,597,600			$ 21,597,600
6	Trails West WWTF - Connect to Midway Crossing		$ 1,715,500		$ 1,715,500
7	Twin Lakes WWTF - WWTF Upgrades		$ 2,284,100		$ 2,284,100
8	Cedar Gate WWTF - Connect to Rocky Fork		$ 3,476,300		$ 3,476,300
9	Quarter Mile Hills WWTF - WWTF Upgrades			$ 1,697,400	$ 1,697,400
10	Sunnyslope WWTF - Connect to Hallsville			$ 1,059,900	$ 1,059,900
	Total Treatment Facility Permit Compliance	**$27,650,800**	**$7,475,900**	**$2,757,300**	**$37,884,000**
TREATMENT FACILITY INFRASTRUCTURE RENEWAL IMPROVEMENTS					
1	Kinkade Crossing WWTP Improvements	$488,900			$488,900
2	Meadow Village WWTP Improvements	$339,000			$339,000
3	Midway Crossing WWTP Improvements	$202,200			$202,200
4	Prairie Meadows WWTP Improvements	$886,000			$886,000
5	Rocheport WWTP Improvements	$75,400			$75,400
6	Rocky Fork WWTP Improvements	$487,100			$487,100
7	Trails West WWTF Improvements	$59,000			$59,000
8	American Outdoor Brands Improvements		$68,200		$68,200
9	Eagle Knoll WWTP Improvements		$255,400		$255,400
10	Midway USA Improvements		$68,200		$68,200
	Total Treatment Facility Infrastructure Renewal	**$2,537,600**	**$391,800**	**$0**	**$2,929,400**
TREATMENT FACILITY CAPACITY EXPANSION IMPROVEMENTS					
1	Rocky Fork WWTP Capacity Expansion	$1,255,800			$1,255,800
	Total Treatment Facility Capacity	**$1,255,800**	**$0**	**$0**	**$1,255,800**
COLLECTION SYSTEM IMPROVEMENTS					
1	Cedar Lake Siphon Sewer Elimination	$851,900			$851,900
2	Hillcreek Pressure Sewer Improvements	$183,900			$183,900
3	Woodlands Pressure Sewer Improvements	$239,000			$239,000
4	NewTown Pump Station Elimination	$145,700			$145,700
5	Rollingwood Aerial Crossing Elimination		$384,500		$384,500
6	Fairway West Pump Station Elimination		$1,336,200		$1,336,200
7	Clearview North Pump Station Replacement		$425,600		$425,600
8	Pump Station Improvements (BCP, Green Hills, & El Rey Heights)		$211,100		$211,100
9	Water's Edge Sewer Improvements			$2,199,100	$2,199,100
	Total Collection System	**$1,420,500**	**$2,357,400**	**$2,199,100**	**$5,977,000**
OPERATIONAL ENHANCEMENTS					
1	Portable Sludge Press w/ Trailer (equipment only)	$1,531,538			$1,531,538
2	Portable Flow Meters	$68,919			$68,919
3	Collection System Evaluation	$638,141	$738,728	$2,182,875	$3,559,743
4	Collection System Rehabilitation	$3,190,704	$3,693,639	$10,914,373	$17,798,715
	Total Operations and Maintenance	**$5,429,302**	**$4,432,366**	**$13,097,248**	**$22,958,916**
	TOTAL IMPROVEMENTS	**$38,294,002**	**$14,657,466**	**$18,053,648**	**$71,005,116**

Note: All budget and cost data were compiled in 2024 and 2025. Costs were then inflated using a 5% annual inflation rate to the planning phase end year of 2030 for the Phase 1 recommendations, the midpoint year of 2033 for the Phase 2 recommendations, and the midpoint year of 2041 for the Phase 3 recommendations.

1.0 INTRODUCTION

1.1 District Overview

The Boone County Regional Sewer District (BCRSD or "District") was established in 1973 as a common sewer district pursuant to Chapter 204 of the Revised Statutes of the State of Missouri (RSMo). The mission of BCRSD is "to provide current and future customers with cost effective, reliable sanitary sewer service by collecting and treating wastewater, and to protect public health and the environment in accordance with local, state and federal permit requirements." BCRSD provides sanitary sewer collection and treatment services to customers throughout unincorporated Boone County and has been approved as a Level 2 Authority by the Missouri Clean Water Commission in accordance with 10 CSR 20-6.010(2). A Board of Trustees, appointed by the Boone County Commission, is responsible for the control and operation of BCRSD.

1.2 Purpose and Scope

The purpose of this Capital Improvements Plan (CIP) is to serve as an update to the *Master Plan for District Facilities* prepared by HDR Engineering, Inc. in 2013. The *Tier 2 Plan for Private Facilities* included in HDR's 2013 Master Plan has been updated as a separate document. The CIP considers long-term planning needs of BCRSD, providing recommendations for improvements to BCRSD facilities. The primary goals of this report are as follows:

1. Update the 2013 *Master Plan for District Facilities* prepared by HDR for long-term planning, allowing BCRSD to cost-effectively manage its facilities.
2. Prepare a CIP to support BCRSD's financial planning and potential future bond election.
3. Prepare a CIP to support a utility user rate study.

The scope of this CIP includes the following:

1. Summary of background information relevant to BCRSD's service area.
2. Review and update key regulatory requirements driving the need for treatment process upgrades.
3. Evaluation of existing wastewater treatment facilities, including an analysis of capacity, condition, and performance.
4. Evaluation of existing collection system infrastructure with planning level improvement recommendations and cost estimates.
5. Develop a preliminary strategy and schedule for completing capital improvement recommendations.

1.3 Previous Reports and References

The following resources were referenced in the development of this report:

- Master Plan for District Facilities and Tier 2 Plan for Private Facilities (HDR, Inc. 2013)
- Columbia Area Transportation Study Organization (CATSO) FY 2050 Long-range Transportation Plan (2019)

- Boone County Master Plan (The i5Group, 2025)
- Facility Plan for Brookfield Estates WWTP Upgrades (Crockett Engineering Consultants, 2021)
- Highfield Acres Facility Plan (Cochran Engineering, 2016)
- Midway Area Wastewater Facility Plan (McClure Engineering Company, 2022)
- Quarter Mile Hills Interconnection and Lagoon Closure Facility Plan (Cochran Engineering, 2017)
- Richardson Acres and Brown Station Wastewater Improvements Facility Plan Amendment 2 (HDR, Inc. 2021)
- Rollingwood Plat No. 1 Wastewater Improvements Facility Plan (HDR, Inc. 2017)
- South Route K Facility Plan (Donohue & Associates, Inc. 2017)
- Sunnyslope Facility Plan (Cochran Engineering, 2019)
- Facility Plan for Trails West Subdivision Pump Station & Lagoon Closure (Allstate Consultants LLC, 2012)
- Twin Lakes Subdivision WWTP Wastewater Facility Plan (Shafer, Kline & Warren, Inc. 2011)
- Edgewater Lots 1-14 Wastewater Evaluation (HDR, Inc. 2021)
- Hillcreek Subdivision Low Pressure Sewer System Report (HDR, Inc. 2014)
- The Woodlands Low Pressure Sewer System Analysis (HDR, Inc. 2019)

2.0 BACKGROUND INFORMATION

2.1 Study Area

The study area for the Capital Improvements Plan is all of Boone County, Missouri where BCRSD has existing or planned wastewater collection system and treatment infrastructure. Boone County encompasses an area of approximately 691 square miles in central Missouri. In the 2020 U.S. Census, Boone County was the eighth most populous county in Missouri. The City of Columbia, located in central Boone County, is the fourth largest city in Missouri. Additional cities in the county include Ashland, Centralia, Hallsville, Rocheport, and Sturgeon.

The majority of BCRSD's customers and infrastructure are located in unincorporated Boone County outside of the corporate limits of a city. However, in certain areas BCRSD does provide service to customers located within the City of Columbia through sewer service connection agreements. BCRSD also owns the wastewater system that serves the City of Rocheport. At the time of this report, BCRSD owns and operates 22 wastewater treatment facilities. The location of these facilities is shown on the following page in Exhibit 2.1. BCRSD's three largest treatment facilities are the Rocky Fork WWTP located north of Columbia, the South Route K WWTP located south of Columbia, and the Midway Crossing WWTP located west of Columbia.

2.1.1 Topography and Watersheds

Boone County has a varied topography ranging in elevation from approximately 540 feet above sea level at the lowest point to approximately 940 feet above sea level at its peak. The southwestern perimeter of the county is bordered by the Missouri River, and the southeastern perimeter generally follows Cedar Creek. The vast majority of land area in the county drains to the Missouri River as part of the Lower Missouri-Moreau (10300102) hydrologic unit code (HUC) 8 watershed. A small portion of northeastern Boone County eventually drains to the Mississippi River via the Salt River as part of the South Fork Salt (05100102) HUC 8 watershed.

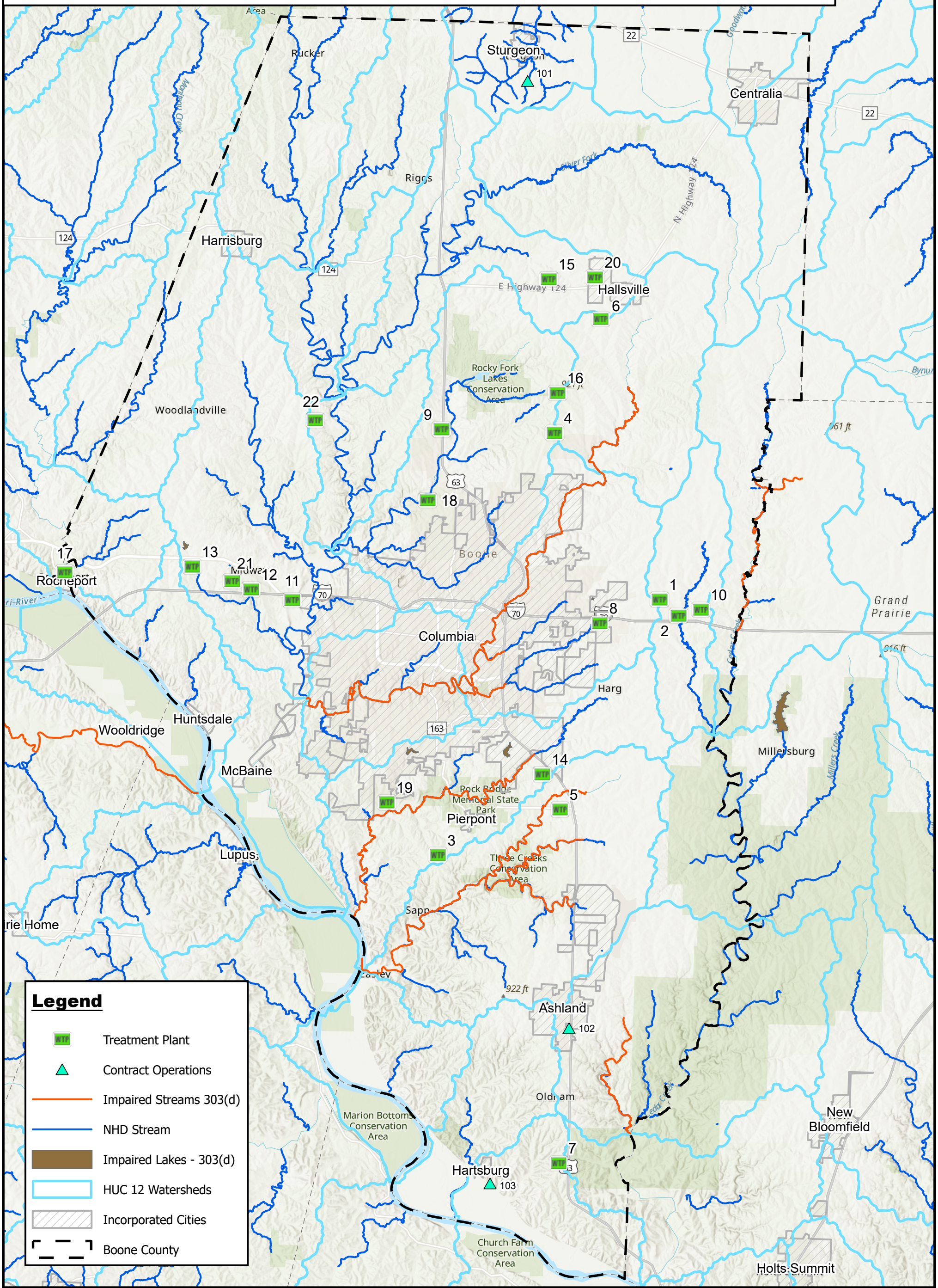
Besides the Missouri River, Perche Creek is the largest stream in Boone County, and the Perche Creek Watershed is the largest major watershed in Boone County, encompassing the central and northern two-thirds of the county. The Greater Bonne Femme Watershed includes the Bonne Femme and Little Bonne Femme sub-watersheds, which drain much of the southern third of the county. Areas south and west of the City of Columbia are known for their karst topography characterized by rocky ground, caves, sink holes, and losing streams.

BCRSD WWTFs

1- American Outdoor Brands
2- Bobcat of Columbia
3- Brookfield Estates
4- Brown Station RSF
5- Butch's Investments
6- Cedar Gate
7- Eagle Knoll
8- Highfield Acres
9- Kinkade Crossing
10- Meadow Village
11- Midway Arms
12- Midway Crossing
13- Midway USA
14- Prairie Meadows
15- Quarter Mile Hills
16- Richardson Acres
17- Rocheport
18- Rocky Fork
19- South Route K
20- Sunny Slope
21- Trails West
22- Twin Lakes

CONTRACT OPERATIONS

101- Sturgeon
102- Ashland
103- Hartsburg



Legend

- Treatment Plant
- Contract Operations
- Impaired Streams 303(d)
- NHD Stream
- Impaired Lakes - 303(d)
- HUC 12 Watersheds
- Incorporated Cities
- Boone County

Exhibit 2.1- BCRSD WWTFs & Contract Operation Facilities

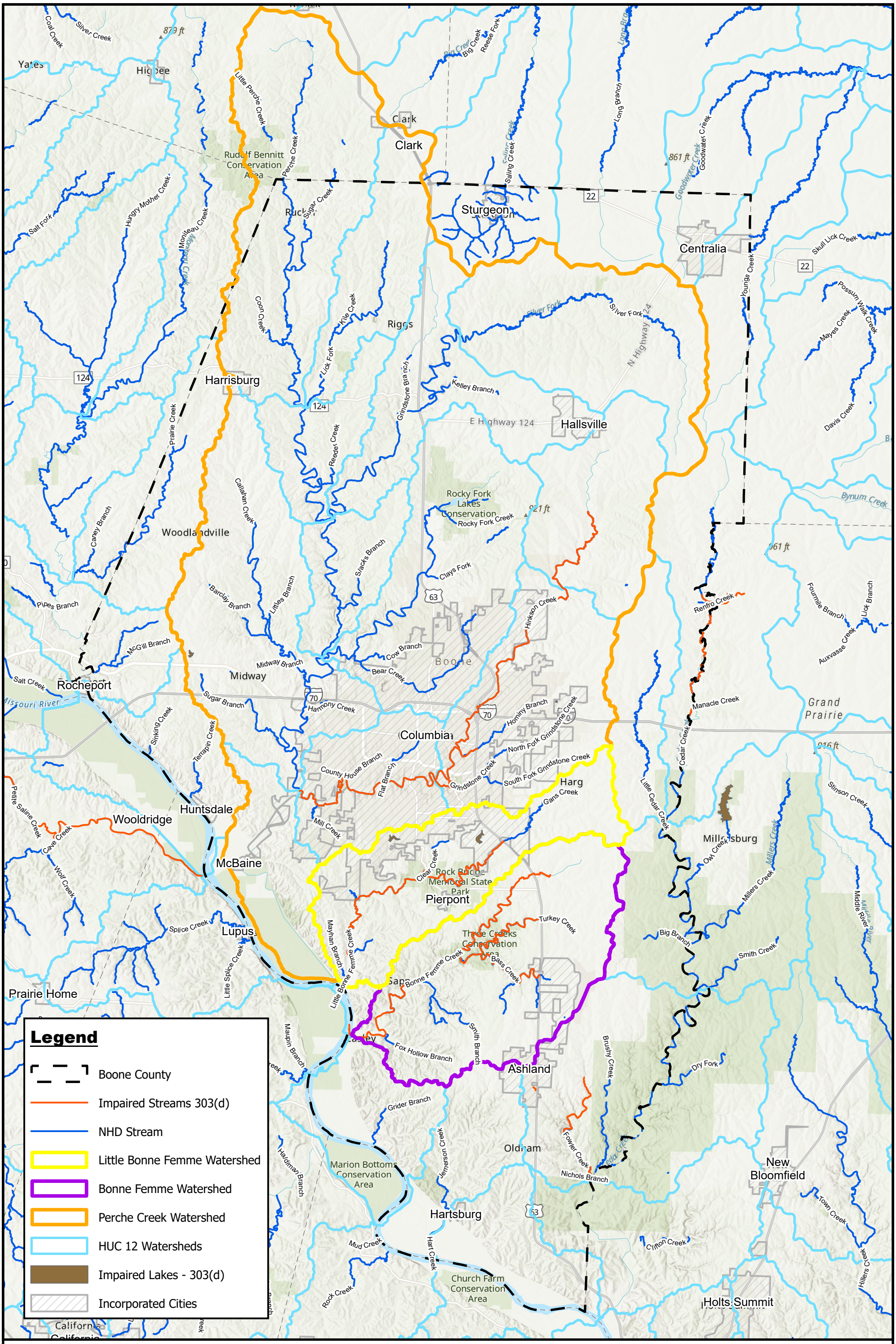
BCRSD CIP | Boone County, MO | 3/12/2025

0 7,750 15,500
Feet

N

McCLURE™

Document Path: C:\2022001400\07-GIS\MXD\BCRSD_MasterPlan\BCRSD_MasterPlan.aprx



Legend

- Boone County
- Impaired Streams 303(d)
- NHD Stream
- Little Bonne Femme Watershed
- Bonne Femme Watershed
- Perche Creek Watershed
- HUC 12 Watersheds
- Impaired Lakes - 303(d)
- Incorporated Cities

Exhibit 2.2 Boone County Major Watersheds

BCRSD CIP | Boone County, MO | 2/14/2025

0 8,250 16,500

Feet

N

McCLURE™

Document Path: C:\2022001400\07-GIS\MXD\BCRSD_MasterPlan\BCRSD_MasterPlan.aprx

2.2 Planning Period

The planning period for the Capital Improvements Plan is approximately 20 years through the year 2045 for the purpose of identifying improvement recommendations and preparing cost estimates. Additionally, population growth projections were evaluated beyond the next 20 years to better understand potential scenarios for population increases throughout the county. The capital improvements recommendations are divided into three phases based on the immediacy of the need to complete the improvements:

1. Phase 1: Improvements to be completed in the next 0 to 5 years.
2. Phase 2: Improvements to be completed in the next 6 to 10 years.
3. Phase 3: Improvements to be completed in the next 11 to 20 years.

It is recommended that the CIP be reviewed annually and updated at a minimum of 10-year intervals.

2.3 Population and Growth

2.3.1 Historical Population

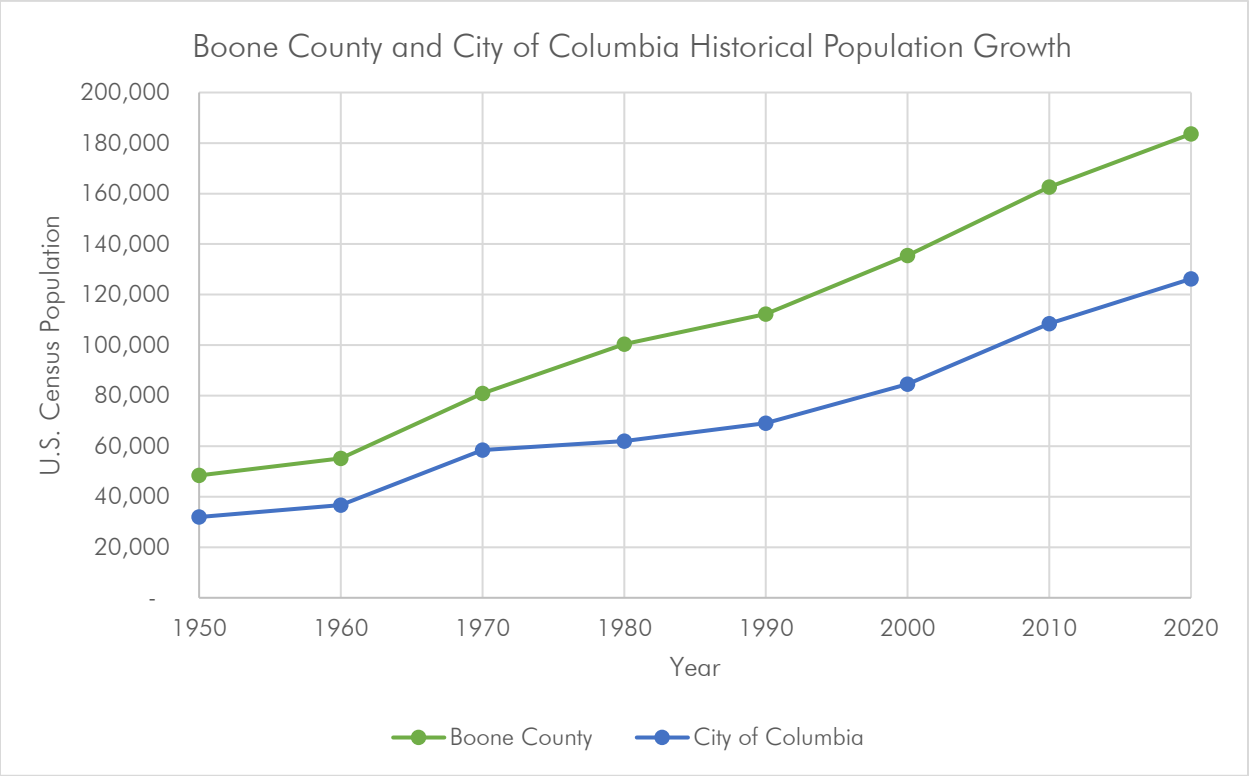
Historically, Boone County has experienced a steady increase in population growth dating back to the 1950s. Much of this growth has been driven by the City of Columbia and the University of Missouri. The 2020 United States Census recorded 183,610 persons residing in Boone County with 126,254 of these residents within the City of Columbia. Table 2.1 and Figure 2.1 present the historical population growth in the county and the City of Columbia based on U.S. Census data.

