MIDWAY AREA WASTEWATER FACILITY PLAN

BOONE COUNTY REGIONAL SEWER DISTRICT

BCRSD
Boone County Regional Sewer District
Clean water for your future

JUNE 2022

McCLURE™

MIDWAY AREA WASTEWATER FACILITY PLAN
BOONE COUNTY, MISSOURI

BOONE COUNTY REGIONAL SEWER DISTRICT
JUNE 2022

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.

6/27/2022

Michael M. Hall, P.E. No. 030044 (Date)

My license renewal date is December 31, 2023.

McCLURE

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ES. 0 EXECUTIVE SUMMARY

ES.1 OVERVIEW

The Boone County Regional Sewer District (BCRSD or District) is a Level 2 Continuing Authority maintaining sewage collection and treatment facilities throughout Boone County, Missouri including facilities in the Midway area of the Perche Creek watershed. All discharging wastewater treatment facilities (WWTFs) are issued a National Pollutant Discharge Elimination System (NPDES) permit that sets specific discharge requirements to ensure protection of public health and water quality. NPDES permits are renewed every five years by the Missouri Department of Natural Resources (MO DNR). Each renewal may modify treatment objectives and effluent requirements to reflect changes in discharge regulations. These permit changes may require upgrades or other modifications to the facility in order to meet more stringent treatment requirements.

Continuing NPDES permit changes and new developments in the Midway area are requiring the District to explore potential plant upgrades at multiple facilities as well as investigate the feasibility of regionalization. Regionalization could be accomplished through connection of existing facilities to the BCRSD Midway Crossing WWTP and construction of improvements to the existing wastewater treatment plant by the District or through connection to the City of Columbia wastewater collection system.

ES.2 PURPOSE OF THIS FACILITY PLAN

The purpose of this Facility Plan is to provide a comprehensive review of the District's existing and planned wastewater collection and treatment facilities within the Midway area of Boone County with a focus on the BCRSD Midway Crossing WWTP. The goal is to identify, evaluate, and select the most practical, economical and environmentally sound wastewater collection and treatment option for the Midway area. Various wastewater treatment options, sewer alignments and related lift station options will be discussed from a capital and operating cost perspective. This plan also describes the proposed wastewater treatment facility closures that would take place as part of this project, if executed. The plan will further provide a detailed review of requirements related to anticipated permitting conditions, including antidegradation and disinfection and nutrient limitations. Finally, this document will provide a planning roadmap for the District as development and growth continues.

ES.3 PLANNING AREA

The planning area is generally defined by Interstate 70 to the south, State Highway J to the west, and US Highway 40 to the north and northeast. Existing domestic wastewater treatment facilities within the study area include:

1. Midway Crossing WWTP – NPDES Permit MO-0132705 (BCRSD)
2. Trails West WWTF – NPDES Permit MO-0092002 (BCRSD)
3. Rollingwood Plat 1 WWTP– NPDES Permit MO-0038792 (BCRSD)
4. Midway Arms WWTP – NPDES Permit MO-0108421 (BCRSD)

5. Midway USA WWTF – NPDES Permit MO-0139629 (BCRSD)
6. Midway Auto/Truck Plaza WWTF – NPDES Permit MO-0100862 (private)

The BCRSD Midway Crossing WWTP is the largest treatment facility in the Midway area with a current permitted design flow of 150,000 gallons per day (gpd). The existing and future developments and subdivisions with committed flows to this treatment plant include:

A. Midway Crossing Subdivision
B. Rollingwood Subdivision
C. Midway Elementary
D. Ravenwood Subdivision
E. MeowLuxe Cat Boarding Facility
F. Bolli Road Neighborhood Improvement District (NID)

The location of each of these facilities is shown on Figure ES-1 indicated by its corresponding number or letter as listed above. A ledger-sized version of Figure ES-1 can also be found in Appendix A.

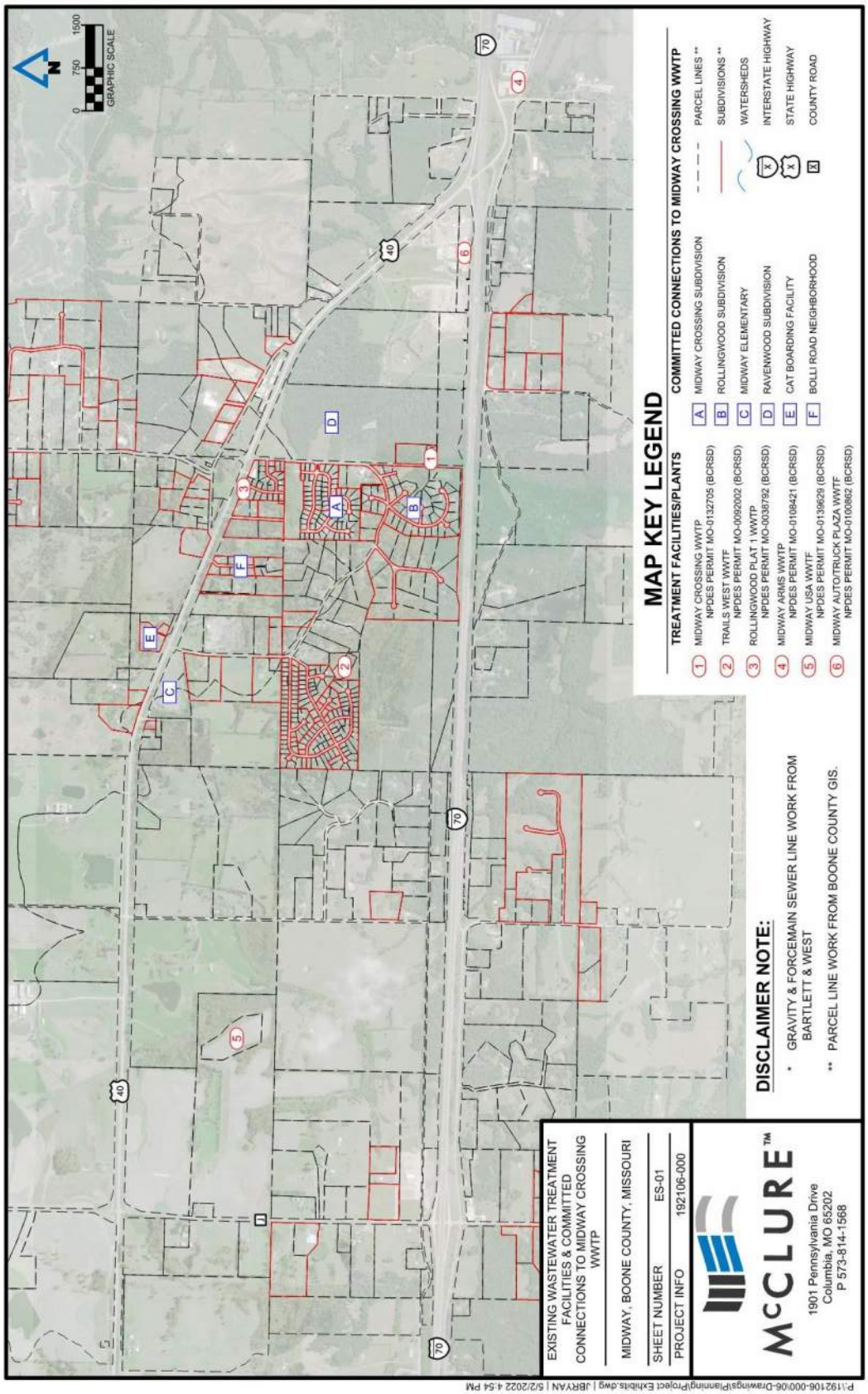
MAP KEY LEGEND
TREATMENT FACILITIES/PLANTS
1 MIDWAY CROSSING WWTP
NPDES PERMIT MO-0132705 (BCRSD)
2 TRAILS WEST WWTF
NPDES PERMIT MO-0092002 (BCRSD)
3 ROLLINGWOOD PLAT 1 WWTP
NPDES PERMIT MO-0038792 (BCRSD)
4 MIDWAY ARMS WWTP
NPDES PERMIT MO-0108421 (BCRSD)
5 MIDWAY USA WWTF
NPDES PERMIT MO-0139629 (BCRSD)
6 MIDWAY AUTOTRUCK PLAZA WWTF
NPDES PERMIT MO-0100862 (BCRSD)
COMMITTED CONNECTIONS TO MIDWAY CROSSING WWTP
A MIDWAY CROSSING SUBDIVISION
B ROLLINGWOOD SUBDIVISION
C MIDWAY ELEMENTARY
D RAVENWOOD SUBDIVISION
E CAT BOARDING FACILITY
F BOLLI ROAD NEIGHBORHOOD
PARCEL LINES **
SUBDIVISIONS **
WATERSHEDS
INTERSTATE HIGHWAY
STATE HIGHWAY
COUNTY ROAD
DISCLAIMER NOTE:
* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST
** PARCEL LINE WORK FROM BOONE COUNTY GIS.
GRAPHIC SCALE
0 750 1500
N
EXISTING WASTEWATER TREATMENT FACILITIES & COMMITTED CONNECTIONS TO MIDWAY CROSSING WWTP
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER ES-01
PROJECT INFO 192106-000
McCLURE™
1901 Pennsylvania Drive
Columbia, MO 65202
P 573-814-1568
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Figure ES-1

ES.4 RECOMMENDATIONS

The recommendations are:

1. Proceed with design and construction to replace the BCRSD Midway Crossing WWTP to meet the long-term needs of the Midway area. This future WWTP would have treatment capacity to accept increased flows and loadings expected in the next 20 years. These recommendations were developed with the following considerations:
    - existing central location with minimal collection system modifications required,
    - area geology features and depth to bedrock,
    - readily available land to expand on,
    - current facility treatment capacity deficiencies when the entire area is planned,
    - existing infrastructure investments, and
    - receiving stream attributes and anticipated discharge limits.

    McClure further recommends that the treatment process to replace the existing facility be a traditional oxidation ditch with disc aerators. This recommendation is based on the following factors:
    - low sidewall depth, allowing for less rock excavation for the new ditch and support buildings,
    - ability to re-use all the existing structures, with the exception of the existing aeration tank splitter box, which appears near the end of its service life,
    - the District's familiarity with the process; this would be the same type of facility as the BCRSD Rocky Fork WWTP,
    - ability to readily handle future BNR needs/requirements, and
    - ability to easily double the treatment capacity if needed in the future.

    Additionally, as part of this specific effort, an aerial sewer crossing that is prone to freezing, located near the intersection of Rollingwood Blvd. and Pinelawn Dr., should be eliminated by re-routing a new gravity sewer main flowing south to the BCRSD Midway Crossing WWTP.

2. Proceed with design and construction to eliminate the BCRSD Trails West WWTF by connection to the BCRSD Midway Crossing WWTP. This connection will allow the District to comply with the Schedule of Compliance deadline established in the facility's NPDES permit.

3. Proceed with construction phase to eliminate the BCRSD Rollingwood Plat 1 WWTP by connection to the BCRSD Midway Crossing WWTP. This design has been completed by others. This connection will allow the District to comply with the Schedule of Compliance deadline established in the facility's NPDES permit.

4. Proceed with the regionalization of the BCRSD Midway Arms WWTP on Van Horn Tavern Road to the City of Columbia.

The wastewater facility serving Midway Truck Stop is included in this study for planning purposes. That system is privately owned, and it is not clear what the owner's intentions are at this time. It is also unclear what the owners of this system intended when they negotiated the current permit. Regardless, this NPDES permit has a SOC that appears to be unattainable, and the BCRSD should protest any further renewal or construction applications.

The BCRSD Midway USA WWTF, which serves the Midway USA industrial complex located at the intersection of State Highway 40 and Route J, is another potential connection to the expanded Midway Crossing WWTP. However, closure of this facility is not an immediate need of the District. The Midway USA WWTF was constructed in 2021, and its NPDES permit does not contain effluent limitations or a Schedule of Compliance. It is a subsurface irrigation treatment system. Capacity for the hydraulic load from this facility is included in the expanded Midway Crossing WWTP design flow to allow for future connection of this facility if desired by the District, but immediate closure and connection is not included as part of the recommendations.

ES.5 COSTS OF RECOMMENDED PROJECTS

From the recommendations discussed in the previous section, high-level project cost estimates are as follows: (NOTE: Detailed project cost estimates for each task can be found in Sections 6.1 and 6.3)

1. The largest project in the list of recommendations is to replace the existing BCRSD Midway Crossing WWTP with a new wastewater treatment plant. It is anticipated that this facility would be designed for an initial design average flow of 250,000 gpd. Increasing the wastewater treatment capacity at this plant is necessary to facilitate the connections described in this Facility Plan and to treat the flows of upcoming developments with existing agreements with the District for wastewater treatment services. The cost estimate in Table ES-1 below is representative of a new multi-channel oxidation ditch treatment system. It also includes the cost associated with the elimination of a problematic aerial sewer main.

Table ES-1 BCRSD Midway Crossing WWTP Replacement and Aerial Crossing Elimination Cost Estimate Summary

Item	*Description*	*Capital Cost*
1	Mobilization & Bonding (8%)	$362,500
2	Site Work	$573,000
3	Aerial Crossing Elimination	$180,592
4	Access Road Improvements	$13,600
5	Headwork Equipment and Building	$973,000
6	Biological Treatment Process - Orbal® Oxidation Ditch	$1,571,000
7	Ultraviolet Disinfection System Improvements	$136,000
8	Backup Power	$240,000
9	New Secondary Clarifier	$567,000
10	Secondary Clarifier Improvements	$171,000
11	Misc. Site and Plant Improvements	$103,500
12	Contingency Allowance (20%)	$978,500
Subtotal - Engineer's Estimate of Probable Construction Cost		**$5,870,500**
13	Engineering Design and Ancillary Project Fees	$1,646,700
Total - Engineer's Opinion of Probable Project Cost		**$7,518,000**

2. Connection of the BCRSD Trails West WWTF to the BCRSD Midway Crossing WWTP.

Table ES-2 Trails West Connection Cost Estimate Summary

Item	*Description*	*Capital Cost*
1	Mobilization & Bonding (8%)	$126,000
2	Site Work	$149,325
3	Gravity Sewer Main & Force Main – Trails West	$1,105,398
4	Lift Station, Wet Well, and Valve Vault	$230,000
5	Mechanical, Electrical, and Control Equipment	$86,500
6	Contingency Allowance (20%)	$340,000
Subtotal - Engineer's Estimate of Probable Construction Cost		**$2,037,300**
7	Engineering Design and Ancillary Project Fees	$397,500
Total - Engineer's Opinion of Probable Project Cost		**$2,434,800**

3. Elimination of the BCRSD Midway Arms WWTP.

Table ES-3 BCRSD Midway Arms WWTP Connection to Columbia Cost Estimate Summary

Item	*Description*	*Capital Cost*
1	Mobilization & Bonding (8%)	$34,500
2	Site Work	$88,417
3	Force Main – Midway Arms	$255,331
4	Lift Station, Wet Well, and Valve Vault	$75,000
5	Mechanical, Electrical, and Control Equipment	$11,500
6	Contingency Allowance (20%)	$93,000
Subtotal – Engineer's Estimate of Probable Construction Cost		**$557,800**
7	Engineering Design and Ancillary Project Fees	$101,250
Total – Engineer's Opinion of Probable Project Cost		**$659,050**

4. Should the flows from the Midway Auto/Truck Plaza be redirected to BCRSD Midway Crossing WWTP the associated costs are illustrated as follows; however, these costs would likely be the responsibility of the Midway Auto/Truck Plaza ownership.

Table ES-4 Midway Auto/Truck Plaza Connection to Midway Crossing WWTP Cost Estimate Summary

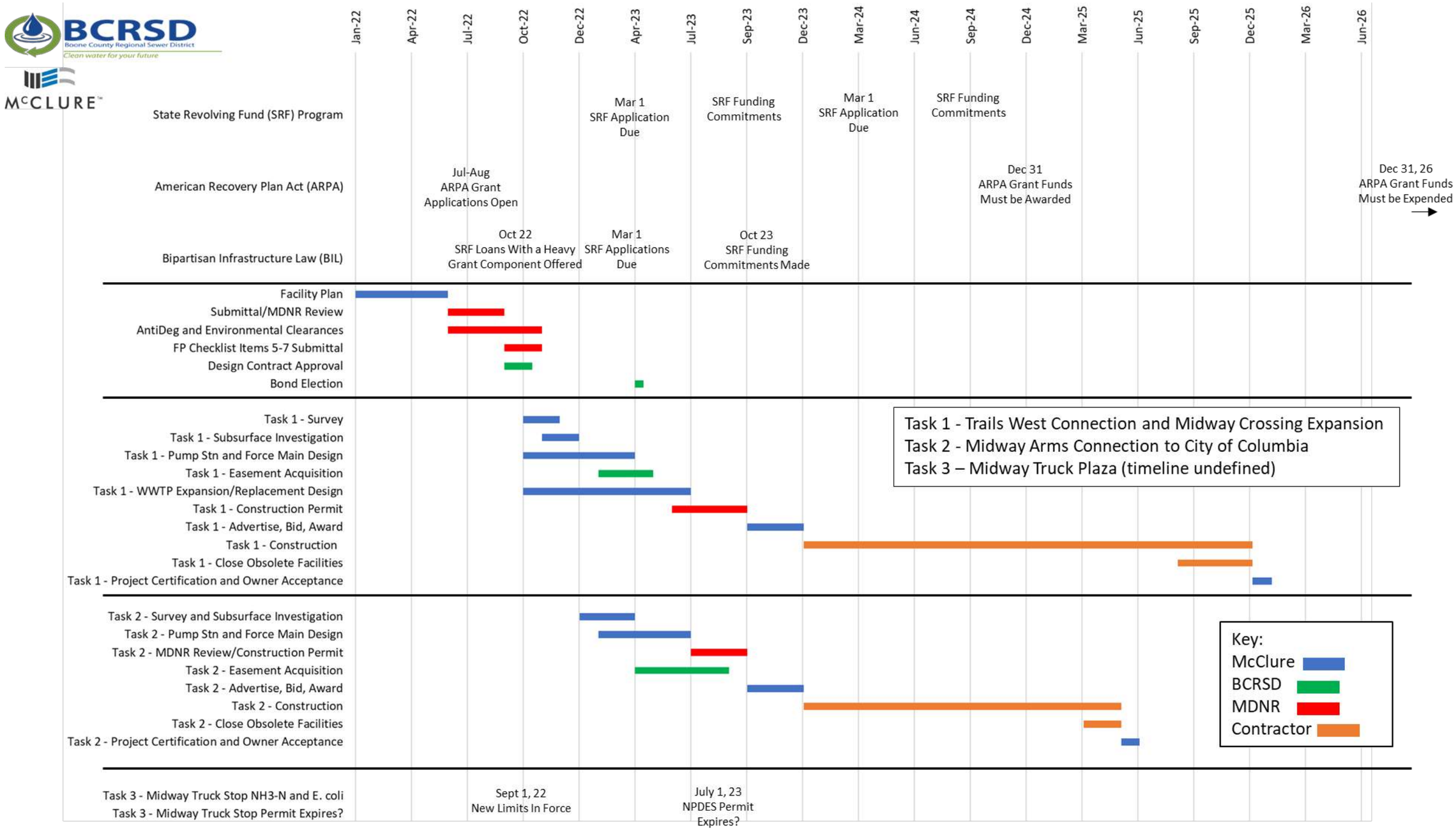
Item	*Description*	*Capital Cost*
1	Mobilization & Bonding (8%)	$73,000
2	Site Work	$131,240
3	Force Main – Midway Truck Stop	$590,642
4	Lift Station, Wet Well, and Valve Vault	$138,500
5	Mechanical, Electrical, and Control Equipment	$46,500
6	Contingency Allowance (20%)	$196,000
Subtotal – Engineer's Estimate of Probable Construction Cost		**$1,175,900**
7	Engineering Design and Ancillary Project Fees	$227,000
Total – Engineer's Opinion of Probable Project Cost		**$1,402,900**

ES.6 PROJECT SCHEDULE

The proposed project schedule is broken into 3 Major Tasks:

Task 1 – New BCRSD Midway Crossing WWTP, Aerial Sewer Main Elimination, and Trails West Connection to BCRSD Midway Crossing WWTP
Task 2 - Design Services for Midway Arms Connection to City of Columbia
Task 3 - Connection of Midway Auto/Truck Plaza

These tasks are broken down as illustrated in Figure ES-2.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McCLURE
Jan-22
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Mar-24
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Dec-25
Mar-26
Jun-26
State Revolving Fund (SRF) Program
Mar 1 SRF Application Due
SRF Funding Commitments
Mar 1 SRF Application Due
SRF Funding Commitments
American Recovery Plan Act (ARPA)
Jul-Aug ARPA Grant Applications Open
Dec 31 ARPA Grant Funds Must be Awarded
Dec 31, 26 ARPA Grant Funds Must be Expended
Bipartisan Infrastructure Law (BIL)
Oct 22 SRF Loans With a Heavy Grant Component Offered
Mar 1 SRF Applications Due
Oct 23 SRF Funding Commitments Made
Facility Plan
Submittal/MDNR Review
AntiDeg and Environmental Clearances
FP Checklist Items 5-7 Submittal
Design Contract Approval
Bond Election
Task 1 - Survey
Task 1 - Subsurface Investigation
Task 1 - Pump Stn and Force Main Design
Task 1 - Easement Acquisition
Task 1 - WWTP Expansion/Replacement Design
Task 1 - Construction Permit
Task 1 - Advertise, Bid, Award
Task 1 - Construction
Task 1 - Close Obsolete Facilities
Task 1 - Project Certification and Owner Acceptance
Task 1 - Trails West Connection and Midway Crossing Expansion
Task 2 - Midway Arms Connection to City of Columbia
Task 3 – Midway Truck Plaza (timeline undefined)
Task 2 - Survey and Subsurface Investigation
Task 2 - Pump Stn and Force Main Design
Task 2 - MDNR Review/Construction Permit
Task 2 - Easement Acquisition
Task 2 - Advertise, Bid, Award
Task 2 - Construction
Task 2 - Close Obsolete Facilities
Task 2 - Project Certification and Owner Acceptance
Key:
McClure
BCRSD
MDNR
Contractor
Task 3 - Midway Truck Stop NH3-N and E. coli
Task 3 - Midway Truck Stop Permit Expires?
Sept 1, 22 New Limits In Force
July 1, 23 NPDES Permit Expires?

Figure ES-2

1. 0 INTRODUCTION

1.1 PROJECT OBJECTIVE

The objective of this project is to centralize wastewater collection and treatment in the Midway area of the Perche Creek watershed, facilitating elimination of multiple operating permits, reducing overall operations costs, increasing treatment capacity to serve planned and future developments, and discharging an improved effluent quality to the environment. This project will also allow the District to avoid costly upgrades to each of the existing facilities in order to meet the ever-tightening regulatory requirements, including current Schedules of Compliance related to disinfection and ammonia and potential future limits related to nutrient removal. The expansion of the BCRSD Midway Crossing WWTP and the connection of the existing collection systems in the area will allow future developments in the watershed to continue to have access to a centralized wastewater collection and treatment system.

1.2 SCOPE OF FACILITY PLAN

The Boone County Regional Sewer District has retained the services of McClure Engineering Company to prepare this Wastewater Facility Plan to examine Midway Area regionalization potential and address centralization of its existing treatment facilities in this area. Additionally, McClure will examine the requirements of a regional treatment facility, whether the final decision be expansion or replacement of the existing WWTP. This Facility Plan has been prepared in accordance with the Agreement between the Boone County Regional Sewer District and McClure dated November 8, 2021. The scope of work includes the following.

1. Review historical wastewater flow and loading information and prepare design year flows and loadings.
2. Evaluate the capacity, condition, and performance of the existing wastewater system with a primary focus on the Midway Crossing WWTP.
3. Evaluate and address the regulatory requirements related to the expansion of the wastewater treatment and collection system.
4. Analyze alternatives for improvements to the wastewater system to address deficiencies, meet design year flows and loads, and meet existing and future NPDES permit requirements.
5. Develop present worth cost estimates for each alternative based on the service life of the proposed improvements.
6. Prepare recommendations for improvement that are economically efficient and meet the immediate and long-term needs of the District.
7. Evaluate available project financing methods and the financial impact of the project.
8. Develop a preliminary project schedule.

1.3 PROJECT PLANNING

The Boone County Regional Sewer District serves a large portion of Boone County with a higher density of facilities near the urban area of the City of Columbia. The District was originally formed in 1973 to reduce the proliferation of private wastewater treatment systems and lagoons serving development areas in Boone County. Over the last four decades, the District, in cooperation with the City of Columbia, has a successful track record of regionalization and has phased out many of these plants and lagoons.

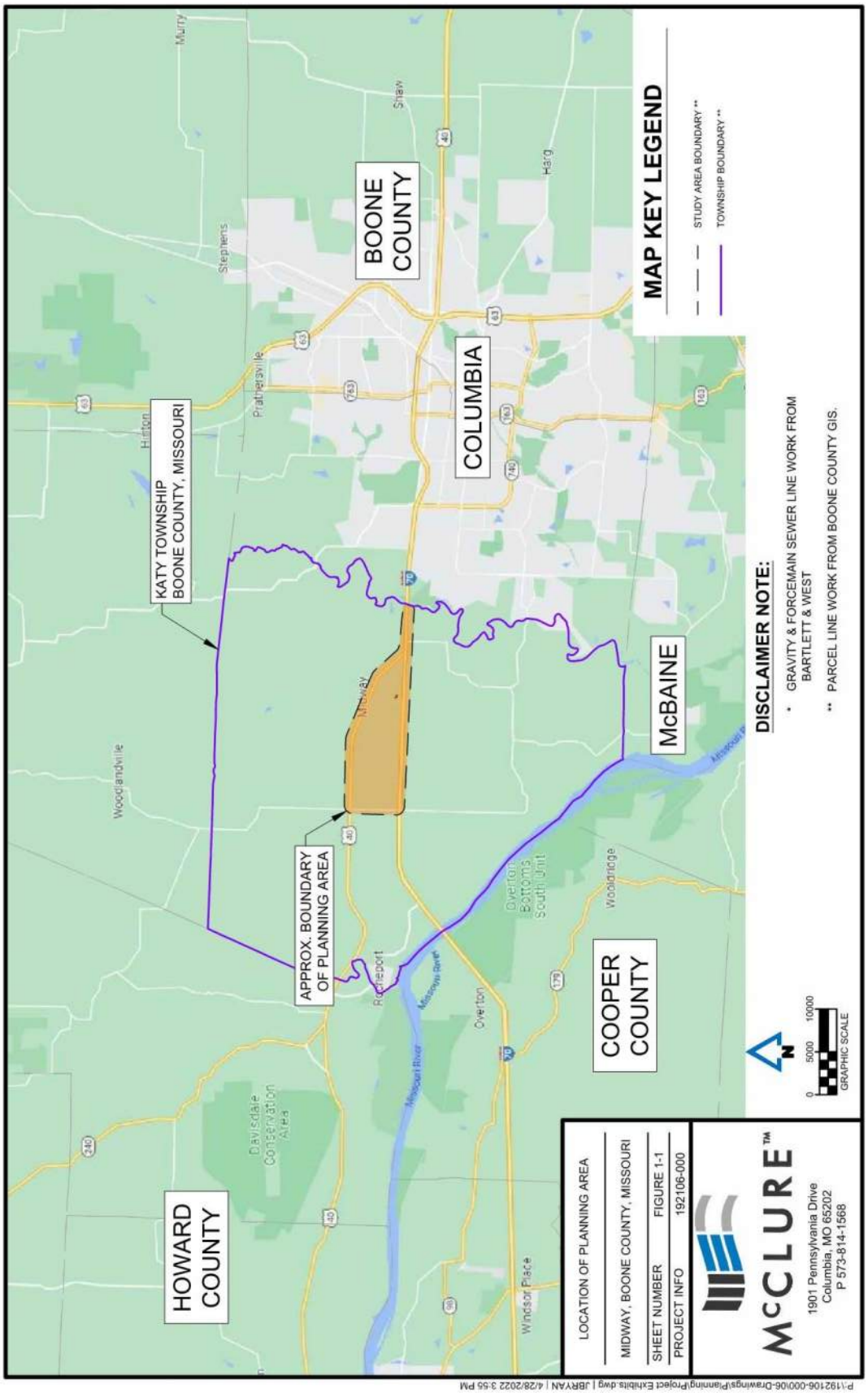
The Boone County Regional Sewer District is governed by a Board of Trustees appointed by the County Commission. The District has a full-time staff to provide day-to-day management and operation of the District's facilities. Since the Boone County Regional Sewer District is a public sewer system, it is provided with specific authority to operate and finance wastewater system improvements under the laws of the State of Missouri.

1.3.1 PLANNING AREA

Midway is an unincorporated region in Boone County, Missouri named for its position midway between St. Louis, MO and Kansas City, MO. The community is located just a few miles west of the City of Columbia, along Interstate 70 (I-70) in the Katy Township of Boone County. The study area covers approximately 2,697 acres or 4.2 square miles. General boundaries for the study area are 500 feet south of Interstate 70 (I-70), 500 feet west of Route J, and 500 feet north of U.S. Highway 40. The Midway Arms campus located on W Van Horn Tavern Road will serve as the eastern boundary.

Further, the City of Columbia and the District have a General Cooperative Agreement dated March 8, 2011, and in pertinent part, was subsequently amended by Amendment No. 3 to this General Cooperative Agreement dated August 19, 2015, which are relevant to the planning area (see Appendix D).

A general location map of the study area is shown in Figure 1-1.


MAP KEY LEGEND
STUDY AREA BOUNDARY **
TOWNSHIP BOUNDARY **
DISCLAIMER NOTE:
* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST
** PARCEL LINE WORK FROM BOONE COUNTY GIS.
KATY TOWNSHIP
BOONE COUNTY, MISSOURI
APPROX. BOUNDARY OF PLANNING AREA
BOONE COUNTY
COLUMBIA
McBAINE
COOPER COUNTY
HOWARD COUNTY
Midway
Rocheport
Overton
Woodlandville
Prathersville
Stephens
Shaw
Harg
Hinton
Woodridge
Windsor Place
Overton Bottoms South Unit
Missouri River
Meadow River
Davisdale Conservation Area
GRAPHIC SCALE
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LOCATION OF PLANNING AREA
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 1-1
PROJECT INFO 192106-000
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Figure 1-1

1.3.2 PLANNING PERIOD

Typically, wastewater treatment and collection system projects are designed to accommodate appropriate growth over a 20-year period. Estimating population trends beyond this timeframe generally becomes more difficult. In addition, mechanical equipment used in the treatment process and pumping facilities in the collection system generally have a useful life expectancy of about 20 years. For these reasons a planning period of 20 years will be used for this Report. Population and wastewater flow and loading projections for the year 2042 will be discussed in detail later in this report.

2.0 GEOGRAPHICAL INFORMATION

2.1 WASTEWATER SERVICE AREA

2.1.1 PRESENT SERVICE AREA

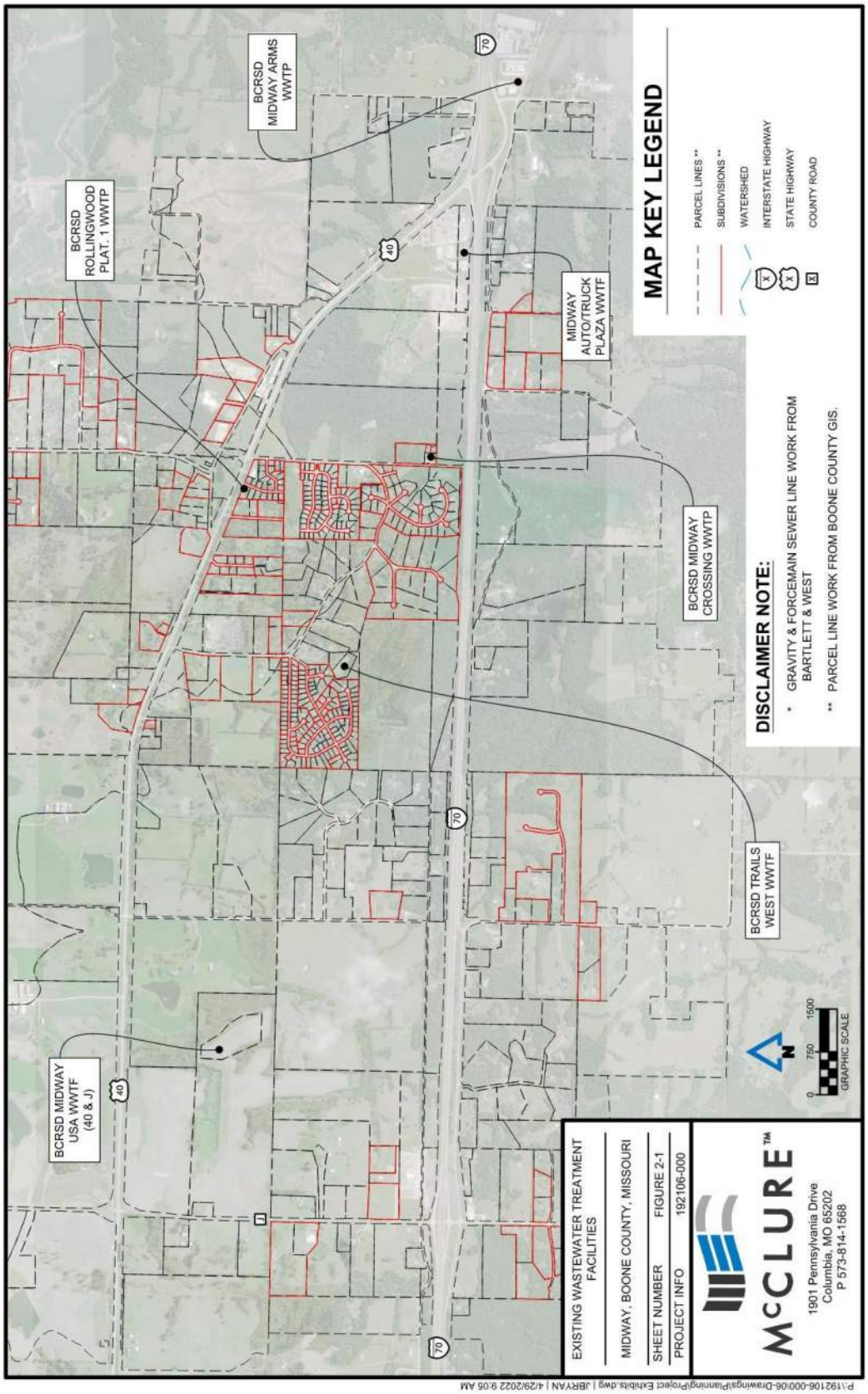
Most of the BCRSD service area within the Midway area of Boone County is located north of I-70 bounded by U.S. Highway 40 and State Highway J. The district currently provides wastewater collection and treatment to a variety of residential, commercial, and industrial customers. See Figure 2-1 on the following page for a map of the existing WWTFs.

As the Midway area of Boone County is an unincorporated community, there is no public census population data available for the community. Based on information received from the County, there are a total of 449 parcels with 436 registered addresses contained within the boundaries of I-70, State Highway 40 and Route J. Some of these registered addresses serve commercial or industrial entities; however, the vast majority are representative of typical single-family homes. Using the MO DNR recommendation of 3.7 persons per single family residence, the estimated population of the present service area is 1,613 persons.

The 2020 Decennial Census estimated a total population of 183,610 persons residing in Boone County and 126,254 persons residing in the City of Columbia adjacent to the Midway area. The Census also recorded a 2020 population of 4,152 persons residing in the Katy Township within Boone County. Table 2-1 contains a summary of the past five decades of census recorded population data for Boone County and the City of Columbia.

Table 2-1 Boone County and City of Columbia Population Trends

Year	*Boone County Population*	*Boone County Population % Increase*	*Columbia Population*	*Columbia Population % Increase*
1980	100,376	24.1%	62,061	6.08%
1990	112,379	12.0%	69,101	11.3%
2000	135,454	20.5%	84,531	22.3%
2010	162,642	20.1%	108,500	28.4%
2020	183,610	12.9%	126,254	16.4%


BCRSD MIDWAY ARMS WWTP
BCRSD ROLLINGWOOD PLAT. 1 WWTP
MIDWAY AUTO/TRUCK PLAZA WWTF
BCRSD MIDWAY CROSSING WWTP
BCRSD TRAILS WEST WWTF
BCRSD MIDWAY USA WWTF (40 & J)
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EXISTING WASTEWATER TREATMENT FACILITIES
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Figure 2-1

Based on the 2021 Boone County Zoning map (Figure 2-2), the majority of the Midway area is zoned for urban agriculture (A-2) or single family residential (R-S), with smaller portions of the area zoned for general commercial (C-G), agriculture-residential (A-R), and light industrial (M-L).

2.1.2 POTENTIAL FUTURE SERVICE AREA

Considering the suburban growth that has occurred in areas surrounding the City of Columbia in recent decades, there is potential for the future addition of customers to the BCRSD's facilities. The present zoning information presented in Figure 2-2 also supports the likelihood of growth in and around the study area. Based on Boone County zoning regulations, the undeveloped land zoned for Single Family Residential (R-S) can be divided and developed into single-family housing with a minimum lot size of 7,000 square feet. The land zoned for Agriculture (A-2) can also be divided and developed into single family housing with a minimum lot size of two and a half acres. The undeveloped land zoned for Agriculture Residential (A-R) can be divided and developed into single-family housing with a minimum lot size of one-half acre. The General Commercial (C-G and C-GP) land near the intersection of I-70 and Highway 40 is in a prime location for potential future restaurants and hotels. Another group of potential future customers are homes and businesses currently served by existing onsite treatment systems such as septic tanks within the watershed. See Section 3.3 for a further analysis of the current and future service area.

