

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Lake Virginia WWTF
Confluence Rivers Utility Operating Company, Inc.
0.05 miles southwest of the intersection between Meadow Lane and Springdale Court
Hematite, MO, 63047

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 17, 2019 August 16, 2019
Effective Date Modification Date

January 16, 2021
Expiration Date


Edward B. Galbraith, Director, Division of Environmental Quality


Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

This is a **DEMONSTRATION** project and additional monitoring requirements are included in the operating permit in accordance with the Approval Process for Innovative Technology Factsheet. The facility is proposing to add aeration to the lagoon cell #2, then install a Triplepoint Water Technologies, LLC NitrOx™ system followed by a clarifier and chlorine disinfection to meet the schedule of compliance to achieve compliance with ammonia effluent limits. With this project the West lagoon will be connected to the East lagoon.

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 in accordance with the plans and specifications submitted by 21 Design Group, Inc. on June 25, 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 St. Louis Regional Office per 10 CSR 20-7.015(9)(E)2.
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. 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.
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. Upon completion of construction:
 - A. Confluence Rivers Utility Operating Company, Inc. will become the continuing authority for operation, maintenance, and modernization 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) and request the operating permit modification be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The facility is installing a moving bed biological reactor (MBBR) between the second cell and the new clarifier to meet the final ammonia effluent limits that become effective on June 1, 2022. The upgrade will be a **DEMONSTRATION** project for the patent pending NitrOx™ Reactor System developed by Triplepoint Environmental. The upgrade will have lagoon cells 1 and 2, add aeration to cell #2, NitrOx™ 2-stage covered Moving Bed Biological Reactor (MBBR), followed by a clarifier and chlorine disinfection.

2. FACILITY DESCRIPTION

The Lake Virginia WWTF is located at 0.05 miles southwest of the intersection between Meadow Lane and Springdale Court, Hematite, in Jefferson County, Missouri. The facility has a design average flow of 9,600 gpd and serves a hydraulic population equivalent of approximately 96 people. The existing facility is a two cell facultative permitted East lagoon and an unpermitted West lagoon. The permit was renewed June 1, 2018 with a schedule of compliance to meet final ammonia effluent limits by June 1, 2022.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits for ammonia as established in the June 2018 operating permit renewal. With the addition of the Nitrox system and clarifier, the facility no longer qualifies for equivalent to secondary effluent limits for biochemical oxygen demand (BOD) or total suspended solids (TSS).

The construction is to meet more protective effluent limits. As this is a demonstration project, for the first year of operation following construction, additional monitoring will be required before and after the MBBR. The limits following the completion of construction will be applicable to the facility:

Parameter	Units	Average Monthly Effluent Limit
Flow	MGD	*
BOD5	mg/L	30
TSS	mg/L	30
Ammonia-summer	mg/L	1.4
Ammonia-winter	mg/L	2.9
pH	SU	6.5-9.0
Total Residual Chlorine	µg/L	8 (<130 ML)
Dissolved Oxygen	mg/L	*
E. Coli	#/100 mL	126

*monitoring only

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The current design guides, 10 CSR 20-8, do not contain design parameters for the innovative NitrOx™ Moving Bed Bioreactor process. As a **DEMONSTRATION** project, the data gathered with the operating permit will be used to help develop design criteria for future projects. In Appendix A is the facility flow diagram with the upgrades in place.

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

- West Lagoon has a surface area of approximately 32,271 ft² with a treatment area of the cell at 29,761 ft² and a depth of 6 ft with a volume of 1.3 MG to provide approximately 392 days of storage.
- East Lagoon has a surface area of approximately 21,939 ft² with a treatment area of the cell at 17,024 ft² and a depth of 3 ft with a volume of 0.4 MG to provide approximately 39 days of storage.
 - o The smaller second cell of the East Lagoon will be sludge storage from the clarifier. The facility will be addressing sludge removal after construction is complete on the upgrades.

