

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



**CONSTRUCTION PERMIT**

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

Dexter East Wastewater Treatment Plant  
South Terminus of Fairground Drive  
Dexter, MO 63841

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.

December 4, 2019  
Effective Date

September 23, 2021  
Modification Date

Edward B. Galbraith  
Edward B. Galbraith, Director, Division of Environmental Quality

December 3, 2022  
Expiration Date

Chris Wieberg  
Chris Wieberg, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

Dexter East will install an open channel, gravity flow, low pressure high intensity ultraviolet disinfection system capable of treating a peak flow of 5.0 MGD while delivering a minimum UV intensity of 30 mJ/cm<sup>2</sup> with an expected ultraviolet transmissivity of 65% or greater. The single open channel UV system consists of two banks in series with 1 modules per bank and 12 lamps per module. The facility's design flow will remain 1.8 MGD.

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 Waters Engineering, Inc. on 10/03/2019 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 Southeast Regional Office per 10 CSR 20-7.015(9)(G).

5. The ultraviolet disinfection unit shall be located above the twenty-five (25)-year flood level.
6. The ultraviolet disinfection 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](http://dnr.mo.gov/env/wpp/epermit/help.htm). See [dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm](http://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/](http://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.
  - Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140 (3) (D)
  - 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 UV disinfection facilities. 10 CSR 20-8.140 (7) (C)
  - Emergency Power. Disinfection and dechlorination 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.

- Open channel UV systems. The combination of the total number of banks 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) 1.
- 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.

10. Upon completion of construction:

- A. The City of Dexter 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 facility is installing disinfection to meet final *E. Coli* effluent limits that become effective February 1, 2021. The city is currently looking for a feasible solution to meet Ammonia effluent limits.

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

The Dexter East WWTF is located at south terminus of Fairground Drive, Dexter, in Stoddard County, Missouri. The facility has a design average flow of 1.8 MGD and serves a hydraulic population equivalent of approximately 18,500 people. The facility has Bar screen / six (6) cell complete mix activated sludge lagoon – EDI ATLAS design – one (1) cell is complete mix / four (4) cells are partial mix / one (1) cell is unaerated for settling / sludge is retained in lagoon / two (2) old lagoon cells used for flow equalization/ peak flow step feed into partial mix cell. The facility is in enforcement to failure to meet their ammonia effluent limits.

### 3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits for *E. Coli* as listed below and established in the Operating Permit MO-0023213. Final *E. Coli* limits become effective February 1, 2021. The limit following the completion of construction will be applicable to the facility:

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

The proposed construction only addresses disinfection. The City is currently looking for a feasible solution to meet Ammonia effluent limits.

### 4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

The facility has the following components that will remain in use during and after construction: bar screen / six (6) cell complete mix activated sludge lagoon – EDI ATLAS design – one (1) cell is complete mix / four (4) cells are partial mix / one (1) cell is unaerated for settling / sludge is retained in lagoon / two (2) old lagoon cells used for flow equalization/ peak flow step feed into partial mix cell.

#### **Construction will cover the following items:**

- **Sewer Line**-Construction of approximately 165 lf of 24-inch PVC SDR-35 gravity sewer lines with approximately 1 manholes.
- Disinfection – Disinfection is the process of removal, deactivation, or killing or pathogenic microorganisms.
  - Open Channel Ultraviolet (UV) – An open channel, gravity flow, low pressure high intensity UV disinfection system capable of treating a peak flow of 5 MGD while delivering a minimum UV intensity of 30 mJ/cm<sup>2</sup> with an expected ultraviolet transmissivity of 65% or greater. The single open channel UV system consists of two banks in series with 1 modules per bank and 12 lamps per module. The channel dimension will be 2.5 ft x 6.5 ft x 30 ft. The disinfected effluent will flow by gravity through flow measurement equipment and to Outfall No. 001. The facility plans to install the Duron UV system from Wedeco.
- Housed Facility – The proposed ultraviolet disinfection system shall be housed in a 32 ft by 18 ft building.
- Emergency Power – The facility has an existing generator which they will be installing separate of the installation of the disinfection system. As part of the disinfection project, they will be installing the transfer switch and concrete pad. The generator is a 250 kW standby generator manufactured by Mathon Electric.