Future population in the Midway area was estimated based upon historical data and predicted growth in Boone County. As presented above in Table 2-1, the growth rate in Boone County and Columbia's urban area in the past few decades has been substantial, averaging near 2.0% per year. This growth has often been seen in areas immediately adjacent to Columbia city limits, such as the project area in the Katy Township. Growth has also occurred near major roadways such as Interstate 70. Based on these population trends and the zoning information described above, an estimated annual growth rate of 2.0% will be applied to the study area. Using the 2.0% annual growth rate, the estimated population in the design year of 2042 is 2,494 persons. Projections of the future population in Boone County, the City of Columbia and the Midway area over the next 20 years are presented in Table 2-2.

Table 2-2 Future Population Projections

Year	*Boone County*	*City of Columbia*	*Midway Area*
2020	183,610	126,254	1,613
2030	223,820	153,903	1,966
2040	272,835	187,607	2,397
Planning year 2042	283,857	195,186	2,494

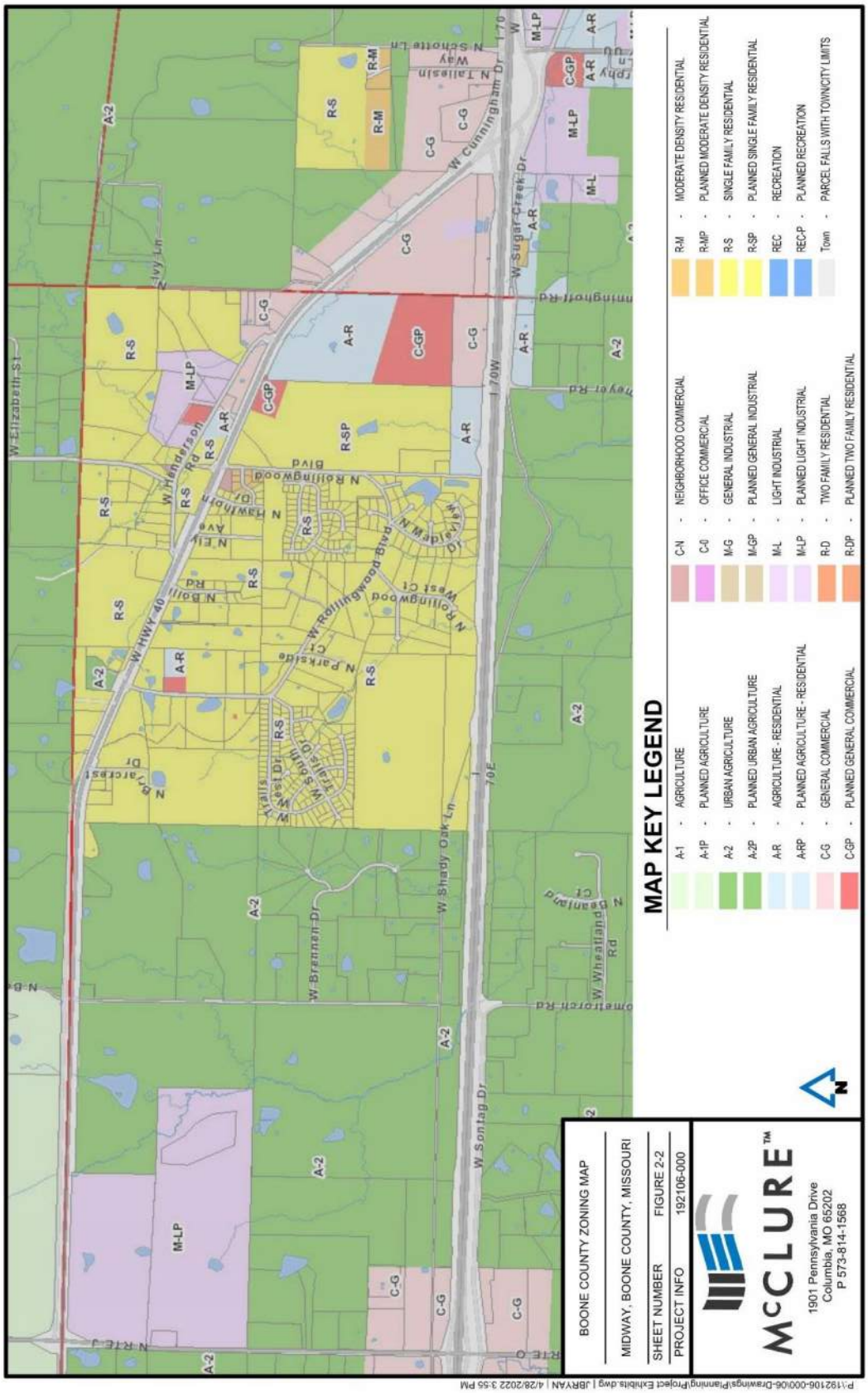
MAP KEY LEGEND
A-1 - AGRICULTURE
A-1P - PLANNED AGRICULTURE
A-2 - URBAN AGRICULTURE
A-2P - PLANNED URBAN AGRICULTURE
A-R - AGRICULTURE - RESIDENTIAL
A-RP - PLANNED AGRICULTURE - RESIDENTIAL
C-G - GENERAL COMMERCIAL
C-GP - PLANNED GENERAL COMMERCIAL
C-N - NEIGHBORHOOD COMMERCIAL
C-O - OFFICE COMMERCIAL
M-G - GENERAL INDUSTRIAL
M-GP - PLANNED GENERAL INDUSTRIAL
M-L - LIGHT INDUSTRIAL
M-LP - PLANNED LIGHT INDUSTRIAL
R-D - TWO FAMILY RESIDENTIAL
R-DP - PLANNED TWO FAMILY RESIDENTIAL
R-M - MODERATE DENSITY RESIDENTIAL
R-MP - PLANNED MODERATE DENSITY RESIDENTIAL
R-S - SINGLE FAMILY RESIDENTIAL
R-SP - PLANNED SINGLE FAMILY RESIDENTIAL
REC - RECREATION
REC-P - PLANNED RECREATION
Town - PARCEL FALLS WITH TOWN/CITY LIMITS
BOONE COUNTY ZONING MAP
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 2-2
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Figure 2-2

2.2 ENVIRONMENTAL CONSIDERATIONS

2.2.1 TOPOGRAPHY

The topography of the Midway area varies from about 600 feet to 800 feet in elevation. The study area is primarily located within the Callahan Creek-Perche watershed (USGS HUC12 10300102-0708), which feeds the Perche Creek southeast of Midway. Perche Creek is a tributary of the Missouri River with its confluence near the Eagle Bluffs Conservation Area south of Columbia. Within the study area, the Callahan Creek-Perche Creek watershed is divided into three sub-watersheds: Sugar Branch, Midway Branch, and Henderson Branch. The far western portion of the study area along Highway J is in the Terrapin Creek-Missouri River Watershed. A topographic map of the planning area is presented Figure 2-3 on the following page.

2.2.2 SOILS AND GEOLOGY

The major soil types within the study area are listed below in Table 2-3 and consist primarily of silt loams with a depth to water table generally greater than 24 inches. This is as recorded in the Natural Resources Conservation Service (NRCS) Web Soil Survey, available online at https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

Table 2-3 Major Soil Types

Soil Type	*Parent Material*	*Depth to Water Table*
Weller silt loam, 5 to 9 percent slopes, eroded	Loess	24 to 48 inches
Weller silt loam, 2 to 5 percent slopes, bench	Loess over alluvium	24 to 48 inches
Winfield silt loam, 5 to 9 percent slopes	Loess	24 to 42 inches
Weller silt loam, 2 to 5 percent slopes, eroded	Loess	24 to 48 inches
Rocheport-Bonnefemme complex, 14 to 25 percent slopes	Loess over residuum weather from limestone	30 to 48 inches
Arisburg silt loam, 1 to 3 percent slopes	Loess	12 to 30 inches
Winfield silt loam, 9 to 14 percent slopes, eroded	Loess	24 to 42 inches

The bedrock in the area is primarily limestone, and like much of Boone County, the north-central zone of the study area near the intersection of U.S. Highway 40 and Briarcrest Drive has a karst landscape, featuring a relatively large number of sinkholes. Additionally, the southwestern portion of the study area near the intersection of Route J and Interstate-70 includes Sinking Creek, a losing stream that flows southwest to the Missouri River. Because of the direct connection of surface to groundwater caused by karst topography, proper management and treatment of wastewater in karst areas is critical to protect groundwater quality. A geological feature map is shown in Figure 2-4.

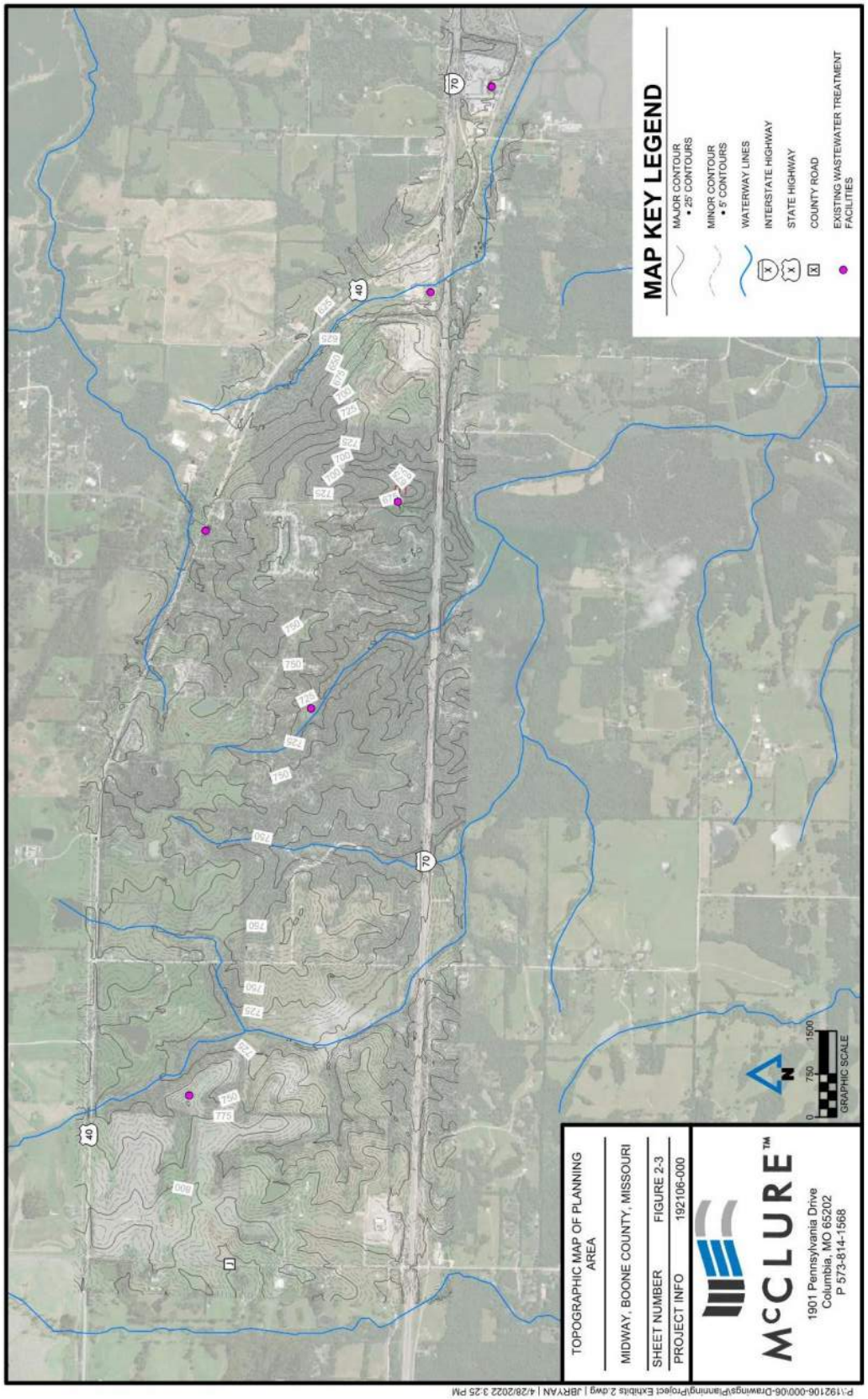
MAP KEY LEGEND
MAJOR CONTOUR
• 25' CONTOURS
MINOR CONTOUR
• 5' CONTOURS
WATERWAY LINES
INTERSTATE HIGHWAY
STATE HIGHWAY
COUNTY ROAD
EXISTING WASTEWATER TREATMENT FACILITIES
TOPOGRAPHIC MAP OF PLANNING AREA
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 2-3
PROJECT INFO 192106-000
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Figure 2-3

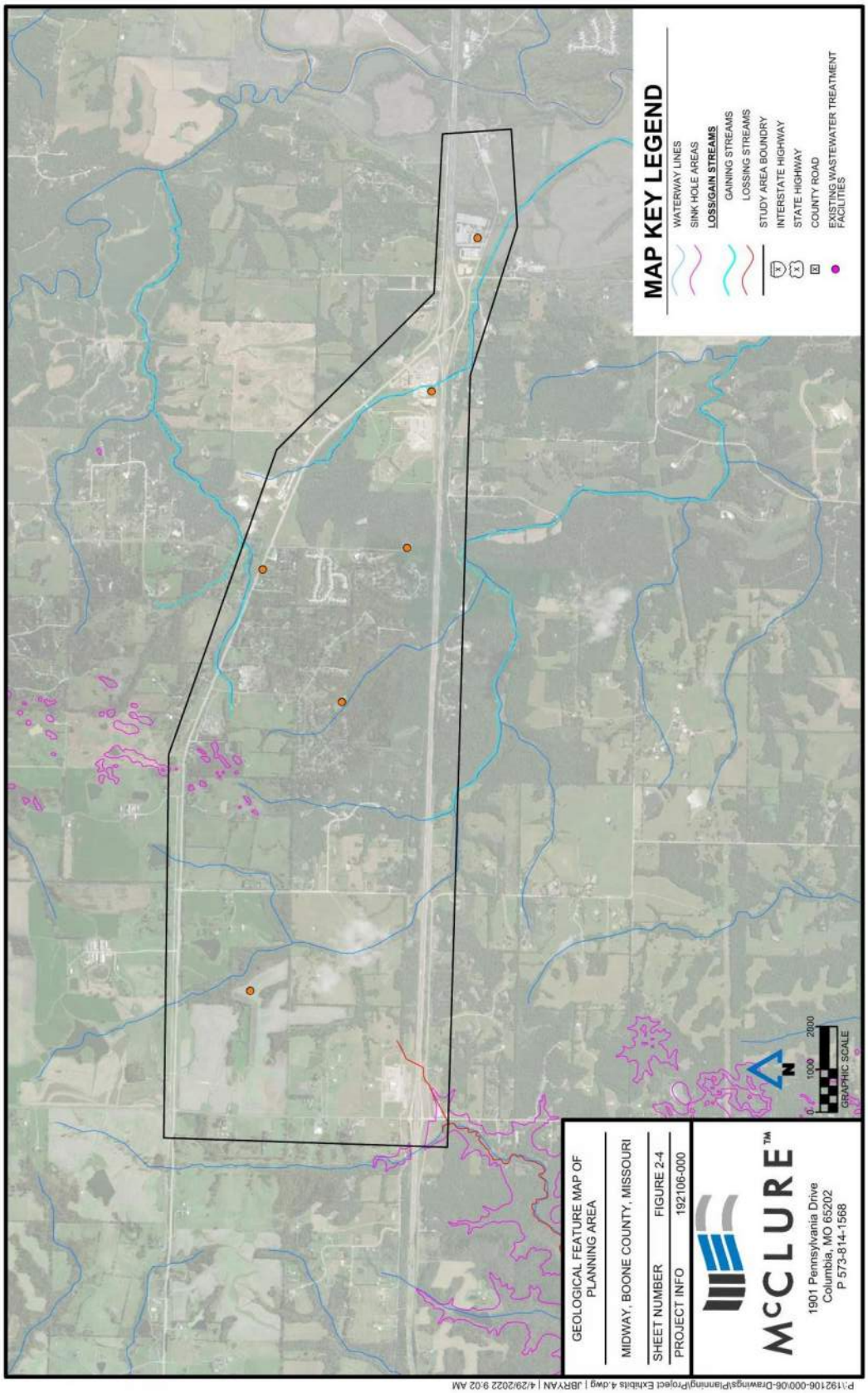
MAP KEY LEGEND
WATERWAY LINES
SINK HOLE AREAS
LOSS/GAIN STREAMS
GAINING STREAMS
LOSSING STREAMS
STUDY AREA BOUNDRY
INTERSTATE HIGHWAY
STATE HIGHWAY
COUNTY ROAD
EXISTING WASTEWATER TREATMENT FACILITIES
GEOLOGICAL FEATURE MAP OF PLANNING AREA
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 2-4
PROJECT INFO 192106-000
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Figure 2-4

2.2.3 CLIMATOLOGICAL INFORMATION

Midway, as with the rest of Missouri, has a temperate climate, with four distinct seasons marked by different temperature and precipitation conditions. Climate details for the project area from the Missouri Climatic Atlas for Design of Land Application Systems (revised 2004) are summarized below.

Average Annual Rainfall	39 to 42 inches
1-in-10-year, 365-day Total Rainfall	51 to 54 inches
25-year, 24-hour Storm Event	5 to 6 inches
Average Temperature	43°F to 44°F average minimum, 64°F to 66°F average maximum
Average Date of Last Freeze	May 1 – May 3
Average Date of First Freeze	September 22 – September 23

3.0 WASTEWATER FLOWS AND LOADINGS

3.1 CURRENT FLOWS

The six permitted domestic wastewater treatment facilities located in the planning area have a total NPDES permitted design capacity of 253,460 gallons per day (gpd). Discharge monitoring report (DMR) data from the past five years indicates the actual average effluent flow from these facilities is a combined 94,509 gpd. A summary of the current permitted design and actual flow information is shown in Table 3-1. The operating permit for each facility can be found in Appendix B.

Table 3-1 WWTF Flow Summary

Facility Name	*Map Ref # Figure 2-1*	*NPDES Permit # MO-*	*Permitted Design Flow (gpd)*	*Design Population Equivalent*	*Actual Average Flow (gpd)*
BCRSD Midway Crossing WWTP	1	0132705	150,000	1,500	23,923
BCRSD Trails West WWTF	2	0092002	57,500	644	31,409
BCRSD Rollingwood Plat 1 WWTP	3	0038792	10,000	100	4,197
BCRSD Midway Arms WWTP	4	0108421	4,800	94	4,391
BCRSD Midway USA WWTF	5	0139629	6,460	259	6,640*
BCRSD Subtotal			**228,760**	**2,597**	**70,380**
Midway Auto/Truck Plaza WWTF	6	0100862	24,700	932	24,129
Total			**253,460**	**3,529**	**94,509**

The BCRSD Midway USA WWTF uses a subsurface drip irrigation system, so there is no actual effluent flow data for this facility. For the purpose of this report, the permitted design flow was assumed to be the actual average flow treated at this facility. A further analysis of flows in the Midway Area can be found in Section 3.3.

3.2 CURRENT LOADING

Two of the most important parameters typically evaluated for wastewater treatment loading are influent 5-day biochemical oxygen demand (BOD_5) and influent total suspended solids (TSS). Of the six treatment facilities in the study area, only three facilities (BCRSD Midway Crossing WWTP, BCRSD Rollingwood Plat 1 WWTP, and BCRSD Midway Arms WWTP) are required to conduct influent sampling for BOD_5 and TSS on a quarterly basis. Table 3-2 contains the average data of the past five years of influent BOD_5 and TSS samples for these three facilities and the average of six influent samples collected from 2018 to 2021 for the BCRSD Trail West WWTF. Influent sampling is not required for BCRSD Midway USA WWTF or the Midway Auto/Truck Plaza WWTF, and therefore no influent data was available.

Table 3-2 WWTF Influent Loading Summary

Facility Name	*Map Ref # Figure 2-1*	*NPDES Permit # MO-*	*Influent BOD_5 (mg/L)*	*Influent TSS (mg/L)*	*Influent NH_3-N (mg/L)*	*Influent TP (mg/L)*
BCRSD Midway Crossing WWTF	1	0132705	235	234	47.6	7.7
BCRSD Trails West WWTF	2	0092002	315	268	-	-
BCRSD Rollingwood Plat 1 WWTP	3	0038792	178	106	-	-
BCRSD Midway Arms WWTP	4	0108421	216	89	-	-
BCRSD Midway USA WWTF	5	0139629	-	-	-	-
Non-BCRSD						**-**
Midway Auto/Truck Plaza WWTF	6	0100862	-	-	-	-

The available influent tests at each of the existing BCRSD facilities indicate that the BOD_5 and TSS concentrations generally fall within the typical ranges for domestic wastewater. As shown in the Table 3-2, the BCRSD Midway Crossing WWTP was the only facility with influent data for nutrients such as ammonia-nitrogen (NH_3-N) and total phosphorus (TP). Because the Midway Crossing WWTP has the largest amount of influent data available and will likely be the site of the WWTP expansion, the sampling results from this facility will be used to determine the future facility design loading.

3.3 FUTURE FLOWS

Future flows are estimated based on historical data, current zoning districts within the study area and predicted growth as discussed in Section 2.1.2. Figure 3-1 shows the 2021 Boone County Zoning Map delineated into 24 different sections based on land use, zoning category, landowner, and the presence of existing development. Each of these areas was reviewed for the likelihood of connection to the expanded Midway Crossing WWTP under the planning period of this project (next 20 years) or in the long-term (more than 20 years from now). These flows are outlined in Table 3-3 with references to the corresponding Figure 3-1.

In areas where flows are sent to existing wastewater treatment facilities, the permitted design flows of these facilities were used to generate future flow predictions. As flow monitoring was not included in the scope of the Report, there was not enough existing flow data to support design flow adjustments. The existing BCRSD treatment facilities expected to connect to the expanded Midway Crossing WWTP within the planning period include Rollingwood Plat 1 WWTP, which serves the Rollingwood Subdivision – Plat 1, Trails West WWTF, which serves the Trails West Subdivision, and Midway USA WWTF, which serves the Midway USA industrial complex near the intersection of State Highway 40 and Route J. It is also likely that the privately-owned Midway Auto/Truck Plaza WWTF will connect to the expanded system within the next 20 years. See Section 4.3 for further information on existing treatment facilities.

For areas with existing built out residential development not presently connected to BCRSD, it was assumed that this development would remain, and the wastewater flows were estimated based on the number of lots and the MO DNR recommended flow contribution of 3.7 persons per home generating a wastewater flow of 100 gallons per person per day. The Bolli Road Neighborhood Improvement District (NID) has an existing plan to connect to the Midway Crossing WWTP in the immediate future and was included in the planning period flow estimate. Other existing residential developments in the area are currently served by onsite wastewater systems and are considered unlikely to connect within the next 20 years due to the costs associated with a sewer extension. Flows from these sections were included in the potential long term flow estimates.

New residential developments already under contract with BCRSD for treatment at the Midway Crossing WWTP include Ravenwood Subdivision, an 86-acre area with 170 single family home lots and 2 commercial lots, and Midway Crossings Plat 3, a 9.2-acre area with 26 single family lots. Additional areas with a high likelihood of development within the 20-year planning period include a 101-acre area zoned for single family residential (R-S) south of the existing Trails West Subdivision and the commercial area (C-G) located near the intersection of I-70 and Highway 40.

For areas where future development was predicted to occur, conservative assumptions were made to estimate future flows due to the large variety of development that could take place. Where future development was expected to be high density residential (zoned R-S) acreages were measured, reduced by 30% to account for wastage and new roadways and converted to flow assuming one home per 7,000 sq. ft. with 3.7 persons per home generating a wastewater flow of 100 gallons per day per capita in accordance with MO DNR recommendations. For moderate density residential (zoned A-R), acreages were measured, reduced by 30%, and converted to flow assuming one home

per 0.5 acres with 3.7 persons per home generating a wastewater flow of 100 gallons per capita per day. Where future development was expected to be low density residential (zoned A-2) acreages were measured, reduced by 30%, and converted to flow assuming one home per 2.5 acres with 3.7 persons per home generating a wastewater flow of 100 gallons per day per capita. Where future development was expected to be commercial (zoned C-G or C-GP) acreages were measured, reduced by 30% and converted to flow assuming 1.0 MGD of flow per 1,000 acres of land.

Total projected wastewater flows for the 20-year planning level were based on the existing treatment facilities to be eliminated by this project, the planned near future developments such as Ravenwood Subdivision, and the predicted potential development likely to occur as the public sewer system expands and population growth continues. Predictions of future flow connections for this timeframe were made within reason, as the District cannot control the rate or type of development that will take place in the Midway area. Based on the calculations, the capacity of the expanded Midway Crossing WWTF will be 250,000 gpd with planned expansion to 500,000 gallons per day by the end of the study period. This 20-year planning period makes some allowance for unpredicted growth not included in Table 3-3. Proposed development and the potential for new connections should be closely monitored to ensure treatment capacity is available.

The area south of the Interstate-70 corridor, including the BCRSD Midway Arms WWTP on Van Horn Tavern Road, was not included in the future flow analysis. It is expected that these facilities will receive sewer service from the City of Columbia in the future due to the proximity of City sewer and the high cost associated with boring under Interstate-70 for connection to the Midway Crossing WWTP. Estimates of potential future flow contributions from the land owned by Sydenstricker near Route J and the land owned by the University of Missouri north of State Highway 40 were also not included in the expected future flow due to the uncertainty of development in these areas.

Table 3-3 Estimated Hydraulic Load

Figure 3-1 Label	*Property Description*	*Existing Design Flow Treated by BCRSD*	*Project Planning Flow**	*Potential Long-Term Flow*
18	Midway Crossing Subdivision	28,860	*38,480*	38,480
19	Rollingwood Subdivision - Plat 2	17,390	*17,390*	17,390
9	Rollingwood Subdivision - Plat 1	10,000	*10,000*	10,000
17	Rollingwood Subdivision - Plat 3 (16 lots)	-	-	5,920
14	Trails West Subdivision	57,500	*57,500*	57,500
7	Bolli Rd NID	-	*4,810*	4,810
10	Ravenwood Subdivision	-	*63,640*	63,640
16	R-S W. Rollingwood Blvd. Area (20 lots)	-	-	7,400
15	Undeveloped R-S (101 acres)	-	162,784	162,784
8	Undeveloped R-S (23 acres)	-	-	37,070
6	Undeveloped R-S (40 acres)	-	-	64,469
4	Undeveloped R-S (87 acres)	-	-	140,220
13	A-2 Brennen Dr. Area (30 lots)	-	-	11,100
3	Undeveloped A-2 (151 acres)	-	-	15,644
2	Undeveloped A-2 (108 acres)	-	-	11,189
11	Undeveloped A-2 (293.5 acres)	-	-	30,407
23	Undeveloped A-R (55 acres)	-	-	28,490
5	Midway Elementary	4,500	*4,500*	4,500
24	MeowLuxe Cat Boarding	80	*80*	80
1	Midway USA 40&J	6,460	*6,460*	6,460
-	Midway Arms Van Horn Tavern Rd	-	-	-
21	Midway Auto/Truck Plaza	-	24,700	51,590
22	Undeveloped Commercial C-G (45 acres)	-	31,500	31,500
20	Undeveloped Commercial C-GP (29 acres)	-	20,300	20,300
12	Sydenstricker Nobbe Partners	-	-	-
-	Foremost Dairy - University of Missouri	-	-	-
	Total	**124,790**	**442,144**	**820,941**

*Project planning flows shown in italics are existing flows and committed flows to be treated by BCRSD.

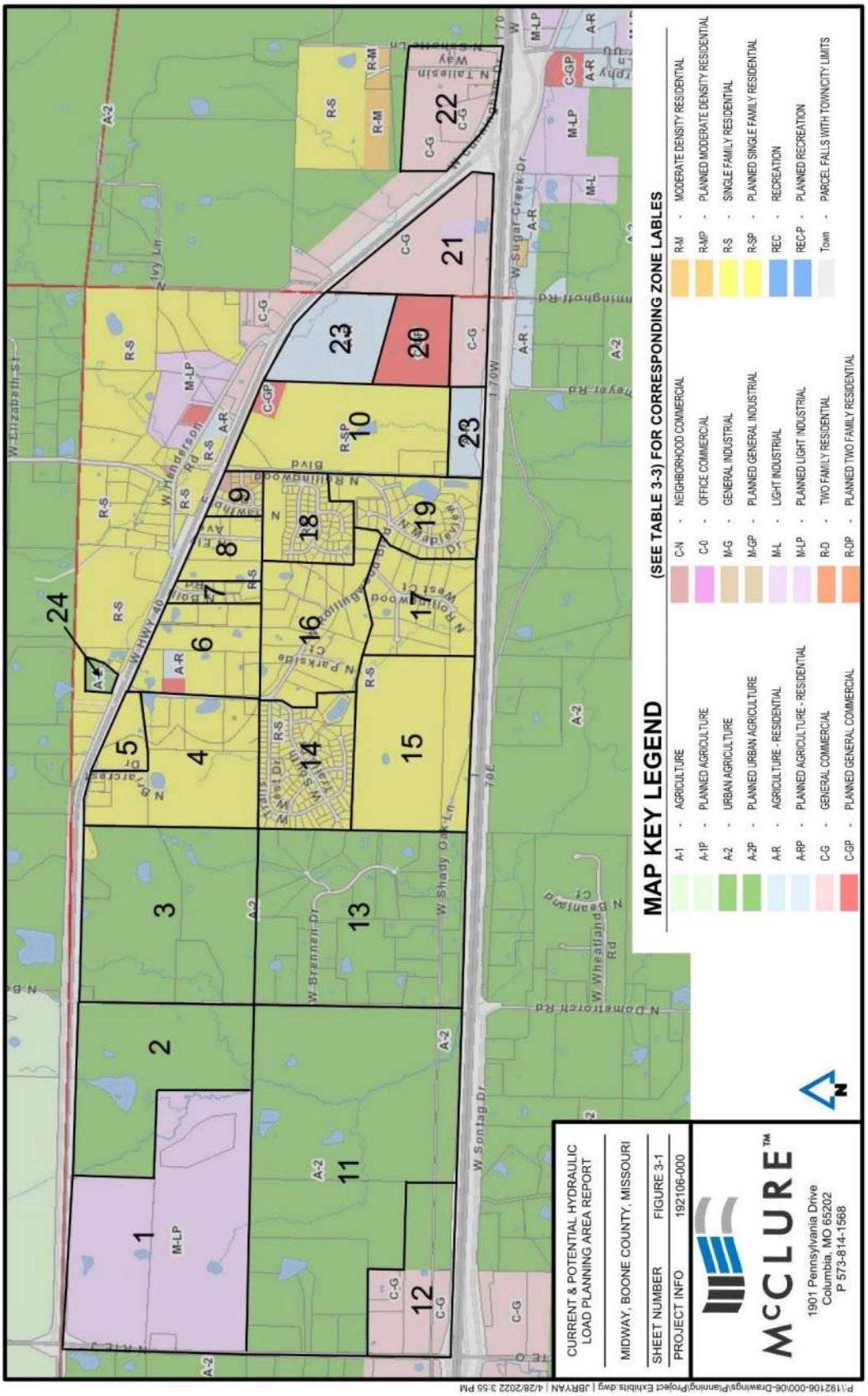
MAP KEY LEGEND
(SEE TABLE 3-3) FOR CORRESPONDING ZONE LABLES
A-1 - AGRICULTURE
A-1P - PLANNED AGRICULTURE
A-2 - URBAN AGRICULTURE
A-2P - PLANNED URBAN AGRICULTURE
A-R - AGRICULTURE - RESIDENTIAL
A-RP - PLANNED AGRICULTURE - RESIDENTIAL
C-G - GENERAL COMMERCIAL
C-GP - PLANNED GENERAL COMMERCIAL
C-N - NEIGHBORHOOD COMMERCIAL
C-O - OFFICE COMMERCIAL
M-G - GENERAL INDUSTRIAL
M-GP - PLANNED GENERAL INDUSTRIAL
M-L - LIGHT INDUSTRIAL
M-LP - PLANNED LIGHT INDUSTRIAL
R-D - TWO FAMILY RESIDENTIAL
R-DP - PLANNED TWO FAMILY RESIDENTIAL
R-M - MODERATE DENSITY RESIDENTIAL
R-MP - PLANNED MODERATE DENSITY RESIDENTIAL
R-S - SINGLE FAMILY RESIDENTIAL
R-SP - PLANNED SINGLE FAMILY RESIDENTIAL
REC - RECREATION
REC-P - PLANNED RECREATION
Town - PARCEL FALLS WITH TOWN/CITY LIMITS
CURRENT & POTENTIAL HYDRAULIC LOAD PLANNING AREA REPORT
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 3-1
PROJECT INFO 192106-000
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Figure 3-1

3.4 FUTURE LOADING

As the Midway area population increases, the waste load constituent concentrations, i.e. the strength of the wastewater, are expected to remain similar to the existing loading concentrations presented in Section 3.2, which are representative of typical domestic waste. As all identified alternatives involve the consolidation of existing treatment systems and the connection of existing and future development to a single treatment facility, the anticipated future loading from each individual contributor was not calculated. The lack of available existing loading data for the individual contributors also weighed into the selected methodology of calculating overall combined loads.

To determine future design loading, the average influent concentrations collected at the existing BCRSD Midway Crossing WWTP were extrapolated and applied to the increased capacity of the expanded treatment plant. The Midway Crossing facility has the most robust influent data of all facilities in the study area and provides a sound representation of anticipated future loads. See Table 3-4 Design Organic Load for the estimated future influent loading in pounds per day. Within the watershed there are some areas of predicted commercial development; however, high-strength organic loads from these facilities are not expected. If a new or existing commercial or industrial development with an organic wastewater load higher than that of typical domestic wastewater does connect to the new system, the District could consider implementing a pre-treatment program.

Table 3-4 Design Organic Load

Parameter	*Concentration (mg/L)*	*Initial Design Flow (MGD)*	*Initial Design Load (lbs/day)*	*20-Year Design Flow (MGD)*	*20-Year Design Load (lbs/day)*
BOD_5	235	0.25	490	0.5	980
TSS	234	0.25	488	0.5	976
NH_3-N	47.6	0.25	99	0.5	198
TP	7.7	0.25	16	0.5	32

To determine the design peak hourly flow of the expanded facility, the following peaking factor equation was used to calculate the ratio of peak hourly flow to design average flow:

$$Peaking\ Factor = \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

Where P = the population in thousands. Using a population equivalent of 2,500 persons, the applicable peaking factor was calculated to be 3.5. Based on a peaking factor of 3.5 and an initial design flow of 0.250 MGD, the peak hourly flow was determined to be 0.875 MGD.

4.0 EXISTING FACILITIES

The capacities and characteristics of the existing domestic wastewater treatment facilities in the project area are summarized in this section, along with an overview of recent treatment performance data.

4.1 HISTORY

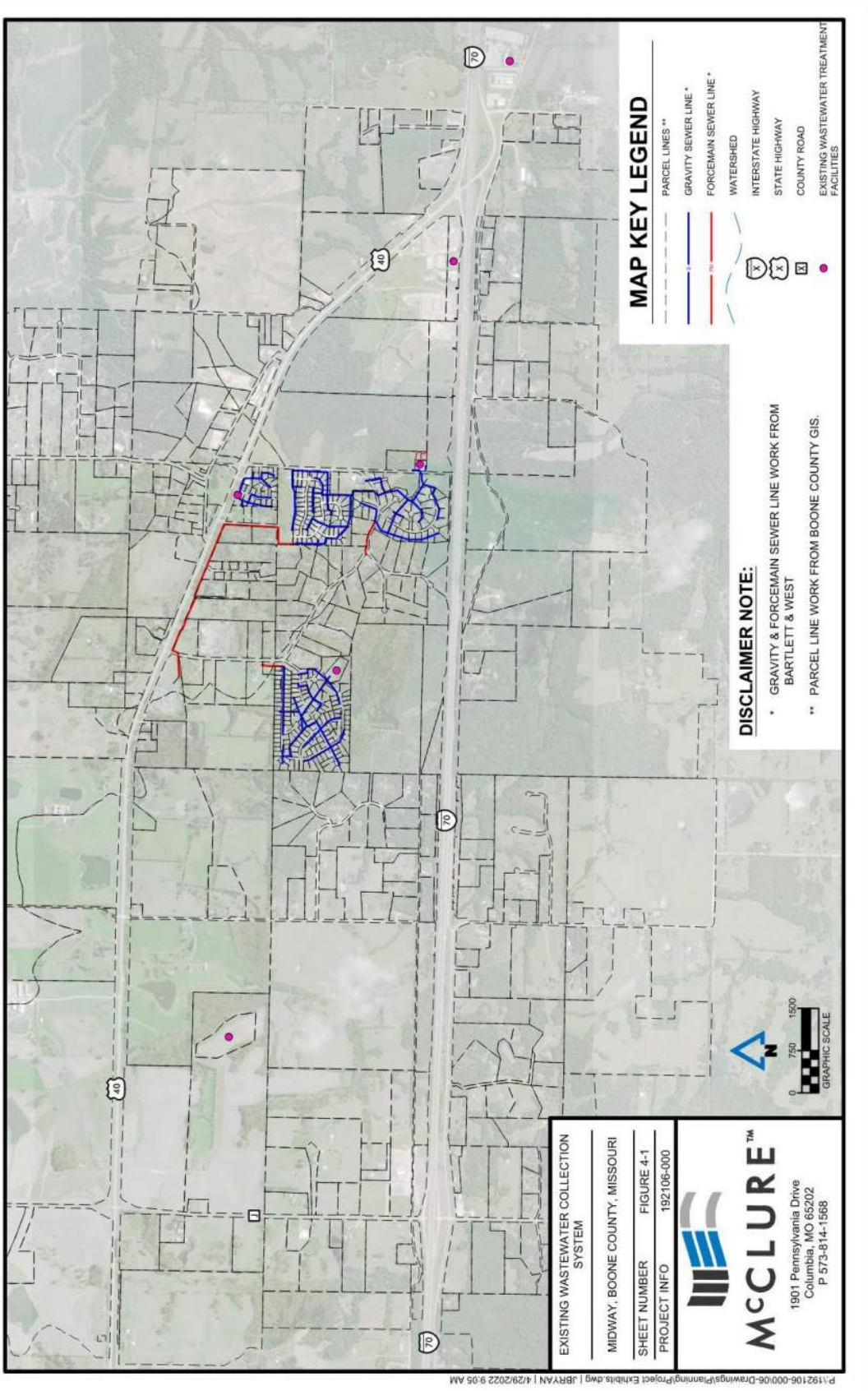
Prior to the construction of the City of Columbia Regional Wastewater Treatment Plant in 1983 and the Boone County Regional Sewer District's formation in 1973, there was a proliferation of small privately owned wastewater treatment plants and lagoons serving businesses and residential areas in Boone County surrounding the City of Columbia. These systems were traditionally poorly operated and maintained by individuals and homeowner's associations. Many of these plants and sewer systems were inefficient, neglected and their effluent did not meet water quality standards. In the past few decades, the City and the District have jointly endeavored to regionalize wastewater collection and treatment in Boone County on a watershed basis, thus eliminating many of these small systems. The District currently owns and operates 21 wastewater treatment facilities with site-specific NPDES permits. This includes facilities located within the Callahan Creek-Perche Creek watershed.