Table 2.1 Boone County Historical Population

	Boone County		City of Columbia	
Year	Population	Annualized Growth Rate*	Population	Annualized Growth Rate*
1950	48,432		31,974	
1960	55,202	1.32%	36,650	1.37%
1970	80,911	2.60%	58,521	3.07%
1980	100,376	2.46%	62,061	2.24%
1990	112,379	2.13%	69,101	1.95%
2000	135,454	2.08%	84,531	1.96%
2010	162,642	2.04%	108,500	2.06%
2020	183,610	1.92%	126,254	1.98%

*Annualized growth rate for each decade was calculated relative to 1950.

Figure 2.1 Boone County and City of Columbia Historical Population Growth



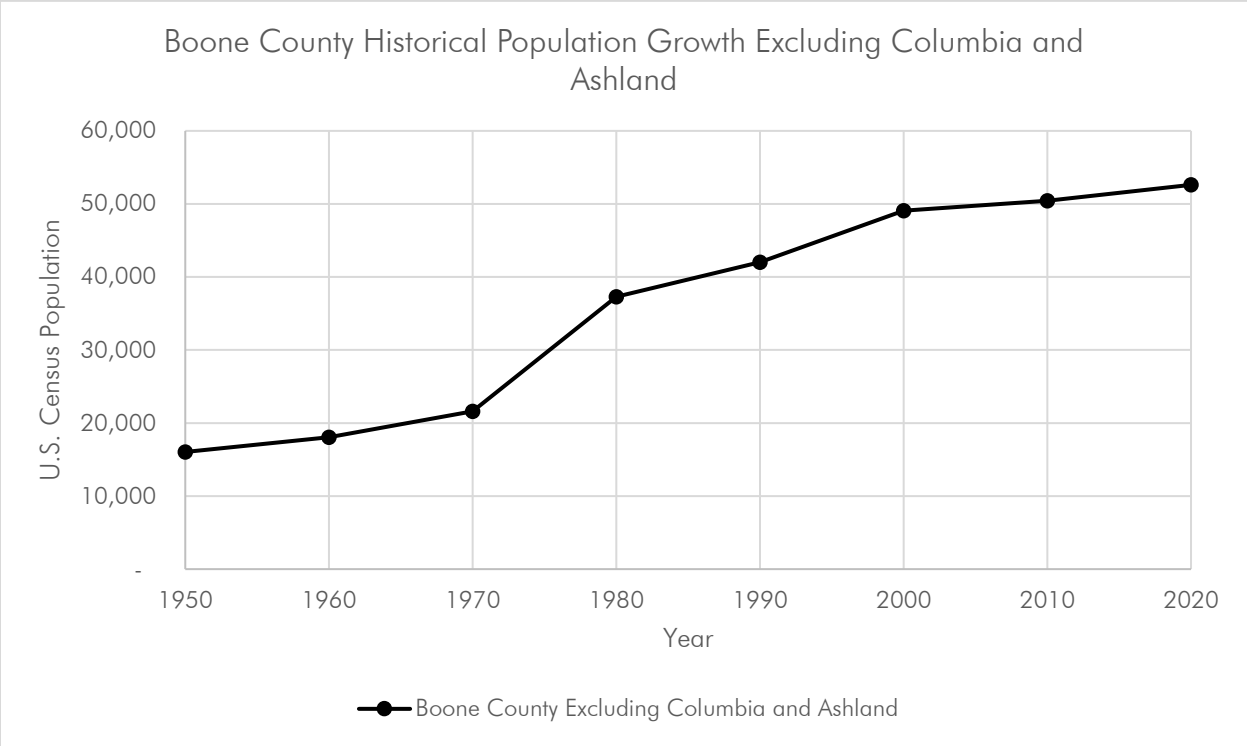
The annualized rate of growth in Boone County and the City Columbia since 1950 is approximately 1.92% per annum and 1.98% per annum respectively. As the majority of BCRSD's customers are located in unincorporated Boone County, population data for the county excluding Columbia and the City of Ashland, the second largest city in the county, was also examined and is presented in Table 2.2 and Figure 2.2. Extracting the population of the cities of Columbia and Ashland results in a 2020 population of approximately 52,609 persons and a slightly decreased annualized growth rate of approximately 1.71% per annum since 1950.

Table 2.2 Boone County Historical Population Excluding Columbia and Ashland

Boone County Excluding Columbia and Ashland		
Year	Population	Annualized Growth Rate*
1950	16,042	
1960	18,057	1.19%
1970	21,621	1.50%
1980	37,294	2.85%
1990	42,026	2.44%
2000	49,054	2.26%
2010	50,435	1.93%
2020	52,609	1.71%

*Annualized growth rate for each decade was calculated relative to 1950.

Figure 2.2 Boone County Historical Population Growth Excluding Columbia and Ashland



2.3.2 Projected Population

The 2013 Master Plan by HDR referenced population projections for Boone County completed by several agencies in Missouri. The population projections provided by the Missouri Economic Research and Information Center and the Missouri Office of Administration have not been updated since the 2013 Master Plan. The Long-Range Transportation Plan prepared by the Columbia Area Transportation Study Organization (CATSO) was updated in 2019, and the plan projected the population in Boone County to reach 292,969 by 2050 based on a 1.50% annual growth rate. The county is currently in the process of updating the Boone County Master Plan, which was last revised in 1996. Initial growth projections released by the Boone County Master Plan team led by the i5Group projected the population in Boone County to reach approximately 252,000 by 2050.

Although the planning period for the CIP was identified as 20 years, population growth to the year 2050 is presented for consistency with similar planning reports. Based on the historical population trends described in Section 2.3.1 above, a 1.50% growth rate was applied to the 2020 census population to perform growth projections for the purpose of this CIP. Applying this method results in a 2050 population of approximately 286,997 residents within Boone County by 2050. Excluding the population growth within Columbia and Ashland, the 2050 population is projected to be 82,232 residents. This represents a 30-year increase of approximately 29,623 residents from 2020 to 2050 that fall within the BCRSD service area of unincorporated Boone County. Projected populations for Boone County are presented in Figures 2.3 and 2.4.

Figure 2.3 Boone County 2050 Projected Population

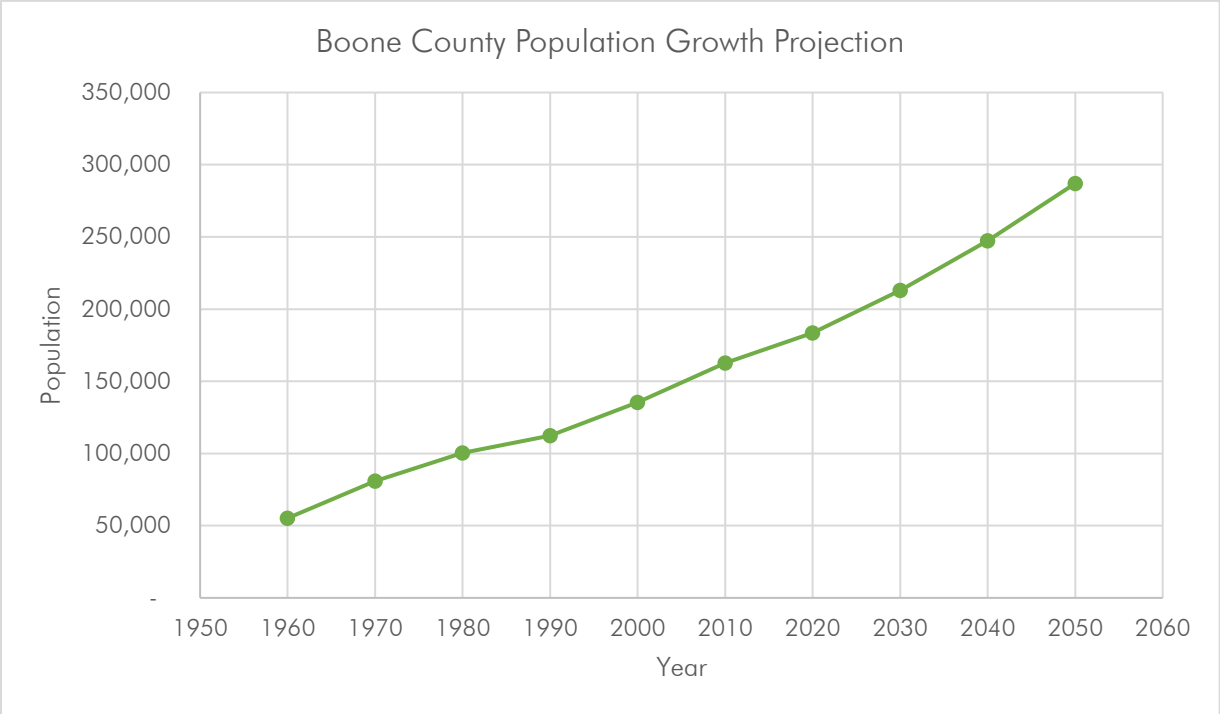
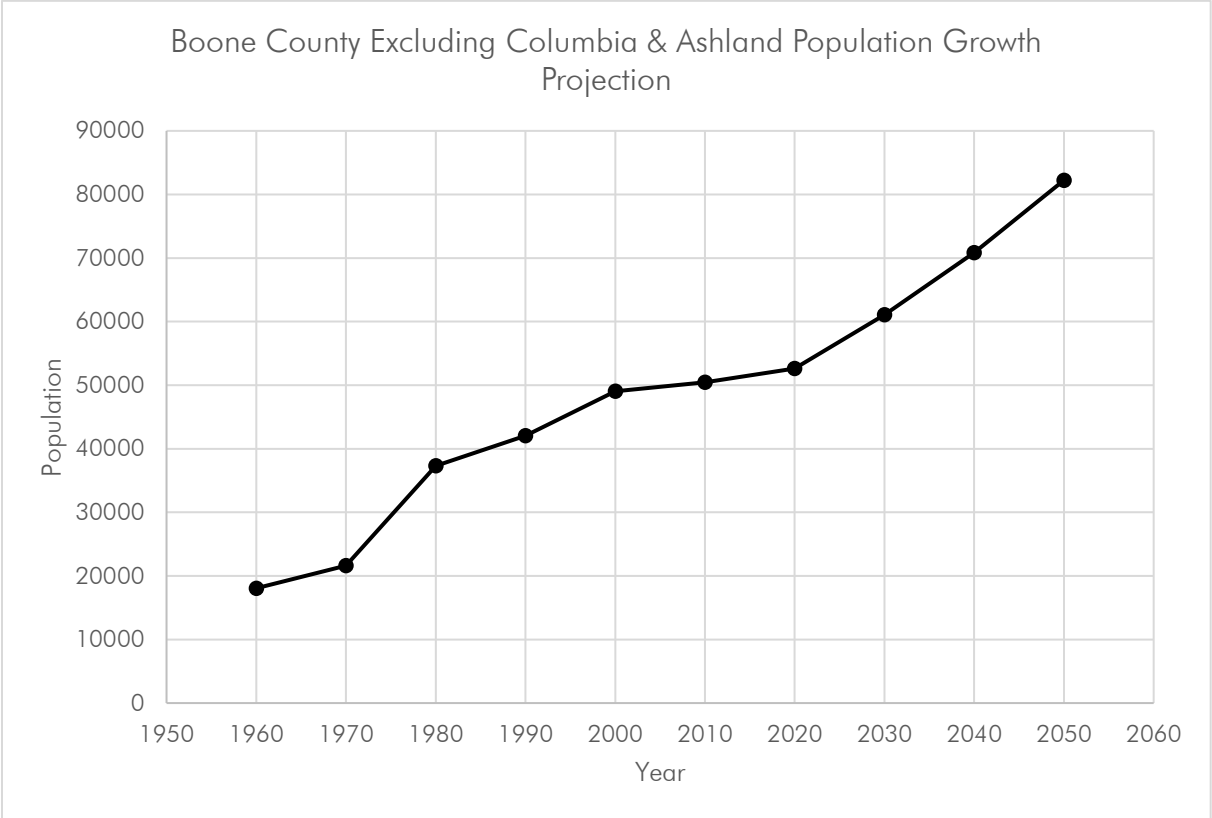


Figure 2.4 Boone County Excluding Columbia and Ashland 2050 Projected Population



2.3.3 BCRSD Customer Growth

As of August 2024, BCRSD serves 7,752 customers. This number has steadily increased over the past 10 years from 6,352 customers in 2014, see Table 2.3.

Table 2.3. Number of BCRSD Customers: 2014 – 2024

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
No. of BCRSD Customers	6,352	6,381	6,435	6,534	6,566	6,599	6,950	7,178	7,408	7,420	7,752

Since 2014, the annualized rate of growth of BCRSD customers is approximately 2.01% per annum, which is higher than the growth rate observed in unincorporated Boone County. This higher rate of growth is likely attributed to high density private subdivisions connecting to BCRSD systems for wastewater treatment. To project BCRSD's future customer growth over the planning period, the 1.50% growth rate identified for Boone County was applied to the 2024 customer count. Applying this method results in a projected number of customers of 10,441 in the year 2044, or an increase of 2,689.

Based on a review of the draft land use concepts prepared by the Boone County Master Plan planning team and meetings with BCRSD and City of Columbia staff, the proposed increase in customers is projected to fall within the following key areas:

Table 2.4 BCRSD Projected Customer Growth

BCRSD Service Area	Estimate of Projected Customer Growth (2024 – 2044)
Rocky Fork	300 – 500
South Route K	1,200 – 1,800
Midway Crossing	100 – 200
North Fork Grindstone Creek / Little Cedar Creek / Hominy Branch Watershed	200 – 400
Outlying Rural Subdivisions	300 – 400
Total	2,100 – 3,400

The South Route K service area located in southwest Columbia is the service area with the largest potential for future customer growth. Housing near southwest Columbia is in high demand; however, new development in this area is limited by the lack of available sewer and wastewater treatment capacity. The projected growth of 1,200 to 1,800 customers in the South Route K service area is based on a proposed alternative to relocate the plant farther south in the Little Bonne Femme Creek watershed and expand its treatment capacity. These recommendations are discussed in Section 4.19.

2.4 Economic Data

As of the 2020 U.S. Census, there are 79,836 total housing units in Boone County. The employment rate for the county stands at 64.7%, with an unemployment rate of 3.0% according to the 2023 American Community Survey (ACS) conducted by the U.S. Census Bureau. The median household income (MHI) in Boone County is $69,218, slightly above the Missouri state MHI of $68,545. In

comparison, an estimated 15.5% of the population in Boone County lives below the poverty line, which is higher than the state average of 12.0% per the 2023 ACS data. This data is summarized below in Table 2.5.

Table 2.5 Boone County and State of Missouri Economic Data

Factor	Description	Boone County Status	State of Missouri Status
Housing Units (2020 Census)	Number of housing units (occupied and vacant)	79,836	2,786,621
MHI (2023 ACS)	Income and benefits (2023 inflation-adjusted dollars)	$69,218	$68,545
Employment Rate (2023 ACS)	Population 16 and over in civilian labor force	64.7%	61.5%
Unemployment Rate (2023 ACS)	Population of unemployed people in civilian labor force	3.0%	3.4%
Poverty Status (2023 ACS)	Population for whom poverty status is determined	15.5%	12.0%

3.0 REGULATORY OVERVIEW

3.1 General

Of the 22 wastewater treatment facilities operated by BCRSD, 20 are permitted by MDNR under the National Pollutant Discharge Elimination System (NPDES). The two unpermitted facilities are exempt from MDNR permit requirements as non-discharging facilities for domestic wastewater flows of three thousand gallons per day (3,000 gpd) or less. The NPDES permits specify the level of treatment required for each facility to maintain compliance with applicable state and federal regulations.

3.2 Current Regulatory Drivers

3.2.1 Schedules of Compliance

At the time of this report, 11 of BCRSD's WWTFs have a schedule of compliance (SOC) to meet new final effluent limitations included in their most recent operating permit. These facilities are listed below in Table 3.1. The majority of the facilities are required to meet new effluent limitations for ammonia and *E. coli.* The deadline to comply with the new limits is specific to each facility and ranges from September 2024 to November 2038. The ability to comply with these new requirements is the key regulatory driver for treatment facility improvements over the next decade.

Table 3.1 Schedule of Compliance Summary

Facility	Permit Expiration Date	SOC Deadline	Effluent Parameters
Midway Arms	6/30/2025	9/1/2024	Ammonia
Highfield Acres	3/31/2025	11/1/2025	Ammonia and *E. coli*
Richardson Acres	3/31/2025	11/1/2028	Ammonia and *E. coli*
Brown Station	3/31/2025	11/1/2028	Ammonia and *E. coli*
South Route K	3/31/2025	11/1/2029	Ammonia and *E. coli*
Trails West	6/30/2025	11/1/2031	Ammonia and *E. coli*
Twin Lakes	9/30/2024	11/1/2033	Ammonia and *E. coli*
Cedar Gate	6/30/2025	11/1/2034	Ammonia and *E. coli*
Brookfield Estates	3/31/2025	11/1/2035	Chloride
Quarter Mile Hills	12/31/2024	11/1/2037	Ammonia and *E. coli*
Sunnyslope	12/31/2024	11/1/2038	Ammonia and *E. coli*

3.2.2 Sensitive and Impaired Waterbodies

Additional regulatory drivers include effluent receiving streams with special protections such as losing streams, Outstanding State Resource Waters (OSRW), and impaired waterbodies.

A losing stream is defined in Missouri's Water Quality Standards as "one that discharges 30% or more of its flow through natural processes such as through permeable geologic materials into a bedrock aquifer." As water in a losing stream enters groundwater much faster than a typical stream, special protections are applied to WWTF discharges within two miles upstream of a losing stream. These protections include more restrictive effluent limitations for Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TTS). Per the MDNR Water Quality Standards Map Viewer, three of BCRSD's

treatment facilities discharge to a losing stream. These facilities and their respective receiving stream are listed in Table 3.2. Out of these three facilities, losing streams limits are currently only applied in the Eagle Knoll Subdivision WWTF operating permit.

Table 3.2 BCRSD Facilities Discharging to Losing Streams

Treatment Facility	Receiving Stream Identified as Losing
Brookfield Estates WWTP	Tributary to Little Bonne Femme Creek
Eagle Knoll WWTP	Tributary to Slate Creek
Prairie Meadows WWTP	Gans Creek

Outstanding State Resource Waters (OSRW) are defined in Missouri's Water Quality Standards as "high quality waters with a significant aesthetic, recreational or scientific value which are specifically designated by the Clean Water Commission. These waters receive special protection against any degradation in water quality as per 10 CSR 20-7.031(2)(C)." BCRSD has one treatment facility that discharges to an OSRW. That facility is the Prairie Meadows WWTP, which discharges to Gans Creek.

Impaired waterbodies are those waters identified as not meeting water quality standards and for which adequate water pollution controls have not been required. These waterbodies are identified by MDNR and placed on the Missouri Section 303(d) Listed Waters. BCRSD has three facilities that are identified as discharging to a 303(d) Listed Waterbody. Those facilities are included in Table 3.3. None of these facilities are considered a source of the identified pollutant impairment.

