STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Mike Johnson, City Administrator
City of Marble Hill
Marble Hill WWTF
302 Union St
Marble Hill, MO 63764

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 31, 2023
Effective Date

July 30, 2025
Expiration Date

John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction will include addition of a backup (third) influent pump, a baffle curtain to divide the first basin, subsurface aerator/mixer units (10 in cell 1, 4 in cell 2) to replace the original aerators, a two-tank NitrOx™ MBBR reactor placed between the two basins (with influent screen, six subsurface aerator/mixers per tank, and media retention screening), three blowers will be installed next to the NitrOx™ system (one for the lagoon aeration, two for the NitrOx™ system (one duty, one standby), a new recirculation pump station to transfer wastewater from the effluent side of cell 3 to the effluent side of cell 2, a new UV system, and an effluent Parshall flume. The construction is based on an increased design average flow of 450,000 gpd and a peak-day flow of 1,900,000 gpd.

Sludge may be removed by the contractor, but the required sludge management plan will be submitted by the contractor to the Southeast Regional Office and reviewed separately.

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

II. COST ANALYSIS FOR COMPLIANCE

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

The Department is required to determine "findings of affordability" because the permit applies to a combined or separate sanitary sewer system for a publically-owned treatment works.

Cost Analysis for Compliance - The Department has made a reasonable search for empirical data indicating the permit is affordable. The search consisted of a review of Department records that might contain economic data on the community, a review of information provided by the applicant as part of the application, and public comments received in response to public notices of this draft permit. If the empirical cost data was used by the permit writer, this data may consist of median household income, any other ongoing projects that the Department has knowledge, and other demographic financial information that the community provided as contemplated by RSMo 644.145.3. See **APPENDIX – COST ANALYSIS FOR COMPLIANCE**.

III. CONSTRUCTION PERMIT CONDITIONS

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

1. This construction permit does not authorize discharge.

2. All construction shall be consistent with plans and specifications signed and sealed by Dominic Thompson, P.E., with S.H. Smith & Co., Inc., and as described in this permit.

3. The Department must be contacted in writing prior to making any changes to the plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the Department's Southeast Regional Office per 10 CSR 20-7.015(9)(G).

5. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred (100)-year flood elevation per 10 CSR 20-8.140(2)(B).The minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300') per 10 CSR 20-8.140(2)(C)1.

6. 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.

7. 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.

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

- Vacuum testing, if specified for concrete sewer manholes, shall conform to the test procedures in ASTM C1244 – 11(2017) *Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill*, as approved and published April 1, 2017, or the manufacturer's recommendation. 10 CSR 20-8.120(4)(F)1.
- Exfiltration testing, if specified, shall conform to the test procedures in ASTM C969 – 17 *Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines*, as approved and published April 1, 2017. 10 CSR 20-8.120(4)(F)2.
- Multiple pumps shall be provided except for design average flows of less than fifteen hundred (1,500) gallons per day. 10 CSR 20-8.130 (3) (B) 1.
- Electrical equipment. Electrical equipment shall be provided with the following requirements:
    - 10 CSR 20-8.130 (3) (B) 2. A. Electrical equipment must comply with 10 CSR 20-8.140(7)(B);
    - Utilize corrosive resistant equipment located in the wet well; 10 CSR 20-8.130 (3) (B) 2. B.
    - Provide a watertight seal and separate strain relief for all flexible cable; 10 CSR 20-8.130(3) (B) 2. C.
    - Install a fused disconnect switch located above ground for the main power feed for all pumping stations. 10 CSR 20-8.130 (3) (B) 2. D.
    - When such equipment is exposed to weather, it shall comply with the requirements of weather proof equipment; enclosure NEMA 4; NEMA 4X where necessary; and *NEMA Standard 250-2014*, published December 15, 2014. 10 CSR 20-8.130 (3) (B) 2. E.
    - Install lightning and surge protection systems; 10 CSR 20-8.130 (3) (B) 2. F.
    - Install a one hundred ten volt (110 V) power receptacle inside the control panel located outdoors to facilitate maintenance; 10 CSR 20-8.130 (3) (B) 2. G.
    - Provide Ground Fault Circuit Interruption (GFCI) protection for all outdoor receptacles. 10 CSR 20-8.130 (3) (B) 2. H.

- Water level controls must be accessible without entering the wet well. 10 CSR 20-8.130 (3) (C)
- Valves shall not be located in the wet well unless integral to a pump or its housing. 10 CSR 20-8.130 (3) (D)
- Covered wet wells shall have provisions for air displacement to the atmosphere, such as an inverted and screened “j” tube or other means. 10 CSR 20-8.130 (3) (E)
- There shall be no physical connection between any potable water supply and a wastewater pumping station, which under any conditions, might cause contamination of the potable water supply. If a potable water supply is brought to the station, 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 20-8.130 (3) (G)
- 10 CSR 20-8.130 (4) (C) Wet well access shall not be through the equipment compartment.
- Submersible pump stations shall meet the applicable requirements under section (3) of this rule, except as modified in this section. 10 CSR 20-8.130 (5)
    - Pump Removal. Submersible pumps shall be readily removable and replaceable without personnel entering, dewatering, or disconnecting any piping in the wet well. 10 CSR 20-8.130 (5) (A)
    - 10 CSR 20-8.130 (5) (B) Valve Chamber and Valves. Valves required under subsection (3)(D) of this rule shall be located in a separate valve chamber.
    - A minimum access hatch dimensions of twenty-four inches by thirty-six inches (24" x 36") shall be provided. 10 CSR 20-8.130 (5) (B) 1.
- Alarm systems with an uninterrupted power source shall be provided for pumping stations. 10 CSR 20-8.130 (6)
- Force main system shall be designed to withstand all pressures (including water hammer and associated cyclic reversal of stresses), and maintain a velocity of at least two feet (2') per second. 10 CSR 20-8.130 (8) (A)
- 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)
- 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.

- Emergency Power. Disinfection, when used, shall be provided during all power outages. 10 CSR 20-8.140 (7) (A) 2. and 10 CSR 20-8.190 (2) (A)
- Electrical systems and components in raw wastewater or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors that are normally present, shall comply with the NFPA 70 *National Electric Code (NEC)* (2017 Edition), as approved and published August 24, 2016, requirements for Class I, Division 1, Group D locations. 10 CSR 20-8.140 (7) (B)
- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140 (7) (C)
- No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140 (7) (D) 1.
- Where a separate non-potable water supply is to be provided, a break tank will not be necessary, but all system outlets shall be posted with a permanent sign indicating the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 4.
- A means of flow measurement shall be provided at all wastewater treatment facilities. 10 CSR 20-8.140 (7) (E)
- 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)
    - Ventilation shall include the following:
        - Force fresh air into enclosed screening device areas or open pits more than four feet (4') deep. 10 CSR 20-8.140 (8) (J) 2.

  - 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)
- Moving Bed Bioreactor (MBBR). A MBBR secondary treatment system shall provide upstream preliminary treatment units capable of—
  - Screening to reduce pass-through and suspended solids; 10 CSR 20-8.180 (8)(A)
  - Grit removal; 10 CSR 20-8.180 (8)(B) and
  - Oil and grease removal. 10 CSR 20-8.180 (8)(C)
- The UV dosage shall be based on the design peak hourly flow, maximum rate of pumpage, or peak batch flow. 10 CSR 20-8.190 (5) (A) 1.
- The UV system shall deliver the target dosage based on equipment derating factors and, if needed, have the UV equipment manufacturer verify that the scale up or scale down factor utilized in the design is appropriate for the specific application under consideration. 10 CSR 20-8.190 (5) (A) 3.
- The UV system shall deliver a minimum UV dosage of thirty thousand microwatt seconds per centimeters squared (30,000 $\mu W \cdot s/cm^2$). 10 CSR 20-8.190 (5) (A) 4.
- UV system. The combination of the total number of banks shall be capable of treating the design peak hourly flow, maximum rate of pumpage, or peak batch flow. 10 CSR 20-8.190 (5) (B)
- The UV system must continuously monitor and display at the UV system control panel the following minimum conditions:
  - The relative intensity of each bank or closed vessel system; 10 CSR 20-8.190 (5) (C) 1. A.
  - The operational status and condition of each bank or closed vessel system; 10 CSR 20-8.190 (5) (C) 1. B.
  - The ON/OFF status of each lamp in the system; 10 CSR 20-8.190 (5) (C) 1. C. and
  - The total number of operating hours of each bank or each closed vessel system. 10 CSR 20-8.190 (5) (C) 1. D.
- The UV system shall include an alarm system. Alarm systems shall comply with 10 CSR 20-8.140(7)(C). 10 CSR 20-8.190 (5) (C) 2.
- Lagoon berms shall be constructed of relatively impervious material and compacted to at least ninety-five percent maximum dry density test method to form a stable structure. 10 CSR 20-8.200(4)(A)1.
- Seep collars shall be provided on drainpipes where they pass through the lagoon seal. 10 CSR 20-8.200(4)(C)4.