4.2 WASTEWATER COLLECTION SYSTEM

The existing collection systems are primarily confined to each individual subdivision or development they serve. The individual sewer systems typically collect wastewater by gravity and covey it to their respective treatment facilities. Figure 4-1 is a map of the existing collection system in the Midway area. The collection system map and supplementary details were taken from an existing GIS file prepared by Bartlett and West.

The collection system consists primarily of 8-inch PVC gravity sewer pipe with approximately 112 manholes. In addition to the gravity system, a 3-inch, approximately 4,596 lf PVC forcemain served by a duplex pump station at Midway Elementary currently transports wastewater from Midway Elementary and MeowLuxe cat boarding facility to the BCRSD Midway Crossing WWTP. The pump station has an existing pumping capacity of approximately 50 gpm. Preliminary plans by HDR to connect the 12 lots in the Bolli Road Neighborhood Improvement District (NID) to the forcemain were approved by BCRSD in 2018. The lots are currently served by onsite wastewater systems. Ten individual grinder pumps are planned to serve the ten existing homes and pump flows to the existing 3-inch forcemain. Additionally, preliminary plans by HDR to connect Rollingwood Plat 1 to the forcemain were approved by BCRSD in 2020. A new duplex pump station is planned at the Rollingwood Plat 1 WWTP site to intercept flows from the connections and route them to the existing forcemain. Following this connection, the Rollingwood Plat 1 WWTP will be decommissioned.

An aerial sewer crossing located near the Rollingwood Blvd. and Pinelawn Dr. intersection in the Rollingwood Plat 2 Subdivision has been identified as an ongoing maintenance issue for the District. Any alternative selected for the treatment upgrades should include a plan to eliminate this aerial crossing by re-routing the sanitary sewer in this area to a new subsurface gravity main. Further collection system investigation such as flow monitoring and fieldwork to identify sources of inflow and infiltration was not included in the scope of this Facility Plan.


MAP KEY LEGEND
PARCEL LINES **
GRAVITY SEWER LINE *
FORCEMAIN SEWER LINE *
WATERSHED
INTERSTATE HIGHWAY
STATE HIGHWAY
COUNTY ROAD
EXISTING WASTEWATER TREATMENT FACILITIES
DISCLAIMER NOTE:
* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST
** PARCEL LINE WORK FROM BOONE COUNTY GIS.
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GRAPHIC SCALE
EXISTING WASTEWATER COLLECTION SYSTEM
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 4-1
PROJECT INFO 192106-000
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Figure 4-1

4.3 WASTEWATER TREATMENT FACILITIES

The BCRSD currently maintains five individual wastewater treatment facilities in the project area. Midway Auto/Truck Plaza WWTF is not owned by BCRSD, but it is also being considered in this study. Each of the six WWTFs in the project area has an individual NPDES operating permit. Table 4-1 includes a summary of the existing WWTFs. The BCRSD systems serve a total population equivalent (PE) of 2,597. The non-district owned system serves an additional 932 PE for a total current design population equivalent of 3,529.

Table 4-1 Summary of Existing Facilities

Facility Name	*Legal Description*	*WWTF Area (acres)*	*Principal Treatment Type*	*Design Population Equivalent*
BCRSD Midway Crossing WWTP	S.1 T48N R14W	1.00	Extended Aeration	1,500
BCRSD Trails West WWTF	S. 2 T48N R14W	2.46	Two-cell Lagoon	644
BCRSD Rollingwood Plat 1 WWTP	S. 1 T48N R14W	0.078	Extended Aeration	100
BCRSD Midway Arms WWTP	S. 7 T48N R13W	0.084	Recirculating Sand Filter	94
BCRSD Midway USA WWTF	S. 3 T48N R14W	11.86	Subsurface Drip Irrigation	259
BCRSD Subtotal				**2,597**
Midway Auto/Truck Plaza WWTF	S. 7 T48N R13W	1.04	Two-cell Lagoon	932
Total				**3,529**

Four of the six treatment facilities in the study area have a Schedule of Compliance in their NPDES permit to attain compliance with new final effluent limitations for either Ammonia, *E. coli* or both. See Table 4-2 for a summary of the compliance schedules and the deadlines when the facilities will be required to meet these new effluent limitations. Meeting the effluent limits in a Schedule of Compliance usually means that it will be necessary to upgrade each treatment facility to provide treatment processes such as nitrification and disinfection.

Table 4-2 Schedule of Compliance Summary

Facility Name	NPDES Permit # MO-	Schedule of Compliance (Y/N)	Schedule of Compliance Parameters	Final Effluent Limits Effective Date
BCRSD Midway Crossing WWTP	0132705	N	-	-
BCRSD Trails West WWTF	0092002	Y	Ammonia & *E. coli*	11-1-2031
BCRSD Rollingwood Plat 1 WWTP	0038792	Y	Ammonia & *E. coli*	11-1-2025
BCRSD Midway Arms WWTP	0108421	Y	Ammonia	09-1-2024
BCRSD Midway USA WWTF	0139629	N	-	-
Non-BCRSD				
Midway Auto/Truck Plaza WWTF	0100862	Y	Ammonia & *E. coli*	09-01-2022

Discharge monitoring report (DMR) data submitted to the Missouri Department of Natural Resources was reviewed for each of the facilities included in the study. Table 4-3 below contains a summary of DMR effluent data collected over a five-year period from 2017 to 2021. The BCRSD Midway USA WWTF is not required to collect effluent samples or submit DMRs as it is considered a non-discharging treatment system.

Table 4-3 Effluent Characteristics of Existing Facilities

Facility Name	*Actual Effluent Flow (gpd)*	*Avg. Effluent BOD_5 (mg/L)*	*Avg. Effluent TSS (mg/L)*	*Avg. Effluent pH (mg/L)*	*Avg. Effluent NH_3-N (mg/L)*
BCRSD Midway Crossing WWTF	23,923	4.75	8.43	7.6	0.33
BCRSD Trails West WWTF	31,409	25.8	25.16	7.8	23.1
BCRSD Rollingwood Plat 1 WWTP	4,197	5.63	6.79	7.6	1.35
BCRSD Midway Arms WWTP	4,391	10.72	9.20	6.9	24.7
BCRSD Midway USA WWTF	-	-	-	-	-
Non-BCRSD					
Midway Auto/Truck Plaza WWTF	24,129	37.1	45.1	7.4	15.2

The BCRSD treatment facilities generally provide good treatment performance with minimal effluent limit violations. In the past five years, the Midway Crossing WWTP has exceeded its effluent limit for BOD_5 once, the Trails West WWTF has exceeded its effluent limit for BOD_5 three times, and the Midway Arms WWTP has exceeded its effluent limit for BOD_5 twice. Rollingwood Plat 1 WWTP did not experience any effluent limit violations during this period. The privately-owned Midway Auto/Truck Plaza WWTF has experienced more frequent effluent limit violations, exceeding its limit for BOD_5 18 times and its limit for TSS 8 times within the past five years.

4.3.1 BCRSD MIDWAY CROSSING WWTP EVALUATION

The BCRSD Midway Crossing WWTP is the largest treatment facility in the Midway area. The plant was constructed in 2007 and has been in operation for 15 years. The existing treatment process consists of a manual bar screen, a flow equalization tank/influent pump station with four submersible pumps, an activated sludge extended aeration basin, two final clarifiers, ultraviolet disinfection, and an aerobic sludge digester. The treatment plant is permitted for a design flow of 150,000 gpd and treats an average flow 23,923 gpd based on the past five years of DMR data. A site plan of the existing treatment facility is shown in Figure 4-3.

As shown above in Table 4-3 Effluent Characteristics of Existing Facilities, the treatment plant consistently discharges high quality effluent, well-below the effluent limitations required in its NPDES permit. The plant does show signs of typical aging and wear, but this has not had any negative effects on the treatment process itself. No significant treatment bottlenecks or points of operational difficulties were identified. Below is a brief description of the condition of the major treatment components:


MAP KEY LEGEND
PARCEL LINES **
GRAVITY SEWER LINE *
FORCEMAIN SEWER LINE *
WATERSHED
INTERSTATE HIGHWAY
STATE HIGHWAY
COUNTY ROAD
EXISTING WASTEWATER TREATMENT FACILITIES
DISCLAIMER NOTE:
* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST
** PARCEL LINE WORK FROM BOONE COUNTY GIS.
BLOWER BUILDING
EXTENDED AERATION BASIN
FINAL CLARIFIERS
UV DISINFECTION
AERATED SLUDGE DIGESTER
MANUAL BAR SCREEN
FLOW EQUALIZATION BASIN/INFLUENT LIFT STATION
OUTFALL 001
N
0
15
30
GRAPHIC SCALE
BCRSD MIDWAY CROSSING WWTP
EXISTING SITE PLAN
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 4-2
PROJECT INFO 192106-000
McCLURE™
1901 Pennsylvania Drive
Columbia, MO 65202
P 573-814-1568
P:\192106-000\06-Drawings\Planning\Project Exhibits.dwg | JBRYAN | 5/2/2022 4:54 PM

Figure 4-2

- Influent Screening:
    - Manual bar screen with 2-inch spacing located in a concrete channel. Only capable of capturing very large solids.
- Influent Pumping/Flow Equalization:
    - One 62,234-gallon aerated, rectangular concrete basin that is well oversized for the existing treatment system. Contains four (4) 96 gpm pumps to lift wastewater to the aeration basin elevation.
- Activated Sludge Aeration Basin:
    - One 168,300-gallon aerated, rectangular concrete basin. Fine cracks are present in the concrete with some beginning to show signs of weeping. The outlet flow splitter box attached to the aeration basin shows signs of severe concrete erosion.
- Sludge Holding Basin
    - One 78,540-gallon aerated, rectangular concrete basin. Shares a common wall with the activated sludge aeration basin and exhibits the same fine cracks in the concrete.
- Final Clarifiers:
    - Two, 20-foot diameter circular concrete basins. Signs of cracking in concrete walls. Secondary clarifier equipment shows signs of deterioration.
- Ultraviolet Disinfection:
    - One Trojan UV 3,000 PTP located in a rectangular concrete basin. Suited to treat flows up to 3 MGD.
- Blower Building:
    - Houses four Kaeser blowers (two for activated sludge basin aeration and two for equalization basin aeration) and the electrical controls.
    - In 2012, the coarse bubble aeration system was replaced with a fine bubble diffuser system and the blower motors were replaced with two (2) new 20 hp motors to match the air output of the new diffusers.

As of April 2022, the existing connections to the Midway Crossing WWTP include: Midway Crossings Subdivision, Rollingwood Plat 2, Midway Elementary School, and MeowLuxe Hotel cat boarding facility. A few additional single family home connections also exist. Future connections committed to the Midway Crossing WWTP through existing plans or agreements with the District include: the Bolli Road Neighborhood Improvement District (NID), Ravenwood Subdivision, Midway Crossings Plat 3, and Rollingwood Plat 1. The District would also like the Trails West Subdivision to connect to the Midway Crossing WWTP to allow for the closure of the BCRSD Trails West WWTF lagoon system. The Midway Auto/Truck Plaza WWTF is another likely connection due to its proximity and Schedule of Compliance for ammonia and disinfection. Table 4-4 below summarizes the existing, committed, and likely future connections to the BCRSD Midway Crossing WWTP.

Table 4-4 Summary of BCRSD Midway Crossing WWTP Existing and Near Future Connections

Property	*Number of Lots*	*Design PE*	*Design GPD per Capita*	*Design Flow (gpd)*
Existing Connections				
Midway Crossing Subdivision	78	288.6	100	28,860
Rollingwood Plat 2	47	173.9	100	17,390
Midway Elementary School	1	450	10	4,500
MeowLuxe Cat Boarding	1	1	80	80
Subtotal	-	**913.5**	-	**50,830**
Existing Agreement or Plans to Connect				
Bolli Road NID	12	48.1	100	4,810
Ravenwood Subdivision	172	636.4	100	63,640
Rollingwood Plat 1	29	100	100	10,000
Midway Crossing Plat 3	26	96.2	100	9,620
Subtotal	-	**880.7**	-	**88,070**
Likely Future Connections				
Trails West Subdivision	153	644	100	57,500
Midway Auto/Truck Plaza	n/a	932	26.5	24,700
Subtotal	-	**1,576**	-	**82,200**
Grand Total	-	**3,370.2**	-	**221,100**

Based on the design population equivalent and design flow of the connections listed above, the Midway Crossing WWTP does not have sufficient excess capacity to accept and treat the flows from all proposed connections. In order to uphold the District's existing sewer service agreements and centralize the treatment of wastewater in the Midway area, the Midway Crossing WWTP will need to be upgraded to increase the treatment capacity of the facility.

5.0 REGULATORY REQUIREMENTS

As discussed in Section 3.0, a site-specific NPDES permit has been issued by MO DNR for each of the existing domestic wastewater treatment facilities in the study area. The NPDES permits regulate the characteristics of the effluent that can be discharged from the WWTPs. The permits are renewed on five-year cycles, at which time the effluent limitations and permit conditions are re-evaluated and new or updated regulatory requirements are incorporated. Effluent limitations and permit conditions are also re-evaluated as WWTPs are modified or expanded during the Antidegradation Review and Construction Permit process.

5.1 ANTIDEGRADATION REVIEW REQUIREMENTS

All new or expanded point source wastewater discharges are required to follow the Missouri Antidegradation Rule and Implementation Procedure. Antidegradation is a component of the State's Water Quality Standards (WQS), which are contained in 10 CSR 20-7.031. The recommended project, which involves the expansion of the BCRSD Midway Crossing WWTP, will require an Antidegradation Review. The Missouri Antidegradation Implementation Procedure (AIP) dated July 13, 2016 was approved by EPA on July 30, 2018 and outlines the State's procedures for performing

Antidegradation Reviews and determining whether or not degradation is allowed in waters of the state from permitted discharges.

The Antidegradation Policy divides receiving streams into three categories. These categories are based on existing water quality (EWQ) and defined as Tier 1, Tier 2 and Tier 3 protection, as follows:

- Tier 1 Protection applies where EWQ for the affected segment(s) of the receiving water is at, near or below WQS and requires that existing uses be maintained and protected.
- Tier 2 Protection applies where EWQ is better than WQS. EWQ shall be maintained and protected unless degradation is justified.
- Tier 3 Protection applies where high water quality constitutes an outstanding national resource, i.e. it covers Outstanding State Resource Waters (OSRW) and Outstanding National Resource Waters (ONRW). EWQ shall be maintained and protected. Only temporary degradation can be allowed and only under specific circumstances.

The identified receiving stream for the expanded discharge is an unclassified tributary to Sugar Branch, and the first classified receiving stream is Sugar Branch (C) (1030). There is no water quality data for the unclassified tributary and limited water quality data for Sugar Branch. In the absence of existing receiving stream water quality data, Tier 2 Protection is assumed and a Tier 2 Antidegradation Review is required. For the purposes of this report, it is assumed that all pollutants of concern (POCs) except five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) will cause "significant degradation" to the receiving stream and an evaluation of alternatives to the proposed discharge has been prepared. See Section 6.0 for an analysis of proposed alternatives.

5.1.1 SOCIAL AND ECONOMIC IMPORTANCE (SEI)

If the preferred alternative is expected to result in significant degradation to the receiving waters, then a demonstration of the social and economic importance of the project is required. The affected community that will benefit from this project are the residents living in Midway and the surrounding areas of Boone County. There are numerous social and economic benefits associated with the proposed increase in the BCRSD Midway Crossing WWTP capacity. One such benefit is the increased potential for residential and commercial growth in the area by having a readily available sanitary sewerage treatment system for connection. This development would increase the community tax base of the area and could lead to the creation of new jobs. It would also increase available housing, which is in significant demand at the time of this Report. Another benefit is the centralization of wastewater treatment in the Midway region. This will facilitate the District's efforts to maintain compliance with MO DNR permitting requirements and reduce the overall operations and maintenance burden associated with managing multiple treatment facilities.

5.2 ANTICIPATED NPDES EFFLUENT LIMITATIONS

New effluent limitations for the expanded BCRSD Midway Crossing WWTP will be determined by the Missouri DNR as part of the Antidegradation Review process. Anticipated effluent limitations are summarized in Table 5-1. These effluent limitations are based on the expected treatment capability of the preferred alternative, the designated uses of the receiving stream, the Effluent Regulations found in 10 CSR 20-7.015, and the Water Quality Standards found in 10 CSR 20-7.031.

Table 5-1 BCRSD Midway Crossing WWTP Anticipated Future Effluent Limitations

Parameter	*Daily Maximum Limit*	*Weekly Average Limit*	*Monthly Average Limit*
*Biochemical Oxygen Demand$_5$ (BOD$_5$)**		27 mg/L**	18 mg/L**
*Total Suspended Solids (TSS)**		27 mg/L**	18 mg/L**
*Ammonia as N*** - Jan*	12.1 mg/L		3.1 mg/L
Feb	12.1 mg/L		3.1 mg/L
Mar	10.1 mg/L		2.7 mg/L
Apr	8.4 mg/L		2.1 mg/L
May	12.1 mg/L		2.1 mg/L
June	10.1 mg/L		1.3 mg/L
July	8.4 mg/L		0.9 mg/L
Aug	8.4 mg/L		0.9 mg/L
Sept	8.4 mg/L		1.2 mg/L
Oct	8.4 mg/L		1.8 mg/L
Nov	8.4 mg/L		2.4 mg/L
Dec	10.1 mg/L		2.7 mg/L
E. coli		1,030 #/100mL	206 #/100mL
pH	6.5-9.0 SU		6.5-9.0 SU
Oil and Grease	15 mg/L		10 mg/L
Total Phosphorus	Monitoring only		Monitoring only
Total Kjeldahl Nitrogen	Monitoring only		Monitoring only
Nitrite + Nitrate	Monitoring only		Monitoring only

*85% (percent) removal efficiency requirement in addition to the concentration limits listed.
**Non-degrading limits based on mass balance calculations.
*** Level III Ecoregion = Interior River Valleys and Hills.

The effluent limitations included in Table 5-1 are predicted based on our understanding of the State and Federal Regulations in effect during the creation of the Report. These effluent limitations have not been approved by Missouri DNR and are subject to change based on the results of the Antidegradation Review process and changes to the applicable regulatory requirements.

6.0 EVALUATION OF ALTERNATIVES

There are many options available when it comes to upgrades to a wastewater treatment system. At a high level these options include but are not limited to:

- Upgrades to the individual wastewater treatment facilities in the study area to enhance treatment performance and meet Schedule of Compliance deadlines.
- Elimination of discharges by conversion to no-discharge land application or subsurface irrigation systems.
- Connection of smaller wastewater treatment facilities to a larger or regional treatment facility.

Due to the District's desire to reduce the number of individual NPDES permits it maintains and consolidate its existing treatment facilities, which aligns with the goals of the Clean Water Act, alternatives involving the upgrade of each individual wastewater facility in the study area were not explored. Discussions of six different alternatives including land application, regionalization and centralization with treatment plant upgrades to BCRSD Midway Crossing WWTP are included in this section. Each of the alternatives presented require extensions of the existing collection systems in the Midway area to allow for the centralization of existing treatment systems to a single treatment site. The proposed collection system work associated with the alternatives is discussed in Section 6.1. No-discharge alternatives are discussed in Section 6.2 and treatment process alternatives are discussed in Section 6.3.

6.1 COLLECTION SYSTEM

The collection system work associated with the proposed project primarily involves an extension of the sanitary sewer to connect the Trails West subdivision to the BCRSD Midway Crossing WWTP and the re-routing of a portion of the existing gravity sewer in the Rollingwood Subdivision to eliminate an aerial crossing. Additionally, the District should work with the City of Columbia to connect the BCRSD Midway Arms WWTP to City sewer.

To eliminate the aerial sewer crossing in Rollingwood Plat 2, a new approximately 800 lf, 8-inch gravity sewer line with ancillary manholes should be constructed to route the flows from this portion of the existing collection system to the south following the Midway Crossing WWTP entry road. The cost associated with the elimination of the aerial sewer main is included in the WWTP Treatment Process Alternatives cost estimates found in Section 6.3.

Extension of the existing gravity sewer from the Trails West Subdivision would require approximately 2,950 lf of 8-inch gravity sewer with ancillary manholes and a new duplex pump station discharging to an approximately 3,000 lf, 6-inch forcemain. Once construction is complete on this new sewer line, the BCRSD Trails West WWTF would be decommissioned. The District is planning to remove approximately 300 dry tons of sludge from the two-cell lagoon in 2022. It is likely additional sludge will need to be removed prior to final lagoon closure. The cost associated with the Trails West Lagoon closure and sewer extension to Midway Crossing WWTP is shown in Table 6-1 on the following page. Considerations for rock excavation due to the prevalence of limestone bedrock in Midway area were included in these estimates.

Table 6-1 Trails West Connection to BCRSD Midway Crossing WWTP Detailed Cost Estimate

MIDWAY FACILITY PLAN
BOONE COUNTY REGIONAL SEWER DISTRICT

NEW PUMP STATION & FORCE MAIN TRAILS WEST

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
GENERAL CONDITIONS					
1	Mobilization and Bonding (8%)	1	LS	$ 126,000	$ 126,000
SITE WORK					
2	Grading/Lagoon Closure (*assumes biosolids incorporated)	5,647	CY	$ 15	$ 84,700
3	Removals	1	LS	$ 20,000	$ 20,000
4	Site Gravel	175	SY	$ 50	$ 8,750
5	Concrete Generator Pad	10	CY	$ 1,000	$ 10,000
6	Fencing, New for Lift Station	1	LS	$ 20,000	$ 20,000
7	Erosion Control	1	LS	$ 1,500	$ 1,500
8	Seeding, Fertilizing and Mulching	1.75	AC	$ 2,500	$ 4,375
GRAVITY SEWER MAIN & FORCE MAIN - Trails West					
9	48" Sanitary Sewer Manhole	10.0	EA	$ 12,000	$ 120,000
10	8" Sewer Main (includes allowance for rock excavatlon)	2,950.0	LF	$ 175	$ 516,250
11	6" Force Main (includes allowance for rock excavation)	3,000.0	LF	$ 135	$ 405,000
12	Air-Vaccum Release Station	2.0	EA	$ 15,000	$ 30,000
13	Seeding, Fertilizing and Mulching	3.41	AC	$ 2,500	$ 8,537
14	Clearing and Grubbing	3.41	AC	$ 7,500	$ 25,611
LIFT STATION, WET WELL, AND VALVE VAULT					
15	Submersible Pumps, Controls, Hatches	1	LS	$ 225,000	$ 225,000
16	Submersible Pressure Transducer (In 19)	1	EA	$ -	$ -
17	Portable Davit Crane (In 19)	1	LS	$ -	$ -
18	Hatches (In 19)	1	LS	$ -	$ -
19	Wet Well (In19)	1	LS	$ -	$ -
20	Trash Basket (In 19)	1	LS	$ -	$ -
21	Magnetic Flow Meter, 6-IN (Installed)	1	EA	$ 5,000	$ 5,000
22	Process Piping, 6-IN (In 19)	1	LS	$ -	$ -
23	Check Valves, 6-IN, DIP (In 19)	2	EA	$ -	$ -
24	Plug Valves, 6-IN, DIP (In 19)	4	EA	$ -	$ -
MECHANICAL, ELECTRICAL, CONTROL EQUIPMENT					
25	Site Lighting	1	LS	$ 1,500	$ 1,500
26	Site Electric	1	LS	$ 35,000	$ 35,000
27	Standby Power Generator & ATS	1	LS	$ 50,000	$ 50,000
				Subtotal of Probable Construction Cost	$ 1,697,300
				Contingency Allowance (20%)	$ 340,000
				Engineer's Estimate of Probable Construction Cost	$ 2,037,300
				Engineering - Design Phase	$ 110,000
				Engineering - Bid Phase	$ 20,000
				Engineering - Construction Phase	$ 80,000
				Resident Project Represenative	$ 157,500
				Easement Preparation	$ 18,000
				Engineering - Operation and Maintenance Manuals	$ 12,000
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	$ 2,434,800

Connection of the Midway Arms facility on Van Horn Tavern Road to the City of Columbia sanitary sewer system would require a new pump station at the Midway Arms campus and a new sanitary sewer forcemain. The cost estimate in Table 6-2 assumes the new forcemain will cross Perche Creek to connect to the existing City trunk sewer main just east of Perche Creek. See the BCRSD/VH Properties Agreement in Appendix E.

Table 6-2 Midway Arms Connection to Columbia Detailed Cost Estimate

MIDWAY FACILITY PLAN
BOONE COUNTY REGIONAL SEWER DISTRICT

NEW PUMP STATION & FORCE MAIN MIDWAY ARMS

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
GENERAL CONDITIONS					
1	Mobilization and Bonding (8%)	1	LS	$ 34,500	$ 34,500
SITE WORK					
2	Grading	278	CY	$ 15	$ 4,167
3	Removals	1	LS	$ 75,000	$ 75,000
4	Fencing, New for Lift Station	1	LS	$ 7,500	$ 7,500
5	Erosion Control	1	LS	$ 1,500	$ 1,500
6	Seeding, Fertilizing and Mulching	0.10	AC	$ 2,500	$ 250
FORCE MAIN - Midway Arms					
7	2" Force Main	4,200.0	LF	$ 35	$ 147,000
8	Air-Vaccum Release Station	1.0	EA	$ 8,000	$ 8,000
9	Pavement Repair	1.0	LS	$ 15,000	$ 15,000
10	Creek Crossing at Van Horn Tavern RD	1.0	LS	$ 15,000	$ 15,000
11	Creek Crossing at Perche Creek	1.0	LS	$ 60,000	$ 60,000
12	Seeding, Fertilizing and Mulching	2.41	AC	$ 2,500	$ 6,026
13	Clearing and Grubbing	0.57	AC	$ 7,500	$ 4,304
LIFT STATION, WET WELL, AND VALVE VAULT					
14	Grinder Pump Station, Controls, Hatches	1	LS	$ 75,000	$ 75,000
MECHANICAL, ELECTRICAL, CONTROL EQUIPMENT					
15	Site Lighting	1	LS	$ 1,500	$ 1,500
16	Site Electric	1	LS	$ 10,000	$ 10,000
17	Standby Power Generator & ATS	0	LS	$ 15,000	$ -
				Subtotal of Probable Construction Cost	$ 464,800
				Contingency Allowance (20%)	$ 93,000
				Engineer's Estimate of Probable Construction Cost	$ 557,800
				Engineering - Design Phase	$ 25,000
				Engineering - Bid Phase	$ 10,000
				Engineering - Construction Phase	$ 18,000
				Resident Project Represenative	$ 39,750
				Easement Preparation	$ 5,000
				Engineering - Operation and Maintenance Manuals	$ 3,500
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	$ 659,050

*ASSUMES CROSS-COUNTRY RUN TO PERCHE CREEK OUTFALL SEWER, ON EAST SIDE OF PERCHE CREEK

Should the flows from the Midway Auto/Truck Plaza be redirected to BCRSD Midway Crossing WWTP the associated costs are illustrated in Table 6-3 as follows; however, these costs would likely be the responsibility of the Midway Auto/Truck Plaza ownership. This cost estimate assumes the connection would involve a new pump station at the Midway Auto/Truck Plaza site and approximately 4,500 lf of 4-inch forcemain. Considerations for rock excavation due to the prevalence of limestone bedrock in Midway area were included in these estimates.

Table 6-3 Midway Auto/Truck Plaza Connection to Midway Crossing Detailed Cost Estimate

MIDWAY FACILITY PLAN
BOONE COUNTY REGIONAL SEWER DISTRICT

NEW PUMP STATION & FORCE MAIN MIDWAY TRUCKSTOP

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
GENERAL CONDITIONS					
1	Mobilization and Bonding (8%)	1	LS	$ 73,000	$ 73,000
SITE WORK					
2	Grading/Lagoon Closure (*assumes biosolids incorporated)	3,549	CY	$ 15	$ 53,240
3	Removals	1	LS	$ 35,000	$ 35,000
4	Site Gravel	175	SY	$ 50	$ 8,750
5	Concrete Generator Pad	10	CY	$ 1,000	$ 10,000
6	Fencing, New for Lift Station	1	LS	$ 20,000	$ 20,000
7	Erosion Control	1	LS	$ 1,500	$ 1,500
8	Seeding, Fertilizing and Mulching	1.10	AC	$ 2,500	$ 2,750
FORCE MAIN					
9	4" Force Main (includes allowance for rock excavation)	4,500.0	LF	$ 125	$ 562,500
10	Air-Vaccum Release Station	1.0	EA	$ 12,000	$ 12,000
11	Seeding, Fertilizing and Mulching	2.58	AC	$ 2,500	$ 6,457
12	Clearing and Grubbing	1.29	AC	$ 7,500	$ 9,685
LIFT STATION, WET WELL, AND VALVE VAULT					
13	Submersible Pumps, Controls, Hatches	1	LS	$ 135,000	$ 135,000
14	Submersible Pressure Transducer (In 13)	1	EA	$ -	$ -
15	Portable Davit Crane (In 13)	1	LS	$ -	$ -
16	Hatches (In 13)	1	LS	$ -	$ -
17	Wet Well (In 13)	1	LS	$ -	$ -
18	Trash Basket (In 13)	1	LS	$ -	$ -
19	Magnetic Flow Meter, 4-IN (Installed)	1	EA	$ 3,500	$ 3,500
20	Process Piping, 6-IN (In 13)	1	LS	$ -	$ -
21	Check Valves, 6-IN, DIP (In 13)	2	EA	$ -	$ -
22	Plug Valves, 6-IN, DIP (In 13)	4	EA	$ -	$ -
MECHANICAL, ELECTRICAL, CONTROL EQUIPMENT					
23	Site Lighting	1	LS	$ 1,500	$ 1,500
24	Site Electric	1	LS	$ 15,000	$ 15,000
25	Standby Power Generator & ATS	1	LS	$ 30,000	$ 30,000
				Subtotal of Probable Construction Cost	$ 979,900
				Contingency Allowance (20%)	$ 196,000
				Engineer's Estimate of Probable Construction Cost	$ 1,175,900
				Engineering - Design Phase	$ 60,000
				Engineering - Bid Phase	$ 15,000
				Engineering - Construction Phase	$ 45,000
				Resident Project Represenative	$ 90,000
				Easement Preparation	$ 5,000
				Engineering - Operation and Maintenance Manuals	$ 12,000
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	$ 1,402,900

As discussed in Section 4.2 other collection system work that has already been approved and is planned to occur independently of this project includes a new pump station and forcemain at the Rollingwood Plat 1 WWTP site to eliminate this facility by connection to the Midway Crossing WWTP and new grinder pumps and forcemain in the Bolli Road NID to connect these homes to the Midway Crossing WWTP. Costs associated with these projects were not evaluated as part of this Report as the District has already developed plans to complete these improvements.

6.2 NO-DISCHARGE ALTERNATIVES

The evaluation of no-discharge alternatives is a required component of the facility planning and Antidegradation Review process. No-discharge alternatives may include connection to a regional treatment facility, surface land application, subsurface land application, and recycle or reuse.

6.2.1 ALTERNATIVE 1: LAND APPLICATION

Alternative 1 explores the possibility of land application. Regionalization will be discussed in the next section. Surface land application systems primarily involve a large earthen detention basin for pre-treatment and storage followed by an irrigation system such as a center pivot, solid set sprinklers, or traveling gun. Land application facilities in Boone County are required to provide a minimum of 105 days of storage based on the design influent wastewater flows plus the net rainfall minus evaporation expected for a one-in-ten year, 24 hour storm event. The feasibility and affordability of a surface land application system quickly diminishes for systems with limited existing storage facilities and large influent design flows. The District currently operates one two-cell lagoon in the Midway area with an estimated volume of approximately 1 million gallons. This lagoon does not provide even a fraction of the storage required for a no-discharge system. Preliminary calculations were done to determine how much additional storage is needed and how much land would be required to achieve land application. The results of the calculations assuming pasture or hayfield (24-inch irrigation depth) are summarized below.

Under Phase 1 Flow Conditions

Dry Weather Design Flow	250,000 gpd
New Basin	602 feet by 602 feet, 16 feet deep
Facility Wet Weather Flow	278,138 gpd
Total Wet Weather Volume	101,520,507 gallons annually
Total Wetted Area Required	156 acres

Under Phase 2 Flow Conditions

Dry Weather Design Flow	500,000 gpd
New Basin (in addition to Phase 1 Basin)	602 feet by 602 feet, 16 feet deep
Facility Wet Weather Flow	556,277
Total Wet Weather Volume	203,041,013

Total Wetted Area Required 312 acres

Based on this analysis, new storage basins would be needed and would likely be built at the land application site. Thus, any land purchased or leased for irrigation would need to be large enough to also accommodate the storage basins. The total required acreage is further increased by the required MO DNR setbacks for land application of wastewater. For Phase 1 flows alone a site of approximately 200 acres is recommended.

Although utilities are allowed to lease land or enter into irrigation agreements with farmers in the area, it is recommended that land is purchased outright. This puts full control of the land and irrigation schedule in the hands of the District. The permit requirements control the operations of a land application system, and keeping third-party agreements out of the way helps to simplify compliance with the permit and mitigate the risks associated with a landowner rejecting the application of wastewater at certain times. Due to the considerable growth that Boone County has experienced in recent years, the land availability near the study area is severely limited. Additionally, high property values and the increasing demand of land for development make the purchase of adequate application areas cost-prohibitive. For these reasons, pursuing a no-discharge land application system was determined to be impracticable. Capital and operational costs associated with this alternative were not further evaluated as it is infeasible due to the extremely limited land availability.

6.2.2 ALTERNATIVE 2: NO-DISCHARGE REGIONALIZATION

Alternative 2 explores the no-discharge option of regionalization via discharge to the City of Columbia. The Missouri DNR currently has a Regionalization and Consolidation Initiative to promote the reduction of individual treatment facilities and the development of resilient and sustainable wastewater infrastructure across the state. Additionally, a detailed evaluation of regionalization is a required component of the Facility Plan under 10 CSR 20-8.110. The Columbia WWTP operates under NPDES Permit MO-0097837. The treatment plant is rated for a design flow of 25.2 MGD and has an actual flow of 14.2 MGD. The nearest potential connection point to the City's existing trunk sewer is located just east of the Perche Creek bridge over Interstate 70. The distance to the connection point that is most feasible for the District to pursue is approximately 12,800 linear feet from the BCRSD Midway Crossing WWTP. The receiving sewer at this point is a 60-inch reinforced concrete pipe (RCP). The City was not willing to provide an estimate of the general capacity remaining in the trunk sewer at this time. The connection would involve a new lift station at the BCRSD Midway Crossing WWTP site and likely a mechanical screening system along with the forcemain to convey wastewater from the Midway area to the Columbia sewer system. Depending on the final alignment, a gravity sewer portion could potentially be included. The project would require boring under I-70, a major interstate in Missouri.

Boone County Regional Sewer District is a Level 2 Continuing Authority and has authority to provide wastewater collection and treatment in Boone County. The District has been in operation since 1973 and has a history of providing reliable sanitary sewer service to its customers in Boone County. Over the past few decades, the District and the City have worked in tandem to eliminate private treatment facilities through connection to City sewer or larger District treatment plants. Regionalization to the

City of Columbia sanitary sewer is feasible for the BCRSD Midway Arms WWTP on Van Horn Tavern Road due to its small hydraulic load and close proximity to City limits; however, connection of the entire Midway area to the City is not preferred. The existing wastewater treatment infrastructure at the BCRSD Midway Crossing WWTP is well-operated and historically discharges a high-quality effluent. The receiving stream, Sugar Branch, is a gaining stream with no listed impairments. Additionally, the preferred alternative, expanding the design capacity of the Midway Crossing WWTP, will allow for the integration of the existing BCRSD collection system in the Callahan Creek-Perche Creek watershed and provide treatment to a larger geographic area at a single facility. The centralization of treatment facilities within the Midway area contributes to the Department's regionalization goals and reduces the number of individually permitted wastewater treatment facilities in Boone County.