Table 3.3 BCRSD Facilities Discharging to 303(d) Listed Streams

Treatment Facility	2022 303(d) Listed Receiving Stream	Pollutant Impairment	Source
Brookfield Estates WWTP	Little Bonne Femme Creek	*E. coli*	Source Unknown
Prairie Meadows WWTP	Gans Creek	*E. coli*	Rural Non-point Sources
South Route K WWTP	Little Bonne Femme Creek	*E. coli*	Source Unknown

The Clean Water Act requires states to develop Total Maximum Daily Loads (TMDLs) for all waters listed on its 303(d) List of impaired waterbodies. A TMDL is a calculation of the maximum amount of a pollutant that a body of water can assimilate and not exceed the water quality criteria for that waterbody. The goal of a TMDL is to restore an impaired waterbody to compliance with Missouri's Water Quality Standards. All BCRSD treatment facilities eventually drain to the Missouri River, which has a TMDL that was approved by the EPA on November 3, 2006. The TMDL was established for the pollutants Chlordane and Polychlorinated Biphenyls (PCBs). The TMDL discusses that there are no Missouri treatment facilities that have a potential to discharge detectable amounts of PCBs or Chlordane; and therefore, none of the BCRSD treatment facilities are considered a source of the impairment. Hinkson Creek is another major stream in Boone County that has an EPA approved TMDL. The Hinkson Creek TMDL was approved by EPA on January 28, 2011 for pollutants of concern which are unknown. Several BCRSD facilities are located within the Hinkson Creek watershed; however, the source of pollutants in the TMDL is listed as urban runoff and urban nonpoint sources. Domestic wastewater treatment facilities are not considered to contribute to the impairment of Hinkson Creek.

3.3 Future Regulatory Drivers

3.3.1 Total Phosphorus Rule (Statewide Nutrient Limits)

Effective October 30, 2023, the Effluent Regulations found in 10 CSR 20-7.015 were updated to establish a procedure for implementing total phosphorus reduction requirements in Missouri State Operating Permits for point source dischargers. The new rule requires a target reduction of total phosphorus for all domestic point sources with a design flow of greater than or equal to one million gallons per day (MGD), and all industrial facilities categorized as major that typically discharge phosphorus in their industrial wastewater.

Facilities subject to the rule as promulgated in 10 CSR 20-7.015(9)(B)2. currently have four options for compliance with the phosphorus reduction targets:

1. Concentration based: Total phosphorus target level of 1.0 milligrams per liter (1.0 mg/L), as an annual average; or
2. Mass based: Total phosphorus annual mass loading target equal to 1.0 mg/L based on the design flow; or
3. An overall reduction of total phosphorus from influent to effluent by seventy-five percent (75%) based on a one-time calculation of adequately representative effluent data; or
4. An overall reduction of annual load of total phosphorus discharged by seventy-five percent (75%) based on a one-time calculation of adequately representative effluent data.

Implementation dates for compliance with the rule varies by size and type of facility, and the rule does allow for permittees to request alternative implementation dates with justification. Currently, for domestic point source facilities with a design flow $>$ 15 MGD the rule must be implemented by January 1, 2029. For domestic point sources with a design flow of $\leq$15 MGD and $\geq$1 MGD, the rule must be implemented by January 1, 2033. For industrial facilities, the rule must be implemented by January 1, 2034.

The rule also includes provisions for facilities to utilize nutrient credits as part of a nutrient trading program to comply with the phosphorus reduction targets. To participate in the Missouri Nutrient Trading Program, facilities are required to submit plans for credit generation for approval by MDNR.

Currently, none of BCRSD's wastewater treatment facilities have a permitted design flow greater than or equal to 1 MGD; and therefore, are not subject to the new Total Phosphorus reduction targets. MDNR has not released information regarding if and when rulemaking to establish phosphorus reduction targets for facilities with design flows $<$ 1 MGD will be pursued. Based on the implementation dates for facilities with design flows $\geq$ 1 MGD, it is not anticipated that reduction targets for smaller facilities will be required within the next 10 years. For the purposes of this CIP, upgrades to BCRSD's treatment facilities to meet effluent limitations for total phosphorus were not evaluated. It is recommended that considerations for a treatment facility's ability to be adapted for future nutrient removal are made during the planning and design phase of any major treatment plant upgrade.

3.3.2 Numeric Nutrient Criteria for Lakes

On December 14, 2018, EPA approved Missouri's numeric nutrient criteria for lakes located in 10 CSR 20-7.031(5)(N) of Missouri's Water Quality Standards. The rule includes numeric chlorophyll-a

criteria for lakes based on ecoregion. The criteria apply to all lakes ten acres or larger during normal conditions that are assigned designated uses in the Missouri Use Designation Dataset, with the exception of lakes located in the Big River Floodplain. Domestic treatment facilities that are determined through a reasonable potential analysis to cause or contribute to violations of lake nutrient criteria should expect effluent limitations for these parameters in future permits. Currently, there are no lakes designated as impaired for the nutrient criteria located in Boone County. Additionally, none of the BCRSD treatment facilities discharge to a lake, so the new numeric nutrient criteria for lakes does not impact any of BCRSD's existing operating permits.

3.3.3 Ammonia Criteria for Aquatic Life Protection

In 2013, EPA updated the aquatic life criteria for ammonia to reflect new data on sensitive freshwater mussels and snails. EPA's final *Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater* (2013) incorporates scientific views received on EPA's 2009 draft updated ammonia criteria and supersede EPA's previously recommended 1999 ammonia criteria. Current ammonia criteria in Missouri are based on the 1999 recommendation. MDNR is currently evaluating potential updates to the water quality standards to adopt the 2013 ammonia criteria in two phases. Phase 1 would adopt the 2013 ammonia criteria statewide, except for the Missouri and Mississippi Rivers. The 2013 ammonia criteria would later be adopted for appropriate segments of the Missouri and Mississippi Rivers in a subsequent rulemaking under Phase 2.

Adoption of the 2013 ammonia criteria will result in lower effluent limitations for ammonia. As a flexibility to the more stringent criteria, MDNR is working on a mussels absent criteria to be included in the rulemaking that would apply to sites where mussel habitat and presence is limited by natural waterbody characteristics and there would be no negative impact on aquatic life downstream. Protocols for determining where the mussels absent criteria would apply are still in development and have not been released at this time.

Additionally, MDNR is proposing a staggered implementation approach that would provide time following the criteria effective date before the criteria is implemented in permits. For facilities with a design flow less than 0.5 MGD, the criteria would not be implemented for 60 months following the final rulemaking. The schedule of compliance (SOC) process allowing additional time to achieve compliance with the new water quality standards would also be available.

Since the rulemaking has not been formally initiated and the timing and details of the potentially reduced effluent ammonia limitations are not finalized, upgrades to BCRSD's treatment facilities to meet reduced ammonia limits were not evaluated as part of this CIP. It is recommended that considerations for a treatment facility's ability to treat for reduced ammonia limits are made during the planning and design phase of any major treatment plant upgrade. As previously mentioned, several of BCRSD's treatment plants are under a current compliance schedule to meet new final effluent limitations for ammonia. If the preferred alternative for compliance is a treatment facility upgrade as opposed to regionalization, it is recommended that the improvements are designed to meet stringent effluent ammonia limitations.

3.3.4 Emerging Contaminants

There are several contaminants of emerging concern (CECs) receiving increased attention from EPA and the public. The most notable of these contaminants are per- and polyfluoroalkyl substances

(PFAS), which are widely used, long lasting chemicals that do not degrade easily in the environment. MDNR has established a Per- and Polyfluoroalkyl Substances (PFAS) Workgroup to begin evaluating issues related to PFAS in response to stakeholder concerns regarding these contaminants. At this time, there are no effluent wastewater monitoring requirements for PFAS, and there is no formal rulemaking in process. The MDNR Water Quality Standards Workgroup has discussed implementing a mandatory monitoring phase for PFAS in the next few years with the goal of identifying potential sources of PFAS entering domestic wastewater treatment plants. Additionally, PFAS in residual sludge and biosolids from the wastewater treatment process has raised concerns as biosolids are commonly land applied as a fertilizer on agricultural lands. Currently, no federal criteria have been established for PFAS in biosolids. Due to the uncertainty surrounding the timing and implementation of future PFAS regulations, capital improvements related to the treatment and disposal of PFAS were not evaluated.

4.0 EVALUATION OF TREATMENT FACILITIES

The 2013 *Master Plan for District Facilities* included an evaluation of 37 BCRSD treatment facilities. Of those 37 facilities, 18 have connected to either the Rocky Fork WWTP, the Midway Crossing WWTP, or the City of Columbia and no longer have an active treatment facility.

Table 4.1 below includes a list of those facilities included in the 2013 Master Plan that are no longer in service.

Table 4.1 BCRSD Treatment Facilities Closed Since the 2013 Master Plan

Past BCRSD Treatment Facilities	Update
Bon Gor Lake Estates	Connected to Rocky Fork WWTP by gravity sewer
Clearview Acres Subdivision	Connected to Rocky Fork WWTP by gravity sewer
County Downes	Connected to Rocky Fork WWTP by gravity sewer
El Rey Heights	Connected to City of Columbia by pump station and force main
Fall Creek Subdivision	Connected to City of Columbia by forcemain
Hillview Acres Subdivision	Connected to City of Columbia by pump station and force main
Lake Capri Subdivision	Connected to City of Columbia by pump station and force main
Lee Heights	Connected to City of Columbia by pump station and force main
Oberlin Valley	Connected to City of Columbia by pump station and force main
Phenora South Subdivision	Connected to Rocky Fork by gravity sewer
Powell Community Lagoon	Connected to Rocky Fork by gravity sewer
Rollingwood Plat #1	Connected to Midway Crossing WWTP by pump station and force main
Sharidan Hills Subdivision	Connected to City of Columbia by pump station and force main
Springpark Subdivision	Connected to City of Columbia by pump station and force main
Sun Valley Estates	Connected to Rocky Fork by pump station and force main
Sunrise Estates NE and NW	Connected to City of Columbia by gravity sewer
Wagon Trail Heights	Connected to Rocky Fork by gravity sewer
Westwood Meadows	Connected to City of Columbia by gravity sewer

Since the 2013 Master Plan, BCRSD has taken ownership of three additional treatment facilities bringing the total to 22 active WWTFs. This includes 9 mechanical plants, 6 aerated lagoon systems, 1 non-aerated lagoon system, 2 recirculating sand filters, and 4 drip irrigation systems. An evaluation of each facility is included in Sections 4.1 through 4.22 of this report.

4.1 American Outdoor Brands

Facility Information: The American Outdoor Brands WWTF is regulated under permit number MO-0138983. The most recent permit had effective dates from October 1, 2018 through September 30, 2023. A permit renewal application was submitted, but an updated permit has not yet been issued. The American Outdoor Brands system is located east of Columbia near the I-70 and Route Z intersection at 1800 North Route Z. This facility was constructed in 2018 and serves the American Outdoor Brands Corp. manufacturing and distribution center on an approximately 210-acre site.

Treatment Description: The treatment process currently includes a trash tank, flow equalization, septic tanks, and subsurface drip irrigation. The permitted design flow of the treatment facility is 4,889 gpd, and the design population equivalent is 65.

Receiving Waterbody Information: The WWTF is located in the Hydraulic Unit Codes (HUC) 12 Watershed 10300102-1001. The operating permit identifies the receiving stream as a tributary to Little Cedar Creek; however, the facility does not discharge wastewater to a surface waterbody.

Comments on Compliance, Condition, and Capacity: American Outdoor Brands does not have permitted effluent limits or a schedule of compliance. There are no reported problems with the facility other than paper products entering the treatment process. There are no known issues with treatment capacity and no plans for expansion of the facility at this time.

Recommended Improvements: Install a manual bar screen on the influent of the WWTF to catch any paper products or large debris.

Future development near the I-70 and Route Z intersection may bring City of Columbia sewer service near the American Outdoor Brands facility. It is recommended that the facility is closed and connected to the City of Columbia collection system at the end of its useful life, if this service becomes available.

Planning Phase: 6-10 years

Total Project Cost Estimate projected to 2033 Dollars: $68,200.00 (See Appendix A – Table A.1)

4.2 Bobcat of Columbia

Facility Information: The Bobcat of Columbia WWTF (formerly Bobcat of St. Louis) does not have a DNR issued operating permit, since the facility is a no-discharge system with a design flow less than 3,000 gpd. The system is located west of Columbia along I-70 Drive NE at 1101 Lenway Drive. The Bobcat of Columbia system was constructed in 2006 and serves the Bobcat Company sales and service department on an approximately 30-acre site.

Treatment Description: The treatment process includes subsurface drip irrigation. The design flow is less than 3,000 gpd, and the facility is estimated to use approximately 25% of its available treatment capacity.

Receiving Waterbody Information: The WWTF uses drip irrigation, so there is no discharge to a receiving waterbody.

Comments on Compliance, Condition, and Capacity: Bobcat of Columbia does not have a schedule of compliance or effluent limits. No issues with the treatment facility were reported by BCRSD staff. There are no issues with treatment capacity and no plans for expansion at this time.

Recommended Improvements: There are no recommended capital improvements for the Bobcat of Columbia wastewater system.

Planning Phase: Not Applicable

Total Project Cost Estimate: No Cost

4.3 Brookfield Estates WWTP

Facility Information: The Brookfield Estates WWTP is regulated under operating permit number MO-0126624. The current permit is effective from November 1, 2020 through March 31, 2025. Brookfield Estates WWTP is located on Lake Meadows Way off of Route N south of Columbia. The treatment plant was originally constructed in 2001 and serves a residential subdivision. The original recirculating sand filter treatment plant was replaced with a new mechanical treatment plant in 2024.

Treatment Description: The treatment process includes a septic tank effluent pump (STEP) system, manual bar screen, flow equalization, aeration tank, clarifier, dual tertiary media filters, post aeration tank, and UV disinfection. The previous treatment process was a recirculating sand filter that was taken offline in 2024 with the installation of the new WWTP. The recirculating sand filter WWTP had a permitted design flow of 10,500 gpd, a design population equivalent of 140, and an actual permit flow of 4,300 gpd. Based on the facility's Discharge Monitoring Report (DMR) data submitted to MDNR, effluent flows for the facility from 2019 through 2023 averaged approximately 3,806 gpd with the highest maximum daily flow reported as 11,900 gpd. An operating permit modification for the new treatment process was issued on September 4, 2024. The new WWTP has a permitted design flow of 30,000 gpd and a population equivalent of 400.

Receiving Waterbody Information: The WWTP is located in the HUC 12 Watershed 10300102-0903. The receiving stream is a tributary to Little Bonne Femme Creek, and the first classified receiving stream is a 100K Extent-Remaining Stream. As discussed in Section 3.2, Little Bonne Femme Creek is included on the 2022 303(d) List for an impairment due to *E. coli* from an unknown source.

Comments on Compliance, Condition, and Capacity: Brookfield Estates WWTP has a schedule of compliance for ammonia, *E. coli*, and chloride. The compliance deadline is November 1, 2035. The recently constructed mechanical treatment plant was designed to treat ammonia and *E. coli*; however, it is unlikely that the WWTP will be able to meet the proposed chloride limits in the SOC. No other issues with the WWTP were reported by BCRSD staff. There are no issues with treatment capacity and no additional plans for expansion at this time. The Pierpont Store located northeast of Brookfield Estates is a private treatment facility permitted by MDNR that could be a future connection to the wastewater system.

Recommended Improvements: Immediate capital improvements to the Brookfield Estates WWTP are not recommended at this time. Treatment to remove chloride from the facility's effluent would require advanced processes such as microfiltration and reverse osmosis. Due to the high cost associated with this advanced treatment, it is recommended BCRSD coordinates with the water supply district and subdivision homeowners to reduce the chloride concentration entering the WWTP at its source. It is likely that self-regenerating water softeners are the largest contributor of chloride to the plant. Coordination with the water district and homeowners in the subdivision to reduce the use of salt in water softeners may be sufficient to comply with the chloride limits in the SOC. Influent chloride levels to the WWTP should be monitored to determine progress. If this approach is unsuccessful, consideration should be given to connecting the system to the South Route K WWTP in the future.

Planning Phase: Not Applicable

Total Project Cost Estimate: No Cost

4.4 Brown Station WWTP

Facility Information: The Brown Station WWTP is regulated under operating permit number MO-0135305. The current permit is effective from November 1, 2020 through March 31, 2025. The WWTP is located off of Route B near the intersection of North Brown Station Road and O'Rear Road north of Columbia. The WWTP was constructed in 2009 and serves a residential community.

Treatment Description: The treatment process includes a STEP system and a recirculating sand filter. Septage is hauled to the Rocky Fork WWTP for disposal. The Brown Station WWTP has a permitted design flow of 1,850 gpd, a design population equivalent of 19, and an actual permit flow of 1,300 gpd. Based on the facility's DMR data submitted to MDNR, effluent flows for the facility from 2019 through 2023 averaged approximately 1,057 gpd with the highest maximum daily flow reported as 3,900 gpd.

Receiving Waterbody Information: The WWTP is in the HUC 12 Watershed 10300102-0706. The receiving stream is a tributary to Clays Fork, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Brown Station WWTP has a schedule of compliance for ammonia and *E. coli*. The scheduled compliance deadline is November 1, 2028. The existing treatment facility will not comply with the new effluent limits. No other issues with the WWTP were reported by BCRSD staff. There are no issues with treatment capacity and no plans for expansion at this time. The Hillcrest Residential Care WWTP north of the Brown Station WWTP is a private facility permitted by MDNR that could be a future connection to the wastewater system.

Recommended Improvements: The *Amendment 2 – Richardson Acres and Brown Station Wastewater Improvements Facility Plan* completed by HDR in 2021 recommends closing the Brown Station WWTP by connection to the Rocky Fork WWTP via pump station and force main in a cooperative project with Richarson Acres and Cedar Gate. The facility plan estimated the total cost of the Brown Station pump station and force main and the Richardson Acres pump station and force main project at $2,366,000. This project is currently funded on the Fiscal Year 2025 Clean Water State Revolving Fund Intended Use Plan with a loan amount of $2,366,000. It is recommended this project is completed as planned. Exhibit C.1 in Appendix C illustrates the proposed force main route. If the pump station and force main from Brown Station to Rocky Fork is not completed, an updated facility plan for the Brown Station WWTP should be prepared to evaluate other possible alternatives for compliance with the new effluent limits. One alternative may be regionalization by connection to the City of Columbia.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $4,096,300.00 (See Appendix A – Table A.2; cost estimate includes Brown Station pump station and force main only.)

4.5 Butch's Investments

Facility Information: Butch's Investments WWTF does not have an operating permit, since the facility is a no-discharge system with a design flow less than 3,000 gpd. The system is located south of

Columbia near the intersection of Highway 163 and Cadet Court. The facility was constructed in 2022 and serves four commercial lots.

Treatment Description: The treatment process includes subsurface drip irrigation with a design flow of 2,910 gpd.

Receiving Waterbody Information: The WWTF uses drip irrigation, so there is no discharge to a receiving waterbody.

Comments on Compliance, Condition, and Capacity: Butch's Investments WWTF does not have a schedule of compliance or effluent limits. No issues with the treatment facility were reported. There is an existing order from the county commission for a neighboring lot to connect to the Butch's Investments treatment facility. This connection will require a treatment capacity expansion, which will increase the design flow above 3,000 gpd requiring an operating permit from MDNR. The cost to expand the treatment capacity of the facility would be funded by the developer.

Recommended Improvements: It is recommended that the Butch's Investments WWTF is expanded to allow the neighboring lot to connect per the order from the county commission. It is anticipated this expansion will be developer funded.

Planning Phase: Not Applicable

Total Project Cost Estimate: No Cost

4.6 Cedar Gate WWTF

Facility Information: The Cedar Gate WWTF is regulated under operating permit number MO-0096415. The current permit is effective from November 1, 2020 through June 30, 2025. The facility is located off of Route B near the intersection of Birch St. and Branch St. south of Hallsville. It was constructed in 1971 and serves a small residential subdivision.

Treatment Description: The treatment process includes a two-cell lagoon with an aerated primary cell and sludge retained in the lagoon. The Cedar Gate WWTF has a permitted design flow of 11,000 gpd, a design population equivalent of 111, and an actual permit flow of 2,000 gpd. Based on the facility's DMR data submitted to MDNR, effluent flows for the facility from 2019 through 2023 averaged approximately 3,228 gpd with the highest maximum daily flow reported as 9,500 gpd.

Receiving Waterbody Information: The WWTP is in the HUC 12 watershed 10300102-0601. The receiving stream is a tributary to Varnon Branch, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Cedar Gate WWTF has a schedule of compliance for ammonia and *E. coli*. The compliance deadline is November 1, 2034. The existing treatment facility will not comply with the new effluent limits. No other issues with the WWTP were reported by BCRSD staff. There are no issues with treatment capacity and no plans for expansion at this time.

