STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Larry Fletcher
Lakeside Estates HOA President
10061 Holt Road
Newburg, MO 65550

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.

January 11, 2022
Effective Date

January 10, 2024
Expiration Date

Chris Wieberg

Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The upgrade will be a NitrOx™ Reactor System developed by Triplepoint Environmental. The NitrOx™ MBBR is designed for an average daily flow of 13,800 gpd with a maximum daily flow of 46,000 gpd. The upgrade will convert lagoon cells 1 and 2 to sludge holding proceeding the NitrOx™ single-stage covered Moving Bed Biological Reactor (MBBR), followed by final clarifier. A new tablet chlorination/tablet dechlorination system will be constructed following the NitrOx™ and clarifier. With construction, repairs to lagoon berms and replacement of existing manhole will be conducted to reduce stormwater I&I.

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 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 consistent with plans and specifications signed and sealed by Joseph Heberlie with Missouri Engineering Company 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 East 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 Army Corps of Engineers (USACE) Clean Water Act Section 404 Department of the Army permit and a Section 401 Water Quality Certification issued by the Department may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied or notification is provided that no Section 404 permit is required by the USACE. You must contact your local USACE district since they determine what waters are jurisdictional and which permitting requirements may apply. You may call the Department's Water Protection Program, Operating Permits Section at 573-522-4502 for more information. See https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality for more information.

10. Upon completion of construction:

    A. The Lakeside Estates Property Owners Association will become the continuing authority for operation and maintenance 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;

    C. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N)

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The purpose of this construction is to enable the facility to be compliant with final effluent limits for ammonia and *E. coli* as dictated in the associated operating permit. A schedule of compliance in the operating permit, renewed April 1, 2019, expired June 30, 2021.

2. FACILITY DESCRIPTION

The existing facility is a two-cell lagoon discharging to Tributary to Tick Creek. The existing lagoon cells will have berm repair work done but will remain in use. The NitrOx^{TM} reactor and clarifier will be constructed following the second lagoon. Chlorine/dechlorination units will be installed with a contact basin following the final clarifier. DMR data shows the existing facility is able to meet the interim limits, however; final effluent limits would not be achieved by the 2-cell lagoon without further treatment.

The Lakeside Estates WWTF is located at the intersection of Lakewood Dr. & CR 8170, City of Newburg, in Phelps County, Missouri. The facility has a design average flow of 13,800 gpd and serves a population equivalent of approximately 138 people.

3. COMPLIANCE PARAMETERS

The construction is to meet final effluent limits established in MO-0106411. The limits following the completion of construction will be applicable to the facility:

Parameter	Units	Average Monthly Limit
Biochemical Oxygen Demand$_5$	mg/L	30
Total Suspended Solids	mg/L	30
Ammonia as N-summer	mg/L	1.4
Ammonia as N-winter	mg/L	2.9
pH	SU	6.5-9.0

Total Residual Chlorine	µg/L	8 (130 ML)
E. coli	#/100mL	206

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Existing Facilities

- Lagoon Cell No. 1 – Lagoon Cell No. 1 has a surface area of 0.48 acres and a wastewater volume of 0.236 million gallons (MG), providing approximately 17.1 days of retention at the design flow.
- Lagoon Cell No. 2 – Lagoon Cell No. 2 has a surface area of 0.17 acres and a wastewater volume of 0.082 million gallons (MG), providing approximately 5.9 days of retention at the design flow.

New Facilities

- Triplepoint Water Technologies, LLC NitrOx^{TM} – The lagoon treated effluent will be transported by air lift process from the existing lagoon cells to the NitrOx^{TM} system. The NitrOx^{TM} system is capable of treating a design average flow of 13,800 gpd and a peak flow of 46,000 gpd.
    - The system is composed of a single reactor, approximately 8 ft in diameter, and a side water depth of 10 ft. Total volume of the tank is 3,755 gallons.
    - The average flow hydraulic retention time is 6.5 hours and the peak flow hydraulic retention time is 2.0 hours.
    - A floating insulating cover shall be installed on the tank. Thickness of the cover will be 3 inches.
    - An immersion tank heater is 7.5kW and will be installed to maintain a minimum wastewater temperature of 41°F.
    - The tanks shall be filled with high surface area HDPE media to a density that allows for adequate aeration and mixing conditions. The media will have a total surface area of 152 ft^2 per cubic foot.
    - Aeration by means of two bi or tri-lobe positive displacement blowers each with a 3 HP motor.
    - The effluent from the NitrOx^{TM} will flow by gravity to the clarifier for polishing prior to disinfection and discharge.