Construction will cover the following items:

- Aeration will be added to the lagoon cell #2 as part of the construction. The facility is proposing to use Triplepoint MARS aeration system or equivalent with fine bubble diffusion to increase mixing.
- Triplepoint Water Technologies, LLC NitrOx™ – The lagoon treated effluent will flow by gravity to the NitrOx™ system. The NitrOx™ system is capable of treating a design average flow of 9,600 gpd and a peak flow of 38,400 gpd.
 - o The system is composed of one tank with approximately 8 ft diameter and a side water depth of 9 ft. Total volume of the tank is 3,367 gallons.
 - o The average flow hydraulic retention time is 7.9 hours and the peak flow hydraulic retention time is 2.6 hours.
 - o The tank shall be filled approximately 65% with high surface area HDPE media, but with the design for up to 70% fill in the future.
 - Each media piece shall be 0.80" diameter, 0.25"-1" long and total surface area of 152 ft²/ft³ and 113 ft²/ft³ protected surface area for bacteria growth
 - o Total media surface area available is 44,428 ft² which is greater than the required is 34,993 ft².
 - o Aeration by means of two tri-lobe positive displacement blowers to maintain a dissolved oxygen of 5.0 mg/L. Each blower is capable of supplying 141 scfm with 3.0 HP motors. 141 scfm is more than the required 39 scfm.
 - o The effluent from the NitrOx™ 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 50.27 square feet. The volume of the clarifier is 1,782.3 gallons with an average overflow rate of 197 gpd/square foot.

- o The hydraulic retention time is 4.46 hours at design average flow which meets the minimum requirements of 10 CSR 20-8.020(13)(B)7 or 1.11 hours at a peak flow of 38,400 gpd.
 - o The clarifier has the dimensions of 8 ft diameter by 3 ft depth in the cylinder section with a sidewater depth of 8.95 feet.
 - o The detention capacity of the hopper, using only the top third (by height) per 10 CSR 20-8.020(13)(B)7.C is 654.4 gallons.
- Disinfection – Disinfection is the process of removal, deactivation, or killing or pathogenic microorganisms.
 - o Tablet Chlorinator – Installation of a tablet Norweco Bio-Dynamic XT2000 or equivalent chlorination chamber receiving clarified effluent and prior to the chlorine contact tank.
 - o The tablet chlorinator shall have a design flow of 20,000 gpd and a maximum flow of 100,000 gpd. The system will dispense hypochlorite as the wastewater comes into contact with the tablets. 72 lf of 12” SDR 35 PVC will be added between the chlorination tank and the dechlorination tank to achieve 15 minutes of contact at peak flow.
 - o Tablet Dechlorinator – Installation of a Norweco Bio-Dynamic XT2000 or equivalent dechlorination chamber receiving the chlorinated effluent and prior to Outfall No. 001. The tablet dechlorinator shall have a design flow of 20,000 gpd and a maximum flow of 100,000 gpd. The system will dispense sodium sulfite as the wastewater comes into contact with the tablets.

5. OPERATING PERMIT

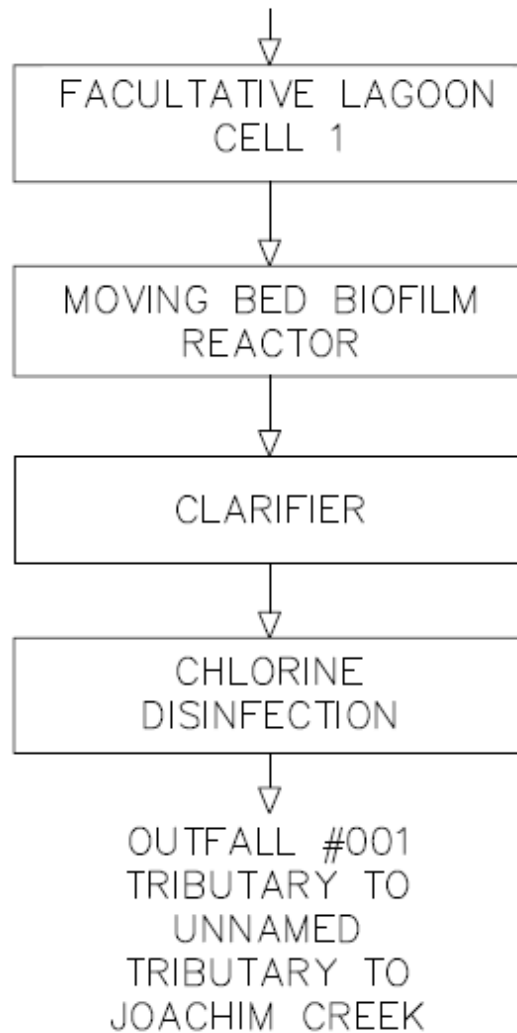
Operating permit MO-0101672 will require a modification to reflect the construction activities. The modification and upgrades to the treatment plant removes the schedule of compliance from the operating permit. The modified Lake Virginia WWTF, MO-0101672, was successfully public noticed from December 14, 2018 to January 14, 2019 with no comments received. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit modification be issued. The facility has already paid for the operating permit modification.