Recommended Improvements: The *Amendment 2 – Richardson Acres and Brown Station Wastewater Improvements Facility Plan* completed by HDR in 2021 recommends closing the Cedar Gate WWTF by connection to the Rocky Fork WWTP via pump station and force main in a cooperative project with Richarson Acres and Brown Station. The Cedar Gate pump station and force main project is currently planned to be completed as a second phase following the completion of the Richardson Acres and Brown Station connection to Rocky Fork. The facility plan estimated the total cost of completing the Cedar Gate pump station and force main project as $1,315,000. It is recommended these improvements are completed as planned. Exhibit C.2 in Appendix C illustrates the proposed force main route. If the pump station and force main projects for connection to Rocky Fork are not completed, an updated facility plan for the Cedar Gate WWTF should be prepared to evaluate other possible alternatives for compliance with the new effluent limits. One alternative may be regionalization through a cooperative agreement with Missouri American Water to connect to the City of Hallsville.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $3,476,300.00 (see Appendix A – Table A.3; cost estimate includes Cedar Gate pump station and force main only)

4.7 Eagle Knoll WWTP

Facility Information: The Eagle Knoll WWTP is regulated under operating permit number MO-0117935. The most recent permit had effective dates from November 1, 2018 to October 31, 2023. A permit renewal application was submitted, but an updated permit has not yet been issued. The facility is located north of Eagle Trace near Highway 63 east of Hartsburg. It was constructed in 1996 and serves a small residential subdivision on a golf course.

Treatment Description: The treatment process includes extended aeration, sock filters, UV disinfection, and sludge holding tanks. Sludge is hauled to the City of Columbia for disposal. Eagle Knoll WWTP has a permitted design flow of 35,000 gpd, a design population equivalent of 350, and an actual permit flow of 2,100 gpd. Based on the facility's DMR data submitted to MDNR, the facility's effluent flow from 2019 through 2023 averaged approximately 2,699 gpd with the highest daily maximum flow reported as 8,800 gpd.

Receiving Waterbody Information: Eagle Knoll WWTP is in HUC 12 watershed 10300102-1302. The receiving stream is a tributary to Slate Creek, and the first classified receiving stream is a 100K Extent-Remaining Stream. The receiving stream is classified as losing, and losing stream limits are applied in the facility's operating permit.

Comments on Compliance, Condition, and Capacity: The current permit includes a schedule of compliance for ammonia limits, which became effective on September 1, 2019. The WWTP is in compliance with the new limits. The facility currently runs on single-phase power and is prone to power outages. The rock quarry south of the facility on Highway 63 causes short power drops that trip the blowers at the WWTP. The treatment capacity of the plant is oversized based on the actual flow amounts received. There are no known plans for future development near the plant at this time.

Recommended Improvements: It is recommended that three-phase power is brought to the WWTP site, and the existing single-phase aeration equipment is replaced. As part of this improvement,

consideration should be given to downsizing the blowers and installing fine bubble diffusers in the aeration basin providing enhanced operational efficiency and reducing overall electricity usage.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $255,400.00 (see Appendix A – Table A.4)

4.8 Highfield Acres WWTF

Facility Information: The Highfield Acres WWTF is regulated under operating permit number MO-0053376. The current permit is effective from November 1, 2020 to March 31, 2025. The WWTF is located west of Columbia near the intersection of Western Lane and I-70 Drive SE. It was constructed in 1968 and serves a small residential subdivision.

Treatment Description: The treatment process includes two separate single-cell aerated lagoons, each with its own permitted outfall. Combining the capacity of the two lagoons, the facility has a permitted design flow of 29,000 gpd, a design population equivalent of 290, and an actual permit flow of 6,900 gpd. Based on the facility's DMR data submitted to MDNR, the effluent flow from the south lagoon (Outfall #001) from 2019 through 2023 averaged approximately 4,490 gpd with the highest daily maximum flow reported as 8,600 gpd. Flow from the north lagoon (Outfall #002) averaged approximately 1,895 gpd with the highest daily maximum flow reported as 6,200 gpd.

Receiving Waterbody Information: Highfield Acres WWTF is in HUC 12 watershed 10300102-0602. The receiving stream is a tributary to North Fork Grindstone Creek, and the first classified receiving stream is the North Fork Grindstone Creek.

Current and Future Issues: Highfield Acres WWTF has a schedule of compliance for ammonia and *E. coli.* The compliance deadline is November 1, 2025. The existing treatment facility will not comply with the new effluent limits. The WWTF does also have occasional issues with algae blooms and exceeded BOD and TSS effluent limits in the first quarter of 2024. There are no issues with treatment capacity and no plans for expansion at this time.

Recommended Improvements: The *Highfield Acres Facility Plan* completed by Cochran in 2016 recommended closing the WWTF by connecting to BCRSD's existing Grindstone sewer, which flows to the City of Columbia. The project is currently funded on the Fiscal Year 2025 Clean Water State Revolving Fund Intended Use Plan for a loan amount of $107,312 and a grant amount of $160,968. The improvements are in design by Cochran, and it is recommended they are completed as planned.

Planning Phase: 0-5 Years

Total Project Cost Estimate in 2024 Dollars: $268,260 (Cost estimate as listed on the MDNR 2025 Clean Water State Revolving Fund Intended Use Plan. Project to be funded using BCRSD's existing available bonding capacity.)

4.9 Kinkade Crossing WWTP

Facility Information: The Kinkade Crossing WWTP is regulated under operating permit number MO-0133515. The current permit is effective from November 1, 2020 through March 31, 2025. The

WWTP is located off of East Honey Lane near Highway 63 north of Columbia. It was constructed in 2007 and primarily serves a residential subdivision and duplexes. A gas station is also connected to the treatment system.

Treatment Description: The treatment process is an extended aeration package plant that includes a bar screen, aerated flow equalization basin, extended aeration, final clarifier, UV disinfection, and aerated sludge holding. Sludge is hauled to the City of Columbia for disposal. The Kinkade Crossing WWTP has a permitted design flow of 50,000 gpd, a design population equivalent of 671, and an actual permit flow of 7,500 gpd. Based on the facility's DMR data reported to MDNR, the facility had an average effluent flow from 2019 through 2023 of approximately 20,948 GPD with the highest maximum daily flow reported as 80,100 GPD.

Receiving Waterbody Information: Kinkade Crossing WWTP is located in HUC 12 watershed 10300102-0706. The receiving stream is a tributary to Rocky Fork, and the first classified receiving stream is Rocky Fork.

Comments on Compliance, Condition, and Capacity: Kinkade Crossing WWTP does not have a schedule of compliance; however, the current operating permit includes monitoring for ammonia, which could lead to future effluent limits. The facility typically discharges low effluent ammonia concentrations and should not require upgrades to meet ammonia limits. The treatment processes are contained in steel basins that exhibit significant signs of corrosion and are in generally poor condition. Effluent flows on the facility's DMR data were observed to noticeably increase in 2023 placing the plant near its design capacity. There are no plans for expansion of the facility at this time.

Recommended Improvements: It is recommended that the existing metal basins be rehabilitated and repainted to repair the corrosion damage. The anodes should also be replaced. If rehabilitation of the existing plant is not preferred, the Kinkade Crossing WWTP could also be a candidate for connection to the Rocky Fork WWTP via a new pump station and force main or a gravity sewer interceptor.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $488,900.00 (see Appendix A – Table A.5)

4.10 Meadow Village WWTP

Facility Information: The Meadow Village WWTP is regulated under operating permit number MO-0098442. The current permit is effective from November 1, 2020 to March 31, 2025. The WWTP is located east of Columbia near the intersection of Serenity Circle and Doziers Station Road. It was constructed in 2009 and serves a small residential subdivision.

Treatment Description: The treatment process is an extended aeration package plant that includes a bar screen, extended aeration, an internal clarifier, UV disinfection, and aerated sludge holding. Sludge is hauled to the City of Columbia for disposal. Meadow Village WWTP has a permitted design flow of 16,500 gpd, a design population equivalent of 165, and an actual permit flow of 1,850 gpd. Based on the facility's DMR data reported to MDNR, the facility had an average effluent flow from 2019 through 2023 of approximately 3,527 gpd with the highest maximum daily flow reported as 22,800 gpd.

Receiving Waterbody Information: Meadow Village WWTP is in HUC 12 watershed 10300102-1001. The receiving stream is a tributary to Little Cedar Creek, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Meadow Village WWTP does not have a schedule of compliance; however, the current operating permit includes monitoring for ammonia, which could lead to future effluent limits. The facility typically discharges low effluent ammonia concentrations and should not require upgrades to meet ammonia limits. The package treatment process is contained in a steel basin that is in poor condition due to significant corrosion. The WWTP site also has drainage issues, which has caused stormwater to overtop the treatment basin in the past. There are no issues with treatment capacity and no plans for expansion at this time. The Edelwiess WWTP south of Meadow Village is a private facility that could be a future connection to the WWTP.

Recommended Improvements: It is recommended that the existing metal basin is rehabilitated and repainted to repair the corrosion damage. The anodes should also be replaced. It is also recommended to install a railing around the basin to improve site safety. Site drainage improvements should be completed to divert stormwater away from the treatment basin.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $339,000.00 (see Appendix A – Table A.6)

4.11 Midway Arms WWTP

Facility Information: The Midway Arms WWTP is regulated under operating permit number MO-0108421. The current permit is effective from November 1, 2020 to June 30, 2025. The WWTP is located at 5875 Van Horn Tavern Road off of I-70 west of Columbia. It was constructed in 2009 and serves a distribution facility warehouse.

Treatment Description: The treatment process includes a septic tank, recirculating sand filter, and UV disinfection with sludge hauled to the City of Columbia for disposal. Midway Arms WWTP has a permitted design flow of 4,800 gpd, a design population equivalent of 94, and an actual permit flow of 4,200 gpd. Based on the facility's DMR data submitted to MDNR, the facility had an average effluent flow from 2019 through 2023 of approximately 3,424 gpd with the highest maximum daily flow reported as 5,760 gpd.

Receiving Waterbody Information: Midway Arms WWTP is in HUC 12 watershed 10300102-0708. The receiving stream is a tributary to Henderson Branch, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Midway Arms WWTP has a schedule of compliance for ammonia. The compliance deadline was September 1, 2024. The existing treatment facility will not comply with the new effluent limits. The facility has exceeded its effluent limits for BOD_5 several times in the past five years. No other issues with the WWTP were reported by BCRSD staff. There are no issues with treatment capacity and no plans for expansion at this time.

Recommended Improvements: The original developer of the Midway Arms facility is contractually obligated to keep the WWTP in compliance with its operating permit requirements. The facility should be connected to the City of Columbia's Henderson Branch Sewer Extension once service is available. If the Henderson Branch Sewer Extension is delayed or cancelled, the developer shall complete a facility plan for a no-discharge treatment facility located above the floodplain.

Planning Phase: 0-5 Years

Total Project Cost Estimate: Not Applicable

4.12 Midway Crossing WWTP

Facility Information: The Midway Crossing WWTP is regulated under operating permit number MO-0132705. The current permit is effective from November 1, 2020 to June 30, 2025. The WWTP is located near the Golden Willow Drive and Rollingwood Boulevard intersection west of Columbia. It was constructed in 2008 and primarily serves residential subdivisions as well as the Midway Elementary School.

Treatment Description: The treatment process includes a bar screen, influent pump station with flow equalization, extended aeration, two final clarifiers, UV disinfection, and aerobic sludge digestion. Sludge is hauled to the City of Columbia for disposal. The Midway Crossing WWTP has a permitted design flow of 150,000 gpd, a design population equivalent of 1,500, and an actual permit flow of 23,000 gpd. Based on the facility's DMR data submitted to DNR, the facility's average effluent flow from 2019 through 2023 was approximately 24,532 gpd with the highest maximum daily flow reported as 837,900 gpd.

Receiving Waterbody Information: Midway Crossing WWTP is located in HUC 12 watershed 10300102-0708. The receiving stream is a tributary to Sugar Branch, and the first classified receiving stream is Sugar Branch.

Comments on Compliance, Condition, and Capacity: Midway Crossing WWTP does not have a schedule of compliance. The current operating permit includes influent and effluent flow monitoring for nutrients as the facility has a design flow greater than 100,000 gpd. The treatment plant is in good condition with a few areas that present operational challenges. The influent manual barscreen has wide spacing, which allows debris to enter the WWTP. The clarifier equipment exhibits signs of rust and deterioration. The UV equipment has issues with freezing that are currently addressed by staff constructing temporary insulation. The average flow discharged by the facility is currently well below the plant's design flow; however, the calculated flows allocated to the plant would place the system at its capacity. Additionally, the collection system may have I/I amounts that would be considered excessive based on the high maximum daily flow reported.

Recommended Improvements: Immediate improvement recommendations include replacing the manual bar screen with a new, finer manual screen, rehabilitating the existing clarifier equipment, and installing a cover over the existing UV equipment. It is also recommended to install permanent influent flow measurement to more accurately monitor the amount of flow entering the treatment plant.

In the future, as the treatment plant's age nears the end of its useful life, consideration should be given to connecting the plant influent to the City of Columbia collection system and closing the

treatment facility. The City of Columbia is in the preliminary planning stages of a sewer project that would extend city sewer along the Henderson Branch of Perche Creek to the northwest corner of the intersection of Interstate 70 and U.S. Highway 40. Additionally, further in the future, as development pressure warrants, the city may extend sewer along the Sugar Branch of Perche Creek closer to the Midway Crossing WWTP site.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $202,200.00 (see Appendix A – Table A.7)

4.13 Midway USA WWTF

Facility Information: The Midway USA WWTF is regulated under operating permit number MO-0129629. The current permit is effective from November 1, 2020 to June 30, 2025. The WWTF is located at 2200 State Highway J west of Columbia. It was constructed in 2017 and serves the Midway USA distribution center located on an approximately 180-acre site.

Treatment Description: The treatment process includes a trash tank, flow equalization, septic tanks, disc filters, and subsurface drip irrigation. Septage is hauled to the City of Columbia for disposal. Midway USA WWTF has a permitted design flow of 6,460 gpd and a design population equivalent of 259.

Receiving Waterbody Information: Midway USA WWTF is located in HUC 12 watershed 10300102-0708. The operating permit identifies the receiving stream as a tributary to Sugar Branch; however, the facility does not discharge wastewater to a surface waterbody.

Comments on Compliance, Condition, and Capacity: Midway USA WWTF does not have permitted effluent limits or a schedule of compliance. There are no reported problems with the WWTF other than paper products and other debris entering the treatment system. There are no known issues with treatment capacity and no plans for expansion of the facility at this time.

Recommended Improvements: Install a manual barscreen on the influent of the WWTF to catch any paper products or large debris. At the end of the facility's useful life, consideration should be given to connecting the site to the Midway Crossing WWTP collection system.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $68,200.00 (see Appendix A – Table A.8)

4.14 Prairie Meadows WWTP

Facility Information: The Prairie Meadows WWTP is regulated under operating permit number MO-0083542. The current permit is effective from November 1, 2020 to March 31, 2025. The WWTP is located near the East Prairie Circle and Meadow Lark Lane intersection just west of Highway 63, south of Columbia. It was constructed in 2006 and primarily serves residential single-family housing and duplexes.

Treatment Description: The treatment process is an extended aeration package plant that includes an influent pump station, bar screen, flow equalization basin, extended aeration, final clarifier, UV disinfection, and aerated sludge holding. Sludge is hauled to the City of Columbia for disposal. The Prairie Meadows WWTP has a permitted design flow of 80,000 gpd, a design population equivalent of 1,000, and an actual permit flow of 33,500 gpd. Based on the facility's DMR data submitted to MDNR, the facility had an average effluent flow from 2019 through 2023 of approximately 31,287 gpd with a reported maximum daily flow of 384,400 gpd.

Receiving Waterbody Information: Prairie Meadows WWTP is located in HUC 12 watershed 10300102-0903. The receiving stream is a tributary to Gans Creek, and the first classified receiving stream is Gans Creek. As discussed in Section 3.2, Gans Creek is classified as an Outstanding State Resource Water. It is also included on the 2022 303(d) List for impairment due to *E. coli* from rural nonpoint sources.

Comments on Compliance, Condition, and Capacity: Prairie Meadows WWTP does not have a schedule of compliance; however, the current operating permit includes monitoring for ammonia, which could lead to future effluent limits. The facility typically discharges low effluent ammonia concentrations and should not require upgrades to meet ammonia limits. The package treatment process is contained in a steel basin that is in poor condition due to signification corrosion. Additionally, the facility began experiencing a significant increase in I/I in 2023. There are developers interested in connecting commercial properties to the WWTP; however, the peak flows experienced due to I/I during storm events severely limits the plant's available capacity for additional connections. Since the WWTP discharges within the watershed of an Outstanding State Resource Water (OSRW), increasing the treatment capacity and design flow of the plant is likely impermissible by MDNR under its current Antidegradation Implementation Procedure.

Recommended Improvements: It is recommended that the existing metal basin is rehabilitated and repainted to repair the corrosion damage. The anodes should also be replaced. The UV disinfection system should be modified or relocated for ease of operator access.

Due to the facility's discharge to an OSRW, future consideration should be given to closure of the WWTP via connection to the City of Columbia sewer system. However, the current City of Columbia collection system infrastructure in this area does not have the excess capacity necessary to accept the flow from Prairie Meadows.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $866,000.00 (see Appendix A – Table A.9)

4.15 Quarter Mile Hills WWTF

Facility Information: The Quarter Mile Hills WWTF is regulated under operating permit MO-0126446. The current permit is effective from November 1, 2020 through December 31, 2024. The WWTF is located west of Hallsville near the intersection of Highway 124 and Barnes School Road off of Quarter Mile Drive. It was constructed in 2001 and serves a small residential subdivision.

Treatment Description: The treatment process is a three-cell lagoon with sludge retained in the lagoon. The Quarter Mile Hills WWTF has a permitted design flow of 5,480 gpd, a design population

equivalent of 57, and an actual permit flow of 1,600 gpd. Based on the facility's DMR data submitted to MDNR, the facility had an average effluent flow from 2019 to 2023 of approximately 1,126 gpd with the highest daily maximum flow reported as 3,400 gpd.

Receiving Waterbody Information: The WWTF is located in HUC 12 watershed 10300102-0704. The receiving stream is a tributary to Kelley Branch, and the first classified receiving stream is Kelley Branch.

Comments on Compliance, Condition, and Capacity: Quarter Mile Hills WWTF has a schedule of compliance for ammonia and *E. coli*. The compliance deadline is November 1, 2037. The existing treatment facility will not comply with the new effluent limits. No other issues were reported by BCRSD staff. There are no issues with treatment capacity and no plans for expansion at this time.

Recommended Improvements: The *Quarter Mile Hills Interconnection and Lagoon Closure Facility Plan* completed by Cochran in 2017 recommended installing tertiary lagoon treatment such as a Nitrox Reactor and UV disinfection to meet the new effluent limits for ammonia and *E. coli.* The facility plan also evaluated a no-discharge alternative of installing a drip disposal system. Due to the benefits of no-discharge systems including the elimination of effluent limits and reduced operational requirements, it is recommended to pursue the conversion of the existing facility to a drip system. The facility plan estimated the total project cost to convert the facility to a drip system as $422,952.75. Alternatively, regionalization through a cooperative agreement with Missouri American Water to connect to the City of Hallsville could be considered if adequate treatment capacity is available.

Planning Phase: 11-20 Years

Total Project Cost Estimate Projected to 2041 Dollars: $1,697,400.00 (see Appendix A – Table A.10)

4.16 Richardson Acres WWTF

Facility Information: The Richardson Acres WWTF is regulated under operating permit number MO-0115185. The current permit is effective from November 1, 2020 to March 31, 2025. The WWTF is located near the Highway B and Flamingo Drive intersection off of Route B north of Columbia. It was constructed in 1989 and serves a small residential subdivision.

Treatment Description: The treatment process includes a STEP system, a two-cell lagoon with aeration in the primary cell, and sludge retained in the lagoon. The Richardson Acres WWTF has a permitted design flow of 8,510 gpd, a design population equivalent of 85, and an actual permit flow of 3,700 gpd. Based on the facility's DMR data submitted to MDNR, the facility had an average effluent flow from 2019 through 2023 of approximately 3,997 gpd with the highest daily maximum flow reported as 8,200 gpd.

Receiving Waterbody Information: Richardson Acres WWTF is located in HUC 12 watershed 10300102-0706. The receiving stream is a tributary to Clays Fork, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Richardson Acres WWTF has a schedule of compliance for ammonia and *E. coli*. The compliance deadline is November 1, 2028. The existing treatment facility will not comply with the new effluent limits. No other issues were reported by BCRSD

staff. There are no issues with treatment capacity and no plans for expansion at this time. Oak Ridge Mobile Home Park is a private treatment facility located south of Richardson Acres that could be a future connection to the wastewater system.

