

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

MISSOURI-AMERICAN WATER COMPANY
Byron Shaw, Senior Project Engineer
Wardsville NW WWTF Upgrade and Regionalization
1105 Friendship Rd
Jefferson City, MO 65101

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.

July 21, 2026
Effective Date

July 20, 2028
Expiration Date

Heather Peters, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Replacement of existing multicell lagoon via construction of new activated sludge wastewater treatment facility with equalization basin, mechanical screens, influent lift station, influent flow monitoring, activated sludge treatment plant utilizing the Aero-Mod SEQUOX process providing biological phosphorus removal, aerobic digesters, and sludge dewatering.

A closure plan will need to be submitted to the Central Field Operations Office for review and approval prior to any closure activities.

This project will also include general site work appropriate to the scope and purpose of the project and all necessary appurtenances to make a complete and usable wastewater treatment facility.

II. COST ANALYSIS FOR COMPLIANCE

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a “finding of affordability” on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

The department is not required to complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publicly-owned treatment works.

III. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.
2. All construction shall be consistent with plans and specifications signed and sealed by Mark Bross, P.E. with Klingner & Associates, P.C. 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 Operations 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 Operations 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-0129658. 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)
- 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 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.
- 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.
- 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)
- 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)
 - Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as

- digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate. 10 CSR 20-8.140(8)(K)
- Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140(8)(L)
- Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E *Standard for Electrical Safety in the Workplace* (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140(8)(M)
- 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)
- 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, lifelines, 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)
 - 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)
 - Lagoon berms shall be constructed of relatively impervious material and compacted to at least ninety-five percent (95%) maximum dry density test method to form a stable structure. 10 CSR 20-8.200(5)(A)1.
 - The minimum berm width shall be eight feet (8') to permit access of maintenance vehicles. 10 CSR 20-8.200(5)(A)2.
 - Minimum freeboard shall be two feet (2'). 10 CSR 20-8.200(5)(A)3.
 - The soil of the lagoon bottom shall be compacted with the moisture content between two percent (2%) below and four percent (4%) above the optimum water content and compacted to at least ninety-five percent (95%) maximum dry density test method. 10 CSR 20 8.200(5)(B)
 - The lagoon shall be sealed to ensure that seepage loss is as low as possible and has a design permeability not exceeding 1.0×10^{-7} cm/sec. 10 CSR 20 8.200(5)(C)1.
 - Synthetic seals thickness may vary due to liner material but the liner thickness shall be no less than two-hundredths inch (0.02") or twenty (20) mil and be the appropriate material to perform under existing conditions. 10 CSR 20 8.200(5)(C)3.
 - Seep collars shall be provided on drainpipes where they pass through the lagoon seal. 10 CSR 20 8.200(5)(C)4.
9. Upon completion of construction:
- The MISSOURI-AMERICAN WATER COMPANY will become the continuing authority for operation and maintenance of these facilities;
 - Submit an electronic copy of the as built if the project was not constructed in accordance with previously submitted plans and specifications;
 - 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 modification public noticed May 29, 2026, to June 29, 2026, be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The MAWC Wardsville Northwest Wastewater Treatment Facility has a history of failing to comply with permitted effluent limits for ammonia. The purpose of construction is to replace the existing wastewater treatment process with an activated sludge system to enable compliance with effluent limits.

2. FACILITY DESCRIPTION

The existing MAWC Wardsville Northwest Wastewater Treatment Facility consists of a four-cell lagoon, with ultraviolet disinfection, and sludge retained in the lagoon. The first three cells are formed by baffle curtains and are aerated. This existing system will be replaced by an activated sludge treatment system, with the existing lagoon being converted for use as an equalization basin.

The MAWC Wardsville Northwest Wastewater Treatment Facility is located about one-half mile north of Friendship Road, Wardsville, in Cole County, Missouri. The facility has a design average flow of 151,000 gpd and serves a hydraulic population equivalent of approximately 1,510 people. Following the upgrades proposed in this construction permit, the new design flow will be 251,410 gpd.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits as established in the Antidegradation review dated October 2022.

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

Parameter	Units	Monthly average limit
Biochemical Oxygen Demand ₅	mg/L	18
Total Suspended Solids	mg/L	18
<i>E. coli</i>	#/100mL	126
Ammonia as N	mg/L	
(January)		3.0
(February)		3.0
(March)		2.6
(April)		2.0
(May)		2.0
(June)		1.3
(July)		0.9
(August)		0.9
(September)		1.1
(October)		1.7
(November)		2.2
(December)		2.6
pH	SU	6.5-9.0

4. ANTIDEGRADATION

The department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated October 11, 2022, due to proposed upgrades to the treatment facility which will increase the design flow from 151,000 gpd to 251,410 gpd. The project will also regionalize several other wastewater treatment facilities owned by MAWC in the Wardsville area. See **APPENDIX – ANTIDEGRADATION**.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

- Disinfection – Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
 - Open Channel Ultraviolet (UV) – An open channel, gravity flow UV disinfection system capable of treating a flow of 280,000 gpd. The dual open channel UV system consists of two banks in each channel with one module per bank and six lamps per module for a total of 24 lamps. The disinfected effluent will flow by gravity through flow measurement equipment and to Outfall No. 001.

Construction will cover the following items:

- Components are designed for a Population Equivalent of 2,514 based on hydraulic loading to the system.
- Influent Pump Station – Construction of a duplex influent pump station with 4.69 HP motor and each submersible pump capable of operating at approximately 218 gpm at 27 feet of TDH.
- Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis. The facility will have three separate flow meters, two of which will be Parshall flume with ultrasonic flow meters, and one magnetic flow meter.
 - Parshall Flume – Two different Parshall flume measurement systems, one at the influent screening, and one following the UV disinfection. The Parshall flume measurement system has a 3-inch throat and will be equipped with ultrasonic flow sensor.
 - Electromagnetic Flow Meter – New electromagnetic flow meter shall measure the waste activated sludge pumped from the waste activated sludge lift station to the sludge holding basin.
- Screening – Installation of screening devices removes nuisance inorganic materials from raw wastewater.
 - Mechanical Coarse Screen – One mechanically cleaned coarse screen positioned at an angle of 75 degrees from the horizontal with a bar rack spacing of ¼-inch. The screening device shall be capable of treating a peak hourly flow of 838,080 gpd. A manually cleaned coarse bar screen shall be in the dual channel with a clear bar spacings of 1.5-inch and be positioned at an angle of 45 degrees from the horizontal to allow for manual raking of the

screen. The addition of a manually cleaned coarse bar screen provides redundancy and a means of unit isolation for the mechanically cleaned coarse screen. The screening structure is followed by influent flow measurement.

- Equalization Basin – The existing treatment lagoon will be converted to serve as an equalization basin to equalize flows exceeding the design average flow of 251,410 gpd. A 60-mil liner is proposed on top of the existing 18-inch clay liner. The basin will have 3:1 side slopes, a depth from the bottom of the basin to the max water level of 11 ft, and a minimum of 2 ft of freeboard. The basin is non-aerated, has a surface area of approximately 0.75 acres, and a volume of 1.63 million gallons. This provides approximately 6.5 days of retention at the proposed design flow. The berm width will be 12 ft. This lagoon site is going to be fenced.
- Activated Sludge Treatment Plant – Installation of one Aero-Mod SEQUOX biological nutrient removal plant capable of treating a design average flow of 251,410 gpd.
 - Positive Displacement Blowers – Three blowers with each having a 30 HP motor and capacity of 524 ICFM. Aerzen model GM 15 positive displacement blowers or equal will be provided to supply air to the treatment components of the activated sludge system and to the sludge holding basin.
 - Selector Tank – The first stage of the activated sludge treatment is the selector tank. The selector tank has dimensions of 8 ft x 22 ft x 18 ft, with a side water depth of 16 ft for a volume of 21,000 gallons. Two wall aerators with two diffusers per drop pipe will be installed in the tank.
 - Aeration Tanks – Two first stage aeration tanks and two second stage aeration tanks. Wastewater will flow from the selector tank to one of two first stage aeration tanks before flowing to the second stage aeration tanks. The first stage aeration tanks will have dimensions of 24.708 ft x 18 ft x 18 ft and will be installed with a total of 16 wall aerators with four diffusers per drop pipe. The second stage aeration tanks will have dimensions of 10.5 ft x 51.5 ft x 18 ft and will be installed with a total of 10 wall aerators with four diffusers per drop pipe. The side water depth will be 16 ft. The combined volume of all four aeration tanks is 211,000 gallons. An airlift pump will be provided to return activated sludge to the aerobic digester.
 - Clarifier Tanks – Two final clarifier tanks with dimensions of 24.708 ft x 22 ft x 18 ft and a side water depth of 16 ft will be provided following the second stage aeration tanks. The clarifiers will have a total volume of 105,000 gallons and a detention time of 5 hours at the design average flow.
 - Aerobic Digester Tanks – Two digester tanks with dimensions of 8.5 ft x 36.75 ft x 18 ft and a total volume of 77,000 gallons. A total of 10 aerators with four diffusers per drop pipe will be supplied for the two aerobic digester tanks. A weir will be provided to allow supernatant to flow back to the first stage aeration tanks. A solids wasting airlift will

be provided to convey waste sludge to the waste activate sludge pump station.