9. Upon completion of construction:

   A. The City of Marble Hill will become the continuing authority for operation and maintenance of these facilities;

   B. Submit an electronic copy of the as-built plans if the project was not constructed in accordance with previously submitted plans and specifications; and

   C. Submit a completed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification to be issued. The operating permit modification fee has already been paid.

dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The city is upgrading the WWTF to consistently meet final effluent limits for Ammonia as N and to provide a treatment cushion for high inflow/infiltration, increasing the design average flow to 450,000 gpd and a peak day flow of 1,900,000 gpd. An ultraviolet disinfection system will replace the existing disinfection (chlorination/dechlorination) system. The project will also include rehabilitation/repair of existing collection system lines, manholes, and lift stations, as needed to mitigate inflow and infiltration and sanitary sewer overflows. The city entered into an abatement order on consent (AOC) on June 13, 2011. The city is using a higher design flow for the WWTF upgrades to address needed treatment improvements while also mitigating impacts from inflow and infiltration (I&I). The city will then continue with long-term planning for I&I reduction.

2. FACILITY DESCRIPTION

The existing WWTF is a two-cell aerated lagoon with influent bar screen, influent Parshall flume, influent lift station, and effluent disinfection via chlorination and dechlorination followed by another Parshall flume. There is an existing recirculation pump station at the effluent end of the second basin. The current design average flow is listed as 256,126 gpd. The earthen basins are reportedly 108,900 ft^2 at the water surface, with a water depth of 8 ft., for the primary and 178,600 ft^2 at the water surface with a water depth of 5 ft for the secondary.

Construction will include a new backup (third) influent pump rated for 637 gpm at 15 ft TDH (10 hp), a baffle curtain to divide the first basin into two roughly equal cells, replacing the original aerators with subsurface combination fine-bubble aerator and coarse-bubble mixer units (10 aerators in the first half of the basin and 4 aerators in the second half of the basin, past the baffle) with a 25-hp blower capable of 470 scfm, a new 10-in gate valve will be installed between the two basins in lieu of the existing transfer pipe, a two-tank NitrOx™ MBBR reactor will be placed between the

two basins, with influent screen, 6 subsurface aerator/mixers per tank, media retention screening, and two 30-hp blowers (one duty, one standby) each capable of 613 scfm, and at the effluent, a new recirculation pump station (dual 3 hp pumps, 323.4 gpm against 16 ft of TDH) will transfer water back to the end of the first basin (second cell) via ~ 873 ft 6-in SDR-21 PVC. In addition, a new UV system will be installed, followed by a new Parshall flume.

The Marble Hill WWTF is located ~ 0.2 mi SE of South St and 3rd St, at the south end of Marble Hill, in Bollinger County, just north of the confluence of Opossum Creek and Crooked Creek. The proposed facility will have a design average flow of 450,000 gpd and will now serve a hydraulic population equivalent of approximately 4,500 people. The actual dry-weather population equivalent will be closer to 2,657 people.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits as established in the Antidegradation review dated September 25, 2019, as the design average flow is increasing to 450,000 gpd (0.45 MGD). The limits following the completion of construction will be applicable to the facility:

Parameter	Units	Monthly average limit
Biochemical Oxygen Demand$_5$	mg/L	20
Total Suspended Solids	mg/L	20
Ammonia as N-summer	mg/L	1.1
Ammonia as N-winter	mg/L	2.4
Oil & Grease	mg/L	10
pH	SU	6.5-9.0
E. coli	#/100mL	126
Percent removal (BOD & TSS)	%	85

4. ANTIDEGRADATION

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated September 25, 2019, due to increasing the design flow to 450,000 gpd. See **APPENDIX – ANTIDEGRADATION**.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

- Two-Cell Lagoon – Influent is pumped into the lagoon's primary earthen basin by an existing influent pump station through a 10-inch force main. The earthen basins are reportedly ~ 5,877,484 gallons (~2.5 acres at the water surface, with a water depth of 8 ft) for the aerated primary basin and ~ 6,530,788 gallons (~ 4.1 acres at the water surface with a water depth of 5 ft) for the secondary basin. At the new proposed design flow, there will reportedly be ~ 13 days of retention in the first basin and ~ 14.5 days of retention in the second basin.

Construction will cover the following items:

Components are designed for a new average flow of 450,000 gpd and a peak hourly flow of 79,167 gph (or ~ 1,900,000 gpd) entering the lagoon headworks.

- Influent Pump Station – Adding a new (third) submersible pump to the influent pump station, capable of 637 gpm against a TDH of 15 ft.

- A 30-mil baffle will be added to the middle of the first earthen basin to divide it into roughly equal cells (i.e., cells 1 and 2). The baffle window will be on the south side of the basin to minimize short-circuiting.

- Aerators (ARES 750T) will be added to all three lagoon cells (10 aerators in cell 1, 4 in cell 2, and 2 in cell 3), with a 25-hp blower capable of supplying a minimum of 470 scfm.

- Screening – Installation of a screening device to minimize large solids and wildlife from entering the NitrOx™ MBBR.
  - Course Screen – A coarse manual basket screen with ⅜-inch clear openings will be located at the inlet of the NitrOx™ reactor.

- Triplepoint Water Technologies, LLC NitrOx™ – The lagoon treated effluent will flow by gravity to the NitrOx™ system. The NitrOx™ system is capable of treating a design average flow of 450,000 gpd or a peak hourly flow of ~ 48,958 gph (or 1,175,000 gpd). The system is composed of two tanks with each approximately 24 ft x 16 ft x 15 ft with a sidewater depth of 12 ft. Total volume of the two tanks is ~ 68,936 gallons. The design average flow hydraulic retention time is 3.68 hours, and the design peak flow hydraulic retention time is 1.4 hours. A floating insulating cover will be installed in each tank. An immersion tank heater will be installed to maintain a minimum wastewater temperature of 5°C. Each tank shall be filled at least eighteen percent with high surface area HDPE media (~ 47 m^3 of media), which is equal to ~ 0.1 NH_4/1,000 ft^2-d. Aeration is by means of two 30-hp positive-displacement blowers (one duty, one standby) each capable of supplying at least 613 scfm to 12 diffusers (6 per tank). The effluent from the NitrOx™ will flow by gravity to the second earthen basin for polishing prior to disinfection and discharge.

- Recirculation Tank – Construction of a recirculation tank to pump wastewater from the effluent side of the second earthen basin to the effluent side of the first basin for additional treatment. The recirculation wet well is 6-ft diameter by 7½ ft deep with a water level depth of ~ 5½ ft. Flow is transferred via two 3 HP submersible pumps – each capable of 323.4 gpm against a TDH of 16 ft, through ~ 873 ft of 6-inch SDR-21 PVC force main. The primary basin will use up to 1 ft of its freeboard for storage during high precipitation events with high inflow and infiltration.

- Disinfection – Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
  - Non-Contact Ultraviolet (UV) – An open channel, gravity flow, low-pressure high-intensity UV non-contact disinfection system capable of treating a peak flow of 1,600,000 gpd while delivering a minimum UV intensity of 30 mJ/cm^2 with an expected ultraviolet transmissivity of sixty-five percent or greater. The UV system consists of 24 lamps per bank. Two non-contact UV banks are arranged in series in the reactor. The disinfected effluent will flow by gravity through flow measurement equipment and to Outfall No. 001.

- Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis.
  - Parshall Flume – A 9-inch throat effluent Parshall flume with ultrasonic flow sensor shall measure the secondary treated and disinfected wastewater prior to discharge at Outfall No. 001.

- Emergency Power – The existing station generator will continue to be used for the influent pump station. A portable generator with manual transfer switch will be used, as needed, to power the disinfection system in event of power failure. The lagoon system will also have ~ 1,685,872 gallons of storage within the two feet of freeboard, which will be used, as needed.

6. OPERATING PERMIT

Operating permit MO-0109762 expired December 31, 2022. An operating permit renewal was therefore drafted to reflect the facility based on the proposed construction activities. The draft operating permit for the proposed Marble Hill WWTF, MO-0109762, was successfully public noticed from June 23 to July 24, 2023, with no comments received. Once construction is completed, submit to the Department the Statement of Work Completed in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued. The modification fee has been paid.