Recommended Improvements: The *Richardson Acres and Brown Station Wastewater Improvements Facility Plan – Amendment 2* completed by HDR in 2021 recommends closing the Richardson Acres WWTP by connection to the Rocky Fork WWTP via pump station and force main in a cooperative project with Brown Station and Cedar Gate. The facility plan estimated the total cost of the Brown Station pump station and force main and the Richardson Acres pump station and force main project as $2,366,000, and the project is currently funded on the Fiscal Year 2025 Clean Water State Revolving Fund Intended Use Plan for a loan amount of $2,366,000. It is recommended that this project is completed as planned. Exhibit C.2 in Appendix C illustrates the proposed force main route. If the pump station and force main projects for connection to Rocky Fork are not completed, an updated facility plan for the Richardson Acres WWTF should be prepared to evaluate other possible alternatives for compliance with the new effluent limits. One alternative may be regionalization by connection to the City of Columbia.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $1,956,900.00 (See Appendix A – Table A.11; cost estimate includes Richardson Acres pump station and force main only)

4.17 Rocheport WWTP

Facility Information: The Rocheport WWTP is regulated under operating permit number MO-0095222. The current permit is effective from April 1, 2021 to June 30, 2025. The WWTP is located near the Columbia Street and 4th Street intersection in Rocheport, MO. The Rocheport WWTP was constructed in 1980 and serves the City of Rocheport. A rehabilitation project at the WWTP was completed in 2018.

Treatment Description: The treatment process includes a manual bar screen, single unit modified circular oxidation ditch with final clarifier, UV disinfection, aerated sludge digester, and a sludge holding basin. Sludge is hauled to the City of Columbia for disposal. The plant has a permitted design flow of 34,400 gpd, a design population equivalent of 380, and an actual permit flow of 12,500 gpd. Based on the facility's DMR data submitted to MDNR, the facility had an average effluent flow from 2019 through 2023 of 25,764 gpd with the highest daily maximum flow reported as 83,000 gpd.

Receiving Waterbody Information: Rocheport WWTP is located in HUC 12 watershed 10300102-0305. The receiving stream is a tributary to Moniteau Creek, and the first classified receiving stream is Moniteau Creek.

Comments on Compliance, Condition, and Capacity: The plant does not have a schedule of compliance; however, the current operating permit includes monitoring for ammonia, which could lead to future effluent limits. The facility typically discharges low effluent ammonia concentrations and should not require upgrades to meet ammonia limits. No issues with the WWTP were reported by BCRSD staff. The Les Bourgeois Winery WWTF is a private facility near Rocheport that could be a future connection to the Rocheport collection system. The owner of the winery is also proposing

additional new developments along Highway BB that may be future connections. The WWTP is nearing its permitted design capacity.

Recommended Improvements: It is recommended that an influent flow meter is installed at the WWTP to obtain more accurate flow data to determine the plant's remaining treatment capacity. Capacity upgrades may be needed in the future to serve new development in the area. It is anticipated that the expansion of the treatment plant would be developer funded.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $75,400.00 (see Appendix A – Table A.12)

4.18 Rocky Fork WWTP

Facility Information: The Rocky Fork WWTP is regulated under operating permit number MO-0137294. The permit is effective from February 1, 2021 to June 30, 2025. The plant is located north of Columbia near the East Cedar Court and Rocky Fork Drive intersection. The plant was constructed in 2013 and serves several residential subdivisions north of Columbia.

Treatment Description: The treatment process includes an influent pump station, mechanical bar screen, grit removal, oxidation ditch, intermediate bar screen, two final clarifiers, UV disinfection, re-aeration, and aerated sludge storage. There is also an area for sludge dewatering in geotextile bags. Sludge is hauled to the City of Columbia landfill for disposal. The Rocky Fork WWTP has a permitted design flow of 460,000 gpd, a design population equivalent of 4,600, and an actual permit flow of 220,000 gpd. Based on the facility's DMR data submitted to MDNR, the facility's average effluent flow from 2019 through 2023 was approximately 277,108 gpd and the highest reported maximum daily flow was 1,610,000 gpd.

Receiving Waterbody Information: Rocky Fork WWTP is located in HUC 12 watershed 10300102-0706. The receiving stream is a tributary to Rocky Fork, and the first classified receiving stream is Rocky Fork.

Comments on Compliance, Condition, and Capacity: The current permit includes a schedule of compliance for lower ammonia limits, which became effective on February 1, 2022. The existing treatment facility is capable of meeting the lower limits. The current operating permit includes influent and effluent flow monitoring for nutrients as the facility has a design flow greater than 100,000 gpd. The treatment plant is in good condition with a few areas that present operational challenges. The key concerns identified by BCRSD staff include: the sludge management process is cumbersome and inefficient, the controls for the return and waste activated sludge (RAS/WAS) pumps do not include redundancy, and algae growth accumulates on the cascade re-aeration stairs during warm weather. The plant is currently operating within its design treatment capacity; however, the collection system may have I/I amounts that would be considered excessive based on the high maximum daily flow reported. There are several private and BCRSD-owned systems that could be connected to the Rocky Fork WWTP in the future.

Recommended Improvements: It is recommended that the sludge handling process is upgraded to a more efficient system. The cost estimate for a portable sludge dewatering screw press that could be used at the Rocky Fork WWTP and South Route K WWTP is included in Section 6.3. Improvements to

the Rocky Fork plant to accommodate the use of this screw press will be needed including electrical and site upgrades. The control panel for the RAS/WAS pumps should be upgraded to include provisions for manual operations in case of system outages. It is also recommended to install a cover over the cascade aeration stairs to prevent algae growth.

Although the WWTP has a design flow of 460,000 gpd, the oxidation ditch and clarifiers installed in 2013 do not require expansion or modification to treat a design average flow up to 690,000 gpd. To increase the overall treatment capacity of the plant to 690,000 gpd, the influent pump station should be modified by adding a third pump to the wet well and the existing two pumps should be replaced. The UV system should be modified to add an additional bank of UV lights. An additional sludge storage basin and blower may be necessary depending on the outcome of the portable screw press recommendation.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars:
$487,100.00 (Infrastructure Renewal Improvements, see Appendix A – Table A.13)

$1,255,800.00 (Capacity Expansion Improvements, see Appendix A – Table A.14)

4.19 South Route K WWTP

Facility Information: The South Route K WWTP is regulated under operating permit number MO-0087173. The current permit is effective from November 1, 2020 through March 31, 2025. The plant is located near the Boris Drive and Amos Drive intersection off of Route K south of Columbia. The facility was originally constructed in 1969 and upgraded in 2000 to include a mechanical treatment plant. The WWTP serves several residential subdivisions south of Columbia.

Treatment Description: The treatment process includes two separate treatment trains, each with its own outfall. All flow to the plant first enters a flow equalization pump station. The pump station pumps flow to the Outfall #002 treatment train, which is an extended aeration package plant that includes a manual bar screen, two aeration chambers, two final clarifiers, and two aerated sludge holding tanks. Sludge dewatering in bags is also provided on site. When influent flows exceed the capacity of the pump station, flow is diverted through an overflow pipe to the Outfall #001 treatment train, which includes a four-cell lagoon with aeration in the first two cells and sludge retained in lagoon.

Combining the two treatment trains, the plant has permitted design flow of 244,000 gpd and a design population equivalent of 2,477. Based on the facility's DMR data submitted to MDNR, Outfall #001 had an average effluent flow from 2019 to 2023 of 10,862 gpd with the highest daily maximum flow reported as 210,100 gpd. Outfall #002 had an average effluent flow of 95,751 gpd with its highest daily maximum flow reported as 210,100 gpd.

Receiving Waterbody Information: South Route K WWTP is located in HUC 12 watershed 10300102-0903. The receiving stream for both outfalls is a tributary to Little Bonne Femme Creek, and the first classified receiving stream is a 100K Extent-Remaining Stream. Little Bonne Femme Creek is included on the 2022 303(d) list for an *E. coli* impairment caused by an unknown source.

Comments on Compliance, Condition, and Capacity: South Route K WWTP has a schedule of compliance for ammonia and *E. coli*. The compliance deadline is November 1, 2029. The existing treatment facility will not comply with the new effluent limits. The current operating permit includes influent and effluent flow monitoring for nutrients as the facility has a design flow greater than 100,000 gpd. The package treatment process is contained in a steel basin that is in poor condition due to signification corrosion. Additionally, there is no headworks other than the manual bar screen and grit accumulates in the bottom of the basin. The plant is located in a floodplain and there have been flooding issues at the site in the past.

The area surrounding the treatment plant has a high potential for new residential development. Cornell's Friendly Acres is a private treatment facility permitted by MDNR that could be a future connection to the South Route K wastewater system.

Recommended Improvements:
The *South Route K Facility Plan* completed by Donohue & Associates, Inc. in 2017 recommended replacing the existing package plant and lagoons with a new oxidation ditch type wastewater treatment plant with the capacity to treat an average daily flow of 860,000 gpd. The plan recommends constructing the new plant on the existing South Route K site in two phases. The first phase would primarily include influent screening, a three-ring oxidation ditch, two secondary clarifiers, and UV disinfection designed to treat an average daily flow 435,000 gpd. Wastewater would be treated in the inner two rings of the oxidation ditch, and the third ring would be used for aerated WAS storage. When demand warrants, the second phase would involve placing the third oxidation ditch ring into operation to treat an average daily flow of 860,000 gpd and constructing an external aerated WAS storage basin. The total initial cost of the Phase 1 project was estimated to be $6,454,000, and the Phase 2 cost was estimated to be $3,237,000.

Due to the demand for new housing units in the Little Bonne Femme watershed, it is recommended that the South Route K treatment plant is relocated as part of the facility upgrades. Moving the South Route K treatment plant further downstream will open up a much larger service area with potential for new gravity sewer connections to the WWTP. The addition of the increased customer base should help to offset the high project cost associated with the treatment plant upgrades. Prior to the design of the new WWTP, a flow monitoring study and facility plan amendment should be completed to identify a preferred treatment plant site and re-evaluate the design flows and loadings for the new facility. For the purposes of the CIP, a cost estimate was prepared for relocating the WWTP approximately 1.6 miles south and constructing a new approximately 0.5 MGD mechanical treatment facility. Exhibit C.3 in Appendix C illustrates the proposed new gravity sewer route and WWTP site.

Alternatively, regionalization to the City of Columbia via a new pump station and force main could be considered if adequate treatment capacity is available.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $21,597,600.00 (see Appendix A – Table A.15)

4.20 Sunnyslope WWTF

Facility Information: The Sunnyslope WWTF is regulated under operating permit number MO-0095354. The current permit is effective from November 1, 2020 through December 31, 2024. The facility is located 0.1 miles southwest of the Ricketts Road and Sunnyslope intersection near Hallsville. The facility was constructed in 1971 and serves a small residential subdivision.

Treatment Description: The treatment process includes a single-cell aerated lagoon with sludge retained in the lagoon. The facility was constructed in 1971. The WWTF has a permitted design flow of 5,500 gpd, a design population equivalent of 55, and an actual permit flow of 1,900 gpd. Based on the facility's DMR data submitted to MDNR, the facility had an average effluent flow from 2019 to 2023 of 2,465 gpd with the highest daily maximum flow reported as 5,200 gpd.

Receiving Waterbody Information: Sunnyslope WWTF is located in HUC 12 watershed 10300102-0704. The receiving stream is a tributary to Kelley Branch, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Sunnyslope WWTF has a schedule of compliance for ammonia and *E. coli.* The compliance deadline is November 1, 2038. The existing treatment facility will not comply with the new effluent limits. Additionally, the facility has had several exceedances of its effluent limits for BOD_5 and TSS in the past five years. There are no issues with treatment capacity and no plans for expansion at this time.

Recommended Improvements: The *Sunnyslope Facility Plan* completed by Cochran in 2017 and revised in 2019 recommended connecting the facility to the City of Hallsville's wastewater system and closing the Sunnyslope WWTF. The connection can be made by installing a short portion of new gravity sewer. BCRSD has an existing cooperative agreement with the City of Hallsville from January 2019 to provide wastewater treatment services for the Sunnyslope Subdivision. It is recommended that this connection is completed as planned. Additionally, a portion of the existing collection system is old truss pipe that is recommended to be replaced with new PVC gravity sewer. The facility plan estimated the total project cost of the new gravity sewer connection and sewer main replacement as $272,293.15.

Planning Phase: 11-20 Years

Total Project Cost Estimate Projected to 2041 Dollars: $1,059,900.00 (see Appendix A – Table A.16)

4.21 Trails West WWTF

Facility Information: The Trails West WWTF is regulated under operating permit number MO-0092002. The current permit is effective from November 1, 2020 through June 30, 2025. The facility is located at the south terminus of South Trails Court west of Columbia. The facility was constructed in 1970 and serves a residential subdivision.

Treatment Description: The treatment process includes a two-cell lagoon with aeration in the primary cell and sludge retained in the lagoon. The WWTF has a permitted design flow of 57,500 gpd, a design population equivalent of 644, and an actual permit flow of 29,400 gpd. Based on the facility's

DMR data submitted to MDNR, the facility had an average effluent flow from 2019 to 2023 of 31,114 gpd with the highest daily maximum flow reported as 86,400 gpd.

Receiving Waterbody Information: The WWTF is located in HUC 12 watershed 10300102-0708. The receiving stream is a tributary to Sugar Branch, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Trails West WWTF has a schedule of compliance for ammonia and *E. coli*. The compliance deadline is November 1, 2031. The existing treatment facility will not comply with the new effluent limits. The plant does not have screening and has experienced issues with aerators clogging due to wipes and debris entering the lagoon. The site is also prone to flooding.

Recommended Improvements: The *Facility Plan for Trails West Subdivision Pump Station & Lagoon Closure* completed by Allstate Consultants, LLC in 2012 and the *Midway Area Wastewater Facility Plan* completed by McClure in 2022 both recommended connecting the existing Trails West WWTF to the Midway Crossing WWTP system via pump station and force main. It is recommended that the connection is completed, and the Trails West WWTF is closed. To reduce the cost associated with the new pump station and force main, the force main should be designed to follow a more direct path to the nearest connection point within the Midway Crossing collection system than proposed in the facility plans. Exhibit C.4 in Appendix C illustrates the proposed force main route. Prior to the connection, it is recommended that a manual bar screen is installed at the Trails West WWTF to capture wipes and prevent the aerators from clogging in the interim. It is also recommended an influent flow monitoring study is conducted and a facility plan amendment is prepared to determine the amount of flow that will be connected to the Midway Crossing WWTP and properly size the pump station and force main. BCRSD staff has indicated inflow and infiltration concerns in the Trails West collection system, which may require rehabilitation prior to the connection to Midway Crossing.

Planning Phase: 0-5 Years (Influent Manual Screen)

Total Project Cost Estimate Projected to 2030 Dollars: $59,000.00 (see Appendix A – Table A.17)

Planning Phase: 6-10 Years (Connection to Midway Crossing)

Total Project Cost Estimate Projected to 2033 Dollars: $1,715,500.00 (see Appendix A – Table A.18)

4.22 Twin Lakes WWTF

Facility Information: The Twin Lakes WWTF is regulated under operating permit number MO-0101885. The current permit is effective from November 1, 2020 through September 30, 2024. The facility is located off of North Cedar Court near the intersection of Route E and Wilhite Road northwest of Columbia. The facility was constructed in 1972 and serves a residential subdivision.

Treatment Description: The treatment process includes a two-cell lagoon with aeration in the primary cell and UV disinfection. Sludge is retained in the lagoon. Twin lakes WWTF has a permitted design flow of 19,400 gpd, a design population equivalent of 194, and an actual permit flow of 1,700 gpd. Based on the facility's DMR data submitted to MDNR, the facility had an average effluent flow from 2019 to 2023 of 2,711 gpd with the highest daily maximum flow reported as 12,000 gpd.

Receiving Waterbody Information: The WWTF is located in HUC 12 watershed 10300102-0707. The facility's receiving stream is a tributary to Perche Creek, and the first classified receiving stream is a 100K Extent-Remaining Stream.

Comments on Compliance, Condition, and Capacity: Twin Lakes WWTF has a schedule of compliance for ammonia. The compliance deadline is November 1, 2032. The existing treatment facility will not comply with the new effluent limits. There are concerns with the existing site due to a spillway from the adjacent lake that runs between the two lagoon cells. The spillway is believed to be a corrugated metal pipe, which is not owned by BCRSD. There are no issues with treatment capacity and no plans for expansion at this time.

Recommended Improvements: The *Twin Lakes Subdivision WWTP Facility Plan* completed by Shafer, Kline & Warren, Inc. in 2011 recommended replacing the existing two-cell lagoon system with a new extended aeration package WWTP. Additional land would be needed to construct the new treatment system due to limited space at the current site. The facility plan estimated the total project cost of completing the proposed improvements as $813,869.00.

Due to the age of the report, it is recommended that a new facility plan and antidegradation review report is completed for the Twin Lakes WWTF. Several improvement options may be available to comply with new effluent limitations including conversion to a no discharge system, addition of a lagoon enhancement tertiary nitrification system such as a SAGR, or installation of a new extended aeration package plant. For the purposes of budgeting for capital improvements, the cost of constructing an extended aeration package plant as previously recommended has been included.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $2,284,100.00 (see Appendix A – Table A.19)

5.0 COLLECTION SYSTEM INFRASTRUCTURE

In addition to the WWTFs included in Section 4.0, BCRSD also owns and maintains significant collection system infrastructure throughout Boone County. These wastewater collection systems discharge to BCRSD treatment facilities or the City of Columbia sewer system. Collection system infrastructure was reviewed with BCRSD staff to identify areas with ongoing issues that are in need of improvements.

5.1 Gravity Sewers

The majority of BCRSD's collection system infrastructure consists of conventional gravity flow sewer mains. As of September 2024, BCRSD's GIS includes 553,736 linear feet (lf) of pipe identified as gravity sewer main. Approximately 13,919 lf of the gravity sewers are less than 8-inches in diameter, which may be attributed to small diameter variable grade sewers. An additional approximately 45,179 lf is attributed to the Sturgeon collection system, which is not owned by BCRSD. Of the remaining pipes identified as gravity sewer main, 475,891 lf or 90.1 miles are 8-inch pipes and 18,748 lf or 3.6 miles are greater than 8-inches. BCRSD's GIS also includes 2,399 manholes of which 2,325 are identified as being owned by BCRSD. BCRSD staff estimate approximately 40 miles of the gravity sewer pipes in BCRSD's collection systems are vitrified clay pipes (VCP). Additional information regarding general collection system investigation and rehabilitation is provided in Section 6.2.

Based on conversations with BCRSD staff, the following gravity sewer segments were identified as priorities for improvement:

5.1.1 Cedar Lake Siphon Sewer Elimination

The Cedar Lake siphon sewer is located near the intersection of North Cedar Lake Dr. and Lake Valley Lane in southwest Columbia. The existing sewer is an 8-inch inverted siphon running underneath Cedar Lake. The siphon has been identified as a problem area by BCRSD staff, and it is recommended that the siphon is eliminated by re-routing the sanitary sewer in this area to a new approximately 2,000 lf gravity main. Pressure grouting 200 lf of existing ductile iron sewer pipe should also be included as part of the improvements.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2030 Dollars: $851,900.00 (see Appendix B – Table B.1)

5.1.2 Rollingwood Aerial Crossing

An aerial sewer crossing located in the vicinity of the Midway Crossing WWTP near the Rollingwood Blvd. and Pinelawn Dr. intersection has been identified as an ongoing maintenance issue for BCRSD. The aerial crossing is approximately 105 lf of ductile iron pipe that is prone to freezing. It is recommended that this aerial crossing is eliminated by re-routing the sanitary sewer in this area to a new subsurface gravity main.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $384,500.00 (see Appendix B – Table B.2)

5.1.3 Waters Edge Sewer Improvements

The Waters Edge subdivision is located east of Columbia, just north of the Clark Lane and St. Charles Rd. intersection. The *Edgewater Lots 1-14 Wastewater Evaluation* prepared by HDR in 2021 recommended upsizing the capacity of three sewer pipe segments from 8-inches to 24-inches in order accept wastewater flows from the Edgewater Lots 1-14 proposed development and additional undeveloped areas of the Waters Edge interceptor watershed. Design drawings have been prepared by HDR for the proposed improvement. The existing Grindstone Creek Watershed -Upper North Fork; Hominy Branch Watershed; Little Cedar Creek Watershed Cooperative Agreement between BCRSD and the City of Columbia dictates what areas of the undeveloped watershed fall within jurisdiction of BCRSD vs. the city for sewer services. It is recommended that this project be constructed when development pressure warrants in a cooperative effort with the City of Columbia.

Planning Phase: 11-20 Years

Total Project Cost Estimate Projected to 2041 Dollars: $2,199,100.00 (see Appendix B – Table B.3)

5.2 Pump Stations and Force Mains

Table 5.1 below includes a list of all wastewater pump stations currently owned and operated by BCRSD. The location of each pump station is shown in Exhibit 5.2 on the following page.