- Waste Activated Sludge (WAS) Pump Station – Construction of a duplex WAS pump station and associated valves. The WAS submersible pump will be capable of approximately 150 gpm at 18.89 ft of TDH with 2.95 HP motor. The WAS pumps are utilized to pump WAS from the aerobic digesters to the sludge holding basin. 2,519 gpd is the design basis of the WAS going to the digester.
- Return Activated Sludge (RAS). The design RAS rate is 100% of the design average flow. RAS will be conveyed by airlift pumps from the second stage aeration tanks to the aerobic digesters. A supernatant weir will be supplied to return displaced supernatant back to the aeration tank or selector tank.
- Sludge Holding Basin – Construction of one concrete lined sludge holding basin with a maximum depth of 6 ft and a volume of 36,060 gallons. Installation of a 10 HP mechanical surface aerator will provide aeration and mixing of the sludge to prevent anaerobic conditions. The sludge will be received from the aerobic digesters.
- Emergency Power – A 200 kW standby diesel generator and automatic transfer switch will be provided to operate the treatment facility in event of power failure.

6. OPERATING PERMIT

The modified MAWC Wardsville Northwest Wastewater Treatment Facility, MO-0129, was successfully public noticed from May 29, 2026, to June 29, 2026, with no comments received. Submit the Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(N) after which point the post construction final effluent limitations and monitoring requirements outlined in Table A-2 of the modified operating permit will become effective..

This facility does not meet the requirements of the MO-GDS issued on July 1, 2024, for the following reason: the design flow of this facility exceeds the maximum design flow for coverage under the MO-GDS general permit, which is 50,000 gallons per day.

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>

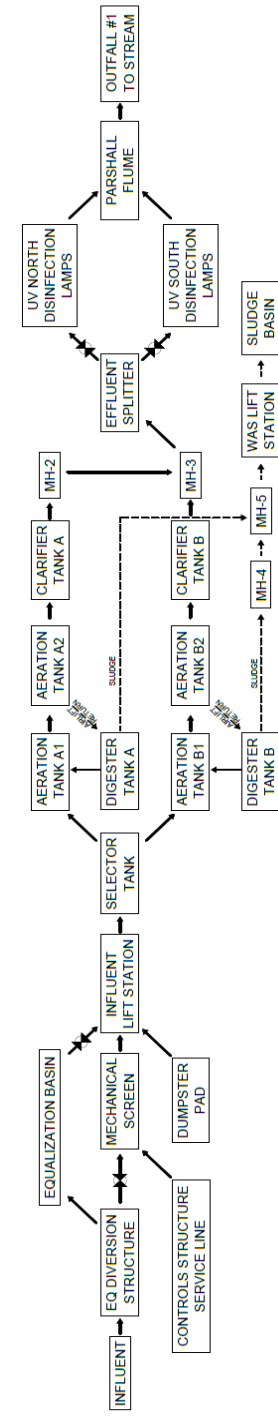
Thomas Silkwood
Engineering Section
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Chia-Wei Young, P.E.
Engineering Section
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APPENDICES

- **Process Flow Diagram**
- **Antidegradation**

• **Process Flow Diagram**



- **Antidegradation**

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to

Herbrandt Branch
By

MAWC Wardsville Northwest WWTF
Upgrade and Regionalization



October, 2022

Table of Contents

1. Permit Limits and Monitoring Information	3
2. Purpose of Antidegradation Review Report	4
3. Facility Information	4
4. Facility History	5
A. Facility performance History:	5
B. Receiving Waterbody Information	5
C. Existing Water Quality	6
D. Mixing Considerations	6
5. Receiving Water Monitoring Requirements	6
6. Antidegradation Review Information	6
A. Tier Determination	6
B. Necessity of Degradation	7
C. Losing Stream Alternative Discharge Location	9
D. Social and Economic Importance	9
E. Natural Heritage Review	9
F. Demonstration of Insignificance	9
7. Derivation and Discussion of Parameters and Limits	10
8. General Assumptions of the Water Quality and Antidegradation Review	14
9. Antidegradation Review Preliminary Determination	14
10. Appendix A: Map of Discharge Location	15
11. Appendix B: Natural Heritage Review	16
12. Appendix C: Antidegradation Review Summary Attachments	22
13. Appendix D: Geohydrologic Evaluation	32

1. PERMIT LIMITS AND MONITORING INFORMATION

Proposed Monitoring Parameters and Effluent Limits

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ***
Flow	MGD	1	*		*	*/	1/weekday	monthly	T
BOD ₅	mg/L	4,5		27	18	45/30	1/month	monthly	C
TSS	mg/L	4,5		27	18	45/30	1/month	monthly	C
<i>Escherichia coli</i> **	#/100mL	1,3	630		126	630/126	1/week	monthly	G
Ammonia as N (January)	mg/L	4,5	11.5		3.0	12.1/3.1	1/month	monthly	C
(February)			11.5		3.0	12.1/3.1	1/month	monthly	C
(March)			9.6		2.6	10.1/2.7	1/month	monthly	C
(April)			8.0		2.0	8.4/2.1	1/month	monthly	C
(May)			11.5		2.0	12.1/2.1	1/month	monthly	C
(June)			9.6		1.3	10.1/1.3	1/month	monthly	C
(July)			8.0		0.9	8.4/0.9	1/month	monthly	C
(August)			8.0		0.9	8.4/0.9	1/month	monthly	C
(September)			8.0		1.1	8.4/1.2	1/month	monthly	C
(October)			8.0		1.7	8.4/1.8	1/month	monthly	C
(November)			8.0		2.2	8.4/2.4	1/month	monthly	C
(December)			9.6		2.6	10.1/2.7	1/month	monthly	C
Total Phosphorus	mg/L	1	*		*	*/	1/quarter	quarterly	C
Total Kjeldahl Nitrogen	mg/L	1	*		*	*/	1/quarter	quarterly	C
Nitrite + Nitrate	mg/L	1	*		*	*/	1/quarter	quarterly	C
PARAMETER	Unit	Basis for Limits	Minimum		Maximum	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type
pH	SU	1	6.5		9.0	6.5-9.0	1/month	monthly	G

* - Monitoring requirement only

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

C = 24-hour composite

G = Grab

T = 24 hr. Total

E = 24 hr. estimate

M = Measured/calculated

Basis for Limitations Codes:

- | | | |
|--|-----------------------------------|---|
| 1. State or Federal Regulation/Law | 5. Antidegradation Policy | 9. WET Test Policy |
| 2. Water Quality Standard (includes RPA) | 6. Water Quality Model | 10. Multiple Discharger Variance |
| 3. Water Quality Based Effluent Limits | 7. Best Professional Judgment | 11. Nutrient Criteria Implementation Plan |
| 4. Antidegradation Review | 8. TMDL or Permit in lieu of TMDL | |

PERMITTED FEATURE – INF - INFLUENT MONITORING

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type
Ammonia as N	mg/L	FSR	*		*	*/	1/quarter	quarterly	C
Total Phosphorus	mg/L	FSR	*		*	*/	1/quarter	quarterly	C
Total Kjeldahl Nitrogen	mg/L	FSR	*		*	*/	1/quarter	quarterly	C
Nitrite + Nitrate	mg/L	FSR	*		*	*/	1/quarter	quarterly	C

* - Monitoring requirement only

FSR – State or Federal Regulation/Law; C – Composite

2. PURPOSE OF ANTIDEGRADATION REVIEW REPORT

Missouri American Water Company (MAWC) is proposing to replace the existing lagoon system at MAWC Wardsville Northwest (NW) Wastewater Treatment Facility (WWTF) with an extended aeration treatment plant. The existing lagoon will not be able to meet more stringent ammonia limits that are required in the current operating permit.

In addition, Missouri American Water Company owns and operates seven other wastewater treatment facilities in the Wardsville area, all within 2.85 miles of the Wardsville NW Wastewater Treatment System. Five will be considered for regionalization. These include Churchview, Kleffner Ridge, Markway Meadows, Van Loo Estates, Coyote Ridge Subdivision. Wardsville NW WWTF is being designed to increase the design flow from 151,000 gpd to 251,410 gpd. Among all six of the consolidating plants, there will be no increase in overall design flow discharging into the Moreau River.

WWTF Name	Permit	Design Flow (gpd)
Wardsville NW - Current	MO-0129658	151,000
Churchview	MO-0109118	30,000
Kleffner Ridge	MO-GD00475	17,760
Markway Meadows	MO-GD00446	16,650
Van Loo Estates	MO-GD00545	33,000
Coyote Ridge Subdivision	MO-0133779	3,000
Wardsville NW - Expanded	MO-0129658	251,410

Missouri American Water Company prepared the application.

The applicant elected to determine that all pollutants of concern (POC) except ammonia are non-degrading in the receiving stream using mass loading maintenance. This analysis was conducted to fulfill the requirements of the AIP. Information that was provided by the applicant in the submitted report and summary forms in Appendix C was used to develop this review document.

