Permit No. CP0002526

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 Area Waste Water Association, Inc.
Owner
LAWWA Turkey Bend WRF
Yacht Club Drive
Osage Beach, MO 65050

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, 2025
Effective Date

November 20, 2027
Expiration Date

John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

- Construction and installation of a new Aeromod Sequox Biological Nutrient Reactor with regional collection system. The new facility will consist of headworks with mechanical trash auger, selector and alum dosing tank, two trains of aeration tanks with varying layouts to accommodate seasonal flow changes, two sludge digestor tanks, two secondary clarifiers, two tertiary filters, and an UV disinfection system. Design flow of the new facility is 528,000 gpd with higher sustained flow anticipated during summer months. Components are rated for a peak hourly flow of 922,000 gpd. The collection system will consist approximately 2,100 lf of 1.5-in, 3,500 lf of 2-in, 12,130 lf of 3-in, 18,670 lf of 4-in, 9,330 lf of 6-in, and 1,430 lf of 8-in HDPE DR-11 force mains with air release valves and 14 lift stations.

Submit a closure plan to the Central Field Office for review and approval prior to any closure activities. Include closure procedures for the 13 treatment facilities and any sewer connection which is no longer necessary to convey wastewater to the new treatment facility.

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 and 10 CSR 20-6.010(5)(E)2.

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 required to determine "findings of affordability" because the permit applies to a combined or separate sanitary sewer system for a publicly-owned treatment works. See **APPENDIX – COST ANALYSIS FOR COMPLIANCE**.

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 Christina Wilson, P.E. with Horner & Shifrin, 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 Central Field Office per 10 CSR 20-7.015(9)(G).

5. 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 https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem. See https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting for more information.

6. 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.

7. In accordance with 10 CSR 20-6.010(12), a full closure plan shall be submitted to the department's Central Field Office for review and approval of any permitted wastewater treatment system being replaced. The closure plan must meet the requirements outlined in Standard Conditions Part III of the Missouri State Operating Permit No. MO-0140783. Closure shall not commence until the submitted closure plan is approved by the department. Form J – *Request for Termination of a State Operating Permit*, shall be submitted to the Water Protection Program for termination of any existing Missouri state operating permit, once closure is completed in accordance with the approved closure plan.

8. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.

- Flood protection shall apply to new construction and to existing facilities undergoing major modification. 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. 10 CSR 20-8.140(2)(B)

- Unless another distance is determined by the Missouri Geological Survey or by the department's Public Drinking Water Branch, the minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300'). 10 CSR 20-8.140(2)(C)1.

- Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140(2)(D)

- The outfall shall be so constructed and protected against the effects of flood water, ice, or other hazards as to reasonably ensure its structural stability and freedom from stoppage. 10 CSR 20-8.140(6)(A)

- All sampling points shall be designed so that a representative and discrete twenty-four (24) hour automatic composite sample or grab sample of the effluent discharge can be obtained at a point after the final treatment process and before discharge to or mixing with the receiving waters. 10 CSR 20-8.140(6)(B)

- All outfalls shall be posted with a permanent sign indicating the outfall number (i.e., Outfall #001). 10 CSR 20-8.140(6)(C)

- All wastewater treatment facilities shall be provided with an alternate source of electric power or pumping capability to allow continuity of operation during power failures. 10 CSR 20-8.140(7)(A)1.

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

- Electrical systems and components in raw wastewater or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors that are normally present, shall comply with the NFPA 70 *National Electric Code (NEC)* (2017 Edition), as approved and published August 24, 2016, requirements for Class I, Division 1, Group D locations. 10 CSR 20-8.140(7)(B)

- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140(7)(C)

- No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140(7)(D)1.

- Where a potable water supply is to be used for any purpose in a wastewater treatment facility other than direct connections, a break tank, pressure pump, and pressure tank or a reduced pressure backflow preventer consistent with the department's Public Drinking Water Branch shall be provided. 10 CSR 20-8.140(7)(D)3.A.

- A means of flow measurement shall be provided at all wastewater treatment facilities. 10 CSR 20-8.140(7)(E)

- Effluent twenty-four (24) hour composite automatic sampling equipment shall be provided at all mechanical wastewater treatment facilities and at other facilities where necessary under provisions of the operating permit. 10 CSR 20-8.140(7)(F)

- Isolate all wastewater treatment components installed in a building where other equipment or offices are located from the rest of the building by an air-tight partition, provide separate outside entrances, and provide separate and independent fresh air supply. 10 CSR 20-8.140(7)(G)

- Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility:
    - Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140 (8) (A)
    - Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140(8)(B)
    - First aid equipment; 10 CSR 20-8.140(8)(C)
    - Posted "No Smoking" signs in hazardous areas; 10 CSR 20-8.140(8)(D)
    - Appropriate personal protective equipment (PPE); 10 CSR 20-8.140(8)(E)
    - Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140(8)(F)
    - 10 CSR 20-8.140(8)(G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;

  - 10 CSR 20-8.140(8)(H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
  - Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140(8)(I)

- The materials utilized for storage, piping, valves, pumping, metering, and splash guards, etc., for chemical handling, shall be specially selected considering the physical and chemical characteristics of each hazardous or corrosive chemical. 10 CSR 20-8.140(9)(A)1.

- Secondary containment storage areas contain the stored volume of chemical until it can be safely transferred to alternate storage or released to the wastewater treatment plant at controlled rates that will not damage the facilities, inhibit the treatment processes, or contribute to stream pollution. Secondary containment shall be designed as follows:
  - A minimum volume of one hundred twenty-five percent (125%) of the volume of the largest storage container located within the containment area plus the space occupied by any other tanks located within the containment area when not protected from precipitation; 10 CSR 20-8.140(9)(A)2.A.
  - A minimum volume of one hundred ten percent (110%) of the volume of the largest storage container located within the containment area plus the space occupied by any other tanks located within the containment area when protected from precipitation; 10 CSR 20-8.140(9)(A)2.B.
  - Walls and floors of the secondary containment structure constructed of suitable material that is compatible with the specifications of the product being stored. 10 CSR 20-8.140(9)(A)2.C.

- All piping containing or transporting corrosive or hazardous chemicals shall be identified with labels every ten feet (10') and with at least two (2) labels in each room, closet, or pipe chase. 10 CSR 20-8.140(9)(A)4.A.

- All connections (flanged or other type), except those adjacent to storage or feeder areas, shall have guards that will direct any chemical leakage away from space occupied by facility personnel. 10 CSR 20-8.140(9)(A)4.B.

- Facilities shall be provided for automatic shutdown of pumps and sounding of alarms when failure occurs in a pressurized chemical discharge line. 10 CSR 20-8.140(9)(A)5.

- Dust collection equipment shall be provided to protect facility personnel from dusts injurious to the lungs or skin and to prevent polymer dust from settling on walkways that become slick when wet. 10 CSR 20-8.140(9)(A)6.

- The following shall be provided to fulfill the particular needs of each chemical housing facility:
    - Provide storage for a minimum of thirty (30) days' supply, unless local suppliers and conditions indicate that such storage can be reduced without limiting the supply; 10 CSR 20-8.140(9(B) 1.
    - Construct the chemical storage room of fire and corrosion resistant material; 10 CSR 20-8.140(9)(B)2.
    - Equip doors with panic hardware. To prevent unauthorized access, doors lock but do not need a key to exit the locked room using the panic hardware; 10 CSR 20-8.140(9)(B)3.
    - Provide chemical storage areas with drains, sumps, finished water plumbing, and the hose bibs and hoses necessary to clean up spills and to wash equipment; 10 CSR 20-8.140(9)(B)4.
    - Construct chemical storage area floors and walls of material that is suitable to the chemicals being stored and that is capable of being cleaned; 10 CSR 20-8.140(9)(B)5.
    - Install floor surfaces to be smooth, chemical resistant, slip resistant, and well drained with three inches per ten feet (3"/10') minimum slope; 10 CSR 20-8.140(9)(B)6.
    - Provide adequate lighting; 10 CSR 20-8.140(9)(B)7.
    - Comply with the NEC recommendation for lighting and electrical equipment based on the chemicals stored. 10 CSR 20-8.140(9)(B)8.
    - Store chemical containers in a cool, dry, and well-ventilated area; 10 CSR 20-8.140(9)(B)9.
    - Design vents from feeders, storage facilities, and equipment exhaust to discharge to the outside atmosphere above grade and remote from air intakes; 10 CSR 20-8.140(9)(B)10.
    - Locate storage area for chemical containers out of direct sunlight; 10 CSR 20-8.140(9)(B)11.
    - Maintain storage temperatures in accordance with relevant Material Safety Data Sheets (MSDS). 10 CSR 20-8.140(9)(B)12.
    - Control humidity as necessary when storing dry chemicals; 10 CSR 20-8.140(9) (B)13.
    - Design the storage area with designated areas for "full" and "empty" chemical containers; 10 CSR 20-8.140(9)(B)14.
    - Provide storage rooms housing flammable chemicals with an automatic sprinkler system designed for four tenths gallons per minute per square foot (0.4 gpm/ft^2) and a minimum duration of twenty (20) minutes; 10 CSR 20-8.140(9)(B)15.
    - Store incompatible chemicals separately to ensure the safety of facility personnel and the wastewater treatment system. Store any two (2) chemicals that can react to form a toxic gas in separate housing facilities; 10 CSR 20-8.140(9)(B)16.
    - Design and isolate areas intended for storage and handling of chlorine and sulfur dioxide and other hazardous gases. 10 CSR 20-8.140(9)(B)17.
    - Design an isolated fireproof storage area and explosion proof electrical outlets, lights, and motors for all powdered activated carbon storage and handling areas in accordance with federal, state, and local requirements; 10 CSR 20-8.140(9)(B)18.

- Vent acid storage tanks to the outside atmosphere, but not through vents in common with day tanks; 10 CSR 20-8.140(9)(B)19.
- Keep concentrated acid solutions or dry powder in closed, acid-resistant shipping containers or storage units; 10 CSR 20-8.140(9)(B)20.
- Pump concentrated liquid acids in undiluted form from the original container to the point of treatment or to a covered storage tank. Do not handle in open vessels. 10 CSR 20-8.140(9)(B)21.

- The following shall be provided, where applicable, for the design of chemical handling:
  - Make provisions for measuring quantities of chemicals used for treatment or to prepare feed solutions over the range of design application rates; 10 CSR 20-8.140(9)(C)1.
  - Select storage tanks, piping, and equipment for liquid chemicals specific to the chemicals; 10 CSR 20-8.140(9)(C)2.
  - Install all liquid chemical mixing and feed installations on corrosion resistant pedestals; 10 CSR 20-8.140(9)(C)3.
  - Provide sufficient capacity of solution storage or day tanks feeding directly for twenty-four- (24-) hour operation at design average flow; 10 CSR 20-8.140(9)(C)4.
  - Provide a minimum of two (2) chemical feeders for continuous operability. Provide a standby unit or combination of units of sufficient capacity to replace the largest unit out-of-service; 10 CSR 20-8.140(9)(C)5.
  - Chemical feeders shall—
    - Be designed with chemical feed equipment to meet the maximum dosage requirements for the design average flow conditions; 10 CSR 20-8.140(9)(C)6.A.
    - Be able to supply, at all times, the necessary amounts of chemicals at an accurate rate throughout the range of feed; 10 CSR 20-8.140(9)(C)6.B.
    - Provide proportioning of chemical feed to the rate of flow where the flow rate is not constant; 10 CSR 20-8.140(9)(C)6.C.
    - Be designed to be readily accessible for servicing, repair, and observation; 10 CSR 20-8.140(9)(C)6.D.
    - Protect the entire feeder system against freezing; 10 CSR 20-8.140(9)(C)6.E.
    - Be located adjacent to points of application to minimize length of feed lines; 10 CSR 20-8.140(9)(C)6.F.
    - Provide for both automatic and manual operation for chemical feed control systems; 10 CSR 20-8.140(9)(C)6.G.
    - Utilize automatic chemical dose or residual analyzers, and where provided, include alarms for critical values and recording charts; 10 CSR 20-8.140(9)(C)6.H.
    - Provide screens and valves on the chemical feed pump suction lines; 10 CSR 20-8.140(9)(C)6.I.
    - Provide an air break or anti-siphon device where the chemical solution enters the water stream; 10 CSR 20-8.140(9)(C)6.J.

        - Dry chemical feed system shall—
            - Be equipped with a dissolver capable of providing a minimum retention period of five (5) minutes at the maximum feed rate; 10 CSR 20-8.140(9)(C)7. A.
            - Be equipped with two (2) solution vessels and transfer piping for polyelectrolyte feed installations; 10 CSR 20-8.140(9)(C)7.B.
            - Have an eductor funnel or other appropriate arrangement for wetting the polymer during the preparation of the stock feed solution on the makeup tanks; 10 CSR 20-8.140(9)(C)7.C.
            - Provide adequate mixing by means of a large diameter, low-speed mixer; 10 CSR 20-8.140(9)(C)7.D.
            - Make provisions to measure the dry chemical volumetrically or gravimetrically; 10 CSR 20-8.140(9)(C)7.E.
            - Completely enclose chemicals and prevent emission of dust; 10 CSR 20-8.140(9)(C)7.F.
    - Provide for uniform strength of solution consistent with the nature of the chemical solution for solution tank dosing; 10 CSR 20-8.140(9)(C)8.
    - Use solution feed pumps to feed chemical slurries that are not diaphragm or piston type positive displacement types; 10 CSR 20-8.140(9)(C)9.
    - Provide continuous agitation to maintain slurries in suspension; 10 CSR 20-8.140 (9)(C)10.
    - Provide a minimum of two (2) flocculation tanks or channels having a combined detention period of twenty to thirty (20 – 30) minutes. Provide independent controls for each tank or channel; 10 CSR 20-8.140(9)(C)11.
    - Insulate pipelines carrying soda ash at concentrations greater than twenty percent (20%) solution to prevent crystallization; 10 CSR 20-8.140(9)(C)12.
    - Prohibit bagging soda ash in a damp or humid place. 10 CSR 20-8.140(9)(C)13.

- The following chemical safety items shall be provided in addition to the safety provisions in section (8) of this rule:
    - Appropriate personal protective equipment (PPE). 10 CSR 20-8.140(9)(D)1.
    - Eye wash fountains and safety showers utilizing potable water shall be provided in the laboratory and on each level or work location involving hazardous or corrosive chemical storage, mixing (or slaking), pumping, metering, or transportation unloading. The design of eye wash fountains and safety showers shall include the following:
        - Eye wash fountains with water of moderate temperature, fifty degrees to ninety degrees Fahrenheit (50°–90°F), suitable to provide fifteen to thirty (15–30) minutes of continuous irrigation of the eyes; 10 CSR 20-8.140(9) (D)2.A.
        - Emergency showers capable of discharging twenty gallons per minute (20 gpm) of water of moderate temperature, fifty degrees to ninety degrees Fahrenheit (50°–90°F), and at pressures of thirty to fifty pounds per square inch (30–50 psi); 10 CSR 20-8.140(9)(D)2.B.

