STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

The Missouri Department of Natural Resources hereby issues a permit to:

City of Burlington Junction
Burlington Junction Wastewater Treatment Facility
Danube Road
Burlington Junction, MO 64428

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo., and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources.

As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

September 18, 2024
Effective Date

September 17, 2026
Expiration Date

John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction will include facilities for chlorination and dechlorination wastewater treatment at the lagoons to meet disinfection requirements on the facility operating permit. The lagoon berms will be raised 2 feet to improve available storage capacity and general flood resiliency for the facility. Some minor improvements will also be implemented, including replacement of the weir gate and transfer structures, updates to the influent pump station, and placing riprap on the lagoon berms.

This project will include general site work appropriate to the scope and purpose of the project and all necessary appurtenances to make a complete and usable wastewater treatment facility.

II. COST ANALYSIS FOR COMPLIANCE

Pursuant to Section 644.145, RSMo., when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a "finding of affordability" on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

The department is required to determine "findings of affordability" because the permit applies to a **combined or separate sanitary sewer system for a publically-owned treatment works.**

Cost Analysis for Compliance - The department has made a reasonable search for empirical data indicating the permit is affordable. The search consisted of a review of department records that might contain economic data on the community, a review of information provided by the applicant as part of the application, and public comments received in response to public notices of this draft permit. If the empirical cost data was used by the permit writer, this data may consist of median household income, any other ongoing projects that the department has knowledge, and other demographic financial information that the community provided as contemplated by Section 644.145.3. See **APPENDIX – COST ANALYSIS FOR COMPLIANCE**.

III. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.

2. All construction shall be in accordance with the plans and specifications submitted by Lamp Rynearson on September 27, 2022, and signed and sealed by Jon Shellhorn, P.E. on September 26, 2022, and approved by the department on September 18, 2024.

3. Regulation 10 CSR 20-4.040(18)(B)1 requires that projects be publicly advertised, allowing sufficient time for bids to be prepared and submitted. Projects should be advertised at least 30 days prior to bid opening.

4. The department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

5. Per 10 CSR 20-4.040(19), all changes in contract price or time within the approved scope of work must be by change order.

6. State and federal law does not permit bypassing of raw wastewater; therefore, steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's electronic Sanitary Sewer Overflow/Bypass Reporting system at https://dnr.mo.gov/mogem/ or Kansas City Regional Office per 10 CSR 20-7.015(9)(G).

7. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the department's ePermitting system available online at https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem. See https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting for more information.

8. A United States Army Corps of Engineers (USACE) Section 404 Department of Army permit (§404) along with the department's Section 401 Water Quality Certification or waiver (§401) may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S., then a §404/§401 will likely be required. Since the USACE makes determinations on what is jurisdictional, you must contact the USACE to determine permitting requirements.

See https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality for more information or you may contact the department's Water Protection Program at 573-522-4502 or wpsc401cert@dnr.mo.gov.

9. Upon completion of construction:

   A. The City of Burlington Junction will become the continuing authority for operation and maintenance of these facilities;

   B. Submit an electronic copy of the as-builts if the project was not constructed in accordance with previously submitted plans and specifications;

   C. Submit the eDMR Permit Holder and Certifier Registration, Form MO 780-2204 to comply with your operating permit; and

   D. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

   The proposed project at the Burlington Junction Wastewater Treatment Facility (WWTF) will ensure that the facility has greater capacity in meeting its effluent limits by the construction of a chlorine disinfection system that will treat for *E. coli*. The construction will provide greater resilience for the existing treatment facility, raising the berms of the lagoon cells beyond the 100-year floodplain. This construction will also include some minor improvements to the existing lagoon system, such as adding riprap to the lagoon cells for erosion control and the replacement of lagoon transfer structures and weir gates.

2. FACILITY DESCRIPTION

   The Burlingtion Junction WWTF is located off of Danube Road, Burlington Junction, Missouri, in Nodaway County. The facility has a design average flow of 76,000 gallons per day (gpd) and serves a hydraulic population equivalent of approximately 760 people. The proposed construction will maintain the same design average flow and methods of treatment, with expanded storage capacity in the existing facilities to meet department storage requirements and options for meeting disinfection requirements.

3. COMPLIANCE PARAMETERS

   The following limits will be applicable to the facilty after completion of construction:

Parameter	Units	Quarterly average limit
Total Residual Chlorine	µg/L	< 130
Dissolved Oxygen	mg/L	Monitoring Only

.

4. REVIEW OF MAJOR TREATMENT DESIGN CRITERIA

Existing major components that will remain in use include the following:

- Lagoon Cell No. 1 is non-aerated and has a surface area of 3.8 acres and a wastewater volume of 3.54 million gallons. This cell has 2 feet (ft) of freeboard, 3 ft of operating depth, and 1 ft of sludge depth. This provides approximately 47 days of detention at the proposed design flow.
- Lagoon Cell Nos. 2 and 3 are non-aerated. Cell No. 2 has a surface area of 1.15 acres and a wastewater volume of 1.01 million gallons. Cell No. 3 has a surface area of 0.37 acres and a wastewater volume of 0.29 million gallons. These two cells have 2 ft of freeboard, 3 ft of operating depth, and 1 ft of sludge depth. Together, the two cells provide approximately 17 total days of detention at the proposed design flow.