Table 5.1. BCRSD Pump Stations

Pump Station*	Receiving WWTP
BCP	Rocky Fork WWTP
Bonne Femme	South Route K WWTP
Clearview North	Rocky Fork WWTP
Clearview South	Rocky Fork WWTP
Concorde East	City of Columbia WWTP
Crestwood Hills	Rocky Fork WWTP
El Rey Heights	City of Columbia WWTP
Green Hills	Rocky Fork WWTP
Hillview Acres	City of Columbia WWTP
Lake Capri	City of Columbia WWTP
Lake of the Woods	City of Columbia WWTP
Lee Heights	City of Columbia WWTP
Martha's Grove	Prairie Meadows WWTP
Midway Elementary School	Midway Crossing WWTP
New Town	South Route K WWTP
Nursery Heights	South Route K WWTP
Oberlin Valley	City of Columbia WWTP
Rayfield	Rocky Fork WWTP
Rocheport North	Rocheport WWTP
Rocheport South	Rocheport WWTP
Rollingwood	Midway Crossing WWTP
Shalimar Gardens	Rocky Fork WWTP
Sharidan Hills	City of Columbia WWTP
Spring Park	City of Columbia WWTP
Sun Valley Estates	City of Columbia WWTP
Fairway West Pump Station	City of Columbia WWTP

* Does not include influent pump stations considered part of a WWTP.

1- Oberlin Valley
2- El Rey Heights
3- Lake Capri
4- Clearview North
5- Clearview South
6- Rayfield
7- BCP
8- Crestwood Hills
9- Shalimar Gardens
10- Bonne Femme
11- Fairway West
12- New Town
13- Lake of the Woods
14- Marthas Grove
15- Rocheport
16- Rocheport
17- Hillview Acres
18- Sharidan Hills
19- Sun Valley Estates
20- Spring Park
21- Nursery Heights
22- Green Hills
23- Concorde East
24- Midway Elem. School
25- Rollingwood
26- Lee Heights

Harrisburg
Hallsville
Hilldale
Woodlandville
Columbia
Rocheport
Huntsdale
Wooldridge
McBaine
Pierpont
Lupus
Sapp
Ashland
Sandy Hook
Wilton
Harg
Elkhurst
Pleasant Grove
Renfro
Rocky Fork Lakes Conservation Area
Big Muddy National Fish And Wildlife Refuge
University of Missouri
Three Creeks Conservation Area
Plowboy Bend Conservation Area
Hunters Creek
Prairie Creek
Reeder Creek
Little Creek
Vernon Branch
Mill Creek
South Fork Grindstone Creek
Maybon Branch
Fox Hollow Branch
Haldiman Branch
Highway 63 N
E Highway 124
819 ft
821 ft
921 ft
922 ft
896 ft

Legend

- Pump Station
- Boone County
- Impaired Streams 303(d)
- NHD Stream
- HUC 12 Watersheds
- Impaired Lakes - 303(d)
- Incorporated Cities

Exhibit 5.2- BCRSD Pump Stations

BCRSD CIP | Boone County, MO | 3/12/2025

0 5,250 10,500
Feet

N

McCLURE™

Document Path: C:\2022001400\07-GIS\MXD\BCRSD_MasterPlan\BCRSD_MasterPlan.aprx

Based on conversations with BCRSD staff, the following pump stations were identified as priorities for improvement:

5.2.1 Clearview North Pump Station

The Clearview North Pump Station is located approximately 0.5 miles south of Rocky Fork WWTP. It is a simplex pump station with a single Myers pump that serves five homes. Given the advantages of having a redundant pump, it is recommended that the existing pump station be replaced with a new duplex grinder pump station.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $425,600.00 (see Appendix B – Table B.4)

5.2.2 Fairway West Pump Station

The Fairway West Pump Station is a duplex pump station located approximately 0.3 miles east of the I-70 and St. Charles Road junction. Records indicate the pump station was constructed in 1997. Due to the pump station's proximity to the City of Columbia sewer system, it could be eliminated by constructing a new gravity sewer line south across I-70 to the city sewer located along Bull Run Dr. Making this connection would eliminate the operation and maintenance costs associated with the Fairway West Pump Station. It is recommended that this connection is constructed as the pump station nears the end of its useful life.

The Lake of the Woods Pump Station located near the West Pump Station just south of the I-70 and St. Charles Road junction was also evaluated for potential elimination through a gravity connection to the City of Columbia. Initial analysis of the existing sewer elevations and topography in this area indicated that this option is not feasible.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $1,366,200.00 (see Appendix B – Table B.5)

5.2.3 New Town Pump Station

The New Town Pump Station is a duplex pump station located just west of the South Route K WWTP at the intersection of Coneflower Ave. and New Meadow Lane. The pump station was constructed in 2000 in conjunction with the installation of the package plant treatment equipment at South Route K. Due to the proximity of the pump station to South Route K, it could potentially be eliminated by making a gravity connection to the proposed South Route K interceptor sewer discussed in Section 4.19. Making this connection would eliminate the operation and maintenance costs associated with the New Town Pump Station. It is recommended that this connection is constructed in coordination with improvements to the South Route K wastewater system.

The Bonne Femme Pump Station was also evaluated for potential elimination through a gravity connection to the proposed South Route K interceptor sewer; however, initial analysis of the existing sewer elevations in the Bonne Femme Estates area indicated that this option is not feasible.

Planning Phase: 0-5 Years

Total Project Cost Estimate Projected to 2033 Dollars: $145,700.00 (see Appendix B – Table B.6)

5.2.4 BCP, El Rey Heights, and Green Hills Pump Stations

The BCP Pump Station is located north of Columbia at 5340 N. Creasy Springs Rd. The pump station has a manhole style lid rather than a typical access hatch cover. It is recommended that the lid is replaced with a new hatch.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $26,200.00 (see Appendix B – Table B.7)

The El Rey Heights Pump Station is located west of Columbia near the intersection of Highway PP and Mary Ann Circle. An approximately 2,000 lf portion of the force main from this pump station was installed without tracer wire. It is recommended that the force main is located and tracer wire is installed.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $71,000.00 (see Appendix B – Table B.8)

The Green Hills Pump Station is located north of Columbia in the Green Hills Mobile Home Park off of Highway VV. The site has issues with stormwater drainage and water overtopping the wet well during wet weather. It is recommended that site drainage improvements are constructed.

Planning Phase: 6-10 Years

Total Project Cost Estimate Projected to 2033 Dollars: $113,500.00 (see Appendix B – Table B.9)

5.3 Pressure Sewers

In addition to the duplex pump stations and force mains that serve multiple connections, BCRSD owns several pressure sewer systems including both grinder pump systems and septic tank effluent pump (STEP) systems. Based on BCRSD's 2023 Annual Operating and Maintenance Summary, BCRSD owns and maintains approximately 253 individual grinder pumps as listed in Table 5.2.

Table 5.2. Summary of Grinder Pump Connections

Subdivision	Number of Grinder Pump Connections
Abel Acres	3
Clear Creek	45
Colchester Rd./Trobridge Rd.	14
Heather Hills	28
Hill Creek	90
Kinkade Crossing/Street Estates	50
Silver Fork	7
Toalson Estates	14
Waters Edge	2

BCRSD also owns and maintains approximately 268 individual septic tanks with effluent pumps as listed in Table 5.3.

Table 5.3 Summary of Septic Tank Effluent Pump Connections

Subdivision	Number of STEP Connections
Brookfield Estates	28
Deerfield Ridge	16
Fall Creek	8
Kristen Acres	3
Lake Capri	27
Quarter Mile Hills	16
Richardson Acres	24
Woodlands	146

In the following subdivisions with pressure sewer systems, BCRSD maintains the pressure sewer laterals only: Arrowhead Lake Estates, Arrowhead Plat 2, Hollingshead, Trobridge Road, Discount Homes, Bond, Buffalo Ridge, Campell and Harvester Rd., Valley Park, Wagon Trail Road, Happy Hollow, Eagles Nest, and Oak Hills.

Based on conversations with BCRSD staff, the following pressure sewer systems were identified as priorities for improvement:

5.3.1 Hill Creek

The Hill Creek subdivision is a low-pressure sewer system with approximately 90 grinder pumps owned and maintained by BCRSD. The subdivision is located southeast of the South Route K WWTP off of Hill Creek Road. Since the low-pressure system was installed in 2009, the subdivision has been

a problem area for BCRSD with numerous pump failures requiring total replacement and frequent service calls. A 2014 report prepared by HDR evaluated the hydraulics of the system and recommended increasing the pipe diameter of two existing pressure sewer segments in the system to reduce the head on the pumps. It is recommended that these improvements are implemented.

Planning Phase: 0-5 Years

Total Project Cost Estimated Projected to 2030 Dollars: $183,900.00 (see Appendix B – Table B.10)

5.3.2 Woodlands

The Woodlands subdivision is a low-pressure sewer system with approximately 146 connections. The subdivision is located east of Columbia near the intersection of New Haven Road and Rolling Hills Road. The subdivision is another problem area for BCRSD with frequent service calls. A 2019 report prepared by HDR evaluated the hydraulics of the system and recommended increasing the pipe diameter of one existing pressure sewer segment to accommodate flows from a proposed new connection and reduce the head on the pumps. The proposed new connection and pipe replacement has not been constructed. BCRSD staff also indicated an additional segment of pressure sewer that is desired to be upsized to improve operating conditions in the system in order to reduce service calls. It is recommended that these improvements are implemented.

Planning Phase: 0-5 Years

Total Project Cost Estimated Projected to 2030 Dollars: $239,900.00 (see Appendix B – Table B.11)

6.0 OPERATIONS AND MAINTENANCE

In addition to the infrastructure improvements discussed above, key operations and maintenance improvements were evaluated as part of this capital improvements plan based on BCRSD staff priorities.

6.1 CMMS and GIS Integration

The 2013 *Master Plan for District Facilities* discussed several improvements to the operations of BCRSD at a planning level including the implementation of a computerized maintenance management system (CMMS). A CMMS is software designed to streamline and optimize asset management and maintenance operations in organizations. It serves as a centralized hub for tracking work orders, managing assets and inventory, scheduling maintenance, and logging performance metrics. At this time, BCRSD does not use a CMMS to track its operations and maintenance activities; however, BCRSD does maintain a GIS system of its utility infrastructure. Integrating asset management software into the existing GIS system could help BCRSD staff streamline operations and improve efficiency. There are various levels of asset management software that could be implemented ranging from basic identification and tracking of materials to advanced real-time data monitoring with predictive analytics. The level of management software implemented will determine the cost of implementation and ongoing subscription fees. Due to the operational efficiencies produced by a GIS integrated asset management system, the cost of the software may be offset by the overall increased staff efficiency. For this reason, the cost of implementing a CMMS was not developed for the purposes of the CIP.

6.2 Collection System Maintenance and Rehabilitation

As discussed in Section 5.1., BCRSD maintains a vast network of sanitary sewer infrastructure throughout the county. Maintaining this system is critical for preventing issues like excessive inflow and infiltration (I/I) and sanitary sewer overflows (SSOs). Typically collection system maintenance involves two key steps: 1. Inspection and assessment and 2. Repair and rehabilitation. The purpose of the inspection and assessment phase, often referred to as a Sanitary Sewer Evaluation Survey (SSES), is to evaluate the physical and hydraulic conditions of the sanitary sewer system to more accurately determine the actions needed to correct defective areas of the collection system. A full-scale SSES often includes physical examination of system components, flow monitoring, smoke testing, closed circuit televising (CCTV), and hydraulic modeling to comprehensively evaluate all facets of the collection systems. Utilizing the results of the assessment phase, areas of the collection system in the worst condition can be prioritized for rehabilitation.

Some general unit costs for common collection system assessment and rehabilitation practices in 2025 dollars are listed below in Table 6.1.

Table 6.1 Collection System Assessment and Rehabilitation Costs

Description	Unit	Unit Cost
Smoke Testing	Linear Foot	$0.75
Manhole Inspections	Each Manhole	$150.00
CCTV	Linear Foot	$4.00
Sewer Main CIPP Lining	Linear Foot	$50.00
Manhole Rehabilitation	Each Manhole	$6,000.00

Based on the approximately 93.7 miles of gravity sewer and 2,325 manholes identified in BCRSD's GIS system, the replacement value of its collection system infrastructure assets can be estimated at upwards of $100 million dollars. Although funding the full value of the depreciation of these assets is cost prohibitive, funds should be allocated for maintaining this infrastructure.

It is estimated BCRSD should budget $100,000 per year for collection system assessment and another $500,000 per year for rehabilitation and repair. Additionally, BCRSD would benefit from the purchase of portable flow meters and associated monitoring equipment to conduct flow monitoring studies in collection systems with suspected I/I issues. Conducting the flow monitoring studies will allow BCRSD to strategically target the leakiest areas of its collection systems for further assessment. The estimated cost for six new portable flow meters in 2025 dollars is $54,000. It is recommended that the flow meters are purchased in Phase 1.

6.3 Biosolids Management

The majority of waste sludge produced at BCRSD facilities is hauled as a liquid to the City of Columbia WWTP by BCRSD staff for disposal. At the Rocky Fork WWTP and South Route K WWTP, sludge is dewatered onsite using passive sludge dewatering bags and then hauled to the City of Columbia landfill. To improve BCRSD's sludge processing capabilities, a portable, trailer-mounted screw press could be purchased to provide for enhanced sludge dewatering at multiple treatment plant sites. Currently, the Rocky Fork WWTP has limited capacity for the storage of liquid sludge creating operational challenges. The addition of a mechanical dewatering process would enhance operational efficiency and provide greater flexibility for operators. The portable screw press could be used at the Rocky Fork WWTP and the South Route K WWTP. Sludge from BCRSD's other smaller facilities could then be hauled to these sites for dewatering. The estimated cost for the screw press equipment and trailer in 2025 dollars is $1,200,000. It is recommended this is purchased in collaboration with the Rocky WWTP improvements or South Route K WWTP relocation project in Phase 1.

7.0 SUMMARY OF CAPITAL IMPROVEMENTS RECOMMENDATIONS

To facilitate the development of a strategic approach for prioritizing and implementing the capital improvements outlined in Sections 4.0, 5.0, and 6.0, the recommendations were classified into five key categories:

1. Regulatory Compliance: Improvements essential for maintaining permit compliance.
2. Infrastructure Renewal: Upgrades necessary to refurbish aging facilities or enhance functionality, focusing on condition improvement and system renewal.
3. Capacity Expansion: Enhancements required to increase the overall treatment capacity of the system.
4. Collection System Upgrades: Improvements specifically targeting the collection system infrastructure.
5. Operational Enhancements: Improvements aimed at optimizing operations and maintenance processes.

Tables 7.1 through 7.5 on the following pages group and summarize all improvement recommendations and associated planning costs based on the five categories. This categorization serves as a framework to guide decision-making and resource allocation in the execution of the CIP. Table 7.6 on page 54 provides the complete Capital Improvements Plan.

All budget and cost data were compiled in 2024 and 2025. Costs were then inflated using a 5% annual inflation rate to the planning phase end year of 2030 for the 0 to 5 year recommendations, the midpoint year of 2033 for the 6 to 10 years recommendations, and the midpoint year of 2041 for the 11 to 20 years recommendations. Cost projections for improvements in the first two phases to be completed within the next 10 years are considered reliable for the purpose of evaluating bonding capacity and budgeting needs. As the accuracy of cost estimates diminishes the further costs are projected into the future, the cost for improvements recommended in Phase 3 are considered accurate in today's dollars; however, the projection of these costs is less sound. It is recommended that the CIP be reviewed annually and updated at a minimum of ten-year intervals.

Table 7.1 Regulatory Compliance Improvements

WWTP Regulatory Permit Compliance Improvements									
Facility	Permitted Design Flow (GPD)	Permit Expiration Date	SOC Deadline	SOC Parameters	Previous Facility Plan Date	Improvement Recommendation	CIP Phase	2025 Cost	CIP Cost - Future Planning Year
Midway Arms	4,800	6/30/2025	9/1/2024	Ammonia	None	Coordinate with original developer to complete a Facility Plan and implement recommendation.	0-5 years	$ -	$ -
Highfield Acres	29,000	3/31/2025	11/1/2025	Ammonia & *E. coli*	2016	Transport flow to City of Columbia and close facility.	0-5 years	$ -	$ -
Richardson Acres	8,510	3/31/2025	11/1/2028	Ammonia & *E. coli*	2021	Transport flow to Rocky Fork and close facility.	0-5 years	$ 1,551,700	$ 1,956,900
Brown Station	1,850	3/31/2025	11/1/2028	Ammonia & *E. coli*	2021	Transport flow to Rocky Fork and close facility.	0-5 years	$ 3,263,600	$ 4,096,300
South Route K	244,000	3/31/2025	11/1/2029	Ammonia & *E. coli*	2017	Replace with New WWTP on relocated site.	0-5 years	$ 17,028,300	$ 21,597,600
Trails West	57,500	6/30/2025	11/1/2031	Ammonia & *E. coli*	2022	Transport flow to Midway Crossing and close facility.	6-10 years	$ 1,186,900	$ 1,715,500
Twin Lakes	19,400	9/30/2024	11/1/2032	Ammonia & *E. coli*	2011	Upgrade facility to extended aeration package plant on adjacent site.	6-10 years	$ 1,571,800	$ 2,284,100
Cedar Gate	11,100	6/30/2025	11/1/2034	Ammonia & *E. coli*	2021	Transport flow to Rocky Fork and close facility.	6-10 years	$ 2,407,800	$ 3,476,300
Brookfield Estates	30,000	3/31/2025	11/1/2035	Chloride	None	Coordinate with water district and homeowners regarding use of water softeners.	11-20 years	$ -	$ -
Quarter Mile Hills	5,480	13/31/2024	11/1/2037	Ammonia & *E. coli*	2017	Upgrade facility to no discharge drip irrigation treatment system.	11-20 years	$ 820,900	$ 1,697,400
Sunnyslope	5,500	13/31/2024	11/1/2038	Ammonia & *E. coli*	2017	Transport flow to Hallsville and close facility.	11-20 years	$ 485,600	$ 1,059,900

Table 7.2 Infrastructure Renewal Improvements

WWTP Infrastructure Renewal Improvements							
Facility	Permitted Design Flow (GPD)	SOC Deadline	Final Improvement Recommendation	CIP Phase	2025 Cost	CIP Cost - Future Planning Year	Notes
Kinkade Crossing	50,000	N/A	Rehabilitate and repaint treatment basins Replace annodes	0-5 years	$ 383,100	$ 488,900	Includes cost for temporary pumping and hauling to Rocky Fork
Meadow Village	16,500	N/A	Rehabilitate and repaint treatment basin Replace anodes Install safety railing Improve site drainage	0-5 years	$ 265,600	$ 339,000	Includes cost for temporary pumping and hauling to Rocky Fork
Midway Crossing	150,000	N/A	New permanent influent flow measurement Replace influent manual bar screen Rehabilitate final clarifier equipment Add cover over UV equipment	0-5 years	$ 158,400	$ 202,200	
Prairie Meadows	80,000	N/A	Rehabilitate and repaint treatment basins Replace anodes UV equipment access improvements	0-5 years	$ 694,100	$ 886,000	Includes cost for temporary pumping and hauling to Rocky Fork
Rocheport	34,400	N/A	New permanent influent flow measurement	0-5 years	$ 59,100	$ 75,400	
Rocky Fork	460,000	N/A	Sludge handling improvements (not including equipment) Controls redundancy for RAS/WAS pumps Cover over cascade aerator	0-5 years	$ 381,600	$ 487,100	Separate equipment cost for portable sludge screw press.
Trails West	57,500	11/1/2031	New influent manual bar screen	0-5 years	$ 46,100	$ 59,000	
American Outdoor Brands	4,889	N/A	New influent manual screen	6-10 years	$ 46,100	$ 68,200	
Eagle Knoll	35,000	N/A	Upgrade site to 3-phase power Replace motors and install fine bubble diffusers	6-10 years	$ 172,800	$ 255,400	Dependent upon electric utility expense
Midway USA	<3,000	N/A	New influent manual screen	6-10 years	$ 46,100	$ 68,200	

Table 7.3 Capacity Expansion Improvements

WWTP Capacity Expansion Improvements				
Facility	Improvement Recommendation	CIP Phase	2025 Cost	CIP Cost - Future Planning Year
Rocky Fork WWTP	Expand Capacity to 690,000 gpd	0-5 Years	$ 983,900	$ 1,255,800

