Permit No. CP0001987

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Robert & Christine Palmer
Palmer WWTP
701 W 24th Street
Independence, MO 64053

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.

November 21, 2018
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

November 21, 2020
Expiration Date

Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction will consist of a septic tank receiving effluent from the two residential apartments. A pre-anoxic tank will be constructed following the septic tank; a soda ash alkalinity pump will be included in construction. First stage recirculation tank with two AdvanTex AX20 units constructed in parallel will follow the pre-anoxic tank. A second stage recirculation tank with a single AX20 unit are constructed next in the treatment train. Two UV disinfection units will be constructed in series and there will be a sample port placed on the effluent line from the UV system.

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 functional 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 complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publically-owned treatment works.

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 Lake Professional Engineering Services, Inc., on November 1st, 2018.

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 South West Regional Office per 10 CSR 20-7.015(9)(E)2.

5. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.

6. Wastewater treatment facility shall not be located within one hundred feet (100'), and preferably three hundred feet (300') of any water well or water supply structure.

7. Upon completion of construction:

   A. Robert and Christine Palmer will become the continuing authority for operation, maintenance, and modernization of these facilities;

   B. Submit an electronic copy of the as builts 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)(D) and request the operating permit be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The proposed treatment facility will replace existing on-site septic systems that are failing on both lots. The area available for the placement of a new or rehabilitated subsurface application is not sufficient to meet current requirements, thus leading to the proposed alternative. The new treatment system will serve both lots and have a reduced footprint.

2. FACILITY DESCRIPTION

The Palmer WWTP is located at 49 Westbrook road, city of Sunrise Beach, in Camden County, Missouri. The facility has a design average flow of 450 gpd and serves a population equivalent of approximately 6 people.

Influent will be directed from each apartment through an existing 1,500 gallon septic tank for primary treatment. A new pump tank will force effluent to the 1,000 pre-anoxic tank. The wastewater will be pumped to the first stage of secondary treatment with a recirculation tank and two AX-20 units. After passing the media filters a splitter box will direct 80% of the effluent to the recirculation tank and the remaining 20% to the second stage secondary treatment which consists of a 500 gallon recirculation tank and an AX-20 unit. The same recirculation process will take place in the second stage recirculation tank. Following the second stage treatment the wastewater will flow to the UV disinfection. Two Sanitron S23 UV units will provide disinfection to the effluent. The treated wastewater will then flow through a sampling port and finally exit the system through the discharge pipe into the Lake of the Ozarks.

3. COMPLIANCE PARAMETERS

The final effluent limits the project is required to meet are established in the Antidegradation review dated June 8, 2018 as the following:

Effluent Parameter(s)	Units	Daily Maximum	Weekly Average	Monthly Average
Flow	MGD	*		*
Biochemical Oxygen Demand$_5$ ***	MG/L		15	10
Total Suspended Solids	MG/L		20	15
pH	SU	6.0– 9.0		6.0 – 9.0
Ammonia as N (Apr 1 – Sept 30)	MG/L	3.7		1.4
Ammonia as N (Oct 1 – Mar 31)	MG/L	7.5		2.9
Escherichia coliform (*E. coli*)	Note 1	630**		126**

* Monitoring requirement only.

4. ANTIDEGRADATION

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated 06/08/2018, due to the project being a new discharge.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

- Recirculation Tank – Construction of one recirculation tank to pump primary treated wastewater to the recirculating media filter. The recirculation tank is 7ft 2-in x 6ft 2-in x 6 ft deep for a wastewater volume of approximately 2,000 gallons. The minimum level for running the pumps is 22 inches while the high water alarm is set at 60 inches. Effective flow equalization volume of 234 gallons between the low water level and the high water "on" level. The recirculation tank has 2 submersible pumps with a minimum of ½ HP – each capable of 30 gpm at 74.9 ft TDH. The pumps transfer wastewater to 68 distribution holes per AX-20 unit. The recirculation ball valve is set at 25 inches.