        - Eye wash fountains and emergency showers located no more than twenty-five feet (25') from points of hazardous chemical exposure; CSR 20-8.140 (9)(D)2.C.
        - Eye wash fountains and showers that are to be fully operable during all weather conditions; 10 CSR 20-8.140(9)(D)2.D.
    - Warning signs requiring use of goggles shall be located near chemical stations, pumps, and other points of frequent hazard. 10 CSR 20-8.140(9)(D)3.

- The identification and hazard warning data included on chemical shipping containers, when received, shall appear on all containers (regardless of size or type) used to store, carry, or use a hazardous substance. 10 CSR 20-8.140(9)(E)

- 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.

- Provisions shall be made for isolating or removing screening devices from their location for servicing. 10 CSR 20-8.150(4)(A)2.

- Manually cleaned screen channels shall be protected by guard railings and deck gratings with adequate provisions for removal or opening to facilitate raking. 10 CSR 20-8.150(4) (A)3.A.(I)

- 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)

- Effective flow splitting devices and control appurtenances (*e.g.* gates and splitter boxes) shall be provided to permit proper proportioning of flow and solids loading to each settling unit, throughout the expected range of flows. 10 CSR 20-8.160(2)(B)

- Overflow weirs shall be readily adjustable over the life of the structure to correct for differential settlement of the tank. 10 CSR 20-8.160(3)(C)1.

- Walls of settling tanks shall extend at least six inches (6") above the surrounding ground surface and shall provide not less than twelve inches (12") of freeboard. 10 CSR 20-8.160(3)(E)

- Safety features shall appropriately include machinery covers, life lines, handrails on all stairways and walkways, and slip resistant surfaces. For additional safety follow the provisions listed in 10 CSR 20-8.140(8). 10 CSR 20-8.160(5)(A)

- The design shall provide for convenient and safe access to routine maintenance items such as gear boxes, scum removal mechanism, baffles, weirs, inlet stilling baffle areas, and effluent channels. 10 CSR 20-8.160(5)(B)

- For electrical equipment, fixtures, and controls in enclosed settling basins and scum tanks, where hazardous concentrations of flammable gases or vapors may accumulate, follow the provisions in 10 CSR 20-8.140(7)(B). The fixtures and controls shall be conveniently located and safely accessible for operation and maintenance. 10 CSR 20-8.160(5)(C)

- Where gas is produced, all necessary safety facilities shall:
    - Provide pressure and vacuum relief valves and flame traps, together with automatic safety shutoff valves and protect from freezing; 10 CSR 20-8.170(4)(C)1.A.
    - Not install water seal equipment; 10 CSR 20-8.170(4)(C)1.B. and
    - House gas safety equipment and gas compressors in a separate room with an exterior entrance. 10 CSR 20-8.170(4)(C)1.C.

- Electrical fixtures, equipment, and controls. Electrical fixtures, equipment, and controls shall comply with the National Electrical Manufacturers Association (NEMA) 4X enclosure rating where necessary; *NEMA Standard 250-2014*, published December 15, 2014. This standard shall hereby be incorporated by reference into this rule, as published by National Electrical Manufacturers Association, 1300 North 17th Street, Arlington, VA 22209. This rule does not incorporate any subsequent amendments or additions. Electrical equipment, fixtures, and controls, in places enclosing and adjacent to anaerobic digestive appurtenances where hazardous gases are included. 10 CSR 20-8.170(4)(C)3.

- Water supplies using indirect connections shall comply with 10 CSR 20-8.140(7)(D). 10 CSR 20-8.170(4)(D)
    - No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140(7)(D)1.
    - Hot water for any direct connections shall not be taken directly from a boiler used for supplying hot water to a digester heating unit or heat exchanger. 10 CSR 20-8.140(7)(D)2.
    - Where a potable water supply is to be used for any purpose in a wastewater treatment facility other than direct connections, a break tank, pressure pump, and pressure tank or a reduced pressure backflow preventer consistent with the department’s Public Drinking Water Branch shall be provided. 10 CSR 20-8.140 (7)(D)3.A.

  - For indirect connections, a sign shall be permanently posted at every hose bib, faucet, hydrant, or sill cock located on the water system beyond the break tank or backflow preventer to indicate that the water is not safe for drinking. 10 CSR 20-8.140(7)(D)3.B.
  - Where a separate non-potable water supply is to be provided, a break tank will not be necessary, but all system outlets shall be posted with a permanent sign indicating the water is not safe for drinking. 10 CSR 20-8.140(7)(D)4.

- Aerobic Solids Digestion High Level Emergency Overflow. An unvalved emergency overflow shall be provided that will convey digester overflow to the treatment plant headworks, the aeration process, or to another liquid sludge storage facility and that has an alarm for high level conditions. 10 CSR 20-8.170(5)

- For solids pumping systems, audio-visual alarms shall be provided in accordance with 10 CSR 20-8.140(7)(C) for:
  - Pump failure; 10 CSR 20-8.170(6)(A)
  - Pressure loss; 10 CSR 20-8.170(6)(B) and
  - High pressure. 10 CSR 20-8.170(6)(C)

- Emergency Power. Disinfection and dechlorination processes, when used, shall be provided during all power outages. 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.

- If no flow equalization is provided for a batch discharger, the UV dosage shall be based on the peak batch flow. 10 CSR 20-8.190(5)(A)2.

- 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.

- The UV system shall deliver a minimum UV dosage of thirty thousand microwatt seconds per centimeters squared (30,000 $\mu W \cdot s/cm^2$). 10 CSR 20-8.190(5)(A)4.

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

- Filtration systems shall be preceded with additional process, such as chemical coagulation and sedimentation or other acceptable process. 10 CSR 20-8.210(3)(A)

- For filtration systems requiring coagulation and flocculation prior to the filtration, the flocculation system shall:
  - Include chemical feed equipment to meet the system's anticipated peak design flow and the ability to proportion chemical feed rates; 10 CSR 20-8.210(3)(B)2.A. and
  - Ensure the rapid dispersion and mixing of chemicals throughout the wastewater by providing mechanical or in-line static mixers. 10 CSR 20-8.210(3)(B)2.B.

- Filtration systems shall have:
  - Convenient access to all components and the media surface for inspection and maintenance without taking other units out of service; 10 CSR 20-8.210(3)(B)1.A.
  - Enclosed controls and heating and ventilation equipment to control humidity; 10 CSR 20-8.210(3)(B)1.B. and
  - The capacity to process the design average flow to the filters with the largest unit out of service utilizing a minimum of two (2) units. 10 CSR 20-8.210(3)(B)1.C.

- The media for cloth/disc filters shall:
  - Follow the manufacturer's recommendations; 10 CSR 20-8.210(3)(E)1.B. and
  - Be chemical-resistant if the filter will be exposed to chemicals, such as chlorine or disinfectants. 10 CSR 20-8.210(3)(E)1.C.

- Filtration Rates and Hydraulics for cloth/disc filters shall be able to treat the design flow rate with one (1) filter unit in backwash mode. 10 CSR 20-8.210(3)(E)2.B.

- All backwash used for microscreening shall be recycled for treatment. 10 CSR 20-8.210 (4)(B)

9. Upon completion of construction:

   A. The Lake Area Waste Water Association, Inc. 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; and

   C. Submit the Statement of Work Completed form to the department in accordance with 10 CSR 20-6.010(5)(N) (https://dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155) and request the operating permit public noticed on June 13, 2025, be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

Construction of both a new WWTF as well as regional collection system will take place for the purpose of providing a means of treating wastewater regionalized from 13 WWTFs and up to 427 privately owned on-site systems on the Turkey Bend peninsula. The facilities to be regionalized include Bay Point Village Condos WWTP, Weston Point WWTF, Lake Pointe Condominiums WWTF, Garden Gate Assisted Living WWTP, Knolls Resort Condominiums WWTF, Three Seasons Condominiums, Pelican Bay Condominiums WWTP, Hawk Island Estates WWTF, San Moritz Estates Condos WWTP 1 & 2, NABRACO WWTP, Harbour Ridge Subdivision WWTF, Oak Shadows Subdivision WWTF, and Waves and Wheels private user. Most of the facilities to be regionalized have a handful of permit limit exceedances in the last 5 years of eDMR data, although none of the facilities are in enforcement with the department.

2. FACILITY DESCRIPTION

This is a new Aeromod Sequox Biological Nutrient Reactor. The new facility will consist of a headworks with mechanical trash auger, selector and alum dosing tank, two trains of aeration tanks with varying layouts to accommodate seasonal flow changes, two sludge digestor tanks, two secondary clarifiers, two tertiary filters, and a UV disinfection system. Design flow of the new facility is 528,000 gpd in and a peak daily flow of 922,000 gpd (38,417 gph).

The LAWWA Turkey Bend WWRF is located at Yacht Club Drive, Osage Beach, in Camden County, Missouri. The facility has a design average flow of 528,000 gpd and serves a hydraulic population equivalent of approximately 5280 people.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits of BOD_5 and TSS of 15 mg/l monthly average as established in the Antidegradation review dated November 2023.

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

Parameter	Units	Monthly average limit
Biochemical Oxygen Demand$_5$	mg/L	15
Total Suspended Solids	mg/L	15
Ammonia as N (Jan-Mar)	mg/L	2.6
Ammonia as N (Apr-Jun)	mg/L	1.1
Ammonia as N (Jul-Sep)	mg/L	0.9
Ammonia as N (Oct – Dec)	mg/L	2.5
Oil & Grease	mg/L	10
Total Phosphorus	lbs/year	1,206
Total Nitrogen	lbs/year	16,802.5
Aluminum, Total Recoverable	µg/L	*
Iron, Total Recoverable	ug/L	*
pH	SU	6.0-9.0
E. coli	#/100mL	126

As this is a demonstration project, for the first year of operation following construction, additional monitoring will be required before and after the ClarAtor secondary clarifier. A report summarizing the performance of the facility consistent with the requirements in 10 CSR 20-8.110(6) will be required after the demonstration period of 1 year concludes. The report will be due within 6 months of that date. After the demonstration period of 1 year, if the system is performing as expected, the monitoring frequency and number of sampling points can be reduced once the demonstration performance report is submitted and reviewed by the department. The sampling frequency may also be revised prior to one year through an operating permit modification if the technology is approved within Missouri.

4. ANTIDEGRADATION

The department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated November 16, 2023, due to the new discharge planned. See **APPENDIX – ANTIDEGRADATION**.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

- Collection System – Construction of new force mains and lift stations to convey flows previously treated at the individual WWTFs around Turkey Bend point.
  - Construction of approximately 2,100 lf of 1.5-in, 3,500 lf of 2-in, 12,130 lf of 3-in, 18,670 lf of 4-in, 9,330 lf of 6-in, and 1,430 lf of 8-in HDPE DR-11 force mains with air release valves.

- 14 duplex lift stations with variable operating points and emergency storage durations. All lift stations meet the minimum emergency storage requirement of two hours at peak hourly flow and contain a manual override switch for attaching a portable generator.
    - St. Moritz 1: Peak pump rate 22 gpm, 87 ft Total Dynamic Head (TDH)
    - St. Moritz 2: peak 33 gpm, 213 ft TDH
    - NABRABCO: peak 50 gpm, 109 ft TDH
    - Pelican Bay: peak 60 gpm, 78 ft TDH
    - Hawk Island: peak 100 gpm, 34 ft TDH
    - Oak Shadows: peak 170 gpm, 161 ft TDH
    - Bay Pointe: peak 95 gpm, 194 ft TDH
    - Lake Pointe: peak 15 gpm, 178 ft TDH
    - Weston Point: peak 20 gpm, 179 ft TDH
    - Harbour Ridge: peak 15 gpm, 172 ft TDH
    - Clement: peak 130 gpm, 151 ft TDH
    - Three Seasons: peak 55 gpm, 179 ft TDH
    - Knolls/Breakwater: peak 180 gpm, 178 ft TDH
    - Garden Gate: peak 500 gpm, 110 ft TDH

- Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis.
    - Electromagnetic Meter – An influent electromagnetic 8-inch flow meter shall measure the untreated influent wastewater from the Garden Gate Force Main prior to entering the plant.
    - Electromagnetic Meter – An influent electromagnetic 3-inch flow meter shall measure the untreated influent wastewater from the Three Seasons Force Main prior to entering the plant.

- Screening – Installation of screening devices removes nuisance inorganic materials from raw wastewater.
    - Automatic Screw Augur – A 6-mm perforated plate spiral augur of 17.5-in. diameter positioned at an angle of 35 degrees from the horizontal will carry solids from the influent stream up into a receptacle for disposal. The discharge of wetted solids into the screening storage is rated for 18 gpm at 40-60 psi. The screw will be fitted with a brush for automatic cleaning and a backwash pump as well. The augur is sized at 0.922 MGD, with overflow going to the manual bar screen.
    - Manual Coarse Bar Screen – The manual coarse bar screen will have clear bar spacings of 0.25 inch and be positioned at an angle of 45 degrees from the horizontal to allow for manual raking of the screen. The coarse bar screen is preceded by influent flow measurement.

- Biological Phosphorus Selector Tank – An anaerobic selector tank following the headworks provides phosphorus removal and flow splitting. The basin has a design volume of 22,000 gallons. The equalization basin is 20 ft x 10.5 ft x 16 ft deep. Two aerators with four diffusers each capable of supplying 4.45 scfm of air will be placed within the basin to allow periodic mixing without creating an aerobic zone. An oxidation reduction potential (ORP) probe will communicate with the SCADA system to control dissolved oxygen concentration in the basin to ensure proper phosphorus removal can occur. Chemical coagulant may be dosed into this tank to improve phosphorus removal.

