

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

<p>Matthews WWTP P.O. Box 54 Matthews, MO 63867</p>

for the construction of (described facilities):

<p>See attached.</p>

Permit Conditions:

<p>See attached.</p>

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).

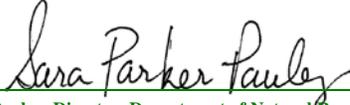
As the Department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

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.

May 2, 2016
Effective Date

May 1, 2018
Expiration Date


Sara Parker Pauley, Director, Department of Natural Resources

Director of Staff, Clean Water Commission or Designee

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The existing facility is a two aerated cell lagoon. The proposed facility will be at the location of existing secondary pond which is 10.0 ft. deep with a total detention time of 31.7 day. The new treatment pond consists of three cells separated by hydraulic baffles. The baffles will provide effective separation of zones within the lagoon. The first cell (2.7 MG) is a 14.2 day complete mix cell, followed by a 14.2 day partial mix cell (2.7 MG) and a 3.3 day settling cell (0.65MG). The existing aeration system continues to provide the aeration and totally mixing in the first cell and partial aeration as well as maintain partial suspension of solids in the second cell.

Modular insulated floating lagoon cover will be installed over entire treatment pond. The cover will allow gases to escape and rainwater to drain through the overlap spaces of adjacent casings. The cover also provides an insulated environment for heat retention and prevents algae growth by shielding sunlight.

A polishing reactor after treatment pond will consist of discrete polishing modules with fixed film biological treatment media. Each module will be 6 feet wide by 6 feet long by 8 feet tall. A total of nine polishing modules will be installed. Eight modules will have a surface area of approximately 69 square feet per cubic foot of media density and one module will have a surface area of approximately 48 square feet per cubic foot of media density. Two 7.5 HP positive displacement blowers (one operating and one standby) are provided air through a low rate diffuser for the polishing reactor to meet aeration requirements.

A flow splitting structure and recirculating lift station with duplex pumps (one operating and one stand by) after the polishing reactor are able to recirculate flow at a maximum 4:1 ration to recycle nitrifiers back to the lagoon. With one 3.9 HP pump running, the lift station will be capable of pumping 524 gallons per minute (GPM) at 18 feet of total dynamic head (TDH).

An Ultraviolet (UV) Disinfection system with a level control weir will be installed which is capable of treating a peak hourly flow of 560,000 gallons per hour. The system will be installed in one open channel approximately 25 feet by 36 inches by 12 inches. The system will have one bank per channel, four UV modules per bank, and four lamps per UV module, for a total of 16 lamps in the system.

Ultrasonic flow monitoring equipment will be installed following UV disinfection.

The above components along with all the necessary appurtenances make the system complete and useable to serve a population equivalent of 1,880 with an average daily flow of 188,000 gallon from the city of Matthews. The discharge will go to Ditch #104 in the SW¹/₄ of the SW ¹/₄ of section 6, T24N, R14E, New Madrid County, Missouri (MO0127175)

II. FINDING OF AFFORDABILITY

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 upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. Where permit modifications, permit renewals, or sewer extensions do not impose new requirements and/or do not require rate increases, the affordability finding may receive a less detailed review. Permits that do not include new requirements may be deemed affordable.

Not applicable; the department is not required to determine findings of affordability 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 in accordance with the plans and specifications submitted by Richard E. Cochran, P.E., of Waters Engineering Inc. on May 22, 2013 and January 31, 2014.
3. The department must be contacted in writing prior to making any changes to the approved 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(8).
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)(E)2.
5. This construction permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"
6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."
7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.

- A. Sewer mains shall be laid at least 10 feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a 10 foot separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.
 - B. Manholes should be located at least 10 feet horizontally from any existing or proposed water main.
 - C. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:
 - a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or
 - b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends 10 feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.
8. 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 www.dnr.mo.gov/env/wpp/epermit/help.htm. See www.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 www.dnr.mo.gov/env/wpp/401/ for more information.