Construction will cover the following items:

- Components are designed for design flow of 76,000 gpd, with a peak hourly flow of 211 gallons per minute (gpm) and a design maximum daily flow of 84,000 gpd.
- The proposed construction will modify the existing lagoon cells to increase their available capacity by raising the berms of each cell two feet. The resulting construction will modify the lagoon cells as such:
    - Lagoon Cell No. 1 will expand to a surface area of approximately 4.13 acres, with a wastewater volume of 5.19 million gallons. The cell will have 2 ft of freeboard, 5 ft of operating depth, and 1 ft of sludge depth. This provides approximately 69 days of detention at the proposed design flow.
    - Lagoon Cell No. 2 will expand to a surface area of approximately 1.37 acres, with a wastewater volume of 1.43 million gallons. The cell will have 2 ft of freeboard, 5 ft of operating depth, and 1 ft of sludge depth. This provides approximately 19 days of detention at the proposed design flow.
    - Lagoon Cell No. 3 will expand to a surface area of approximately 0.50 acres, with a wastewater volume of 579,000 gallons. The cell will have 2 ft of freeboard, 5 ft of operating depth, and 1 ft of sludge depth. This provides approximately 8 days of detention at the proposed design flow.
- Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
    - Tablet Chlorinator – Installation of a tablet chlorination chamber receiving clarified effluent and prior to the chlorine contact tank. The tablet chlorinator shall have a design flow of 76,000 gpd and a maximum flow of 400,000 gpd.

The system will dispense hypochlorite as the wastewater comes into contact with the tablets.

- Chlorine Contact Tank – Lagoon Cell No. 3 is acting as the contact tank for the treatment facility, with chlorination treatment for the influent starting upon entering into the treatment cell. This tank will allow for a 15-minute contact time during a peak flow of 211 gpm.
- Tablet Dechlorinator – Installation of a tablet dechlorination chamber receiving the chlorinated effluent and prior to Outfall No. 001. The dechlorinator is located at the discharge of Lagoon Cell No. 3. The tablet dechlorinator shall have a design flow of 76,000 gpd and a maximum flow of 400,000 gpd. The system will dispense sodium sulfite as the wastewater comes into contact with the tablets. Approximately 1,600 linear feet of 8-inch pipe follows the dechlorinator to provide additional contact time, with an estimated 12,500 gallons of storage being available, which will provide sufficient contact time in peak flow conditions.

5. OPERATING PERMIT

Missouri State Operating Permit No. MO-0048194 will require a modification to reflect the construction activities. The modified Burlington Junction WWTF operating permit was public noticed from August 2, 2024, to September 3, 2024, with no comments received. Submit the Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued.

Joshua Brown
Financial Assistance Center
Joshua.Brown@dnr.mo.gov

APPENDIX

- Cost Analysis for Compliance

Missouri Department of Natural Resources
Water Protection Program
Cost Analysis for Compliance
(In accordance with §644.145, RSMo)

Burlington Junction WWTF, Permit Modification
City of Burlington Junction
Missouri State Operating Permit No. MO-0048194

Section 644.145 RSMo requires the Department of Natural Resources to make a "finding of affordability" when "issuing permits under" or "enforcing provisions of" state or federal clean water laws "pertaining to any portion of a combined or separate sanitary sewer system for publicly-owned treatment works." This cost analysis does not dictate how the permittee will comply with new permit requirements.

New Permit Requirements
The permit requires compliance with new monitoring requirements for total residual chlorine and dissolved oxygen.

Connections
The number of connections was reported by the permittee on the Financial Questionnaire

Connection Type	Number
Residential	219
Commercial	4
Industrial	0
Total	**223**

Data Collection for this Analysis
This cost analysis is based on data available to the department as provided by the permittee and data obtained from readily available sources. For the most accurate analysis, it is essential that the permittee provides the department with current information about the city's financial and socioeconomic situation. The financial questionnaire available to permittees on the department's website (https://dnr.mo.gov/document-search/financial-questionnaire-mo-780-2511) is a required attachment to the permit renewal application. If the financial questionnaire is not submitted with the renewal application, the department sends a request to complete the form with the welcome correspondence. If certain data was not provided by the permittee to the department and the data is not obtainable through readily available sources, this analysis will state that the information is "unknown".

Eight Criteria of 644.145 RSMo
The department must consider the 8 criteria presented in subsection 644.145 RSMo to evaluate the cost associated with new permit requirements.