3. FACILITY INFORMATION

Facility Name:	MAWC Wardsville Northwest Wastewater Treatment Facility
Address:	0.5 miles North of Friendship Road, Wardsville, MO 65101
Permit #:	MO-0129658
County:	Cole
Facility Type:	Non-POTW / PSC Regulated
Owner:	Missouri-American Water Company
Continuing Authority:	Same as Owner
UTM Coordinates:	X = 570609 ; Y = 4262695
Legal Description:	Sec. 01, T43N, R12W, Cole County
Ecological Drainage Unit:	Ozark/Moreau/Loutre

4. FACILITY HISTORY

The existing Wardsville NW WWTF is permitted as a four cell lagoon with ultraviolet disinfection. The lagoon system has difficulty meeting the ammonia limits stated in the current operating permit during the winter months. The facility started operation in late 2003. The facility is a 4-celled lagoon system with the first three cells aerated and separated by curtains. The fourth cell is separated from the first three with a concrete wall and is covered. Once the wastewater leaves the fourth cell it is disinfected with ultraviolet disinfection, then flows through a parshall flume with an ultrasonic flow meter and discharged to Herbrandt Branch with sludge retained in the lagoon system.

A. FACILITY PERFORMANCE HISTORY:

A review of the past 5 years of Discharge Monitoring Report data show exceedances in the following parameters: BOD₅ (3/31/20), Ammonia (11/30/17, 12/31/17, 1/31/18, 2/28/18, 3/31/18, 4/30/18, 12/31/18, 1/31/19, 2/28/19, 3/31/19, 4/30/19, 12/31/19, 1/31/20, 2/29/20, 3/31/20, 4/30/20, 11/30/20, 12/31/20, 1/31/21, 2/28/21, 3/31/21, 4/30/21, 5/31/21, 9/31/21, 10/31/21, 11/30/21, 12/31/21, 1/30/22, 2/28/22, and 3/31/22), etc.

RECEIVING WATERBODY INFORMATION

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
001	0.39	Secondary	Domestic

RECEIVING STREAM(S) TABLE:

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
100K Extent-Remaining Streams	C	3960	AQL, WBC-B, SCR, HHP, IRR, LWW	10300102-1207	0.0
Moreau River	P	941	AQL, WBC-A, SCR, HHP, IRR, LWW		1.1

* Protection of Warm Water Aquatic Life (AQL), 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).

RECEIVING STREAM(S) LOW-FLOW VALUES:

RECEIVING STREAM	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
100K Extent Remaining Streams	0.0	0.0	0.0

Receiving Water Body Segment Outfall #1:		
Upper end segment* UTM coordinates:	X = 570609 ; Y = 4262695	outfall
Lower end segment* UTM coordinates:	X = 569448 ; Y = 4264105	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.

A Geohydrologic Evaluation was submitted with the request and the receiving stream is gaining for discharge purposes (see Appendix D).

EXISTING WATER QUALITY

The applicant submitted a Non-Degrading Tier 2 Antidegradation Review request. No existing water quality data was submitted.

MIXING CONSIDERATIONS

MIXING CONSIDERATIONS TABLE:

MIXING ZONE (CFS) [10 CSR 20-7.031(5)(A)4.B.(I)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(5)(A)4.B.(I)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
0	0	0	0	0	N/A

	Flow (cfs)	MZ (cfs)	ZID (cfs)
7Q10	0.0	0.0	0.0
1Q10	0.0	0.0	0.0
30Q10	0.0	0.0	N/A

5. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

6. 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 *Antidegradation Review Request Project Summary Report* dated September 6, 2022.

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 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 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 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.

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).

Pollutants of Concern and Tier Determination

Pollutants of Concern	Tier	Degradation	Comment
Biological Oxygen Demand (BOD ₅)/DO	2*	Insignificant	
Total Suspended Solids (TSS)	**	Insignificant	
Ammonia as N	2*	Significant	
<i>Escherichia coli</i> (<i>E. coli</i>)	2*	Insignificant	Permit Limits Applied
Phosphorus, Total	2*	Insignificant	Permit Limits Applied
Nitrogen, Total	2*	Insignificant	Permit Limits Applied
pH	***	Insignificant	Permit Limits Applied

* Tier assumed.

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

*** Standards for these parameters are ranges.

Tier 1 Review

The receiving streams, Herbrandt Branch (C) and Moreau River (P), are not 303(d) listed and do not have TMDLs.

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.

B. 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. The applicant submitted a mixed review that included an alternatives analysis.

i. Regionalization

The preferred alternative is presented as a regionalization alternative. The consolidation of Churchview, Kleffner Ridge, Markway Meadows, Van Loo Estates, and Coyote Ridge Subdivision into the expanded Wardsville NW is presented in the practicable Alternative 1, Activated Sludge & Aeration.

ii. No Discharge Evaluation

Land Application was presented as a no discharge alternative. Land in this area is well-developed and additional areas are being planned currently. The wastewater would have to be pumped across the Moreau River in order to find adequate land available. This would require pumping a distance of 1 to 2 miles in probably two or more different directions to find adequate land area. In addition, land in this area is very expensive. Land prices are estimated to be \$13,500 to \$20,000 per acre. Approximately 250 acres of land would need to be purchased for the storage cell and land application area combined. This yields a land purchase cost of \$3,375,000 to \$5,000,000. Including the cost of pumping the required distance, irrigation equipment, and excavation cost for the storage cell will add at least an additional \$5,191,403 (\$500,000 pumping, \$547,500 force main and piping, center pivot \$425,000, excavation \$3,718,903), which yields an approximate construction cost of \$8,566,403 to \$10,191,403 and makes land application a non-feasible alternative. In addition, it would most likely be impossible to purchase that amount of land in this area.

iii. Alternatives to No discharge

Alternative 1: Activated Sludge and Aeration – Base Case

The activated sludge process using extended aeration would be utilized with the Aero-Mod Sequox process. This system would utilize a mechanical bar screen followed by the extended aeration process and clarifiers. Effluent from the clarifiers will then be disinfected in an ultra-violet disinfection system prior to entering the flow meter and then discharged to Herbrandt Branch. Sludge will be stabilized in the aerated sludge holding basins and then hauled to the Missouri American Water Taos Wastewater Treatment Facility to be dewatered at a future sludge screw press when construction is complete.

Alternative 2: Multi-channel Oxidation Ditch

This is the activated sludge process using extended aeration and is the Orbal System. This system would utilize a mechanical bar screen followed by the extended aeration process and clarifiers. Effluent from the clarifiers will then be disinfected in a UV disinfection system prior to entering the flow meter and then discharged to Herbrandt Branch. Sludge will be stabilized in the aerated sludge holding basins and then hauled to the Missouri American Water Taos Wastewater Treatment Facility to be dewatered at the future sludge screw press when construction is complete.

Alternative 3: Polishing Reactor

This system is manufactured by Lemna Technologies, commonly known as the Lemna System. This is a covered aerated lagoon system followed by the polishing reactor which utilizes the fixed film process for ammonia removal. This system would utilize a mechanical bar screen followed by the covered aerated lagoon, UV disinfection, flow measurement and then discharge to Herbrandt Branch. Sludge would be retained in the lagoon and removed in 20 years.

Alternative 4: Moving Bed Biofilm Reactor (MBBR)

This is the fixed film process utilizing plastic wafer media within a series of aeration tanks. This system would utilize a mechanical bar screen followed by the MBBR and clarifiers. Effluent from the clarifiers will then be disinfected in a UV disinfection system prior to entering the flow meter and then discharged to Herbrandt Branch. Sludge will be hauled to the Missouri American Water Taos Wastewater Treatment Facility to be dewatered at a future sludge screw press when construction is complete.

Alternative 5: Lagoon Nitrification Reactor

This system would utilize a mechanical bar screen, then two lagoon cells for biological removal, followed by an MBBR tank utilizing plastic wafer media and aeration for ammonia removal. The water then flows into a clarifier prior to ultra-violet disinfection, flow measurement, and discharge into Herbrandt Branch. Sludge from the clarifiers will be hauled to the Missouri American Water Taos Wastewater Treatment Facility to be dewatered at a future sludge screw press when construction is complete. Sludge in the lagoons will be retained in the lagoons and removed in 20 years. The MBBR tank is heated during cold weather to ensure ammonia removal takes place.

Alternative 6: Submerged Attached Growth Reactor (SAGR)

This system is a fixed film process utilizing an aerated rock filter for ammonia removal. Microorganisms attach to the rock media and provide ammonia removal. A mechanical bar screen would be followed by a lagoon system then an aerated rock filter prior to UV disinfection, flow measurement and discharge to Herbrandt Branch.

iv. Preferred Alternative

Alternative 1, Activated Sludge and Aeration Aero-Mod Extended Aeration System, was selected as the preferred alternative due to the high quality of effluent, flexibility, affordability, and small treatment footprint.

