

**STATE OF MISSOURI**  
**DEPARTMENT OF NATURAL RESOURCES**  
**MISSOURI CLEAN WATER COMMISSION**



**CONSTRUCTION PERMIT**

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

Jacob Freeman, P.E.  
Engineering Director  
Confluence Rivers Utility Operating Company, Inc.  
1630 Des Peres Rd, Suite 140  
St. Louis, MO 63131

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 (department).

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.

June 3, 2024  
Effective Date

June 2, 2026  
Expiration Date

  
\_\_\_\_\_  
John Hoke, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

The proposed construction is the installation of a sideline moving bed bioreactor (MBBR) that will receive flow from the recirculation tank and return the MBBR effluent to the recirculation tank to improve ammonia treatment. One recirculating sand filter dosing pump in the existing recirculation tank will be relocated in the recirculation tank to allow for the installation of two MBBR dosing pumps. No changes to the existing septic tank effluent pump (STEP), septic tanks, pressurized collection system, recirculating sand filter, chlorine disinfection and dechlorination, flow meter, and outfall are being proposed. The design flow for the facility will remain 11,400 gpd.

This project will also 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 not required to complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publicly owned treatment works.

### **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 consistent with plans and specifications signed and sealed by Benjamin Kuenzel, P.E. with 21 Design Group, Inc. and as described in this permit.

3. The department must be contacted in writing prior to making any changes to the 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).
4. 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 Kansas City Regional Office per 10 CSR 20-7.015(9)(G).
5. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one 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.
6. A United States Army Corps of Engineers (USACE) Clean Water Act Section 404 Department of the Army permit and a Section 401 Water Quality Certification issued by the department may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied or notification is provided that no Section 404 permit is required by the USACE. You must contact your local USACE district since they determine what waters are jurisdictional and which permitting requirements may apply. You may call the department's Water Protection Program, Operating Permits Section at 573-522-4502 for more information. See <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality> for more information.
7. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.
  - Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the 100-year flood elevation. 10 CSR 20-8.140(2)(B).
  - Unless another distance is determined by the Missouri Geological Survey or by the department's Public Drinking Water Branch, the minimum distance between wastewater treatment facilities and all potable water sources shall be at least 300 feet. 10 CSR 20-8.140 (2) (C) 1.

- No treatment unit with a capacity of 22,500 gpd (gallons per day) or less shall be located closer than the minimum distance of 200 feet to a neighboring residence and 50 feet to property line for lagoons; 200 feet to a neighboring residence for open recirculating media filters following primary treatment; and 50 feet to a neighboring residence for all other discharging facilities. See 10 CSR 20-2.010(68) for the definition of a residence. 10 CSR 20-8.140 (2) (C) 2.
- Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140 (2) (D)
- The outfall shall be so constructed and protected against the effects of flood water, ice, or other hazards as to reasonably ensure its structural stability and freedom from stoppage. 10 CSR 20-8.140 (6) (A)
- All sampling points shall be designed so that a representative and discrete twenty-four (24) hour automatic composite sample or grab sample of the effluent discharge can be obtained at a point after the final treatment process and before discharge to or mixing with the receiving waters. 10 CSR 20-8.140 (6) (B)
- All outfalls shall be posted with a permanent sign indicating the outfall number (i.e., Outfall #001). 10 CSR 20-8.140 (6) (C)
- All wastewater treatment facilities shall be provided with an alternate source of electric power or pumping capability to allow continuity of operation during power failures. 10 CSR 20-8.140 (7) (A) 1.
- Disinfection and dechlorination, when used, shall be provided during all power outages. 10 CSR 20-8.140 (7) (A) 2.
- Electrical systems and components in raw wastewater or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors that are normally present, shall comply with the NFPA 70 *National Electric Code (NEC)* (2017 Edition), as approved and published August 24, 2016, requirements for Class I, Division 1, Group D locations. 10 CSR 20-8.140 (7) (B)
- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140 (7) (C)
- No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140 (7) (D) 1.
- Where a potable water supply is to be used for any purpose in a wastewater treatment facility other than direct connections, a break tank, pressure pump, and pressure tank or a reduced pressure backflow preventer consistent with the department's Public Drinking Water Branch shall be provided. 10 CSR 20-8.140 (7) (D) 3. A.