6.3 TREATMENT PROCESS ALTERNATIVES

As the no-discharge options discussed in Section 6.2 are not practical for the District to pursue, a variety of treatment process upgrades to the BCRSD Midway Crossing WWTP were evaluated. The treatment process alternatives considered are as follows:

1. Alternative 3: Extended Aeration Treatment System Expansion
2. Alternative 4: New Multichannel Oxidation Ditch Treatment System
3. Alternative 5: New Aero-Mod Treatment System
4. Alternative 6: New Sequencing Batch Reactor (SBR) Treatment System

In order to evaluate and select the most practical alternative to meet both the permit requirements for existing facilities and to provide the capacity for growth in the service area, a phased approach to wastewater planning was used. This approach serves as a guide for upgrading treatment performance, expanding capacity, minimizing environmental impacts, and maintaining compliance. The initial design and cost estimates were based on a Phase 1 capacity of 250,000 gpd for Alternatives 4, 5 and 6. Because Alternative 3 involves mirror-imaging of the existing 150,000 gpd treatment system, this alternative was evaluated based on a Phase 1 capacity of 300,000 gpd. Two lots in Ravenwood Subdivision adjacent to the existing treatment plant site are available for the District to purchase to accommodate the expansion. The current treatment plant site owned by the District is approximately 1.0 acres. Purchasing these two lots will expand the site to approximately 1.6 acres.

Table 6-4 below provides a brief comparison of the four alternatives. The major factors considered when comparing the alternatives and selecting the preferred treatment process are as follows:

- Total estimated cost of the proposed improvements.
- Sidewall depth of treatment basins; deeper sidewall depths will require significant rock excavation due to the presence of limestone bedrock at the treatment plant site.
- The District's familiarity with the process; selection of a familiar treatment process will streamline startup and operation.
- Ability to readily handle future biological nutrient removal requirements.
- Ability to easily double the treatment capacity if needed in the future.

Table 6-4 Treatment Process Alternatives Comparison

Alternative	*Total Project Cost*	*Present Worth Cost*	*Pros*	*Cons*
Alt. 3: Extended Aeration	$7,070,000	$9,135,116	- Fully utilize all existing structures - Process familiarity	- Deep sidewall depth - Not easily adaptable to BNR - More involved second phase expansion
Alt. 4: Oxidation Ditch	$7,518,000	$9,544,774	- Shallow sidewall depth - Process familiarity - BNR capability - Easily expandable	- Largest footprint
Alt. 5: Aero-Mod	$7,769,000	$9,949,150	- Small footprint - BNR capability	- Most expensive - Deep sidewall depth - More involved second phase expansion - Less familiar process
Alt. 6: SBR	$6,904,000	$8,974,263	- Least Expensive - Smallest footprint - BNR capability - Easily expandable	- Deepest sidewall depth - Less familiar process

Details of each alternative are outlined in the following sections. Each alternative was reviewed based on the initial capital investment and ongoing operation and maintenance (O&M) costs. The O&M costs were brought to present worth over the 20-year design life of Phase 1 of the plant and then averaged over the period. For this purpose, an annual inflation rate of 2.875% was assumed. Additionally, the detailed cost estimate for each alternative includes the costs associated with the elimination of the aerial sewer main near the intersection of Rollingwood Blvd. and Pinelawn Dr. as described in Section 6.1. Costs for a future Phase 2 expansion to 500,000 gpd were not evaluated due to the uncertainty of future pricing.

6.3.1 ALTERNATIVE 3: EXTENDED AERATION TREATMENT SYSTEM EXPANSION

Alternative 3 involves expanding the existing BCRSD Midway Crossing WWTP by "mirror-imaging" of the existing treatment train with an additional 150,000 gpd extended aeration treatment system. This would increase the total design average flow treatment capacity of the facility to 300,000 gpd. Extended aeration is a common wastewater treatment process where the wastewater is aerated as a completely mixed solution. The process provides a long hydraulic detention time and high sludge age. This results in a system that is easy to operate and relatively stable under varying flow conditions, which makes it the process of choice for many small operations. For larger operations the inherent inefficiencies of extended aeration plants tend to outweigh the stability and simplicity of operation. The proposed major improvements identified for this alternative are as follows:

- New headworks building with combination screening and grit removal package.
- Addition of new 150,000 gpd extended aeration basin with common wall sludge holding basin.
- Addition of two new secondary clarifier basins.
- Rehabilitation of existing secondary clarifiers.
- Improvements to the existing UV disinfection system including a roof covering structure and stairs.

With Alternative 3, the existing extended aeration activated sludge treatment system would remain in use. The new extended aeration basin and secondary clarifiers would be designed to operate in parallel with the existing system in order to double the available treatment capacity. Keeping the existing secondary treatment process in operation will require concrete repair work to both the activated sludge basin and the two final clarifiers. The existing secondary clarifier equipment will remain in use and will be rehabilitated via repainting and other refurbishments. The existing UV disinfection equipment will also remain in use and a structure to cover the open channel will be added. It is anticipated that sludge will continue to be hauled to the BCRSD Rocky Fork WWTP for processing. Figure 6-1 on the following page illustrates the proposed site layout of Alternative 3. Considerations for a future expansion to 600,000 gpd were made when developing the preliminary site plan.

A detailed list of proposed improvements and associated costs can be found in Table 6-5. The estimated capital cost of Alternative 3 is $7,070,000. This includes engineering design and ancillary project fees such as geotechnical coordination, construction permitting, and resident project representative services. The estimated annual operations and maintenance (O&M) costs associated with this alternative are $137,209. Including these O&M costs, the 20-year present worth cost of Alternative 3 is estimated to be $9,135,116.

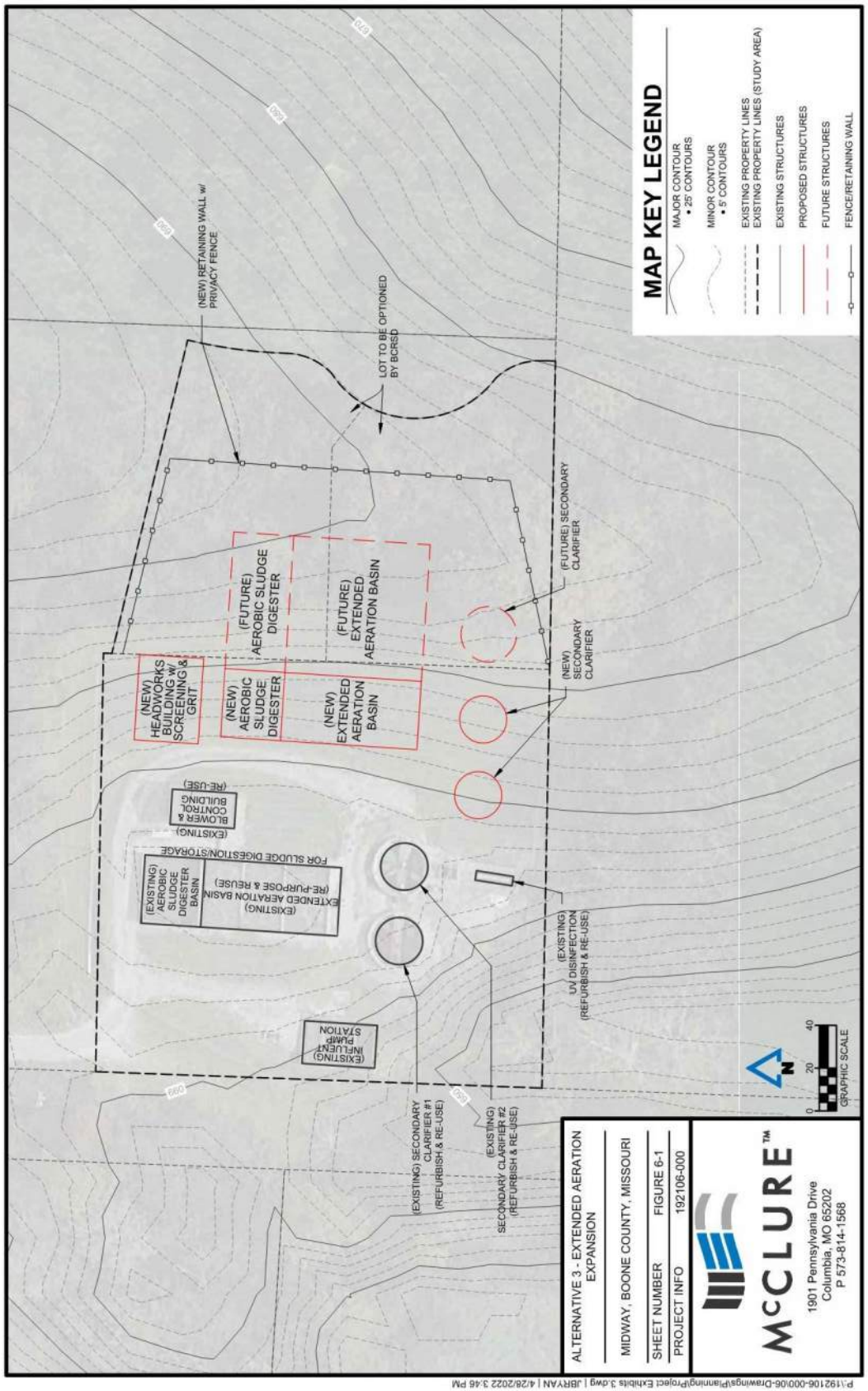
MAP KEY LEGEND
MAJOR CONTOUR • 25' CONTOURS
MINOR CONTOUR • 5' CONTOURS
EXISTING PROPERTY LINES
EXISTING PROPERTY LINES (STUDY AREA)
EXISTING STRUCTURES
PROPOSED STRUCTURES
FUTURE STRUCTURES
FENCE/RETAINING WALL
(NEW) RETAINING WALL w/ PRIVACY FENCE
LOT TO BE OPTIONED BY BCRSD
(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT
(FUTURE) AEROBIC SLUDGE DIGESTER
(FUTURE) EXTENDED AERATION BASIN
(FUTURE) SECONDARY CLARIFIER
(NEW) AEROBIC SLUDGE DIGESTER
(NEW) EXTENDED AERATION BASIN
(NEW) SECONDARY CLARIFIER
BLOWER & CONTROL BUILDING (RE-USE) (EXISTING)
FOR SLUDGE DIGESTION/STORAGE
(EXISTING) AEROBIC SLUDGE DIGESTER BASIN
EXTENDED AERATION BASIN (EXISTING) (RE-PURPOSE & REUSE)
(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)
(EXISTING) INFLUENT PUMP STATION
(EXISTING) SECONDARY CLARIFIER #1 (REFURBISH & RE-USE)
(EXISTING) SECONDARY CLARIFIER #2 (REFURBISH & RE-USE)
GRAPHIC SCALE
0 20 40
ALTERNATIVE 3 - EXTENDED AERATION EXPANSION
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 6-1
PROJECT INFO 192106-000
McCLURE™
1901 Pennsylvania Drive
Columbia, MO 65202
P 573-814-1568
P:\192106-000\06-Drawings\Planning\Project Exhibits 3.dwg | JBRYAN | 4/26/2022 3:46 PM

Figure 6-1

Table 6-5 Alternative 3 Detailed Cost Estimate

MIDWAY FACILITY PLAN
BOONE COUNTY REGIONAL SEWER DISTRICT

Engineer's Opinion of Probable Cost

Alternative 3: Extended Aeration Expansion 300,000 GPD Treatment Capacity

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
GENERAL CONDITIONS					
1	Mobilization & Bonding (8%)	1	LS	$ 340,000	$ 340,000
SITE WORK					
2	Grading	4,300	CY	$ 35	$ 150,500
3	Rock Excavation	1,180	CY	$ 200	$ 236,000
4	Yard Piping	1	LS	$ 250,000	$ 250,000
5	Seeding and Mulching	3	AC	$ 5,000	$ 15,000
6	Retaining Wall	150	LF	$ 850	$ 127,500
7	Erosion Control	1	LS	$ 10,000	$ 10,000
8	Potable Water	1	LS	$ 20,000	$ 20,000
ELIMINATE AERIAL CROSSING					
9	48" Sanitary Sewer Manhole	3.0	EA	$ 12,000	$ 36,000
10	8" Sewer Main (includes allowance for rock excavatlon)	800.0	LF	$ 175	$ 140,000
11	Seeding, Fertilizing and Mulching	0.46	AC	$ 2,500	$ 1,148
12	Clearing and Grubbing	0.46	AC	$ 7,500	$ 3,444
ACCESS ROAD IMPROVEMENTS					
9	Modified Subbase, 6-inch	400	CY	$ 10	$ 4,000
10	Granular Access Road, 1-inch	800	CY	$ 12	$ 9,600
HEADWORKS BUILDING					
11	Concrete, Slab on Grade, 8"	36	CY	$ 1,000	$ 36,000
12	Masonry Exterior Wall, Wood Truss, Steel Roof Panels	1,200	LF	$ 200	$ 240,000
13	Doors, Hardware, Overhead Doors	1	LS	$ 25,000	$ 25,000
14	Screening and Grit Removal Equipment	1	LS	$ 547,000	$ 547,000
15	Gas Detection Equipment	1	LS	$ 15,000	$ 15,000
16	Mechanical, Electrical, Controls	1	LS	$ 110,000	$ 110,000
BIOLOGICAL TREATMENT PROCESS - EXTENDED AERATION ACTIVATED SLUDGE					
17	Concrete, Slab on Grade, Basin	115	CY	$ 1,000	$ 115,000
18	Concrete, Walls, Basin	235	CY	$ 1,250	$ 293,750
19	Grating, Stairs, and Handrails	1	LS	$ 65,000	$ 65,000
20	Diffused Aeration System, Installed	1	LS	$ 80,200	$ 80,200
21	20 HP Blower Package, Installed	2	LS	$ 26,600	$ 53,200
22	RAS/WAS Pump Station and Equipment	1	LS	$ 180,000	$ 180,000
23	Mechanical, Electrical, Controls	1	LS	$ 85,000	$ 85,000
ULTRAVIOLET DISINFECTION SYSTEM IMPROVEMENTS					
24	Red Iron Roof Covering Structure	1	LS	$ 48,000	$ 48,000
25	Grating, Stairs, and Handrails	1	LS	$ 25,000	$ 25,000
26	Control Structures	1	LS	$ 15,000	$ 15,000
27	Effluent Parshall Flume, Installed	1	LS	$ 25,000	$ 25,000
28	Effluent Flow Sampling	1	LS	$ 8,000	$ 8,000
29	Mechanical and Electrical Components	1	LS	$ 15,000	$ 15,000
BACKUP POWER					
30	Standby Generator	1	LS	$ 200,000	$ 200,000
31	Related Electric	1	LS	$ 40,000	$ 40,000
NEW SECONDARY CLARIFIERS					
32	Concrete, Slab, Clarifiers	40	CY	$ 1,100	$ 44,000
33	Concrete, Walls, Clarifiers	75	CY	$ 1,250	$ 93,750
34	Grating, Stairs, and Handrails	2	EA	$ 15,000	$ 30,000
35	Clarifier Mechanisms, Installed	1	LS	$ 454,815	$ 454,815
36	Weirs and baffles	2	EA	$ 30,000	$ 60,000
37	Mechanical and Electrical Components	1	LS	$ 68,250	$ 68,250
SECONDARY CLARIFIER IMPROVEMENTS					
38	Concrete Cleaning, Inspection, Repair	2	EA	$ 8,000	$ 16,000
39	Clarifier Equipment Rehabilitation	2	LS	$ 40,000	$ 80,000
40	Wier and Baffle Replacement (SS)	2	EA	$ 30,000	$ 60,000
41	Electrical Improvements	1	LS	$ 15,000	$ 15,000

MISC SITE AND PLANT IMPROVEMENTS					
42	Misc. Concrete Repairs/Improvements	1	LS	$ 50,000.00	$ 50,000
43	Security Fence Improvements and Signage	1	LS	$ 2,000	$ 2,000
44	Privacy Fencing	450	LF	$ 70	$ 31,500
45	Paintings, Coatings, and Fire Extinguishers	1	LS	$ 20,000	$ 20,000
				Subtotal of Probable Construction Cost	**$ 4,590,000**
				Contingency Allowance (20%)	$ 918,000
				Engineer's Estimate of Probable Construction Cost	**$ 5,508,000**
				Engineering - Design Phase	$ 330,500
				Engineering - Bid Phase	$ 69,000
				Engineering - Construction Phase	$ 92,000
				Resident Project Representative (75% of Engineering Design Fees)	$ 369,000
				Operation and Maintenance Manual	$ 40,000
				User Charge Ordinance/Sewer Use Ordinance	$ -
				Emergency Response Plan	$ -
				Environmental Report	$ 5,000
				Special Engineering & Testing	$ 25,000
				Boundary & TOPO Survey	$ 35,000
				Construction Staking	$ 12,500
				Geotechnical	$ 50,000
				Geotechnical Coordination	$ 5,000
				Construction Permitting	$ 6,000
				SWPPP	$ 4,000
				Interest (24 months)	$ 440,700
				Audit	$ 12,500
				Administration and Legal	$ 50,000
				Prefund Bond Reserve	$ 10,000
				Bond Council	$ 5,000
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 7,070,000**
ADDITIONAL ANNUAL OPERATION AND MAINTENANCE COSTS					
1	Staff Operation	1,560	HR	$ 40	$ 62,400
2	Replacement Parts & Equipment	1	LS	$ 7,500	$ 7,500
3	Trash Service	12	FEE	$ 50	$ 600
4	Power - Headworks Equipment	65,195	kWh	$ 0.10	$ 6,520
5	Power - Influent Pump Station - EXISTING	72,235	kWh	$ 0.10	$ 7,224
6	Power - Aeration Equipment, Extended Aeration	261,300	kWh	$ 0.10	$ 26,130
7	Power - Aeration Equipment, Extended Aeration - EXISTING	261,300	kWh	$ 0.10	$ 26,130
8	Power - UV Disinfection Equipment (7 months) - EXISTING	7,060	kWh	$ 0.10	$ 706
				Total Annual O&M Cost	**$ 137,209**
				ENGINEER'S OPINION OF TOTAL 20-YR PRESENT WORTH COST	**$ 2,065,116**
				ENGINEER'S OPINION OF TOTAL PRESENT WORTH PROJECT COST	**$ 9,135,116**

The benefits of Alternative 3 include the cost savings associated with the re-use of the existing secondary treatment system. The existing treatment plant discharges high quality effluent and should continue to comply with the facility's existing NPDES permit limitations. A disadvantage of Alternative 3 are the complications associated with expanding the system to a larger Phase 2 design flow. For this to occur, the most straightforward expansion would likely involve constructing an additional extended aeration basin and final clarifier. Continuing to expand the extended aeration treatment capacity of the site via activated sludge basins and clarifiers may not be the most efficient use of the space available. The extended aeration treatment process would likely require more extensive upgrades to comply with the nutrient removal requirements that may be coming in the future than the other alternatives evaluated. Another disadvantage of Alternative 3 are the 14-foot sidewall depths required for the new extended aeration basin and secondary clarifiers. Building structures of this depth would require signification rock excavation due to the presence of bedrock in the vicinity of the treatment plant site.

6.3.2 ALTERNATIVE 4: NEW MULTICHANNEL OXIDATION DITCH TREATMENT SYSTEM

Alternative 4 involves the replacement of the BCRSD Midway Crossing WWTP with a new 250,000 gpd multichannel oxidation ditch treatment plant capable of nutrient removal at the existing site. A multichannel oxidation ditch is an activated sludge treatment process that uses a series of concentric loops with varying oxygen levels to create dedicated zones for specific treatment purposes. Due to the large tank volume, the system is most immune to dramatic changes in flows and loadings and typically does not require flow equalization. Screening and grit removal headworks are both optional, but recommended. Influent enters a large concrete tank and then flows through a horizontal loop. Aerators add energy and air to promote the circular movement and biological growth in the ditch. The oxidation ditch can be configured several different ways to economize capital costs, including common wall construction and other design techniques and methods. The system can also be piped and operated in a manner that allows the most operational flexibility. The effluent from the ditch discharges to secondary clarifiers where WAS is removed and sent to a separate basin for further digestion, settling, and holding. The final clarifiers are followed by a disinfection facility. The proposed major improvements identified for this alternative are as follows:

- New headworks building with combination screening and grit removal package.
- New 250,000 gpd Orbal® oxidation ditch treatment system.
- New 32' diameter secondary clarifier.
- Rehabilitation of existing secondary clarifiers.
- Re-purposing of the existing activated sludge extended aeration basin to an aerated sludge digester.
- Improvements to the existing UV disinfection system including a roof covering structure and stairs.

Existing infrastructure that will be reused in Alternative 4 includes the flow equalization basin/influent pump station, the secondary clarifier basins, the UV disinfection system, and the blower building. As listed above, the existing basin utilized for activated sludge extended aeration would be converted to an aerated sludge digester and holding basin. It is anticipated that sludge will be hauled to the BCRSD Rocky Fork WWTP for processing. The existing secondary clarifier equipment will remain in use and will be rehabilitated via repainting and other refurbishments. Some concrete repair work will be needed for the existing infrastructure to remain in use.

A new, 32' diameter secondary clarifier is recommended to increase the settling capacity of the treatment plant to handle peak flows. Based on a surface overflow rate of 800 gpd/ft^2 at the peak hourly flow for multi-stage nitrification treatment processes, the existing 20' diameter secondary clarifiers are suited for a total peak flow of approximately 500,000 gpd. As discussed in Section 3.4, a peaking factor of 3.5 was used to calculate a design peak hourly of 875,000 gpd for the expanded treatment facility. This calculated peak flow is a conservative estimate due to the lack of influent flow monitoring data. Designing for a peak hourly flow of 875,000 gallons per day results in the need for an additional 375,000 gpd of hydraulic clarifier capacity to provide the required surface overflow rate at peak flows. The inclusion of a 32' diameter clarifier will provide an additional approximately 640,000 gpd of settling capacity, allowing the plant to meet the clarifier loading design requirements

with one of the existing clarifiers out of service for maintenance. Additionally, larger diameter clarifiers are more widely available and thus generally more cost effective than smaller diameter clarifiers. The proposed site layout of Alternative 4 is illustrated in Figure 6-2 on the following page.

Considerations for a future expansion to 500,000 gpd were made when developing the preliminary site plan. Influent flow monitoring at the plant is recommended to determine the actual peak hourly flow entering the treatment facility. This flow monitoring data could be used to determine a more accurate peaking factor, potentially reducing the size of the secondary clarifier basins needed at the treatment plant, including the addition of a fourth clarifier in the future.

A detailed list of proposed improvements and associated costs can be found in Table 6-6. The estimated capital cost of Alternative 4 is $7,518,000. This includes engineering design and ancillary project fees such as geotechnical coordination, construction permitting, and resident project representative services. The estimated annual operations and maintenance costs associated with this alternative are $134,662. Including these O&M costs, the 20-year present worth cost of Alternative 4 is estimated to be $9,544,774.

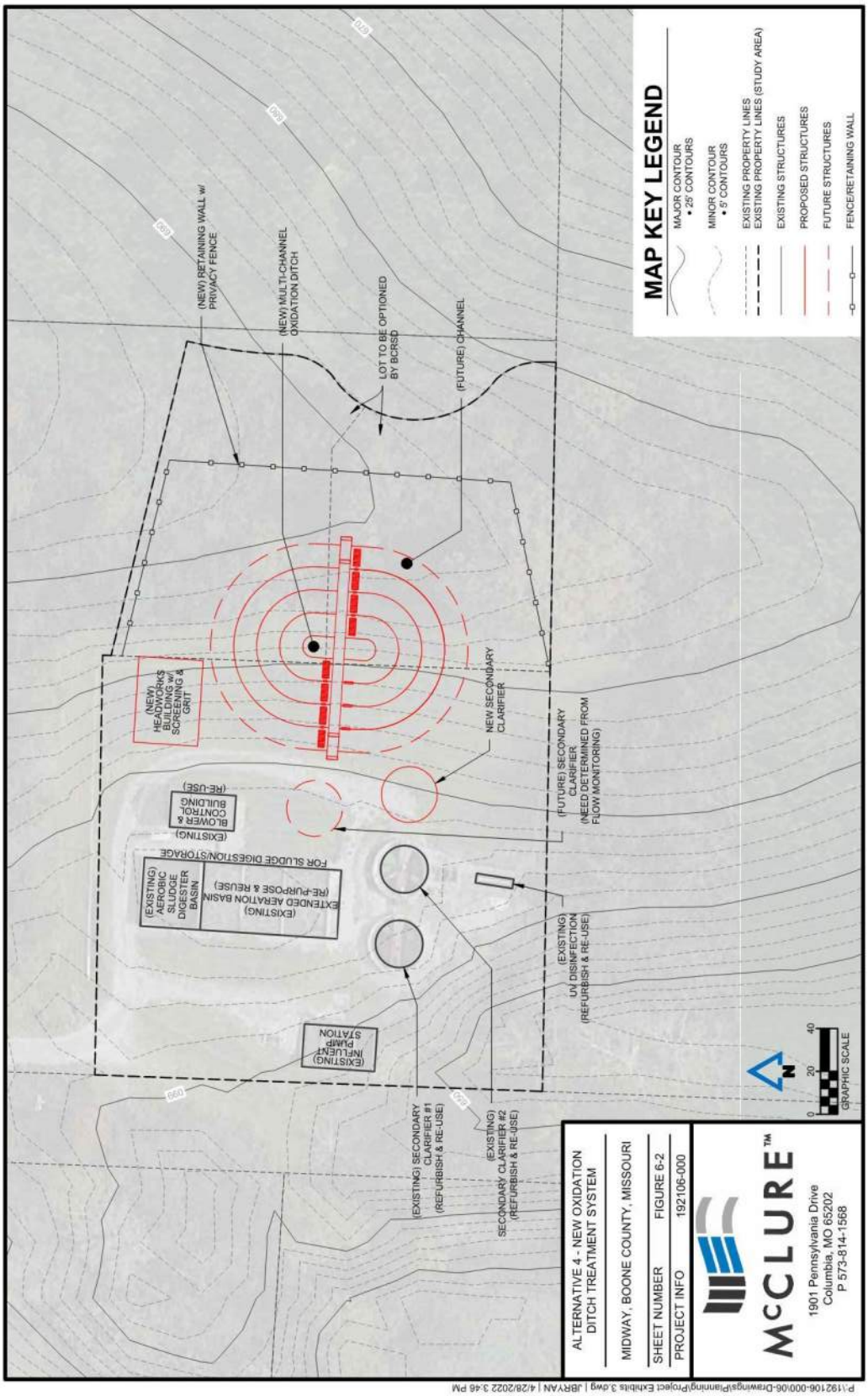
MAP KEY LEGEND
MAJOR CONTOUR
• 25' CONTOURS
MINOR CONTOUR
• 5' CONTOURS
EXISTING PROPERTY LINES
EXISTING PROPERTY LINES (STUDY AREA)
EXISTING STRUCTURES
PROPOSED STRUCTURES
FUTURE STRUCTURES
FENCE/RETAINING WALL
(NEW) RETAINING WALL w/ PRIVACY FENCE
(NEW) MULTI-CHANNEL OXIDATION DITCH
LOT TO BE OPTIONED BY BCRSD
(FUTURE) CHANNEL
(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT
NEW SECONDARY CLARIFIER
(FUTURE) SECONDARY CLARIFIER (NEED DETERMINED FROM FLOW MONITORING)
(EXISTING) BLOWER & CONTROL BUILDING (RE-USE)
FOR SLUDGE DIGESTION/STORAGE
(EXISTING) AEROBIC SLUDGE DIGESTER BASIN
(EXISTING) EXTENDED AERATION BASIN (RE-PURPOSE & REUSE)
(EXISTING) INFLUENT PUMP STATION
(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)
(EXISTING) SECONDARY CLARIFIER #1 (REFURBISH & RE-USE)
(EXISTING) SECONDARY CLARIFIER #2 (REFURBISH & RE-USE)
ALTERNATIVE 4 - NEW OXIDATION DITCH TREATMENT SYSTEM
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 6-2
PROJECT INFO 192106-000
McCLURE™
1901 Pennsylvania Drive
Columbia, MO 65202
P 573-814-1568
GRAPHIC SCALE
P:\192106-000\06-Drawings\Planning\Project Exhibits 3.dwg | JBRYAN | 4/28/2022 3:46 PM

Figure 6-2

Table 6-6 Alternative 4 Detailed Cost Estimate

MIDWAY FACILITY PLAN
BOONE COUNTY REGIONAL SEWER DISTRICT

Engineer's Opinion of Probable Cost

Alternative 4: Orbal Oxidation Ditch - 250,000 GPD Treatment Capacity

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
GENERAL CONDITIONS					
1	Mobilization & Bonding (8%)	1	LS	$ 362,500	$ 362,500
SITE WORK					
2	Grading	4,300	CY	$ 35	$ 150,500
3	Rock Excavation	0	CY	$ 200	$ -
4	Yard Piping	1	LS	$ 250,000	$ 250,000
5	Seeding and Mulching	3	AC	$ 5,000	$ 15,000
6	Retaining Wall	150	LF	$ 850	$ 127,500
7	Erosion Control	1	LS	$ 10,000	$ 10,000
8	Potable Water	1	LS	$ 20,000	$ 20,000
ELIMINATE AERIAL CROSSING					
9	48" Sanitary Sewer Manhole	3.0	EA	$ 12,000	$ 36,000
10	8" Sewer Main (includes allowance for rock excavatlon)	800.0	LF	$ 175	$ 140,000
11	Seeding, Fertilizing and Mulching	0.46	AC	$ 2,500	$ 1,148
12	Clearing and Grubbing	0.46	AC	$ 7,500	$ 3,444
ACCESS ROAD IMPROVEMENTS					
9	Modified Subbase, 6-inch	400	CY	$ 10	$ 4,000
10	Granular Access Road, 1-inch	800	CY	$ 12	$ 9,600
HEADWORKS BUILDING					
11	Concrete, Slab on Grade, 8"	36	CY	$ 1,000	$ 36,000
12	Masonry Exterior Wall, Wood Truss, Steel Roof Panels	1,200	LF	$ 200	$ 240,000
13	Doors, Hardware, Overhead Doors	1	LS	$ 25,000	$ 25,000
14	Screening and Grit Removal Equipment	1	LS	$ 547,000	$ 547,000
15	Gas Detection Equipment	1	LS	$ 15,000	$ 15,000
16	Mechanical, Electrical, Controls	1	LS	$ 110,000	$ 110,000
BIOLOGICAL TREATMENT PROCESS - ORBAL OXIDATION DITCH ACTIVATED SLUDGE					
17	Concrete, Slab on Grade, Ditch	250	CY	$ 1,000	$ 250,000
18	Concrete, Walls, Ditch	160	CY	$ 1,250	$ 200,000
19	Grating, Stairs, and Handrails	1	LS	$ 65,000	$ 65,000
20	Orbal Treatment System, Installed	1	LS	$ 730,000	$ 730,000
21	RAS/WAS Pump Station and Equipment	1	LS	$ 180,000	$ 180,000
22	Mechanical, Electrical, Controls	1	LS	$ 146,000	$ 146,000
ULTRAVIOLET DISINFECTION SYSTEM IMPROVEMENTS					
23	Red Iron Roof Covering Structure	1	LS	$ 48,000	$ 48,000
24	Grating, Stairs, and Handrails	1	LS	$ 25,000	$ 25,000
25	Control Structures	1	LS	$ 15,000	$ 15,000
26	Effluent Parshall Flume, Installed	1	LS	$ 25,000	$ 25,000
27	Effluent Flow Sampling	1	LS	$ 8,000	$ 8,000
28	Mechanical and Electrical Components	1	LS	$ 15,000	$ 15,000
BACKUP POWER					
29	Standby Generator	1	LS	$ 200,000	$ 200,000
30	Related Electric	1	LS	$ 40,000	$ 40,000
NEW SECONDARY CLARIFIER					
31	Concrete, Slab, Clarifier	45	CY	$ 1,100	$ 49,500
32	Concrete, Walls, Clarifier	60	CY	$ 1,250	$ 75,000
33	Grating, Stairs, and Handrails	1	LS	$ 25,000	$ 25,000
34	Clarifier Mechanisms, Installed	1	LS	$ 337,500	$ 337,500
35	Weirs and baffles	1	LS	$ 30,000	$ 30,000
36	Mechanical and Electrical Components	1	LS	$ 50,000	$ 50,000
SECONDARY CLARIFIER IMPROVEMENTS					
37	Concrete Cleaning, Inspection, Repair	2	EA	$ 8,000	$ 16,000
38	Clarifier Equipment Rehabilitation	2	LS	$ 40,000	$ 80,000
39	Wier and Baffle Replacement (SS)	2	EA	$ 30,000	$ 60,000
40	Electrical Improvements	1	LS	$ 15,000	$ 15,000

MISC SITE AND PLANT IMPROVEMENTS					
41	Misc. Concrete Repairs/Improvements	1	LS	$ 50,000.00	$ 50,000
42	Security Fence Improvements and Signage	1	LS	$ 2,000	$ 2,000
43	Privacy Fencing	450	LF	$ 70	$ 31,500
44	Paintings, Coatings, and Fire Extinguishers	1	LS	$ 20,000	$ 20,000
				Subtotal of Probable Construction Cost	**$ 4,892,000**
				Contingency Allowance (20%)	$ 978,500
				Engineer's Estimate of Probable Construction Cost	**$ 5,870,500**
				Engineering - Design Phase	$ 352,500
				Engineering - Bid Phase	$ 73,500
				Engineering - Construction Phase	$ 98,000
				Resident Project Representative (75% of Engineering Design Fees)	$ 393,000
				Operation and Maintenance Manual	$ 40,000
				User Charge Ordinance/Sewer Use Ordinance	$ -
				Emergency Response Plan	$ -
				Environmental Report	$ 5,000
				Special Engineering & Testing	$ 25,000
				Boundary & TOPO Survey	$ 35,000
				Construction Staking	$ 12,500
				Geotechnical	$ 50,000
				Geotechnical Coordination	$ 5,000
				Construction Permitting	$ 6,000
				SWPPP	$ 4,000
				Interest (24 months)	$ 469,700
				Audit	$ 12,500
				Administration and Legal	$ 50,000
				Prefund Bond Reserve	$ 10,000
				Bond Council	$ 5,000
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 7,518,000**
ADDITIONAL ANNUAL OPERATION AND MAINTENANCE COSTS					
1	Staff Operation	1,560	HR	$ 40	$ 62,400
2	Replacement Parts & Equipment	1	LS	$ 7,500	$ 7,500
3	Trash Service	12	FEE	$ 50	$ 600
4	Power - Headworks Equipment	65,195	kWh	$ 0.10	$ 6,520
5	Power - Influent Pump Station - EXISTING	72,235	kWh	$ 0.10	$ 7,224
6	Power - Aeration Equipment, Orbal	235,825	kWh	$ 0.10	$ 23,583
7	Power - Aeration Equipment, Digester - EXISTING	261,300	kWh	$ 0.10	$ 26,130
8	Power - UV Disinfection Equipment (7 months) - EXISTING	7,060	kWh	$ 0.10	$ 706
				Total Annual O&M Cost	**$ 134,662**
				ENGINEER'S OPINION OF TOTAL 20-YR PRESENT WORTH COST	**$ 2,026,774**
				ENGINEER'S OPINION OF TOTAL PRESENT WORTH PROJECT COST	**$ 9,544,774**

A major benefit of Alternative 4 is the shallow proposed depth of the oxidation ditch. The ditch channels only require a 5-foot sidewall depth, which should eliminate the extensive rock excavation necessary for all other treatment plant alternatives evaluated. Another benefit of Alternative 4 are the nutrient removal capabilities of the oxidation ditch, and the process adaptability to achieve lower effluent total nitrogen and total phosphorus concentrations as regulations change. The concentric loop design facilitates simultaneous nitrification-denitrification (SND) and eliminates the need for a dedicated anoxic zone typically used in biological nutrient removal processes. This reduces the associated treatment footprint, saves on concrete cost, and reduces operational energy costs. To reduce effluent nutrient concentrations further, an additional basin can be added ahead of the oxidation ditch to provide an anaerobic zone in the future. Further, the process is easily expandable to the Phase 2 capacity of 500,000 gpd by adding an additional channel around the existing Phase 1 oxidation ditch and potentially constructing an additional secondary clarifier.

Finally, the design of the plant would be very similar to that of the BCRSD Rocky Fork WWTP located north of the City of Columbia. The District is highly knowledgeable in the operations and maintenance associated with an oxidation ditch treatment system, which will streamline the startup of the new facility. A disadvantage of Alternative 4 is the requirement of separate clarifier basins following the oxidation ditch. This increases the footprint of the treatment system and adds to the overall project cost.

6.3.3 ALTERNATIVE 5: NEW SEQUOX ACTIVATED SLUDGE AERO-MOD TREATMENT SYSTEM

Alternative 5 involves the replacement of the BCRSD Midway Crossing WWTP with a new 250,000 gpd Aero-Mod treatment system capable of nutrient removal at the existing site. The Aero-Mod system combines the basic treatment elements of aeration, mixing, and clarification in a common wall treatment basin allowing for an overall reduced footprint and construction cost savings. The Aero-Mod biological wastewater treatment plant features their patented SEQUOX nutrient removal process, which combines the benefits of sequencing aeration with the reliability of continuous clarification. Screening and grit removal headworks are required ahead of this process. Influent enters the large concrete Aero-Mod basin, which is subdivided into multiple basins for nutrient removal, aeration, clarification, and aerobic sludge digestion. Simple timers and controls perform much of the operation, minimizing operational attention. The Aero-Mod system is then followed by a disinfection facility. The major proposed improvements identified for this alternative are as follows:

- New headworks building with combination screening and grit removal package.
- New 250,000 gpd Aero-Mod SEQUOX activated sludge treatment system.
- Conversion of the existing activated sludge aeration basin to an aerated sludge digester.
- Improvements to the existing UV disinfection system including a roof covering structure and stairs.