- Biological Nutrient Removal Reactor – Two treatment trains with a hydraulic retention time of 23.6 hours. The average design flow with one train active is 0.264 MGD for the winter, with two trains it is 0.528 MGD during the summer, with a peak hourly flow of 0.922 MGD in the summer. During periods of low flow, only Basins A2-1 and A2-2 will be active, with basin A1 activating between 0.1 and 0.264 MGD. For flows that exceed 0.264 MGD basins B1 and B2 will activate. Tanks A1 and B1 are 24 ft x 26 ft x 16 ft. Tank B2, and the combined A2-1 and A2-2, are 45.5 ft x 13.5 ft x 16 ft. The tanks are designed with two feet of freeboard, an average water depth of 14 ft and a maximum water depth of 16 ft. Tanks A1 and B1 each receive 142 scfm of air via 32 course bubble diffusers. Tank B2 receives 22.25 scfm of air via 5 course bubble diffusers. Tank A2-1 receives 13.35 scfm of air via three course bubble diffusers and Tank A2-2 receives 8.9 scfm of air via two course bubble diffusers. Aeration is provided by 104 coarse air bubble diffusers providing up to 4.45 scfm per diffuser. There are three 50 hp blowers supplying air.

- Secondary Clarifier – Two rectangular, hopper-style secondary clarifiers will be constructed with a total surface area of 800 sf at the 0.922 MGD. Wastewater flows from the aeration basins to the distribution line in the clarifier tank. Solids settle into the hoppers and sludge is pumped to the digestor and clarified water flows over the weir into the center trough. The clarifier tanks will be 74 ft x 20 ft x16 ft deep with two feet of freeboard. The sidewater depth will be 9.25 ft. The total weir length of both units is 74 ft. The peak weir loading rate is 7,141 gpd which meets the requirements of 10 CSR 20-8.160(3)(C)2 of being less than 20,000 gpd/sf. The peak solids loading rate is 20.9 lbs/day/ft^2 which meets the requirements of 10 CSR 20-8.160(3)(B)3 of less than 35 lbs/day/ft^2 at peak flow. The surface overflow rate is 972 gpd/ft^2 at peak hourly flow. The facility will have increased monitoring for TSS as part of a demonstration project to evaluate the ClarAtor system.

- Aerobic Digester – Construction of two rectangular sludge holding basin of 30 ft x 26.5 ft and a depth of 16 ft. Sidewater depth is 14 ft, and a combined volume of 172,451 gallons. The design basis of the digester is an influent solids concentration of 3,800 mg/L (3%) with a flowrate of 14,817 gpd. Decant pumps capable of pumping at 250 gpm at 40 ft TDH will return 11,306 gpd of liquid to the selector tank. Two decant pumps will be installed per aerobic digestor, one in operation and one on stand-by. Installation of coarse bubble diffusers will provide aeration and mixing of the sludge to prevent anaerobic conditions. The blower system is capable

of providing a maximum air rate of 106.8 standard cubic feet per minute (scfm) at 7.4 psig to each unit. Combined, the digestors treat 66.8 lbs of solids per day. The aerobic digester follows the secondary clarifier, but prior to the sludge holding tank. The digestion is designed to reduce VSS by 40%.

- Sludge holding Tank – Construction of a sludge holding tank of 27.5 ft x 30 ft x 16 ft for a total volume of 86,394 gallons. The tank provides 53.3 days of sludge storage. There are 24 course bubble aerators capable of supplying 106.8 scfm of air.

- Screen Disk Tertiary Filtration – Installation of tertiary disk filter for the removal of chemical precipitates. With one unit out-of-service, the disk filters are capable of treating a peak flow of 0.528 MGD at a maximum flux rate of 4.97 gpm/ft^2. With both units in service, the design peak hourly flow is 0.922 MGD. Each unit has seven disks with a total filtration area of 126 ft^2 per unit. The discs are constructed with 10 µm openings. Each disk filter unit shall be supplied with a backwash assembly. Backwash shall consist of eight suction headers. The backwash pump is capable of 173 gpm at 40 ft TDH with a five HP motor. Disk filtration shall follow clarification prior to disinfection.

- Disinfection – Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
  - Non-Contact Ultraviolet (UV) – A closed channel, gravity flow, low pressure, high intensity UV non-contact disinfection system capable of treating a peak flow of 0.922 MGD while delivering a minimum UV intensity of 30 mJ/cm^2 with an expected ultraviolet transmissivity of 65% or greater. The enclosed UV system consists of two banks with three racks each holding eight lamps per rack for 48 lamps total. The disinfected effluent will flow to an effluent sump where sampling and flow measurement occurs.

- Waste Activated Sludge (WAS) – Construction of a duplex WAS pumps and associated valves. The WAS self-priming pump will be capable of pumping 249 gpm at 40 ft of TDH with a five HP motor. WAS pumps are utilized to pump solids from the secondary clarifiers to the aerobic digester. WAS pumps are also used to pump solids from the aerobic digestor to the sludge holding basin. There will be two pumps per clarifier and two per digestor, one operational and one standby.

- Return Activated Sludge (RAS) – Construction of duplex RAS pumps and associated valves. The maximum RAS rate is 150% of the design average flow, 0.396 MGD. The RAS MLSS is expected to be 3,800 mg/L. RAS is pumped from both the secondary clarifiers and the aerobic digestors back to the selector tank. The RAS pumps with VFDs are 5 HP and designed for 249 gpm at 40 ft TDH. There will be two pumps per clarifier unit and two per digestor unit, one operational and one standby.

- Emergency Power – A 400kW standby diesel generator and automatic transfer switch will be provided to operate the treatment facility in event of power failure.

6. **OPERATING PERMIT**

This facility does not meet the requirements of the MOGD issued on July 1, 2024, for the following reason: the design flow of the proposed facility is 528,200 gpd which exceeds the limit of 50,000 gpd.

The operating permit MO-0140783 was public noticed from June 13, 2025, to July 14, 2025. No comments were received.

V. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Section 621.250 RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

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Chia-Wei Young, P.E.
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APPENDIX

- **Antidegradation**

Water Quality and Antidegradation Review

For the Protection of Water Quality

and Determination of Effluent Limits for Discharge to

Lake of the Ozarks

by

Lake Area Waste Water Association, Inc.

LAWWA Turkey Bend WRF

November 2023

Table of Contents

PURPOSE OF ANTIDEGRADATION REVIEW REPORT

The purpose of this Antidegradation Review is for the construction of the new LAWWA Turkey Bend WRF. The Turkey Bend WRF will replace 12 smaller plants discharging to Lake of the Ozarks with one new treatment plant designed to provide a high level of treatment, including nitrogen and phosphorus removal. With the expected upcoming effluent limits for ammonia and nutrients, along with the varying ages of the treatment plant, LAWWA decided that construction of one new treatment plant would serve the community best. The Antidegradation Report was compiled and submitted by Rachel Dixon, P.E., with Horner and Shifrin in February 2023.

The applicant completed both an alternatives analysis and a demonstration that the discharge was non-degrading in comparison to the existing facilities permitted effluent limits to fulfill the requirements of the AIP. The design flow of the proposed Aero-Mod SEQUOX system with tertiary filters, alum feed, and UV disinfection is 264,000 gallons per day (0.264 MGD).

This is an updated Antidegradation Review with a higher design average flow and different alternatives than the previously completed 2016 Antidegradation Review submitted by HDR Engineering.

The proposed facility will regionalize and close the following facilities, with a design average flow of 264,000 gpd (0.264 MGD):

- St. Moritz Estates Condominiums #1 &#2 , MOGD00229
- Hawk Island Estates, MOGD00150
- Pelican Bay Condominiums, MOGD00617
- Lake Pointe Condominiums, MOGD00121
- Bay Point Village, MO0104361
- Garden Gate Assisted Living, MOGD00618
- Knolls Resort Condos/Breakwater Bay, MO0099040
- Three Seasons Condominiums, MOGD00100
- Oak Shadows, MOGD00286
- NABRABCO, MOGD00614
- Harbour Ridge, MOGD00451
- Waves and Wheels
-

FACILITY INFORMATION

Facility Name:	LAWWA Turkey Bend WRF
Address:	Yacht Club Drive, Osage Beach, MO 65065
Permit #:	New Facility
County:	Camden
Facility Type:	393 nonprofit /Domestic Wastewater
Owner:	Lake Area Waste Water Association, Inc. (LAWWA)
Continuing Authority:	Lake Area Waste Water Association, Inc.
Sec. of State Charter No:	N00809847

UTM Coordinates:	X = 525901 ; Y = 4221780
Legal Description:	Sec. 5 T39N, R16W
12 digit watershed:	10290109-0401
Ecological Drainage Unit:	Ozark/Osage
Ecoregion:	Ozark Highlands

PERMIT LIMITS AND MONITORING INFORMATION

Table 3.1 Proposed Monitoring Parameters and Effluent Limits

PARAMETER	Unit	Basis for Limits	Monthly Average
Flow	MGD	FSR	*
BOD_5	mg/L	NDEL, PBA	15
TSS	mg/L	NDEL, PBA	15
*Escherichia coli***	#/100mL	WBEL	126
Ammonia as N 1st quarter(January-March) 2nd quarter(April-June) 3rd quarter(July-September) 4th quarter(October-December)	mg/L	NDEL, PBA	 2.6 1.1 0.9 2.5
Oil & Grease	mg/L	WQBEL	10
Total Phosphorus	lbs/year	PBA	1,206
Total Nitrogen	lbs/year	PBA	16,802.5
Aluminum, Total Recoverable	µg/L	WQBEL	*

Acute WET	TU	WQBEL	*
pH	SU	WQBEL	6.0-9.0

* - Monitoring requirement only

** - #/100mL; the Monthly Average for *E. coli* is a geometric mean.

Basis for Limitations Codes:

MDEL – Minimally Degrading Effluent Limit
NDEL – Non-Degrading Effluent Limit
PBA – Performance Based Average
TBEL – Technology-Based Effluent Limit
WQBEL – Water Quality-Based Effluent Limit

FACILITY HISTORY

Lake Area Waste Water Association, Inc. is a nonprofit sewer company formed in April 2007 for the specific purpose of owning and operating wastewater treatment systems around the state's lakes and to provide treatment and operational control. LAWWA owns and operates the treatment facilities within the Turkey Bend service area in Camden County. The Turkey Bend Service is defined as north of Camdenton, west of Osage Beach and between Lake of the Ozarks and Highway 54.

FACILITY PERFORMANCE HISTORY:

There is no performance history for this facility since it is a new and proposed discharging facility. As of April 15, 2023, none of the proposed facilities are currently under enforcement with the Department.

RECEIVING WATERBODY INFORMATION

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
001	0.4092	Tertiary	Domestic

RECEIVING STREAM(S) TABLE:

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Lake of the Ozarks	L2	7205	AQL-WWH, HHP, IRR, LWW,NNC, SCR, WBC-A	10290109-0401	0

* Protection of Warm Water Aquatic Life (AQL) Warm Water Habitat, Cold Water Fishery (CDF), Cool Water Fishery (CLF), Whole Body Contact Recreation – Category A (WBC-A), Whole Body Contact Recreation – Category B (WBC-B), Secondary Contact Recreation (SCR), Human Health Protection (HHP), Irrigation (IRR), Livestock &

Wildlife Watering (LWW), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW), Numeric Nutrient Criteria (NNC).

RECEIVING STREAM(S) LOW-FLOW VALUES:

RECEIVING STREAM	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Lake of the Ozarks	0.0	0.0	0.29

Receiving Water Body Segment Outfall #1:		
Upper end segment* UTM coordinates:	X = 525901 ; Y = 4221780	outfall
Lower end segment* UTM coordinates:	X = 532865 ; Y = 4228470	downstream confluence

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

EXISTING WATER QUALITY

New facility, no existing discharge. The facility will discharge to Lake of the Ozarks, which is on the 303(d) list for nutrient impairment.

MIXING CONSIDERATIONS

Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(IV)(b)].

Mixing Zone:

Mixing Zone (MZ) Parameters: According to the USGS 1:24,000K Quadrangle, the lake width near the *assumed* new facility outfall location is approximately 417 feet (ft.). Using "normal" water levels of 417 ft. wide and one-quarter of this width equals 104.25 ft. Therefore, because 100 feet is less than 104.25 ft., MZ = 100 feet [10 CSR 20-7.031(5)(A)5.B.(IV)(a)].

Mixing Zone Volume: The flow volume approximates a triangular prism because of the slope of the lake bottom, where the formula is Volume = L*W*(D*0.5). Assuming that the width will be either side of the discharge (MZ) length (100 feet) to form the plume effect, the box dimensions are length (L) = 100 ft., width (W) = 100 ft., and depth (D) = 5 ft. Depth was obtained using mixing zone length projected 100 ft. from shoreline to the intersecting contour on 7.5' USGS topographic map (contour near propose discharge=190 ft. and lake depth contour at 100 ft. from shore = 185 ft.).

Volume = L*W*(D*(0.5)) = (100')*(100')*(5'*(0.5)) = 25,000 ft^3.

The flow volume of 25,000 ft^3 is assumed as the daily mixing zone. Therefore;

30Q10 = (25,000 ft^3/day)*(1 day/86,400 sec) = 0.29 ft^3/sec.

RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

ANTIDEGRADATION REVIEW INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the department developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review, which documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, and revised July 13, 2016, a facility is required to use Missouri's AIP for new and expanded wastewater discharges.

The AIP specifies that if the proposed activity results in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required.

The following is a review of the Wastewater Treatment Facility Antidegradation Review Report for LAWWA Turkey Bend dated February 2023 prepared by Rachel Dixon, P.E., with Horner & Shifrin.

A. Tier Determination

Waterbodies are assigned Tier 1, 2, or 3 protection levels.

Tier 1 protection is applied to a waterbody on a pollutant by pollutant basis for pollutants which may cause or contribute to the impairment of a beneficial use or violation of Water Quality Criteria (WQC); and prohibit further degradation of Existing Water Quality (EWQ) where additional pollutants of concern (POCs) would result in the water being included on the 303(d) List.

- Tier 1 Pollutants for this review include: total phosphorus and total nitrogen as Lake of the Ozarks is on the 2020 303(d) list for nutrient impairments.

Tier 2 level protection is assigned to the waterbody on a pollutant by pollutant basis that prohibits the degradation of water quality of a surface water unless a review of reasonable alternatives and social and economic considerations justifies the degradation in accordance with the methods presented in the AIP.

- Tier 2 Pollutants for this review include: biochemical oxygen demand (BOD), total suspended solids (TSS), ammonia, oil and grease, aluminum, and pH.

Tier 3 protection prohibits any degradation of water quality of Outstanding National Resource Waters and Outstanding State Resource Waters as identified in Tables D and E of the Water Quality Standards (WQS). Temporary degradation of water receiving Tier 3 protection may be allowed by the Department on a case-by-case basis as explained in Section VI of the AIP.

- As this proposed discharge is located at Lake of the Ozarks, the receiving waterbody is not an Outstanding National Resource Water or an Outstanding State Resource Water, and as such Tier 3 is not applicable.

