

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 Peculiar
Peculiar WWTF
23119 SE Outer Road
Peculiar, MO 64078

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 19, 2019
Effective Date


Edward B. Galbraith, Director, Division of Environmental Quality

June 18, 2021
Expiration Date


Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The proposed construction project is to meet final effluent limits for *E. coli* with the installation of ultraviolet disinfection. The facility has a design average flow of 0.75 MGD with a peak flow of 3.0 MGD. The construction will add UV disinfection and add density current baffles and effluent launder covers to the existing secondary clarifiers. The 2 existing secondary clarifiers will be modified to include a density current baffle and a launder cover to eliminate algal growth and to increase the retainage of solids in the clarifiers. Construction of the UV disinfection system will be a closed channel, gravity flow, low pressure, high intensity UV non-contact disinfection system capable of treating a peak flow of 3.3 MGD while delivering a minimum UV intensity of 30 mJ/cm² with an expected ultraviolet transmissivity of 60% or greater. 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 GBA 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. The disinfection system shall be located above the twenty-five (25)-year flood level.
6. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation per 10 CSR 20-8.140(2)(B). The minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300') per 10 CSR 20-8.140(2)(C)1.
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 dnr.mo.gov/env/wpp/epermit/help.htm. See dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.
8. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver 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 be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the Department's Water Protection Program at 573-751-1300 for more information. See dnr.mo.gov/env/wpp/401/ for more information.
9. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.
 - 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.
 - 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 must continuously monitor and display at the UV system control panel the following minimum conditions:
 - The relative intensity of each bank or closed vessel system; 10 CSR 20-8.190 (5) (C) 1. A.
 - The operational status and condition of each bank or closed vessel 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 vessel 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.
 - 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 the disinfection system. 10 CSR 20-8.140 (7) (C)

10. Upon completion of construction:

- A. The City of Peculiar 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 enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N). When the facility applies for their next operating permit renewal, they will be expected to include an updated facility description on their application.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The proposed construction project is to meet final effluent limits for *E. coli* with the installation of ultraviolet disinfection. The facility has to be in compliance with the *E. coli* effluent limits by October 1, 2020. Additionally, the facility will do improvements on the secondary clarifiers.

2. FACILITY DESCRIPTION

The Peculiar WWTF is located at 23119 SE Outer Road, Peculiar, in Cass County, Missouri. The facility has a design average flow of 0.75 MGD with a peak flow of 3.0 MGD. The facility serves a population equivalent of approximately 4,600 people. Flow is received at the treatment plant from forcemains. The existing treatment plant facility is 2 grinder pumps, activated sludge aeration basin, two secondary clarifiers, aerobic digester, sludge pump station, with sludge hauled to a Harrisonville WWTF. The construction will add UV disinfection and add density current baffles and effluent launder covers to the existing secondary clarifiers.

As part of the 2018 facility plan, the City of Peculiar evaluated long-term plans for the improvement of the treatment plant that will be undertaken in the future, including upgrades to the influent headworks and update electrical lines for the system.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits for *E. coli* of 1,030 #/100mL weekly average and 206 #/100mL monthly average during the recreational season (April 1-October 31), as established in Operating Permit MO-0089443.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

- Influent Headworks
 - Influent flow is measured with a magnetic flow meter in a 12 inch forcemain that flows into the existing headworks structure.
 - The facility has 2 grinders installed in parallel and controlled by depth sensors.
 - The influent flow splitter receives flows from the headworks, the South excess flow basin, the dewatering pump station, and the RAS pump station. Flows are conveyed from the splitter to the aeration basin. The splitter has a stub for flows to be diverted to a second aeration basin with a future plant expansion.
- Peak flow clarifier- In 2013, the peak flow clarifier was modified so that it no longer discharges. The clarifier receives flow from 2 sources-the 12-inch pipe from an overflow weir in the headworks structure and from the 18-inch diameter pipe from the excess flow diversion valve. A 30 ft baffle and launder provide a path for discharge to the South excess flow holding basin when water reaches the sidewater depth of 10 ft.
- South Excess Flow Basin – Installed in 2013, the south excess flow basin has a capacity of 2.0 MG and delivers flows from the basin to the flow splitter. The pump has a design point of 500 gpm at 62 ft TDH.
- Activated Sludge aeration basin is a Schreiber process basin constructed in 1999. The basin has a design average flow capacity of 0.75 MGD. Aeration is cycled to create anoxic and aerated conditions within the basin (0.5 to 2.0 mg/L dissolved oxygen). There are 3 blowers.
- Secondary Clarifier – There are 2 secondary clarifiers, constructed in 1999. Each clarifier has a sidewater depth of 12ft and a radius of 22 ft, which provides a total surface area of 3,041 sf. At a peak flow of 3.0 MGD, the surface overflow rate is 986.5 gpd/ft².
- Waste Activated Sludge (WAS) Pump Station; Return Activated Sludge (RAS) Pump Station; and Aerobic Digester.
- In the event of a power outage, flows will go to the excess flow basin for storage and be routed to the treatment plant when power returns. There is 2 to 3 days of storage provided.