(1) A community's financial capability and ability to raise or secure necessary funding;

Criterion 1 Table. Current Financial Information for the City of Burlington Junction	
Current Monthly User Rates per 5,000 gallons*	$34
Median Household Income (MHI)[1]	$37,163
Current Annual Operating Costs (excludes depreciation)	$33,000

*User Rates were reported by the permittee on the Financial Questionnaire

(2) Affordability of pollution control options for the individuals or households at or below the median household income level of the community;

The following tables outline the estimated costs of the new permit requirements:

Criterion 2A Table. Estimated Cost Breakdown of New Permit Requirements			
New Requirement	Frequency	Estimated Cost	Estimated Annual Cost
Total Residual Chlorine	Quarterly	$35	$140
Dissolved Oxygen	Quarterly	$13	$52
Total Estimated Annual Cost of New Permit Requirements			$192

Criterion 2B Table. Estimated Costs for New Permit Requirements		
(1)	Estimated Annual Cost	$192
(2)	Estimated Monthly User Cost for New Requirements [2]	$0.07
	Estimated Monthly User Cost for New Requirements as a Percent of MHI [3]	0.002%
(3)	Total Monthly User Cost*	$34.07
	Total Monthly User Cost as a Percent of MHI [4]	1.1%

* Current User Rate + Estimated Monthly Costs of New Sampling Requirements

Due to the minimal cost associated with new permit requirements, the department anticipates an extremely low to no rate increase will be necessary, which could impact individuals or households of this community.

(3) An evaluation of the overall costs and environmental benefits of the control technologies;

This analysis is being conducted based on new requirements in the permit, which will not require the addition of new control technologies at the facility. However, the new sampling requirements are being established in order to provide data regarding the health of the receiving stream's aquatic life and to ensure that the existing permit limits are providing adequate protection of aquatic life. Improved wastewater provides benefits such as avoided health costs due to water-related illness, enhanced environmental ecosystem quality, and improved natural resources. The preservation of natural resources has been proven to increase the economic value and sustainability of the surrounding communities. Maintaining Missouri's water quality standards fulfills the goal of restoring and maintaining the chemical, physical, and biological integrity of the receiving stream; and, where attainable, it achieves a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water.

(4) Inclusion of ongoing costs of operating and maintaining the existing wastewater collection and treatment system, including payments on outstanding debts for wastewater collection and treatment systems when calculating projected rates:

The community did not provide the department with this information, nor could it be found through readily available data.

(5) An inclusion of ways to reduce economic impacts on distressed populations in the community, including but not limited to low and fixed income populations. This requirement includes but is not limited to:

(a) Allowing adequate time in implementation schedules to mitigate potential adverse impacts on distressed populations resulting from the costs of the improvements and taking into consideration local community economic considerations.

(b) Allowing for reasonable accommodations for regulated entities when inflexible standards and fines would impose a disproportionate financial hardship in light of the environmental benefits to be gained.

The following table characterizes the current overall socioeconomic condition of the community as compared to the overall socioeconomic condition of Missouri. The following information was compiled using the latest U.S. Census data.

Criterion 5 Table. Socioeconomic Data [1, 5-9] for the City of Burlington Junction

No.	Administrative Unit	Burlington Junction City	Missouri State	United States
1	Population (2022)	509	6,154,422	331,097,593
2	Percent Change in Population (2000-2022)	-19.5%	10.0%	17.7%
3	2022 Median Household Income (in 2023 Dollars)	$37,163	$68,634	$78,242
4	Percent Change in Median Household Income (2000-2022)	-31.6%	-1.1%	1.9%
5	Median Age (2022)	29.1	38.8	38.8
6	Change in Median Age in Years (2000-2022)	-4.9	2.7	3.5
7	Unemployment Rate (2022)	1.0%	4.3%	5.3%
8	Percent of Population Below Poverty Level (2022)	37.5%	12.8%	12.5%
9	Percent of Household Received Food Stamps (2022)	13.0%	10.0%	11.5%
10	(Primary) County Where the Community Is Located	Nodaway County		

(6) An assessment of other community investments and operating costs relating to environmental improvements and public health protection;

The community did not report any other investments relating to environmental improvements.

(7) An assessment of factors set forth in the United States Environmental Protection Agency's guidance, including but not limited to the "Combined Sewer Overflow Guidance for Financial Capability Assessment and Schedule Development" that may ease the cost burdens of implementing wet weather control plans, including but not limited to small system considerations, the attainability of water quality standards, and the development of wet weather standards;

The new requirements associated with this permit will not impose a financial burden on the community, nor will they require the City of Burlington Junction to seek funding from an outside source.

(8) An assessment of any other relevant local community economic conditions.

The department contracted with Wichita State University to complete an assessment tool that would allow for predictions on rural Missouri community populations and future sustainability. The purpose of the study is to use a statistical modeling analysis in order to determine factors associated with each rural Missouri community that would predict the future population changes that could occur in each community. A stepwise regression model was applied to 19 factors which were determined as predictors of rural population change in Missouri. The model established a hierarchy of the predicting factors which allowed the model to place a weighted value on each of the factors. A total of 745 rural towns and villages in Missouri received a weighted value for each of the predicting factors. The weighted values for each town / village were then added together to determine an overall decision score. The overall decision scores were then divided into five categories and each town was assigned to a different categorical group based on the overall decision score. The categorical groups were developed from the range of overall scores across all rural towns and villages within Missouri.