10. Upon completion of construction;
 - A. Submit the enclosed form Statement of Work Completed to the department In accordance with 10 CSR 20-6.010(5)(D);
 - 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 a Form B2 - Application for Construction or Operating Permit for Facilities which receive basically domestic waste and have a design flow more than 100,000 gallons per day along with the modification fee.

IV. REVIEW SUMMARY

1. AMMONIA

The Water Protection Program is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The department has initiated stakeholder discussions on this topic and at this time, there is no firm target date for starting the rulemaking to adopt new standards. More information can be found at <http://dnr.mo.gov/pubs/pub2481.pdf>.

As result of the potential lowering of the ammonia limit, the current design included capabilities for recirculation at a maximum 4:1 ration to recycle nitrifiers to the lagoon and further improve the ammonia treatment.

2. CONSTRUCTION PURPOSE

The current operating permit (MO-0127175) contains a Schedule of Compliance to meet the nitrification and disinfection requirements. The city of Matthews must treat ammonia and disinfect any effluent before discharge into its receiving stream by the year 2016. The treatment plant upgrades are necessary to meet new ammonia limits and include disinfection equipment.

The new wastewater treatment facility will be a hybrid lagoon, in that the treatment is still in an earthen basin, however it will be covered and have aeration. It will be followed by a polishing reactor that includes media and additional aeration. The final step of treatment will be from the ultraviolet light disinfection system. The new plant will address water quality issues such as ammonia and disinfection.

3. FACILITY DESCRIPTION

Current Facility Description:

Two cell aerated lagoon/Sludge is retained in lagoon

Future Facility Description:

Screening/Baffled three-cell earthen basin with a complete-mix primary, partial-mix secondary, and quiescent tertiary/ Lemna Polishing Reactor/ Seasonal UV disinfection/Sludge retained in the earthen basin

4. COMPLIANCE PARAMETERS

The draft operating permit publicly noticed December 27, 2013 included final effluent limitations for Biochemical Oxygen Demand₅ of 45 mg/L weekly average and 30 mg/L monthly average; and Total Suspended Solids of 45 mg/L weekly average and 30 mg/L monthly average; and Ammonia as N of 3.7 mg/L daily maximum and 1.4 mg/L monthly average during summer, 7.5 mg/L daily maximum and 2.9 mg/L monthly average during winter; and Oil & Grease of 15 mg/L daily maximum and 10 mg/L monthly average; and Escherichia Coliform of 1030 colonies per 100 mL weekly average and 206 colonies per 100 mL monthly average.

The draft operating permit also has monitoring only requirement for Flow and pH. This proposed construction project will allow the facility to meet these limits.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The LemTec™ Biological Treatment Lagoon (LBTP) will be constructed at the current lagoon site. The treatment has been considered an innovative or New Technology in recent years. Many installations of this process have been approved, constructed and are currently operating across the state of Missouri. The design has no deviations from 10CSR 20-8 other than utilizing new technology. The LBTP is composed of a series of aerobic treatment cells separated by hydraulic baffles and followed by a low-loaded anaerobic settling zone. A fixed film reactor immediately follows the settling zone providing BOD and ammonia polishing. The aerobic and anaerobic cells are covered by LemTec™ Modular Cover System.

The treatment system is designed for homes and businesses within the city limits. The facility will have a design flow of 188,000 GPD, a design max daily flow of 1,036,800 GPD, design peak hourly flow of 560,000 GPD.

6. OPERATING PERMIT MODIFICATION

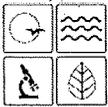
Draft Missouri State Operating Permit MO-0127175 which reflects this proposed construction had been on the public notice for public comments from February 28, 2014 to March 31, 2014. There were no comments received regarding the draft permit.

Operating permit MO-0127175 will require a modification to reflect the construction activities. Upon construction completion submit a modification fee and Form B2 - Application for Construction or Operating Permit for Facilities which receive basically domestic waste and have a design flow more than 100,000 gallons per day.