Alternatives Analysis Comparison

Pollutant	Alternative 1 (Base Case) Activated Sludge and Aeration	Alternative 2 Multi-channel Oxidation Ditch	Alternative 3 Polishing Reactor	Alternative 4 Moving Bed Biofilm Reactor	Alternative 5 Lagoon Nitrification Reactor	Alternative 6 Submerged Attached Growth Reactor
Ammonia as N	≤ 0.9 mg/l	≤ 0.9 mg/l	≤ 0.9 mg/l	≤ 0.9 mg/l	≤ 0.9 mg/l	≤ 0.9 mg/l
Present Worth Cost	\$4,860,875	\$5,048,275	\$6,141,658	\$7,234,289	\$5,221,896	\$8,728,060
Ratio	1	1:1.04	1:1.26	1:1.49	1:1.07	1:1.80

* monitoring requirement

C. LOSING STREAM ALTERNATIVE DISCHARGE LOCATION

Under 10 CSR 20-7.015(4) (A), discharges to losing stream shall be permitted only after other alternatives including land application, discharge to gaining stream and connection to a regional facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

A losing stream alternative discharge location was not presented since the receiving stream is gaining for discharge purposes

D. SOCIAL AND ECONOMIC IMPORTANCE

The affected community consists of the area near Wardsville. A description of social and economic importance was not submitted with the application since the applicant chose the non-degrading path. The proposed project will convert 6 surface discharging systems to one consolidated system at Wardsville NW WWTF. This regionalization and consolidation project will establish a reliable treatment facility for the region for more stringent ammonia effluent limits that may come up in the future. The facility serves the environmental and economic interests of both the State of Missouri and the local communities.

E. NATURAL HERITAGE REVIEW

A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant. Two species of bats, Indiana and Northern Long-Eared, may be present in the project area. 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.

F. 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 Request Project Summary Report* dated

September 6, 2022, the Table below summarizes the results of current loading based on the current permit concentrations and proposed loadings based on the proposed permit concentrations.

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

POLLUTANTS OF CONCERN	CURRENT WEEKLY AVERAGE OR MAXIMUM DAILY LIMIT (MG/L)	PROPOSED WEEKLY AVERAGE OR MAXIMUM DAILY LIMIT (MG/L)	CURRENT LOADING (LBS/DAY)	PROPOSED LOADING (LBS/DAY)	NET CHANGE (LBS/DAY)
BOD ₅	45 (AWL)	27 (AWL)	56.67	56.61	-0.06
Total Suspended Solids (TSS)	45 (AWL)	27 (AWL)	56.67	56.61	-0.06

AWL = average weekly limit, MDL = Maximum Daily Limit.

7. 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:

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

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 BOD₅ 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 to derive the average weekly limit (AWL).

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 BOD₅ 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 BOD₅ 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 (BOD₅).** Effluent limits of 18 mg/L average monthly and 27 mg/L average weekly were established as a result of a mass loading maintenance or reduction demonstration by the applicant. At the existing design flow 151,000 gpd the mass loading to the waterbody is 56.67 lbs/day while the proposed loading was calculated to be 56.61 lbs/day at the proposed effluent concentration and increased design flow. These limits are at least as stringent as the minimum effluent regulations established in 10 CSR 20-7.015(8).

Dissolved Oxygen Modeling

The review was exempt from DO modeling since the consultant selected the non-degrading path for BOD₅.

- **Total Suspended Solids (TSS).** Effluent limits of 18 mg/L average monthly and 27 mg/L average weekly were established as a result of a mass loading maintenance or reduction demonstration by the applicant. At the existing design flow 151,000 gpd the mass loading to the waterbody is 56.67 lbs/day while the proposed loading was calculated to be 56.61 lbs/day at the proposed effluent concentration and increased design flow. These limits are at least as stringent as the minimum effluent regulations established in 10 CSR 20-7.015(8).
- ***Escherichia coli (E. coli)*.** Monthly average of 126 per 100 mL as a geometric mean and Daily Maximum of 630 per 100 mL as a geometric mean during the recreational season (April 1 – October 31), for discharges within two miles upstream of segments or lakes with Whole Body Contact Recreation (A) designated use of the receiving stream, as per 10 CSR 20-7.015(9)(B). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d). The Geometric Mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 6, 10, and 5 (#/100mL). Geometric Mean = 5th root of (1)(4)(6)(10)(5) = 5th root of 1,200 = 4.1 #/100mL.
- **Total Ammonia Nitrogen.** Total Ammonia Nitrogen (TAN) effluent limits for the expanded facility are presented below. The selected limits will be implemented as Preferred Alternative Effluent Limits.

TAN Non-Degrading Effluent Limits for the Expanded Wardsville NW WWTF at the Design Flow of 251,410 gpd

Month	Daily Maximum Limit mg/L	Monthly Average Limit mg/L	Basis of Effluent Limit
January	11.5	3.0	PEL
February	11.5	3.0	PEL
March	9.6	2.6	PEL
April	8.0	2.0	PEL
May	11.5	2.0	PEL
June	9.6	1.3	PEL
July	8.0	0.9	PEL
August	8.0	0.9	PEL
September	8.0	1.1	PEL
October	8.0	1.7	PEL
November	8.0	2.2	PEL
December	9.6	2.6	PEL

PEL – Preferred Alternative Effluent Limit

Comparison of Total Ammonia as Nitrogen Water Quality Based and Preferred Alternative Effluent Limits for the Expanded Wardsville NW WWTF at a Design Flow of 251,410 gpd

Month	MDNR WQBEL		PEL	
	MDL mg/L	AML mg/L	MDL mg/L	AML mg/L
January	12.1	3.1	11.5	3.0
February	12.1	3.1	11.5	3.0
March	10.1	2.7	9.6	2.6
April	8.4	2.1	8.0	2.0
May	12.1	2.1	11.5	2.0
June	10.1	1.3	9.6	1.3
July	8.4	0.9	8.0	0.9
August	8.4	0.9	8.0	0.9
September	8.4	1.2	8.0	1.1
October	8.4	1.8	8.0	1.7
November	8.4	2.4	8.0	2.2
December	10.1	2.7	9.6	2.6

Preferred Alternative Effluent Limits – Ammonia

The applicant proposed effluent limits for total ammonia as nitrogen were proposed as Preferred Alternative Effluent Limits (PEL). The following values were presented as the level of treatment that is reliably achievable for the preferred alternative. 95% of Water Quality Based Effluent Limits were presented as a design target due to the financial constraints of the project.

Preferred Alternative Effluent Limits for Total Ammonia as Nitrogen for the Wardsville NW WWTF Expansion to 251,410 gpd

Month	TAN MDL (mg/L)	TAN AML (mg/L)
January	11.5	3.0
February	11.5	3.0
March	9.6	2.6
April	8.0	2.0
May	11.5	2.0
June	9.6	1.3
July	8.0	0.9
August	8.0	0.9
September	8.0	1.1
October	8.0	1.7
November	8.0	2.2
December	9.6	2.6

Total Ammonia as Nitrogen – Water Quality Based Effluent Limits

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

Month	Temp (°C)*	pH (SU)*	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
January	2.8	7.8	3.1	12.1
February	4.4	7.8	3.1	12.1
March	9.4	7.9	2.7	10.1
April	16.1	8.0	2.1	8.4
May	21.1	7.8	2.1	12.1
June	26.0	7.9	1.3	10.1
July	29.4	8.0	0.9	8.4
August	29.3	8.0	0.9	8.4
September	25.6	8.0	1.2	8.4
October	19.0	8.0	1.8	8.4
November	12.0	8.0	2.4	8.4
December	6.9	7.9	2.7	10.1

* Ecoregion Data (Interior River Valleys and Hills)

WBOEL equation

$$C_e = (((Q_e + Q_s) * C) - (Q_s * C_s)) / Q_e$$

<u>January</u> AML = 3.1 mg/L MDL = 12.1 mg/L	<u>February</u> AML = 3.1 mg/L MDL = 12.1 mg/L	<u>March</u> AML = 2.7 mg/L MDL = 10.1 mg/L
<u>April</u> AML = 2.1 mg/L MDL = 8.4 mg/L	<u>May</u> AML = 2.1 mg/L MDL = 12.1 mg/L	<u>June</u> AML = 1.3 mg/L MDL = 10.1 mg/L
<u>July</u> AML = 0.9 mg/L MDL = 8.4 mg/L	<u>August</u> AML = 0.9 mg/L MDL = 8.4 mg/L	<u>September</u> AML = 1.2 mg/L MDL = 8.4 mg/L
<u>October</u> AML = 1.8 mg/L MDL = 8.4 mg/L	<u>November</u> AML = 2.4 mg/L MDL = 8.4 mg/L	<u>December</u> AML = 2.7 mg/L MDL = 10.1 mg/L

- **Total Phosphorus, Total Kjeldahl Nitrogen, & Nitrate + Nitrite.** Effluent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrate + Nitrite are required per 10 CSR 20-7.015(9)(D)8. Quarterly monitoring required for facilities with design capacities greater than 100,000 gpd and less than 1,000,000 gpd for a period up to five years.
- **pH.** 6.5 – 9.0 SU. pH limitations of 6.0-9.0 SU [10CSR 20-7.015] are not protective of the in-stream Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU. Due to the classification of the receiving stream, the Department has determined that there is no assimilative capacity during critical low flow periods, therefore the water quality standard must be met at the outfall.