- Hopper Style Clarifier- The hopper type clarifier will have a surface area of 50.0 square feet. The volume of the clarifier is 4,511 gallons with an average surface overflow rate of 1,000 gpd/square foot at peak flow.
    - The clarifier has the dimensions of 8 ft diameter by 14.5 ft total depth with a sidewater depth of 12 feet.

- Chlorine Disinfection
    - Tablet Chlorination / Dechlorination - Norweco Bio-Dynamic tablet feeder Model ITR 2000-S or approved equal. Shall be able to provide treatment at a maximum flow of 100,000 gpd. Contact Basin will be baffled and provide at least 15 minutes of contact time at peak flows. The basin will be 30 feet in length by 1.5 feet wide by 1.5 feet deep

(water level). Using peak flows the basin will provide 67.5 cubic feet of storage exceeding the necessary 64 cubic feet needed for a peak flow of 46,000 gpd. Contact basin will be covered with aluminum grating. Basin floor elevation is 895.67 ft with top of wall being at 902.00 ft. An aluminum 90 notch weir will be installed at the inlet of the basin. Baffle walls will be 6 inches thick.

5. OPERATING PERMIT

Operating permit MO-0106411 requires a modification to reflect the construction activities. The modified Lakeside Estates WWTF, MO-0106411, was successfully public noticed from April 19, 2019 to May 20, 2019 with no comments received. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued.

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

Cindy LePage, P.E.
Engineering Section Chief
cindy.lepage@dnr.mo.gov

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER FACILITY

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $1000	CHECK NO. 1706
DATE RECEIVED 11/12/21 SH	

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: _____

1.4 Has the department approved the proposed project's facility plan*?
☑ YES Date of Approval: 1/4/2019 ☐ 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
Treatment Plant Improvements - Lakeside Estates Homeowners Association

2.2 PROJECT DESCRIPTION
Add heated post aeration and clarification treatment following lagoons and add disinfection with table chlorination, contact basin and tablet de-chlorination prior to discharge. Re-build berm of section of lagoon and remove and replace manhole to reduce storm water inflow.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Sludge is retained in private septic tanks and in lagoons.

2.4 DESIGN INFORMATION
A. Current population: 122; Design population: 138
B. Actual Flow: 19,700 gpd; Design Average Flow: 13,800 gpd;
Actual Peak Daily Flow: 19,700 gpd; Design Maximum Daily Flow: 46,000 gpd;
Design Wet Weather Event: 46,000

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

RECEIVED
NOV 12 2021
Water Protection Program

2.6 ESTIMATED PROJECT CONSTRUCTION COST
$ 155,000.00

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Lakeside Estates Homeowners Association	(573) 762-3865	lfletch@embarqmail.com

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
Intersection of Lakewood Dr & CR 8170	Newburg	MO	65550	Phelps

Wastewater Treatment Facility: Mo- 0106411 (Outfall 1 Of 1)

3.1 Legal Description: ¼, NW ¼, NW ¼, Sec. 12 , T 37N , R 9W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 598639 Northing (Y): 4206816
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Tributary to Tick Creek

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Lakeside Estates Homeowners Association	(573) 762-3865	lfletch@embarqmail.com

ADDRESS	CITY	STATE	ZIP CODE
10061 Holt Road	Newburg	MO	65550

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
Lakeside Estates Homeowners Association	(573) 762-3865	lfletch@embarqmail.com

ADDRESS	CITY	STATE	ZIP CODE
10061 Holt Road	Newburg	MO	65550

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
Joseph G Heberlie, Missouri Engineering Company	(573) 364-4003	jheberlie@moengco.com

ADDRESS	CITY	STATE	ZIP CODE
PO Box 13	Rolla	MO	65402

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	DATE
Larry Fletcher	NOV 8 2021

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
President	(573) 762-3865	lfletch@embarqmail.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.