Permit No. CP0002079

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Mr. Curt Mooney
Board Chairman
Village of Sunrise Beach
16363 MO-5
Sunrise Beach, MO 65079

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.

August 27, 2019
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

August 26, 2021
Expiration Date

Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The proposed project will construct a 50,000 gallon per day mechanical wastewater treatment facility and an extension of the collection services to approximately 96 dwelling units and 69 commercial buildings. The mechanical plant is an extended air package plant with flow equalization tank, aeration tanks, final clarifier tanks, sludge holding tanks, UV disinfection structure and flow measuring device & sampling station, etc. The Facility will discharge to a losing stream, an unnamed tributary to the Lake of the Ozark.

The project also includes construction of a low pressure sewer with grinder pumps and approximately 16,518 lf of 1.5-inch through 4-inch PVC SDR-21 force main with cleanouts and air release valves to transfer wastewater from the dewelling units and buildings to the proposed treatment plant. Install of 26 simplex grinder pump units with a 320 gallon capacity and 9 duplex grinder pump units with volumes between 560 to 1175 gallon capacity. Install of 2 duplex lift stations with each pump capable of operating at 80 gpm at 126 feet of TDH.

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 and was included in the public notice of the operating permit MO-0139131 from January 18, 2019 through February 19, 2019.

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 Shoreline Surveying & Engineering 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 Southwest Regional Office per 10 CSR 20-7.015(9)(G).

5. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment.

6. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.

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

8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the Department's ePermitting system available online at dnr.mo.gov/env/wpp/epermit/help.htm. See dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.

9. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the Department's Water Protection Program at 573-751-1300 for more information. See dnr.mo.gov/env/wpp/401/ for more information.

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

- Rain water from roofs, streets, and other areas and groundwater from foundation drains shall be excluded from all new sewers. 10 CSR 20-8.120 (2)

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

- Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals. 10 CSR 20-8.140 (8) (A)

- The distance between wastewater pumping stations and all potable water sources shall be at least fifty feet (50') in accordance with 10 CSR 23-3.010(1)(B). 10 CSR 20-8.130 (2) (D)

- There shall be no physical connections between a public or private potable water supply system and a sewer or appurtenance that would permit the passage of any wastewater or polluted water into the potable supply. Sewers shall be laid at least fifty feet (50') in a horizontal direction from any existing or proposed public water supply well or other water supply sources or structures. Sewers must also comply with 10 CSR 23-3.010. 10 CSR 20-8.120 (5)

- Service connections to the sewer main shall be watertight and cannot protrude into the sewer. 10 CSR 20-8.120 (3) (C) 1.

- Locator wire must be utilized when sewer lines are installed within the public right-of-way in accordance with 319.033, RSMo. 10 CSR 20-8.125 (5) (A) 5.

- Appurtenances shall be compatible with the piping system and full bore with smooth interior surfaces to eliminate obstruction and keep friction loss to a minimum. 10 CSR 20-8.125 (5) (B)
    - Isolation valves shall be—
        - Comprised of resilient seated gate valve or ball valve with a position indicator;
        - Constructed from corrosion resistant materials; and
        - Enclosed in a watertight and lockable valve box.
    - Isolation valves shall be installed on—
        - The upstream side of major pipe intersections;
        - Both sides of stream, bridge, and railroad crossings, and unstable soil; and
        - The terminal end of the system to facilitate future extensions.
    - Proper support (e.g., crushed stone, concrete pads, or a well compacted trench bottom) shall be provided for valves so the weight of the valve not carried by the pipe.

- The minimum diameter service line pipe shall be one and one quarter inches (1.25") for pressure sewers. 10 CSR 20-8.125 (7) (C) and 10 CSR 20-8.125 (5) (C)

- Simplex grinder pump station shall—
  - Not serve multiple equivalent dwelling units (EDU) if owned, operated, and maintained by individual homeowners; and
  - Not serve commercial facilities. 10 CSR 20-8.125 (5) (D) 1. A.

- Multiple unit grinder pump stations must be owned, operated, and maintained by an approved continuing authority. See subsection (4)(A) of this rule for more continuing authority information. 10 CSR 20-8.125 (5) (D) 1. B.