Based on the assessment tool, the City of Burlington Junction has been determined to be a category 1 community. This means that the City of Burlington Junction could potentially face more challenging socioeconomic circumstances over time and may have significant declines in population in the future. The department has determined an adequate schedule of compliance that will alleviate the potential financial burdens that the City of Burlington Junction may face due to the necessary upgrades required to meet the new permit requirements. If this community experiences a decline in population, which results in the inability to secure the necessary funding for an upgrade to meet the new requirements within this permit, a modification to the schedule of compliance may be necessary. The community may contact the department and send an application for a modification to the schedule of compliance with justification for the time necessary to comply with this permit.

Conclusion and Finding

As a result of new regulations, the department is proposing modifications to the current operating permit that may require the permittee to increase monitoring. The department has considered the 8 criteria presented in subsection 644.145 RSMo to evaluate the cost associated with the new permit requirements.

This analysis examined whether the new sampling requirements affect the ability of an individual customer or household to pay a utility bill without undue hardship or unreasonable sacrifice in the essential lifestyle or spending patterns of the individual or household. After reviewing the above criteria, the department finds that the new sampling requirements may result in a low burden with regard to the community's overall financial capability and a low financial impact for most individual customers/households; therefore, the new permit requirements are affordable.

References

1. (A) 2022 MHI in 2022 Dollar: United States Census Bureau. 2018-2022 American Community Survey 5-Year Estimates, Table B19013: Median Household Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars). https://data.census.gov/cedsci/table?q=B19013&tid=ACSDT5Y2022.B19013.
   (B) 2000 MHI in 1999 Dollar: (1)For United States, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-1 Part 1. United States Summary, Table 5. Work Status and Income in 1999: 2000, Washington, DC. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
   (2) For Missouri State, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-27, Missouri, Table 10. Work Status and Income in 1999: 2000, Washington, DC. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
   (C) 2023 CPI and 1999 CPI: U.S. Department of Labor Bureau of Labor Statistics (2023) Consumer Price Index - All Urban Consumers, U.S. City Average. All Items. 1982-84=100 (unadjusted) - CUUR0000SAO. https://data.bls.gov/cgi-bin/surveymost?bls.
   (D) 2022 MHI in 2023 Dollar = 2022 MHI in 2022 Dollar x 2023 CPI /2023 CPI; 2000 MHI in 2023 Dollar = 2000 MHI in 1999 Dollar x 2023 CPI /1999 CPI.
   (E) Percent Change in Median Household Income (2000-2022) = (2022 MHI in 2023 Dollar - 2000 MHI in 2023 Dollar) / (2000 MHI in 2023 Dollar).
2. ($192/223)/12 = $0.07 (Estimated Monthly User Cost for New Requirements)
3. ($0.07/($37,163/12))100% = 0.002% (New Sampling Only)
4. ($34.07/($37,163/12))100% = 1.1% (Total User Cost)
5. (A) Total Population in 2022: United States Census Bureau. 2018-2022 American Community Survey 5-Year Estimates, Table B01003: Total Population - Universe: Total Population. https://data.census.gov/cedsci/table?q=B01003&tid=ACSDT5Y2022.B01003.
   (B) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
   (2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC. https://www2.census.gov/library/publications/2003/dec/phc-2-1-pt2.pdf.
   (C) Percent Change in Population (2000-2022) = (Total Population in 2022 - Total Population in 2000) / (Total Population in 2000).
6. Median Age in 2022: United States Census Bureau. 2018-2022 American Community Survey 5-Year Estimates, Table B01002: Median Age by Sex - Universe: Total population. https://data.census.gov/cedsci/table?q=B01002&tid=ACSDT5Y2022.B01002.

(B) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC., Page 2. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
(2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC., Pages 64-92. https://www2.census.gov/library/publications/2003/dec/phc-2-1-pt2.pdf.
(C) Change in Median Age in Years (2000-2022) = (Median Age in 2022 - Median Age in 2000).

7. United States Census Bureau. 2018-2022 American Community Survey 5-Year Estimates, S2301: Employment Status for the Population 16 Years and Over - Universe: Population 16 years and Over. https://data.census.gov/cedsci/table?q=unemployment&tid=ACSST5Y2022.S2301.
8. United States Census Bureau. 2018-2022 American Community Survey 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months. https://data.census.gov/cedsci/table?q=S1701&tid=ACSST5Y2022.S1701.
9. United States Census Bureau. 2018-2022 American Community Survey 5-Year Estimates, Table S2201: Food Stamps/Supplemental Nutrition Assistance Program (SNAP) - Universe: Households. https://data.census.gov/cedsci/table?q=S2201&tid=ACSST5Y2022.S2201.