- Stage One Secondary Treatment Components: Two AdvanTex AX20 treatment systems will be placed in conjunction with the recirculation tank. Recirculation and discharge to the stage two treatment components will be supported by a pump capable of 30 gpm. A splitter valve will divert wastewater from the recirculation tank to both textile filters. Each Advantex unit is approximately 7.5 ft x 3 ft x 2.5 ft deep with total surface area of 20 ft^2. The hydraulic loading rate for the system is 21.24 gpd/ft^2. An underdrain will transport the treated wastewater back to the recirculation tank. 80% of the wastewater from the textile filters is diverted back into the system while the remaining 20% is directed to the Stage Two Secondary Treatment Components.

- Stage Two Secondary Treatment Components: A single AdvanTex AX20 treatment unit will be placed in conjunction with a 500 gallon recirculation tank. The Recirculation tank will be equipped with a recirculation valve capable of recirculating 80% of flows back through the Stage Two AX20 unit while discharging 20% of flows to the next phase of treatment. The loading rate for the Stage Two AX20 unit will be 21.24 gpd/ft^2. Surface treatment area is 20 ft^2 for the AX20. A 30 gpm pump will transmit flows to the UV disinfection units.

- Two closed vessel, gravity flow, low pressure high intensity UV disinfection system capable of treating a peak flow of 12 gpm while delivering a minimum UV intensity of 30 mJ/cm2 with an expected ultraviolet transmissivity of 85% or greater. The closed vessel UV system consists of 1 lamp per reactor. Two closed vessel UV reactors are arranged in series. The disinfected effluent will flow by gravity through flow measurement equipment and to Outfall No. 001.

  Note 1: Due to lot size, shape, and location of road right-of-way constraints the applicant demonstrated the facility is not able to be located at a minimum 50 feet from the dwelling. The applicant is granted a deviation from this requirement.

6. OPERATING PERMIT

The operating permit, MO-0318991, associated with this facility was public noticed from June 29, 2018 to July 30, 2018 with no comments received. Upon completion of construction submit the statement of work complete and request the operating permit be issued.

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

AP29756

CP0001987

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

RECEIVED
APR 16 2018
Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $1000.00	CHECK NO. 2731
DATE RECEIVED 4-16-18	SB

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: _____ 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: Review is Concurrent

1.4 Has the department approved the proposed project's facility plan*?
☐ YES Date of Approval: _____ ☐ 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
Palmer Wastewater Treatment Plant

2.2 PROJECT DESCRIPTION
Two Advantex Filters with recirculation tank and UV Lights for a two unit apartment building

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Septic tank w/ hauling by others

2.4 DESIGN INFORMATION
A. Current population: 6.0 ; Design population: 6.0
B. Actual Flow: 450 gpd; Design Average Flow: 450 gpd;
Actual Peak Daily Flow: 450 gpd; Design Maximum Daily Flow: 1800 gpd;
Design Wet Weather Event: 0

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
$ 66,000.00

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Palmer WWTP	816-806-0900	

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
49 Westbrook Rd	Sunrise Beach	MO	65079	Camden

Wastewater Treatment Facility: Mo- (Outfall 1 Of 1)

3.1 Legal Description: NE ¼, NE ¼, SE ¼, Sec. 11, T 39, R 17
(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: Lake of the Ozarks

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Robert & Christine Palmer	816-806-0900	

ADDRESS	CITY	STATE	ZIP CODE
701 West 24th St	Independence	MO	64053

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	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Robert & Christine Palmer		

ADDRESS	CITY	STATE	ZIP CODE
701 West 24th St	Independence	MO	64053

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	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
James O Jackson Sr Lake Professional Engineering	573-873-3898	

ADDRESS	CITY	STATE	ZIP CODE
PO Box 27	Camdenton	MO	65020

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: X Christine Palmer

PRINTED NAME	DATE
CHRISTINE PALMER	11/21/16

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
OWNER	816 806 0900	WEDANZ2X2@AOL.COM

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.