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

Scott Adams, P.E.
Engineering Section
scott.adams@dnr.mo.gov

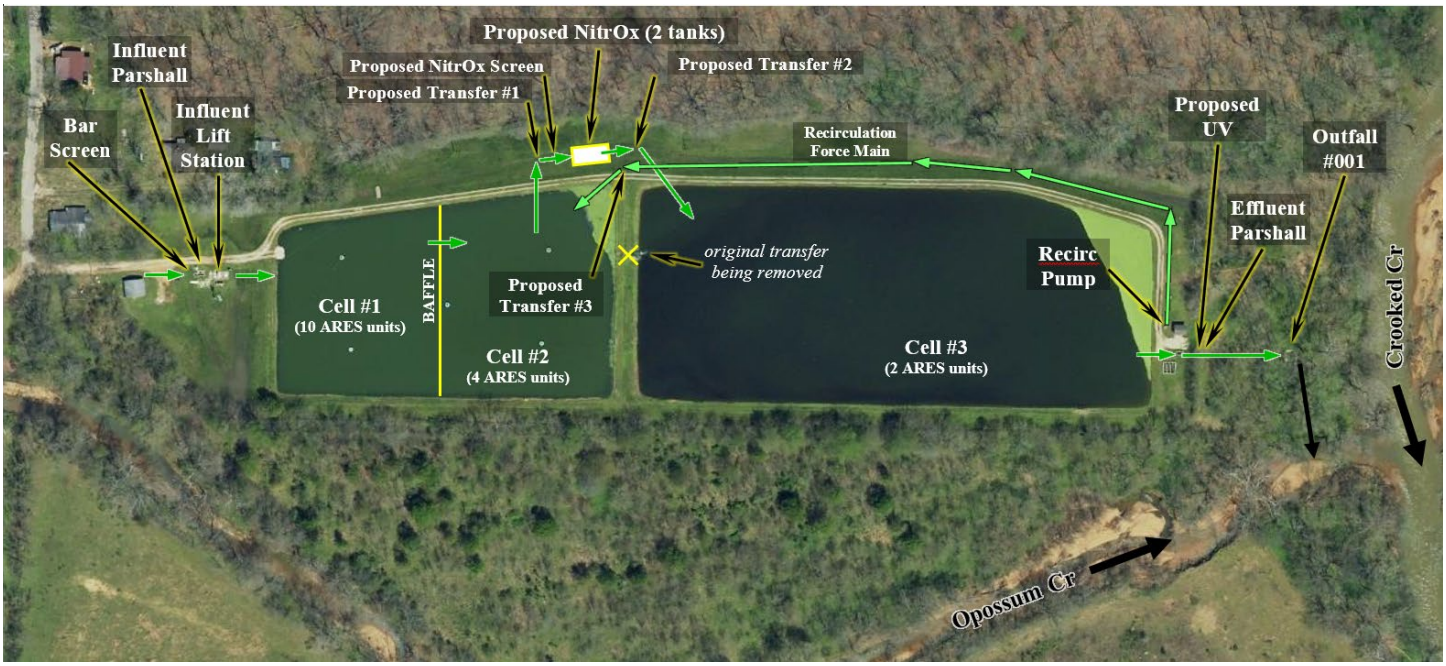
APPENDICES

- **Facility Flow Diagram and Layout**
- **CAFCOM**
- **Antidegradation**

APPENDIX – Facility Flow Diagram

Influent
Manual Bar Screen *(existing)*
Influent Parshall Flume *(existing)*
Influent Lift Station *(adding one additional pump)*
Influent Manhole *(existing)*
Aerated Cell #1 (Earthen Basin #1)
Lagoon Baffle *(30-mil PVC)*
Aerated Cell #2 (Earthen Basin #1) ← Transfer Structure #3
Transfer Structure #1
NitrOx™ Screen Structure
NitrOx™ MBBR Reactor (Two Tanks in Series)
Transfer Structure #2
Aerated (Mostly Quiescent) Lagoon Cell #3 (Earthen Basin #2)
↓ ↘ ↑
Effluent Depth Selector Box — Recirculation Pump Station
UV Disinfection *(2 banks, 3 racks per bank, 8 lamps per rack = 48 total lamps)*
Parshall Flume *(9-in)*
Outfall Structure *(#001)*

APPENDIX –Flow Layout



APPENDIX – COST ANALYSIS FOR COMPLIANCE:

Missouri Department of Natural Resources
Water Protection Program
Cost Analysis for Compliance
(In accordance with RSMo 644.145)

Marble Hill WWTF, Permit for Renewal and Upgrade/Expansion
City of Marble Hill
Missouri State Operating Permit #MO-0109762

Section 644.145 RSMo requires the Department of Natural Resources (Department) to make a "finding of affordability" when "issuing permits under" or "enforcing provisions of" state or federal clean water laws "pertaining to any portion of a combined or separate sanitary sewer system for publicly-owned treatment works." This cost analysis does not dictate how the permittee will comply with new permit requirements.

New Permit Requirements

The permit requires compliance with new monitoring requirements for Biochemical Oxygen Demand$_5$, Total Suspended Solids, Total Phosphorus, Total Nitrogen, Ammonia as N, and Nitrate + Nitrite. Total Kjeldahl Nitrogen is also required but is a calculation. This is offset with removal of Total Residual Chlorine and Dissolved Oxygen monitoring.

Connections
The number of connections was reported by the permittee on the permit modification application received on April 17, 2023. It is noted that the renewal application contained different numbers (350, 114, 0) but was received on September 6, 2022.

Connection Type	Number
Residential	487
Commercial	124
Industrial	0
Total	**611**

Data Collection for this Analysis
This cost analysis is based on data available to the Department as provided by the permittee and data obtained from readily available sources. For the most accurate analysis, it is essential that the permittee provides the Department with current information about the City's financial and socioeconomic situation. The financial questionnaire available to permittees on the Department's website (https://dnr.mo.gov/document-search/financial-questionnaire-mo-780-2511) is a required attachment to the permit renewal application. If the financial questionnaire is not submitted with the renewal application, the Department sends a request to complete the form with the welcome correspondence. Though the Department has made attempts to gather financial information from the City of Marble Hill; no information has been provided. The Department has relied heavily on readily available data to complete this analysis. If certain data was not provided by the permittee to the Department and the data is not obtainable through readily available sources, this analysis will state that the information is "unknown".

Eight Criteria of 644.145 RSMo
The Department must consider the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with new permit requirements.

(1) A community's financial capability and ability to raise or secure necessary funding;

Criterion 1 Table. Current Financial Information for the City of Marble Hill	
Current Monthly User Rates per 5,000 gallons*	$44.00
Median Household Income (MHI)[1]	$38,101
Current Annual Operating Costs (excludes depreciation)	unknown

*User Rates were obtained from the 2022 Missouri Public Utility Alliance Water and Wastewater Rate Survey.

(2) Affordability of pollution control options for the individuals or households at or below the median household income level of the community;

The following tables outline the estimated costs of the new permit requirements:

Criterion 2A Table. Estimated Cost Breakdown of New Permit Requirements				
New Requirement		Frequency	Estimated Cost	Estimated Annual Cost
Biochemical Oxygen Demand $_5$	Influent	Monthly	$44 x 12	$176
Total Suspended Solids	Influent	Monthly	$17 x 12	$68
Total Phosphorus	Influent	Quarterly	$26 x 4	$312
Total Nitrogen	Influent	Quarterly	$13 x 4	$156
Total Kjeldahl Nitrogen	Influent	Quarterly	Calculation = $0	
Nitrate + Nitrite	Influent	Quarterly	$44 x 4	$528
Ammonia	Influent	Quarterly	$22 x 4	$264
Total Kjeldahl Nitrogen	Effluent	Quarterly	Calculation = $0	
Nitrate + Nitrite	Effluent	Quarterly	$44 x 4	$352
Total Estimated Annual Cost of New Permit Requirements				$1,328

Criterion 2B Table. Estimated Costs for New Permit Requirements		
(1)	Estimated Annual Cost	$1,328
(2)	Estimated Monthly User Cost for New Requirements [2]	$0.18
	Estimated Monthly User Cost for New Requirements as a Percent of MHI [3]	0.006%
(3)	Total Monthly User Cost*	$44.18
	Total Monthly User Cost as a Percent of MHI [4]	1.391%

* Current User Rate + Estimated Monthly Costs of New Sampling Requirements

Due to the minimal cost associated with new permit requirements, the Department anticipates an extremely low to no rate increase will be necessary, which is unlikely to impact individuals or households of this community.

(3) An evaluation of the overall costs and environmental benefits of the control technologies;

This analysis is being conducted based on new requirements in the permit, which will not require the addition of new control technologies at the facility. However, the new sampling requirements are being established in order to provide data regarding the health of the receiving stream's aquatic life and to ensure that the existing permit limits are providing adequate protection of aquatic life. Improved wastewater provides benefits such as avoided health costs due to water-related illness, enhanced environmental ecosystem quality, and improved natural resources. The preservation of natural resources has been proven to increase the economic value and sustainability of the surrounding communities. Maintaining Missouri's water quality standards fulfills the goal of restoring and maintaining the chemical, physical, and biological integrity of the receiving stream; and, where attainable, it achieves a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water.

(4) Inclusion of ongoing costs of operating and maintaining the existing wastewater collection and treatment system, including payments on outstanding debts for wastewater collection and treatment systems when calculating projected rates:

The community did not provide the Department with this information, nor could it be found through readily available data.