CP0002482 AP45396

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED	CHECK NO.
DATE RECEIVED	

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Treatment Facility form has been developed in a modular format and consists of Part A and B. **All applicants must complete Part A.** Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. **Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.**

PART A – BASIC INFORMATION

1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

1.1 Is this a Federal/State funded project? ☑ YES ☐ N/A Funding Agency: MDNR/SRF Project #: N/a

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☐ YES Date of Approval: _____ ☑ N/A

1.3 Has the department approved the proposed project's facility plan*?
☐ YES Date of Approval: _____ ☑ NO (If No, complete No. 1.4.)

1.4 [Complete only if answered No on No. 1.3.] Is a copy of the facility plan* for wastewater treatment facilities included with this application?
☑ YES ☐ NO ☐ Exempt because _____

1.5 Is a copy of the appropriate plans* and specifications* included with this application?
☑ YES Denote which form is submitted: ☐ Hard copy ☑ Electronic copy (See instructions.) ☐ NO

1.6 Is a summary of design* included with this application? ☑ YES ☐ NO

1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?
☐ YES Date of submittal: _____
☑ Enclosed is the appropriate operating permit application and fee submittal. Denote which form: ☐ A ☑ B ☐ B2
☐ N/A: However, In the event the department believes that my operating permit requires revision to permit limitation such as changing equivalent to secondary limits to secondary limits or adding total residual chlorine limits, please share a draft copy prior to public notice? ☐ YES ☐ NO

1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? ☐ YES ☑ NO

1.9 Is the appropriate fee or JetPay confirmation included with this application? ☑ YES ☐ NO
See Section 7.0

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT	2.2 ESTIMATED PROJECT CONSTRUCTION COST
Burlington Junction Wastewater Facility Improvements	$ 1,150,000

2.3 PROJECT DESCRIPTION

Project will include raising the lagoon berms to increase the capacity and meet DNR detention time requirements, the addition of valve vaults to control water surface levels between lagoon cells and will also include the addition of a chlorine feed system.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Sludge will be held in the lagoons

2.5 DESIGN INFORMATION

A. Current population: 482 ; Design population: 500

B. Actual Flow: 25k gpd; Design Average Flow: 76k gpd;
Actual Peak Daily Flow: unk. gpd; Design Maximum Daily Flow: 84k gpd; Design Wet Weather Event: 100y

2.6 ADDITIONAL INFORMATION

A. Is a topographic map attached? ☑ YES ☐ NO

B. Is a process flow diagram attached? ☑ YES ☐ NO

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Burlington Junction WWTF	660-725-4514	cityofbj@iamotelephone.com

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
Danube Road	Burlington Junction	MO	64428	Nodaway

Wastewater Treatment Facility: Mo- 0048194 (Outfall 1 Of 1)

3.1 Legal Description: SE ¼, SE ¼, SE ¼, Sec. 8, T 65, R 37
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 323054 Northing (Y): 4479855
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Nodaway River

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
City of Burlington Junction	660-725-4514	cityofbj@iamotelephone.com

ADDRESS	CITY	STATE	ZIP CODE
PO Box 50	Burlington Junction	MO	64428

5.0 CONTINUING AUTHORITY:

A continuing authority is a company, business, entity or person(s) that will be operating the facility and/or ensuring compliance with the permit requirements.

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
City of Burlington Junction	660-725-4514	cityofbj@iamotelephone.com

ADDRESS	CITY	STATE	ZIP CODE
PO Box 50	Burlington Junction	MO	64428

5.1 A letter from the continuing authority, if different than the owner, is included with this application. ☐ YES ☐ NO ☑ N/A

5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.

A. Is a copy of the certificate of convenience and necessity included with this application? ☐ YES ☐ NO

5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.

A. Is a copy of the as-filed restrictions and covenants included with this application? ☐ YES ☐ NO

B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? ☐ YES ☐ NO

C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? ☐ YES ☐ NO

D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? ☐ YES ☐ NO

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Jon Shellhorn/Lamp Rynearson	816-361-0440	jon.shellhorn@lamprynearson.com

ADDRESS	CITY	STATE	ZIP CODE
9001 State Line Rd., Ste 200	Kansas City	MO	64114

7.0 APPLICATION FEE

☐ CHECK NUMBER ☐ JETPAY CONFIRMATION NUMBER

8.0 PROJECT OWNER: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE: Jo Anna Marriott

PRINTED NAME	DATE
Jo Anna Marriott	05/02/2024

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
City Clerk	6607254514	cityofbj@iamotelephone.com

Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
P.O. BOX 176
JEFFERSON CITY, MO 65102-0176

END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.

PART B – LAND APPLICATION ONLY
(Submit only if the proposed construction project includes land application of wastewater.)

8.0 FACILITY INFORMATION

8.1 Type of wastewater to be irrigated: ☐ Domestic ☐ State/National Park ☐ Seasonal business
☐ Municipal ☐ Municipal with a pretreatment program or significant industrial users
☐ Other (explain) _____

8.2 Months when the business or enterprise will operate or generate wastewater:
☐ 12 months per year ☐ Part of the year (list months): _____

8.3 This system is designed for:
☐ No-discharge.
☐ Partial irrigation when feasible and discharge rest of time.
☐ Irrigation during recreational season, April – October, and discharge during November – March.
☐ Other (explain) _____.