Below is a list of POCs reasonably expected and identified by the permittee in their application to be in the discharge. Pollutants of concern are defined as those pollutants "proposed for discharge that affect beneficial use(s) in waters of the state." They include pollutants that "create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge" (AIP, Page 6).

Table 6.1: Pollutants of Concern and Tier Determination

Pollutants of Concern	Tier	Degradation	Comment

Biological Oxygen Demand/Dissolved Oxygen	2	Insignificant	Non-degrading
Total Suspended Solids (TSS)	**	Insignificant	Non-degrading
Ammonia as N	2*	Insignificant	Non-degrading
Escherichia coli (E. coli)	2	Insignificant	Disinfection required, UV proposed
Phosphorus, Total	1	Insignificant	Nutrient Implementation Policy
Nitrogen, Total	1	Insignificant	Nutrient Implementation Policy
Aluminum, Total Recoverable	2	Significant	Monitoring only
pH	***	Significant	Water Quality Standards applied

* Tier assumed.

** Tier determination not possible: No in-stream standards for these parameters.

*** Standards for these parameters are ranges.

B. Tier 1 Review

According to the AIP, the waters may receive the POCs that are causing impairments if 1) the discharge would not cause or contribute to a violation of the WQS, 2) all other conditions of the state permitting requirements are met (i.e., no discharge options are explored and technology based requirements (including ELGs) are met); and 3) the permit is issued with the highest statutory and regulatory requirements.

The proposed discharge is to Lake of the Ozarks, which is on the 2020 303(d) list for chlorophyll-a impairments. Chlorophyll-a is an indicator for total phosphorus and total nitrogen exceedances in the waterbody. The Department has not developed a total maximum daily load (TMDL) for Lake of the Ozarks. Following the Department's Nutrient Implementation Policy, the proposed project has an annual mass loading of 16,802.5 lbs/year total nitrogen and 1,206 lbs/year total phosphorus. That translates to an average concentration of 20 mg/L total nitrogen and 1.5 mg/L total phosphorus, however the facility has elected at this time to have an annual mass concentration, which is allowed under 10 CSR 20-7.015(9)(B). LAWWA expects it to be more cost effective to design and construct a wastewater treatment facility capable of meeting the expected upcoming effluent limits due to the nutrient impairment than have to upgrade the plant within a few years of it going online.

While the treatment plant is designed with a high level of treatment provided, there is still the potential when a TMDL is developed for Lake of the Ozarks, the facility's permit may be reopened to establish more protective wasteload allocations.

C. Necessity of Degradation

The AIP specifies that if the proposed activity does result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Part of that analysis as shown below is the evaluation of non-degrading alternatives, such as regionalization or no discharge systems.

The applicant has the option of assuming discharge will be significant and proceeding directly to the alternatives analysis, thereby avoiding the determination of the assimilative capacity of the receiving water.

Regionalization

Lake of the Ozarks Regional Wastewater Treatment Plant #1, MO-0103241, is the closest treatment plant with the capacity to treat flows from the LAWWA facilities. This would require closing the existing treatment plants and installing pump stations and forcemains. The treatment plant was contacted about potential connection, however there are planned developments already committed to connecting to regional treatment plant that will use the remaining capacity and thus to connect the LAWWA facilities, the Lake of the Ozarks Regional WWTP #1 would need to be expanded.

The construction of the LAWWA Turkey Bend WRF serves as a regionalization project for dischargers around the lake. The proposed project will remove 12 permitted facilities and one business wastewater facility and combine them into one treatment facility.

No Discharge Evaluation

To convert to a no discharge land application facility, the facility would need a 32-acre storage basin with the capacity to hold 24 million gallons of water for the minimum of 90 days required in 10 CSR 20-8.200, plus a minimum of 165 acres at default hydraulic loading of 24 inches per year per acre. With a soil morphology study, that could be increased to 40 inches per year per acre, thus decreasing the necessary land to approximately 100 acres.

With the hilly and rocky landscape around Lake of the Ozarks, there is limited land suitable for a land application system. Additionally the presence of many private drinking water wells near the site, also limits the ability to do land application. Installing a no-discharge system is not considered feasible.

Alternatives to No discharge

Alternative 1: Aero-Mod SEQUOX

The proposed facility would include the construction and installation of an Aero-Mod SEQUOX activated sludge treatment process, with influent screening, an anoxic selector tank, 2 stage aeration, clarifiers, UV disinfection and aerobic digestion. The proposed process would have influent received at the selector tank where it would be mixed with recycled activated sludge under anoxic conditions. Flow then would continue through parallel treatment processes including 2-stage aeration to provide a plug-flow process with nitrification and denitrification. This option would provide higher level of treatment than is currently experienced at the existing facilities and it would be able to be modified in future for nutrient removal and additional discharge limits if necessary.

Alternative 2: Aero-Mod SEQUOX with biological nutrient removal

This alternative is similar to Alternative 1 however with a fermentor/anaerobic selector tank instead of the anoxic tank and additional monitoring and controls to achieve an advanced biological phosphorus, nutrient removal system. An alum feed system would have to be installed for peak condition or to polish effluent to meet phosphorus limits. This system would require more operator control to maximize treatment.

Alternative 3: Aero-Mod SEQUOX with tertiary filters

This alternative is similar to the other alternatives in that is uses Aero-Mod SEQUOX, however this alternative uses an alum feed system for all flows and adds tertiary disk filtration to achieve the highest level of treatment. This is the preferred alternative for LAWWA as it will achieve a high level of treatment from the beginning and is expected to meet potential nutrient limits that may be established in a TMDL or with the adoption of EPA's 2013 Ammonia Criteria.

All alternatives include the necessity to close existing treatment plants and possibly construct new collection systems, including forcemains and lift stations to get all flow to a centralized treatment system.

Table 6.2: Alternatives Analysis Comparison

Pollutant	Alternative 1 (Base Case) Aero-Mod SEQUOX	Alternative 2: Aero-Mod SEQOUX	Alternative 3: Aero-Mod SEQUOX with Tertiary Filters
BOD_5	<15 mg/L	<15 mg/L	10 mg/L
TSS	<15 mg/L	< 15mg/L	≤ 5 mg/L
Ammonia as N-summer	< 0.9 mg/L	< 0.9 mg/L	0.6 mg/L
Ammonia as N-winter	<2.6 mg/L	<2.6 mg/L	2.1 mg/L
Phosphorus, Total	4.4 mg/L	≤ 1.5 mg/L	≤ 1.5mg/L
Nitrogen, Total	20 mg/L	≤ 20 mg/L	≤ 20 mg/L
Construction Cost	$6,565,900	$7,205,000	$7,994,800
Annual O&M Cost	$203,600	$211,600	$261,600
Life Cycle Cost**	$12,628,800	$13,522,900	$15,735,500
Ratio	1.0	1.07	1.25

* monitoring requirement

**Life cycle cost at 33 year design life and 2.25 percent interest

D. Social and Economic Importance

The affected community consists of the residents and tourists to Lake of the Ozarks. Lake of the Ozarks is a large tourist attraction for the state, with over 5 million visitors per year and generating approximately $965 million dollars in sales tax receipts in 2019 for the local communities around Lake of the Ozark and for the state, according to Central Missouri's Lake of the Ozarks Demographic Profile 2020.

By removing 12 wastewater treatment plants, of varying age and condition with one new treatment plant that provides a high level of treatment, this is providing a benefit to the community by protecting human health and the environment. Several of the existing treatment plants are located near docks and swimming areas, increasing the potential impact to residents and visitors. Proper and cost-effective operation of the facility serves the environmental and economic interests of both the State of Missouri and the local communities.

E. Geohydrologic Evaluation

A geohydrologic evaluation was completed by Missouri Geological Survey on May 19, 2022 (LWE22103). The site is located on a hillslope adjacent to Lake of the Ozarks. The system has slight overall geologic limitations with topography ranging from less than 4 percent slope to 15 percent slope. The system will discharge to Lake of the Ozarks, which is considered gaining for discharge purposes (see Appendix B).

F. Natural Heritage Review

A Missouri Department of Conservation Natural Heritage Review was obtained on May 31, 2022. The proposed facility occurs near the Mansfield (Alice Ahart) Conservation Area. The review returned no known

records of endangered species in the area; however, two species of bats may be present in the project area, Indiana and Northern Long-Eared and the project is located within the range of the Gray bat. The following recommendations were made for construction activities:

- Manage construction to minimize sedimentation and run-off to nearby streams.
- At stream and drainage crossings, avoid erosion, silt introduction, petroleum or chemical pollution, and disruption or realignment of stream banks and beds.
- If any trees need to be removed for the project, contact the U.S. Fish and Wildlife Service for coordination under the Endangered Species Act. (see Appendix C)

G. Demonstration of Insignificance

The AIP states that a demonstration of insignificance of the discharge requires the applicant to show a reduction, or maintenance of loading, i.e., no change in ambient water quality concentrations in the receiving waters. As demonstrated in Antidegradation Review Report Calculation of Loading and Alternatives Analysis, the regionalization of 12 discharging facilities and 1 other facility into 1 treatment plant, with the following proposed monthly limits results in a reduction in pollutants being discharged to Lake of the Ozarks. Existing loading was calculated based on permitted design flow and monthly average effluent limit at each of the 12 facilities. For Total Phosphorus and total nitrogen loading was based on sampling data at the facilities and in conjunction with average levels from wastewater literature.

In discussion with the consultant and the facility owners, the facility is still proposing non-degrading effluent limits, however they requested the values be slightly higher to allow the facility a little more flexibility when combining 12 different areas into treatment plant, especially with the highly variable flow that some of the condos and subdivisions serve at the lake. With the variability of the effluent and flows, the BOD and TSS effluent limits were evaluated at 15 mg/L monthly average, ammonia as N was evaluated at <0.9 mg/L for summer. In the discussion of nutrients, the facility will be designed to meet a total phosphorus of less than 1.0 mg/L and a total nitrogen of less than 10 mg/L; however the facility wants time to get the treatment plant up and running and to see if effluent limits are necessary, so the facility will have total phosphorus and total nitrogen effluent limits in terms of annual loading, with a monitoring requirements.

Table 6.3: Net Change in Loadings Based upon Current and Proposed Permit Limits.

Pollutants of Concern	Current Monthly Average Limit (mg/L)	Proposed Monthly Average Limit (mg/L)	Current loading (lbs/day)	Proposed Loading (lbs/day)	Net change (lbs/day)	% Change
BOD_5	20	15	44.5	33.05	-11.45	-25.73%
TSS	20	15	44.5	33.05	-11.45	-25.73%
Ammonia -summer	4.6	0.9	9.5	1.98	-7.52	-79.16%
Ammonia-winter	9.0	2.6	17.5	5.73	-12.9	-32.73%
Total Phosphorus	*	1.5	9.70	3.3	-6.4	-66.00%
Total Nitrogen	*	20	68.31	44.06	-24.25	-35.50%

* Monitoring only (Current loading for total phosphorus is based on 4.4 mg/L and total nitrogen on 31 mg/L)

DERIVATION AND DISCUSSION OF PARAMETERS AND LIMITS

Wasteload allocations and limits were calculated using two methods:

A. **Water quality-based** – Using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration

C_s = upstream concentration

Q_s = upstream flow

C_e = effluent concentration

Q_e = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality-based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

B. **Alternative Analysis-based** – Using the preferred alternative's treatment capacity for conventional pollutants such as BOD_5 and TSS that are provided by the consultant as the WLA, the significantly-degrading effluent average monthly and average weekly limits are determined by applying the WLA as the average monthly (AML) and multiplying the AML by 1.5 or 2.0 to derive the average weekly limit (AWL) or daily maximum limit (MDL), as described in EPA's Technical Support Document Section 5.4.2.

Note: Significantly-degrading effluent limits have been based on the authority included in Section I.A. of the AIP. Also under 40 CFR 133.105, permitting authorities shall require more stringent limitations than equivalent to secondary treatment limitations for 1) existing facilities if the permitting authority determines that the 30-day average and 7-day average BOD_5 and TSS effluent values could be achievable through proper operation and maintenance of the treatment works, and 2) new facilities if the permitting authority determines that the 30-day average and 7-day average BOD_5 and TSS effluent values could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process.

Outfall #001 **– Main Facility Outfall**

- **Flow.** Though not limited itself, the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations [40 CFR Part 122.44(i)(1)(ii)]. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may

require the submittal of an operating permit modification. Influent monitoring has been and will be required for this facility in its Missouri State Operating Permit.

- **Biochemical Oxygen Demand (BOD_5).** Effluent limits of 15 mg/L average monthly was established as a result of a discharging technology alternatives analysis conducted by the applicant. Facility proposed a daily maximum effluent limit of 20 mg/L. At the existing design flow 264,000 gpd the mass loading to the waterbody is 44.5 lbs/day while the proposed loading was calculated to be 33.05 lbs/day at the proposed monthly average effluent concentration. These limits are at least as stringent as the minimum effluent regulations established in 10 CSR 20-7.015(3)(A)1.
- **Total Suspended Solids (TSS).** Effluent limits of 15 mg/L average monthly was established as a result of a discharging technology alternatives analysis conducted by the applicant. Facility proposed a daily maximum effluent limit of 20 mg/L. At the existing design flow 264,000 gpd the mass loading to the waterbody is 44.5 lbs/day while the proposed loading was calculated to be 33.05 lbs/day at the proposed monthly average effluent concentration. These limits are at least as stringent as the minimum effluent regulations established in 10 CSR 20-7.015(3)(A)1.
- ***Escherichia coli (E. coli).*** Effluent limits of 126 CFU per 100 mL monthly average and 630 CFU per 100 mL as a daily maximum of geometric mean during the recreation season (April 1 – October 31) were established as a result of a discharging technology alternatives analysis conducted by the applicant. LAWWA Turkey Bend WRF will utilize UV irradiation for disinfection.
- **Total Ammonia Nitrogen.** Effluent limits were established as a result of a discharging technology alternatives analysis conducted by the applicant. At the existing design flow 264,000 gpd the mass loading to the waterbody is 9.5 lbs/day while the proposed loading was calculated to be 1.85 lbs/day at the proposed effluent concentration in summer. As the proposed facility is greater than 0.1 MGD, influent monitoring will be required per 10 CSR 20-7.015(9)(D)8.). In discussions with the facility, the treatment plant is being designed to meet mollusk ammonia, however with the seasonality of their flows and loadings, along with constructing a new treatment plant, the facility proposed non-degrading effluent limits that allow them some additional flexibility when bringing the plant online and fine-tuning its operations to the highly variable flows and loadings experienced at the lake.