(5) An inclusion of ways to reduce economic impacts on distressed populations in the community, including but not limited to low and fixed income populations. This requirement includes but is not limited to:

(a) Allowing adequate time in implementation schedules to mitigate potential adverse impacts on distressed populations resulting from the costs of the improvements and taking into consideration local community economic considerations.
(b) Allowing for reasonable accommodations for regulated entities when inflexible standards and fines would impose a disproportionate financial hardship in light of the environmental benefits to be gained.

The following table characterizes the current overall socioeconomic condition of the community as compared to the overall socioeconomic condition of Missouri. The following information was compiled using the latest U.S. Census data.

Criterion 5 Table. Socioeconomic Data [1, 5-9] for the City of Marble Hill

No.	Administrative Unit	Marble Hill City	Missouri State	United States
1	Population (2021)	1,704	6,141,534	329,725,481
2	Percent Change in Population (2000-2021)	13.4%	9.8%	17.2%
3	2021 Median Household Income (in 2022 Dollars)	$38,101	$65,928	$74,545
4	Percent Change in Median Household Income (2000-2021)	-2.1%	-1.1%	1.1%
5	Median Age (2021)	32.4	38.8	38.4
6	Change in Median Age in Years (2000-2021)	-3.7	2.7	3.1
7	Unemployment Rate (2021)	4.2%	4.5%	5.5%
8	Percent of Population Below Poverty Level (2021)	31.5%	12.8%	12.6%
9	Percent of Household Received Food Stamps (2021)	38.3%	10.1%	11.4%
10	(Primary) County Where the Community Is Located	Bollinger County		

(6) An assessment of other community investments and operating costs relating to environmental improvements and public health protection;

The city is in the process of upgrading the existing lagoon system to replace the aeration system and to add a baffle, a Nitrox MBBR, and UV disinfection, which is being funded through the American Rescue Plan Act (ARPA - https://moarpa.mo.gov/).

(7) An assessment of factors set forth in the United States Environmental Protection Agency's guidance, including but not limited to the "Combined Sewer Overflow Guidance for Financial Capability Assessment and Schedule Development" that may ease the cost burdens of implementing wet weather control plans, including but not limited to small system considerations, the attainability of water quality standards, and the development of wet weather standards;

The new requirements associated with this permit are unlikely to impose a financial burden on the community, nor will they require the City of Marble Hill to seek additional funding from an outside source.

(8) An assessment of any other relevant local community economic conditions.

The community did not report any other relevant local economic conditions.

The Department contracted with Wichita State University to complete an assessment tool that would allow for predictions on rural Missouri community populations and future sustainability. The purpose of the study is to use a statistical modeling analysis in order to determine factors associated with each rural Missouri community that would predict the future population changes that could occur in each community. A stepwise regression model was applied to 19 factors which were determined as predictors of rural population change in Missouri. The model established a hierarchy of the predicting factors which allowed the model to place a weighted value on each of the factors. A total of 745 rural towns and villages in Missouri received a weighted value for each of the predicting factors. The weighted values for each town / village were then added together to determine an overall decision score. The overall decision scores were then divided into five categories and each town was assigned to a different categorical group based on the overall decision score. The categorical groups were developed from the range of overall scores across all rural towns and villages within Missouri.

Based on the assessment tool, the City of Marble Hill has been determined to be a category 5 community. This means that the City of Marble Hill is predicted to be stable over time. The proposed construction is being funded through the ARPA grants.

Conclusion and Finding
As a result of new regulations, the Department is proposing modifications to the current operating permit that may require the permittee to increase monitoring. The Department has considered the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with the new permit requirements.

This analysis examined whether the new sampling requirements affect the ability of an individual customer or household to pay a utility bill without undue hardship or unreasonable sacrifice in the essential lifestyle or spending patterns of the individual or household. After reviewing the above criteria, the Department finds that the new sampling requirements may result in a low burden with regard to the community's overall financial capability and a low financial impact for most individual customers/households; therefore, the new permit requirements are affordable.

References

1. (A) 2021 MHI in 2021 Dollar: United States Census Bureau. 2017-2021 American Community Survey 5-Year Estimates, Table B19013: Median Household Income in the Past 12 Months (in 2021 Inflation-Adjusted Dollars). https://data.census.gov/cedsci/table?q=B19013&tid=ACSDT5Y2021.B19013.
   (B) 2000 MHI in 1999 Dollar: (1)For United States, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-1 Part 1. United States Summary, Table 5. Work Status and Income in 1999: 2000, Washington, DC. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
   (2) For Missouri State, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-27, Missouri, Table 10. Work Status and Income in 1999: 2000, Washington, DC. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
   (C) 2022 CPI, 2021 CPI and 1999 CPI: U.S. Department of Labor Bureau of Labor Statistics (2022) Consumer Price Index - All Urban Consumers, U.S. City Average. All Items. 1982-84=100 (unadjusted) - CUUR0000SAO. https://data.bls.gov/cgi-bin/surveymost?bls.
   (D) 2021 MHI in 2022 Dollar = 2021 MHI in 2021 Dollar x 2022 CPI /2021 CPI; 2000 MHI in 2021 Dollar = 2000 MHI in 1999 Dollar x 2022 CPI /1999 CPI.
   (E) Percent Change in Median Household Income (2000-2021) = (2021 MHI in 2022 Dollar - 2000 MHI in 2022 Dollar) / (2000 MHI in 2022 Dollar).
2. ($1,328/611)/12 = $0.18 (Estimated Monthly User Cost for New Requirements)
3. ($0.18/($38,101/12))100% = 0.006% (New Sampling Only)
4. ($44.18/($38,101/12))100% = 1.391% (Total User Cost)
5. (A) Total Population in 2021: United States Census Bureau. 2017-2021 American Community Survey 5-Year Estimates, Table B01003: Total Population - Universe: Total Population. https://data.census.gov/cedsci/table?q=B01003&tid=ACSDT5Y2021.B01003.
   (B) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
   (2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC. https://www2.census.gov/library/publications/2003/dec/phc-2-1-pt2.pdf.
   (C) Percent Change in Population (2000-2021) = (Total Population in 2021 - Total Population in 2000) / (Total Population in 2000).
6. Median Age in 2021: United States Census Bureau. 2017-2021 American Community Survey 5-Year Estimates, Table B01002: Median Age by Sex - Universe: Total population. https://data.census.gov/cedsci/table?q=B01002&tid=ACSDT5Y2021.B01002.
   (B) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC., Page 2. https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf.
   (2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC., Pages 64-92. https://www2.census.gov/library/publications/2003/dec/phc-2-1-pt2.pdf.
   (C) Change in Median Age in Years (2000-2021) = (Median Age in 2021 - Median Age in 2000).
7. United States Census Bureau. 2017-2021 American Community Survey 5-Year Estimates, S2301: Employment Status for the Population 16 Years and Over - Universe: Population 16 years and Over. https://data.census.gov/cedsci/table?q=unemployment&tid=ACSST5Y2021.S2301.
8. United States Census Bureau. 2017-2021 American Community Survey 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months. https://data.census.gov/cedsci/table?q=S1701&tid=ACSST5Y2021.S1701.
9. United States Census Bureau. 2017-2021 American Community Survey 5-Year Estimates, Table S2201: Food Stamps/Supplemental Nutrition Assistance Program (SNAP) - Universe: Households. https://data.census.gov/cedsci/table?q=S2201&tid=ACSST5Y2021.S2201.

Water Quality and Antidegradation Review

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

by
Marble Hill Wastewater Treatment Facility

September 2019

Table of Contents

1. FACILITY INFORMATION

FACILITY NAME: Marble Hill Wastewater Treatment Facility (WWTF) NPDES #: MO-0109762

FACILITY TYPE/DESCRIPTION:

FACILITY TYPE: POTW – SIC #4952

FACILITY DESCRIPTION: The current permitted design flow is 0.256 MGD. Actual flow is 0.352 MGD. The Marble Hill WWTF is a two cell aerated lagoon system with chlorine disinfection. The applicant is proposing to implement a NitrOx™ reactor along with UV disinfection. The proposed design flow will be 0.450 MGD.