Table 7.4 Collection System Improvements

Collection System Improvements				
Facility	Improvement Recommendation	CIP Phase	2025 Cost	CIP Cost - Future Planning Year
Cedar Lake Siphon Elimination	Gravity re-route to eliminate inverted siphon sewer	0-5 years	$ 667,500	$ 851,900
Hillcreek LPS System	Upsize portion of existing pressure sewer	0-5 years	$ 144,000	$ 183,900
Woodland LPS System	Upsize portion of existing pressure sewer	0-5 years	$ 187,200	$ 239,000
NewTown Pump Station	Gravity to new South Route K sewer	0-5 years	$ 115,200	$ 145,700
Rollingwood Aerial Crossing	Gravity re-route of aerial crossing	6-10 years	$ 260,200	$ 384,500
Clearview North Pump Station	Replace with duplex grinder pump station	6-10 years	$ 288,000	$ 425,600
El Rey Heights Pump Station	Install 2,000 lf of tracer wire	6-10 years	$ 48,000	$ 71,000
Green Hills Pump Station	Site drainage improvements	6-10 years	$ 76,800	$ 113,500
BCP Pump Station	Replace access hatch	6-10 years	$ 18,000	$ 26,600
Fairway West Pump Station	Gravity to City of Columbia across I-70	6-10 years	$ 924,400	$ 1,336,200
Water's Edge	Upsize portion of existing sewer to 24" gravity main	11-20 years	$ 1,007,400	$ 2,199,100

Table 7.5 Operational Enhancements

Operational Enhancements			
Recommendation	CIP Phase	2025 Cost	CIP Cost - Future Planning Year
Purchase Trailer-Mounted Portable Sludge Screw Press	0-5 Years	$ 1,200,000	$ 1,531,538
Purchase Portable Flow Meters	0-5 Years	$ 54,000	$ 68,919
Collection System Investigation	0-5 Years	$ 500,000	$ 638,141
Collection System Rehabilitation	0-5 Years	$ 2,500,000	$ 3,190,704
Collection System Investigation	6-10 Years	$ 500,000	$ 738,728
Collection System Rehabilitation	6-10 Years	$ 2,500,000	$ 3,693,639
Collection System Investigation	11-20 Years	$ 1,000,000	$ 2,182,875
Collection System Rehabilitation	11-20 Years	$ 5,000,000	$ 10,914,373

Table 7.6 Capital Improvements Plan Summary

BCRSD Capital Improvements Plan 2025					
	Description	Phase 1 (0-5 YR)	Phase 2 (6-10 YR)	Phase 3 (11-20 YR)	Total
TREATMENT FACILITY PERMIT COMPLIANCE IMPROVEMENTS					
1	Rollingwood Plat 1 - Connect to Midway Crossing	-			-
2	Highfield Acres - Connect to City of Columbia	-			-
3	Brown Station WWTP - Connect to Rocky Fork	$ 4,096,300			$ 4,096,300
4	Richardson Acres WWTF - Connect to Rocky Fork	$ 1,956,900			$ 1,956,900
5	South Route K WWTP - New WWTP	$ 21,597,600			$ 21,597,600
6	Trails West WWTF - Connect to Midway Crossing		$ 1,715,500		$ 1,715,500
7	Twin Lakes WWTF - WWTF Upgrades		$ 2,284,100		$ 2,284,100
8	Cedar Gate WWTF - Connect to Rocky Fork		$ 3,476,300		$ 3,476,300
9	Quarter Mile Hills WWTF - WWTF Upgrades			$ 1,697,400	$ 1,697,400
10	Sunnyslope WWTF - Connect to Hallsville			$ 1,059,900	$ 1,059,900
	Total Treatment Facility Permit Compliance	**$27,650,800**	**$7,475,900**	**$2,757,300**	**$37,884,000**
TREATMENT FACILITY INFRASTRUCTURE RENEWAL IMPROVEMENTS					
1	Kinkade Crossing WWTP Improvements	$488,900			$488,900
2	Meadow Village WWTP Improvements	$339,000			$339,000
3	Midway Crossing WWTP Improvements	$202,200			$202,200
4	Prairie Meadows WWTP Improvements	$886,000			$886,000
5	Rocheport WWTP Improvements	$75,400			$75,400
6	Rocky Fork WWTP Improvements	$487,100			$487,100
7	Trails West WWTF Improvements	$59,000			$59,000
8	American Outdoor Brands Improvements		$68,200		$68,200
9	Eagle Knoll WWTP Improvements		$255,400		$255,400
10	Midway USA Improvements		$68,200		$68,200
	Total Treatment Facility Infrastructure Renewal	**$2,537,600**	**$391,800**	**$0**	**$2,929,400**
TREATMENT FACILITY CAPACITY EXPANSION IMPROVEMENTS					
1	Rocky Fork WWTP Capacity Expansion	$1,255,800			$1,255,800
	Total Treatment Facility Capacity	**$1,255,800**	**$0**	**$0**	**$1,255,800**
COLLECTION SYSTEM IMPROVEMENTS					
1	Cedar Lake Siphon Sewer Elimination	$851,900			$851,900
2	Hillcreek Pressure Sewer Improvements	$183,900			$183,900
3	Woodlands Pressure Sewer Improvements	$239,000			$239,000
4	NewTown Pump Station Elimination	$145,700			$145,700
5	Rollingwood Aerial Crossing Elimination		$384,500		$384,500
6	Fairway West Pump Station Elimination		$1,336,200		$1,336,200
7	Clearview North Pump Station Replacement		$425,600		$425,600
8	Pump Station Improvements (BCP, Green Hills, & El Rey Heights)		$211,100		$211,100
9	Water's Edge Sewer Improvements			$2,199,100	$2,199,100
	Total Collection System	**$1,420,500**	**$2,357,400**	**$2,199,100**	**$5,977,000**
OPERATIONAL ENHANCEMENTS					
1	Portable Sludge Press w/ Trailer (equipment only)	$1,531,538			$1,531,538
2	Portable Flow Meters	$68,919			$68,919
3	Collection System Evaluation	$638,141	$738,728	$2,182,875	$3,559,743
4	Collection System Rehabilitation	$3,190,704	$3,693,639	$10,914,373	$17,798,715
	Total Operations and Maintenance	**$5,429,302**	**$4,432,366**	**$13,097,248**	**$22,958,916**
	TOTAL IMPROVEMENTS	**$38,294,002**	**$14,657,466**	**$18,053,648**	**$71,005,116**

8.0 SCHEDULE AND IMPLEMENTATION

Projects recommended for completion in the Phase 1: 0-5 Years category are summarized below in Table 8.1. Further prioritization within each of the five improvement categories is provided in Section 8.1 through 8.5.

Table 8.1 CIP Phase 1 (0-5 Years)

BCRSD Capital Improvements Plan 2025		
Description		Phase 1 (0-5 YR)
TREATMENT FACILITY PERMIT COMPLIANCE IMPROVEMENTS		
1	Brown Station WWTP - Connect to Rocky Fork or Columbia	$ 4,096,300
2	Richardson Acres WWTF - Connect to Rocky Fork or Columbia	$ 1,956,900
3	South Route K WWTP - New WWTP or Connect to Columbia	$ 21,597,600
	Total Treatment Facility Permit Compliance	$27,650,800
TREATMENT FACILITY INFRASTRUCTURE RENEWAL IMPROVEMENTS		
1	Kinkade Crossing WWTP Improvements	$488,900
2	Meadow Village WWTP Improvements	$339,000
3	Midway Crossing WWTP Improvements	$202,200
4	Prairie Meadows WWTP Improvements	$886,000
5	Rocheport WWTP Improvements	$75,400
6	Rocky Fork WWTP Improvements	$487,100
7	Trails West WWTF Improvements	$59,000
	Total Treatment Facility Condition and Renewal	$2,537,600
TREATMENT FACILITY CAPACITY EXPANSION IMPROVEMENTS		
1	Rocky Fork WWTP Capacity Expansion	$1,255,800
	Total Treatment Facility Capacity	$1,255,800
COLLECTION SYSTEM IMPROVEMENTS		
1	Cedar Lake Siphon Sewer Elimination	$851,900
2	Hillcreek Pressure Sewer Improvements	$183,900
3	Woodlands Pressure Sewer Improvements	$239,000
4	NewTown Pump Station Elimination	$145,700
	Total Collection System	$1,420,500
OPERATIONAL ENHANCEMENTS		
1	Portable Sludge Press w/ Trailer (equipment only)	$1,531,538
2	Portable Flow Meters	$68,919
3	Collection System Evaluation	$638,141
4	Collection System Rehabilitation	$3,190,704
	Total Operations and Maintenance	$5,429,302
	TOTAL IMPROVEMENTS	$38,294,002

8.1 Regulatory Compliance

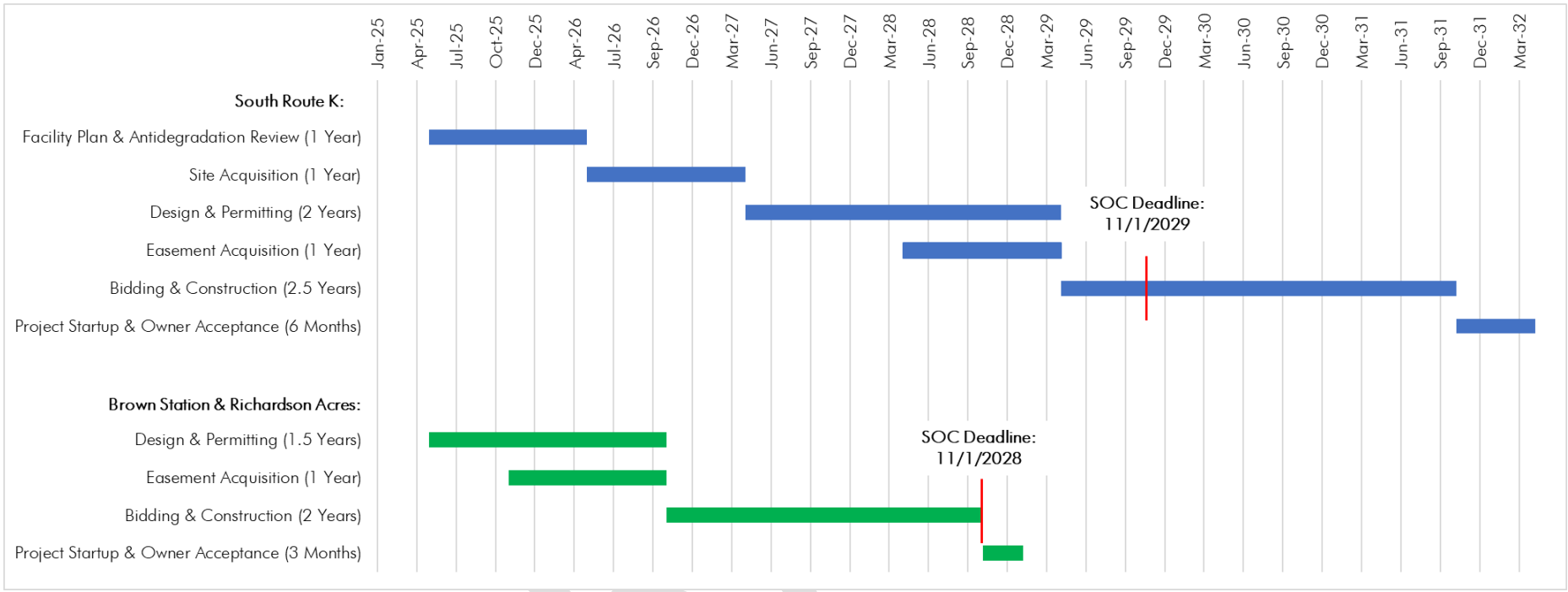
Completing projects identified in the regulatory compliance category should take first priority in order to meet SOC deadlines and maintain compliance with MDNR regulations. Projects in the regulatory compliance category to be completed in Phase 1 (0-5 Years) should be prioritized as follows:

1. Brown Station WWTP connection to Rocky Fork WWTP
2. Richardson Acres WWTF connection to Rocky Fork WWTP
3. South Route K WWTP relocation and capacity expansion

Initiating the design phase of the proposed pump stations and force mains for the connection of the Brown Station WWTP and the Richardson Acres WWTP to the Rocky Fork WWTP should begin quickly as these projects are currently funded on the CWSRF 2025 IUP and have SOC deadlines in 2028. Due to the length of time required to complete the proposed South Route K WWTP relocation, it is also recommended that the facility plan and antidegradation review updates required to complete the project are initiated as soon as practicable.

Figure 8.1 on the following page illustrates the proposed timeline for completing these three projects. This schedule highlights the need for these projects to begin quickly, as it may not be possible to complete the necessary improvements by the current SOC deadlines. Prioritization of completing these projects could be shifted based on possible collaboration with DNR to extend the SOC deadlines.

Figure 8.1 Phase 1 Regulatory Compliance Proposed Project Schedules



8.2 Infrastructure Renewal

Projects in the infrastructure renewal category recommended for completion in Phase 1 (0-5 Years) should be prioritized as follows:

1. Trails West WWTF condition and renewal improvements
2. Rocky Fork WWTP condition and renewal improvements
3. Rocheport WWTP condition and renewal improvements
4. Kinkade Crossing WWTP condition and renewal improvements
5. Meadow Village WWTP condition and renewal improvements
6. Prairie Meadows WWTP condition and renewal improvements

The Trails West WWTF improvements for the new influent manual screen should be prioritized due to its relatively low capital cost and the ongoing need to replace aerators in the lagoon. The Rocky Fork WWTP improvements should be considered next due to the increased operational efficiency the improvements will provide. Improvements to Kinkade Crossing, Meadow Village, and Prairie Meadows could be completed as a joint project or separately. Timing for the completion of these improvements will be dependent upon the speed at which the existing basins continue to deteriorate.

8.3 Capacity Expansion

Projects in the treatment capacity expansion category to be completed in Phase 1 (0-5 Years) should be prioritized as follows:

1. Rocky Fork WWTP capacity expansion

Expansion of the Rocky Fork WWTP capacity to 690,000 gpd should be completed as development or regionalization pressure warrant.

8.4 Collection System Improvements

Projects in the collection system improvements category to be completed in Phase 1 (0-5 Years) should be prioritized as follows:

1. Hillcreek Pressure Sewer Improvements
2. Woodlands Pressure Sewer Improvements
3. Cedar Lake Siphon Sewer Elimination
4. New Town Pump Station Elimination (complete in Coordination with South Route K WWTP relocation)

Due to the frequent service calls and numerous pump failures experienced in the Hillcreek pressure sewer system, it is recommended that this project is prioritized first. The Woodlands pressure sewer improvements and Cedar Lake siphon sewer elimination should be completed next. The New Town pump station elimination project should be completed in coordination with the South Route K WWTP relocation project.

8.5 Operational Enhancements

Projects in the operational enhancements category to be completed in Phase 1 (0-5 Years) should be prioritized as follows:

1. Purchase Portable Flow Meters
2. Purchase Portable Sludge Screw Press (purchase in coordination with South Route K WWTP relocation or Rocky Fork WWTP condition and renewal improvements)
3. Collection System Investigation
4. Collection System Rehabilitation

Purchase of portable flow meters should be prioritized due to the low capital cost and the highly beneficial information provided by collection system flow monitoring and analysis. Purchase of a portable sludge screw press should be prioritized next due to the enhanced operational efficiencies the equipment will provide. Collection system investigation and rehabilitation work should be completed on an annual basis, targeting the oldest and leakiest collection system infrastructure first.

Prioritization of the improvements within all five categories can be further developed by completing a cost-benefit analysis of the overall financial impact of each of the individual improvement recommendations. Additionally, project priorities may need to be shifted based on new development within Boone County, changes in DNR regulations, or other unpredictable circumstances.

9.0 FINANCING

9.1 Financing

At the time of this report, BCRSD has approximately $3 million dollars of remaining bonding capacity available to fund capital improvements. BCRSD may also pursue a bond issue to finance capital improvements projects recommended in this report. The bond amount and timing of any bond election would be determined by the Board of Trustees.

Historically, BCRSD has utilized the Clean Water State Revolving Fund (CWSRF) program to obtain low interest loans and grants to fund large capital improvements to its wastewater treatment and collection system infrastructure. The program features a fixed-rate loan with a subsidized target interest rate that is 30% of the municipal market rate for loans with a standard term of 20 years. Additionally, the CWSRF program offers additional subsidization in the form of grants. The most common grants for capital improvements projects are the CWSRF Affordability Grant and the CWSRF Water Quality Incentive Grant. Eligibility for an Affordability Grant is determined by the demographic and economic characteristics of the population served by the project. In the past, BCRSD did not meet the qualifications to receive Affordability Grant funds, but eligibility should be revisited at the time SRF applications are submitted. Water Quality Incentive Grants are available to fund projects that include certain components that have significant benefits to water quality, including projects for the construction of upgrades to meet new wastewater effluent permit limits and projects targeting collection system I/I reduction. The improvements projects recommended to upgrade or connect the treatment facilities with a SOC should qualify for the Water Quality Incentive Grant if the program has available funding. The maximum grant award available generally varies each fiscal year.

Projects can also be financed through private sources or by the sale of revenue bonds. Given the additional regulatory hurdles associated with funding projects through the CWSRF program, opting for private financing may be beneficial for projects that do not qualify for grant funding. Moreover, if a project can be completed more quickly with private financing, it can help mitigate the effects of inflation on construction costs.

9.2 Impact to User Rates

A user rate study was not included in the scope of the Capital Improvements Plan. An updated user rate study will be necessary to ensure BCRSD generates sufficient revenue to cover its operational and capital expenses and maintains the required 1.10 debt service coverage ratio. By analyzing the relationship between costs and revenue, the study will enable BCRSD to establish a fair and sustainable rate structure.

APPENDIX A

Treatment Facility Detailed Cost Estimates

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.1 American Outdoor Brands

Engineer's Opinion of Probable Cost

Project Description: American Outdoor Brands Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Influent Manual Screen	1	LS	$ 32,000.00	$ 32,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 32,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 6,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 38,400.00**
				COST ESCALATION	$ 18,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 56,800.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 11,400.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 68,200.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.2 Brown Station

Engineer's Opinion of Probable Cost

Project Description: Brown Station Connection to Rocky Fork WWTP

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization (5%)	1	LS	$ 99,650.00	$ 99,650.00
2	Pump Station	1	LS	$ 300,000.00	$ 300,000.00
3	6" Force Main	23,900	LF	$ 70.00	$ 1,673,000.00
4	WWTF Closure	1	LS	$ 20,000.00	$ 20,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 2,092,650.00**
				CONTINGENCY ALLOWANCE (20%)	$ 418,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 2,511,300.00**
				COST ESCALATION	$ 693,900.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 3,205,200.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 641,100.00
				LAND ACQUISITION	$ 250,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 4,096,300.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.3 Cedar Gate

Engineer's Opinion of Probable Cost

Project Description: Cedar Gate Connection to Rocky Fork WWTP via Richardson Acres & Brown Station

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization (5%)	1	LS	$ 74,000.00	$ 74,000.00
2	Pump Station	1	LS	$ 300,000.00	$ 300,000.00
3	6" Force Main	16,000	LF	$ 70.00	$ 1,120,000.00
4	WWTF Closure	1	LS	$ 60,000.00	$ 60,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 1,554,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 310,800.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 1,864,800.00**
				COST ESCALATION	$ 890,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 2,755,200.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 551,100.00
				LAND ACQUISITION	$ 170,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 3,476,300.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.4 Eagle Knoll

Engineer's Opinion of Probable Cost

Project Description: Eagle Knoll WWTP Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Site Upgrade to 3-Phase Power and Motors	1	LS	$ 100,000.00	$ 100,000.00
2	Fine Bubble Diffusers	1	LS	$ 20,000.00	$ 20,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 120,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 24,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 144,000.00**
				COST ESCALATION	$ 68,800.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 212,800.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 42,600.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 255,400.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.5 Kinkade Crossing

Engineer's Opinion of Probable Cost

Project Description: Kinkade Crossing WWTP Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Rehabilitate and Repaint Treatment Basin	1	LS	$ 260,000.00	$ 260,000.00
2	Anode Replacement	1	LS	$ 6,000.00	$ 6,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 266,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 53,200.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 319,200.00**
				COST ESCALATION	$ 88,200.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 407,400.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 81,500.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 488,900.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Includes cost for temporary pumping and hauling to Rocky Fork WWTP during rehabilitation .

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.6 Meadow Village

Engineer's Opinion of Probable Cost

Project Description: Meadow Village WWTP Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Rehabilitate and Repaint Treatment Basin	1	LS	$ 95,400.00	$ 95,400.00
2	Anode Replacement	1	LS	$ 2,000.00	$ 2,000.00
3	Site Drainage Improvements	1	LS	$ 64,000.00	$ 64,000.00
4	Install Railing	1	LS	$ 23,000.00	$ 23,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 184,400.00**
				CONTINGENCY ALLOWANCE (20%)	$ 36,900.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 221,300.00**
				COST ESCALATION	$ 61,200.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 282,500.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 56,500.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 339,000.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Includes cost for temporary pumping and hauling to Rocky Fork WWTP during rehabilitation .