9.0 STORAGE BASINS

9.1 Number of storage basins: _____ (Use additional pages if greater than three basins.)

9.2 Type of basins: ☐ Steel ☐ Concrete ☐ Fiberglass ☑ Earthen ☐ Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.
Basin #1: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____
Basin #2: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____
Basin #3: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____

9.4 Storage Basin operating levels (report as feet below emergency overflow level).
Basin #1: Maximum operating water level _____ ft Minimum operating water level _____ ft
Basin #2: Maximum operating water level _____ ft Minimum operating water level _____ ft
Basin #3: Maximum operating water level _____ ft Minimum operating water level _____ ft

9.5 Design depth of sludge in storage basins.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.6 Existing sludge depth, if the basins are currently in operation.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.7 Total design sludge storage: _____ dry tons and _____ cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 Number of irrigation sites _____ Total Acres _____ Maximum % field slopes _____
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
(Use additional pages if greater than three irrigation sites.)

10.2 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☐ Row crops
☐ Other (describe) _____

10.3 Wastewater flow (dry weather) gallons per day: Average annual _____ Seasonal _____ Off-season _____

10.4 Land application rate (design flow including 1-in-10 year storm water flows):
Design: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week
Actual: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week

10.5 Total irrigation per year (gallons): Design: _____ gal Actual: _____ gal

10.6 Actual months used for irrigation (check all that apply):
☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec

10.7 Land application rate is based on:
☐ Hydraulic Loading ☐ Other (describe) _____
☐ Nutrient Management Plan (N&P) If N&P is selected, is the plan included? ☐ YES ☐ NO

Summary of Design

The City of Burlington Junction, Missouri operates a Wastewater Treatment Facility which consists of a flow-through lagoon system of three cells operating in series. Effluent from the facility is discharged into the Nodaway River. This project will add disinfection through chlorine, increase detention time through raising the lagoon berm height and improve BOD and TSS removal rates.

The design flow for the facility is 76,000 gallons per day (gpd) with a peak hourly flow of 211 gallons per minute (gpm). The Design maximum daily flow is 84,000 gpd. The influent design organic loading for BOD5 is 200 mg/L or 127 pounds per day. Effluent BOD5 ranges from 2 mg/L to 59 mg/L with a monthly average of 26 mg/L. Influent design for TSS is 288 mg/L, or 180 lbs per day with an effluent average of 45 mg/L. Ammonia in effluent has ranged from less than 1 mg/L to 16.6 mg/L. Data collection has been inconsistent and unreliable but it is not believed the current lagoon layout can consistently meet the noted effluent discharge requirements without facility improvements.

Cell No. 1 has a water depth of three feet (3'); a surface area of 3.8 acres; a volume of 3.54 million gallons. Cell No. 2 also has a water depth of three feet (3'); a surface area of 1.15 acres; a volume of 1.01 million gallons. Cell No. 3 has a water depth of three feet (3'); a surface area of 0.37 acres; a volume of 0.29 million gallons.

The velocity rates through the lagoon and system are minimal, but velocities through any pipelines were sloped to achieve a minimum velocity of 2.0 feet per second. The facility currently has a total detention time of 64 days which does not meet the DNR requirement of 120 days. The cells do not have sufficient storage to vary the flow at the peak hour to increase the detention time throughout the year. The facility improvements aim to address the detention time and effluent quality.

The lagoon improvements include new transfer structures between cells, additional rip rap around all 3 cells, increasing berm height to at an elevation of 922 and extending the 3:1 slope, and adding chlorine before discharge.