COUNTY:	Bollinger	UTM COORDINATES:	X = 768553 / Y = 4131675
12- DIGIT HUC:	07140107-0305	LEGAL DESCRIPTION:	Sec. 8, T30N, R10E
EDU*:	Ozark/Upper St. Francis/Castor	ECOREGION:	Ozark

* - Ecological Drainage Unit

2. WATER QUALITY 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 Missouri Department of Natural Resources (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 Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1. WATER QUALITY HISTORY:

The discharge monitoring data over the last five years indicated significant issues with flow through the plant. The average values over the sampling period from January 2014 to September 2019 were as follows: Ammonia (summer) –3.0 mg/L, Ammonia (winter) – 5.8 mg/L, BOD_5 – 12.6 mg/L, TSS – 11.7 mg/L, Oil & Grease – 4.4 mg/L, pH – 7.4, DO – 6.25 mg/L. The facility has reported six exceedances of monthly *E. coli* limits in the last five years with the most recent being in May 2017. The highest maximum daily flow reported since 2014 was 1.56 MGD while averaging the reported monthly average flow value was 0.450 MGD.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.696	Tertiary	Tributary to Opossum Creek	0.0
			Opossum Creek	0.03

3. RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Tributary to Opossum Creek	-	-	0	0	0	General Criteria
Opossum Creek	P	2269	0	0	0	AQL, HHP, IRR, LWW, SCR, WBC-B

** Irrigation (IRR), Livestock & Wildlife Protection (LWP), Protection of Warm Water Aquatic Life (AQL), Human Health Protection (HHP), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation – Category A (WBC-A), Whole Body Contact Recreation – Category B (WBC-B), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

RECEIVING WATER BODY SEGMENT #1: Tributary to Opossum Creek
Upper end segment* UTM coordinates: X=768555 / Y=4131675 (Outfall)
Lower end segment* UTM coordinates: X=768579 / Y=4131617 (Meets classified)

RECEIVING WATER BODY SEGMENT #2: Confluence between Opossum Creek and Hurricane Creek
Upper end segment* UTM coordinates: X=768579 / Y=4131617 (Opossum Creek)
Lower end segment* UTM coordinates: X=768640 / Y=4131613 (Confluence with Hurricane Creek

*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.

4. GENERAL COMMENTS

Dominic Thompson, P.E. with Smith & Co. Engineers prepared, on behalf of the City of Marble Hill, the Antidegradation Review Summary/Request received July 18, 2019.

Applicant elected to determine that discharge of all pollutants of concern (POC) is non-degrading or insignificant to the receiving stream. 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 B was used to develop this review document.

A Geohydrological Evaluation was submitted for this facility upgrade. The stream is gaining for discharge purposes (Appendix A: Map).

A Missouri Department of Conservation Natural Heritage Review Report was obtained by the applicant; MDC found no record or records of wildlife preserves, critical habitats, or state or federal endangered-list species records within one mile of the site.

5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *Marble Hill Wastewater Treatment Facility Preliminary Engineering Report* received July 18, 2019.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix B). Pollutants of concern are defined as those pollutants "proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge" (AIP, Page 7). Tier 2 is assumed for all POCs; however, tier determinations were not necessary with maintenance of mass loading determinations (see Appendix B).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
BOD_5	*	Insignificant	
Total Suspended Solids (TSS)	*	Insignificant	
Ammonia as N	*	Insignificant	
pH	***		Permit limits applied
Escherichia coli (*E. coli*)	*	Insignificant	Permit limits applied
Total Phosphorus	**		
Total Nitrogen	**		

*Tier determination not possible with maintenance of mass loading: ** No in-stream standards for these parameters. *** Standards for these parameters are ranges.

The following Antidegradation Review Summary attachments in Appendix B were used by the applicant: For pollutants of concern, the attachments are:

☒ Path A, Tier 2: Non-Degrading

5.2. EXISTING WATER QUALITY

No existing water quality data was submitted.

5.3. NO DISCHARGE EVALUATION

According to 10 CSR 20-6.010 (4)(D), reports for the purpose of constructing a wastewater treatment facility shall consider the feasibility of constructing and operating a no discharge facility. Missouri's antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required. For this reason, the no discharge evaluation should be completed during the submittal of engineering report or facility plan for the purpose of obtaining a construction permit.

5.4. LOSING STREAM ALTERATIVE DISCHARGE LOCATION

Under 10 CSR 20-7.015(4) (A), *discharges to a 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*. The facility does not discharge to a losing stream segment or will not discharge within 2 miles of a losing stream segment.

5.5. DEMONSTRATION OF INSIGNIFICANCE

In Section II.A of *Missouri's Antidegradation Rule and Implementation Procedure,* 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 the Antidegradation Review Summary Path A: Tier 2 – Non-degrading Mass Balance received July 18, 2019, Table 2 below summarizes the results of current loading based on the current permit concentrations and proposed loadings based on the proposed permit concentrations.

Table 2. Net Change in Loadings Based upon Current and Proposed Permit Limits.

POLLUTANTS OF CONCERN	CURRENT LIMIT (MG/L)	PROPOSED LIMIT (MG/L)	CURRENT LOADING (LBS/DAY)	PROPOSED LOADING (LBS/DAY)	NET CHANGE (LBS/DAY)
BOD_5	45 (AWL) / 40 (AML)	20 (AWL) 20 (AML)	96.1 85.4	75.1 75.1	-21.0 -10.3
Total Suspended Solids (TSS)	100 (AWL) / 80 (AML)	20 (AWL) 20 (AML)	213.6 170.9	75.1 75.1	-138.5 -95.8
Ammonia (Summer)	7.0 (MDL) 1.9 (AML)	4.0 (MDL) 1.1 (AML)	15.0 4.1	15.0 4.1	0.0 0.0
Ammonia (Winter)	11.5 (MDL) 4.2 (AML)	6.5 (MDL) 2.4 (AML)	24.6 9.0	24.6 9.0	0.0 0.0
Escherichia coli (*E. coli*)	Regulatory limits apply	Regulatory limits apply	Not applicable**	Not applicable	Not applicable
pH	6.5-9.0 SI units	6.5-9.0 SI units	Not applicable**	Not applicable	Not applicable
Oil & Grease	Regulatory limits apply	Regulatory limits apply	Not applicable**	Not applicable	Not applicable

*WQBEL=water quality based effluent limit. **See Derivation and Discussion of Limits, Section 10.
***Value is in the current permit, rather than the expired permit. AWL = average weekly limit.

Current design flow (Qd) = 0.45 MGD
Mass conversion -- 1 mg/L = 8.34 lbs/million gallons
Wasteload Allocation (WLA) = maximum daily or weekly average

Existing Load (lbs/day) = Mass conversion * WLA * Qd
Example: 8.34 (lbs/MG)/(mg/L) * 1.9 mg/L * 0.45 MGD = 4.1 lbs/day

5.6. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

Missouri's antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required. Thus, the Tier 2 Review is not required.

6. GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDEGRADATION REVIEW

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. 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.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.

7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.
9. If the proposed treatment technology is not covered in 10 CSR 20-8 Design Guides, the treatment process may be considered a new technology. As a new technology, the permittee will need to work with the review engineer to ensure equipment is sized properly. 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.

7. Mixing Considerations

Mixing Zone (MZ): Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)].

8. Permit Limits and Monitoring Information

Wasteload Allocation Study Conducted (Y or N):	N	Use Attainability Analysis Conducted (Y or N):	N	Whole Body Contact Use Retained (Y or N):	Y

Table 3. Effluent Limits for Outfall #001

Parameter	Units	Daily Maximum	Weekly Average	Monthly Average	Basis for Limit (Note 2)	Monitoring Frequency
Flow	MGD	*		*	FSR	once/month
BOD_5***	MG/L		20	20	NDEL	once/month
TSS***	MG/L		20	20	NDEL	once/month
pH	SU	6.5 – 9.0		6.5 – 9.0	FSR	once/month
Ammonia as N (April1 – Sept 30)	MG/L	4.0		1.1	WQBEL/ NDEL	once/month
Ammonia as N (Oct 1 – Mar 31)	MG/L	6.5		2.4	WQBEL/ NDEL	once/month
Oil & Grease	MG/L	15		10	FSR	once/month
Escherichia coliform (*E. coli*)	Note 1		630**	126**	FSR	once/week
Total Phosphorus	MG/L	*		*	FSR	once/quarter
Total Nitrogen	MG/L	*		*	FSR	once/quarter

Note 1 – Colonies/100 mL
Note 2– Water Quality-based Effluent Limitation – WQBEL; or Minimally Degrading Effluent Limit – MDEL; or Preferred Alternative Effluent Limit – PEL; or Technology-based Effluent Limit – TBEL; or No Degradation effluent Limit – NDEL; or Federal/State Regulation – FSR; or Not Applicable – N/A. Also, please see the **General Assumptions of the WQAR #4 & #5.**

* Monitoring requirements only.

** The Monthly and Weekly Average for *E. coli* shall be reported as a Geometric Mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

*** This facility is required to meet a removal efficiency of 85% or more for BOD_5 and TSS. Influent BOD_5 and TSS data should be reported to ensure removal efficiency requirements are met.

9. Receiving Water Monitoring Requirements

No receiving water monitoring requirements recommended at this time.

10. Derivation and Discussion of Limits

Wasteload allocations and limits were calculated using two methods:

1) Water quality-based – Using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where: C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = 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).

Chronic wasteload allocations (WLAc) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and upstream stream flow without mixing considerations. Acute wasteload allocations are only determined in the absence of applicable chronic criteria.

10.1. Outfall #001 – Main Facility Outfall

10.2. Limit Derivation

- **Flow**. In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. 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.