Influent Parameters

- **Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS).** An influent sample is required to determine the removal efficiency. In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD₅ and TSS for Publicly Owned Treatment Works (POTWs)/municipals.
- **Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia.** Influent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia required per 10 CSR 20-7.015(9)(D)8.

8. 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.

9. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed expanded facility discharge will result in significant degradation of Herbrandt Branch with respect to ammonia and no degradation with respect to BOD₅ and TSS. The proposed expansion will result in no degradation of the Moreau River. Alternative 1, Activated Sludge & Aeration, was proposed as the preferred alternative. Other technologies may be considered during the review of the facility plan and construction permit application if the technologies are designed to meet the effluent limits derived in this review.

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: Steve Hamm, P.E.
Date: October 2022

Appendix A: Map of Discharge Location



Appendix B: 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 Three Report: Species Listed Under the Federal Endangered Species Act

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

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: Wardsville NW WWTP Ammonia Upgrade/Regionalization #11376

Project Description: T43N, R12W, Section 01, Cole County Herbrandt Branch; X=570609, Y=4262695; Construction of new mechanical WWTP, Elimination of five to seven existing WWTPs and pumping that wastewater to the new Wardsville NW mechanical WWTP.

Project Type: Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Construction or expansion

Contact Person: Byron Shaw

Contact Information: byron.shaw@amwater.com or 5732913314

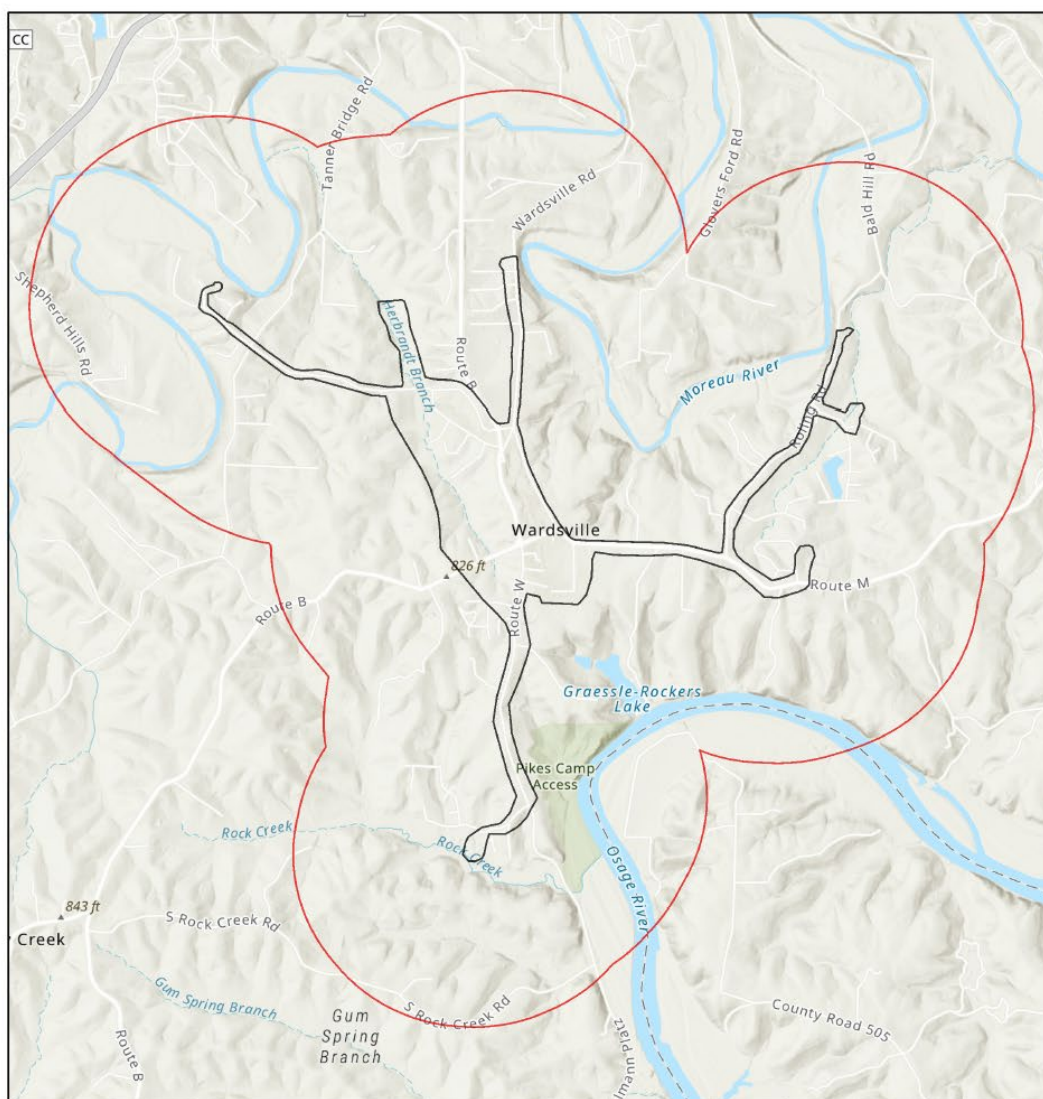
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive 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.

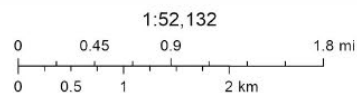
Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit <https://www.modot.org/> for additional information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

Wardsville NW WWTP Ammonia Upgrade/Regionalization



August 24, 2022

- Buffered Project Boundary
- Project Boundary



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

Species or Communities of Conservation Concern within the Area:

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

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

Other Special Search Results:

The project occurs on or near public land, Pikes Camp Access, 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 site submitted and evaluated is on or near Sensitive Aquatic Species Waters Osage River, an important stream for freshwater mussel and amphibian populations. These streams were so designated because they have highly diverse mussel communities and mussel and amphibian species identified as Species of Conservation Concern. These streams are important to maintaining, restoring, or avoiding future listing of Species of Conservation Concern. Impacts to these aquatic species and habitats can be reduced by avoiding or minimizing activities that disturb the stream substrate, including rock placement, dredging, trenching, and wetted gravel bar disturbance; and avoid introducing heavy sediment loads, chemical or organic pollutants. These streams also are included as a Missouri Nationwide Permit Regional Condition (Number 7) that must be considered if working under if working under a Clean Water Act Section 404 Permit issued by the U.S. Army Corps of Engineers (<http://www.nwk.usace.army.mil/Missions/RegulatoryBranch/NationWidePermit...>). A list of all streams designated under this Condition is available at <http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/nationwidepermi...>

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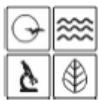
Miscellaneous Information

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.

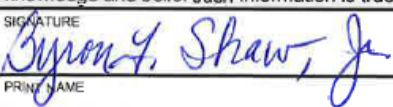
STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 10). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 10-4.111. 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 \(mo.gov\)](https://www.mo.gov/conservation/species-and-communities-of-concern-checklist) for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at [Mofwis Search Results](#). Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.

Appendix C: 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 MAWC Wardsville Northwest Wastewater Treatment Facility		COUNTY Cole	
ADDRESS (PHYSICAL) 0.5 Miles North of Friendship Rd	CITY Wardsville	STATE MO	ZIP CODE 65101
PERMIT NUMBER MO-0129658	PROPOSED DESIGN FLOW 251,410 GPD	SIC / NAICS CODE 4952/8641	
2. OWNER			
NAME Missouri American Water Company			
ADDRESS 901 Hog Hollow Road	CITY Chesterfield	STATE MO	ZIP CODE 63017
EMAIL ADDRESS timothy.ganz@amwater.com		TELEPHONE NUMBER WITH AREA CODE 314-469-6050	
3. CONTINUING AUTHORITY The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(2).			
NAME Same as Owner		SECRETARY OF STATE CHARTER NUMBER 0001468	
ADDRESS	CITY	STATE	ZIP CODE
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
4. CONSULTANT			
PREPARER NAME Byron F. Shaw, Jr.		COMPANY NAME Missouri American Water Company	
ADDRESS 320 Hoover Road	CITY Jefferson City	STATE MO	ZIP CODE 65109
EMAIL ADDRESS byron.shaw@amwater.com		TELEPHONE NUMBER WITH AREA CODE 573-606-6384	
5. RECEIVING WATER BODY SEGMENT #1			
NAME Herbrandt Branch			
5.1 Upper end of segment – Location of discharge UTM: X= _____, Y= _____ OR Lat <u>38.50983940</u> , Long <u>-92.19015024</u>			
5.2 Lower end of segment – UTM: X= _____, Y= _____ OR Lat <u>38.52263426</u> , Long <u>-92.20311058</u>			
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? Ultra-violet Disinfection (Existing and Proposed)			
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.			