The proposed non-degrading and alternative analysis based effluent limits are:

Parameter	Units	AML
Ammonia as N-1st quarter	mg/L	2.6
Ammonia as N-2nd quarter	mg/L	1.1
Ammonia as N-3rd quarter	mg/L	0.9
Ammonia as N-4th quarter	mg/L	2.5

To verify the proposed non-degrading effluent limits provided by the facility are protective of the water quality based effluent limits, below is the following calculation of water quality based effluent limits. It demonstrates that the proposed non-degrading effluent limits proposed by the applicant are more protective. The facility evaluated that the proposed non-degrading effluent limits were protective against the state default standards for discharges to lakes and the ecoregional temperature and pH values.

Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L

State Lake Default Temperature and pH

Quarter	Temp (˚C)*	pH (SU)*	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
1st	11	7.8	3.1	12.1
2nd	21.2	7.8	1.9	12.1
3rd	26	7.8	1.6	12.1
4th	15.5	7.8	2.9	12.1

1st Quarter (Jan-March)

Chronic WLA: Ce = ((0.4092 + 0.0723)3.1 – (0.0723 * 0.01)) / 0.4092

Ce = 3.7

Acute WLA: Ce = ((0.4092 + 0)12.1 – (0 * 0.01)) / 0.4092

Ce = 12.1

AML = WLAc = 3.7 mg/L

MDL = WLAa = 12.1 mg/L

2nd Quarter (April-June)

Chronic WLA: Ce = ((0.4092 + 0.0723)1.6 – (0.0723 * 0.01)) / 0.4092

Ce = 1.9

Acute WLA: Ce = ((0.4092 + 0)12.1 – (0 * 0.01)) / 0.4092

Ce = 12.1

AML = WLAc = 1.9 mg/L

MDL = WLAa = 12.1 mg/L

3rd Quarter (July-September)

Chronic WLA: Ce = ((0.4092 + 0.0723)1.3 – (0.0723 * 0.01) / 0.4092

Ce = 1.6

Acute WLA: Ce = ((0.4092 + 0)12.1 – (0 * 0.01)) / 0.4092

Ce = 12.1

AML = WLAc = 1.6 mg/L

MDL = WLAa = 12.1 mg/L

4th Quarter

Chronic WLA: Ce = ((0.4092 + 0.0723)2.5 – (0.0723 * 0.01) / 0.4092

Ce = 2.9

Acute WLA: Ce = ((0.4092 + 0)12.1 – (0 * 0.01)) / 0.4092

Ce = 12.1

AML = WLAc = 2.9 mg/L

MDL = WLAa = 12.1 mg/L

Comparison Chart of WQBEL AML and Non-degrading AML

Month	Monthly Average Limit		
	WQBEL (mg/L) state lake default	WQBEL (mg/L) Ozark Highlands Ecoregion	Non-degrading/PBA (mg/L)
January	3.7	3.1	**2.6**
April	1.9	2.0	**1.1**
September	1.6	1.5	**0.9**
October	2.9	2.9	**2.5**

- **Oil & Grease.** Conventional pollutant, [10 CSR 20-7.031(4)(B)]. Waters shall be free from oil, scum, and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses.
- **Total Phosphorus.** The preferred alternative selected for ammonia treatment serves as the base case for total nitrogen and phosphorus and then alternatives were evaluated for total phosphorus and total nitrogen removal per the Lake Nutrient Implementation Policy and the knowledge that Lake of the Ozarks is on the 303(d) list for nutrient impairments. Effluent limits based on annual loading were established as a result of a discharging technology alternatives analysis conducted by the applicant. The proposed annual loading limit is 1206 lbs/year total phosphorus, which is based on a concentration of 1.5 mg/L at design average flow. As the proposed facility is greater than 0.1 MGD, influent monitoring will be required per 10 CSR 20-7.015(9)(D)8.
- **Total Nitrogen.** The preferred alternative selected for ammonia treatment serves as the base case for total nitrogen and phosphorus and then alternatives were evaluated for total phosphorus and total nitrogen removal per the Lake Nutrient Implementation Policy and the knowledge that Lake of the Ozarks is on the 303(d) list for nutrient impairments. Effluent limits based on annual loading were established as a result of a discharging technology alternatives analysis conducted by the applicant. The proposed annual loading limit is 16802.5 lbs/year total nitrogen, which is based on a concentration of 20 mg/L at design average flow. As the proposed facility is greater than 0.1 MGD, influent monitoring will be required per 10 CSR 20-7.015(9)(D)8. Total Nitrogen is calculated as Total Kjeldahl Nitrogen + Nitrate+Nitrite.
- **pH.** The preferred alternative selected for ammonia treatment serves as the base case for pH with effluent limit range of 6.0-9.0. Technology based limits, 6.0/9.0 SU [10 CSR 20-7.015] are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the buffering capacity of the mixing zone.

- **Aluminum, Total Recoverable.** Monitoring requirement only. This facility uses chemicals for phosphorus removal that may contain aluminum. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards for Aluminum (Total Recoverable).

GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDEGRADATION REVIEW

A. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(2) Continuing Authorities and 10 CSR 20-6.010(4)(A)5.B., consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
B. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
C. Changes to Federal and State Regulations (FSR) made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
D. Effluent limitations derived from FSR may be WQBEL or Effluent Limit Guidelines (ELG).
E. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
F. A WQAR does not allow discharges to waters of the State, and shall not be construed as a National Pollution Discharge Elimination System (NPDES) or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
G. Limitations and other requirements in a WQAR may change as Water Quality Standards (WQS), Methodology, and Implementation procedures change.
H. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.
I. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation. This Antidegradation Review is based on the information provided by the facility and is not a comprehensive review of the proposed treatment technology. If the review engineer determines the proposed technology will not consistently meet proposed effluent limits, the permittee will be required to revise their Antidegradation Report.

ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

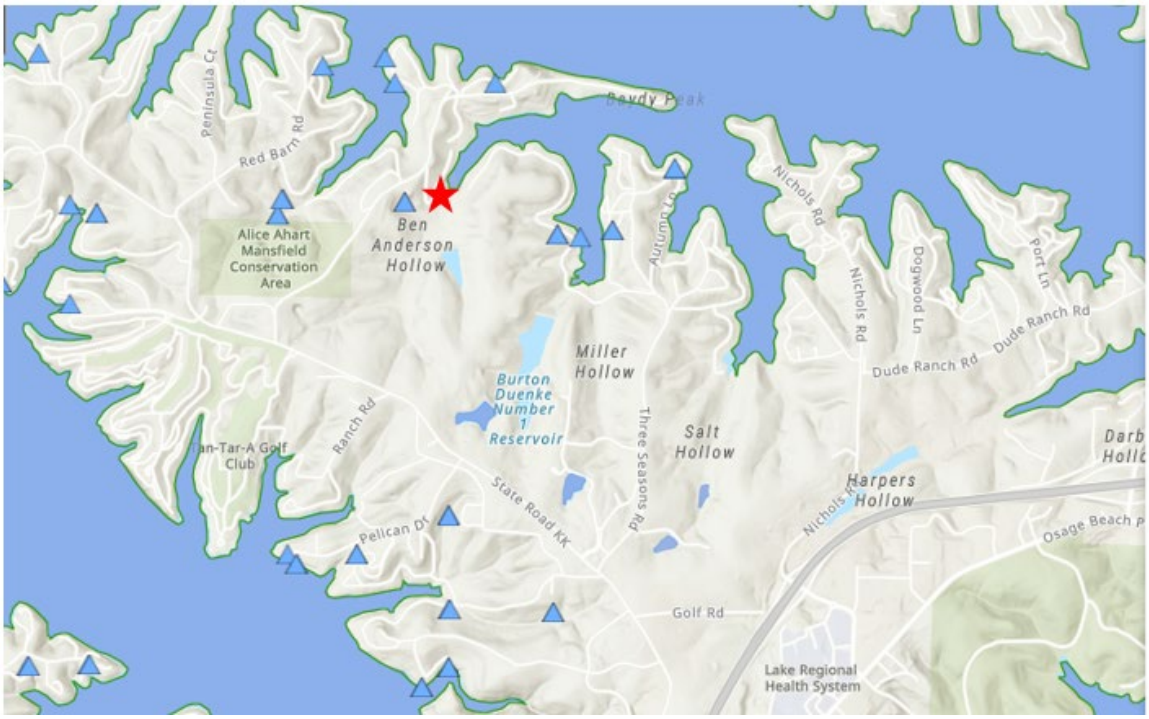
The proposed project will remove 12 facilities from the Turkey Bend area of Camden County and replace them with one new treatment facility. The proposed discharge is considered non-degrading with the alternatives analysis selecting the Aero-Mod SEQUOX with tertiary filtration, alum feed, and UV disinfection to meet effluent limits. The base case was not selected as the preferred alternative due to the 303(d) list of Lake of the Ozarks for nutrients and potentially more stringent ammonia criteria forthcoming. LAWWA decided that it would be more cost effective to construct a treatment plant that meets the higher level of removal now than have to modify or retrofit the plant within a few years of it being constructed. The discharge will be to Lake of Ozarks and the proposed new design flow is 0.264 MGD.

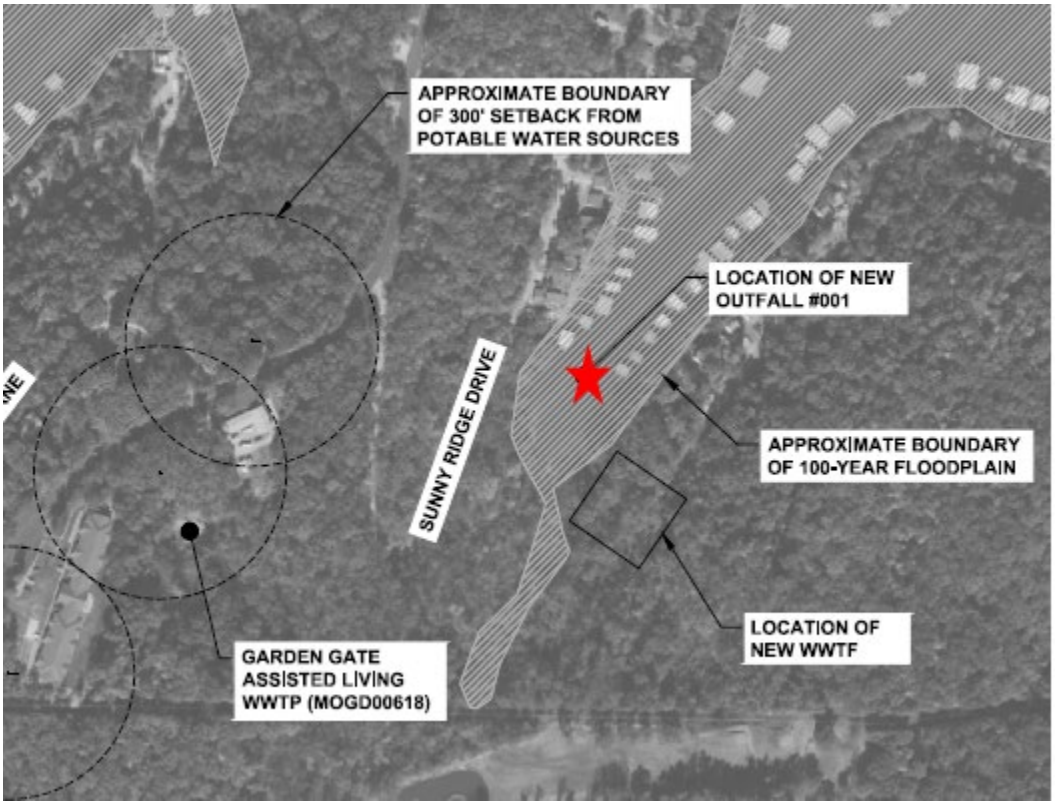
Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. The Department has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

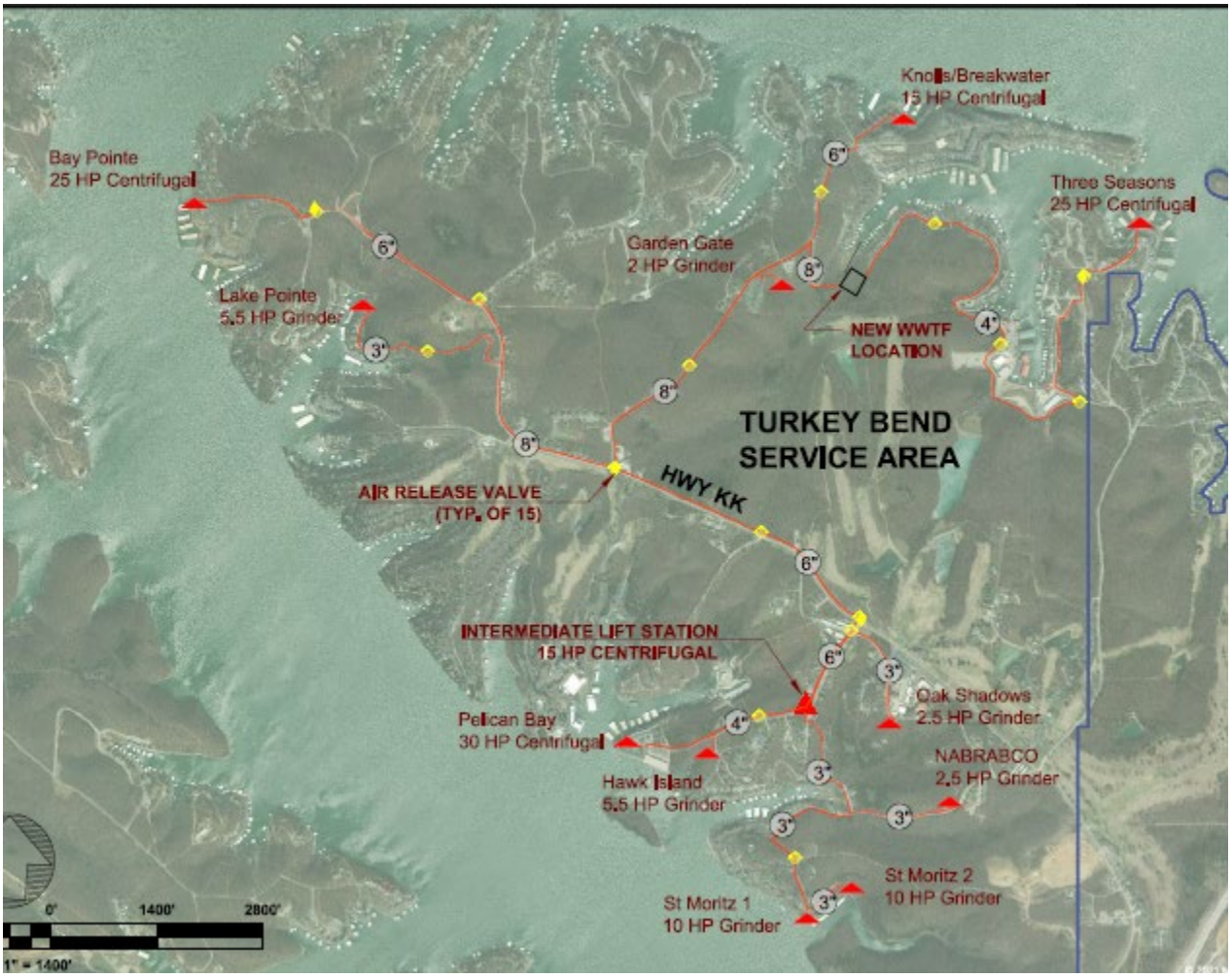
Reviewer: Leasue Meyers, EI
Date: November 2023

Reviewer: Cailie Carlile, P.E.