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.7 Midway Crossing

Engineer's Opinion of Probable Cost

Project Description: Midway Crossing WWTP Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Repair Clarifiers	1	LS	$32,000.00	$ 32,000.00
2	Replace Manual Barscreen	1	LS	$32,000.00	$ 32,000.00
3	Permanent Influent Flow Measurement	1	LS	$41,000.00	$ 41,000.00
4	Cover for UV Equipment	1	LS	$5,000.00	$ 5,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 110,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 22,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 132,000.00**
				COST ESCALATION	$ 36,500.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 168,500.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 33,700.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 202,200.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.8 Midway USA

Engineer's Opinion of Probable Cost

Project Description: Midway USA WWTF Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Influent Manual Screen	1	LS	$ 32,000.00	$ 32,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 32,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 6,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 38,400.00**
				COST ESCALATION	$ 18,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 56,800.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 11,400.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 68,200.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.9 Prairie Meadows

Engineer's Opinion of Probable Cost

Project Description: Prairie Meadows WWTP Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	UV Access Improvements	1	LS	$40,000.00	$ 40,000.00
2	Rehabilitate and Repaint Treatment Basin	1	LS	$434,000.00	$ 434,000.00
3	Anode Replacement	1	LS	$8,000.00	$ 8,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 482,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 96,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 578,400.00**
				COST ESCALATION	$ 159,900.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 738,300.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 147,700.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 886,000.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Includes cost for temporary pumping and hauling to Rocky Fork WWTP during rehabilitation .

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.10 Quarter Mile Hills

Engineer's Opinion of Probable Cost

Project Description: Quarter Mile Hills WWTF No-Discharge System Upgrade

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization (5%)	1	LS	$24,500.00	$ 24,500.00
2	Drip Irrigation Treatment System	1	LS	$490,000.00	$ 490,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 514,500.00**
				CONTINGENCY ALLOWANCE (20%)	$ 102,900.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 617,400.00**
				COST ESCALATION	$ 730,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 1,347,800.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 269,600.00
				LAND ACQUISITION	$ 80,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 1,697,400.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of planning phase (2041) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.11 Richardson Acres

Engineer's Opinion of Probable Cost

Project Description: Richardson Acres Connection to Rocky Fork WWTP via Brown Station

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization (5%)	1	LS	$ 48,500.00	$ 48,500.00
2	Pump Station	1	LS	$ 350,000.00	$ 350,000.00
3	6" Force Main	8,000	LF	$ 70.00	$ 560,000.00
4	WWTF Closure	1	LS	$ 60,000.00	$ 60,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 1,018,500.00**
				CONTINGENCY ALLOWANCE (20%)	$ 203,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 1,222,200.00**
				COST ESCALATION	$ 337,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 1,559,900.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 312,000.00
				LAND ACQUISITION	$ 85,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 1,956,900.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.12 Rocheport

Engineer's Opinion of Probable Cost

Project Description: Rocheport WWTP Infrastructure Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Permanent Influent Flow Measurement	1	LS	$41,000.00	$ 41,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 41,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 8,200.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 49,200.00**
				COST ESCALATION	$ 13,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 62,800.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 12,600.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 75,400.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.13 Rocky Fork

Engineer's Opinion of Probable Cost

Project Description: Rocky Fork WWTP Infrastrucutre Renewal Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Sludge Processing Improvements (excluding equipment)	1	LS	$150,000.00	$ 150,000.00
2	RAS/WAS Controls Redundancy	1	LS	$100,000.00	$ 100,000.00
3	Cover over Cascade Aeration	1	LS	$15,000.00	$ 15,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 265,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 53,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 318,000.00**
				COST ESCALATION	$ 87,900.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 405,900.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 81,200.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 487,100.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.14 Rocky Fork

Engineer's Opinion of Probable Cost

Project Description: Rocky Fork WWTP Treatment Capacity Expansion Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Additional Sludge Digester Basin	1	LS	$353,400.00	$ 353,400.00
2	Operations Building - Digester Blower Improvements	1	LS	$38,700.00	$ 38,700.00
3	Influent Pump Station Improvements	1	LS	$188,900.00	$ 188,900.00
4	Additional UV Bank	1	LS	$102,200.00	$ 102,200.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 683,200.00**
				CONTINGENCY ALLOWANCE (20%)	$ 136,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 819,900.00**
				COST ESCALATION	$ 226,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 1,046,500.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 209,300.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 1,255,800.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

Table A.15 South Route K

Engineer's Opinion of Probable Cost

Project Description: South Route K WWTP Relocation and Capacity Expansion

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization	1	LS	$546,900.00	$ 546,900.00
2	Gravity Sewer Extension	8,500	LF	$300.00	$ 2,550,000.00
3	Manholes	24	EA	$12,000.00	$ 288,000.00
4	New 0.5 MGD Extended Aeration WWTP	1	LS	$8,000,000.00	$ 8,000,000.00
5	WWTF Closure	1	LS	$100,000.00	$ 100,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 11,484,900.00**
				CONTINGENCY ALLOWANCE (20%)	$ 2,297,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 13,781,900.00**
				COST ESCALATION	$ 3,807,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 17,589,600.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 3,518,000.00
				LAND ACQUISITION	$ 410,000.00
				FACILITY PLAN & ANTIDEGRADATION REVIEW AMENDMENT	$ 80,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 21,597,600.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.16 Sunnyslope

Engineer's Opinion of Probable Cost

Project Description: Sunnyslope Connection to City of Hallsville WWTP

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization	1	LS	$16,050.00	$ 16,050.00
2	8" Gravity Sewer	1,400	LF	$175.00	$ 245,000.00
3	Manhole	3	EA	$12,000.00	$ 36,000.00
4	WWTF Closure	1	LS	$40,000.00	$ 40,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 337,050.00**
				CONTINGENCY ALLOWANCE (20%)	$ 67,500.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 404,600.00**
				COST ESCALATION	$ 478,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 883,200.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 176,700.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 1,059,900.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2041) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.17 Trails West

Engineer's Opinion of Probable Cost

Project Description: Trails West Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Influent Manual Screen	1	LS	$ 32,000.00	$ 32,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 32,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 6,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 38,400.00**
				COST ESCALATION	$ 10,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 49,100.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 9,900.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 59,000.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.18 Trails West

Engineer's Opinion of Probable Cost

Project Description: Trails West Connection to Midway Crossing WWTP

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization (5%)	1	LS	$ 36,600.00	$ 36,600.00
2	Pump Station	1	LS	$ 450,000.00	$ 450,000.00
3	4" Force Main	3,700	LF	$ 60.00	$ 222,000.00
4	WWTF Closure	1	LS	$ 60,000.00	$ 60,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 768,600.00**
				CONTINGENCY ALLOWANCE (20%)	$ 153,800.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 922,400.00**
				COST ESCALATION	$ 440,500.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 1,362,900.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 272,600.00
				LAND ACQUISITION	$ 40,000.00
				FACILITY PLAN AMENDMENT (Flow Monitoring Study)	$ 40,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 1,715,500.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table A.19 Twin Lakes

Engineer's Opinion of Probable Cost

Project Description: Twin Lakes Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization	1	LS	$49,325.00	$ 49,325.00
2	8" Gravity Sewer	300	LF	$175.00	$ 52,500.00
3	Manhole	2	EA	$12,000.00	$ 24,000.00
4	New 0.02 MGD Extended Aeration WWTP	1	LS	$850,000.00	$ 850,000.00
5	WWTF Closure	1	LS	$60,000.00	$ 60,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 1,035,825.00**
				CONTINGENCY ALLOWANCE (20%)	$ 207,200.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 1,243,100.00**
				COST ESCALATION	$ 593,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 1,836,700.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 367,400.00
				LAND ACQUISITION	$ 80,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 2,284,100.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are included.

APPENDIX B

Collection System Detailed Cost Estimates

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.1 Cedar Lake Siphon Sewer Elimination

Engineer's Opinion of Probable Cost

Project Description: Cedar Lake Siphon Sewer Elimination

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	48" Sanitary Sewer Manhole	9	EA	$12,000.00	$ 108,000.00
2	8" Sewer Main	2,000	LF	$175.00	$ 350,000.00
3	Grouting Existing Sewer Main	200	LF	$15.00	$ 3,000.00
4	Surface Restoration	1.00	AC	$2,500.00	$ 2,500.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 463,500.00**
				CONTINGENCY ALLOWANCE (20%)	$ 92,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 556,200.00**
				COST ESCALATION	$ 153,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 709,900.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 142,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 851,900.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are not included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.2 Rollingwood Sewer Aerial Crossing

Engineer's Opinion of Probable Cost

Project Description: Rollingwood Gravity Sewer Aerial Crossing Elimination

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	48" Sanitary Sewer Manhole	3	EA	$12,000.00	$ 36,000.00
2	8" Sewer Main	800	LF	$175.00	$ 140,000.00
3	Clearing and Grubbing	0.46	AC	$7,500.00	$ 3,450.00
4	Surface Restoration	0.46	AC	$2,500.00	$ 1,150.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 180,600.00**
				CONTINGENCY ALLOWANCE (20%)	$ 36,200.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 216,800.00**
				COST ESCALATION	$ 103,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 320,400.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 64,100.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 384,500.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.
3. Land acquisition costs are not included.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.3 Waters Edge Gravity Sewer

Engineer's Opinion of Probable Cost

Project Description: Waters Edge 24" Gravity Sewer

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Mobilization	1	LS	$36,337.50	$ 36,337.50
2	24" Sewer Main	1,670	LF	$325.00	$ 542,750.00
3	8" Sewer Main	80	LF	$175.00	$ 14,000.00
4	Manholes	9	EA	$12,000.00	$ 108,000.00
5	Rock Excavation	1	LS	$27,000.00	$ 27,000.00
6	Clearing and Grubbing	1	LS	$25,000.00	$ 25,000.00
7	Surface Restoration	1	AC	$10,000.00	$ 10,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 763,087.50**
				CONTINGENCY ALLOWANCE (20%)	$ 152,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 915,800.00**
				COST ESCALATION	$ 1,083,300.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 1,999,100.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (10%)	$ 200,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 2,199,100.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2041) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.4 Clearview North Pump Station

Engineer's Opinion of Probable Cost

Project Description: Clearview North Pump Station Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	New Duplex Grinder Pump Station	1	EA	$ 200,000.00	$ 200,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 200,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 40,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 240,000.00**
				COST ESCALATION	$ 114,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 354,600.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 71,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 425,600.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.5 Fairway West Pump Station

Engineer's Opinion of Probable Cost

Project Description: Fairway West Pump Station Elimination

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	8" Gravity Sewer Main	1600	LF	$ 175.00	$ 280,000.00
2	Manhole	4	EA	$ 12,000.00	$ 48,000.00
3	I-70 Bore	300	LF	$ 1,000.00	$ 300,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 628,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 125,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 753,600.00**
				COST ESCALATION	$ 359,900.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 1,113,500.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 222,700.00
				LAND ACQUISITION	$ 20,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 1,336,200.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.6 New Town Pump Station

Engineer's Opinion of Probable Cost

Project Description: New Town Pump Station Elimination

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	8" Gravity Sewer Main	300	LF	$ 175.00	$ 52,500.00
2	Manhole	2	EA	$ 12,000.00	$ 24,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 76,500.00**
				CONTINGENCY ALLOWANCE (20%)	$ 15,300.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 91,800.00**
				COST ESCALATION	$ 25,400.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 117,200.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 23,500.00
				LAND ACQUISITION	$ 5,000.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 145,700.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.7 BCP Pump Station

Engineer's Opinion of Probable Cost

Project Description: BCP Pump Station Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	New Access Hatch	1	EA	$ 15,000.00	$ 15,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 15,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 3,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 18,000.00**
				COST ESCALATION	$ 8,600.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 26,600.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	N/A
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 26,600.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

Table B.8 El Rey Heights Pump Station

Engineer's Opinion of Probable Cost

Project Description: El Rey Heights Pump Station Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Additional Tracer Wire	2,000	LF	$ 20.00	$ 40,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 40,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 8,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 48,000.00**
				COST ESCALATION	$ 23,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 71,000.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	N/A
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 71,000.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

Table B.9 Green Hills Pump Station

Engineer's Opinion of Probable Cost

Project Description: Green Hills Pump Station Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Site Drainage Improvements	1	EA	$ 64,000.00	$ 64,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 64,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 12,800.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 76,800.00**
				COST ESCALATION	$ 36,700.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (MIDPOINT OF CIP PHASE)	**$ 113,500.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	N/A
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 113,500.00**

Notes:

1. Costs are 2025 dollars, escalated to midpoint of CIP phase (2033) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.10 Hill Creek LPS

Engineer's Opinion of Probable Cost

Project Description: Hillcreek LPS Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Upsize Pressure Sewer Main	2,000	LF	$ 50.00	$ 100,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 100,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 20,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 120,000.00**
				COST ESCALATION	$ 33,200.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 153,200.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 30,700.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 183,900.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

BOONE COUNTY REGIONAL SEWER DISTRICT
CAPITAL IMPROVEMENTS PLAN
BOONE COUNTY, MISSOURI
2022001400

Table B.11 Woodlands LPS

Engineer's Opinion of Probable Cost

Project Description: Woodlands LPS Improvements

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
1	Upsize Pressure Sewer Main	2,600	LF	$ 50.00	$ 130,000.00
				SUBTOTAL - PROBABLE CONSTRUCTION COST	**$ 130,000.00**
				CONTINGENCY ALLOWANCE (20%)	$ 26,000.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST	**$ 156,000.00**
				COST ESCALATION	$ 43,100.00
				ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (END OF CIP PHASE)	**$ 199,100.00**
				ENGINEERING, LEGAL, ADMINISTRATIVE (20%)	$ 39,900.00
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 239,000.00**

Notes:

1. Costs are 2025 dollars, escalated to end of CIP phase (2030) utilizing a 5% inflation rate.
2. AACE Class 4 Level Cost Estimate.

APPENDIX C

Area Exhibits

ROCKY FORK WATERSHED

KINKADE CROSSING WWTP

BROWN STATION WWTP

BEAR CREEK WATERSHED

COUNTY DOWNES WATERSHED

BROWN STATION TO ROCKY FORK

CITY OF COLUMBIA SEWER

ROCKY FORK WWTP

LEGEND

- BCRSD PUMP STATION
- CITY OF COLUMBIA PUMP STATION
- BCRSD SANITARY GRAVITY
- BCRSD FORCEMAIN
- PROPOSED FORCEMAIN

N

HORIZ. SCALE

2500 1250 0 3000

Scale: 1" = 3000' (Sheet Size 11x17)

BROWN STATION TO ROCKY FORK
PROPOSED FORCE MAIN

EXHIBIT NUMBER	C.1
PROJECT NUMBER	2022001400

McCLURE™
2001 W. Broadway
Columbia, MO 65203
P 573-814-1568
F 573-814-1128

P:\2022001400\06-Drawings\Exhibits\2022001400 - Area Maps.dwg | EWOLTJEN | 2/21/2025 8:18 AM

ROCKY FORK WATERSHED

CEDAR GATE WWTF

CEDAR GATE TO RICHARDSON ACRES

RICHARDSON ACRES WWTF

RICHARDSON ACRES TO BROWN STATION

BROWN STATION WWTP

BEAR CREEK WATERSHED

LEGEND

- BCRSD PUMP STATION
- CITY OF COLUMBIA PUMP STATION
- BCRSD SANITARY GRAVITY
- BCRSD FORCEMAIN
- PROPOSED FORCEMAIN

CEDAR GATE & RICHARDSON ACRES TO BROWN STATION FORCE MAIN

EXHIBIT NUMBER C.2

PROJECT NUMBER 2022001400

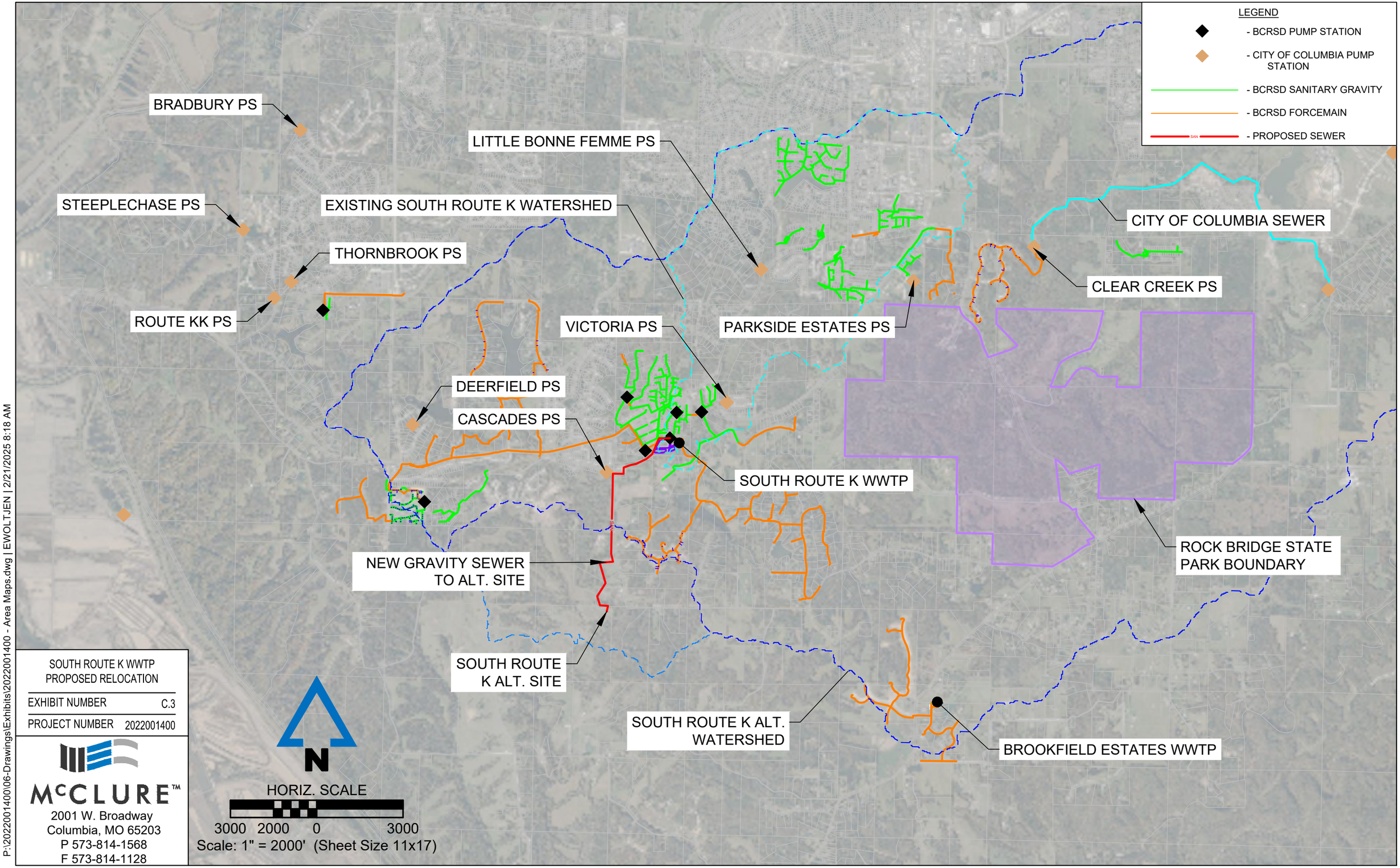
HORIZ. SCALE

2500 1250 0 2500

Scale: 1" = 2500' (Sheet Size 11x17)

McCLURE™
2001 W. Broadway
Columbia, MO 65203
P 573-814-1568
F 573-814-1128

P:\2022001400\06-Drawings\Exhibits\2022001400 - Area Maps.dwg | EWOLTJEN | 2/21/2025 8:18 AM



SOUTH ROUTE K WWTP
PROPOSED RELOCATION

EXHIBIT NUMBER C.3

PROJECT NUMBER 2022001400

McCLURE™
2001 W. Broadway
Columbia, MO 65203
P 573-814-1568
F 573-814-1128

N

HORIZ. SCALE

3000 2000 0 3000

Scale: 1" = 2000' (Sheet Size 11x17)

P:\2022001400\06-Drawings\Exhibits\2022001400 - Area Maps.dwg | EWOLTJEN | 2/21/2025 8:18 AM

LEGEND

- BCRSD PUMP STATION
- CITY OF COLUMBIA PUMP STATION
- BCRSD SANITARY GRAVITY
- BCRSD FORCEMAIN
- PROPOSED FORCEMAIN

MIDWAY USA WWTF

ROLLINGWOOD PLAT #1 WWTP

HENDERSON BRANCH WATERSHED

NEW FORCE MAIN

TRAILS WEST WWTF

MIDWAY CROSSING WWTP

SUGAR BRANCH WATERSHED

PROPOSED
CITY OF COLUMBIA SEWER

MIDWAY ARMS WWTP

TRAILS WEST TO MIDWAY CROSSING
PROPOSED FORCE MAIN

EXHIBIT NUMBER	C.4
PROJECT NUMBER	2022001400

McCLURE™
2001 W. Broadway
Columbia, MO 65203
P 573-814-1568
F 573-814-1128

N

HORIZ. SCALE

1500 750 0 1500

Scale: 1" = 1500' (Sheet Size 11x17)

P:\2022001400\06-Drawings\Exhibits\2022001400 - Area Maps.dwg | EWOLTJEN | 2/21/2025 8:18 AM