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. Land in this area is well developed and additional areas are being planned currently. The water would have to be pumped across the Moreau River in order to find adequate land available. This would require pumping a distance of 1 to 2 miles in probably two or more different directions to find adequate land area. In addition land in this area is very expensive. Land prices are estimated to be \$13,500 to \$20,000 per acre. Approximately 250 acres of land would need to be purchased for the storage cell and land application area combined. This yields a land purchase cost of \$3,375,000 to \$5,000,000. Including the cost of pumping the required distance, irrigation equipment, and excavation cost for the storage cell will add at least an additional \$5,191,403 (\$500,000 pumping, \$547,500 force main and piping, center pivot \$425,000, excavation \$3,718,903), which yields an approximate construction cost of \$8,566,403 to \$10,191,403 and makes land application a non feasible alternative. In addition it would most likely be impossible to purchase that amount of land in this area.					
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
BOD ₅	X		Path A/Non-Degradation	18.0	27.0
TSS	X		Path A/Non-Degradation	18.0	27.0
Ammonia (Summer)	X				
Ammonia (Winter)	X				
Total Phosphorus	X				
Ammonia (Jan and Feb) WQBL	X		Path C/Significant Deg	3.1	12.1
Ammonia (March and Dec) WQBL	X		Path C/Significant Deg	2.7	10.1
Ammonia (April) WQBL	X		Path C/Significant Deg	2.1	8.4
Ammonia (May) WQBL	X		Path C/Significant Deg	2.1	12.1
Ammonia (June) WQBL	X		Path C/Significant Deg	1.3	10.1
Ammonia (July and August) WQBL	X		Path C/Significant Deg	0.9	8.4
Ammonia (September) WQBL	X		Path C/Significant Deg	1.2	8.4
Ammonia (October) WQBL	X		Path C/Significant Deg	1.8	8.4
Ammonia (November) WQBL	X		Path C/Significant Deg	2.4	8.4
* Place an X in appropriate box for the concentration units for each Pollutant of Concern.					

12. PROPOSED PROJECT SUMMARY	
The U.S. Environmental Protection Agency and the Missouri Department of Natural Resources promotes regionalization whenever possible to have a positive impact on the environment. Missouri American Water Company also believes this is a great way to improve our environment and we look for opportunities to regionalize our facilities when possible. Since it is necessary to upgrade the Wardsville NW facility to consistently meet ammonia limits, we are taking this opportunity to regionalize the Churchview, Kleffner Ridge, Van Loo, Coyote Ridge, and Markway Meadows facilities into one wastewater treatment plant to be located at the Wardsville NW WWTF site. The new facility will be a mechanical wastewater treatment plant consisting of mechanical screening, flow equalization, secondary treatment utilizing activated sludge with extended aeration, final clarification, UV disinfection, flow measurement and discharge at the existing outfall location.	
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 <i>New Technology Definitions and Requirements fact sheet</i>.	
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 20036706
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 10/3/2022
PRINT NAME Byron F. Shaw, Jr.	TITLE Senior Project Engineer
PLEASE IDENTIFY YOUR STATUS FOR THIS PROJECT: ☒ OWNER ☐ CONTINUING AUTHORITY ☐ CONSULTANT	



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY
PATH C: TIER 2 – SIGNIFICANT DEGRADATION

1. FACILITY				
NAME MAWC Wardsville Northwest Wastewater Treatment Facility				COUNTY Cole
2. SUMMARY OF THE POLLUTANTS OF CONCERN				
Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.A. and assumed or demonstrated to cause significant degradation. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031(2).				
What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:				
Pollutants of Concern*	Concentration*		Base Case Limit	Basis (WQS, WLA, ELG, Other)**
	mg/L	µg/L		
BOD ₅	X		18.0 / 27.0	WLA
TSS	X		18.0 / 27.0	WLA
Ammonia (Summer)	X			
Ammonia (Winter)	X			
Total Nitrogen	X		Monitoring Only	ELG
Total Phosphorus	X		Monitoring Only	ELG
Ammonia (Jan and Feb) WQBL	X		3.1 / 12.1	ELG
Ammonia (March and Dec) WQBL	X		2.7 / 10.1	ELG
Ammonia (April) WQBL	X		2.1 / 8.4	ELG
Ammonia (May) WQBL	X		2.1 / 12.1	ELG
Ammonia (June) WQBL	X		1.3 / 10.1	ELG
Ammonia (July and August) WQBL	X		0.9 / 8.4	ELG
Ammonia (September) WQBL	X		1.2 / 8.4	ELG
Ammonia (October) WQBL	X		1.8 / 8.4	ELG
Ammonia (November) WQBL	X		2.4 / 8.4	ELG
E. Coli		#/100 ml	126 / 630	WQS
pH		SU	6.5 - 9.0	
* Place an X in appropriate box for the concentration units for each Pollutant of Concern				
** Provide the Basis for the Base Case Limit: WQS – Water Quality Standard, WLA – Wasteload Allocation, ELG – Effluent Limit Guideline, or describe other.				
3. IDENTIFYING ALTERNATIVES				
Supply a summary of the non-discharging alternatives considered. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the Antidegradation Implementation Procedure Section II.B.1. These alternatives include no-discharge. Attach all supportive documentation in the Antidegradation Review report.				
Feasibility of non-discharging alternatives (regionalization, land application, subsurface irrigation, and recycling or reuse): The selected project is regionalization . This is the best feasible alternative for all facilities in consideration. Five discharges will be eliminated and their wastewater transported to the Wardsville NW WWTF, which will be upgraded to handle the flows from the other facilities including an upgrade to improve treatment for ammonia. The five facilities to be eliminated are as follows: Coyote Ridge, Churchview, Markway Meadows, Van Loo, and Kleffner Ridge Wastewater Treatment Facilities. The Wardsville NW WWTF, the largest of all of the facilities, will be the centralized facility for the area. Regionalization was selected as the no-discharge option due to the fact that land application is not feasible due to the unavailability in that area and the costs to get to land that may be available as well as the costs for purchase and construction.				

Minimum of three (preferably five or more) discharging alternatives* ranging from less-degrading to degrading including Preferred Alternative (All treatment levels for POCs must at a minimum meet water quality standards):		
Discharging Alternative #	Treatment Type	Description
1	Activated Sludge & Aeration	Aero-Mod Sequox - Biological Nutrient Removal System
2	Multi-channel Oxidation Ditch	Orbal System
3	Polishing Reactor	Lemna Polishing Reactor
4	Moving Bed Biofilm Reactor	Fixed Film on mobile plastic media
5	Lagoon Nitrification Reactor	NitrOx
6	Submerged Attached Growth Rea	Nexom SAGR
* Same technology may be multiple alternatives as you have the base unit and add to it with more capacity to provide additional treatment.		
4. DETERMINATION OF THE REASONABLE ALTERNATIVE		
Per the Antidegradation Implementation Procedure Section II.B.2, "a reasonable alternative is one that is practicable, economically efficient and affordable." Provide basis and supporting documentation in the Antidegradation Review report. Please do not write "See Report" for any box below. Practicability Summary: "The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the Antidegradation Implementation Procedure Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the Antidegradation Implementation Procedure Section II.B.2.a. The AeroMod Sequox system offers flexibility in flows, influent concentrations, a low footprint, and ease of upscale and implementation of additional treatment capacity. The system has bypassing capabilities for maintenance and flexible treatment depending on incoming flows. The other options do not offer treatment capabilities during maintenance schedules on the scale of the AeroMod as the AeroMod has multiple treatment trains. The other options will require additional lagoon capacity adjustments or larger footprints.		
Economic Efficiency Basis: What is the design life cycle for the comparison? 20 years What interest rate was used in the present worth calculations? 2.25%		
Economic Efficiency Summary: Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the Antidegradation Implementation Procedure Section II.B.2.b. The summary can be viewed in the following table. The base case was determined to be an AeroMod treatment set up with a present worth to base case ration ranging between 1.04-3.02.		