- For indirect connections, a sign shall be permanently posted at every hose bib, faucet, hydrant, or sill cock located on the water system beyond the break tank or backflow preventer to indicate that the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 3. B.
  - A means of flow measurement shall be provided at all wastewater treatment facilities. 10 CSR 20-8.140 (7) (E)
  - Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility:
    - Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140 (8) (A)
    - Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140 (8) (B)
    - First aid equipment; 10 CSR 20-8.140 (8) (C)
    - Posted “No Smoking” signs in hazardous areas; 10 CSR 20-8.140 (8) (D)
    - Appropriate personal protective equipment (PPE); 10 CSR 20-8.140 (8) (E)
    - Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140 (8) (F)
    - 10 CSR 20-8.140 (8) (G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
    - 10 CSR 20-8.140 (8) (H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
    - Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140 (8) (I)
    - Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate. 10 CSR 20-8.140 (8) (K)
    - Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140 (8) (L)
    - Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E *Standard for Electrical Safety in the Workplace* (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140 (8) (M)
8. Upon completion of construction:
- A. Confluence Rivers Utility Operating Company, Inc will become the continuing authority for operation and maintenance of these facilities;
  - B. Submit an electronic copy of the as built if the project was not constructed in accordance with previously submitted plans and specifications; and

- C. Submit the Statement of Work Completed form to the department in accordance with 10 CSR 20-6.010(5)(N) (<https://dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155>) and submit a Form B - Application for an Operating Permit for Domestic or Municipal Wastewater ( $\leq 100,000$  gallons per day) 60 days prior to operation.

#### **IV. REVIEW SUMMARY**

##### **1. CONSTRUCTION PURPOSE**

The existing treatment facility does not consistently meet ammonia limitations. Improvements will provide additional ammonia treatment to help achieve compliance with the final ammonia effluent limits.

##### **2. FACILITY DESCRIPTION**

The existing treatment system is STEP septic tanks at each individual residence, pressurized collection system, recirculating sand filter, and chlorine disinfection and dechlorination.

Construction will add a sideline MBBR unit that will receive dosing from the recirculation tank, with the MBBR effluent being returned back to the recirculation tank. The construction will not change the design flow of the treatment system.

The Fox Run WWTF is located at 0.2 miles west of the intersection of Fox Run Dr. and NE 147<sup>th</sup> Street, Kearney, in Clay County, Missouri. The facility has a design average flow of 11,400 gpd and serves a hydraulic population equivalent of approximately 152 people.

##### **3. COMPLIANCE PARAMETERS**

The proposed project is needed to meet final monthly ammonia effluent limits of 1.4 mg/L (April 1 – September 30) and 2.9 mg/L (October 1 – March 31) as established in Operating Permit MO-0120006.

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

Parameter	Units	Monthly average limit
Biochemical Oxygen Demands	mg/L	30
Total Suspended Solids	mg/L	30
Ammonia as N-summer	mg/L	1.4
Ammonia as N-winter	mg/L	2.9
pH	SU	6.5-9.0
Total Residual Chlorine	µg/L	8 (130 ML)
<i>E. coli</i>	#/100mL	206

#### **4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA**

**Existing major components which will remain in use include the following:**

- Septic Tank – Each house has a septic tank that pumps wastewater to the treatment plant.
- Recirculation Sand Filter – The existing sand filter was designed for 11,400 gallons per day. After the recirculating sand filter, the splitter valve discharges 20 percent to the disinfection system and returns 80 percent to the recirculation tank.
- Flow Meter – The existing flow meter was appropriately sized for this facility.
- Chlorine disinfection and dechlorination system – The existing chlorine disinfection system consists of a chlorine tablet feeder and a dechlorination tablet feeder with a 1,000 gallon chlorine contact tank that is capable of providing 32 minutes of contact time at a peak flow of 45,600 gpd.

**Construction will cover the following items:**

- Moving Bed Biofilm Reactor (MBBR) – Installation of one MBBR capable of treating a design average flow of 11,400 gpd and a peak flow of 17,100 gpd. The MBBR is approximately 6 ft diameter and 11 ft deep with a sidewater depth of 9 ft for a volume of approximately 1,903 gallons. The hydraulic retention time at design flow is 4 hours. The MBBR will be filled approximately 50% with high surface area media. The high surface area media will have a surface area to media volume of 259 ft<sup>2</sup>/ft<sup>3</sup>, which exceeds the recommended 152 ft<sup>2</sup>/ft<sup>3</sup>. The MBBR will be provided with an aluminum cover. Aeration will be provided by means of two blowers each capable of supplying 39 scfm with 4 HP motors to the coarse air diffusers. The effluent from the MBBR will flow by gravity back to the recirculation tank.
- Recirculation Tank - The existing recirculation tank will have one of the dosing pumps to the recirculating sand filter relocated to allow for the installation of the two MBBR dosing pumps. The MBBR dosing pumps will be Goulds EP04 0.4 HP pumps each capable of pumping 45 gallons per minute at 13 feet of total dynamic head.

#### **5. OPERATING PERMIT**

The construction activities do not require a modification of the operating permit under 10 CSR 20-6.010. This facility's operating permit is in the process of being renewed and will be evaluated for conversion to a general operating permit during this time. If the facility is not converted to a general permit during the renewal process the department will conduct an internal modification to reflect the current facility description upon receipt of the Statement of Work Completed form.

## **V. NOTICE OF RIGHT TO APPEAL**

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Section 621.250 RSMo. To appeal, you must file a petition with the AHC within 30 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>

Conrad (Joe Blume), PE  
Engineering Section  
[Conrad.blume@dnr.mo.gov](mailto:Conrad.blume@dnr.mo.gov)