Existing infrastructure that will be reused in Alternative 5 includes the flow equalization basin/influent pump station, the UV disinfection system, and the blower building. As listed above, the existing basin utilized for activated sludge extended aeration would be converted to an aerated sludge holding basin. Some concrete repair work will be needed for the existing infrastructure to remain in use. It is anticipated that sludge will be hauled to the BCRSD Rocky Fork WWTP for processing. The existing clarifier basins will be decommissioned but remain in place. There is not an intended use for the clarifier basins at this time, but the District may find a need for the infrastructure in the future. The proposed site layout of Alternative 5 is illustrated in Figure 6-3 on the following page. Considerations for a future expansion to 500,000 gpd were made when developing the preliminary site plan.

A detailed list of proposed improvements and associated costs can be found in Table 6-7. The estimated capital cost of Alternative 5 is $7,769,000. This includes engineering design and ancillary project fees such as geotechnical coordination, construction permitting, and resident project representative services. The estimated annual operations and maintenance costs associated with this alternative are $144,852. Including these O&M costs, the 20-year present worth cost of Alternative 5 is estimated to be $9,949,150.

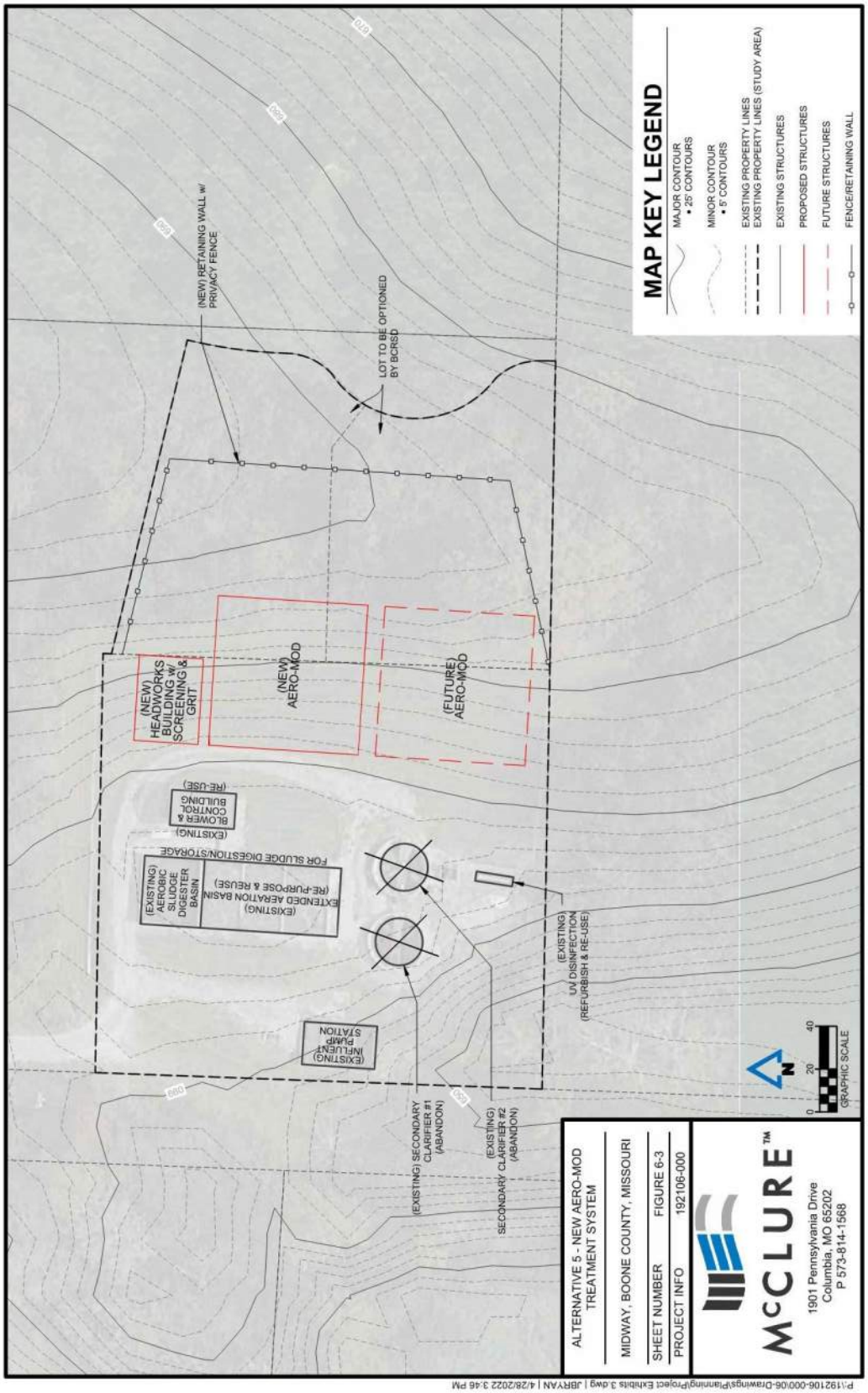
MAP KEY LEGEND
MAJOR CONTOUR
• 25' CONTOURS
MINOR CONTOUR
• 5' CONTOURS
EXISTING PROPERTY LINES
EXISTING PROPERTY LINES (STUDY AREA)
EXISTING STRUCTURES
PROPOSED STRUCTURES
FUTURE STRUCTURES
FENCE/RETAINING WALL
(NEW) RETAINING WALL w/ PRIVACY FENCE
LOT TO BE OPTIONED BY BCRSD
(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT
(NEW) AERO-MOD
(FUTURE) AERO-MOD
(EXISTING) BLOWER & CONTROL BUILDING (RE-USE)
FOR SLUDGE DIGESTION/STORAGE
(EXISTING) AEROBIC SLUDGE DIGESTER BASIN
(EXISTING) EXTENDED AERATION BASIN (RE-PURPOSE & REUSE)
(EXISTING) INFLUENT PUMP STATION
(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)
(EXISTING) SECONDARY CLARIFIER #1 (ABANDON)
(EXISTING) SECONDARY CLARIFIER #2 (ABANDON)
GRAPHIC SCALE
0
20
40
N
ALTERNATIVE 5 - NEW AERO-MOD TREATMENT SYSTEM
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 6-3
PROJECT INFO 192106-000
McCLURE™
1901 Pennsylvania Drive
Columbia, MO 65202
P 573-814-1568
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Figure 6-3

Table 6-7 Alternative 5 Detailed Cost Estimate

MIDWAY FACILITY PLAN
BOONE COUNTY REGIONAL SEWER DISTRICT

Engineer's Opinion of Probable Cost

Alternative 5: AERO-MOD Sequox Activated Sludge - 250,000 GPD Treatment Capacity

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
GENERAL CONDITIONS					
1	Mobilization & Bonding (8%)	1	LS	$ 375,000	$ 375,000
SITE WORK					
2	Grading	4,300	CY	$ 35	$ 150,500
3	Rock Excavation	2,160	CY	$ 200	$ 432,000
4	Yard Piping	1	LS	$ 180,000	$ 180,000
5	Seeding and Mulching	3	AC	$ 5,000	$ 15,000
6	Retaining Wall	150	LF	$ 850	$ 127,500
7	Erosion Control	1	LS	$ 10,000	$ 10,000
8	Potable Water	1	LS	$ 20,000	$ 20,000
ELIMINATE AERIAL CROSSING					
9	48" Sanitary Sewer Manhole	3.0	EA	$ 12,000	$ 36,000
10	8" Sewer Main (includes allowance for rock excavation)	800.0	LF	$ 175	$ 140,000
11	Seeding, Fertilizing and Mulching	0.46	AC	$ 2,500	$ 1,148
12	Clearing and Grubbing	0.46	AC	$ 7,500	$ 3,444
ACCESS ROAD IMPROVEMENTS					
9	Modified Subbase, 6-inch	400	CY	$ 10	$ 4,000
10	Granular Access Road, 1-inch	800	CY	$ 12	$ 9,600
HEADWORKS BUILDING					
11	Concrete, Slab on Grade, 8"	36	CY	$ 1,000	$ 36,000
12	Masonry Exterior Wall, Wood Truss, Steel Roof Panels	1,200	LF	$ 200	$ 240,000
13	Doors, Hardware, Overhead Doors	1	LS	$ 25,000	$ 25,000
14	Screening and Grit Removal Equipment	1	LS	$ 547,000	$ 547,000
15	Gas Detection Equipment	1	LS	$ 15,000	$ 15,000
16	Mechanical, Electrical, Controls	1	LS	$ 110,000	$ 110,000
BIOLOGICAL TREATMENT PROCESS - AERO-MOD SEQUOX ACTIVATED SLUDGE					
17	Concrete, Slab on Grade, Aero-Mod Basin	265	CY	$ 1,000	$ 265,000
18	Concrete, Walls, Aero-Mod Basin	470	CY	$ 1,250	$ 587,500
19	Grating, Stairs, and Handrails	1	LS	$ 65,000	$ 65,000
20	Aero-Mod Treatment System, Installed	1	LS	$ 841,500	$ 841,500
21	Grout for Aero-Mod Clarifier	40	CY	$ 700	$ 28,000
22	WAS Pump Station and Equipment	1	LS	$ 150,000	$ 150,000
23	Mechanical, Electrical, Controls	1	LS	$ 168,300	$ 168,300
ULTRAVIOLET DISINFECTION SYSTEM IMPROVEMENTS					
24	Red Iron Roof Covering Structure	1	LS	$ 48,000	$ 48,000
25	Grating, Stairs, and Handrails	1	LS	$ 25,000	$ 25,000
26	Control Structures	1	LS	$ 15,000	$ 15,000
27	Effluent Parshall Flume, Installed	1	LS	$ 25,000	$ 25,000
28	Effluent Flow Sampling	1	LS	$ 8,000	$ 8,000
29	Mechanical and Electrical Components	1	LS	$ 15,000	$ 15,000
BACKUP POWER					
30	Standby Generator	1	LS	$ 200,000	$ 200,000
31	Related Electric	1	LS	$ 40,000	$ 40,000

MISC SITE AND PLANT IMPROVEMENTS					
32	Misc. Concrete Repairs/Improvements	1	LS	$ 50,000.00	$ 50,000
33	Security Fence Improvements and Signage	1	LS	$ 2,000	$ 2,000
34	Privacy Fencing	450	LF	$ 70	$ 31,500
35	Paintings, Coatings, and Fire Extinguishers	1	LS	$ 20,000	$ 20,000
				Subtotal of Probable Construction Cost	**$ 5,062,000**
				Contingency Allowance (20%)	$ 1,012,500
				Engineer's Estimate of Probable Construction Cost	**$ 6,074,500**
				Engineering - Design Phase	$ 364,500
				Engineering - Bid Phase	$ 76,000
				Engineering - Construction Phase	$ 101,500
				Resident Project Representative (75% of Engineering Design Fees)	$ 406,500
				Operation and Maintenance Manual	$ 40,000
				User Charge Ordinance/Sewer Use Ordinance	$ -
				Emergency Response Plan	$ -
				Environmental Report	$ 5,000
				Special Engineering & Testing	$ 25,000
				Boundary & TOPO Survey	$ 35,000
				Construction Staking	$ 12,500
				Geotechnical	$ 50,000
				Geotechnical Coordination	$ 5,000
				Construction Permitting	$ 6,000
				SWPPP	$ 4,000
				Interest (24 months)	$ 486,000
				Audit	$ 12,500
				Administration and Legal	$ 50,000
				Prefund Bond Reserve	$ 10,000
				Bond Council	$ 5,000
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 7,769,000**
ADDITIONAL ANNUAL OPERATION AND MAINTENANCE COSTS					
1	Staff Operation	1,560	HR	$ 40	$ 62,400
2	Replacement Parts & Equipment	1	LS	$ 7,500	$ 7,500
3	Trash Service	12	FEE	$ 50	$ 600
4	Power - Headworks Equipment	65,195	kWh	$ 0.10	$ 6,520
5	Power - Influent Pump Station - EXISTING	72,235	kWh	$ 0.10	$ 7,224
6	Power - Aeration Equipment, Aero-Mod	337,730	kWh	$ 0.10	$ 33,773
7	Power - Aeration Equipment, Digester - EXISTING	261,300	kWh	$ 0.10	$ 26,130
8	Power - UV Disinfection Equipment (7 months) - EXISTING	7,060	kWh	$ 0.10	$ 706
				Total Annual O&M Cost	**$ 144,852**
				ENGINEER'S OPINION OF TOTAL 20-YR PRESENT WORTH COST	**$ 2,180,150**
				ENGINEER'S OPINION OF TOTAL PRESENT WORTH PROJECT COST	**$ 9,949,150**

The benefits of Alternative 5 include the reduced footprint facilitated by the common wall construction of multiple treatment processes in a compact rectangular configuration. The SEQUOX biological nutrient removal process produces effluent low in total nitrogen but may require chemical addition to achieve low total phosphorus. Additionally, it is the only alternative with a built-in solids digestion system. A disadvantage of Alternative 5 is the need for an entirely new Aero-Mod treatment train to be constructed to increase the capacity of the plant to the Phase 2 flow of 500,000 gpd. Another disadvantage of Alternative 5 is depth of the Aero-Mod basin. The proposed system requires a basin with an 18-foot sidewall depth. Construction of this alternative would require signification rock excavation due to the bedrock present at the treatment plant site.

6.3.4 ALTERNATIVE 6: NEW SEQUENCING BATCH REACTOR (SBR) TREATMENT SYSTEM

Alternative 6 involves the replacement of the BCRSD Midway Crossing WWTP with a new 250,000 gpd sequencing batch reactor (SBR) treatment plant capable of nutrient removal at the existing site. A sequencing batch reactor is a wastewater treatment process where the waste stream undergoes an anoxic phase, an aerated react phase, a settling phase, a decant phase, and an idle phase all in the same tank. Separate clarification is not required. While not necessary, screening and grit removal headworks are recommended. Multiple aeration types including jet, fine bubble, and fixed diffuser aeration are available for use with this system. The SBR basins are followed by a disinfection system. The major proposed improvements identified for this alternative are as follows:

- New headworks building with combination screening and grit removal package.
- New 250,000 gpd sequencing batch reactor (SBR) treatment system.
- Conversion of the existing activated sludge aeration basin to an aerated sludge digester.
- Improvements to the existing UV disinfection system including a roof covering structure and stairs.

Existing infrastructure that will be reused in Alternative 6 includes the flow equalization basin/influent pump station, the UV disinfection system, and the blower building. As listed above, the existing basin utilized for activated sludge extended aeration would be converted to an aerated sludge holding basin. Some concrete repair work will be needed for the existing infrastructure to remain in use. It is anticipated that sludge will be hauled to the BCRSD Rocky Fork WWTP for processing. The existing clarifier basins will be decommissioned but remain in place. There is not an intended use for the clarifier basins at this time, but the District may find a need for the infrastructure in the future. The proposed site layout of Alternative 6 is illustrated in Figure 6-4 on the following page. Considerations for a future expansion to 500,000 gpd were made when developing the preliminary site plan.

A detailed list of proposed improvements and associated costs can be found in Table 6-8. The estimated capital cost of Alternative 6 is $6,904,000. This includes engineering design and ancillary project fees such as geotechnical coordination, construction permitting, and resident project representative services. The estimated annual operations and maintenance costs associated with this alternative are $137,551. Including these O&M costs, the 20-year present worth cost of Alternative 6 is estimated to be $8,974,263

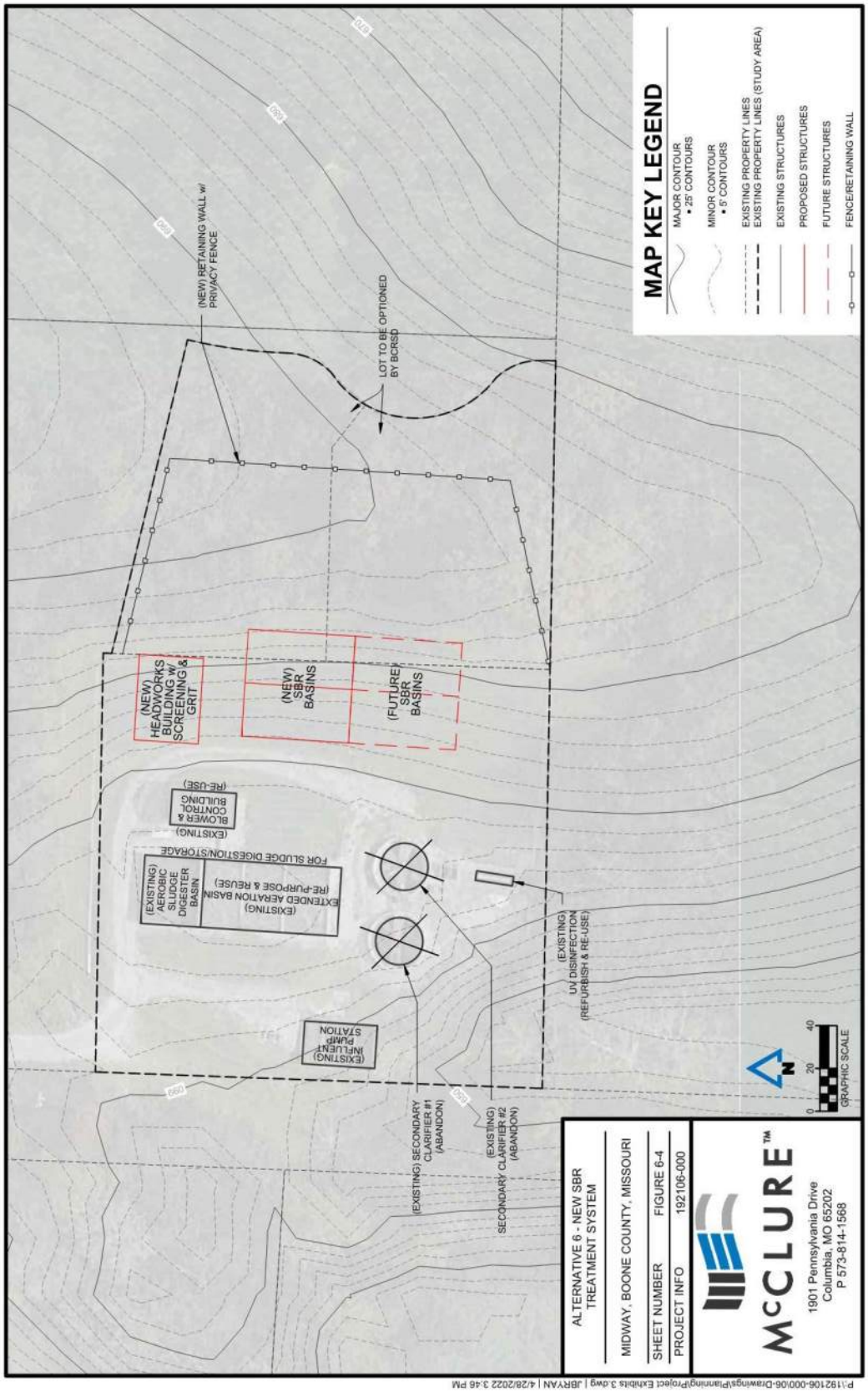
MAP KEY LEGEND
MAJOR CONTOUR
• 25' CONTOURS
MINOR CONTOUR
• 5' CONTOURS
EXISTING PROPERTY LINES
EXISTING PROPERTY LINES (STUDY AREA)
EXISTING STRUCTURES
PROPOSED STRUCTURES
FUTURE STRUCTURES
FENCE/RETAINING WALL
(NEW) RETAINING WALL w/ PRIVACY FENCE
LOT TO BE OPTIONED BY BCRSD
(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT
(NEW) SBR BASINS
(FUTURE) SBR BASINS
BLOWER & CONTROL BUILDING (EXISTING) (RE-USE)
FOR SLUDGE DIGESTION/STORAGE
(EXISTING) AEROBIC SLUDGE DIGESTER BASIN
EXTENDED AERATION BASIN (EXISTING) (RE-PURPOSE & REUSE)
(EXISTING) INFLUENT PUMP STATION
(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)
(EXISTING) SECONDARY CLARIFIER #1 (ABANDON)
(EXISTING) SECONDARY CLARIFIER #2 (ABANDON)
GRAPHIC SCALE
ALTERNATIVE 6 - NEW SBR TREATMENT SYSTEM
MIDWAY, BOONE COUNTY, MISSOURI
SHEET NUMBER FIGURE 6-4
PROJECT INFO 192106-000
McCLURE™
1901 Pennsylvania Drive
Columbia, MO 65202
P 573-814-1568
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Figure 6-4

Table 6-8 Alternative 6 Detailed Cost Estimate

MIDWAY FACILITY PLAN
BOONE COUNTY REGIONAL SEWER DISTRICT

Engineer's Opinion of Probable Cost

Alternative 6: Sequencing Batch Reactor - 250,000 GPD Treatment Capacity

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	EXTENSION
GENERAL CONDITIONS					
1	Mobilization & Bonding (8%)	1	LS	$ 332,000	$ 332,000
SITE WORK					
2	Grading	4,300	CY	$ 35	$ 150,500
3	Rock Excavation	1,380	CY	$ 200	$ 276,000
4	Yard Piping	1	LS	$ 180,000	$ 180,000
5	Seeding and Mulching	3	AC	$ 5,000	$ 15,000
6	Retaining Wall	150	LF	$ 850	$ 127,500
7	Erosion Control	1	LS	$ 10,000	$ 10,000
8	Potable Water	1	LS	$ 20,000	$ 20,000
ELIMINATE AERIAL CROSSING					
9	48" Sanitary Sewer Manhole	3.0	EA	$ 12,000	$ 36,000
10	8" Sewer Main (includes allowance for rock excavatlon)	800.0	LF	$ 175	$ 140,000
11	Seeding, Fertilizing and Mulching	0.46	AC	$ 2,500	$ 1,148
12	Clearing and Grubbing	0.46	AC	$ 7,500	$ 3,444
ACCESS ROAD IMPROVEMENTS					
9	Modified Subbase, 6-inch	400	CY	$ 10	$ 4,000
10	Granular Access Road, 1-inch	800	CY	$ 12	$ 9,600
HEADWORKS BUILDING					
11	Concrete, Slab on Grade, 8"	36	CY	$ 1,000	$ 36,000
12	Masonry Exterior Wall, Wood Truss, Steel Roof Panels	1,200	LF	$ 200	$ 240,000
13	Doors, Hardware, Overhead Doors	1	LS	$ 25,000	$ 25,000
14	Screening and Grit Removal Equipment	1	LS	$ 547,000	$ 547,000
15	Gas Detection Equipment	1	LS	$ 15,000	$ 15,000
16	Mechanical, Electrical, Controls	1	LS	$ 110,000	$ 110,000
BIOLOGICAL TREATMENT PROCESS - SEQUENCING BATCH REACTOR ACTIVATED SLUDGE					
17	Concrete, Slab on Grade, SBR Basins	95	CY	$ 1,000	$ 95,000
18	Concrete, Walls, SBR Basins	350	CY	$ 1,250	$ 437,500
19	Grating, Stairs, and Handrails	1	LS	$ 65,000	$ 65,000
20	SBR Treatment System, Installed	1	LS	$ 810,000	$ 810,000
21	WAS Pump Station and Equipment	1	LS	$ 150,000	$ 150,000
22	Mechanical, Electrical, Controls	1	LS	$ 162,000	$ 162,000
ULTRAVIOLET DISINFECTION SYSTEM IMPROVEMENTS					
23	Red Iron Roof Covering Structure	1	LS	$ 48,000	$ 48,000
24	Grating, Stairs, and Handrails	1	LS	$ 25,000	$ 25,000
25	Control Structures	1	LS	$ 15,000	$ 15,000
26	Effluent Parshall Flume, Installed	1	LS	$ 25,000	$ 25,000
27	Effluent Flow Sampling	1	LS	$ 8,000	$ 8,000
28	Mechanical and Electrical Components	1	LS	$ 15,000	$ 15,000
BACKUP POWER					
29	Standby Generator	1	LS	$ 200,000	$ 200,000
30	Related Electric	1	LS	$ 40,000	$ 40,000

MISC SITE AND PLANT IMPROVEMENTS					
31	Misc. Concrete Repairs/Improvements	1	LS	$ 50,000.00	$ 50,000
32	Security Fence Improvements and Signage	1	LS	$ 2,000	$ 2,000
33	Privacy Fencing	450	LF	$ 70	$ 31,500
34	Paintings, Coatings, and Fire Extinguishers	1	LS	$ 20,000	$ 20,000
				Subtotal of Probable Construction Cost	**$ 4,478,000**
				Contingency Allowance (20%)	$ 896,000
				Engineer's Estimate of Probable Construction Cost	**$ 5,374,000**
				Engineering - Design Phase	$ 322,500
				Engineering - Bid Phase	$ 67,500
				Engineering - Construction Phase	$ 90,000
				Resident Project Representative (75% of Engineering Design Fees)	$ 360,000
				Operation and Maintenance Manual	$ 40,000
				User Charge Ordinance/Sewer Use Ordinance	$ -
				Emergency Response Plan	$ -
				Environmental Report	$ 5,000
				Special Engineering & Testing	$ 25,000
				Boundary & TOPO Survey	$ 35,000
				Construction Staking	$ 12,500
				Geotechnical	$ 50,000
				Geotechnical Coordination	$ 5,000
				Construction Permitting	$ 6,000
				SWPPP	$ 4,000
				Interest (24 months)	$ 429,900
				Audit	$ 12,500
				Administration and Legal	$ 50,000
				Prefund Bond Reserve	$ 10,000
				Bond Council	$ 5,000
				ENGINEER'S OPINION OF PROBABLE PROJECT COST	**$ 6,904,000**
ADDITIONAL ANNUAL OPERATION AND MAINTENANCE COSTS					
1	Staff Operation	1,560	HR	$ 40	$ 62,400
2	Replacement Parts & Equipment	1	LS	$ 7,500	$ 7,500
3	Trash Service	12	FEE	$ 50	$ 600
4	Power - Headworks Equipment	65,195	kWh	$ 0.10	$ 6,520
5	Power - Influent Pump Station - EXISTING	72,235	kWh	$ 0.10	$ 7,224
6	Power - Aeration Equipment, SBR	264,720	kWh	$ 0.10	$ 26,472
7	Power - Aeration Equipment, Digester - EXISTING	261,300	kWh	$ 0.10	$ 26,130
8	Power - UV Disinfection Equipment (7 months) - EXISTING	7,060	kWh	$ 0.10	$ 706
				Total Annual O&M Cost	**$ 137,551**
				ENGINEER'S OPINION OF TOTAL 20-YR PRESENT WORTH COST	**$ 2,070,263**
				ENGINEER'S OPINION OF TOTAL PRESENT WORTH PROJECT COST	**$ 8,974,263**

The benefits of Alternative 6 include the internal clarification in the SBR basins eliminating the need for separate clarifiers and associated yard piping. This reduces the overall footprint of the treatment system and saves construction costs. The cyclic operation inherent to the SBR process is easily adaptable to provide the conditions needed for biological nutrient removal. Additionally, the process is easily modularly expandable to the Phase 2 capacity of 500,000 gpd. A disadvantage of Alternative 6 is the depth of the SBR basins requiring significant excavation. The proposed basins would require a sidewall height of 21 feet, the deepest of all alternatives considered. Construction of this alternative would require the greatest amount of rock excavation due to the limestone bedrock present at the treatment plant site. Additional upgrades such as chemical addition for phosphorus removal would likely be needed to meet low nutrient limits.

7.0 RECOMMENDATIONS

The recommended project is for the District to increase the treatment capacity of the BCRSD Midway Crossing WWTP to a Phase 1 design average flow of 250,000 gpd. This will allow the District to successfully accept and treat the hydraulic loading that has been committed to the treatment plant and allow for the connection of the Trails West subdivision and subsequent closure of the BCRSD Trails West WWTF. Additionally, it is recommended that the District connect the Midway Arms facility on Van Horn Tavern Road to the City's sanitary sewer system and that the District decommission the BCRSD Midway Arms WWTP. The aerial sewer crossing in Rollingwood Plat 2 should be re-routed via a new gravity collection line to the BCRSD Midway Crossing WWTP.

The recommended treatment alternative is Alternative 4, construction of a new multichannel oxidation ditch treatment system at the existing BCRSD Midway Crossing WWTP site. The oxidation ditch is the preferred treatment alternative because of the District's familiarity with this treatment technology and its lower operational requirements and operations and maintenance costs. Oxidation ditches are robust treatment systems capable of operating successfully under a variety of hydraulic and organic loading conditions, minimizing the impact of surges to the system. This treatment process is also readily adaptable for biological nutrient removal, preparing the District for future nitrogen and phosphorus limits on the horizon. Another significant benefit of Alternative 4 is the shallow sidewall depth of the oxidation ditch channels. All other treatment process alternatives evaluated require the construction of secondary treatment basins with depths of 14 feet or greater. Due to these required depths, Alternative 3, 5 and 6 would require more extensive rock excavation during construction. Lastly, the multichannel oxidation ditch basin can be easily expanded to the future Phase 2 design average flow of 500,000 gpd. Although Alternative 4 is not the lowest cost alternative identified for the initial expansion to 250,000 gpd, its adaptability and expandability will likely make this alternative the most cost-effective solution in the long-term.

8.0 IMPLEMENTATION PLAN AND FINANCING

8.1 FINANCING DISCUSSION

The scale of the recommended project in the Midway area requires that the District seek funding through low interest loans, and if available, grants from government funding agencies. The preferred financing mechanism for the project is the Clean Water State Revolving Fund (CWSRF) administered by the Missouri Department of Natural Resources. The District has historically used the CWSRF program to fund the upgrade and expansion of its wastewater treatment and collection system infrastructure. The program features a fixed-rate loan with a standard interest rate that is 30% of the municipal market rate for loans with a standard term of 20 years. The first step in the CWSRF process is submitting a loan application to the Financial Assistance Center, which will lead to the project being listed on the State's Intended Use Plan and Project Priority Lists. The proposed expansion of the BCRSD Midway Crossing WWTP is listed on the Fiscal Year 2022 Intended Use Plan (IUP) with a financial assistance request of $6,615,000. Additionally, the BCRSD Trails West WWTF is listed on the IUP for $1,042,450, and the BCRSD Midway Arms WWTP is listed on the IUP for $1,163,400.

The District currently has an authorized bonding capacity of $3,226,501.02 per a letter from Toni Stegeman, the District's bond counsel with Gilmore and Bell, dated May 2, 2022.

In addition to the CWSRF program, there are new funding sources that may be available to finance the proposed project. The first is the American Rescue Plan Act (ARPA) fiscal recovery funds, which can be used to address underfunded areas of public infrastructure such as wastewater treatment systems. All ARPA fiscal recovery funds must be encumbered by December 31, 2024 and all projects must be complete with all funds expended by December 31, 2026. Applications for ARPA funding are expected to open in the summer of 2022, and because of the aggressive timeline for expending funds, it is likely that the funding will be prioritized to projects that can demonstrate quick completion agendas. The second new funding source is the Infrastructure Investment and Jobs Act (IIJA) which is also known as the Bipartisan Infrastructure Law (BIL). Projects financed through the BIL will adopt the same process as the typical CWSRF program but within a reduced timeframe. The goal with utilizing either the ARPA or BIL funds is to obtain a fifty percent grant and fifty percent loan split. Utilizing ARPA or BIL funds to obtain a substantial portion of grant funding would reduce the overall financial impact of the project on the District and its customers. It is advised that the District pursue the recommended project following the schedule outlined below in Section 8.2 to best position themselves to receive this grant funding. Deviating from the proposed schedule and delaying the project will risk the District becoming ineligible for these temporary funding mechanisms due to their expeditious federal deadlines.

Projects receiving funding through the CWSRF program require an environmental review to ensure that the project will comply with the applicable local, state, and federal laws and rules related to the protection and enhancement of the environment. A Natural Heritage Review for the proposed BCRSD Midway Crossing WWTP expansion has been obtain and is included in Appendix C. A Request for a Geohydrologic Evaluation from the Missouri Department of Natural Resources Missouri Geological Survey has also been submitted. This form can also be found in Appendix C. Upon conditional approval of the Report and the project recommendations, requests to obtain the additional required environmental, historical, and cultural clearances will be submitted.

8.2 SCHEDULE

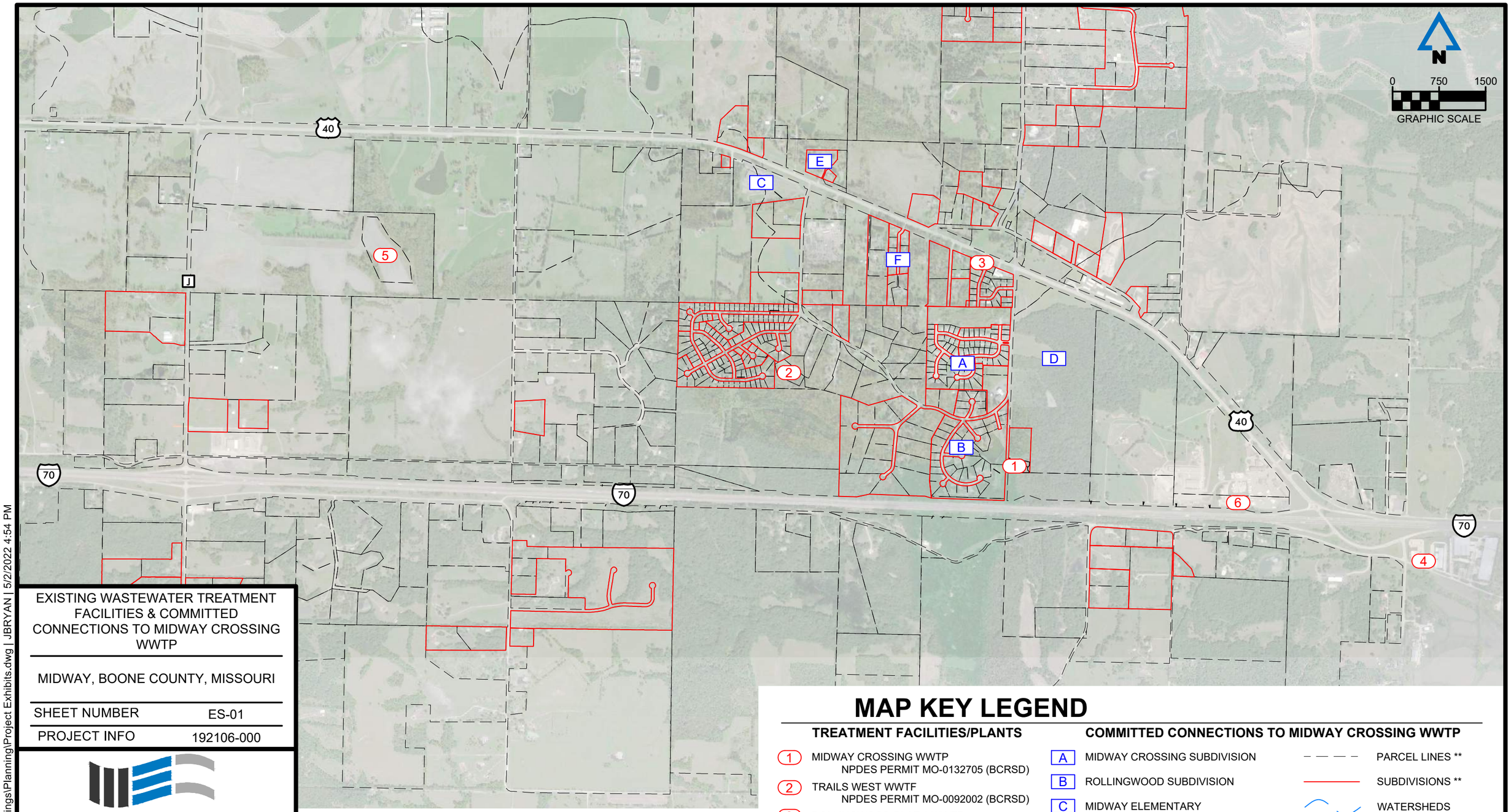
The recommendations discussed in Section 7.0 will take several years to complete. These recommendations were divided into three major project completion task groups as follows:

1. Task 1 – New BCRSD Midway Crossing WWTP, Trails West Connection to BCRSD Midway Crossing WWTP and Aerial Re-route
2. Task 2 - Design Services for Midway Arms Connection to City of Columbia
3. Task 3 - Connection of Midway Auto/Truck Plaza

In the schedule listed below, the proposed completion deadline for each task is the last day of the month listed. Task 3 - Connection of Midway Auto/Truck Plaza to BCRSD Midway Crossing WWTP was not included in this schedule as the Midway Auto/Truck Plaza WWTF is privately owned, and it is not clear what the owner's intentions are at this time.