Appendix A: Map of Discharge Location




APPROXIMATE BOUNDARY OF 300' SETBACK FROM POTABLE WATER SOURCES
LOCATION OF NEW OUTFALL #001
SUNNY RIDGE DRIVE
APPROXIMATE BOUNDARY OF 100-YEAR FLOODPLAIN
LOCATION OF NEW WWTF
GARDEN GATE ASSISTED LIVING WWTP (MOGD00618)


Knolls/Breakwater
15 HP Centrifugal
Bay Pointe
25 HP Centrifugal
Three Seasons
25 HP Centrifugal
Garden Gate
2 HP Grinder
Lake Pointe
5.5 HP Grinder
NEW WWTF
LOCATION
TURKEY BEND
SERVICE AREA
AIR RELEASE VALVE
(TYP. OF 15)
HWY KK
INTERMEDIATE LIFT STATION
15 HP CENTRIFUGAL
Oak Shadows
2.5 HP Grinder
Pelican Bay
30 HP Centrifugal
NABRABCO
2.5 HP Grinder
Hawk Island
5.5 HP Grinder
St Moritz 2
10 HP Grinder
St Moritz 1
10 HP Grinder
0'
1400'
2800'
1" = 1400'

Appendix B: Geohydrologic Evaluation

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

LWE22103
Camden County

May 23, 2022

Sean Mickey
401 S 18th St
St Louis, MO 63103

RE: Turkey Bend WRF

Dear Sean Mickey:

On May 13, 2022, the Missouri Geological Survey received a request to perform a geohydrologic evaluation for the above referenced project located in Camden County. Included with this letter is a report that details the geologic and hydrologic conditions at the site and the potential for groundwater contamination in the event of wastewater treatment failure.

Thank you for the evaluation request. If you are in need of further assistance or have questions regarding the report, please contact our office at P.O Box 250, Rolla, Mo 65402-0250, by telephone at 573-368-2100 or gspeg@dnr.mo.gov.

Sincerely,

MISSOURI GEOLOGICAL SURVEY

Kirsten Schaefer

Kirsten Schaefer
Geologist
Environmental Geology Section

c: Kelly Goss
WPP
Southwest Regional Office

STATE OF MISSOURI
KIRSTEN N. SCHAEFER
RG
2021034025
REGISTERED GEOLOGIST

05/23/2022

Missouri Department Of Natural Resources
Missouri Geological Survey
Geological Survey Program
Environmental Geology Section

Project ID Number
LWE22103
County
Camden County

Request Details

Project: Turkey Bend WRF

Legal Description: 05 T39N R16W
Quadrangle: LAKE OZARK
Latitude: 38 8 31.62
Longitude: -92 42 13.36

Organization Official
Name: Kelly Goss
Address: 515 Old South 5
City: Camdenton
State: MO Zip: 65020
Phone: 573-353-9595
Email:

Preparer
Name: Sean Mickey
Address: 401 S 18th St
City: St Louis
State: MO Zip: 63103
Phone: 314-335-8667
Email: scmickey@hornershifrin.com

Project Details

Report Date: 05/23/2022
Date of Field Visit: 05/19/2022

Previous Reports: Not Applicable

Facility Type
- [X] Mechanical treatment plant
- [ ] Recirculating filter bed
- [ ] Land application
- [ ] Lagoon or storage basin
- [ ] Subsurface soil absorption system
- [ ] Lagoon or storage basin W/Land App
- [ ] Lagoon or storage basin W/SSAS
- [ ] Other type of facility

Type of Waste
- [ ] Animal
- [X] Human
- [ ] Process or industrial
- [ ] Leachate
- [ ] Other waste type

Funding Source
- [X] IWT
- [ ] WWL-SRF

Additional Information
- [ ] Plans were submitted
- [ ] Site was investigated by NRCS
- [ ] Soil or geotechnical data were submitted

Geologic Stream Classification: [X] Gaining [ ] Losing [ ] No discharge

Overall Geologic Limitations
- [X] Slight
- [ ] Moderate
- [ ] Severe

Collapse Potential
- [X] Not applicable
- [ ] Slight
- [ ] Moderate
- [ ] Severe

Topography
- [X] <4%
- [X] 4% to 8%
- [X] 8% to 15%
- [ ] >15%

Landscape Position
- [ ] Broad uplands
- [ ] Floodplain
- [ ] Ridgetop
- [ ] Alluvial plain
- [X] Hillslope
- [ ] Terrace
- [ ] Narrow ravine
- [ ] Sinkhole

Bedrock: Approximately 45 feet of solution weathered, moderately permeable Ordovician-age Gasconade Dolomite

Surficial Materials: Approximately 10 feet of clay and silt loam with approximately 50 percent pebble to gravel sized clasts

Missouri Department Of Natural Resources
Missouri Geological Survey
Geological Survey Program
Environmental Geology Section

Project ID Number
LWE22103
County
Camden County

Recommended Construction Procedures for Earthen Facility	**Determine Overburden Properties**	**Determine Hydrologic Conditions**
	☐ Particle size analysis	☐ Groundwater elevation
☐ Installation of clay pad and Compaction	☐ Atterberg limits	☐ Direction of groundwater flow
☐ Diversion of subsurface flow	☐ 95% Max. dry density test method	☐ 25-Year flood level
☐ Artificial sealing	☐ Overburden thickness	☐ 100-Year flood level
☐ Rock excavation	☐ Permeability coefficient-undisturbed	
☐ Limit excavation depth	☐ Permeability coefficient-remolded	

Remarks:

On May 19, 2022, a geologist with the Missouri Geological Survey conducted a geohydrologic evaluation for the proposed Turkey Bend discharging mechanical treatment plant, located at the southwestern terminus of Yacht Club Drive, Osage Township. The site is located on a hillslope adjacent to the Lake of the Ozarks in Camden County. The purpose of the site visit was to observe the geologic and hydrologic elements of the site and determine the potential for groundwater contamination in the event of wastewater treatment failure.

According to logs of nearby wells, previous mapping, and field observations; bedrock onsite consists of approximately 45 feet of solution weathered, moderately permeable Ordovician-age Gasconade Dolomite. The Gasconade is a coarsely crystalline dolomite with high secondary porosity. Surficial materials are comprised of 10 feet of clay and silt loam with approximately 50 percent pebble to gravel sized clasts. However, the proposed method does not rely on existing soils for treatment.

The system will discharge to the Lake of the Ozarks, adjacent to the site, which is considered gaining for discharge purposes. The site receives a slight overall geologic limitations rating. In the event of wastewater treatment failure, the local groundwater, and the surface waters of the Lake of the Ozarks, may be adversely impacted.

Appendix C: Natural Heritage Review

Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

Natural Heritage Review Level One Report: No Known Records

Foreword: Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this website is to provide information to federal, state and local agencies, organizations, municipalities, corporations and consultants regarding sensitive fish, wildlife, plants, natural communities and habitats to assist in planning, designing and permitting stages of projects.

PROJECT INFORMATION

Project Name and ID Number: Lake Area Wastewater Authority Turkey Bend WWTF Antidegradation Review #10949
User Project Number: 2208300
Project Description: Antidegradation review for a new wastewater treatment facility to regionalize wastewater treatment in the Turkey Bend area of the Lake of the Ozarks. The proposed facility will discharge to Lake Ozark.
Project Type: Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Construction or expansion
Contact Person: Rachel Dixon
Contact Information: redixon@hornershifrin.com or 3143358675

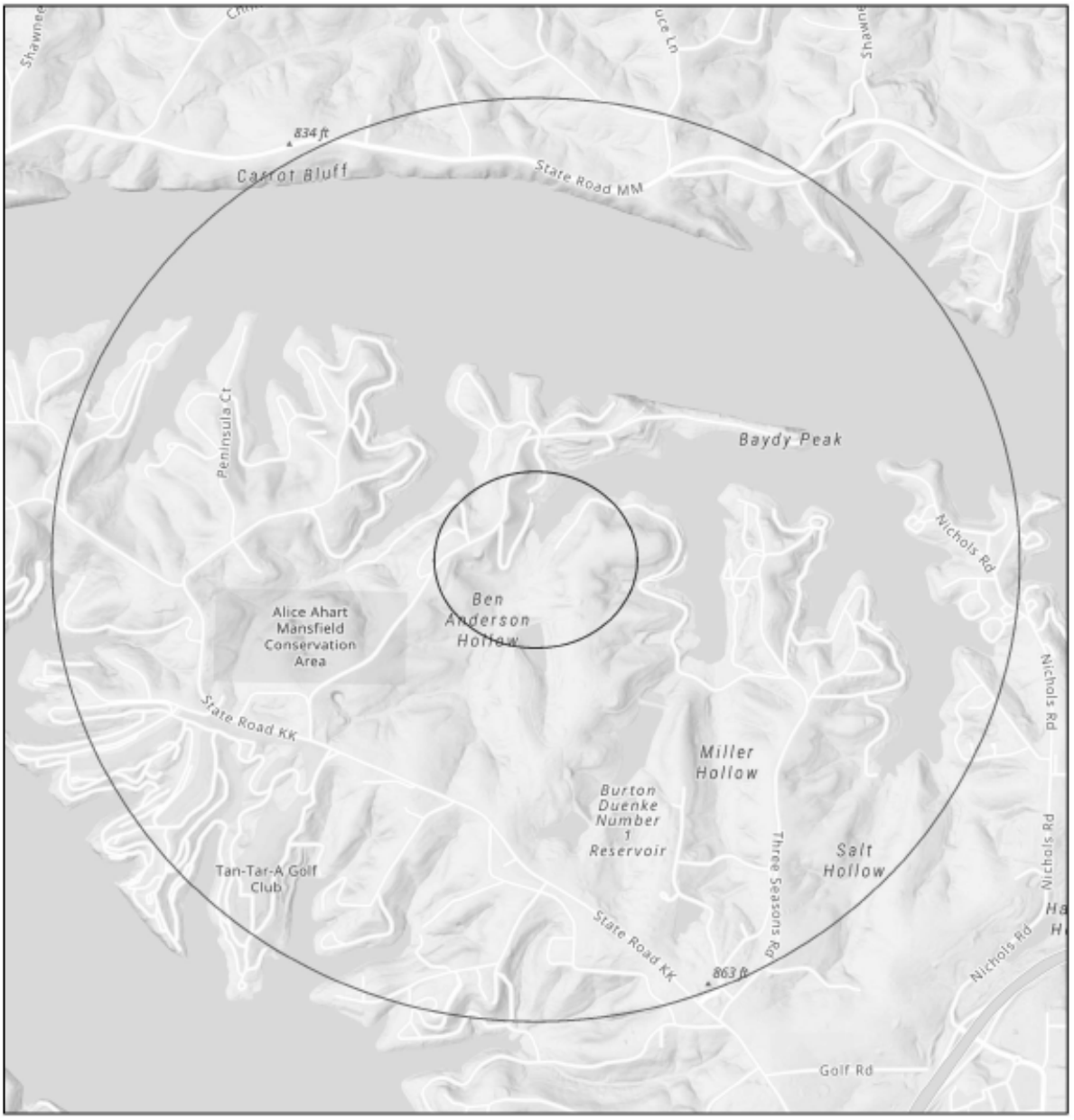
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive species or special habitats. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information. The Natural Heritage Program tracks occurrences of sensitive species and natural communities where the species or natural community has been found. Lack of an occurrence record does not mean that a sensitive plant, animal or natural community is not present on or near the project area. Depending on the project, current habitat conditions, and geographic location in the state, surveys may be necessary. Additionally, because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, Reports include information about records near but not necessarily on the project site.

The Natural Heritage Report is not a site clearance letter for the project. It provides an indication of whether or not public lands and sensitive resources are known to be (or are likely to be) located close to the proposed project. Incorporating information from the Natural Heritage Program into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive fish, forest and wildlife resources. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. The information within this report is not intended to replace Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit the USFWS Information for Planning and Conservation (IPaC) website at https://ecos.fws.gov/ipac/ for further information. This site was developed to help streamline the USFWS environmental review process and is a first step in ESA coordination. The Columbia Missouri Ecological Field Services Office may be reached at 573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203.

Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit https://www.modot.org/ for additional information on recommendations.

Lake Area Wastewater Authority Turkey Bend WWTF Antidegradation Review



May 31, 2022

1:23,472

0 0.2 0.4 0.8 mi
0 0.3 0.6 1.2 km

☐ Buffered Project Boundary

☐ Project Boundary

Esri, NASA, NGA, USGS, FEMA, Missouri Dept. of Conservation, Missouri DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

Species or Communities of Conservation Concern within the Area:

There are no known records of Species or Natural Communities of Conservation Concern within the defined Project Area.

Other Special Search Results:

The project occurs on or near public land, Mansfield (Alice Ahart) CA, please contact MDC.