6. CONSTRUCTION PERMIT MODIFICATION

On July 29, 2019, Confluence Rivers Utility Operating Company, Inc. submitted an ownership transfer. The construction permit has been updated to reflect the new owner and continuing authority. Permit condition #10 was updated to reflect the new continuing authority. The operating permit modification will be issued to Confluence Rivers Utility Operating Company, Inc.

APPENDIX A – PROCESS FLOW DIAGRAM

WASTEWATER FACILITY PROCESS
FLOW DIAGRAM FOR
LAKE VIRGINIA
HEMATITE, MO



AP 33375

RECEIVED

JUL 29 2019



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
APPLICATION FOR TRANSFER OF OPERATING PERMIT

FOR AGENCY USE ONLY

CHECK NO.

1961

DATE RECEIVED

FEE SUBMITTED

7-29-19

\$100.00

B

THE FOLLOWING ITEMS (1 - 4) ARE TO BE COMPLETED BY THE CURRENT OWNER.
SEE INSTRUCTIONS FOR APPROPRIATE FEE TO BE SUBMITTED WITH APPLICATION.

1. FACILITY

NAME Lake Virginia Subdivision		TELEPHONE NUMBER WITH AREA CODE (573) 415-8379	
ADDRESS (PHYSICAL) .05 mi SW of Intersection btwn Meadow Ln /Springdale Ct	CITY Hematite	STATE MO	ZIP 63074
PERMIT NUMBER #MO- 0101672	COUNTY Jefferson		

2. CURRENT OWNER

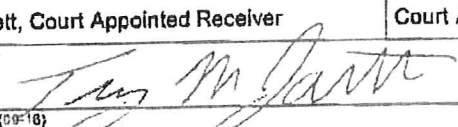
NAME M.P.B., Inc.	EMAIL ADDRESS terry@healylawoffices.com	TELEPHONE NUMBER WITH AREA CODE (573) 415-8379	
ADDRESS P.O. Box 105980	CITY Jefferson City	STATE MO	ZIP 65109

3. CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the facility. (If same as current owner, respond "same")

NAME Same	EMAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE	
ADDRESS	CITY	STATE	ZIP

4. CERTIFICATION

I certify I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and upon transfer approval, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available under the Missouri Clean Water Law. Further, I certify I have read the existing permit and agree to abide by the terms and conditions once the transfer is complete.

NAME (TYPE OR PRINT) Terry Jarrett, Court Appointed Receiver	OFFICIAL TITLE Court Appointed Receiver for M.P.B., Inc.	TELEPHONE NUMBER WITH AREA CODE (573) 415-8379
SIGNATURE 		DATE SIGNED 6-19-19

THE FOLLOWING ITEMS (5 – 10) WILL APPLY AFTER THE COMPLETION OF TRANSFER (SALE) AND ARE TO BE COMPLETED BY THE APPLICANT FOR TRANSFER OF OPERATING PERMIT (BUYER) OR AUTHORIZED AGENT.

5. FACILITY (IF DIFFERENT THAN ABOVE)

NAME	TELEPHONE NUMBER WITH AREA CODE
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6. FUTURE OWNER

NAME Confluence Rivers Utility Operating Company, Inc.	EMAIL ADDRESS jcox@cswrgroup.com	TELEPHONE NUMBER WITH AREA CODE 314-494-9522	
ADDRESS 500 Northwest Plaza Dr. #500	CITY St. Ann	STATE MO	ZIP 63074

7. CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the facility. (If same as future owner, respond "same")

NAME same	EMAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE	
ADDRESS	CITY	STATE	ZIP

8. FACILITY CONTACT

NAME Josiah Cox	TITLE President		
EMAIL ADDRESS jcox@cswrgroup.com	TELEPHONE NUMBER WITH AREA CODE 314-494-9522		
ADDRESS 500 Northwest Plaza Dr. #500	CITY St. Ann	STATE MO	ZIP 63074

9. ADDITIONAL INFORMATION

9.1 Anticipated effective date of transfer of ownership: 6/21/19

9.2 Are any changes in production, in raw materials, or in the quantity of discharges from this facility planned or anticipated?
☐ Yes ☒ No If yes, explain (Attach sheets as necessary)

10. ELECTRONIC DISCHARGE MONITORING REPORT (eDMR) SUBMISSION SYSTEM

Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally-consistent set of data. **One of the following must be checked in order for this application to be considered complete.** Please visit <http://dnr.mo.gov/env/wpp/edmr.htm> to access the Facility Participation Package.