TASK	COMPLETION
Complete Facility Plan and District Approval	May 2022
Facility Plan Submittal and MO DNR Review	August 2022
Antidegradation Review and Environmental Clearances Submittal	October 2022
Facility Plan Checklist Items 5-7	October 2022
Design Contract Approval	October 2022
Bond Election	April 2023
Task 1- Survey	November 2022
Task 1- Subsurface Investigation	December 2022
Task 1- Gravity Sewer, Pump Station and Forcemain Design	March 2023
Task 1- Easement Acquisition	April 2023
Task 1- BCRSD Midway Crossing WWTP Upgrade Design	June 2023
Task 1- MO DNR Construction Permit	October 2023
Task 1- Advertise, Bid, Award	December 2023
Task 1- Construction	December 2025
Task 1- Close BCRSD Trails West WWTF	December 2025
Task 1- Project Certification and Owner Acceptance	January 2026
Task 2- Survey and Subsurface Investigation	March 2023
Task 2- Pump Station and Forcemain Design	June 2023
Task 2- Easement Acquisition	August 2023
Task 2- MO DNR Construction Permit	September 2023
Task 2- Advertise, Bid, Award	December 2023
Task 2- Construction	May 2025
Task 2- Close BCRSD Midway Arms WWTP	May 2025
Task 2- Project Certification and Owner Acceptance.	June 2025

APPENDIX A – LEDGER SIZED FIGURES



EXISTING WASTEWATER TREATMENT FACILITIES & COMMITTED CONNECTIONS TO MIDWAY CROSSING WWTP

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	ES-01
PROJECT INFO	192106-000

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DISCLAIMER NOTE:

* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST

** PARCEL LINE WORK FROM BOONE COUNTY GIS.

MAP KEY LEGEND

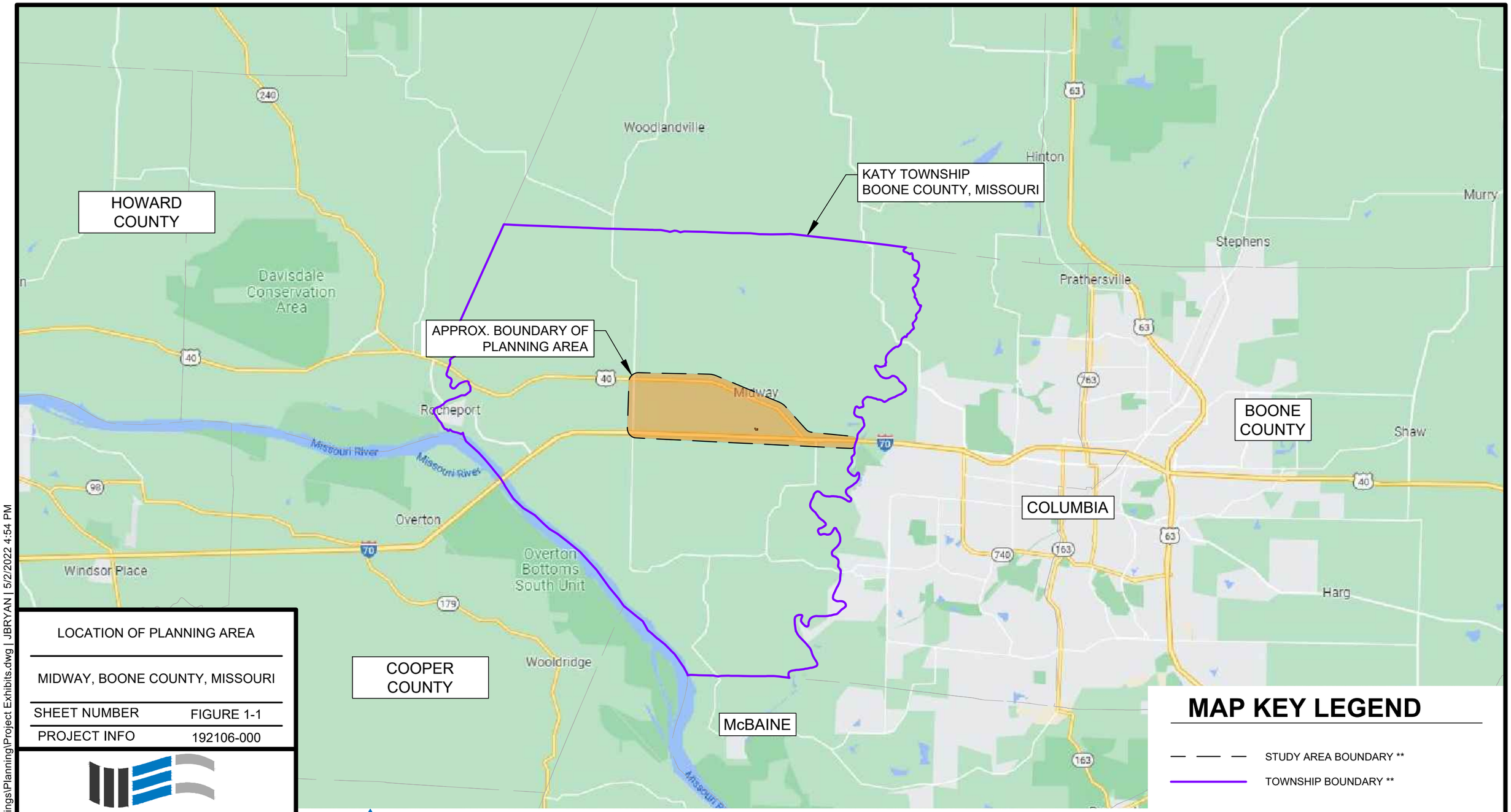
TREATMENT FACILITIES/PLANTS

1. MIDWAY CROSSING WWTP — NPDES PERMIT MO-0132705 (BCRSD)
2. TRAILS WEST WWTF — NPDES PERMIT MO-0092002 (BCRSD)
3. ROLLINGWOOD PLAT 1 WWTP — NPDES PERMIT MO-0038792 (BCRSD)
4. MIDWAY ARMS WWTP — NPDES PERMIT MO-0108421 (BCRSD)
5. MIDWAY USA WWTF — NPDES PERMIT MO-0139629 (BCRSD)
6. MIDWAY AUTO/TRUCK PLAZA WWTF — NPDES PERMIT MO-0100862 (BCRSD)

COMMITTED CONNECTIONS TO MIDWAY CROSSING WWTP

- A — MIDWAY CROSSING SUBDIVISION
- B — ROLLINGWOOD SUBDIVISION
- C — MIDWAY ELEMENTARY
- D — RAVENWOOD SUBDIVISION
- E — CAT BOARDING FACILITY
- F — BOLLI ROAD NEIGHBORHOOD

- PARCEL LINES **
- SUBDIVISIONS **
- WATERSHEDS
- X — INTERSTATE HIGHWAY
- X — STATE HIGHWAY
- X — COUNTY ROAD



LOCATION OF PLANNING AREA

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 1-1
PROJECT INFO	192106-000

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GRAPHIC SCALE

MAP KEY LEGEND

— — — STUDY AREA BOUNDARY **

——— TOWNSHIP BOUNDARY **

DISCLAIMER NOTE:

* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST

** PARCEL LINE WORK FROM BOONE COUNTY GIS.

BCRSD MIDWAY USA WWTF (40 & J)

BCRSD ROLLINGWOOD PLAT. 1 WWTP

BCRSD MIDWAY ARMS WWTP

MIDWAY AUTO/TRUCK PLAZA WWTF

BCRSD MIDWAY CROSSING WWTP

BCRSD TRAILS WEST WWTF

40

70

J

N

0 750 1500

GRAPHIC SCALE

EXISTING WASTEWATER TREATMENT FACILITIES

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 2-1
PROJECT INFO	192106-000

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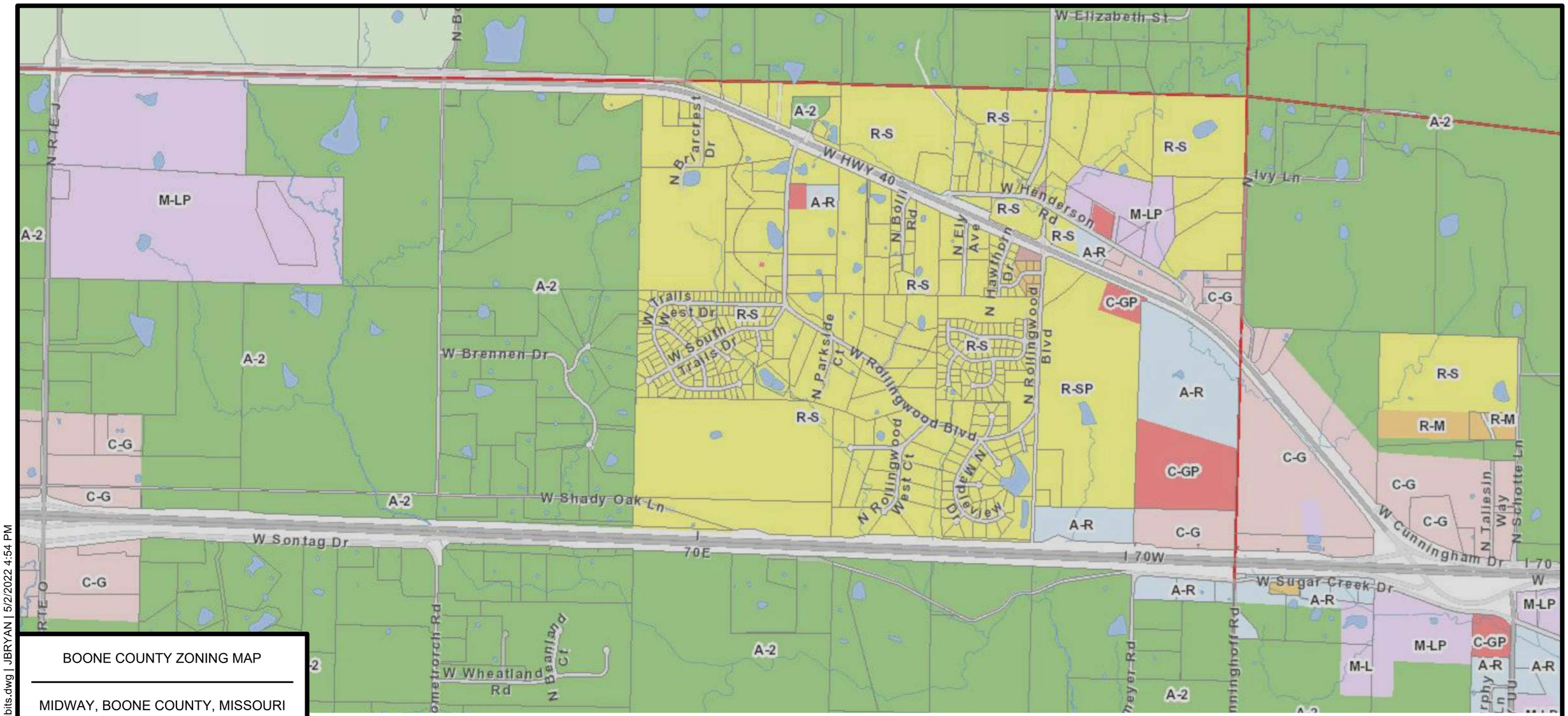
** PARCEL LINE WORK FROM BOONE COUNTY GIS.

MAP KEY LEGEND

- PARCEL LINES **
- SUBDIVISIONS **
- WATERSHED
- INTERSTATE HIGHWAY
- STATE HIGHWAY
- COUNTY ROAD



BOONE COUNTY ZONING MAP

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 2-2
PROJECT INFO	192106-000

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MAP KEY LEGEND

A-1	AGRICULTURE	C-N	NEIGHBORHOOD COMMERCIAL	R-M	MODERATE DENSITY RESIDENTIAL
A-1P	PLANNED AGRICULTURE	C-0	OFFICE COMMERCIAL	R-MP	PLANNED MODERATE DENSITY RESIDENTIAL
A-2	URBAN AGRICULTURE	M-G	GENERAL INDUSTRIAL	R-S	SINGLE FAMILY RESIDENTIAL
A-2P	PLANNED URBAN AGRICULTURE	M-GP	PLANNED GENERAL INDUSTRIAL	R-SP	PLANNED SINGLE FAMILY RESIDENTIAL
A-R	AGRICULTURE - RESIDENTIAL	M-L	LIGHT INDUSTRIAL	REC	RECREATION
A-RP	PLANNED AGRICULTURE - RESIDENTIAL	M-LP	PLANNED LIGHT INDUSTRIAL	REC-P	PLANNED RECREATION
C-G	GENERAL COMMERCIAL	R-D	TWO FAMILY RESIDENTIAL	Town	PARCEL FALLS WITH TOWN/CITY LIMITS
C-GP	PLANNED GENERAL COMMERCIAL	R-DP	PLANNED TWO FAMILY RESIDENTIAL		

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TOPOGRAPHIC MAP OF PLANNING AREA

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 2-3
PROJECT INFO	192106-000

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GRAPHIC SCALE

MAP KEY LEGEND

- MAJOR CONTOUR • 25' CONTOURS
- MINOR CONTOUR • 5' CONTOURS
- WATERWAY LINES
- INTERSTATE HIGHWAY
- STATE HIGHWAY
- COUNTY ROAD
- EXISTING WASTEWATER TREATMENT FACILITIES

GEOLOGICAL FEATURE MAP OF PLANNING AREA

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 2-4
PROJECT INFO	192106-000

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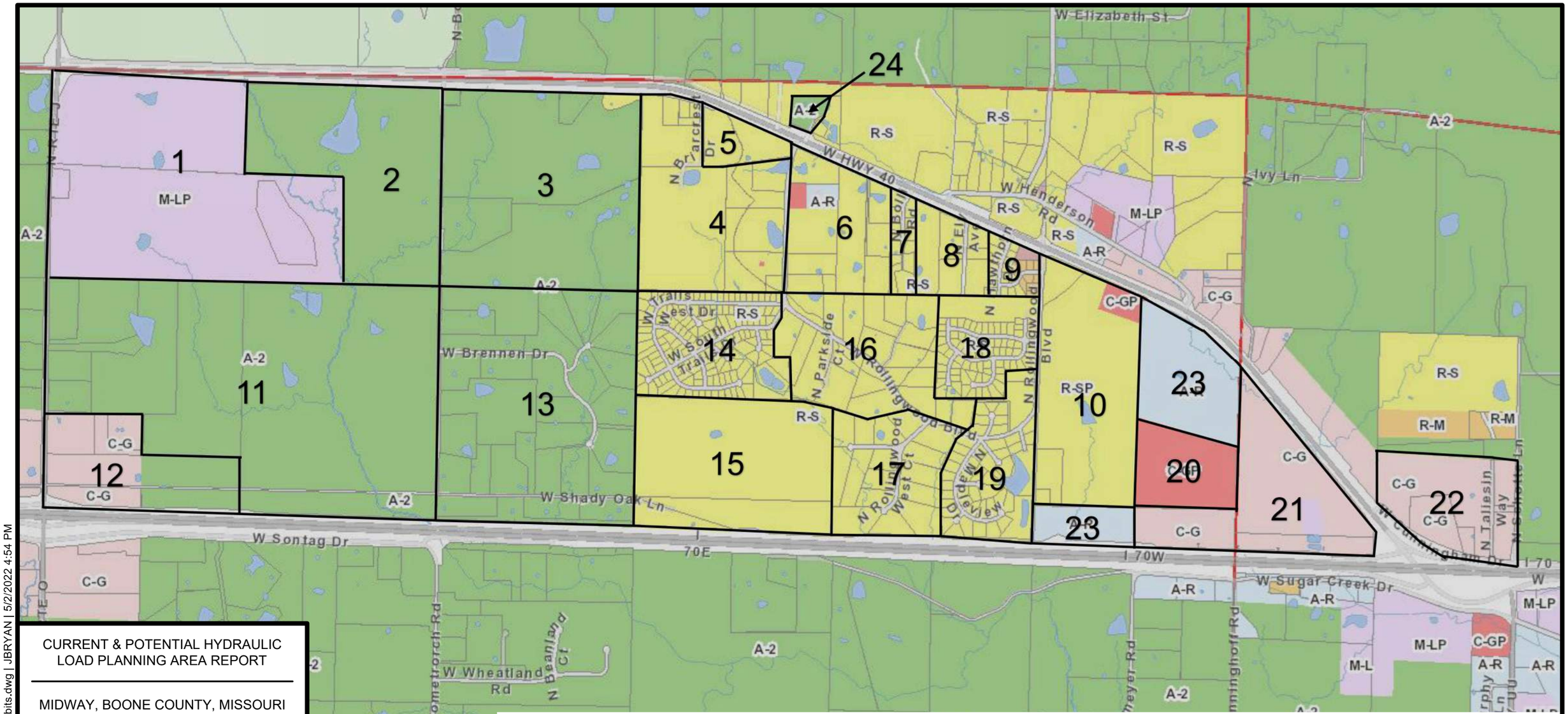
GRAPHIC SCALE

MAP KEY LEGEND

- WATERWAY LINES
- SINK HOLE AREAS
- **LOSS/GAIN STREAMS**
  - GAINING STREAMS
  - LOSSING STREAMS
- STUDY AREA BOUNDRY
- INTERSTATE HIGHWAY
- STATE HIGHWAY
- COUNTY ROAD
- EXISTING WASTEWATER TREATMENT FACILITIES



CURRENT & POTENTIAL HYDRAULIC LOAD PLANNING AREA REPORT

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 3-1
PROJECT INFO	192106-000

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MAP KEY LEGEND

(SEE TABLE 3-3) FOR CORRESPONDING ZONE LABLES

A-1	AGRICULTURE	C-N	NEIGHBORHOOD COMMERCIAL	R-M	MODERATE DENSITY RESIDENTIAL
A-1P	PLANNED AGRICULTURE	C-0	OFFICE COMMERCIAL	R-MP	PLANNED MODERATE DENSITY RESIDENTIAL
A-2	URBAN AGRICULTURE	M-G	GENERAL INDUSTRIAL	R-S	SINGLE FAMILY RESIDENTIAL
A-2P	PLANNED URBAN AGRICULTURE	M-GP	PLANNED GENERAL INDUSTRIAL	R-SP	PLANNED SINGLE FAMILY RESIDENTIAL
A-R	AGRICULTURE - RESIDENTIAL	M-L	LIGHT INDUSTRIAL	REC	RECREATION
A-RP	PLANNED AGRICULTURE - RESIDENTIAL	M-LP	PLANNED LIGHT INDUSTRIAL	REC-P	PLANNED RECREATION
C-G	GENERAL COMMERCIAL	R-D	TWO FAMILY RESIDENTIAL	Town	PARCEL FALLS WITH TOWN/CITY LIMITS
C-GP	PLANNED GENERAL COMMERCIAL	R-DP	PLANNED TWO FAMILY RESIDENTIAL		

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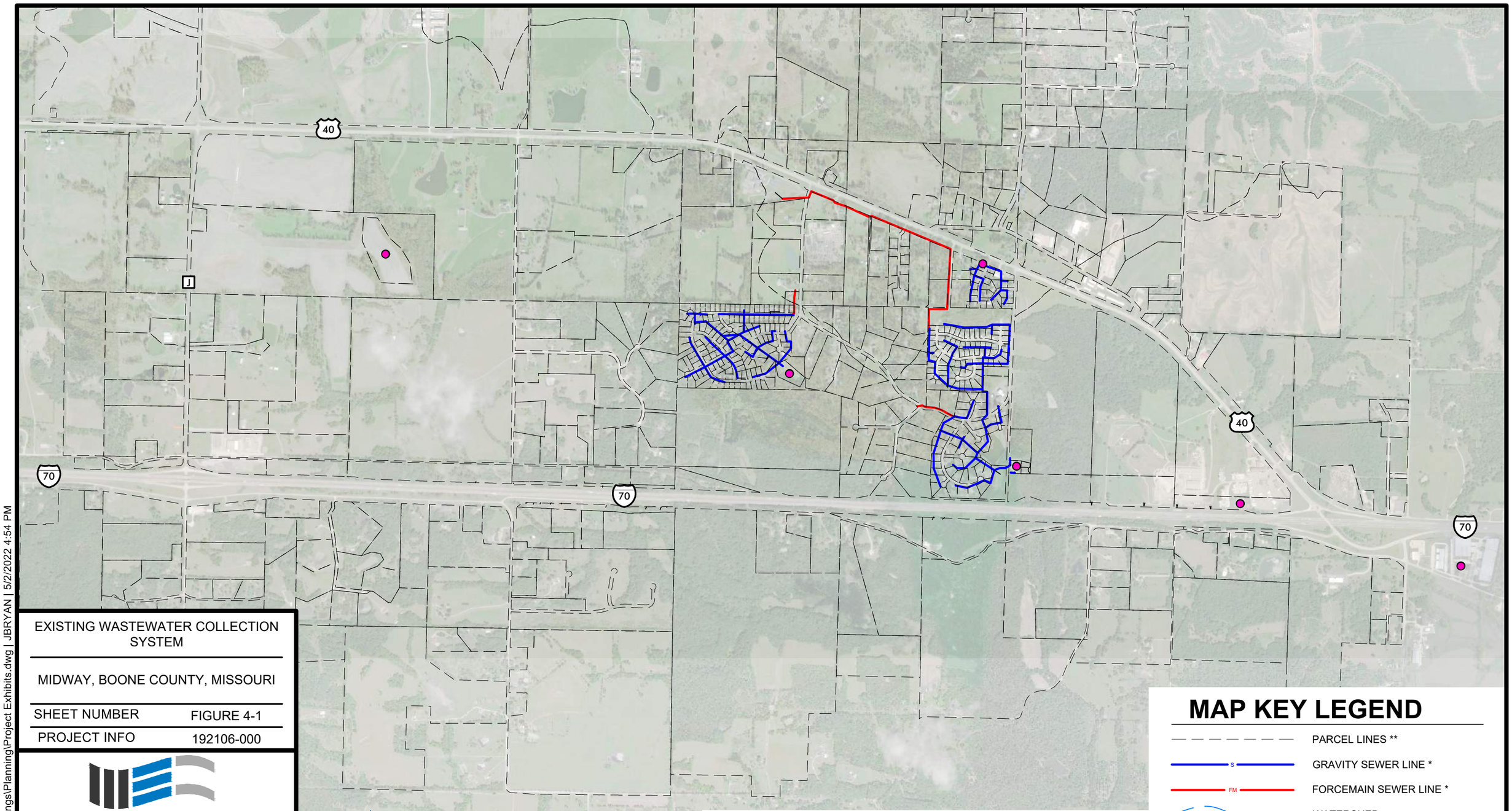

EXISTING WASTEWATER COLLECTION SYSTEM

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 4-1
PROJECT INFO	192106-000

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GRAPHIC SCALE

DISCLAIMER NOTE:

* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST

** PARCEL LINE WORK FROM BOONE COUNTY GIS.

MAP KEY LEGEND

- PARCEL LINES **
- GRAVITY SEWER LINE *
- FORCEMAIN SEWER LINE *
- WATERSHED
- INTERSTATE HIGHWAY
- STATE HIGHWAY
- COUNTY ROAD
- EXISTING WASTEWATER TREATMENT FACILITIES

BCRSD MIDWAY CROSSING WWTP
EXISTING SITE PLAN

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 4-2
PROJECT INFO	192106-000

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DISCLAIMER NOTE:

* GRAVITY & FORCEMAIN SEWER LINE WORK FROM BARTLETT & WEST

** PARCEL LINE WORK FROM BOONE COUNTY GIS.

MAP KEY LEGEND

- PARCEL LINES **
- GRAVITY SEWER LINE * (S)
- FORCEMAIN SEWER LINE * (FM)
- WATERSHED
- INTERSTATE HIGHWAY (X)
- STATE HIGHWAY (X)
- COUNTY ROAD (X)
- EXISTING WASTEWATER TREATMENT FACILITIES

(EXISTING) AEROBIC SLUDGE DIGESTER BASIN

(EXISTING) EXTENDED AERATION BASIN (RE-PURPOSE & REUSE) FOR SLUDGE DIGESTION/STORAGE

(EXISTING) BLOWER & CONTROL BUILDING (RE-USE)

(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT

(NEW) AEROBIC SLUDGE DIGESTER

(FUTURE) AEROBIC SLUDGE DIGESTER

(NEW) EXTENDED AERATION BASIN

(FUTURE) EXTENDED AERATION BASIN

(EXISTING) INFLUENT PUMP STATION

(NEW) RETAINING WALL w/ PRIVACY FENCE

LOT TO BE OPTIONED BY BCRSD

(EXISTING) SECONDARY CLARIFIER #1 (REFURBISH & RE-USE)

(EXISTING) SECONDARY CLARIFIER #2 (REFURBISH & RE-USE)

(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)

(NEW) SECONDARY CLARIFIER

(FUTURE) SECONDARY CLARIFIER

660 650 690 680 670

ALTERNATIVE 3 - EXTENDED AERATION EXPANSION

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 6-1
PROJECT INFO	192106-000

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GRAPHIC SCALE

MAP KEY LEGEND

- MAJOR CONTOUR • 25' CONTOURS
- MINOR CONTOUR • 5' CONTOURS
- EXISTING PROPERTY LINES
- EXISTING PROPERTY LINES (STUDY AREA)
- EXISTING STRUCTURES
- PROPOSED STRUCTURES
- FUTURE STRUCTURES
- FENCE/RETAINING WALL

(EXISTING) AEROBIC SLUDGE DIGESTER BASIN

(EXISTING) EXTENDED AERATION BASIN (RE-PURPOSE & REUSE)

FOR SLUDGE DIGESTION/STORAGE

(EXISTING) BLOWER & CONTROL BUILDING (RE-USE)

(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT

(EXISTING) INFLUENT PUMP STATION

(NEW) RETAINING WALL w/ PRIVACY FENCE

(NEW) MULTI-CHANNEL OXIDATION DITCH

LOT TO BE OPTIONED BY BCRSD

(FUTURE) CHANNEL

(EXISTING) SECONDARY CLARIFIER #1 (REFURBISH & RE-USE)

(EXISTING) SECONDARY CLARIFIER #2 (REFURBISH & RE-USE)

NEW SECONDARY CLARIFIER

(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)

(FUTURE) SECONDARY CLARIFIER (NEED DETERMINED FROM FLOW MONITORING)

660 650 690 680 670

ALTERNATIVE 4 - NEW OXIDATION DITCH TREATMENT SYSTEM

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 6-2
PROJECT INFO	192106-000

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GRAPHIC SCALE

MAP KEY LEGEND

- MAJOR CONTOUR • 25' CONTOURS
- MINOR CONTOUR • 5' CONTOURS
- EXISTING PROPERTY LINES
- EXISTING PROPERTY LINES (STUDY AREA)
- EXISTING STRUCTURES
- PROPOSED STRUCTURES
- FUTURE STRUCTURES
- FENCE/RETAINING WALL

(EXISTING) AEROBIC SLUDGE DIGESTER BASIN

(EXISTING) EXTENDED AERATION BASIN (RE-PURPOSE & REUSE)

FOR SLUDGE DIGESTION/STORAGE

(EXISTING) BLOWER & CONTROL BUILDING (RE-USE)

(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT

(NEW) AERO-MOD

(FUTURE) AERO-MOD

(EXISTING) INFLUENT PUMP STATION

(EXISTING) SECONDARY CLARIFIER #1 (ABANDON)

(EXISTING) SECONDARY CLARIFIER #2 (ABANDON)

(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)

(NEW) RETAINING WALL w/ PRIVACY FENCE

LOT TO BE OPTIONED BY BCRSD

660

650

690

680

670

ALTERNATIVE 5 - NEW AERO-MOD TREATMENT SYSTEM

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 6-3
PROJECT INFO	192106-000

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GRAPHIC SCALE

MAP KEY LEGEND

- MAJOR CONTOUR • 25' CONTOURS
- MINOR CONTOUR • 5' CONTOURS
- EXISTING PROPERTY LINES
- EXISTING PROPERTY LINES (STUDY AREA)
- EXISTING STRUCTURES
- PROPOSED STRUCTURES
- FUTURE STRUCTURES
- FENCE/RETAINING WALL

(EXISTING) AEROBIC SLUDGE DIGESTER BASIN

(EXISTING) EXTENDED AERATION BASIN (RE-PURPOSE & REUSE)

FOR SLUDGE DIGESTION/STORAGE

(EXISTING) BLOWER & CONTROL BUILDING (RE-USE)

(NEW) HEADWORKS BUILDING w/ SCREENING & GRIT

(NEW) SBR BASINS

(FUTURE) SBR BASINS

(EXISTING) INFLUENT PUMP STATION

(EXISTING) SECONDARY CLARIFIER #1 (ABANDON)

(EXISTING) SECONDARY CLARIFIER #2 (ABANDON)

(EXISTING) UV DISINFECTION (REFURBISH & RE-USE)

(NEW) RETAINING WALL w/ PRIVACY FENCE

LOT TO BE OPTIONED BY BCRSD

660

650

690

680

670

N

0 20 40

GRAPHIC SCALE

ALTERNATIVE 6 - NEW SBR TREATMENT SYSTEM

MIDWAY, BOONE COUNTY, MISSOURI

SHEET NUMBER	FIGURE 6-4
PROJECT INFO	192106-000

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MAP KEY LEGEND

- MAJOR CONTOUR
  - 25' CONTOURS
- MINOR CONTOUR
  - 5' CONTOURS
- EXISTING PROPERTY LINES
- EXISTING PROPERTY LINES (STUDY AREA)
- EXISTING STRUCTURES
- PROPOSED STRUCTURES
- FUTURE STRUCTURES
- FENCE/RETAINING WALL

APPENDIX B – NPDES PERMITS

NPDES Permit MO0132705 – BCRSD Midway Crossing WWTP

NPDES Permit MO0092002 – BCRSD Trails West WWTF

NPDES Permit MO0038792 – BCRSD Rollingwood Plat 1 WWTP

NPDES Permit MO0108421 – BCRSD Midway Arms WWTP (W Van Horn Tavern Road)

NPDES Permit MO0139629 – BCRSD Midway USA WWTF (US40 & St Hwy J)

NPDES Permit MO0100862 – Midway Auto/Truck Plaza WWTF

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0132705
Owner:	Boone County Regional Sewer District (BCRSD)
Address:	1314 North 7th Street, Columbia, MO 65201
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	BCRSD Midway Crossing WWTP
Facility Address:	0.4 miles south of Golden Willow Drive and Rollingwood Boulevard intersection, Columbia, MO 65202
Legal Description:	See Page 2
UTM Coordinates:	See Page 2
Receiving Stream:	See Page 2
First Classified Stream and ID:	See Page 2
USGS Basin & Sub-watershed No.:	See Page 2

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

See Page 2

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

November 1, 2020
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

June 30, 2025
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (continued):

Outfall #001 – POTW
The use or operation of this facility shall be by or under the supervision of a Certified "C" Operator.
Bar screen / flow equalization tank / extended aeration / 2 final clarifiers / UV disinfection / aerobic sludge digester / sludge disposal by hauler

Design population equivalent is 1,500.
Design flow is 150,000 gallons per day.
Actual flow is 23,000 gallons per day.
Design sludge production is 27 dry tons/year.

Legal Description:	Sec. 1, T48N, R14W, Boone County
UTM Coordinates:	X=547768, Y=4314027
Receiving Stream:	Tributary to Sugar Branch
First Classified Stream and ID:	Sugar Branch (C) (1030)
USGS Basin & Sub-watershed No.:	(10300102-0708)

Permitted Feature INF – Influent Monitoring Location – Headworks

Legal Description:	Sec. 1, T48N, R14W, Boone County
UTM Coordinates:	X=547745, Y=4314062

OUTFALL #001

TABLE A-1.
FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in **Table A-1** shall become effective on **November 1, 2020** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: M						
Flow	MGD	*		*	once/month	24 hr. total
Biochemical Oxygen Demand$_5$	mg/L		45	30	once/month	composite**
Total Suspended Solids	mg/L		45	30	once/month	composite**
E. coli (**Note 1, Page 4**)	#/100mL		1,030	206	once/week	grab
EFFLUENT PARAMETER(S)	**UNITS**	**MINIMUM**		**MAXIMUM**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
pH – Units***	SU	6.5		9.0	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE DECEMBER 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Limit Set: Q						
EFFLUENT PARAMETER(S)	**UNITS**	**DAILY MAXIMUM**	**WEEKLY AVERAGE**	**MONTHLY AVERAGE**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
Ammonia as N	mg/L	*		*	once/quarter****	composite**
Total Phosphorus	mg/L	*		*	once/quarter****	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/quarter****	composite**
Nitrite + Nitrate	mg/L	*		*	once/quarter****	composite**

EFFLUENT PARAMETER(S)	UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand$_5$ – Percent Removal (**Note 2, Page 4**)	%	85	once/quarter****	calculated
Total Suspended Solids – Percent Removal (**Note 2, Page 4**)	%	85	once/quarter****	calculated

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2021.

* Monitoring requirement only.

** A 24-hour composite sample is either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

*** pH is measured in pH units and is not to be averaged.

**** See table on Page 4 for quarterly sampling.

Quarterly Minimum Sampling Requirements			
Quarter	**Months**	**Quarterly Effluent Parameters**	**Report is Due**
First	January, February, March	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28th

PERMITTED FEATURE INF	TABLE B-1. INFLUENT MONITORING REQUIREMENTS

The monitoring requirements in **Table B-1** shall become effective on **November 1, 2020** and remain in effect until expiration of the permit. The influent wastewater shall be monitored by the permittee as specified below:

PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: IQ						
Biochemical Oxygen Demand$_5$ (**Note 2**)	mg/L			*	once/quarter****	composite**
Total Suspended Solids (**Note 2**)	mg/L			*	once/quarter****	composite**
Ammonia as N	mg/L	*		*	once/quarter****	composite**
Total Phosphorus	mg/L	*		*	once/quarter****	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/quarter****	composite**
Nitrite + Nitrate	mg/L	*		*	once/quarter****	composite**

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2021.

* Monitoring requirement only.

** A 24-hour composite sample is either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

**** See table below for quarterly sampling requirements.

Note 1 – Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

Note 2 – Influent sampling for BOD_5 and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula: [(Average Influent –Average Effluent) / Average Influent] x 100% = Percent Removal. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a 24-hour composite sample is either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

Quarterly Minimum Sampling Requirements			
Quarter	**Months**	**Quarterly Influent Parameters**	**Report is Due**
First	January, February, March	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28th

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. Electronic Discharge Monitoring Report (eDMR) Submission System. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
   (a) eDMR Registration Requirements. The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/mogem. Information about the eDMR system can be found at https://dnr.mo.gov/env/wpp/edmr.htm. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
   (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://apps5.mo.gov/mogems/welcome.action. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
   (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.

2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
   (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.

3. All outfalls must be clearly marked in the field.

4. Report as no-discharge when a discharge does not occur during the report period.

5. Reporting of Non-Detects:
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
   (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

6. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

D. SPECIAL CONDITIONS (continued)

7. The permittee shall comply with any applicable requirements listed in 10 CSR 20-9. The permittee has been granted approval for an alternative operational monitoring schedule in accordance with 10 CSR 20-9.010(3). This approval is limited to operational monitoring and does not apply to the certified operator requirements of 10 CSR 20-9.020. The applicable operational monitoring parameters and frequencies for this facility are:

Operational Monitoring Parameter	Frequency
Weather Conditions – Ambient Temperature and Precipitation	3 days per week
Flow – Influent or Effluent	3 days per week
pH – Influent	3 days per week
NFR – Influent	once per month
NFR – Mixed Liquor	once per week
Settleability – Mixed Liquor	once per week
Dissolved Oxygen – Mixed Liquor	3 days per week
Dissolved Oxygen – Aerobic Digester	3 days per week

8. The permittee shall develop and implement a program for maintenance and repair of its collection system. The permittee may compare collection system performance results and other data with the benchmarks used in the Departments' Capacity, Management, Operation, And Maintenance (CMOM) Model located at http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc. Additional information regarding the Departments' CMOM Model is available at http://dnr.mo.gov/pubs/pub2574.htm.

   The permittee shall also submit a report via the Electronic Discharge Monitoring Report (eDMR) Submission System annually, by January 28th, for the previous calendar year. The report shall contain the following information:
   (a) A summary of the efforts to locate and eliminate specific sources of excessive infiltration and inflow into the collection system serving the facility for the previous year.
   (b) A summary of the general maintenance and repairs to the collection system serving the facility for the previous year.
   (c) A summary of any planned maintenance and repairs to the collection system serving the facility for the upcoming calendar year. This list shall include locations (GPS, 911 address, manhole number, etc.) and actions to be taken.

9. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Northeast Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: https://dnr.mo.gov/mogem/ or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.

10. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

11. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.

12. An all-weather access road to the treatment facility shall be maintained.

13. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably insure its structural stability, freedom from stoppage, and that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.

E. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 RSMo. hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.:	MO-0092002
Owner:	Boone County Regional Sewer District (BCRSD)
Address:	1314 North 7th Street, Columbia, MO 65201
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	BCRSD Trails West WWTF
Facility Address:	South terminus of South Trails Court, Columbia, MO 65202
Legal Description:	See Page 2
UTM Coordinates:	See Page 2
Receiving Stream:	See Page 2
First Classified Stream and ID:	See Page 2
USGS Basin & Sub-watershed No.:	See Page 2

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

See Page 2

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

November 1, 2020
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

June 30, 2025
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (continued):

Outfall #001 – POTW
The use or operation of this facility shall be by or under the supervision of a Certified "D" Operator.
Two-cell lagoon with aerated primary / sludge retained in lagoon

Design population equivalent is 644.
Design flow is 57,500 gallons per day.
Actual flow is 29,400 gallons per day.
Design sludge production is 9.6 dry tons/year.

Legal Description:	Sec. 2, T48N, R14W, Boone County
UTM Coordinates:	X=546724, Y=4314487
Receiving Stream:	Tributary to Sugar Branch
First Classified Stream and ID:	100K Extent-Remaining Streams (C) (3960)
USGS Basin & Sub-watershed No.:	(10300102-0708)

Permitted Feature INF – Influent Monitoring Location – Influent manhole

Legal Description:	Sec. 2, T48N, R14W, Boone County
UTM Coordinates:	X=546631, Y=4314557

OUTFALL #001

TABLE A-1.
INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in **Table A-2** must be achieved as soon as possible but no later than **November 1, 2031**. These interim effluent limitations in **Table A-1** are effective beginning **November 1, 2020** and remain in effect through **October 31, 2031** or as soon as possible. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Flow	MGD	*		*	once/quarter***	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		65	45	once/quarter***	grab
Total Suspended Solids	mg/L		120	80	once/quarter***	grab
Ammonia as N	mg/L	*		*	once/quarter***	grab
EFFLUENT PARAMETER(S)	**UNITS**	**MINIMUM**		**MAXIMUM**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
pH – Units**	SU	6.5		9.0	once/quarter***	grab

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Limit Set: A

EFFLUENT PARAMETER(S)	UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand$_5$ – Percent Removal (**Note 2, Page 5)**	%	65	once/year	calculated
Total Suspended Solids – Percent Removal (**Note 2, Page 5)**	%	65	once/year	calculated

MONITORING REPORTS SHALL BE SUBMITTED **ANNUALLY**; THE FIRST REPORT IS DUE JANUARY 28, 2022.