Project Type Recommendations:
Waste Transfer, Treatment and Disposal -Wastewater treatment plant: New or Maintenance; Clean Water Act permits issued by other agencies regulate both construction and operation of wastewater systems, and provide many important protections for fish and wildlife resources throughout the project area and at some distance downstream. Fish and wildlife almost always benefit when unnatural pollutants are removed from water, and concerns are minimal if construction is managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any "Clean Water Permit" conditions.
Revegetate disturbed areas to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crownvetch and Sericea lespedeza. Management Recommendations for Construction Projects Affecting Missouri Rivers and Streams is available at https://mdc.mo.gov/sites/default/files/2020-06/Streams.pdf

Project Location and/or Species Recommendations:

Endangered Species Act Coordination - Indiana bats *(Myotis sodalis*, federal- and state-listed endangered) and **Northern long-eared bats** (*Myotis septentrionalis,* federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April. **If any trees need to be removed for your project, please contact the U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 ext. 100 for Ecological Services) for further coordination under the Endangered Species Act.**

The project location submitted and evaluated is within the geographic range of nesting Bald Eagles in Missouri. Bald Eagles (*Haliaeetus leucocephalus*) may nest near streams or water bodies in the project area. Nests are large and fairly easy to identify. Adults begin nesting activity in late December and January and young birds leave the nest in late spring to early summer. While no longer listed as endangered, eagles continue to be protected by the federal government under the Bald and Golden Eagle Protection Act. Work managers should be alert for nesting areas within 1500 meters of project activities, and follow federal guidelines at: Do I need an eagle take permit? | U.S. Fish & Wildlife Service (fws.gov) if eagle nests are seen.

The submitted project location is within the range of the Gray Myotis (i.e., Gray Bat) in Missouri. Depending on habitat conditions of your project's location, Gray Myotis (*Myotis grisescens*, federal and state-listed endangered) could occur within the project area, as they forage over streams, rivers, lakes, and reservoirs. Avoid entry or disturbance of any cave inhabited by Gray Myotis and when possible retain forest vegetation along the stream and from the cave opening to the stream.

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See https://mdc.mo.gov/community-conservation/managing-invasive-species-your-community for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (http://www.nwk.usace.army.mil/Missions/RegulatoryBranch.aspx) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (http://dnr.mo.gov/env/wpp/401/index.html), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit http://dnr.mo.gov/env/wpp/permits/index.html for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Miscellaneous Information
FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.
STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See Missouri Species and Communities of Conservation Concern Checklist (mo.gov) for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at Missouri Fish and Wildlife Information System (MOFWIS). Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.

Appendix D: Antidegradation Review Summary Attachments

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY / REQUEST

FOR DEPARTMENT USE ONLY	
APP NO.	
FEE RECEIVED	CHECK NO.
DATE RECEIVED	

1. FACILITY

NAME			COUNTY
Lake Area Waste Water Association (LAWWA) Turkey Bend WWTF			Camden
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
	Osage Beach	MO	65065
PERMIT NUMBER	PROPOSED DESIGN FLOW	SIC / NAICS CODE	
N/A - Proposed Facility	0.264	4952	

2. OWNER

NAME			
Lake Area Waste Water Association, Inc. (LAWWA)			
ADDRESS	CITY	STATE	ZIP CODE
515 Old South 5	Camdenton	MO	65020
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
info@lakeareaww.org		833-563-1749	

3. CONTINUING AUTHORITY The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(2).

NAME	SECRETARY OF STATE CHARTER NUMBER		
SAME AS OWNER			
ADDRESS	CITY	STATE	ZIP CODE
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	

4. CONSULTANT

PREPARER NAME	COMPANY NAME		
Rachel Dixon	Horner & Shifrin, Inc.		
ADDRESS	CITY	STATE	ZIP CODE
401 S. 18th Street, Suite 400	St. Louis	MO	63103
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
redixon@hornershifrin.com		314-335-8765	

5. RECEIVING WATER BODY SEGMENT #1

NAME: Lake of the Ozarks

5.1 Upper end of segment – Location of discharge
UTM: X= 525901, Y= 4221780 OR Lat _____, Long _____

5.2 Lower end of segment – Osage River
UTM: X= 532865, Y= 422847 OR Lat _____, Long _____

Per the Missouri Antidegradation Implementation Procedure (AIP), the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."

6. WATER BODY SEGMENT #2 (IF APPLICABLE, Use another form if a third segment is needed)

NAME:

6.1 Upper end of segment – End of Segment #1
UTM: X= _____, Y= _____ OR Lat _____, Long _____

6.2 Lower end of segment –
UTM: X= _____, Y= _____ OR Lat _____, Long _____

7. DECHLORINATION

If chlorination and dechlorination is the existing or proposed method of disinfection treatment, will the effluent discharged be equal to or less than the Water Quality Standards for Total Residual Chlorine stated in Table A1 of 10 CSR 20-7.031?

☐ Yes ☑ No – What is the proposed method of disinfection? UV

Based on the disinfection treatment system being designed for total removal of Total Residual Chlorine, minimal degradation for Total Residual Chlorine is assumed and the facility will be required to meet the water quality based effluent limits. These compliance limits for Total Residual Chlorine are much less than the method detection limit of 0.13 mg/L.

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8. SUMMARIZE THE FEASIBILITY OF CONSTRUCTING A NO-DISCHARGE TREATMENT WASTEWATER FACILITY

According to the Antidegradation Implementation Procedure Sections I.B. and II.B.1., the feasibility of no-discharge alternatives must be considered. No-discharge alternatives may include connection to a regional treatment facility, surface land application, subsurface land application, and recycle or reuse.

No discharge alternative of land application and connection to a regional facility were considered. Land application was ruled out due to the limited availability of suitable land as the project area is very in hilly nature, within close proximity to several drinking water wells and dwellings, and shallow bedrock is known to be in the area.

The closest existing wastewater treatment facility with capacity available to accept the proposed project flow is the Lake of the Ozarks Regional Wastewater Treatment Plant #1. The facility serves the City of Osage Beach and the City of Lake Ozark. The City of Osage Beach was contacted to discuss the alternative. During discussions, the City Engineer indicated that planned developments within the City would limit available capacity at the regional facility and that the additional flow from connection of the LAWWA facilities would likely push the regional treatment facility beyond its design capacity. This alternative is not possible without the upgrade of the City of Osage Beach's collection system and the regional facility. Therefore, the alternative was determined to not be feasible.

9. ADDITIONAL REQUIREMENTS

Complete and submit the following with this submittal:

- ☑ Copy of the Geohydrologic Evaluation – Submit request through the Missouri Geological Survey website
- ☑ Copy of the Missouri Natural Heritage from the Missouri Department of Conservation website
- ☑ Attach your Antidegradation Review Report and all supporting documentation as these forms are only a summary.
- ☐ If applicable, submit a copy of any Existing Water Quality data used in this process. Include the date range of the data, source(s) of the data, and location of data collection relative to the outfall. If using your own collected water quality data, submit a copy of the Quality Assurance Project Plan (QAPP) approved by the department's Watershed Protection Section. For more detailed information, see the Missouri Antidegradation Implementation Procedure (AIP), Section II.A.1.

10. PATH / TIER REVIEW ATTACHMENTS ENCLOSED

Path A: Tier 2 – Non-Degradation Mass Balance	☐ **Yes**	☑ **No**
Path B: Tier 2 – Minimal Degradation	☐ **Yes**	☑ **No**
Path C: Tier 2 – Significant Degradation	☑ **Yes**	☐ **No**
Path D: Tier 1 – Preliminary Review Request	☐ **Yes**	☑ **No**
Path E: Temporary Degradation	☐ **Yes**	☑ **No**

11. APPLICANT PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS

Preliminary effluent limits for the proposed project are dependent upon the path selected:

Applicable Pollutants of Concern	Concentration*		Path / Tier Review Attachment Used for POC Evaluation	Average Monthly Limit	Daily Maximum Limit or Average Weekly Limit
	mg/L	µg/L			
BOD_5	X		Tier 2/Path A	10	15
TSS	X		Tier 2/Path A	10	15
Ammonia (Summer)	X		Tier 2/Path A	0.6	1.7
Ammonia (Winter)	X		Tier 2/Path A	2.1	5.6
Total Phosphorus	X		Tier 2/Path A	Monitoring	Monitoring
Total Nitrogen	X		Tier 2/Path A	Monitoring	Monitoring

* Place an X in appropriate box for the concentration units for each Pollutant of Concern.

12. PROPOSED PROJECT SUMMARY

The proposed project includes the construction and installation of a new wastewater treatment facility and collection system to serve the Turkey Bend service area and decommission 12 permitted wastewater treatment facilities. Treatment at the new facility will consist of an Aero-MOD Sequential Oxidation (SEQUOX) activated sludge treatment process, an aluminum sulfate (alum) feed system, tertiary disk filtration, UV disinfection, and aerobic digestion.

Applicants choosing to use a new wastewater technology that are considered an "unproven technology" in Missouri must comply with the requirements set forth in the *New Technology Definitions and Requirements fact sheet*.

13. CONTINUING AUTHORITY WAIVER (For New Discharges)

In accordance with 10 CSR 20-6.010(2)(C), applicants proposing use of a lower preference continuing authority, when the higher level authority is available, must submit a waiver from the existing higher authority one or other documentation for the department's review, provided it does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or by the Missouri Clean Water Commission. Is the waiver necessary? ☐ Yes ☑ No
If yes, provide a copy.

14. APPLICATION FEE

☐ CHECK NUMBER ☐ JETPAY CONFIRMATION NUMBER

15. SIGNATURE

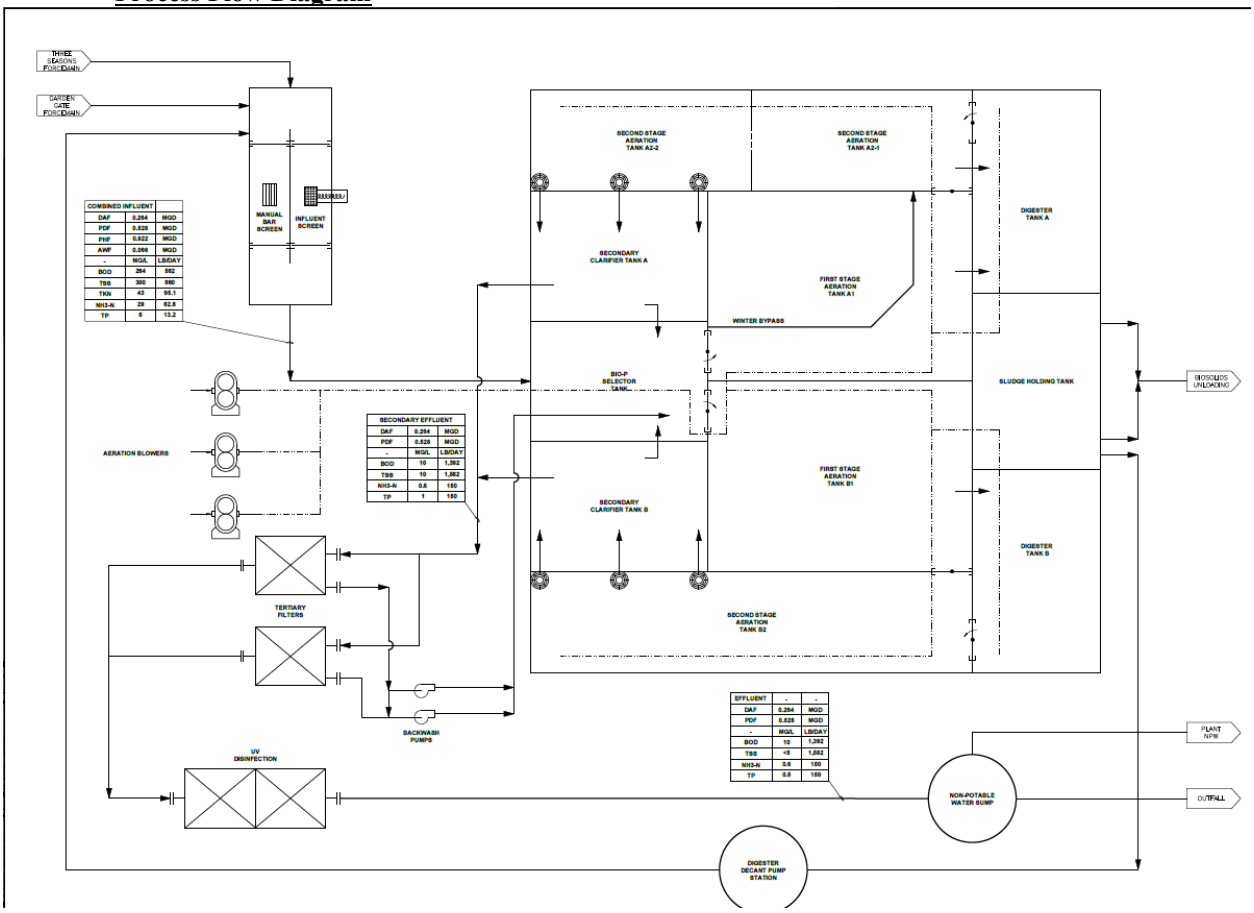
I am authorized and hereby certify that I am familiar with the information contained in this document and to the best of my knowledge and belief such information is true, complete and accurate.

SIGNATURE	DATE
Rachel Dixon	2/15/2023
PRINT NAME	TITLE
Rachel Dixon	Project Engineer

PLEASE IDENTIFY YOUR STATUS FOR THIS PROJECT: ☐ OWNER ☐ CONTINUING AUTHORITY ☒ CONSULTANT

MO 780-2025 (03-19)

- **Process Flow Diagram**



- **Summary of Design**

The Turkey Bend arm of the Lake of the Ozarks is primarily seasonal with a peak daily flow of 0.528 MGD in the summer (peak season). Winter occupancy (off-season) percentage is estimated to be 30% of the peak flow. The proposed facility includes the construction and installation of a new headworks structure with automatic influent screening and manual bar screen bypass, and odor control. Secondary treatment utilizes Aeromod design with enhanced BioP design. The process includes 2 aeration trains, primary and secondary aeration tanks equipped with coarse bubble diffusers. Only 1 train will be utilized for winter low flow turndown. The facility will also include tertiary filtration and UV disinfection. Please refer to following plan sheet references for summaries of design criteria:

Rcvd 11/20/24

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: USDA RD Project #: _____

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☑ YES Date of Approval: 11/16/2 ☐ N/A

1.3 Has the department approved the proposed project's facility plan*?
☑ YES Date of Approval: 9/13/21 ☐ 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 _____

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 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
Turkey Bend Water Reclamation Facility

2.2 ESTIMATED PROJECT CONSTRUCTION COST
$ 24M

2.3 PROJECT DESCRIPTION
The proposed regional treatment facility will be located on Parcel 1A, Southeast of the western termination of Yacht Club Dr and north of HWY KK in Camden County. The facility includes a new headworks, Aeromod treatment, aerobic digestion, tertiary filters, and UV disinfection.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Aerobic digestions with course bubble diffusers.