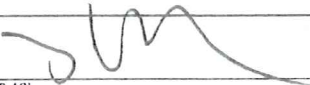
☐ - You have completed and submitted with this permit application the required documentation to participate in the eDMR system.

☒ - You have previously submitted the required documentation to participate in the eDMR system and/or you are currently using the eDMR system.

☐ - You have submitted a written request for a waiver from electronic reporting. See instructions for further information regarding waivers.

11. CERTIFICATION

I certify I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and upon transfer approval, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available under the Missouri Clean Water Law. Further, I certify I have read the existing permit and agree to abide by the terms and conditions once the transfer is complete.

NAME (TYPE OR PRINT) Josiah Cox	OFFICIAL TITLE President	TELEPHONE NUMBER WITH AREA CODE 314-494-9522
SIGNATURE 		DATE SIGNED 6/20/2019

INSTRUCTIONS FOR COMPLETING APPLICATION FOR TRANSFER OF OPERATING PERMIT

All blanks must be filled in when the application is submitted to the Missouri Department of Natural Resources. This includes **BOTH** required signatures. Current permittee (present owner/seller) is to complete items 1 – 4. Applicant for transfer of operating permit (future owner/buyer) is to complete items 5 – 10.

Department of Natural Resources regulation 10 CSR 20-6.010 (11) governs the transfer of National Pollutant Discharge Elimination System (NPDES) permits. Until such time as the permit is officially transferred, the current permittee remains responsible for complying with the terms and conditions of the existing permit. The department, within thirty (30) days of receipt of this application, shall notify the new applicant of its intent to revoke and reissue or transfer the permit.

Electronic Discharge Monitoring Report (eDMR) Submission System – Visit the eDMR site at <http://dnr.mo.gov/wpp/edmr.htm> and click on the "Facility Participation Package" link. The eDMR Permit Holder and Certifier Registration Form and information about the eDMR system can be found in the Facility Participation Package.

Waivers to electronic reporting may be granted by the Department per 40 CFR 127.15 under certain, special circumstances. A written request must be submitted to the Department for approval. Waivers may be granted to facilities owned or operated by:

- members of religious communities that choose not to use certain technologies or
- permittees located in areas with limited broadband access. The National Telecommunications and Information Administration (NTIA) in collaboration with the Federal Communications Commission (FCC) have created a broadband internet availability map: <http://www.broadbandmap.gov>. Please contact the Department if you need assistance.

Signatures – All applications must be signed as follows and the signatures must be **original**:

- For a corporation, by an officer having responsibility for the overall operation of the regulated facility or activity or for environmental matters.
- For a partnership or sole proprietorship, by a general partner or the proprietor.
- For a municipal, state, federal or other public facility, by either a principal executive officer or by an individual having overall responsibility for environmental matters at the facility.

Permit modifications, including transfers, are subject to the following fees:

Municipals – \$200 each
All others – \$100 each

Note: Business name and address changes where owner and continuing authority remain the same are not considered transfers.

Submittal of an incomplete application may result in the application being returned.

This completed form and any attachments along with the applicable permit fees, should be submitted to:

DATE RCVD 6-28-19 GL CODE 926.100 Department of Natural Resources
SCAN EMAIL JOB Water Protection Program
DATAPP QB 6-28-19 ATTN: Operating Permits Section
DT PD CK# P.O. Box 176
Jefferson City, MO 65102

Map of regional offices with addresses and phone numbers are available on the Web at <http://dnr.mo.gov/regions/>. If there are any questions concerning this form, please contact the appropriate regional office or the Department of Natural Resources, Water Protection Program, Operating Permits Section at 800-361-4827 or 573-751-6825.

JOF 6/27/19 - Permit Xfer #9

LAKE VIRGINIA WASTEWATER
CONFLUENCE RIVERS
NPDES PERMIT TRANSFER FEE