* Monitoring requirement only.
** pH is measured in pH units and is not to be averaged.
*** See table below for quarterly sampling.

Quarterly Minimum Sampling Requirements			
Quarter	**Months**	**Quarterly Effluent Parameters**	**Report is Due**
First	January, February, March	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28th

OUTFALL #001	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations in **Table A-2** shall become effective on **November 1, 2031** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Flow	MGD	*		*	once/quarter***	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		65	45	once/quarter***	grab
Total Suspended Solids	mg/L		120	80	once/quarter***	grab
E. coli (**Note 1, Page 5**)	#/100mL		1,030	206	once/quarter***	grab
Ammonia as N - (Jan – Mar)	mg/L	14.4		3.5	once/quarter***	grab
Ammonia as N - (Apr – Jun)	mg/L	15.8		2.0	once/quarter***	grab
Ammonia as N - (Jul – Sep)	mg/L	15.8		2.0	once/quarter***	grab
Ammonia as N - (Oct – Dec)	mg/L	14.4		3.5	once/quarter***	grab
EFFLUENT PARAMETER(S)	**UNITS**	**MINIMUM**		**MAXIMUM**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
pH – Units**	SU	6.5		9.0	once/quarter***	grab

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2032. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Limit Set: A

EFFLUENT PARAMETER(S)	UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand$_5$ – Percent Removal (**Note 2, Page 5**)	%	65	once/year	calculated
Total Suspended Solids – Percent Removal (**Note 2, Page 5**)	%	65	once/year	calculated

MONITORING REPORTS SHALL BE SUBMITTED **ANNUALLY**; THE FIRST REPORT IS DUE JANUARY 28, 2033. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.
** pH is measured in pH units and is not to be averaged.
*** See table below for quarterly sampling.

Quarterly Minimum Sampling Requirements				
Quarter	**Months**	***E. coli***	**All Other Parameters**	**Report is Due**
First	January, February, March	Not required to sample.	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	October 28th
Fourth	October	**Sample once during October**	Sample at least once during any month of the quarter	January 28th
	November & December	Not required to sample.		

PERMITTED FEATURE INF	TABLE B-1. INFLUENT MONITORING REQUIREMENTS

The monitoring requirements in **Table B-1** shall become effective on **November 1, 2020** and remain in effect until expiration of the permit. The influent wastewater shall be monitored by the permittee as specified below:

PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: IA						
Biochemical Oxygen Demand$_5$ (**Note 2**)	mg/L			*	once/year	grab
Total Suspended Solids (**Note 2**)	mg/L			*	once/year	grab
MONITORING REPORTS SHALL BE SUBMITTED **ANNUALLY**; THE FIRST REPORT IS DUE JANUARY 28, 2022.						

* Monitoring requirement only.

Note 1 – Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

Note 2 – Influent sampling for BOD_5 and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula: [(Average Influent –Average Effluent) / Average Influent] x 100% = Percent Removal. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a grab sample.

C. SCHEDULE OF COMPLIANCE

The facility shall attain compliance with final effluent limitations for Ammonia and *E. coli* as soon as possible but in no case later than **eleven (11) years** of the effective date of this permit.

1. Within six months of the effective date of this permit, the permittee shall report progress made in attaining compliance with the final effluent limits for Ammonia and *E. coli*.

2. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits for Ammonia and *E. coli* every 12 months from the effective date of this permit.

3. Within **eleven (11) years** of the effective date of this permit, the permittee shall attain compliance with the final effluent limits for Ammonia and *E. coli*.

Please submit progress reports to the Missouri Department of Natural Resources via the Electronic Discharge Monitoring Report (eDMR) Submission System.

D. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein.

E. SPECIAL CONDITIONS

1. Electronic Discharge Monitoring Report (eDMR) Submission System. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
   (a) eDMR Registration Requirements. The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/mogem. Information about the eDMR system can be found at https://dnr.mo.gov/env/wpp/edmr.htm. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
   (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://apps5.mo.gov/mogems/welcome.action. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
   (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.

2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
   (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.

3. All outfalls must be clearly marked in the field.

4. Report as no-discharge when a discharge does not occur during the report period.

5. Reporting of Non-Detects:
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
   (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

6. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

E. SPECIAL CONDITIONS (continued)

7. The permittee shall comply with any applicable requirements listed in 10 CSR 20-9. The permittee has been granted approval for an alternative operational monitoring schedule in accordance with 10 CSR 20-9.010(3). This approval is limited to operational monitoring and does not apply to the certified operator requirements of 10 CSR 20-9.020. The applicable operational monitoring parameters and frequencies for this facility are:

Operational Monitoring Parameter	Frequency
Weather Conditions – Precipitation	twice per month
Flow – Influent or Effluent	twice per month
pH – Primary Cell	twice per month
Dissolved Oxygen – Primary Cell	twice per month

8. The permittee shall develop and implement a program for maintenance and repair of its collection system. The permittee may compare collection system performance results and other data with the benchmarks used in the Departments' Capacity, Management, Operation, And Maintenance (CMOM) Model located at http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc. Additional information regarding the Departments' CMOM Model is available at http://dnr.mo.gov/pubs/pub2574.htm.

   The permittee shall also submit a report via the Electronic Discharge Monitoring Report (eDMR) Submission System annually, by January 28th, for the previous calendar year. The report shall contain the following information:
   (a) A summary of the efforts to locate and eliminate specific sources of excessive infiltration and inflow into the collection system serving the facility for the previous year.
   (b) A summary of the general maintenance and repairs to the collection system serving the facility for the previous year.
   (c) A summary of any planned maintenance and repairs to the collection system serving the facility for the upcoming calendar year. This list shall include locations (GPS, 911 address, manhole number, etc.) and actions to be taken.

9. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Northeast Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: https://dnr.mo.gov/mogem/ or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.

10. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

11. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.

12. An all-weather access road to the treatment facility shall be maintained.

13. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably insure its structural stability, freedom from stoppage, and that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.

14. The lagoon shall be operated and maintained to ensure their structural integrity, which includes maintaining adequate freeboard and keeping the berms free of deep-rooted vegetation, animal dens, or other potential sources of damage.

15. The facility shall ensure that adequate provisions are provided to prevent or minimize surface water intrusion into the lagoon and to divert stormwater runoff around the lagoon and protect embankments from erosion.

F. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.:	MO-0038792
Owner:	Boone County Regional Sewer District (BCRSD)
Address:	1314 North 7th Street, Columbia, MO 65201
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	BCRSD Rollingwood Plat #1 WWTP
Facility Address:	Southwest of Hawthorn Drive & Hwy 40 intersection, Columbia, MO 65202
Legal Description:	See Page 2
UTM Coordinates:	See Page 2
Receiving Stream:	See Page 2
First Classified Stream and ID:	See Page 2
USGS Basin & Sub-watershed No.:	See Page 2

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

See Page 2

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

November 1, 2020
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

June 30, 2025
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (continued):

Outfall #001 – POTW
Extended aeration / aerobic sludge digester / sludge disposal by hauler

Design population equivalent is 100.
Design flow is 10,000 gallons per day.
Actual flow is 4,200 gallons per day.
Design sludge production is 1.5 dry tons/year.

Legal Description:	Sec. 1, T48N, R14W, Boone County
UTM Coordinates:	X=547594, Y=4315064
Receiving Stream:	Tributary to Midway Branch
First Classified Stream and ID:	100K Extent-Remaining Streams (C) (3960)
USGS Basin & Sub-watershed No.:	(10300102-0708)

Permitted Feature INF – Influent Monitoring Location – Headworks

Legal Description:	Sec. 1, T48N, R14W, Boone County
UTM Coordinates:	X=547595, Y=4315064

OUTFALL #001	TABLE A-1. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in **Table A-2** must be achieved as soon as possible but no later than **November 1, 2025**. These interim effluent limitations in **Table A-1** are effective beginning **November 1, 2020** and remain in effect through **October 31, 2025** or as soon as possible. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Flow	MGD	*		*	once/quarter****	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		45	30	once/quarter****	composite**
Total Suspended Solids	mg/L		45	30	once/quarter****	composite**
Ammonia as N	mg/L	*		*	once/quarter****	composite**
EFFLUENT PARAMETER(S)	**UNITS**	**MINIMUM**		**MAXIMUM**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
pH – Units***	SU	6.5		9.0	once/quarter****	grab

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Limit Set: A

EFFLUENT PARAMETER(S)	UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand$_5$ – Percent Removal (**Note 2**)	%	85	once/year	calculated
Total Suspended Solids – Percent Removal (**Note 2**)	%	85	once/year	calculated

MONITORING REPORTS SHALL BE SUBMITTED **ANNUALLY**; THE FIRST REPORT IS DUE JANUARY 28, 2022.

* Monitoring requirement only.

** A 24-hour composite sample is either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

*** pH is measured in pH units and is not to be averaged.

**** See table below for quarterly sampling.

Note 2 – Influent sampling for BOD_5 and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula: [(Average Influent –Average Effluent) / Average Influent] x 100% = Percent Removal. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a 24-hour composite sample, either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

Quarterly Minimum Sampling Requirements			
Quarter	**Months**	**Quarterly Effluent Parameters**	**Report is Due**
First	January, February, March	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28th

OUTFALL #001	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in **Table A-2** shall become effective on **November 1, 2025** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Flow	MGD	*		*	once/quarter****	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		45	30	once/quarter****	composite**
Total Suspended Solids	mg/L		45	30	once/quarter****	composite**
E. coli (**Note 1**)	#/100mL		1,030	206	once/quarter****	grab
Ammonia as N (Jan – Mar)	mg/L	12.1		3.1	once/quarter****	composite**
Ammonia as N (Apr – Jun)	mg/L	10.1		1.5	once/quarter****	composite**
Ammonia as N (Jul – Sep)	mg/L	8.4		1.0	once/quarter****	composite**
Ammonia as N (Nov – Dec)	mg/L	8.4		2.2	once/quarter****	composite**
EFFLUENT PARAMETER(S)	**UNITS**	**MINIMUM**		**MAXIMUM**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
pH – Units***	SU	6.5		9.0	once/quarter****	grab

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2026. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Limit Set: A

EFFLUENT PARAMETER(S)	UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand$_5$ – Percent Removal (**Note 2**)	%	85	once/year	calculated
Total Suspended Solids – Percent Removal (**Note 2**)	%	85	once/year	calculated

MONITORING REPORTS SHALL BE SUBMITTED **ANNUALLY**; THE FIRST REPORT IS DUE JANUARY 28, 2027.

* Monitoring requirement only.

** A 24-hour composite sample is either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

*** pH is measured in pH units and is not to be averaged.

**** See table on Page 5 for quarterly sampling.

Note 1 – Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

Note 2 – Influent sampling for BOD_5 and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula: [(Average Influent –Average Effluent) / Average Influent] x 100% = Percent Removal. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a 24-hour composite sample, either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

PERMITTED FEATURE INF	TABLE B-1. INFLUENT MONITORING REQUIREMENTS

The monitoring requirements in **Table B-1** shall become effective on **November 1, 2020** and remain in effect until expiration of the permit. The influent wastewater shall be monitored by the permittee as specified below:

PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: IA						
Biochemical Oxygen Demand$_5$ (**Note 2**)	mg/L			*	once/year	composite**
Total Suspended Solids (**Note 2**)	mg/L			*	once/year	composite**
MONITORING REPORTS SHALL BE SUBMITTED **ANNUALLY**; THE FIRST REPORT IS DUE JANUARY 28, 2022.						

* Monitoring requirement only.

** A 24-hour composite sample is either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

Note 2 – Influent sampling for BOD_5 and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula: [(Average Influent –Average Effluent) / Average Influent] x 100% = Percent Removal. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a 24-hour composite sample, either composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device or made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

Quarterly Minimum Sampling Requirements				
Quarter	**Months**	***E. coli***	**All Other Parameters**	**Report is Due**
First	January, February, March	Not required to sample.	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	October 28th
Fourth	October	**Sample once during October**	Sample at least once during any month of the quarter	January 28th
	November & December	Not required to sample.		

C. SCHEDULE OF COMPLIANCE

The facility shall attain compliance with final effluent limitations for Ammonia and *E. coli* as soon as possible but in no case later than **November 1, 2025.**

1. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every 12 months from the effective date of this permit.

2. By **November 1, 2025**, the permittee shall attain compliance with the final effluent limits for Ammonia and *E. coli*.

Please submit progress reports to the Missouri Department of Natural Resources via the Electronic Discharge Monitoring Report (eDMR) Submission System.

D. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein.

E. SPECIAL CONDITIONS

1. Electronic Discharge Monitoring Report (eDMR) Submission System. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
   (a) eDMR Registration Requirements. The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/mogem. Information about the eDMR system can be found at https://dnr.mo.gov/env/wpp/edmr.htm. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
   (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://apps5.mo.gov/mogems/welcome.action. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
   (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.

2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
   (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.

3. All outfalls must be clearly marked in the field.

4. Report as no-discharge when a discharge does not occur during the report period.

5. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

6. Reporting of Non-Detects:
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
   (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

E. SPECIAL CONDITIONS (continued)

7. The permittee shall develop and implement a program for maintenance and repair of its collection system. The permittee may compare collection system performance results and other data with the benchmarks used in the Departments' Capacity, Management, Operation, And Maintenance (CMOM) Model located at http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc. Additional information regarding the Departments' CMOM Model is available at http://dnr.mo.gov/pubs/pub2574.htm.

   The permittee shall also submit a report via the Electronic Discharge Monitoring Report (eDMR) Submission System annually, by January 28th, for the previous calendar year. The report shall contain the following information:
   (a) A summary of the efforts to locate and eliminate specific sources of excessive infiltration and inflow into the collection system serving the facility for the previous year.
   (b) A summary of the general maintenance and repairs to the collection system serving the facility for the previous year.
   (c) A summary of any planned maintenance and repairs to the collection system serving the facility for the upcoming calendar year. This list shall include locations (GPS, 911 address, manhole number, etc.) and actions to be taken.

8. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Northeast Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: https://dnr.mo.gov/mogem/ or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.

9. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

10. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.

11. An all-weather access road to the treatment facility shall be maintained.

12. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably insure its structural stability, freedom from stoppage, and that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.

F. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.:	MO-0108421
Owner:	Boone County Regional Sewer District (BCRSD)
Address:	1314 North 7th Street, Columbia, MO 65201
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	BCRSD Midway Arms WWTP
Facility Address:	5875 Van Horn Tavern Road, Columbia, MO 65203
Legal Description:	Sec. 7, T48N, R13W, Boone County
UTM Coordinates:	X=549930, Y=4313501
Receiving Stream:	Tributary to Henderson Branch
First Classified Stream and ID:	100K Extent-Remaining Streams (C) (3960)
USGS Basin & Sub-watershed No.:	(10300102-0708)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – POTW
STEP system / recirculating sand filter / UV disinfection / septage stored in 4 septic tanks / septage disposal by hauler

Design population equivalent is 94.
Design flow is 4,800 gallons per day.
Actual flow is 4,200 gallons per day.
Design sludge production is 0.66 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

November 1, 2020
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

June 30, 2025
Expiration Date

Chris Wieberg, Director, Water Protection Program

OUTFALL #001	TABLE A-1. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in **Table A-2** must be achieved as soon as possible but no later than **September 1, 2024**. These interim effluent limitations in **Table A-1** are effective beginning **November 1, 2020** and remain in effect through **August 31, 2024** or as soon as possible. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Flow	MGD	*		*	once/quarter***	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L lbs./day		45	30 1.2	once/quarter***	grab
Total Suspended Solids	mg/L lbs./day		45	30 1.2	once/quarter***	grab
E. coli (**Note 1, Page 4**)	#/100mL		1,030	206	once/quarter***	grab
Ammonia as N	mg/L	*		*	once/quarter***	grab
EFFLUENT PARAMETER(S)	**UNITS**	**MINIMUM**		**MAXIMUM**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
pH – Units**	SU	6.5		9.0	once/quarter***	grab

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.
** pH is measured in pH units and is not to be averaged.
*** See table below for quarterly sampling.

Quarterly Minimum Sampling Requirements				
Quarter	**Months**	***E. coli***	**All Other Parameters**	**Report is Due**
First	January, February, March	Not required to sample.	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	October 28th
Fourth	October	**Sample once during October**	Sample at least once during any month of the quarter	January 28th
	November & December	Not required to sample.		

OUTFALL #001	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in **Table A-2** shall become effective on **September 1, 2024** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Flow	MGD	*		*	once/quarter***	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L lbs./day		45	30 1.2	once/quarter***	grab
Total Suspended Solids	mg/L lbs./day		45	30 1.2	once/quarter***	grab
E. coli (**Note 1, Page 4**)	#/100mL		1,030	206	once/quarter***	grab
Ammonia as N (Jan – Mar)	mg/L	12.1		3.1	once/quarter***	grab
Ammonia as N (Apr – Jun)	mg/L	10.1		1.5	once/quarter***	grab
Ammonia as N (Jul – Sep)	mg/L	8.4		1.0	once/quarter***	grab
Ammonia as N (Oct – Dec)	mg/L	8.4		2.2	once/quarter***	grab
EFFLUENT PARAMETER(S)	**UNITS**	**MINIMUM**		**MAXIMUM**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
pH – Units**	SU	6.5		9.0	once/quarter***	grab

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2025. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.
** pH is measured in pH units and is not to be averaged.
*** See table below for quarterly sampling.

Quarterly Minimum Sampling Requirements				
Quarter	**Months**	***E. coli***	**All Other Parameters**	**Report is Due**
First	January, February, March	Not required to sample.	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	Sample at least once during any month of the quarter	October 28th
Fourth	October	**Sample once during October**	Sample at least once during any month of the quarter	January 28th
	November & December	Not required to sample.		

Note 1 – Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

B. SCHEDULE OF COMPLIANCE

The facility shall attain compliance with final effluent limitations as soon as possible but in no case later than **September 1, 2024**.

1. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits for Ammonia every 12 months from the effective date of this permit.

2. By **September 1, 2024**, the permittee shall attain compliance with the final effluent limits for parameter.

Please submit progress reports to the Missouri Department of Natural Resources via the Electronic Discharge Monitoring Report (eDMR) Submission System.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. Electronic Discharge Monitoring Report (eDMR) Submission System. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
   (a) eDMR Registration Requirements. The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/mogem. Information about the eDMR system can be found at https://dnr.mo.gov/env/wpp/edmr.htm. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
   (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://apps5.mo.gov/mogems/welcome.action. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
   (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.

2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
   (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.

3. All outfalls must be clearly marked in the field.

4. Report as no-discharge when a discharge does not occur during the report period.

D. SPECIAL CONDITIONS (continued)

5. Reporting of Non-Detects:
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
   (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

6. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

7. The permittee shall develop and implement a program for maintenance and repair of its collection system. The permittee may compare collection system performance results and other data with the benchmarks used in the Departments' Capacity, Management, Operation, And Maintenance (CMOM) Model located at http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc. Additional information regarding the Departments' CMOM Model is available at http://dnr.mo.gov/pubs/pub2574.htm.

   The permittee shall also submit a report via the Electronic Discharge Monitoring Report (eDMR) Submission System annually, by January 28th, for the previous calendar year. The report shall contain the following information:
   (a) A summary of the efforts to locate and eliminate specific sources of excessive infiltration and inflow into the collection system serving the facility for the previous year.
   (b) A summary of the general maintenance and repairs to the collection system serving the facility for the previous year.
   (c) A summary of any planned maintenance and repairs to the collection system serving the facility for the upcoming calendar year. This list shall include locations (GPS, 911 address, manhole number, etc.) and actions to be taken.

8. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Northeast Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: https://dnr.mo.gov/mogem/ or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.

9. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

10. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.

11. An all-weather access road to the treatment facility shall be maintained.

12. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably insure its structural stability, freedom from stoppage, and that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.

E. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.:	MO-0139629
Owner:	Boone County Regional Sewer District (BCRSD)
Address:	1314 North Seventh St., Columbia, MO 65201
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	BCRSD Midway USA WWTF
Facility Address:	2200 North Route J, Rocheport, MO 65279
Legal Description:	See Page 2
UTM Coordinates:	See Page 2
Receiving Stream:	See Page 2
First Classified Stream and ID:	See Page 2
USGS Basin & Sub-watershed No.:	See Page 2

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

See Page 2

This permit authorizes only irrigation of wastewater under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

November 1, 2021
Effective Date

June 30, 2025
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (continued):

Permitted Feature #001 – POTW
The use or operation of this facility shall be by or under the supervision of a Certified "D" Operator.
Trash tank/ flow equalization/ septic tanks/ disc filters/subsurface drip irrigation/ sludge hauled by owner
Design population equivalent is 259.
Design Flow is 6,460 gallons per day.
Design sludge production is 3.8 dry tons per year.

Legal Description:	NE ¼, Sec. 3, T48N, R14W, Boone County
UTM Coordinates:	X = 544574, Y = 4315259
Receiving Stream:	Tributary to Sugar Branch
First Classified Stream and ID:	100K Extent – Remaining Streams (C) (3960)
USGS Basin & Sub-watershed No.:	(10300102-0708)

Permitted Feature #002 – Drip Irrigation Field

Legal Description:	NE ¼, Sec. 3, T48N, R14W, Boone County
UTM Coordinates:	X = 544591, Y = 4315178
Receiving Stream:	Tributary to Sugar Branch
First Classified Stream and ID:	100K Extent – Remaining Streams (C) (3960)
USGS Basin & Sub-watershed No.:	(10300102-0708)

Wastewater Irrigation Design Parameters:
Irrigation volume per year: 2,357,900 gallons (based on annual irrigation rate)
Irrigation areas: 3.0 acres.
Irrigation rates: 0.05 gallons per day per square foot
Field slopes: less than 15 percent
Equipment type: drip irrigation
Vegetation: grass over irrigation field
Irrigation rate is based on: hydraulic loading rate

A. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein.

B. SPECIAL CONDITIONS

1. Wastewater Irrigation System.
   (a) No-discharge facility requirements. Wastewater shall be stored and irrigated during suitable conditions so that there is no discharge from the storage tanks or irrigation sites.
   (b) Set Backs. There shall be no irrigation within:
      (1) 300 feet of any sinkhole, losing stream, or any other feature that may provide a connection to the ground water table and the surface;
      (2) 300 feet from any existing potable water supply well not located on the property;
      (3) 25 feet of dwelling or public use areas;
      (4) 50 feet of any gaining perennial or intermittent streams or tributaries or any publicly or privately owned ponds or lakes.
      (5) 10 feet of the property line.
   (c) Livestock and Crop Restrictions. Vegetation such as grasses or other non-food crops must be grown over the system. The only equipment allowed on the area is equipment used to maintain the vegetation. No livestock shall be allowed to use the area.
   (d) Application. Subsurface irrigation shall not cause surfacing of wastewater.
   (e) Equipment Checks during Irrigation. The irrigation system and application site shall be visually inspected at least once/month during wastewater irrigation to check for equipment malfunctions and runoff from the irrigation site.

B. SPECIAL CONDITIONS (continued)

2. Subsurface dispersion systems under this permit are Class V wells if they have the capacity to serve 20 or more people and shall comply with the reporting requirements of 40 CFR 144.26. In addition, an inventory form shall be submitted to the Department of Natural Resources' Missouri Geological Survey for these wells, as required under Federal regulations. Questions about whether a subsurface dispersion system is a Class V well can be directed to the Missouri Geological Survey's Energy Resources Unit at 573-368-2100.

3. Wastewater treatment and irrigation records shall be maintained and summarized into an annual operating report for the previous calendar year. The report shall be made available during inspection, and to department personnel upon request. The summarized annual report shall include the following:
   (a) Record of maintenance and repairs performed during the year, average number of times per month the facility is checked to see if it is operating properly, and description of any unusual operating conditions encountered during the year;

4. Electronic Discharge Monitoring Report (eDMR) Submission System. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
   (a) eDMR Registration Requirements. The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem. Information about the eDMR system can be found at https://dnr.mo.gov/water/business-industry-other-entities/reporting/electronic-discharge-monitoring-reporting-system-edmr. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
   (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://apps5.mo.gov/mogems/welcome.action. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
   (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: https://dnr.mo.gov/document-search/electronic-discharge-monitoring-report-waiver-request-form-mo-780-2692. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.

5. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
   (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) pursuant to 40 CFR or 403.18(e), respectively.

6. Permittee will cease operation by connection to a facility with an area-wide management plan per 10 CSR 20-6.010(2)(B) within the timeframe allotted by the continuing authority with its notice of its availability. The permittee shall obtain department approval for closure according to section 10 CSR 20-6.010(12) or alternate use of these facilities.

7. Changes in existing pollutants or the addition of new pollutants to the treatment facility

   The permittee must provide adequate notice to the Director of the following:
   (a) Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; and
   (b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
   (c) For purposes of this paragraph, adequate notice shall include information on;
      (1) the quality and quantity of effluent introduced into the POTW, and
      (2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

8. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

9. The permittee shall develop, maintain and implement an Operation and Maintenance (O&M) Manual that includes all necessary items to ensure the operation and integrity of the waste handling and wastewater irrigation systems, including key operating procedures, an aerial or topographic site map with the permitted features, irrigation fields, and irrigation buffer zones marked, and a brief summary of the operation of the facility. The O&M manual shall be made available to the operator and shall be reviewed and updated at least every five years or when there is a change in equipment or irrigation sites.

10. Reporting of Non-Detects:
    (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
    (b) See sufficiently sensitive test method requirements in Standard Conditions Part I, Section A, No. 4 regarding proper testing and method minimum levels used for sample analysis.
    (c) The permittee shall not report a sample result as "Non-Detect" without also reporting the method minimum level of the test. Reporting as "Non Detect" without also including the method minimum level, will be considered failure to report, which is a violation of this permit.
    (d) The permittee shall provide the "Non-Detect" sample result using the less than symbol and the method minimum level (e.g., <50 µg/L, if the method minimum level for the parameter is 50 µg/L).
    (e) Where the permit contains a Department determined Minimum Quantification Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
    (f) For the daily maximum, the facility shall report the highest value. If the highest value was a non-detect, use the less than "<" symbol and the laboratory's highest method minimum level.
    (g) For reporting an average based on all non-detected values, remove the "<" sign from the values, average the values, and then add the "<" symbol back to the resulting average.
    (h) For reporting an average based on a mix of detected and non-detected values (not including *E. coli*), assign a value of "0" for all non-detects for that reporting period and report the average of all the results.
    (i) When *E. coli* is not detected above the method minimum level, the permittee must report the data qualifier signifying less than detection limit for that parameter (e.g., <1 #/100mL, if the method minimum level is 1 #/100mL). For reporting a geometric mean based on a mix of detected and non-detected values, use one-half of the detection limit (instead of zero) for non-detects when calculating geometric means.
    (j) See the Fact Sheet Appendix - Non-Detect Example Calculations for further guidance.

11. Access to the treatment facility and any associated wastewater irrigation equipment must be sufficiently restricted or secured to prevent entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

12. An all-weather access road shall be provided to the treatment facility.

13. Wastewater Irrigation Sites. To add additional irrigation sites or to convert any of the land to public-use-areas, a construction permit, geohydrologic evaluation, soils report, and permit modification may be required. The facility shall contact the Department for a written determination.

D. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0100862
Owner:	Bechtold Properties, LLC
Address:	6401 West Hwy 40, Columbia, MO 65202
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Midway Auto/Truck Plaza WWTF
Facility Address:	6401 West Hwy 40, Columbia, MO 65202
Legal Description:	Sec. 7, T48N, R13W, Boone County
UTM Coordinates:	X=548927, Y=4313850
Receiving Stream:	Henderson Branch
First Classified Stream and ID:	8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.:	(10300102-0708)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – Service Station / Commercial Property / Motel / Daycare / Tire shop / Restaurant / Expo Center
SIC #5541 / #5661 / #5999 / #5932 / #7011 / #8351 / #7534 / #5812 / #7999
Two-cell lagoon with aerated primary cell / sludge retained in lagoon
Design population equivalent is 932.
Design flow is 24,700 gallons per day.
Actual flow is 22,500 gallons per day.
Design sludge production is 6.5 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 621.250 RSMo, Section 640.013 RSMo and Section 644.051.6 of the Law.

September 1, 2018
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

June 30, 2020
Expiration Date

Chris Wieberg, Director, Water Protection Program

OUTFALL #001	**TABLE A-1. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on **September 1, 2018** and remain in effect through **August 31, 2022**. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/month	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		65	45	once/month	grab
Total Suspended Solids	mg/L		110	70	once/month	grab
Ammonia as N	mg/L	*		*	once/month	grab
Oil & Grease	mg/L	15		10	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE OCTOBER 28, 2018. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

EFFLUENT PARAMETER(S)	UNITS	MINIMUM		MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH – Units**	SU	6.5		9.0	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE OCTOBER 28, 2018.

* Monitoring requirement only.

** pH is measured in pH units and is not to be averaged.

OUTFALL #001	**TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **September 1, 2022** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/month	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		65	45	once/month	grab
Total Suspended Solids	mg/L		110	70	once/month	grab
E. coli (Note 1)	#/100mL	1,030		206	once/month	grab
Ammonia as N (Apr 1 – Sep 30) (Oct 1 – Mar 31)	mg/L	2.7 5.8		1.4 3.0	once/month	grab
Oil & Grease	mg/L	15		10	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE OCTOBER 28, 2022. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

EFFLUENT PARAMETER(S)	UNITS	MINIMUM		MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH – Units**	SU	6.5		9.0	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE OCTOBER 28, 2022.

* Monitoring requirement only.
** pH is measured in pH units and is not to be averaged.

Note 1 - Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean.

B. SCHEDULE OF COMPLIANCE

The facility shall attain compliance with final effluent limitations for Ammonia and *E. coli* as soon as reasonably achievable or no later than **4 years** of the effective date of this permit.

1. Within six months of the effective date of this permit, the permittee shall report progress made in attaining compliance with the final effluent limits.

2. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every 12 months from the effective date of this permit.

3. Within **4 years** of the effective date of this permit, the permittee shall attain compliance with the final effluent limits, for Ammonia and *E. coli*.

Please submit progress reports to the Missouri Department of Natural Resources via the Electronic Discharge Monitoring Report (eDMR) Submission System.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I & III standard conditions dated August 1, 2014 and March 1, 2015, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. Electronic Discharge Monitoring Report (eDMR) Submission System.
   The permittee shall submit an eDMR Permit Holder and Certifier Registration form within **90 days** of the effective date of this permit. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure a timely, complete, accurate, and nationally-consistent set of data. Visit http://dnr.mo.gov/pubs/pub2474.pdf to access the Facility Participation Package which contains the eDMR Permit Holder and Certifier Registration form.

   Once the permittee is activated in the eDMR system:
   (a) Discharge Monitoring Reporting Requirements. The permittee must electronically submit compliance monitoring data via the eDMR system. In regards to Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit.
   (b) Programmatic Reporting Requirements. The following reports (if required by this permit) must be electronically submitted as an attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:
      (1) Schedule of Compliance Progress Reports;
      (2) Sludge/Biosolids Annual Reports; and
      (3) Any additional report required by the permit excluding bypass reporting.
      After such a system has been made available by the Department, required data shall be directly input into the system by the next report due date.
   (c) Other actions. The following shall be submitted electronically after such a system has been made available by the Department:
      (1) Notices of Intent to discharge (NOIs);
      (2) Notices of Termination (NOTs); and
      (3) Bypass reporting, See Special Condition #9 for 24-hr. bypass reporting requirements.
   (d) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx.
   (e) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective.
2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
   (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.

3. All outfalls must be clearly marked in the field.

4. Permittee will cease discharge by connection to a facility with an area-wide management plan per 10 CSR 20-6.010(3)(B) within 90 days of notice of its availability.

D. SPECIAL CONDITIONS (continued)

5. Changes in Discharges of Toxic Substances
   The permittee shall notify the Director as soon as it knows or has reason to believe:
   (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
      (1) One hundred micrograms per liter (100 µg/L);
      (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
      (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
      (4) The level established by the Director in accordance with 40 CFR 122.44(f).
   (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

6. Report as No Discharge when a discharge does not occur during the report period.

7. Reporting of Non-Detects:
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
   (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When calculating monthly averages, one-half of the method detection limit (MDL) should be used instead of a zero. Where all data are below the MDL, the "<MDL" shall be reported as indicated in item (c).

8. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

9. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Northeast Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: http://dnr.mo.gov/modnrcag/ or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.

10. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

11. At least one gate must be provided to access the wastewater treatment facility and provide for maintenance and mowing. The gate shall remain closed except when temporarily opened by the permittee to access the facility to perform operational monitoring, sampling, maintenance, or mowing. The gates shall also be temporarily opened for inspections by the Department. The gate shall be closed and locked when the facility is not staffed.

12. At least one (1) warning sign shall be placed on each side of the facility enclosure in such positions as to be clearly visible from all directions of approach. There shall also be one (1) sign placed for every five hundred feet (500') (150 m) of the perimeter fence. A sign shall also be placed on each gate. Minimum wording shall be SEWAGE TREATMENT FACILITY—KEEP OUT. Signs shall be made of durable materials with characters at least two inches (2") high and shall be securely fastened to the fence, equipment or other suitable locations.

13. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.

D. SPECIAL CONDITIONS (continued)

14. An all-weather access road shall be provided to the treatment facility.

15. The discharge from the wastewater treatment facility shall be conveyed to the receiving stream via a closed pipe or a paved or rip-rapped open channel. Sheet or meandering drainage is not acceptable. The outfall sewer shall be protected against the effects of floodwater, ice or other hazards as to reasonably insure its structural stability and freedom from stoppage. The outfall shall be maintained so that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.

16. Sludge treatment storage and disposal practices shall be conducted in accordance with Standard Conditions Part III. The permittee shall receive approval for any sludge treatment, storage, or disposal practices not identified in the facility description of the operating permit.

17. A minimum of two (2) feet of freeboard must be maintained in each lagoon cell. A lagoon level gauge, which clearly marks the minimum freeboard level, shall be provided in each lagoon cell.

18. The berms of the lagoon shall be mowed and kept free of any deep-rooted vegetation, animal dens, or other potential sources of damage to the berms.

19. The facility shall ensure that adequate provisions are provided to prevent surface water intrusion into the lagoon and to divert stormwater runoff around the lagoon and protect embankments from erosion.

APPENDIX C - NATURAL HERITAGE REVIEW & GEOHYDROLOGIC REQUEST

Missouri Department of Conservation

Missouri Department of Conservation's Mission is to
protect and manage the forest, fish, and
wildlife resources of the state and to
facilitate and provide opportunities for all citizens to
use, enjoy and learn about these resources.

Natural Heritage Review Level Two Report: State Listed Endangered Species and/or Missouri Species/Natural Communities of Conservation Concern

There are records of state-listed Endangered Species, or Missouri Species or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact Missouri Department of Conservation for further coordination.

Foreword: Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this website is to provide information to federal, state and local agencies, organizations, municipalities, corporations and consultants regarding sensitive fish, wildlife, plants, natural communities and habitats to assist in planning, designing and permitting stages of projects.

PROJECT INFORMATION

Project Name and ID Number: BCRSD Midway Crossing WWTP Expansion #10833
Project Description: Proposed expansion to the existing BCRSD Midway Crossing WWTP. Sec. 1, T48N, R14W Existing Outfall Lat/Long:38.973943 / -92.448580 Receiving stream: Unclassified Tributary to Sugar Branch. First Classified Stream: Sugar Branch. Project located in Boone County.
Project Type: Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Construction or expansion
Contact Person: Ellen Modglin
Contact Information: emodglin@mcclurevision.com or 5732342641

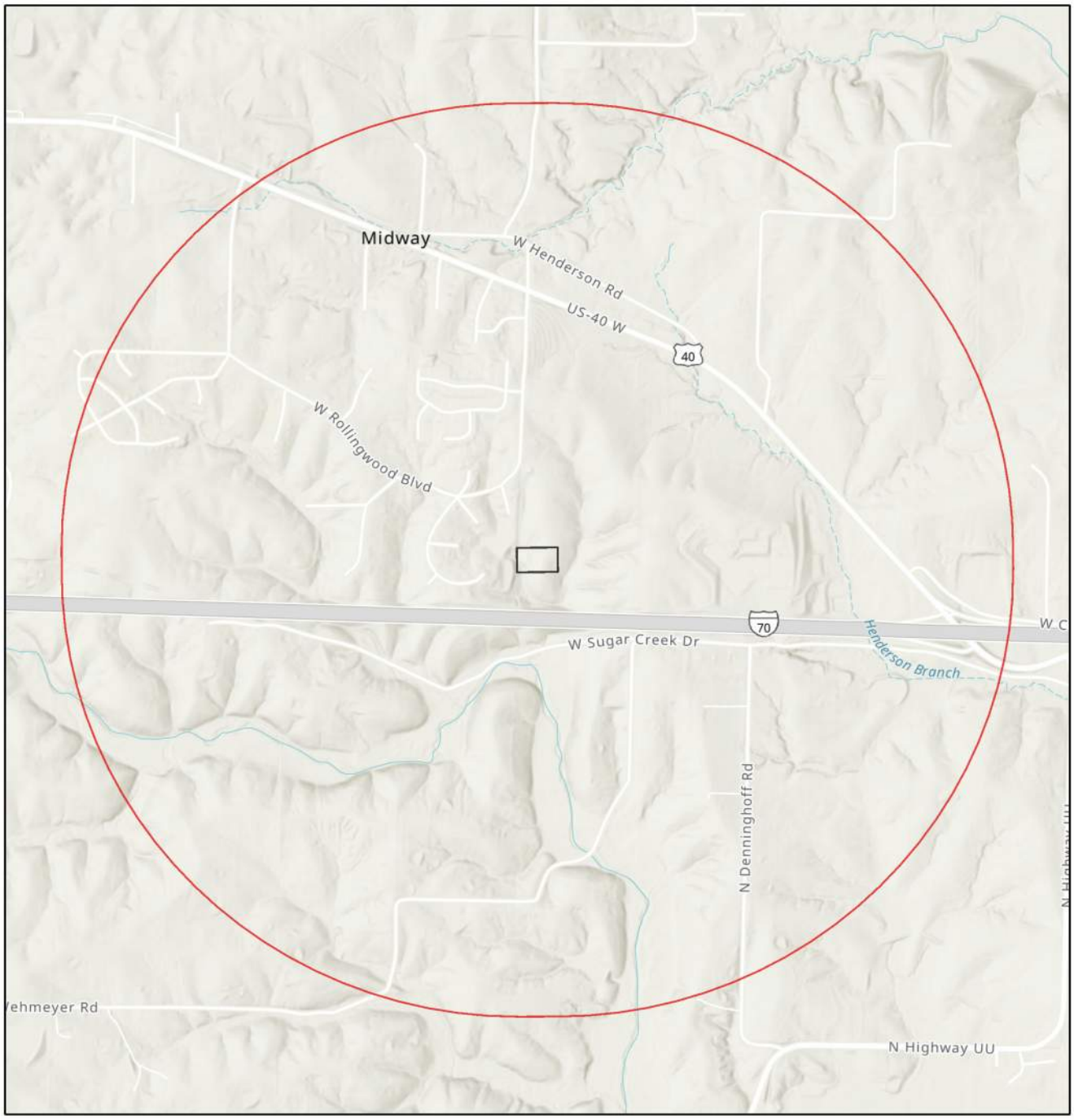
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive species or special habitats. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information. The Natural Heritage Program tracks occurrences of sensitive species and natural communities where the species or natural community has been found. Lack of an occurrence record does not mean that a sensitive plant, animal or natural community is not present on or near the project area. Depending on the project, current habitat conditions, and geographic location in the state, surveys may be necessary. Additionally, because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, Reports include information about records near but not necessarily on the project site.