- **Biochemical Oxygen Demand (BOD_5).** BOD_5 limits of 20 mg/L monthly average, 20 mg/L average weekly. Due to the proposed upgrades to the facility for the purpose of permit limit derivation the treatment will now be considered secondary treatment. The technology-based secondary limitations found at 10 CSR 20-7.015 (8) of 30 mg/L monthly and 45 mg/L average weekly are less protective of water quality than the proposed non-degradation expansion limitations. The table below shows that the expanded loading will be reduced as compared to the current permitted loading. This demonstration of insignificance satisfies the requirements of the AIP. These limitations are non-degrading and protective of existing water quality.

BOD	existing flow (MGD)	current limit (mg/L)	conversion factor	existing load (lbs/day)		proposed flow (MGD)	non-deg max limit (mg/L)
AML	0.256126	40	8.34	85.4		0.45	22.8
AWL	0.256126	45	8.34	96.1		0.45	25.6

Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Total Suspended Solids (TSS).** 20 mg/L monthly average, 20 mg/L average weekly limit. Due to the proposed upgrades to the facility for the purpose of permit limit derivation the treatment will now be considered secondary treatment. The table below demonstrates what the maximum allowable effluent concentration would be to maintain or reduce pollutant loading to the stream. These limits are not protective of secondary treatment limits of 30 mg/L monthly and 45 mg/L average weekly, however; the applicant proposed effluent limits are protective of secondary treatment and provide a reduction in loading to the stream. The technology-based secondary limitations found at 10 CSR 20-7.015 (8) of 30 mg/L monthly and 45 mg/L average weekly are less protective of water quality than the proposed non-degradation expansion limitations. The table below shows that the expanded loading will be reduced as compared to the current permitted loading. This demonstration of insignificance satisfies the requirements of the AIP. These limitations are non-degrading and protective of existing water quality.

TSS	existing flow (MGD)	current limit (mg/L)	conversion factor	existing load (lbs/day)		proposed flow (MGD)	non-deg max limit (mg/L)
AML	0.256126	80	8.34	170.9		0.45	45.5
AWL	0.256126	100	8.34	213.6		0.45	56.9

Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Total Ammonia Nitrogen.**

  A proposed discharge will be non-degrading after demonstrating the pollutant loading to the receiving waterbody will be maintained or reduced with the expanded discharge flows. In order to make this demonstration the permitted final effluent limit and design flow are used to calculate the mass load contributed to the waterbody. A maximum allowable effluent limit concentration can be calculated by using the equations below.

  Due to discrepancy in the existing permitted effluent limits for ammonia and those calculated in the fact sheet of the permit, the department further examined the discharge monitoring results during the period of January 2014 to September 2019. The analysis shows that the monthly average effluent concentration for summer and winter as well as the maximum recorded daily concentrations more closely reflect the existing stream condition and the final effluent limits in current permit. Based on the review of reported effluent concentrations, final effluent limits were utilized as the basis for derivation of non-degrading ammonia effluent limits. The non-degrading ammonia limits are protective of designated uses within the stream and the proposed upgrade is not expected to result in further degradation of water quality.

  Notice to Permittee: On August 22, 2013, the Environmental Protection Agency (EPA) published a notice in the Federal Register announcing the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, *Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013,* is not a rule, nor automatically part of a state's water quality standards. States must adopt new ammonia criteria consistent with EPA's published ammonia criteria into their water quality standards that protect aquatic life in water.

  The Water Protection Program (WPP) is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The Department has begun discussions about how these new criteria will be implemented. WPP is suggesting that all permittees consider the lower ammonia criteria and adjust the proposed alternative's treatment design, if they so choose. Consideration of the future ammonia criteria at this time could avoid a near-future upgrade. More information about the new ammonia criteria for aquatic life protection may be found at: http://dnr.mo.gov/pubs/pub2481.htm.

Non-Degrading Effluent Limits:

Existing Load = Current Limit * Conversion Factor * Existing Design Flow
Maximum Non-Degrading Effluent Limit = Existing Load / (Conversion Factor * Proposed Flow)

Ammonia (summer)	existing flow (MGD)	current limit (mg/L)	conversion factor	existing load (lbs/day)		proposed flow (MGD)	non-deg max limit (mg/L)
AML	0.256126	1.9	8.34	4.1		0.45	1.1
MDL	0.256126	7	8.34	15.0		0.45	4.0
Ammonia (winter)	**existing flow (MGD)**	**current limit (mg/L)**	**conversion factor**	**existing load (lbs/day)**		**proposed flow (MGD)**	**non-deg max limit (mg/L)**
AML	0.256126	4.2	8.34	9.0		0.45	2.4
MDL	0.256126	11.5	8.34	24.6		0.45	6.5

- **pH**. – 6.5-9.0 SU. Technology based effluent limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU. No mixing zone is allowed due to the classification of the receiving stream, therefore the water quality standard must be met at the outfall.

- ***Escherichia coli (E. coli)***. Monthly Average of 126 per 100 mL as a geometric mean and Daily Maximum of 630 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (A) designated use of the receiving stream, as per 10 CSR 20-7.031(5)(C). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d).

  For facilities greater than 100,000 gpd: At a minimum, weekly monitoring is required during the recreational season (April 1 – October 31), with compliance to be determined by calculating the geometric mean of all samples collected during the reporting period (samples collected during the calendar week for the weekly average, and samples collected during the calendar month for the monthly average). The weekly average requirement is consistent with EPA federal regulation 40 CFR 122.45(d). Please see **GENERAL ASSUMPTIONS OF THE WQAR #7.**

- **Oil & Grease**. Conventional pollutant, [10 CSR 20-7.031, Table A]. Effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

- **Total Phosphorus and Total Nitrogen**. Monitoring required for facilities greater than 100,000 gpd design flow per 10 CSR 20-7.015(9)(D)7. Once per quarter sampling for one permit cycle or up to 5 years if permit cycle is less than 5 years.

11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed facility discharge will be non-degrading in the segment identified as the Tributary to Opossum Creek. Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. 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: Aaron Sawyer
Date: 09/24/2019
Unit Chief: John Rustige, P.E.

Appendix A: Map of Discharge Location Outfall #001

Appendix B: Antidegradation Review Summary Attachments
The attachments that follow contain summary information provided by the applicant.

1) Antidegradation Review Summary/Request

RECEIVED
JUL 18 2019
Water Protection Program

ACT640

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

FOR DEPARTMENT USE ONLY	
APP NO.	
FEE RECEIVED: $250.00	CHECK NO.: 13459
DATE RECEIVED: 7-18-19	

1. FACILITY

NAME			
Marble Hill Wastewater Treatment Facility		COUNTY: Bollinger	
ADDRESS (PHYSICAL): 302 Union Street	CITY: Marble Hill	STATE: MO	ZIP CODE: 63764
PERMIT NUMBER: MO-0109762	PROPOSED DESIGN FLOW: 450,000	SIC / NAICS CODE: 4952	

2. OWNER

NAME			
City of Marble Hill			
ADDRESS: 302 Union St.	CITY: Marble Hill	STATE: MO	ZIP CODE: 63764
EMAIL ADDRESS: cityofmarblehill63764@yahoo.com		TELEPHONE NUMBER WITH AREA CODE: 573-238-3622	

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

NAME	SECRETARY OF STATE CHARTER NUMBER		
Same as Above			
ADDRESS	CITY	STATE	ZIP CODE
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	

4. CONSULTANT

PREPARER NAME	COMPANY NAME		
Dominic Thompson, P.E.	S.H. Smith & Company		
ADDRESS: 901 Vine Street	CITY: Poplar Bluff	STATE: MO	ZIP CODE: 63901
EMAIL ADDRESS: domt@shsmithco.com		TELEPHONE NUMBER WITH AREA CODE: 573-785-9621	

5. RECEIVING WATER BODY SEGMENT #1

NAME: Unnamed tributary to Opossum Creek

5.1 Upper end of segment – Location of discharge
UTM: X= _____, Y= _____ OR Lat 37°17'35"N, Long 89°58'14"W

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

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

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

NAME:

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

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

7. DECHLORINATION

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

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

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

MO 780-2025 (03-19) Page 1

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.

See Attached Preliminary Engineering Report.

