

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 Marshfield
798 S. Marshall Road
Marshfield, MO 65706

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.

August 2, 2019
Effective Date

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

August 1, 2021
Expiration Date

Chris Wieberg
Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction consists of installation of UV disinfection to replace existing chlorination system, new effluent flow meter, new mechanically cleaned screen and static weir in headworks to divert flows up to 6 MGD through secondary treatment and flows greater than 6 MGD through the excess flow basin and new excess flow pump station. The facility operating permit, renewed on March 1, 2019, was modified to include requirements for periods of peak flow where the excess flow pump station will be used to blend flows prior to disinfection.

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 Scott Knight of Crawford, Murphy & Tilly 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 South West Regional Office per 10 CSR 20-7.015(9)(G).
5. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment.
6. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.
7. 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.
8. 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.
9. 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.
10. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.

UV Disinfection:

- Disinfection shall be provided during all power outages.
10 CSR 20-8.140 (7) (A) 2. and 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.

- 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) and 10 CSR 20-8.190 (5) (C) 2.

Submersible Pump Station:

- Submersible pump stations shall meet the applicable requirements under section (3) of this rule, except as modified in this section. 10 CSR 20-8.130 (5)
- Submersible pumps shall be readily removable and replaceable without personnel entering, dewatering, or disconnecting any piping in the wet well. 10 CSR 20-8.130 (5) (A)
- Valves shall not be located in the wet well unless integral to a pump or its housing. 10 CSR 20-8.130 (3) (D)
- A minimum access hatch dimensions of twenty-four inches by thirty-six inches (24" x 36") shall be provided. 10 CSR 20-8.130 (5) (B) 1.
- The distance between wastewater pumping stations and all potable water sources shall be at least fifty feet (50') in accordance with 10 CSR 23-3.010(1)(B) and 10 CSR 20-8.130 (2) (D).
- Valves shall not be located in the wet well unless integral to a pump or its housing. 10 CSR 20-8.130 (3) (D)

Mechanical Screening:

- All wastewater treatment facilities must have a screening device, comminutor, or septic tank for the purpose of removing debris and nuisance materials from the influent wastewater. 10 CSR 20-8.150 (2)
- All screening devices and screening storage areas shall be protected from freezing. 10 CSR 20-8.150 (4) (A) 1.
- Mechanically cleaned screen channels shall be protected by guard railings and deck gratings. 10 CSR 20-8.150 (4) (A) 3. A. (II)
- Mechanical screening equipment shall have adequate removal enclosures to protect facility personnel against accidental contact with moving parts and to prevent dripping in multi-level installations. 10 CSR 20-8.150 (4) (A) 3. B. (I)
- A positive means of locking out each mechanical screening device shall be provided. 10 CSR 20-8.150 (4) (A) 3. B. (II)
- An emergency stop button with an automatic reverse function shall be located in close proximity to the mechanical screening device. 10 CSR 20-8.150 (4) (A) 3. B. (III)

11. Upon completion of construction:

- A. The City of Marshfield will become the continuing authority for operation and maintenance of these facilities;
- B. Submit an electronic copy of the as built's 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 purpose of the proposed construction is to eliminate excess flow bypass outfall by way of new excess flow pump station/piping to blend. The upgrades will also eliminate the use of chlorine and dechlorination chemicals by switching to UV disinfection process. All flows, including blended flows will be discharged through outfall #002.

2. FACILITY DESCRIPTION

The facility is an existing activated sludge treatment process with two activated sludge reactors, two secondary clarifiers, tertiary filtration, four aerobic digesters, two digested sludge holding tanks, chlorination/dechlorination, excess flow basin, and effluent flow measurement by parshall flume.

The proposed construction will add an excess flow pump station to accommodate flows greater than 1.5 MGD and include the necessary piping for blending of excess flows with secondary treated flows. Blending will occur prior to disinfection and eliminate the use of bypass outfall.

The Marshfield WWTF is located 0.3 miles NE of State Highway W and Outer Road N intersection, in Webster County, Missouri. The facility has a design average flow of 1.5 MGD and serves a population equivalent of approximately 15,000 people.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits as established in Operating Permit MO-0040843. The facility is required to comply with additional requirements for sampling and reporting of blending events as established in Special Condition #2 and #12 of the operating permit.

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

Parameter	Units	Monthly average limit
Biochemical Oxygen Demand ₅	mg/L	10
Total Suspended Solids	mg/L	15
Ammonia as N-summer	mg/L	0.9
Ammonia as N-winter	mg/L	*
pH	SU	6.5-9.0
Total Residual Chlorine ***	µg/L	8 (130 ML)
E. Coli	#/100mL	126 (daily max)
Biochemical Oxygen Demand ₅ **	% removal	85
Total Suspended Solids **	% removal	85
Oil and Grease	mg/L	10
Copper, Total Recoverable	µg/L	14.4
Lead, Total Recoverable	µg/L	5.4
Zinc, Total Recoverable	µg/L	120.1

* monitoring requirement

** additional daily influent and effluent requirement during blending events

*** report "0 µg/L" for TRC and "NA" for DO once UV disinfection replaces chlorination.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

- Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis.
 - Electromagnetic Meter – An effluent electromagnetic 8-inch flow meter shall measure the tertiary treated and disinfected wastewater prior to discharge at Outfall No. 002.
- Mechanical Fine Screen – A single mechanically cleaned fine screen with a maximum perforated plate spacing of 1/4-inch. The screening device shall be capable of treating a design average flow of 1.5 MGD and a peak hourly flow of 10 MGD. The screen will be installed in a 3 foot wide channel with a 1 foot wide channel to allow flow around the screen where necessary. A pivot frame will be used to allow easy removal and access of screen for repairs and replacement. Includes a screenings grinder/washer/compactor unit prior to screenings dumpster.
- 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 10 MGD while delivering a minimum UV intensity of 30 mJ/cm² with an expected ultraviolet transmissivity of 65% or greater. The single open channel UV system consists of 1 bank with 4 modules and 40 lamps per module. The disinfected effluent will flow by gravity through flow measurement equipment and to Outfall No. 002.
- Excess flow pump station – Flows will be transported to the pump station via 14 inch influent pipe and will be reduced to three 8-in feed pipes to the valve vault which precedes the wet well. The valve vault will be 6-ft long by 10-ft wide by 9-ft deep. The pump station will house two (2) duty pumps, FLYGT NP3153 LT3, and a third standby pump. Each pump is rated at 17 hp, 60 Hz, and 460 V. The pumps will operate at 1,450 gpm each at a head of 30.9 ft. The submersible pumps will be housed in the wet well with dimensions of 12-ft long by 10-ft wide by 9-ft deep. A weir wall will be constructed in the well to mitigate flows to a 30-in high flow transfer pipe and will be 2-ft 7.5-in tall.

The wet well and valve vault will contain hatches above each valve and pump totaling 6 access hatches.

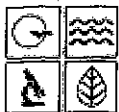
- Emergency Power – The facility has an existing backup generator that will be fitted to provide support to new system loads associated with this construction.

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 new excess flow pump station, UV disinfection and headworks mechanical screen updates.

Aaron Sawyer
Engineering Section
aaron.sawyer@dnr.mo.gov

Cindy LePage, P.E.
Engineering Section
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

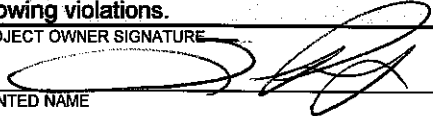
1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

- 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 Project to comply with Bypass Elimination Plan & Voluntary Compliance Agreement
- 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 MARSHFIELD MISSOURI WWTP - BYPASS ELIMINATION	2.2 ESTIMATED PROJECT CONSTRUCTION COST \$ 2,800,000
2.3 PROJECT DESCRIPTION Construction of new excess flow basin discharge pipe, outfall sewer and installation of UV disinfection equipment. Improvements to existing headworks and construction of excess flow pump station to screen excess flow prior to primary treatment	
2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION Aerobically digested and land applied to farm ground	
2.5 DESIGN INFORMATION A. Current population: <u>7350</u> ; Design population: <u>15k</u> B. Actual Flow: <u>.87M</u> gpd; Design Average Flow: <u>1.5M</u> gpd; Actual Peak Daily Flow: <u>1.5M</u> gpd; Design Maximum Daily Flow: <u>1.5M</u> gpd; Design Wet Weather Event: <u>6.0M</u>	
2.6 ADDITIONAL INFORMATION A. Is a topographic map attached? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO B. Is a process flow diagram attached? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

3.0 WASTEWATER TREATMENT FACILITY				
NAME Marshfield Wastewater Treatment Facility		TELEPHONE NUMBER WITH AREA CODE 417-818-4681		E-MAIL ADDRESS samrost@marshfieldmo.gov
ADDRESS (PHYSICAL) 0.3 miles NE of State Hwy W & Outer Rd N i		CITY Marshfield	STATE MO	ZIP CODE 65706
COUNTY Webster				
Wastewater Treatment Facility: Mo- 0040843 (Outfall 1 Of 1)				
3.1 Legal Description: <u>NW 1/4, NE 1/4, SE 1/4, Sec. 33, T 31N, R 18W</u> (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): <u>507651</u> Northing (Y): <u>4134976</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 West Fork Niangua River</u>				
4.0 PROJECT OWNER				
NAME City of Marshfield		TELEPHONE NUMBER WITH AREA CODE 417-818-4681		E-MAIL ADDRESS samrost@marshfieldmo.gov
ADDRESS 798 S. Marshall St.		CITY Marshfield	STATE MO	ZIP CODE 65706
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 as above		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 Crawford, Murphy & Tilly, Inc.		TELEPHONE NUMBER WITH AREA CODE 314-571-9057		E-MAIL ADDRESS sknight@cmtengr.com
ADDRESS One S. Memorial Drive, Suite 500		CITY St. Louis	STATE MO	ZIP CODE 63102
7.0 APPLICATION FEE				
<input checked="" type="checkbox"/> CHECK NUMBER <u>001001</u> <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 <u>Sam Rost</u>			DATE <u>5/21/2019</u>	
TITLE OR CORPORATE POSITION <u>DEPUTY ADMINISTRATOR</u>		TELEPHONE NUMBER WITH AREA CODE <u>417-818-4681</u>		E-MAIL ADDRESS <u>samrost@marshfieldmo.gov</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.				