## **5. OPERATING PERMIT**

These construction activities do not require a modification to the operating permit. Operating permit MO-0023213 will be expiring on March 31, 2021. A renewal application must be filed before October 2, 2020 regardless of the status of these construction activities. If you have questions on completing the renewal application, please contact the NPDES permitting section at 573-751-1300.

## **6. CONSTRUCTION PERMIT MODIFICATION**

This construction permit is being modified upon the request of the City of Dexter to extend the construction permit schedule. The construction permit will now expire on **December 3, 2022**.

With your CP application, an operating permit application for a renewal has been submitted on January 8, 2021 and still under review.

Mohammed Mohammed  
Engineering Section  
[Mohammed.Moahammed@dnr.mo.gov](mailto:Mohammed.Moahammed@dnr.mo.gov)

Cindy LePage, P.E.  
Engineering Section  
[cindy.lepage@dnr.mo.gov](mailto:cindy.lepage@dnr.mo.gov)



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: \_\_\_\_\_  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 UV disinfection improvements only
- 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 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 Wastewater UV Disinfection Improvements	2.2 ESTIMATED PROJECT CONSTRUCTION COST \$ 450,000
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2.3 PROJECT DESCRIPTION  
Construction of UV disinfection facilities

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION  
N/A

2.5 DESIGN INFORMATION  
 A. Current population: 13k ; Design population: 18.5k  
 B. Actual Flow: 1.3M gpd; Design Average Flow: 1.8M gpd;  
 Actual Peak Daily Flow: 4.3 gpd; Design Maximum Daily Flow: 3.0 gpd; Design Wet Weather Event: 3.0

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 Dexter East Wastewater Treatment Facility		TELEPHONE NUMBER WITH AREA CODE 573-624-5959		E-MAIL ADDRESS
ADDRESS (PHYSICAL) South terminus of Fairground Drive		CITY Dexter	STATE MO	ZIP CODE 63841
COUNTY Stoddard				
Wastewater Treatment Facility: Mo- 0023213 (Outfall 1 Of 1 )				
3.1 Legal Description: <u>      </u> ¼, <u>NE</u> ¼, <u>SW</u> ¼, Sec. <u>26</u> , T <u>25N</u> , R <u>10E</u> (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): <u>772434</u> Northing (Y): <u>4074566</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 Lateral #2 Main Ditch</u>				
4.0 PROJECT OWNER				
NAME City of Dexter		TELEPHONE NUMBER WITH AREA CODE 573-624-5959		E-MAIL ADDRESS
ADDRESS 301 East Stoddard Street		CITY Dexter	STATE MO	ZIP CODE 63841
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 Same		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS
ADDRESS		CITY	STATE	ZIP CODE
5.1 A letter from the continuing authority, if different than the owner, is included with this application. <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> 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? <input type="checkbox"/> YES <input type="checkbox"/> 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? <input type="checkbox"/> YES <input type="checkbox"/> 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? <input type="checkbox"/> YES <input type="checkbox"/> 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? <input type="checkbox"/> YES <input type="checkbox"/> NO				
D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
6.0 ENGINEER				
ENGINEER NAME / COMPANY NAME Richard E. Cochran, Jr., Waters Engineering, Inc.		TELEPHONE NUMBER WITH AREA CODE 573-471-5680		E-MAIL ADDRESS rcochran@waterseng.com
ADDRESS P.O. Box 567		CITY Sikeston	STATE MO	ZIP CODE 63801
7.6 APPLICATION FEE				
<input checked="" type="checkbox"/> CHECK NUMBER <input type="checkbox"/> 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 Mark Stidham			DATE 10-3-19	
TITLE OR CORPORATE POSITION City Administrator		TELEPHONE NUMBER WITH AREA CODE 573-624-5959		E-MAIL ADDRESS
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.				