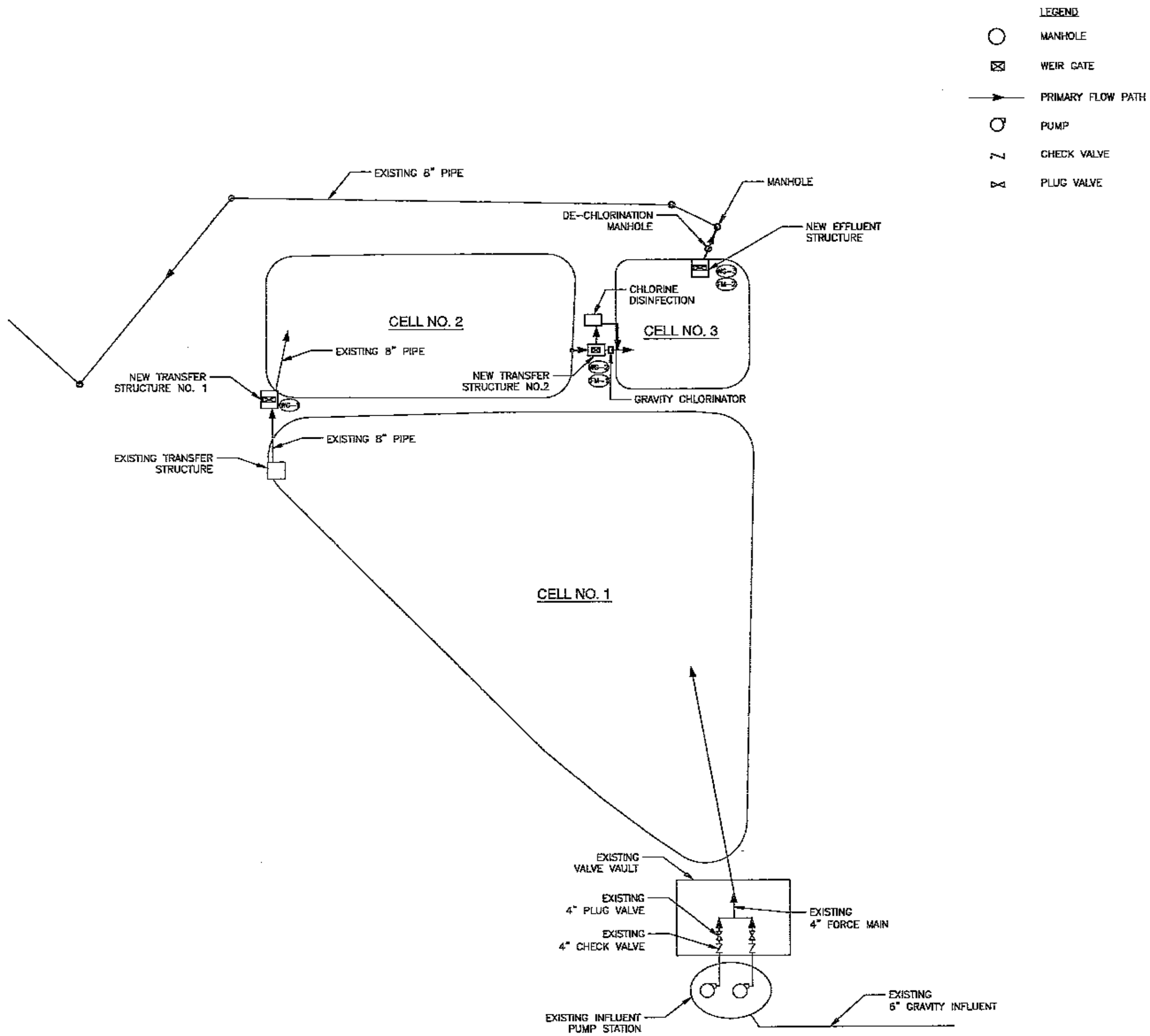
This project is limited to the wastewater treatment facility improvements. No collections systems improvements are planned at this time. Continued repair of deficient segments is recommended for future projects.

Resources used for the design of the facility include the following:

- 10 CSR 20-8 Minimum Design Standards
- Recommended Standards for Wastewater Facilities (10 States Standard), 2014 ed
- Wastewater Engineering Treatment and Resource Recovery by Metcalf & Eddy, 5th ed

The process flow diagram and hydraulic profiles are shown in the following attachment