TABLE OF THE ALTERNATIVES EVALUATION (Attach additional page if necessary)						
PARAMETERS	Alternatives #					
	1	2	3	4	5	6
BOD ₅ – mg/L	18	18	18	18	18	18
TSS – mg/L	18	18	18	18	18	18
Ammonia (Summer) – mg/L	8.4 / 0.9	8.4 / 0.9	8.4 / 0.9	8.4 / 0.9	8.4 / 0.9	8.4 / 0.9
Ammonia (Winter) – mg/L	12.1 / 3.1	12.1 / 3.1	12.1 / 3.1	12.1 / 3.1	12.1 / 3.1	12.1 / 3.1
E. Coli – #/100 mL	630 / 126	630 / 126	630 / 126	630 / 126	630 / 126	630 / 126
Total Nitrogen – mg/L						
Total Phosphorus – mg/L						
Construction Cost – \$	3,418,097.95	3,673,665.44	4,448,693.92	4,894,651.01	3,535,025.73	7,208,733.23
Operating Cost – \$	90,378.56	86,108.40	106,050.77	146,559.76	105,669.07	95,173.77
Present Worth – \$	4,860,875.29	5,048,275.17	6,141,657.91	7,234,288.86	5,221,896.37	8,728,059.92
Ratio present worth to base case	1	1:1.04	1:1.26	1:1.49	1:1.07	1:1.80
Affordability Summary: Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the Antidegradation Implementation Procedure Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."						
Justification for Preferred Alternative: AeroMod has been selected to be the preferred alternative due to its lowest present worth, treatment capabilities, and functionality. The shared wall treatment structure allows for a smaller footprint typically opposed to a 3 to 4 cell lagoon system and other technologies. The flexibility in flow and incoming contaminant levels allows for a wide range of treatment while producing effluent to the levels outlined by the NPDES permit.						
Reasons for Rejecting the other Evaluated Alternatives: Some of the reasons for rejecting the other options would be the capital, operating, and present worth costs in relation to the AeroMod treatment system. In addition to the costs, the ease of operation of the AeroMod makes it more amenable over the difficulty in operation of other alternatives. Some alternatives are not as easy to upgrade as permit limits change or population growth requires additional treatment.						
Comments/Discussion:						

5. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

If the preferred alternative will result in significant degradation, then it must be demonstrated that it will allow important economic and social development in accordance to the Antidegradation Implementation Procedure Section II.E. Social and Economic Importance is defined as the social and economic benefits to the community that will occur from any activity involving a new or expanding discharge.

Identify the affected community:

The affected community is defined in 10 CSR 20-7.031(2)(B) as the community "in the geographical area in which the waters are located. Per the Antidegradation Implementation Procedure Section II.E.1, "the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project."

The affected community would be the customers of the proposed system and those that live along Herbrandt Branch.

Identify relevant factors that characterize the social and economic conditions of the affected community:

Examples of social and economic factors are provided in the Antidegradation Implementation Procedure Section II.E.1., but specific community examples are encouraged.

The facility upgrade will allow the subdivisions, with the treatment facilities to be regionalized, to grow independently of the size of the existing plants. Currently the facilities to be regionalized theoretically have a cop of treatment at the subdivision without additional capital to upgrade the smaller plants. In addition any upgrades down the road will have less impact on the cost per customer opposed to the smaller facilities upgrading to meet limits, which could include the additional overhead for operators dependent on the plant upgrade requirements on top of the cost of upgrades. **OUTFALL ELIMINATION**

Describe the important social and economic development associated with the project:

Determining benefits for the community and the environment should be site specific and in accordance with the Antidegradation Implementation Procedure Section II.E.1.

The community and environment would benefit by the regionalization as it will provide the ability to reduce the number of outfalls to local waters. By regionalizing to a single discharge point, the chances of contamination to the local waters and streams and adversely affecting plant and animal life is reduced as a single plant is easier to operate in comparison to 6 separate treatment plants.

PROPOSED PROJECT SUMMARY:

The U.S. Environmental Protection Agency and the Missouri Department of Natural Resources promotes regionalization whenever possible to have a positive impact on the environment. Missouri American Water Company also believes this is a great way to improve our environment and we look for opportunities to regionalize our facilities when possible.

Since it is necessary to upgrade the Wardsville NW facility to consistently meet ammonia limits, we are taking this opportunity to regionalize the Churchview, Kleffner Ridge, Van Loo, Coyote Ridge, and Markway Meadows facilities into one wastewater treatment plant to be located at the Wardsville NW WWTF site.

The new facility will be a mechanical wastewater treatment plant consisting of mechanical screening, flow equalization, secondary treatment utilizing activated sludge with extended aeration, final clarification, UV disinfection, flow measurement and discharge at the existing outfall location.

Attach the Antidegradation Review report and all supporting documentation. This is a technical document, which must be signed, sealed and dated by a registered professional engineer of Missouri.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION: REGIONALIZATION AND NO-DISCHARGE EVALUATION

REGIONALIZATION AND NO-DISCHARGE EVALUATION

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.

Please refer to the *No-Discharge Alternative Evaluation* fact sheet for examples of information to provide to justify common reasons for not pursuing regionalization or no-discharge land application. If sufficient information is not provided on this form to demonstrate that these alternatives are not feasible, a more detailed evaluation of no-discharge options may have to be submitted.

Additional pages may be attached if more room is needed.

1. FACILITY:

NAME	COUNTY
MAWC Wardsville Northwest Wastewater Treatment Facility	Cole

2. EVALUATION OF REGIONALIZATION (Complete all applicable reasons why regionalization was not pursued)

2.1 Regionalization Feasibility:

- A. What is the distance to connect to the closest municipality's line or other facility's line? 20 years
- B. List facilities contacted about possible regionalization. NA
- C. Is there any planning or zoning in the area regarding development and services? Ultra-violet Disinfection (Existing and Proposed)
- D. Who would have the responsibility to maintain the sewer connection line?
- E. What is the estimated cost for piping and pumps to regionalize?
- F. Explain any engineering challenges with the regionalization connection – topography, rivers, highways, or other issues.
Most of the force mains will be laid in the road right-of-way.
- G. Does a regional facility have the capacity to treat the additional effluent from this project? This facility will be upgraded.
- H. Were land owners contacted for rights to an easement? ☐ Yes ☐ No
- I. Describe the easement issues:
Owners will be contacted where needed to install a pump station and/or force main to transport the wastewater from the wastewater plants that will be eliminated to this facility.

2.2 Summarize why regionalization was not a practicable or economically efficient alternative

Regionalization will be performed as a part of this project. We will be eliminating five of our area WWTPs and transporting their wastes to the Wardsville NW upgraded facility.

3. EVALUATION OF NO-DISCHARGE LAND APPLICATION	
Check all applicable reasons why no-discharge land application was not pursued:	
☒ 3.1 Land Availability and Cost:	A. Is land available for land application? ☐ Yes ☒ No If not, explain: Not enough land is available nearby due to development. Would need to pump 1 to 2 miles. If yes, answer the following: B. How many acres are required for land application of the effluent? Storage, Buffers, and Irrigation: 250 acres C. Provide a breakdown of the capital cost for any necessary additional land, piping, pumps, and irrigation equipment? Pumps: \$500,000; Piping: \$ D. Were long-term costs evaluated and compared for upgrading to a mechanical plant with future Water Quality Standards changes (i.e. mussel ammonia, bacteria, TP, TN) versus cost for a land application system? ☒ Yes ☐ No E. Were land owners contacted for rights to an easement? ☐ Yes ☒ No F. Describe the easement issues: Land would be purchased if this was selected alternative.
☐ 3.2 Zoning or Suitability of Site in Proximity to Neighboring Sites or Waterbodies:	A. Was drip or subsurface irrigation evaluated as opposed to surface application? ☐ Yes ☒ No B. Does the county ordinance specifically restrict land application, surface and subsurface? ☐ Yes ☒ No C. Can a vegetated buffer be installed to reduce necessary buffer distances? ☒ Yes ☐ No D. Are there other steps or considerations that can be made? None
☐ 3.3 Unsuitability of Geology or Soils	A. Is a geohydrologic evaluation, county soils survey map, or other resource showing suitability and application rates included with this application? ☐ Yes ☒ No B. Is it cost-effective to bring in additional soils? ☐ Yes ☒ No C. Can the application rate be decreased to a suitable rate? ☐ Yes ☒ No D. Were subsurface application alternatives (e.g. low pressure pipe, drip) considered? ☐ Yes ☒ No E. If collapse potential is a concern, was using a liner or alternative site evaluated? ☐ Yes ☒ No
3.4 Summarize why no-discharge land application was not a practicable or economically efficient alternative Land in this area is well developed and additional areas are being planned currently. The water would have to be pumped across the Moreau River in order to find adequate land available. This would require pumping a distance of 1 to 2 miles in probably two or more different directions to find adequate land area. In addition land in this area is very expensive. Land prices are estimated to be \$13,500 to \$20,000 per acre. Approximately 250 acres of land would need to be purchased for the storage cell and land application area combined. This yields a land purchase cost of \$3,375,000 to \$5,000,000. Including the cost of pumping the required distance, irrigation equipment, and excavation cost for the storage cell will add at least an additional \$5,191,403 (\$500,000 pumping, \$547,500 force main and piping, center pivot \$425,000, excavation \$3,718,903), which yields an approximate construction cost of \$8,566,403 to \$10,191,403 and makes land application a non feasible alternative. In addition it would most likely be impossible to purchase that amount of land in this area.	

4. DOCUMENTATION

4.1 Is any other written correspondence or documentation included with this application to provide further justification for not pursuing a no-discharge option or regionalization?