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* mg/L	Concentration* µg/L	Path / Tier Review Attachment Used for POC Evaluation	Average Monthly Limit	Daily Maximum Limit or Average Weekly Limit
BOD_5	X		Path A/Tier 2	40	45
TSS	X		A/2	80	100
Ammonia (Summer)	X		A/2	1.9	7.0
Ammonia (Winter)	X		A/2	4.2	11.5
Total Phosphorus	X				

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

MO 780-2025 (03-19)

12. PROPOSED PROJECT SUMMARY

See Attached Preliminary Engineering Report

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

13. CONTINUING AUTHORITY WAIVER (For New Discharges)

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

14. APPLICATION FEE

☐ CHECK NUMBER ☐ JETPAY CONFIRMATION NUMBER

15. SIGNATURE

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

SIGNATURE	DATE
	07/01/2019
PRINT NAME: Mike Johnson	TITLE: City Administrator

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

MO 780-2025 (03-19) Page 3

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

ANTIDEGRADATION REVIEW SUMMARY
PATH A: TIER 2 – NON-DEGRADATION MASS BALANCE

1. FACILITY

NAME	COUNTY
Marble Hill Wastewater Treatment Facility	Bollinger

2. EXISTING LOAD SUMMARY – NET CHANGE

Pollutant of Concern	Type of Limit	Current Permit Limit*	Current Design Flow	Current Load	New Load	New Expanded Design Flow	No-Degradation Expansion Concentration
		mg/L	MGD	lbs/day	lbs/day	MGD	mg/L
Biochemical Oxygen Demand (BOD_5)	AWL	45	.256126	96.18	75.11	.45	20
	AML	40		83.87	75.11		20
Total Suspended Solids (TSS)	AWL	100		213.74	75.11		20
	AML	80		170.99	75.11		20
Ammonia (Summer)	MDL				26.28		7.0
	AML				7.13		1.9
Ammonia (Winter)	MDL				43.18		11.5
	AML				15.77		4.2

* If current facility discharges the pollutant of concern and does not have a current permit limit for this pollutant of concern, the water quality standard should be used in the calculation.

AWL – Average Weekly Limit MDL – Maximum Daily Limit AML – Average Monthly Limit

Equation: Load = Limit (mg/L)* Conversion Factor (8.34 (LBS/MG)/(mg/L))*Design Flow (MGD). Note: New Load must be less than or equal to the Current Load.

Is mass balance non-degradation proposed for all pollutants of concern? ☑ Yes ☐ No
If no, the appropriate additional forms must be used for those pollutants which are degrading.

MO 780-2872 (02-19)

3. PROPOSED PROJECT SUMMARY

See attached Preliminary Engineering Report

2) Geohydrologic Evaluation

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

LWE19087
Bollinger County

RECEIVED
JUL 18 2019
Water Protection Program

June 28, 2019

Dominic Thompson
901 Vine Street
Poplar Bluff, MO 63901

RE: Marble Hill Wastewater Treatment Facility

Dear Dominic Thompson:

On May 31, 2019, the Missouri Geological Survey received a request to perform a geohydrologic evaluation for the above referenced project located in Bollinger 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 gspgeol@dnr.mo.gov.

Sincerely,

MISSOURI GEOLOGICAL SURVEY

Kirsten Schaefer

Kirsten Schaefer
Geologist
Environmental Geology Section

STATE OF MISSOURI
RG 2014001481
REGISTERED GEOLOGIST

06/28/2019

c: Dominic Thompson
WPP
Southeast Regional Office

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

Project ID Number
LWE19087
County
Bollinger

Request Details

Project: Marble Hill Wastewater Treatment Facility

Legal Description: 08 T30N R10E

Quadrangle: Marble Hill
Latitude: 37 17 35.34
Longitude: -89 58 21.95

Property Owner
Name: Dominic Thompson
Address: 901 Vine Street
City: Poplar Bluff
State: MO Zip: 63901
Phone: 573-429-1894
Email:

Requestor
Name: Dominic Thompson
Address: 901 Vine Street
City: Poplar Bluff
State: MO Zip: 63901
Phone: 573-785-9621
Email: domt@shsmithco.com

Project Details

Report Date: 06/28/2019
Date of Field Visit: 06/18/2019

Previous Reports: Not Applicable

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

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

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

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

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

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

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

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

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

Bedrock: The uppermost bedrock consists of approximately 260 feet of Ordovician-age Jefferson City-Cotter Dolomite

Surficial Materials: Surficial materials consist of approximately 30 feet of moderately well drained, low permeability silty clay

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

Project ID Number
LWE19087
County
Bollinger

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

Remarks:

On June 18, 2019, a geologist from the Geological Survey Program (GSP) conducted a geohydrologic evaluation for an existing discharging lagoon associated with the Marble Hill Wastewater Treatment Facility in Bollinger County, Missouri. The site is located in an alluvial floodplain at the end of 3rd Street in Marble Hill. The existing discharging lagoon consists of two cells with a combined area of approximately 7 acres. The purpose of the site visit was to observe the geologic and hydrologic elements and determine the potential for groundwater contamination in the event of lagoon liner or treatment failure.

Bedrock was not observed on site. According to logs of nearby wells, the uppermost bedrock consists of approximately 260 feet of Ordovician-age Jefferson City-Cotter Dolomite. The Jefferson City-Cotter Dolomite in this area exhibits high secondary permeability in an upper weathered zone, with low permeability at depth. Surficial materials consist of approximately 30 feet of moderately well drained, low permeability silty clay with sparse pebble to cobble sized chert and limestone clasts.

The facility discharges to Opossum Creek, which joins Crooked Creek approximately 200 feet from the outfall. The receiving streams were evaluated during the site visit were classified as gaining. Based on the characteristics observed, the site receives a slight overall geological limitation rating and a moderate collapse potential rating. The potential for regional groundwater contamination is minimal, however, in the event of treatment failure the surface waters of Opossum Creek and Crooked Creek may be adversely impacted.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI GEOLOGICAL SURVEY

REQUEST FOR GEOHYDROLOGIC EVALUATION OF LIQUID-WASTE TREATEMENT FACILITY/SITE

FOR OFFICE USE ONLY
PROJECT ID NUMBER

FACILITY OR PROJECT LOCATION

FACILITY OR PROJECT NAME Marble Hill Wastewater Treatment Facility			
LEGAL DESCRIPTION 08 T30N R10E			QUADRANGLE NAME Marble Hill
WRITTEN LOCATION IF LEGAL DESCRIPTION IS UNAVAILABLE (USE COMMENTS AREA IF NECESSARY)			
COUNTY Bollinger	COORDINATE LOCATION LATITUDE: 37 17 35.34	LONGITUDE: -89 58 21.95	

OWNER INFORMATION

PROPERTY OWNERS NAME Dominic Thompson			TELEPHONE 573-429-1894
ADDRESS 901 Vine Street	CITY Poplar Bluff	STATE MO	ZIP CODE 63901
EMAIL ADDRESS (PLEASE PROVIDE AN EMAIL ADDRESS IF YOU WISH TO RECEIVE ELECTRONIC DELIVERY OF EVALUATION REQUEST)			
FACILITY ADDRESS (IF DIFFERENT FROM OWNERS) 901 Vine Street	CITY Poplar Bluff	STATE	ZIP CODE 63901

EVALUATION REQUESTED BY

NAME AND COMPANY OF REQUESTOR Dominic Thompson			TELEPHONE 573-785-9621
ADDRESS 901 Vine Street	CITY Poplar Bluff	STATE MO	ZIP CODE 63901
EMAIL ADDRESS (PLEASE PROVIDE AN EMAIL ADDRESS IF YOU WISH TO RECEIVE ELECTRONIC DELIVERY OF EVALUATION REQUEST) domt@shsmithco.com			

FACILITY INFORMATION

TYPE OF FACILITY LAGOON OR STORAGE BASIN	LAGOON/STORAGE BASIN LINER CONSTRUCTION MATERIALS EXISTING SOILS	DISCHARGE FACILITIES WILL DISCHARGE	TYPE OF WASTE HUMAN (DOMESTIC)
NUMBER OF ACRES OF LAND APPLICATION OR SUBSURFACE SOIL ABSORPTION AREA ACRES	WILL OWNER APPLY FOR STATE REVOLVING FUNDS? No	IF YES, WILL AN NPDES PERMIT BE REQUIRED? No	

THIS PORTION APPLIES TO LAGOONS AND STORAGE BASINS ONLY

EXISTING	TOTAL ESTIMATED SIZE OF STORAGE BASIN/LAGOON GREATER THAN 4 ACRES	MAXIMUM OPERATING DEPTH OF LIQUIDS GREATER THAN 5 FEET BUT LESS THAN OR EQUAL TO 10 FEET	MAXIMUM DEPTH OF PROPOSED EXCAVATION IN FEET
WILL FACILITY BE PART OF A CLASS 1A CONFINED ANIMAL FEEDING OPERATION? No			
COMMENTS			
REQUESTORS SIGNATURE			
PROPERTY OWNERS SIGNATURE(INDICATES PERMISSION TO ACCESS PROPERTY FOR EVALUATION)			DATE

3) **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.

