

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Franklin County Public Water Supply District No. 1
3021 High A Suite 101,
Washington, MO 63090

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.

October 28, 2024
Effective Date

October 27, 2026
Expiration Date

John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction of a UV disinfection system to meet final effluent limits for *E. coli* which become effective starting May 1, 2027. Selected UV system to be installed is a Enaqua Ultraviolet M3 unit with a capacity of treatment of up to 64 gallons per minute (92,200 gallons per day (gpd)) of wastewater. The disinfection system consists of up to two similar activated fluoropolymer (AFP) tubes, each with up to four low pressure high intensity lamp, arranged in parallel while delivering a minimum UV intensity of 30 mJ/cm² with an expected transmissivity of 65.0 percent or greater at 254 nm. The design average flow will remain at 22,000 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 determine Cost Analysis for Compliance because the permit contains no new conditions or requirements that convey a new cost to the facility.

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 William R. Johannig, P.E., with Cochran Engineering 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 Saint Louis Regional Office per 10 CSR 20-7.015(9)(G).
5. 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.
6. 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). 10 CSR 20-8.130 (2) (A).
 - Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140 (2) (D). 10 CSR 20-8.130 (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.
 - 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 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).

- Disinfection, 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.
- 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). o 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).
- Emergency Power. Disinfection processes, when used, shall be provided during all power outages. 10 CSR 20-8.190 (2) (A).
 - The UV dosage shall be based on the design peak hourly flow, maximum rate of pumpage, or peak batch flow. 10 CSR 20-8.190 (5) (A) 1.
 - If no flow equalization is provided for a batch discharger, the UV dosage shall be based on the peak batch flow. 10 CSR 20-8.190 (5) (A) 2.
 - The UV system shall deliver the target dosage based on equipment derating factors and, if needed, have the UV equipment manufacturer verify that the scale up or scale down factor utilized in the design is appropriate for the specific application under consideration. 10 CSR 20-8.190 (5) (A) 3.
 - The UV system shall deliver a minimum UV dosage of $30,000 \mu\text{W} \cdot \text{s}/\text{cm}^2$ (microwatt seconds per centimeters squared). 10 CSR 20-8.190 (5) (A) 4.
 - Closed channel UV systems. The combination of the total number of closed channels shall be capable of treating the design peak hourly flow, maximum rate of pumpage, or peak batch flow. 10 CSR 20-8.190 (5) (B) 2.
 - The UV system must continuously monitor and display at the UV system control panel the following minimum conditions:
 - The relative intensity of each bank or closed channel system; 10 CSR 20-8.190 (5) (C) 1. A.
 - The operational status and condition of each bank or closed channel system; 10 CSR 20-8.190 (5) (C) 1. B.

- The ON/OFF status of each lamp in the system; 10 CSR 20-8.190 (5) (C) 1. C. and,
- The total number of operating hours of each bank or each closed channel system. 10 CSR 20-8.190 (5) (C) 1. D.
- The UV system shall include an alarm system. Alarm systems shall comply with 10 CSR 20-8.140(7)(C). 10 CSR 20-8.190 (5) (C) 2.

7. Upon completion of construction:

- A. Franklin County Public Water Supply District No. 1 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 request the operating permit modification be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

E. coli limitations included in operating permit MO-0125539 Table A-2 are effective May 1, 2027. *E. coli* limits will only be effective during the recreation season from April 1 through October 31. UV disinfection will enable the facility to meet the future *E. coli* limitations.

2. FACILITY DESCRIPTION

The FCPWSO #1-- Cobblestone Creek Estate is located at Greystone Dr., Washington, MO 63090, in Franklin County, Missouri. The existing facility treats domestic wastewater from the surrounding development. The facility is an extended aeration activated sludge treatment plant, which has a design average flow of 22,200 gpd and serves a design population equivalent of approximately 222 people, with an actual flow of approximately 4,500 gpd. The number of connections is 21. Sludge is retained in the facility until removed by contract hauler. Design sludge production is 4.0 dry tons/year. The existing WWTP operates under the current permit number MO-0125539, originally issued on September 1, 2021. The receiving stream the facility discharges to is a Tributary to St. Johns Creek. The addition of a UV treatment system is to meet future *E. coli* effluent limits in table A-2 of the permit.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits for *E. coli* as listed below and as established in table A-2 from Operating Permit MO-0124885. The limit will be applicable to the facility on May 1, 2027, when table A-2 of the operating permit becomes effective:

The limits following the schedule of compliance will be applicable to the facility:

Parameter	Units	Monthly average limit
<i>E. coli</i>	#/100mL	206

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

- Extended aeration plant system with a design flow of 22,200 gpd. Actual flow is 4,500 gpd. The extended aeration wastewater treatment plant includes influent bar screen, flow equalization, extended aeration basin, secondary clarification, and an aerated sludge holding tank. Flow is currently measured by a V-Notch Weir.
- Power Outage – The facility has an equalization basin which provides approximately 1.5 hours of storage at peak flow and approximately 6 hours of storage at the average daily flow. The Franklin County Public Water Supply District No. 1 and treatment facility operator, Alliance Water has mobile pumps and generators available to provide power for treatment and utilize the sludge holding tanks as needed during extended power outages.

Construction will cover the following items:

- Disinfection – Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
 - Ultraviolet (UV) – A non-contact, gravity flow, low pressure, high intensity UV disinfection system capable of treating a peak flow of 64 gallons per minute, 92,200 gpd while delivering a minimum UV intensity of 30 mJ/cm² with an expected ultraviolet transmissivity of 65 percent or greater. The enclosed UV system consists of one Enaqua M3 UV unit. The disinfected effluent will flow by gravity through a new 8-inch outfall pipe and to Outfall No. 001.
 - Relocated Outfall – The new outfall location is approximately 5 ft West and downstream from the current outfall location. The outfall consists of a discharge pipe with a drop to allow for discrete effluent samples.

5. OPERATING PERMIT

Operating permit MO-0125539 will require a modification to reflect the construction activities. The modified FCPWSO No 1 Cobblestone Creek Estate WWTF, MO-0125539, will be public noticed to remove the schedule of compliance for *E. coli*, update regulatory references, add permit condition related to submittal of the renewal permit, update the receiving stream from WBID #3960 and 100K Extent-Remaining Stream to the new numbering system and new naming convention of the streams/lakes. The actual receiving stream is not changing. 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.

Operating permit MO-0125539 will be expiring on June 30, 2026. A renewal application must be filed before January 1, 2026, regardless of the status of these construction activities. If you have questions on completing the renewal application, please contact the NPDES permitting section at 573-522-4502 or cleanwaterpermits@dnr.mo.gov.

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>

Andrew Sell
Engineering Section
andrew.sell@dnr.mo.gov

Chia-Wei Young, P.E.
Engineering Section
chia-wei.young@dnr.mo.gov

APPENDIX

• **Process Flow Diagram**