04/19/2024



LAMP RYNEARSON
LAMPRYNEARSON.COM
OMAHA, NEBRASKA
FORT COLLINS, COLORADO
KANSAS CITY, MISSOURI

09/26/2022

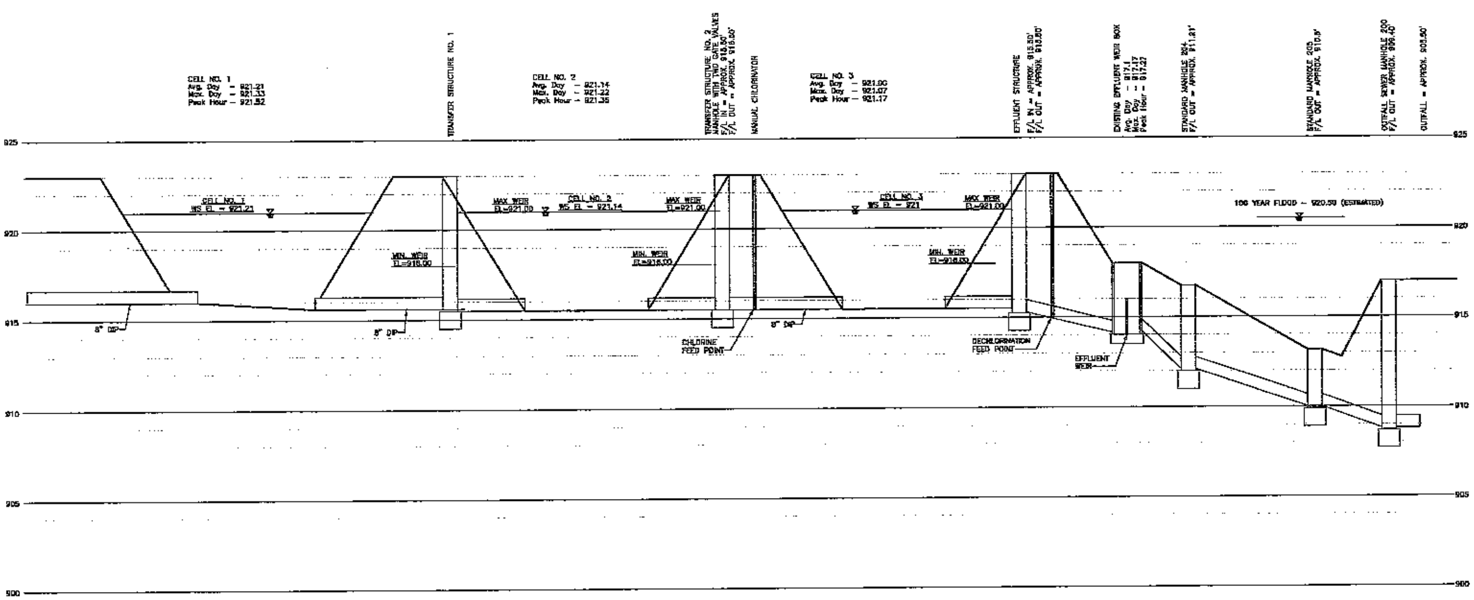
PROCESS FLOW DIAGRAM

WASTEWATER FACILITY IMPROVEMENTS
BURLINGTON JUNCTION, MISSOURI

811 Know what's below. Call before you dig.

REVISIONS

DESIGNER / DRAFTER
JCS/SAM
DATE
09-22-2022
PROJECT NUMBER
BOOK AND PAGE
MISSOURI AUTHORIZATION NUMBER
SHEET
4



HYDRAULIC PROFILE

LAMP RYNEARSON

LAMPRYNEARSON.COM

OMAHA, NEBRASKA
14710 W. DODGE RD, STE. 100 (402)496.2498

FORT COLLINS, COLORADO
4715 INNOVATION DR., STE. 100 (970)226.0342

KANSAS CITY, MISSOURI
9001 STATE LINE RD., STE. 200 (816)361.0440

STATE OF MISSOURI PROFESSIONAL ENGINEER 08/26/2022

Jon C. Saathoff

HYDRAULIC PROFILE

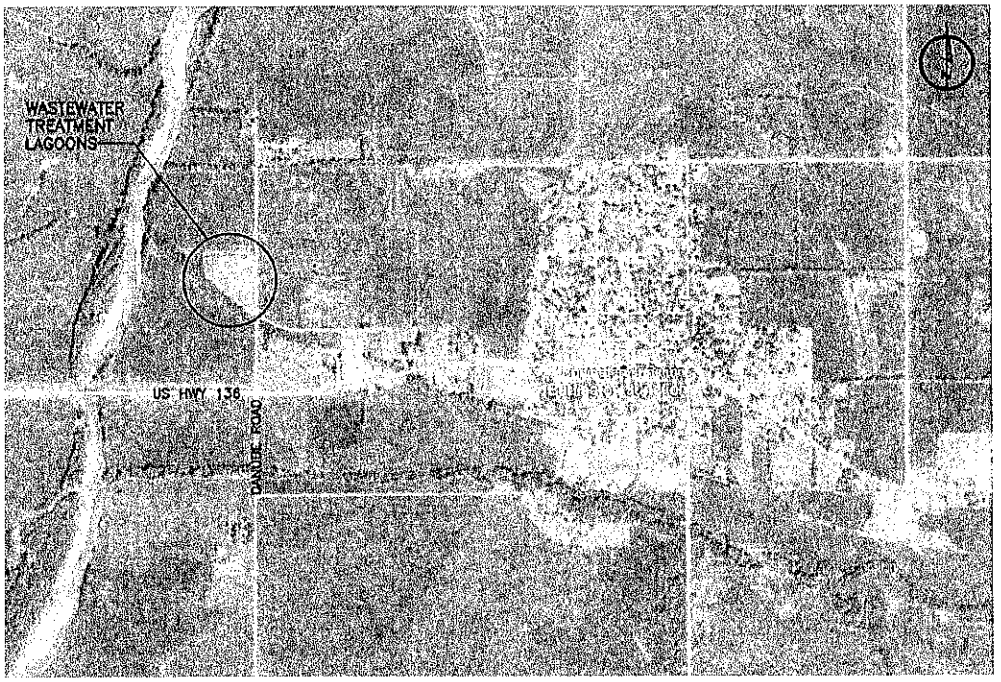
WASTEWATER FACILITY IMPROVEMENTS
BURLINGTON JUNCTION, MISSOURI

811 Know what's below. Call before you dig.

REVISIONS

DESIGNER / DRAFTER: JCS/SAM
DATE: 08-22-2022
PROJECT NUMBER
BOOK AND PAGE
MISSOURI AUTHORIZATION NUMBER: F01284734
SHEET: 5

Site Location



Aerial Map of Lagoons