CP0001833
 MO 0127173
 AP 23423
 06108

RECEIVED

APR 12 2016



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM
APPLICATION FOR CONSTRUCTION PERMIT –
WASTEWATER FACILITY
 Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED \$150,003.10	CHECK NO.
DATE RECEIVED 4-12-16	

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Facility form is for construction pertaining to domestic wastewater treatment facilities, agrichemical facilities, and components thereof. This 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: USDA-RD Project #: _____
- 1.2 Is this an application for an agrichemical? YES (See instructions.) N/A
- 1.3 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
 YES Date of Approval: April 24, 2014
- 1.4 Has the department approved the proposed project's facility plan*?
 YES Date of Approval: April 24, 2014 NO N/A (If Not Applicable, complete No. 1.5.)
- 1.5 [Complete only if answered Not Applicable on No. 1.4] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
 YES NO
- 1.6 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
- 1.7 Is a summary of design* included with this application? YES NO
- 1.8 Is a general operating permit applicable?
 YES Submit the appropriate operating permit application to the Regional Office at least 60 days prior to operation.
 NO Enclose the appropriate operating permit application and fee submittal. Denote which form: B B2
- 1.9 Is the facility currently under enforcement with the department or the Environmental Protection Agency? YES NO
- 1.10 Is the appropriate fee included with this application? YES NO (See instructions for appropriate fee.)

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT
 Matthews Wastewater Treatment Improvements

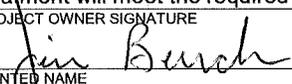
2.2 PROJECT DESCRIPTION
 Upgrade of existing aerated lagoon with floating insulated covers, fixed film reactor basin, recirculating pump station, and UV disinfection facilities.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
 Retained in Lagoon

2.4 DESIGN INFORMATION
 A. Current population: 1585; Design population: 1880
 B. Actual Flow: 137000 gpd; Design Average Flow: 188000 gpd;
 Actual Peak Daily Flow: 560000 gpd; Design Maximum Daily Flow: 560000 gpd;
 Design Wet Weather Event: 560000

2.5 ADDITIONAL INFORMATION
 A. Is a topographic map attached? YES NO
 B. Is a process flow diagram attached? YES NO

2.6 ESTIMATED PROJECT CONSTRUCTION COST
 \$ 959,892.00

3.0 WASTEWATER TREATMENT FACILITY				
NAME Matthews Wastewater Treatment Plant		TELEPHONE NUMBER WITH AREA CODE (573) 471-2541		EMAIL ADDRESS
ADDRESS (PHYSICAL) P.O. Box 54	CITY Matthews	STATE Mo	ZIP CODE 63867	COUNTY New Madrid
Wastewater Treatment Facility: Mo- 0127175 (Outfall 1 Of 1)				
3.1 Legal Description: $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 , T 24N , R 14E (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): Northing (Y): For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)				
3.3 Name of receiving streams: Ditch #104				
4.0 PROJECT OWNER				
NAME City of Matthews		TELEPHONE NUMBER WITH AREA CODE (573) 471-2541		EMAIL ADDRESS
ADDRESS P.O. Box 54	CITY Matthews	STATE MO	ZIP CODE 63867	
5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.				
NAME Same as above		TELEPHONE NUMBER WITH AREA CODE		EMAIL 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 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 Cochran, Jr./Waters Engineering		TELEPHONE NUMBER WITH AREA CODE (573) 471-5680		EMAIL ADDRESS rcochran@waterseng.com
ADDRESS 908 S. Kingshighway	CITY Sikeston	STATE MO	ZIP CODE 63801	
7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.				
PROJECT OWNER SIGNATURE 				
PRINTED NAME Jim Burch			DATE 04/11/16	
TITLE OR CORPORATE POSITION Mayor		TELEPHONE NUMBER WITH AREA CODE (574) 471-2542		EMAIL 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.				