The Natural Heritage Report is not a site clearance letter for the project. It provides an indication of whether or not public lands and sensitive resources are known to be (or are likely to be) located close to the proposed project. Incorporating information from the Natural Heritage Program into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive fish, forest and wildlife resources. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. The information within this report is not intended to replace Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit the USFWS Information for Planning and Conservation (IPaC) website at https://ecos.fws.gov/ipac/ for further information. This site was developed to help streamline the USFWS environmental review process and is a first step in ESA coordination. The Columbia Missouri Ecological Field Services Office may be reached at 573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203.

Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit https://www.modot.org/ for additional information on recommendations.

BCRSD Midway Crossing WWTP Expansion



April 26, 2022

1:19,759

0 0.15 0.3 0.6 mi

0 0.28 0.55 1.1 km

Buffered Project Boundary

Project Boundary

Species or Communities of Conservation Concern within the Area:

There are records of state-listed Endangered Species, or Missouri Species or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact the Missouri Department of Conservation for further coordination.

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

Other Special Search Results:

Your project is near a designated Natural Area . Please contact Missouri Department of Conservation (NaturalHeritageReview@mdc.mo.gov) for further coordination.

Project Type Recommendations:
Waste Transfer, Treatment and Disposal -Wastewater treatment plant: New or Maintenance; Clean Water Act permits issued by other agencies regulate both construction and operation of wastewater systems, and provide many important protections for fish and wildlife resources throughout the project area and at some distance downstream. Fish and wildlife almost always benefit when unnatural pollutants are removed from water, and concerns are minimal if construction is managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any “Clean Water Permit” conditions.
Revegetate disturbed areas to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crownvetch and Sericea lespedeza. Management Recommendations for Construction Projects Affecting Missouri Rivers and Streams is available at https://mdc.mo.gov/sites/default/files/2020-06/Streams.pdf

Project Location and/or Species Recommendations:

Endangered Species Act Coordination - Indiana bats *(Myotis sodalis*, federal- and state-listed endangered) and **Northern long-eared bats** (*Myotis septentrionalis,* federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April. **If any trees need to be removed for your project, please contact the U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 ext. 100 for Ecological Services) for further coordination under the Endangered Species Act.**

The submitted project location is within the range of the Gray Myotis (i.e., Gray Bat) in Missouri. Depending on habitat conditions of your project's location, Gray Myotis (*Myotis grisescens*, federal and state-listed endangered) could occur within the project area, as they forage over streams, rivers, lakes, and reservoirs. Avoid entry or disturbance of any cave inhabited by Gray Myotis and when possible retain forest vegetation along the stream and from the cave opening to the stream.

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See https://mdc.mo.gov/community-conservation/managing-invasive-species-your-community for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (http://www.nwk.usace.army.mil/Missions/RegulatoryBranch.aspx) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (http://dnr.mo.gov/env/wpp/401/index.html), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit http://dnr.mo.gov/env/wpp/permits/index.html for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Miscellaneous Information
FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.
STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See Missouri Species and Communities of Conservation Concern Checklist (mo.gov) for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at Missouri Fish and Wildlife Information System (MOFWIS). Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI GEOLOGICAL SURVEY
REQUEST FOR GEOHYDROLOGIC EVALUATION OF LIQUID-WASTE TREATEMENT FACILITY/SITE

FOR OFFICE USE ONLY
PROJECT ID NUMBER

FACILITY OR PROJECT LOCATION

FACILITY OR PROJECT NAME	
BCRSD Midway Crossing WWTP	
LEGAL DESCRIPTION	**QUADRANGLE NAME**
01 T48N R14W	HUNTSDALE
WRITTEN LOCATION IF LEGAL DESCRIPTION IS UNAVAILABLE (USE COMMENTS AREA IF NECESSARY)	
COUNTY	**COORDINATE LOCATION**
Boone	**LATITUDE: 38 58 26.61** **LONGITUDE: -92 26 53.46**

ORGANIZATION OFFICIAL INFORMATION

NAME			TELEPHONE
Gary Cunningham, PE			573-814-9260
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
1901 Penn Drive	Columbia	MO	65201
EMAIL ADDRESS (PLEASE PROVIDE AN EMAIL ADDRESS IF YOU WISH TO RECEIVE ELECTRONIC DELIVERY OF EVALUATION REQUEST)			
gcunningham@mcclurevision.com			
FACILITY ADDRESS (IF DIFFERENT FROM ORGANIZATION OFFICIAL'S)	**CITY**	**STATE**	**ZIP CODE**
1901 Penn Drive	Columbia		65202

EVALUATION REQUESTED BY

NAME AND COMPANY			TELEPHONE
Gary Cunningham			573-814-9260
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
1495 County Road 258	Fulton	MO	65251
EMAIL ADDRESS (PLEASE PROVIDE AN EMAIL ADDRESS IF YOU WISH TO RECEIVE ELECTRONIC DELIVERY OF EVALUATION REQUEST)			
fourgirlsdad@gmail.com			

FACILITY INFORMATION

TYPE OF FACILITY	LAGOON/STORAGE BASIN LINER CONSTRUCTION MATERIALS	DISCHARGE	TYPE OF WASTE
MECHANICAL TREATMENT PLANT		FACILITIES WILL DISCHARGE	HUMAN (DOMESTIC)

NUMBER OF ACRES OF LAND APPLICATION OR SUBSURFACE SOIL ABSORPTION AREA	APPLYING FOR STATE REVOLVING FUNDS?	IF YES, WILL AN NPDES PERMIT BE REQUIRED?
ACRES	No	No

THIS PORTION APPLIES TO LAGOONS AND STORAGE BASINS ONLY

	TOTAL ESTIMATED SIZE OF STORAGE BASINLAGOON	MAXIMUM OPERATING DEPTH OF LIQUIDS	MAXIMUM DEPTH OF PROPOSED EXCAVATION IN FEET

WILL FACILITY BE PART OF A CLASS 1A CONFINED ANIMAL FEEDING OPERATION?

No

COMMENTS
Boone County Regional Sewer District is planning upgrades to the existing Midway Crossing WWTP

PREPARER'S SIGNATURE	DATE
Gary Cunningham	04/26/2022
ORGANIZATION OFFICIAL'S SIGNATURE(INDICATES PERMISSION TO ACCESS PROPERTY FOR EVALUATION) Tom Batermann	**DATE** 5/3/2022

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

LWE22099
Boone County

June 21, 2022

Gary Cunningham
1495 County Road 258
Fulton, MO 65251

RE: BCRSD Midway Crossing WWTP

Dear Gary Cunningham:

On May 05, 2022, the Missouri Geological Survey received a request to perform a geohydrologic evaluation for the above referenced project located in Boone County. Included with this letter is a report that details the geologic and hydrologic conditions at the site and the potential for groundwater contamination in the event of wastewater treatment failure.

Thank you for the evaluation request. If you are in need of further assistance or have questions regarding the report, please contact our office at P.O Box 250, Rolla, Mo 65402-0250, by telephone at 573-368-2100 or gspeg@dnr.mo.gov.

Sincerely,

MISSOURI GEOLOGICAL SURVEY

Molly A. Starkey

Molly Starkey
Geologist
Environmental Geology Section

06/21/2022

c: Gary Cunningham, PE
WPP
Northeast Regional Office

Missouri Department Of Natural Resources
Missouri Geological Survey
Geological Survey Program
Environmental Geology Section

Project ID Number
LWE22099
County
Boone County

Request Details

Project: BCRSD Midway Crossing WWTP

Legal Description: 01 T48N R14W
Quadrangle: HUNTSDALE
Latitude: 38 58 26.61
Longitude: -92 26 53.46

Organization Official
Name: Gary Cunningham, PE
Address: 1901 Penn Drive
City: Columbia
State: MO Zip: 65201
Phone: 573-814-9260
Email: gcunningham@mcclurevision.com

Preparer
Name: Gary Cunningham
Address: 1495 County Road 258
City: Fulton
State: MO Zip: 65251
Phone: 573-814-9260
Email: fourgirlsdad@gmail.com

Project Details

Report Date: 06/21/2022
Date of Field Visit: 05/10/2022
Previous Reports: Not Applicable

Facility Type
- [X] Mechanical treatment plant
- [ ] Recirculating filter bed
- [ ] Land application
- [ ] Lagoon or storage basin
- [ ] Subsurface soil absorption system
- [ ] Lagoon or storage basin W/Land App
- [ ] Lagoon or storage basin W/SSAS
- [ ] Other type of facility

Type of Waste
- [ ] Animal
- [X] Human
- [ ] Process or industrial
- [ ] Leachate
- [ ] Other waste type

Funding Source
- [X] IWT
- [ ] WWL-SRF

Additional Information
- [ ] Plans were submitted
- [ ] Site was investigated by NRCS
- [ ] Soil or geotechnical data were submitted

Geologic Stream Classification: [X] Gaining [ ] Losing [ ] No discharge

Overall Geologic Limitations
- [X] Slight
- [ ] Moderate
- [ ] Severe

Collapse Potential
- [X] Not applicable
- [ ] Slight
- [ ] Moderate
- [ ] Severe

Topography
- [ ] <4%
- [X] 4% to 8%
- [X] 8% to 15%
- [ ] >15%

Landscape Position
- [ ] Broad uplands
- [ ] Floodplain
- [ ] Ridgetop
- [ ] Alluvial plain
- [X] Hillslope
- [ ] Terrace
- [ ] Narrow ravine
- [ ] Sinkhole

Bedrock: Mississippian-age Burlington Keokuk Limestone

Surficial Materials: Dark brown silt and loess above gravelly silty clay

Missouri Department Of Natural Resources
Missouri Geological Survey
Geological Survey Program
Environmental Geology Section

Project ID Number
LWE22099
County
Boone County

Recommended Construction Procedures for Earthen Facility	**Determine Overburden Properties**	**Determine Hydrologic Conditions**
☐ Installation of clay pad and Compaction	☐ Particle size analysis	☐ Groundwater elevation
☐ Diversion of subsurface flow	☐ Atterberg limits	☐ Direction of groundwater flow
☐ Artificial sealing	☐ 95% Max. dry density test method	☐ 25-Year flood level
☐ Rock excavation	☐ Overburden thickness	☐ 100-Year flood level
☐ Limit excavation depth	☐ Permeability coefficient-undisturbed	
	☐ Permeability coefficient-remolded	

Remarks:

On May 10, 2022, a geologist with the Missouri Geological Survey conducted a geohydrologic evaluation for proposed upgrades to the existing water treatment facility for the Boone County Regional Sewer District's Midway Crossing Wastewater Treatment Plant. The purpose of the site visit was to observe the geologic and hydrologic characteristics of the site and to determine the potential impacts in the event of water treatment failure. The site is located on a hillslope, two miles west-northwest of the City of Columbia in Boone County.

Surficial materials on and around the site were observed in situ in stream bank cuts and and sampled with a handheld auger. Surficial materials were predominantly dark brown silt loam and loess. In some areas a red brown gravelly silty clay was encountered below the silt loam. These materials have a moderate permeability overall. Areas with higher amounts of cherty gravel will have moderate to high permeability. Surficial material thickness is variable in the area, but is estimated at 5 to 10 feet at the site.

Bedrock was observed on site and in the surrounding area. Uppermost bedrock is the Mississippian-age Burlington-Keokuk Limestone; a gray to white highly fossilized limestone. Minor karst development along bedding planes was observed in outcrops along the stream banks, but no enlarged joints or other features were observed in the stream channel. This bedrock has a low primary permeability, but a high secondary permeability in areas where karst conduits have developed. There are many sinkholes in this portion of Boone County, but there are none known within one mile of the site.

The receiving stream was classified during the site visit, as the facility discharges to waters of the state. The uppermost stretch of the receiving stream was poorly sorted, with an erratic gradient, but below the upper reaches displayed a consistent gradient with moderate sorting. Consistent flow was observed in the stream, with alternating gravel and bedrock substrate. This unnamed tributary to Sugar Branch has been classified as gaining. Sugar Branch had previously been classified as gaining and observations during this site visit support that conclusion.

This site receives a slight overall geologic limitations rating. In the event of treatment failure, the local shallow groundwater and the surface waters of the unnamed tributaries to Sugar Branch may be adversely impacted.

APPENDIX D – BCRSD/CITY OF COLUMBIA CONNECTION AGREEMENTS

extra copy

CITY OF COLUMBIA, MISSOURI

PUBLIC WORKS DEPARTMENT

August 25, 2015

Tom Ratermann
Boone County Regional Sewer District
1314 N. 7th Street
Columbia, MO 65201

RE: Amendment No 3 to General Cooperative Agreement

Enclosed for your file is a fully executed Amendment No. 3 to the general cooperative agreement between the City of Columbia and Boone County Regional Sewer District relating to sewer service within Midway area and financial participation in the construction of the Henderson Branch Sewer Extension project. Also enclosed is a copy of City Ordinance 22555 authorizing the execution of this amendment.

If you have any questions concerning this amendment, please contact me at 874-7255.

DEPARTMENT OF PUBLIC WORKS

Kim McCulloch

Kim McCulloch
Assistant to the Public Works Director

Enclosures

c: David Sorrell, P.E.

701 E. Broadway • P.O. Box 6015 • Columbia, Missouri 65205-6015
(573) 874-7250 • FAX (573) 874-7132 • www.GoColumbiaMo.com

Introduced by McDavid

First Reading 8-3-15 Second Reading 8-17-15

Ordinance No. 022555 Council Bill No. B 232-15

AN ORDINANCE

authorizing Amendment 3 to the general cooperative agreement with the Boone County Regional Sewer District relating to sewer service within the Midway area and financial participation in the construction of the Henderson Branch Sewer Extension project; and fixing the time when this ordinance shall become effective.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. The City Manager is hereby authorized to execute Amendment 3 to the general cooperative agreement with the Boone County Regional Sewer District relating to sewer service within the Midway area and financial participation in the construction of the Henderson Branch Sewer Extension project. The form and content of the agreement shall be substantially in the same form as set forth in "Exhibit A" attached hereto.

SECTION 2. This ordinance shall be in full force and effect from and after its passage.

PASSED this 17th day of August, 2015.

ATTEST:

City Clerk

Mayor and Presiding Officer

APPROVED AS TO FORM:

City Counselor

AMENDMENT 3 TO THE GENERAL COOPERATIVE AGREEMENT DATED MARCH 8TH, 2011

On this 19th day of August, 2015, the Boone County Regional Sewer District, a common sewer district organized pursuant to Chapter 204 RSMo ("District") and the City of Columbia, Missouri, a municipal corporation ("City") hereby amend their agreement of March 8th, 2011 (hereinafter the General Cooperative Agreement).

WHEREAS, the General Cooperative Agreement contemplated that said agreement may be amended from time to time by adding, deleting, and/or revising the Special Conditions and Exhibits as needed and as mutually agreed upon by the Board of Trustees of the District and the City Council of the City; and

WHEREAS, the following are the revisions to the GENERAL CONDITIONS and the SPECIAL CONDITIONS of the General Cooperative Agreement.

REVISIONS TO THE GENERAL CONDITIONS

1. Section 1 is deleted in its entirety. In its place a new Section 1 is included, as follows:

   1. The scope of the this agreement is limited to those geographic areas within the "Boundary of Area Covered by Agreement" on the attached Exhibits 1 through 9, both inclusive, and which are entitled "State Highway HH Cooperative Agreement", "Westwood Meadows Cooperative Agreement", "El Rey Heights Cooperative Agreement", "Cow Branch Watershed Cooperative Agreement", "Little Bonne Femme Pump Station Cooperative Agreement", "Jerry Morris Subdivision Cooperative Agreement", "Water's Edge, Lakewood Villas, Lakewood Estates, Lakeland Acres and Pin Oak Subdivisions Service Area", "Abilene Acres Cooperative Agreement" and "Midway Area Cooperative Agreement".

   All other GENERAL CONDITIONS of the original March 8th, 2011, General Cooperative Agreement shall remain in effect.

END OF GENERAL CONDITIONS, BEGINNING OF SPECIAL CONDITIONS

SPECIAL CONDITIONS

1. Add the following Special Condition 9 & 10.

   9. The City and District agree that the customers in the District's service area shown on Exhibit 9, "Midway Area Cooperative Agreement" shall be allowed to connect to the City's wastewater treatment and collection system as provided for in the GENERAL CONDITIONS of this agreement.

   10. The City and District agree to share in the cost to construct the "Henderson Branch Sewer Extension" as follows:

a. The Henderson Branch Sewer Extension (HBSE) shall be constructed from the City existing Perche Creek Outfall Sewer to the existing WWTF currently serving the Midway Plaza Truck Stop generally following the Henderson Branch Creek in a route determined by the City.

b. The City shall prepare the construction plans, specifications and bid documents for the HBSE project.

c. The City shall acquire all easements necessary for construction of the HBSE project.

d. The City shall bid the HBSE project pursuant to established City policy. District shall reimburse the City for 31.3%, with a not to exceed amount of $628,047.00, of the cost to construct the HBSE project which includes construction, engineering, subsurface exploration to determine rock excavation quantities and easement acquisition; but District shall not pay for easement acquisition related to trail easements.

e. The City shall own and maintain the entire length of HBSE project.

f. The City shall provide construction management services for the HBSE project.

g. The project contribution by the District shall be paid in five equal annual installments without interest, commencing within 60 days of District's receipt that construction of HBSE project has been completed and work accepted by the City, and each subsequent installment being due on the anniversary date of the first installment. These payments would be subject to annual appropriations, however if the funds are not appropriated and paid to the City all existing and proposed District's service area shown on Exhibit 9 "Midway Area Cooperative Agreement" may be, refused connection or become City customers at the City's option.

IN WITNESS WHEREOF, the Parties have caused this amendment to be executed by their duly authorized agents on the day and year first above written.

CITY OF COLUMBIA, MISSOURI

BY: _____
Michael Matthes, City Manager

ATTEST

_____
Sheela Amin, City Clerk

APPROVED AS TO FORM:

Nancy Thompson, City Counselor

BOONE COUNTY REGIONAL SEWER DISTRICT

BY: _____
Randall Chann, Chair

ATTEST:

_____
Lesley Oswald, Assistant Secretary

APPROVED AS TO FORM:

_____
John L. Whiteside, General Counsel

N

0 0.25 0.5 1 Miles

Scale

US Hwy 40

US Hwy 40

I-70

I-70

Perche Creek

Henderson Branch

Boundary of Area Covered by Agreement

Route UU

Perche Creek

Legend

- Existing BCRSD Customers - Annex and Develop to City Standards Total Area=21.5 acres
- Proposed BCRSD Customers - Annexation Not Required Unless Subdivides or Use of Property Changes to Non-Residential - Total Area=400 acres
- Existing BCRSD Customers - Not Required to Annex and Develop to City Standards to Receive Sewer Service - Total Area=242 acres
- Proposed City of Columbia Customers - Annex and Develop to City Standards - Total Area=1454 acres
- Existing City Trunk Sewer
- Proposed Sewer
- City Limits
- Henderson Branch Watershed Boundary Total Area=1300 acres

Parcel Information Property of Boone County

City of Columbia, Missouri
Department of Public Works

BCRSD Midway Connection Agreement Map
Exhibit 9

Scale: As Shown	Drawn: J.K.M	Date: 7/13/2015

APPENDIX E – BCRSD/VH PROPERTIES AGREEMENT

Recorded in Boone County, Missouri
Date and Time: 05/04/2022 at 01:35:56 PM
Instrument #: 2022009662 Book: 5615 Page: 76
Instrument Type: AGR
Recording Fee: $45.00 S
No. of Pages: 8
Nora Dietzel, Recorder of Deeds

AGREEMENT FOR PROVISION
OF WASTEWATER COLLECTION AND TREATMENT SERVICES

THIS AGREEMENT dated the 21st day of April, 2022, is made by and between Boone County Regional Sewer District, a common sewer district organized and operated under the provisions of Chapter 204 RSMo., (herein "District"), and VH Properties, LLC, a Missouri Limited Liability Company, and Larry W. Potterfield (herein "Developer").

IN CONSIDERATION of the performance by each party of the respective obligations described in this agreement, the parties specifically agree to the following:

1. **Background of Agreement** - This Agreement is made in view of the following facts which the parties agree to be true:

1.1 Developer owns real estate (the "Property") located in Boone County, Missouri and described as follows:

Lots 3-4 of the FINAL PLAT of VH ACRES, PLAT No. 2 as shown by final plat recorded in Plat Book 49, Page 14, Records of Boone County, Missouri.

District currently operates Midway Arms WWTP (the "WWTP"), a wastewater collection and treatment system providing collection and treatment services to the Property. Said treatment system is currently operating under Missouri State Operating Permit issued by the State of Missouri Department of Natural Resources; said Permit Number being MO-0108421 with an effective date of November 1, 2020 (the "MSOP").

1.2 Developer is willing to make improvements to the existing collection and treatment system in order to meet the final effluent limitations outlined in the MSOP if required in the future in exchange for District's agreement to provide wastewater collection and treatment services. Such agreement shall be in writing and shall contain such terms and conditions as mutually agreed upon by Developer and District. Developer's timely performance of its obligations under the terms and conditions of this Agreement shall be a condition precedent to District's performance of its obligations under this Agreement.

1.3 District is willing to provide wastewater collection and treatment services to the Property, subject to the terms and conditions set forth herein.

1.4 In order to memorialize the terms and conditions of the Developer's and District's agreement with respect to the provision of public sanitary sewer services to Developer's property, the parties are entering into this written Agreement.

2. **Developer's Obligations** - Developer agrees to perform the following obligations:

2.1 **Design and Construction of Future Improvements to Midway Arms WWTP** – The State of Missouri requires certain improvements to the WWTP as outlined in the MSOP, and Developer shall pay any and all costs associated with said improvements. Such costs shall include, but not be limited to, environmental studies (such as a "Reasonable Potential Analysis" study) if required by MDNR. Developer hereby agrees to, at Developer's sole expense, retain a licensed, qualified engineer reasonably acceptable to District to develop the plans and specifications for construction of the new public sewer main, treatment system and sewer connections to the WWTP, with overall capacity and design approved by District, in accordance with District and MDNR standards and regulations. Upon District's approval of such plans and specifications, Developer further agrees to construct such improvements at Developer's sole expense in accordance with the approved plans and specifications. Plans and specifications for the construction of the new public sewer main, treatment system and sewer connections shall be reviewed and approved by District as a condition precedent to the performance by District of its obligations under this Agreement. All sanitary sewer construction by Developer shall be inspected and approved by District. Developer agrees to obtain all necessary permits and to pay all fees for permits required by governmental agencies having jurisdiction over construction work.

2.2 **Connection to City of Columbia** – The provisions of Section 2.1 of this Agreement notwithstanding, Developer may elect to connect the Property to the City of Columbia wastewater collection system in lieu of paying costs associated with improvements to the WWTP required by the State of Missouri. In the event that Developer elects to connect the Property to the City of Columbia wastewater collection system, Developer hereby agrees to, at Developer's sole expense, retain a licensed, qualified engineer reasonably acceptable to District to develop the plans and specifications for the construction of extension of the existing collection system to the City of Columbia collection system, in accordance with District and MDNR standards and regulations. Upon District's approval of such plans and specifications, Developer further agrees to construct such extension at Developer's sole expense in accordance with the approved plans and specifications. Plans and specifications for the construction of the extension shall be reviewed and approved by District as a condition precedent to the performance by District of its obligations under this Agreement. All sanitary sewer construction by Developer shall be inspected and approved by District.

2.3 **District Permits** – Developer shall discharge wastewater into District's collection and treatment system only in compliance with a Waste Water Treatment Capacity Allocation Permits duly issued by District. Each of the four lots comprising the

Property shall operate in compliance with a separate permit for each individual lot. The permits shall authorize daily discharge of wastewater in an amount not to exceed the following: (i) Lot 1 of the Property – six hundred (600) gallons per day; (ii) Lot 2 of the Property – one thousand (1,000) gallons per day; (iii) Lot 3 of the Property – two thousand (2,000) gallons per day; and (iv) Lot 4 of the Property – one thousand two hundred (1,200) gallons per day. Each such permit shall run with the land to which it applies, be binding upon the Developer and its successors in title, and shall be recorded by District in the office of the Boone County Recorder of Deeds. Developer agrees that it will comply with all conditions of the permits issued by District. In the event that Developer connects to the City of Columbia wastewater collection system and, consequently, the above-described permits are no longer required, District shall rescind the permits and record appropriate documentation of such rescission with the Boone County Recorder of Deeds as necessary. Upon Developer's connection to the City of Columbia wastewater collection system and rescission of the above-described permits, capacity will be limited to the hydraulic capacity of the collection system.

2.4 **Closure of WWTP** – In the event that operation of the WWTP is no longer necessary due to Developer's election to connect to the City of Columbia wastewater collection system or for any other reason, Developer shall close the WWTP in accordance with the MSOP at the sole expense of Developer.

2.5 **Pumping of Septic Tank** – Developer agrees that District may pump out the septic tank serving the building located on the Property commonly known as the Midway Arms building ("Midway Arms Septic Tank") at any time until such time as the Midway Arms Septic Tank has been replaced or is no longer needed. The necessity for pumping the Midway Arms Septic Tank, the frequency of such pumping, whether the Midway Arms Septic Tank has been replaced or is no longer needed, and all other considerations related to pumping the Midway Arms Septic Tank shall be determined by District at its sole and exclusive discretion. Developer agrees to bear all costs associated with District pumping the Midway Arms Septic Tank as determined in accordance with the District's Labor and Equipment Rates in effect at the time of such pumping, which rates may be amended from time to time at the sole discretion of District. District shall bill the Developer for the service described in this Section 2.5, and Developer shall promptly remit payment to District for such services rendered in addition to Developer's payment for services as described in Section 3.1 below.

2.6 **Timeline and Payment of Penalty** – By no later than September 1, 2024, Developer shall either (i) complete construction of the improvements to the WWTP in accordance with Section 2.1 of this Agreement; (ii) connect the Property to the City of Columbia wastewater collection system in accordance with Section 2.2 of this Agreement; or (iii) subject to available capacity, connect to District's Midway Crossing Wastewater Treatment Plant at Developer's sole cost and expense and in accordance with a separate written agreement with District. If, after failure by Developer to perform one of the actions described in clauses (i) – (iii) of the preceding sentence by September 1, 2024, the Missouri Department of Natural Resources assesses a penalty, fee, fine or any other monetary demand of any sort whatsoever against District for violation of the MSOP, Developer shall be liable for any such penalty, fee, fine or monetary demand and Developer shall reimburse District the full and complete amount of any such penalty, fee,

fine or monetary demand.

3. **District Obligations** - District hereby agrees to undertake and perform the following obligations:

3.1 **Provision of Treatment Services** - In exchange for Developer's performance of Developer's obligations under this Agreement, District agrees to provide wastewater collection and treatment services necessary to serve Developer's development as described in Section 1.1 above as permissible under the zoning regulations of Boone County and Missouri Department of Natural Resources design guidelines for waste water treatment capacity necessary to serve the Property, with overall treatment capacity not to exceed 4,800 gallons per day. All service shall be provided in accordance with and subject to District's normal rules, policies, procedures and regulations applicable to providing customer services and at the rates and charges normally scheduled for those services. Specifically, Developer shall pay four (4) base service fees (one such fee for each commercial building of the Property), District's standard treatment charge based upon water usage, and surcharges for septic tank pumping and pump maintenance, in accordance with Rate B of District's User Rate Regulations and its 2022 Labor and Equipment Rates, both of which may be amended from time to time.

3.2 **Conduct Plan Review and Evaluation** – Developer acknowledges that District intends to retain a licensed, qualified engineer to conduct independent plan review and evaluation of the construction plans and specifications described in Sections 2.1 or 2.2 herein as applicable. The Developer shall reimburse to the District the actual cost of the plan review and evaluation study within sixty (60) days of invoice. Cost of independent plan review and evaluation of the construction plans shall not exceed $5,200 without written approval of the Developer.

3.3 **Waiver of Connection Fees** - District agrees not to impose general District connection fees for the lots for which treatment capacity is provided under this Agreement so long as Developer fulfills all obligations hereunder.

3.4 **Conveyance of WWTP Site** – District hereby covenants and agrees that in the event that District or its successor or assign shall cease to use the real estate upon which the WWTP is located for wastewater collection and treatment purposes and reclaim such property, then District shall give reasonable written notice to the Developer or their successor or assign of such fact, including the filing of such notice in the land records of Boone County, Missouri. After District's notice to Developer and completion of the closure of the WWTP by Developer in accordance with Section 2.4 of this Agreement, District or its successors or assigns covenants and agrees that it shall convey the real estate upon which the WWTP is located to the Developer or their successors or assigns. If the Developer fails to close the WWTP in accordance with Section 2.4 of this Agreement, then the District's covenant to convey shall be thereafter void and of no force or effect.

4. **Assignment** - The Developer shall not assign its rights or obligations under this Agreement in whole or in part as a part of any sale or transfer of ownership of the land to which this Agreement is applicable without the written consent of District; provided, however, nothing in the Agreement shall be construed to prohibit Developer from selling, leasing, or assigning part or all of its ownership interests in the property which is the subject matter of this Agreement under permissible

zoning provided that any such sale, lease, or assignment shall be subject to the terms and conditions of this Agreement as applicable and any other regulations adopted by the District which are binding upon users of District services and customers of the District.

5. **Miscellaneous** - The following provisions shall be applicable to the entire Agreement unless the specific language of any provision herein shall indicate otherwise:

5.1 This Agreement shall be governed by and construed pursuant to the laws of the State of Missouri.

5.2 Time is declared to be of the essence of this Agreement.

5.3 The parties hereto agree that this Agreement was negotiated at arm's length and that for purposes of interpretation neither party shall be deemed the drafter of this Agreement.

5.4 Whenever the context requires, the singular shall be deemed to include the plural, the plural shall be deemed to include each of the singular, and pronouns of one or no gender shall be deemed to include the equivalent pronoun of the other or no gender.

5.5 Each person whose signature appears subscribed below on behalf of any entity party hereto who is not a natural person, does hereby warrant that he or she is duly authorized to so subscribe this Agreement and that said act is sufficient, or has been made sufficient by co-subscription or seal, to bind and commit said entity to all terms, requirements and conditions of this Agreement.

5.6 All exhibits and other documents specifically referenced herein shall be for all purposes incorporated herein and adopted by reference, as is set forth herein verbatim et literatim.

5.7 Unless specified otherwise, any reference to a "day" or "days" herein shall mean a calendar day or days.

5.8 The rights, powers and remedies of either party contained in this Agreement are cumulative; and no one of them is exclusive of the others or exclusive of any rights, powers or remedies allowed either party by law, and shall not affect the right of either party to pursue any other equitable or legal remedy to which that party might be entitled so long as any remedy remains unsatisfied or undischarged.

5.9 No waiver by either party or any breach of any other party's obligations, agreements, or covenants hereunder shall be deemed to be a waiver of any prior or subsequent breach of the same or any other obligation, agreement, or covenant, nor shall any forbearance to seek remedy for any such breach be deemed a waiver by either party of its rights and remedies with respect to such breach or any prior or subsequent breach.

5.10 Neither this Agreement, nor any terms or provisions hereof, may be changed, discharged, or terminated orally, but only by an instrument in writing signed by the party against whom enforcement of the change, discharge or termination is sought.

5.11 The covenants, promises and conditions to be performed pursuant to this Agreement shall survive the closing of the transaction and shall continue to be binding upon the parties hereto, their heirs, personal representatives, successors and assigns.

5.12 This Agreement shall be binding upon, and inure to the benefit of, Developer and District, and their respective successors and permitted assigns.

5.13 The parties hereby waive trial by jury in any action or lawsuit brought by either party against the other, at any time, arising out of this Agreement or the subject matter of this contact.

6. **Entire Agreement and Amendment of Agreement** - This Agreement constitutes the entire agreement of the parties and supersedes all prior negotiations and agreements between the parties, written or verbal, and may be amended only by a signed writing executed with the same formality as this Agreement. All parties to this Agreement acknowledge that by executing this Agreement they have read, considered, and understand the terms and conditions of this agreement and consequences thereof.

7. **Signature, Execution, and Authorizations.** This Agreement may be executed in two or more counterparts, each of which together shall be deemed an original, but all of which together shall constitute one and the same instrument. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a ".pdf" format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or ".pdf" signature page were an original thereof. Each party agrees that this Agreement may be electronically signed, and that any electronic signatures appearing on this Agreement are the same as the handwritten signatures for the purposes of validity, enforceability, and admissibility.

8. **Recording** – The District shall record this Agreement in the office of the Boone County Recorder of Deeds.

9. **Developer Representations and Warranties** – On behalf of Developer, the undersigned hereby represent and warrant to District that each of the persons who signs this agreement is empowered to bind said Developer, in their respective capacities as _____ and/or individual, to the terms and conditions herein contained.

[*Remainder of page intentionally blank; signature page follows*]

IN WITNESS WHEREOF, the undersigned have executed this Agreement as of the day and year first set forth above.

DEVELOPER:

VH PROPERTIES, LLC

By: _____

Printed Name: Larry Potterfield

Title: Member

and

_____

Larry W. Potterfield

DISTRICT:

BOONE COUNTY
REGIONAL SEWER DISTRICT

By: _____

Tom Ratermann, General Manager

ATTEST:

_____

Lara Florea, Assistant Secretary

FORM APPROVED:

By: _____

Christopher Pieper, General Counsel

BOONE COUNTY MO MAY 04 2022

State of Missouri)
)SS.
County of Boone)

On this 22nd day of April, 2022, before me, a Notary Public in and for the County of Boone, in the State of Missouri, personally appeared Tom Ratermann, to me known to be the General Manager of the Boone County Regional Sewer District, described in and who executed the foregoing agreement for provision of Wastewater Treatment Services, on behalf of said Boone County Regional Sewer District for the purposes therein stated.

IN TESTIMONY THEREOF, I have hereunto set my hand and affixed my official seal, at my office in Columbia, Missouri, the day and year first above written.

My Commission expires 4/20/2024

ANDY LISTER
Notary Public - Notary Seal
Boone County - State of Missouri
Commission Number 12518060
My Commission Expires Apr 20, 2024

Andy Lister, Notary Public

ANDY LISTER
Notary Public - Notary Seal
Boone County - State of Missouri
Commission Number 12518060
My Commission Expires Apr 20, 2024

State of Missouri)
)SS.
County of Boone)

On this 28th day of April, 2022, before me, a Notary Public in and for the County of Boone, in the State of Missouri, personally appeared **Larry W. Potterfield, Member of VH Properties, LLC** to me known to be the persons who executed the foregoing Agreement for Provision of Wastewater Treatment Services, and being duly sworn, acknowledged that he is a Member of **VH Properties, LLC**, a limited liability company, and that he is authorized by said limited liability company to execute said Agreement for Provision of Wastewater Treatment Services on behalf of said Limited Liability company and acknowledged that he executed the same as a free act and deed of said limited liability company for the purposes therein stated.

IN TESIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in Boone County, Missouri, the day and year first above written.

Jason M. Kemna , Notary Public

State of Missouri)
)SS.
County of Boone)

JASON M. KEMNA
Notary Public - Notary Seal
State of Missouri
Commissioned for Boone County
My Commission Expires: June 25, 2023
Commission Number: 15180419

On this 28th day of April, 2022, before me, a Notary Public in and for the County of Boone, in the State of Missouri, personally appeared **Larry W. Potterfield, Developer**, to me known to be the person who executed the foregoing Agreement for Provision of Wastewater Treatment Services, and acknowledged that he executed the same as his free act and deed.

IN TESIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in Boone County, Missouri, the day and year first above written.

JASON M. KEMNA
Notary Public - Notary Seal
State of Missouri
Commissioned for Boone County
My Commission Expires: June 25, 2023
Commission Number: 15180419

Jason M Kemna , Notary Public