Construction will cover the following items:

- Secondary Clarifier –The 2 existing secondary clarifiers will be modified to include a density current baffle and a launder cover to eliminate algal growth and to increase the retention of solids in the clarifiers.
 - Stamford Density Current Baffle
 - Minimum tensile strength of 10,000 psi using ASTM D-638
 - Series of baffle panels attached to the wall of the clarifier

- Maximum baffle panel length of 8 ft and be curved to follow the curvature of the clarifier.
- The baffle inclination angle shall be 30° from the horizontal.
- Launder Cover
 - Minimum tensile strength of 12,000 psi using ASTM D-638
 - Minimum water absorption of 0.2% per ASTM D-570.
 - Molded fiberglass panels attached to form a continuous cover over the launder trough, weir and scum baffle.
 - Designed to inhibit incident sunlight from striking the surface of the launder and the weir and to handle common snow and ice loads at the facility.
 - Individual sections shall be a minimum of 4 ft in length
- Approximately 97.32 lf of 16-inch PVC, C905 pipe to connect from a manhole to the UV disinfection building and 26.82 lf of 16-inch PVC, C905 pipe from the UV disinfection building to the effluent manhole will be installed.
- Disinfection – Disinfection is the process of removal, deactivation, or killing or pathogenic microorganisms.
 - Non-Contact Ultraviolet (UV) – A closed channel, gravity flow, low pressure (<20 psi), high intensity UV non-contact disinfection system capable of treating a peak flow of 3.3 MGD while delivering a minimum UV intensity of 30 mJ/cm² with an expected ultraviolet transmissivity of 60% or greater.
 - The enclosed UV system consists of 1 reactor with 2 banks in series.
 - With 1 bank in use, the disinfection system will be capable of treating 1.65 MGD.
 - There will be 6 lamp racks per bank, and 8 lamps per rack, for a total of 48 lamps per bank (96 total lamps).
 - The UV system will include a level sensor, 2 UV intensity monitors, and a control panel.
 - The alarm will sound for low UV intensity, lamp out, lamp life, over temperature, and lamp rack failure.
 - The disinfected effluent will flow by gravity through flow measurement equipment and to Outfall No. 001.
 - Housed Facility – The UV disinfection system shall be housed in an approximately 32.66 ft by 18 ft building.

5. **OPERATING PERMIT**

These construction activities do not require a modification to the operating permit. It is expected that the facility owner will include a new facility description and process flow diagram in their next operating permit renewal application to reflect the installation of an ultraviolet disinfection. Operating permit MO-0089443 expires on December 31, 2020. A renewal application must be filed before July 4, 2020 regardless of the construction status.



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: _____ Project #: _____
- 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: 8/30/18 ☐ 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 UV Disinfection System and Secondary Clarifier Improvements	2.2 ESTIMATED PROJECT CONSTRUCTION COST \$ 655,000.00
2.3 PROJECT DESCRIPTION Project is the installation of a UV disinfection system, construction of a UV building and other appurtenant site work; the installation of Stamford density current baffles and effluent launder covers in the secondary clarifiers.	
2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION N/A	
2.5 DESIGN INFORMATION A. Current population: <u>5,120</u> ; Design population: <u>7,500</u> B. Actual Flow: <u>519,000</u> gpd; Design Average Flow: <u>750,000</u> gpd; Actual Peak Daily Flow: <u>2,250,000</u> gpd; Design Maximum Daily Flow: <u>3,000,000</u> gpd; Design Wet Weather Event: <u>3.3</u> MGD	
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 Peculiar Wastewater Treatment Plant		TELEPHONE NUMBER WITH AREA CODE 816-779-2228		E-MAIL ADDRESS cbrooks@cityofpeculiar.org
ADDRESS (PHYSICAL) 23119 SE Outer Rd	CITY Peculiar	STATE MO	ZIP CODE 64078	COUNTY Cass
Wastewater Treatment Facility: Mo- 0089443 (Outfall 1 Of 1)				
3.1 Legal Description: <u>NW 1/4, SE 1/4, _____ 1/4, Sec. 23, T 45N, R 32W</u> (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): <u>375514</u> Northing (Y): <u>4284600</u> For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)				
3.3 Name of receiving streams: <u>Tributary to East Branch South Grand River</u>				
4.0 PROJECT OWNER				
NAME City of Peculiar, Carl Brooks, City Engineer		TELEPHONE NUMBER WITH AREA CODE 816-779-2228		E-MAIL ADDRESS cbrooks@cityofpeculiar.org
ADDRESS 250 S Main St	CITY Peculiar	STATE MO	ZIP CODE 64078	
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 City of Peculiar		TELEPHONE NUMBER WITH AREA CODE 816-779-2228		E-MAIL ADDRESS cbrooks@cityofpeculiar.org
ADDRESS 250 S Main St	CITY Peculiar	STATE MO	ZIP CODE 64078	
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 Gary Beck / GBA		TELEPHONE NUMBER WITH AREA CODE 913-577-8216		E-MAIL ADDRESS gbeck@gbateam.com
ADDRESS 9801 Renner Blvd, Ste. 300	CITY Lenexa	STATE KS	ZIP CODE 66219	
7.0 APPLICATION FEE				
☒ CHECK NUMBER <u>18806</u> ☐ 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 				
PRINTED NAME <u>Carl M. Brooks, PE, CFM</u>			DATE <u>5/9/19</u>	
TITLE OR CORPORATE POSITION <u>City Engineer</u>		TELEPHONE NUMBER WITH AREA CODE <u>816 779-2228</u>		E-MAIL ADDRESS <u>cbrooks@cityofpeculiar.org</u>
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.				