2.5 DESIGN INFORMATION

A. Current population: 2642 ; Design population: _____

B. Actual Flow: _____ gpd; Design Average Flow: .264M gpd;
Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: .528M gpd; Design Wet Weather Event: _____

2.6 ADDITIONAL INFORMATION

A. Is a topographic map attached? ☑ YES ☐ NO

B. Is a process flow diagram attached? ☑ YES ☐ NO

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
LAWWA Turkey Bend WRF	N/A	

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
Yacht Club Drive	Osage Beach	MO	65065	Camden

Wastewater Treatment Facility: Mo- (Outfall Of)

3.1 Legal Description: ____ ¼, ____ ¼, ____ ¼, Sec. 5, T 39N, R 16W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 525901 Northing (Y): 4221780
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Lake Ozark

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Lake Area Waste Water Association, Inc. (LAWWA)	(573) 346-3810	info@lakeareaww.org

ADDRESS	CITY	STATE	ZIP CODE
515 Old South 5	Camdenton	MO	65020

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	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Lake Area Waste Water Association, Inc. (LAWWA)	(573) 346-3810	info@lakeareaww.org

ADDRESS	CITY	STATE	ZIP CODE
515 Old South 5	Camdenton	MO	65020

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	E-MAIL ADDRESS
Christina Willson/Horner & Shifrin, Inc.	618-726-0319	cfwillson@hornershifrin.com

ADDRESS	CITY	STATE	ZIP CODE
401 S. 18th Street	St. Louis	MO	63103

7.0 APPLICATION FEE

☐ CHECK NUMBER ☑ JETPAY CONFIRMATION NUMBER 20059427

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

Kelly N. Goss

PRINTED NAME	DATE
Kelly Goss	11/18/2024

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Administrator	573-353-9595	kellygoss@totalenvironmental.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.

PART B – LAND APPLICATION ONLY
(Submit only if the proposed construction project includes land application of wastewater.)

8.0 FACILITY INFORMATION

8.1 Type of wastewater to be irrigated: ☐ Domestic ☐ State/National Park ☐ Seasonal business
☐ Municipal ☐ Municipal with a pretreatment program or significant industrial users
☐ Other (explain) _____

8.2 Months when the business or enterprise will operate or generate wastewater:
☐ 12 months per year ☐ Part of the year (list months): _____

8.3 This system is designed for:
☐ No-discharge.
☐ Partial irrigation when feasible and discharge rest of time.
☐ Irrigation during recreational season, April – October, and discharge during November – March.
☐ Other (explain) _____.

9.0 STORAGE BASINS

9.1 Number of storage basins: _____ (Use additional pages if greater than three basins.)

9.2 Type of basins: ☐ Steel ☐ Concrete ☐ Fiberglass ☐ Earthen ☐ Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.
Basin #1: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____
Basin #2: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____
Basin #3: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____

9.4 Storage Basin operating levels (report as feet below emergency overflow level).
Basin #1: Maximum operating water level _____ ft Minimum operating water level _____ ft
Basin #2: Maximum operating water level _____ ft Minimum operating water level _____ ft
Basin #3: Maximum operating water level _____ ft Minimum operating water level _____ ft

9.5 Design depth of sludge in storage basins.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.6 Existing sludge depth, if the basins are currently in operation.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.7 Total design sludge storage: _____ dry tons and _____ cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 Number of irrigation sites _____ Total Acres _____ Maximum % field slopes _____
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
(Use additional pages if greater than three irrigation sites.)

10.2 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☐ Row crops
☐ Other (describe) _____

10.3 Wastewater flow (dry weather) gallons per day: Average annual _____ Seasonal _____ Off-season _____

10.4 Land application rate (design flow including 1-in-10 year storm water flows):
Design: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week
Actual: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week

10.5 Total irrigation per year (gallons): Design: _____ gal Actual: _____ gal

10.6 Actual months used for irrigation (check all that apply):
☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec

10.7 Land application rate is based on:
☐ Hydraulic Loading ☐ Other (describe) _____
☐ Nutrient Management Plan (N&P) If N&P is selected, is the plan included? ☐ YES ☐ NO

INSTRUCTIONS FOR COMPLETING
APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITIES

All blanks must be filled in when the application is submitted to the Missouri Department of Natural Resources. This includes the **required signature**.

Note: Use the form Application for Construction Permit – Sewer Extension, MO 780-1632, if only collection system component(s) are to be constructed.

A land disturbance permit is required if construction will result in the disturbance of one or more acres of land. A land disturbance permit is available through the department's ePermitting system at dnr.mo.gov/env/wpp/epermit/help.htm. A permit fee in accordance with 10 CSR 20-6.011 is required.

After receiving a complete application, the Department enters the application information into the Missouri Clean Water Information System. You may search for the status of a construction permit online at dnr.mo.gov/mocwis_public/applicationInprocessSearch.do.

Part A – Basic Application Information

1.0 If the answer to any of the questions in this section is no, this application may be considered incomplete and returned to the applicant.

1.1 Check the appropriate box. If the project is funded with federal or state monies, supply the funding agency name and project number.

1.2 Check the appropriate box. Provide the date of department approval for the antidegradation report. Include a copy of the approved *Water Quality and Antidegradation Review* with this application. Not every construction project may require an antidegradation review. For more information, guidance documents and forms concerning antidegradation visit dnr.mo.gov/env/wpp/permits/antideg-implementation.htm.

1.3 Check the appropriate box and provide the date of department approval. Per 10 CSR 20-8.110(2), a facility plan must be submitted to the department prior to the submittal of a construction permit application. The department has developed a fact sheet to aid in the development of an approvable facility plan, Facility Plan Guidance for Wastewater Treatment Facilities, Fact Sheet--PUB2416.

1.4 Complete only if No. 1.3 is answered No. Check the appropriate box. Include the exemption reason from 10 CSR 20-6.010(4)(B).

1.5 Check the appropriate box. Provide a copy of the appropriate plans and specifications for department review when applying for a construction permit per 10 CSR 20-8.110 and 10 CSR 20-6.010. A Missouri registered professional engineering seal, signature and date is required on each sheet of the plans and the cover of the technical specifications. An electronic copy of the construction permit application and the information listed below in Portable Document Format (PDF) searchable format or department approved equivalent per 10 CSR 20-6.010(5)(G), along with one (1) paper copy for projects not seeking department funding or two (2) paper copies for projects seeking department funding under 10 CSR 20-4.

1.6 Check the appropriate box. A summary of design shall accompany the plans and specifications when applying for a construction permit per 10 CSR 20-6.010(5)(G) and10 CSR 20-8.110(8). The department has developed a fact sheet to aid in the development of an acceptable summary of design. This document is available online at dnr.mo.gov/pubs/pub2417.htm.

1.7 Check the appropriate box if an operating permit modification is needed. Include the applicable operating permit application. New outfalls, discharges, projects converting to land application, or a lagoon upgrade require an operating permit modification application. Contact the Department for clarification. Projects that may not need an operating permit modification check the N/A box and indicate whether you want to review the draft prior to public notice should the Department determine a modification is required. The Department can modify your operating permit without an application for projects that are adding chlorine disinfection, constructing to meet current operating permit limits, or constructing to meet limits in a schedule of compliance.

- Form A is available online at dnr.mo.gov/forms/780-1479-f.pdf.
- Form B is available online at dnr.mo.gov/forms/780-1512-f.pdf.
- Form B2 is available online at dnr.mo.gov/forms/780-1805-f.pdf.

1.8 Check the appropriate box. More information about the Compliance and Enforcement Water Protection Program is available online at dnr.mo.gov/env/wpp/enf/index.html.

1.9 Check the appropriate box. Include payment or payment confirmation for the fee with your application. See 10 CSR 20-6.011(2) and Wastewater Treatment Facility Permit Fees -- PUB2564.

Note: The department returns incomplete construction permit applications and related engineering documents and the application forfeits the fees. See 10 CSR 20-6.011(5)(A). The applicant forfeits the fees when the applicant withdraws construction applications. See 10 CSR 20-6.011(5)(B).

2.1 Provide the name of the proposed construction project.

2.2 Provide the estimated project construction cost. The estimated and final project construction cost will be useful to the department in conducting affordability analyses.

2.3 Briefly describe the construction project by providing the number and capacity of each new unit.

2.4 Briefly describe the method of sludge handling, use and disposal at the treatment facility.

2.5 Provide the project design information and when required in the units specified.

A. Provide the current population and the design population to be served by the wastewater treatment facility.

B. Provide the estimated design flow information in accordance with 10 CSR 20-8.110(3).

2.6 Provide the additional project information in accordance with 10 CSR 20-8.110(5).

A. Attach a topographic map of the area extending at least one mile beyond the facility property boundaries. This map must show the outline of the facility and the following information. A topographic map is available online at dnr.mo.gov/internetmapviewer or from the Department of Natural Resources' Missouri Geological Survey in Rolla, Mo., at 573-368-2125. (Submittals of more than one map may be necessary to show the entire area.)

1. The area surrounding the wastewater treatment facility, including all unit processes.
2. The major pipes or other structures through which wastewater enters the treatment facility and the pipes or other structures through which treated wastewater is discharged from the treatment facility. Include outfalls from bypass piping, if applicable.
3. The actual point of discharge.
4. Wells, springs, other surface water bodies and drinking water wells that are: 1) within ¼ mile of the property boundaries of the treatment facility and 2) listed in public record or otherwise known to the applicant.
5. Any areas where biosolids produced by the treatment facility are treated, stored, or disposed.
6. If the treatment facility receives waste classified as hazardous under the Resource Conservation and Recovery Act, or RCRA, by truck, rail, or special pipe, show on the map where hazardous waste enters the treatment works and where it is treated, stored or disposed.
7. Outline any wastewater land application sites.

B. Provide a process flow diagram with the influent and effluent design average flow and peak flow capabilities. Also, depict all of the treatment facility components and the corresponding hydraulic capacities of each component. In addition, include all recycle flows in the diagram. If land application is used, depict all irrigation equipment and application sites.

3.0 Complete the Wastewater Treatment Facility information. Include the Missouri State Operation Permit number, outfall number, physical location, and other appropriate contact information.

3.1 Provide the project legal description. The department's mapping system is available online at dnr.mo.gov/internetmapviewer.

3.2 A Global Positioning System, or GPS, is a satellite-based navigation system. The department prefers that a GPS receiver is used and the displayed coordinates submitted. If access to a GPS receiver is not available, use a mapping system to approximate the coordinates.

3.3 Provide the name of the receiving stream(s) to which the discharge is directed and any subsequent tributary until a continuous flowing stream is reached.

4.0 Complete Project Owner information. Include the legal name, address, phone number with area code and email address.

5.0 Complete Continuing Authority contact information. If same as the Project Owner, write "Same as above". 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. A continuing authority is not, however, an entity or individual that is contractually hired by the permittee to sample or operate and maintain the system for a defined time period, such as a certified operator or analytical laboratory. To access the regulatory requirement regarding continuing authority, 10 CSR 20-6.010(2), please visit https://s1.sos.mo.gov/cmsimages/adrules/csr/current/10csr/10c20-6.pdf. A continuing authority's name must be listed exactly as it appears on the Missouri Secretary of State's (SoS's) webpage: https://bsd.sos.mo.gov/BusinessEntity/BESearch.aspx?SearchType=0, unless the continuing

authority is an individual(s), government, or otherwise not required to register with the SoS. See 10 CSR 20-6.010(2) for the regulatory requirement regarding continuing authority.

5.1 Check the appropriate box. Include a letter signed by the continuing authority (if not same as the project owner) stating they will "accept, operate and maintain" the wastewater treatment facility after successful construction.

If the continuing authority will not accept and agree to operate and maintain the wastewater treatment facility, this application will be considered incomplete.

5.2 Complete if the continuing authority is a Missouri Public Service Commission, or PSC, regulated entity. See 10 CSR 20-6.010(2)(B)3 for more information. This information is not necessary for existing wastewater treatment facilities currently permitted with a PSC entity as owner and continuing authority.

5.3 Complete if the continuing authority is a property owners association. See 10 CSR 20-6.010(2)(B)5 for more information. This information is not necessary for existing wastewater treatment facilities currently permitted with the property owners association as owner and continuing authority.

6.0 Complete Engineer contact information.

7.0 Check the appropriate box and include check or confirmation number. Applicants can pay fees online by credit card or eCheck through a system called JetPay.

- Per Section 37.001, RSMo, a transaction fee will be included. The transaction fee is paid to the third party vendor JetPay, not the Department of Natural Resources.
- Be sure to select the correct fee type and corresponding URL to ensure your payment is applied appropriately. If you are unsure what type of fee to pay, please contact the Water Protection Program's Budget, Fees, and Grants Management Unit by phone at (573) 522-1485 for assistance.
- Upon successful completion of your payment, JetPay provides a payment confirmation. Submit this form with a copy of the payment confirmation if requesting a new permit or a permit modification. For permit renewals of active permits, the Department will invoice fees annually in a separate request.
- If you are unable to make your payment online, but want to pay with credit card, you may email your name, phone number, and invoice number, if applicable, WPPFEES@dnr.mo.gov. The Budget, Fees, and Grants Management Unit will contact you to assist with the credit card payment. **Please do not include your credit card information in the email.**
- Applicants can find fee rates in 10 CSR 20-6.011 and Wastewater Treatment Facility Permit Fees -- PUB2564 (https://dnr.mo.gov/pubs/pub2564.htm).

WP 04 Construction Permits: https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/592/

8.0 The owner of the construction project must sign the application.

Part B – Land Application

Complete Part B only if the proposed construction project includes land application of wastewater from a treatment facility.

8.0 Provide the applicable Facility Information land application information. Check the appropriate boxes.

9.0 Provide the applicable Storage Basins information. Check the appropriate boxes.

- Freeboard – The depth from the top of the berm to the emergency spillway. Minimum depth • is one foot.
- Safety Volume – The depth to contain the 25-year, 24-hour storm event. Minimum depth is • one foot.
- Maximum Operating Water Level – The water level at the bottom of the safety volume. • Minimum depth is two feet below the top of the berm.
- Minimum Operating Water Level – The water level above the bottom of the lagoon basin for • seal protection. Minimum depth is two feet and may be greater when additional treatment volume is included.
- Total Depth is from the top of the berm to the bottom of the lagoon basin including freeboard.•

10.0 Provide the applicable Land Application System information. Check the appropriate boxes.

10.7 Check the appropriate box. If the land application rate is based on a Nutrient Management Plan, or N and P, include the plan with this application for department review.

Mail the completed form and applicable fee to the department.

If there are any questions concerning this form, please contact the Department of Natural Resources, Water Protection Program at 800-361-4827 or 573-751-1300 or visit dnr.mo.gov/env/wpp.