☒ No

☐ Yes:

- ☐ A letter from an existing higher preference continuing authority waiving preferential status where service is not available in accordance with 10 CSR 20-6.0 10 (2) or if capacity is not available.
- ☐ A letter from the existing higher preference continuing authority stating that the regional facility has no interest in taking flow from the new or expanded facility.
- ☐ A letter from the regional municipality stating that the project area is outside city limits and annexation would be required.
- ☐ Council meeting minutes.
- ☐ Correspondence with land owners regarding easement rights.
- ☐ Correspondence with land owners regarding land for sale or lease.
- ☐ Letters from the community or a consulting engineer regarding availability, proximity, and location of suitable land and the reasonable cost of such land.
- ☐ Documentation of recent land sales or appraisals.
- ☐ Calculations for sizing a land application system.
- ☐ Detailed cost estimates for a land application system or regionalization including lift stations, piping, easements, liners, and/or connection costs.
- ☐ Geohydrologic evaluation or other soils report.
- ☐ Copy of a county or city ordinance.
- ☐ Verification of funding from State Revolving Fund, which does not fund projects outside city limits.
- ☐ Other:

Appendix D: Geohydrologic Evaluation



Michael L. Parson
Governor

Dru Buntin
Director

LWE23013
Cole County

September 16, 2022

Byron Shaw
320 Hoover Road
Jefferson City, MO 65109

RE: MAWC-Wardsville NW WWTP Upgrade/Regionalization

Dear Byron Shaw:

On August 22, 2022, the Missouri Geological Survey received a request to perform a geohydrologic evaluation for the above referenced project located in Cole 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 gspg@dnr.mo.gov.

Sincerely,

MISSOURI GEOLOGICAL SURVEY

Molly Starkey
Geologist
Environmental Geology Section

c: Byron Shaw
WPP
Central Field Operations

Missouri Department Of Natural Resources Missouri Geological Survey Geological Survey Program Environmental Geology Section		Project ID Number LWE23013 County Cole County
Request Details Project: MAWC-Wardsville NW WWTP Upgrade/Regionalization Legal Description: 01 T43N R12W <u>Organization Official</u> Name: Byron Shaw Address: 320 Hoover Road City: Jefferson City State: MO Zip: 65109 Phone: 573-291-3314 Email: <u>Preparer</u> Name: Byron Shaw Address: 320 Hoover Road City: Jefferson City State: MO Zip: 65109 Phone: 573-291-3314 Email: byron.shaw@amwater.com		
Project Details Report Date: Date of Field Visit: 09/15/2022 Previous Reports: Not Applicable <u>Facility Type</u> ☒ 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 <u>Type of Waste</u> ☐ Animal ☒ Human ☐ Process or industrial ☐ Leachate ☐ Other waste type <u>Funding Source</u> ☐ IWT ☒ WWL-SRF <u>Additional Information</u> ☐ Plans were submitted ☐ Site was investigated by NRCS ☐ Soil or geotechnical data were submitted Geologic Stream Classification: ☒ Gaining ☐ Losing ☐ No discharge <u>Overall Geologic Limitations</u> ☒ Slight ☐ Moderate ☐ Severe <u>Collapse Potential</u> ☒ Not applicable ☐ Slight ☐ Moderate ☐ Severe <u>Topography</u> ☒ <4% ☐ 4% to 8% ☐ 8% to 15% ☐ >15% <u>Landscape Position</u> ☐ Broad uplands ☒ Floodplain ☐ Ridgetop ☒ Alluvial plain ☐ Hillslope ☐ Terrace ☐ Narrow ravine ☐ Sinkhole <u>Bedrock:</u> Ordovician-age Cotter and Jefferson City Dolomite <u>Surficial Materials:</u> Dark brown silt loam and loess		

 Missouri Department Of Natural Resources Missouri Geological Survey Geological Survey Program Environmental Geology Section		Project ID Number LWE23013 County Cole County
<u>Recommended Construction Procedures for Earthen Facility</u> ☐ Installation of clay pad and Compaction ☐ Diversion of subsurface flow ☐ Artificial sealing ☐ Rock excavation ☐ Limit excavation depth	<u>Determine Overburden Properties</u> ☐ Particle size analysis ☐ Atterberg limits ☐ 95% Max. dry density test method ☐ Overburden thickness ☐ Permeability coefficient-undisturbed ☐ Permeability coefficient-remolded	<u>Determine Hydrologic Conditions</u> ☐ Groundwater elevation ☐ Direction of groundwater flow ☐ 25-Year flood level ☐ 100-Year flood level

Remarks:

On September 15, 2022, a geologist with the Missouri Geological Survey conducted a geohydrologic evaluation of proposed upgrades to the existing wastewater treatment plant in Wardsville. The purpose of the site visit was to observe the geologic and hydrologic conditions at the site and to determine the potential impacts in the event of wastewater treatment failure.

The site is located in the northwest corner of Wardsville, in the floodplain of Herbrandt Branch. Surface water flow is northwest into Herbrandt Branch, which is also the receiving stream for discharge from the facility. From the facility, water flows through the receiving stream for approximately 1.4 miles before joining with the Moreau River. Both streams have previously been classified as gaining streams.

Surficial materials onsite were sampled using a handheld auger. Surficial materials at the site were a uniform dark brown silt and loess with moderate permeability. Local well logs indicate that surficial materials are generally less than 10 feet thick in this area, although surficial materials may be thicker at the site due to its landscape position.

Bedrock was observed a short distance from the site in the receiving stream. The tan to buff, silty dolomite is identified as the Ordovician-age Jefferson City and Cotter Dolomite. This bedrock has low primary permeability and moderate to high permeability in areas where karst dissolution has widened joints, fractures, and bedding planes. Joints observed in the bedrock of the stream did not show any dissolution and there are no documented sinkholes or springs within 3 miles of the site.

Overall, the site receives a slight geologic limitations rating. In the event of treatment failure, the local shallow groundwater and the surface waters of Herbrandt Branch and the Moreau River may be adversely impacted.



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

FOR DEPARTMENT USE ONLY

APP NO. 48350	CP NO. CP0002585
FEE RECEIVED	CHECK NO.
DATE RECEIVED 11/07/2025	

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

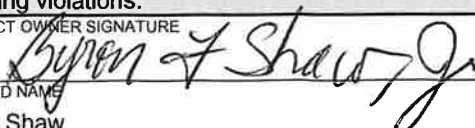
1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

- 1.1 Is this a Federal/State funded project? ☐ YES ☒ N/A Funding Agency: _____ Project #: _____
- 1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☒ YES Date of Approval: 10/2022 ☐ N/A
- 1.3 Has the department approved the proposed project's facility plan*?
☒ YES Date of Approval: 02/2024 ☐ 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: 11/02/2025
☒ 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 MAWC - Wardsville NW WWTF Upgrade and Regionalization	2.2 ESTIMATED PROJECT CONSTRUCTION COST \$ 5,805,252.73
2.3 PROJECT DESCRIPTION Construction of an Aero-Mod Extended Aeration WWTF to replace the Aerated Lagoon System. The system is designed to treat the flow from five additional WWTFs, of which one will be eliminated as part of this project and one is in process. The others later.	
2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION Sludge will be aerobically digested, then hauled to the MAWC Taos WWTF for Dewatering, then disposed of at the landfill.	
2.5 DESIGN INFORMATION A. Current population: <u>1510</u> ; Design population: <u>2299</u> B. Actual Flow: <u>69k</u> gpd; Design Average Flow: <u>251k</u> gpd; Actual Peak Daily Flow: <u>288k</u> gpd; Design Maximum Daily Flow: <u>766k</u> gpd; Design Wet Weather Event: <u>1.012</u>	
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 MAWC - WARDSVILLE NW WWTF		TELEPHONE NUMBER WITH AREA CODE 573-694-9146		E-MAIL ADDRESS aaron.rollins@amwater.com
ADDRESS (PHYSICAL) 1105 Friendship Rd	CITY Jefferson City	STATE MO	ZIP CODE 65101	COUNTY Cole
Wastewater Treatment Facility: Mo- 0129658 (Outfall 001 Of 001)				
3.1 Legal Description: _____ ¼, _____ ¼, _____ ¼, Sec. 01, T 43N, R 12W (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): 570609 Northing (Y): 4262695 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)				
3.3 Name of receiving streams: Herbrandt Branch				
4.0 PROJECT OWNER				
NAME Missouri-American Water Company		TELEPHONE NUMBER WITH AREA CODE 314-548-0189		E-MAIL ADDRESS timothy.ganz@amwater.com
ADDRESS 901 Hog Hollow Road	CITY Chesterfield	STATE MO	ZIP CODE 63017	
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 SAME		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS
ADDRESS	CITY	STATE	ZIP CODE	
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 Shane Lowe / Klingner & Associates, PC		TELEPHONE NUMBER WITH AREA CODE 573-355-5988		E-MAIL ADDRESS slowe@klingner.com
ADDRESS 3622 Endeavor Ave Ste 117	CITY Columbia	STATE MO	ZIP CODE 65201	
7.0 APPLICATION FEE				
☐ CHECK NUMBER ☒ JETPAY CONFIRMATION NUMBER 20071057				
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 				
PRINTED NAME Byron Shaw			DATE 11/03/2025	
TITLE OR CORPORATE POSITION Senior Project Engineer		TELEPHONE NUMBER WITH AREA CODE 573-606-6384		E-MAIL ADDRESS byron.shaw@amwater.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.				

MAWC Wardsville NW WWTF
2.6 Topographic Map