RECEIVED
JUL 18 2019
Water Protection Program

Natural Heritage Review Level Three Report: Species Listed Under the Federal Endangered Species Act

There are records for 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: Marble Hill Wastewater Treatment Facility #5840
Project Description: Modification of existing treatment facility
Project Type: Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Modification
Contact Person: Dominic Thompson
Contact Information: domt@shsmithco.com or 573-785-9621

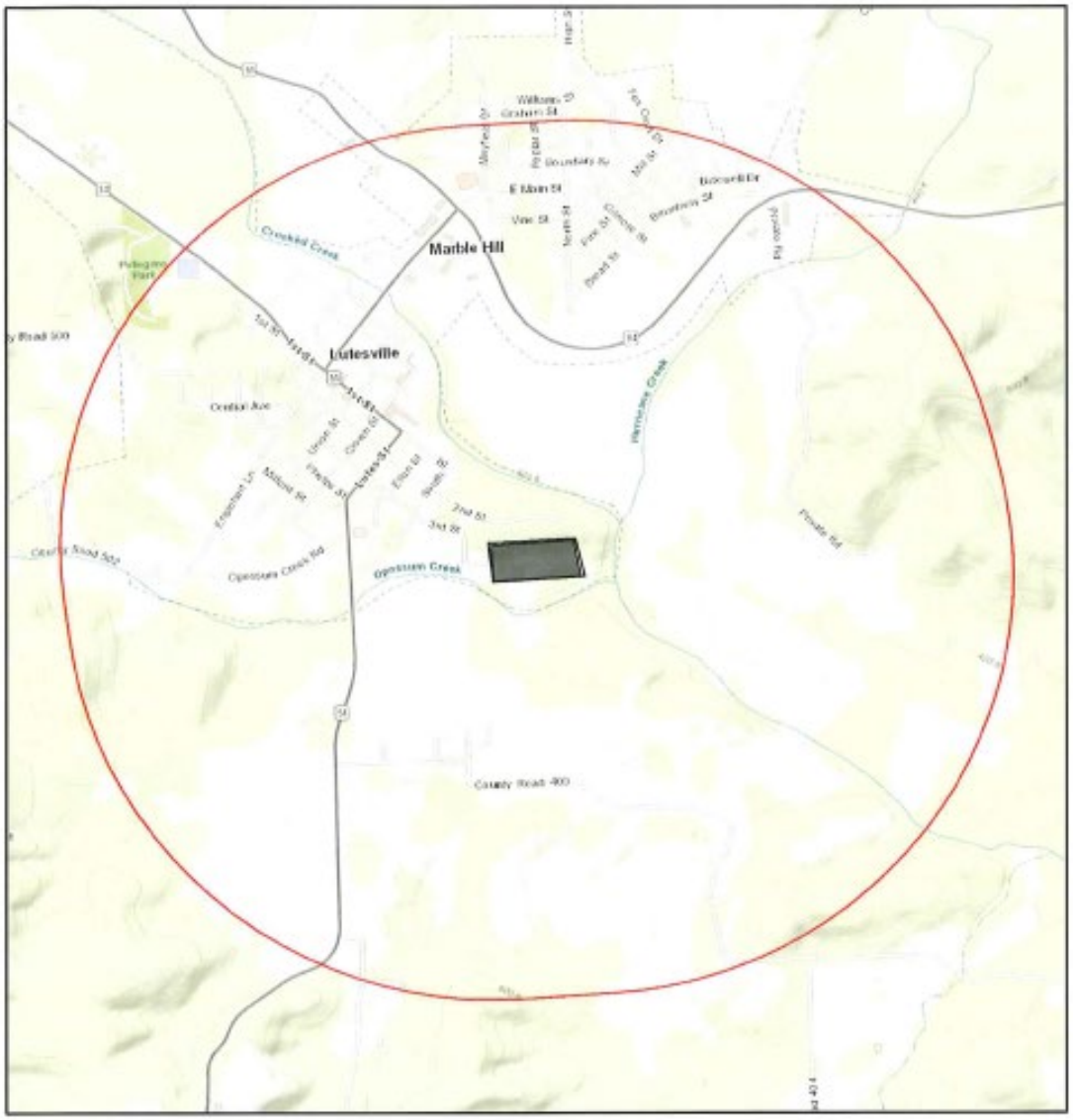
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive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

Marble Hill Wastewater Treatment Facility



May 31, 2019

1:20,916

0 0.175 0.35 0.7 mi
0 0.275 0.55 1.1 km

Project Boundary

Buffered Project Boundary

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Species or Communities of Conservation Concern within the Area:

There are records for 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.

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

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:

No results have been identified for this project location.

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.
Revegetation of disturbed areas is recommended to minimize erosion, as is restoration with of native plant species compatible with the local landscape and for wildlife needs. Annuals like ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch and sericea lespedeza.
Management Recommendations for Construction Projects Affecting Missouri Streams and Rivers is a Conservation Department publication available at http://mdc.mo.gov/sites/default/files/resources/2013/02/constprojnearstreams_2013.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.**

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See http://mdc.mo.gov//9633 for more information.

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

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

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

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

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

Miscellaneous Information

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

Additional information on Missouri's sensitive species may be found at http://mdc.mo.gov/discover-nature/field-guide/endangered-species . Detailed information about the animals and some plants mentioned may be accessed at http://mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx . If you would like printed copies of best management practices cited as internet URLs, please contact the Missouri Department of Conservation.

RECEIVED

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
APR 17 2023
APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY
Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $1000.00	CHECK NO. 15660
DATE RECEIVED 4-17-23 JB	

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: ARPA Project #: ww934dedef09b2

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☑ YES Date of Approval: 9/2019 ☐ N/A

1.3 Has the department approved the proposed project's facility plan*?
☑ YES Date of Approval: _____ ☐ NO (If No, complete No. 1.4.)

1.4 [Complete only if answered No on No. 1.3.] Is a copy of the facility plan* for wastewater treatment facilities included with this application?
☐ YES ☐ NO ☐ Exempt because _____

1.5 Is a copy of the appropriate plans* and specifications* included with this application?
☑ YES Denote which form is submitted: ☑ Hard copy ☐ Electronic copy (See instructions.) ☐ NO

1.6 Is a summary of design* included with this application? ☑ YES ☐ NO

1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?
☐ YES Date of submittal: _____
☐ Enclosed is the appropriate operating permit application and fee submittal. Denote which form: ☐ A ☐ B ☐ B2
☑ N/A: However, In the event the department believes that my operating permit requires revision to permit limitation such as changing equivalent to secondary limits to secondary limits or adding total residual chlorine limits, please share a draft copy prior to public notice? ☐ YES ☐ NO

1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? ☑ YES ☐ NO

1.9 Is the appropriate fee or JetPay confirmation included with this application? ☑ YES ☐ NO
See Section 7.0

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT
Marble Hill Wastewater & Capital Improvements

2.2 ESTIMATED PROJECT CONSTRUCTION COST
$ 4,567,456.00

2.3 PROJECT DESCRIPTION
See Facility Plan.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Sludge is retained within the lagoon.

2.5 DESIGN INFORMATION

A. Current population: 1,388 ; Design population: 2,657

B. Actual Flow: 352k gpd; Design Average Flow: 456k gpd;
Actual Peak Daily Flow: 665k gpd; Design Maximum Daily Flow: _____ gpd; Design Wet Weather Event: 1mgd

2.6 ADDITIONAL INFORMATION

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

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

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Marble Hill Wastewater Treatment Facility	573-238-3622	

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
South and 3rd Street	Marble Hill	MO	63764	Bollinger

Wastewater Treatment Facility: Mo- 0109762 (Outfall 1 Of 1)

3.1 Legal Description: _____ ¼, _____ ¼, _____ ¼, Sec. 8, T 30N, R 10E
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 768553 Northing (Y): 4131675
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Opossum Creek

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
City of Marble Hill	573-238-3622	clerk@cityofmarblehill.org

ADDRESS	CITY	STATE	ZIP CODE
302 Union Street	Marble Hill	MO	63764

5.0 CONTINUING AUTHORITY: A continuing authority is a company, business, entity or person(s) that will be operating the facility and/or ensuring compliance with the permit requirements.

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Same as above		

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	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Dominc Thompson P.E./SH Smith & Company	573-785-9621	domt@shsmithcom.com

ADDRESS	CITY	STATE	ZIP CODE
901 Vine St.	Poplar Bluff	MO	63901

7.0 APPLICATION FEE

☐ CHECK NUMBER ☐ JETPAY CONFIRMATION NUMBER

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	DATE
Mike Johnson	4-11-23

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
City Adminstrator	573-238-3622	admin@cityofmablehill.org

Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
P.O. BOX 176
JEFFERSON CITY, MO 65102-0176

END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.

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

8.0 FACILITY INFORMATION

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

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

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

9.0 STORAGE BASINS

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

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

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

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

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

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

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

10.0 LAND APPLICATION SYSTEM

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

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

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

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

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

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

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

INSTRUCTIONS FOR COMPLETING
APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITIES

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

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

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

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

Part A – Basic Application Information

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

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

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

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

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

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

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

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

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

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

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

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

2.1 Provide the name of the proposed construction project.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6.0 Complete Engineer contact information.

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

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

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

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

Part B – Land Application

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

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

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

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

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

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

Mail the completed form and applicable fee to the department.

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