- Grinder pump vaults shall be watertight. 10 CSR 20-8.125 (5) (D) 2.

- A grinder pump vault shall have a storage volume of at least seventy (70) gallons. 10 CSR 20-8.125 (5) (D) 3.

- The following valves must be provided in the grinder pump vaults: 10 CSR 20-8.125 (5) (D) 4.
  - A shutoff valve accessible from the ground surface;
  - A check valve to prevent backflow; and
  - An anti-siphon valve, where siphoning could occur.

- Grinder pump stations shall meet the applicable requirements under section 10 CSR 20-8.130 (3) of this rule, except as modified in this section. 10 CSR 20-8.130 (5)
  - Submersible pumps shall be readily removable and replaceable without personnel entering, dewatering, or disconnecting any piping in the wet well.
  - Valves 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.
  - A portable pump connection on the discharge line with rapid connection capabilities shall be provided.

- Water level controls must be accessible without entering the wet well. 10 CSR 20-8.130 (3) (C)

- 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)

- Electrical Equipment shall utilize corrosive resistant equipment located in the wet well. 10 CSR 20-8.130 (3) (B) 2. B.

- Electrical Equipment shall 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 electrical 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. 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.

- When the continuing authority operates and maintains the grinder pump stations, provisions must be made for periods of mechanical or power failure. 10 CSR 20-8.125 (5) (D) 8.

- Duplex pumps shall be provided where the design flow from the EDUs, or other, is one thousand five hundred (1,500) gallons per day or greater. 10 CSR 20-8.125 (6) (F) 1.

- 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)

- The following valves must be provided in the grinder pump vaults: 10 CSR 20-8.125 (5) (D) 4.
    - A shutoff valve accessible from the ground surface;
    - A check valve to prevent backflow; and
    - An anti-siphon valve, where siphoning could occur.

- Provisions must be made for periods of mechanical or power failure. 10 CSR 20-8.125 (6) (F) 6.

- When manholes are utilized at major junctions of sewer mains,
    - Manholes shall be installed—10 CSR 20-8.120 (4) (A)
        - At the end of each line;
        - At all changes in grade, size, or alignment;
        - At all sewer pipe intersections; and
        - At distances appropriate to allow for sufficient cleaning and maintenance of sewer lines.
    - A drop pipe shall be provided for a sewer entering a manhole at an elevation of twenty-four inches (24") or more above the manhole invert. 10 CSR 20-8.120 (4) (B) 1.
    - When using precast manholes, drop connections must not enter the manhole at a joint. 10 CSR 20-8.120 (4) (B) 2.

- The minimum diameter of manholes shall be forty-two inches (42") on eight-inch (8") diameter gravity sewer lines and forty-eight inches (48") on all sewer lines larger than eight inches (8") in diameter. A minimum access diameter of twenty-two inches (22") (56 cm) shall be provided. Cleanouts shall be a minimum of eight inches (8") for pipes eight inches (8”) in diameter or larger and equal to the diameter for pipes less than eight inches (8").10 CSR 20-8.120 (4) (C)
- No sewer, service connection, or drop manhole pipe shall discharge onto the surface of the manhole bench. 10 CSR 20-8.120 (4) (D)
- Manholes shall be watertight, constructed, and installed in accordance with the manufacturer’s recommendations and procedures. 10 CSR 20-8.120 (4) (E)
- 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 for concrete sewer manholes, 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.

- Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation. 10 CSR 20-8.140 (2) (B)

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

- No treatment unit with a capacity of twenty-two thousand five hundred gallons per day (22,500 gpd) or less shall be located closer than the minimum distance of 200' to a neighboring residence and 50' to property line for lagoons; 200' to a neighboring residence for open recirculating media filters following primary treatment; and 50' to a neighboring residence for all other discharging facilities. See 10 CSR 20-2.010(68) for the definition of a residence. 10 CSR 20-8.140 (2) (C) 2

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

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

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

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

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

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

- 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. The alarm shall be activated in cases of high water levels. 10 CSR 20-8.140 (4) (D), 10 CSR 20-8.140 (7) (C)

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

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

- For indirect connections, a sign shall be permanently posted at every hose bib, faucet, hydrant, or sill cock located on the water system beyond the break tank or backflow preventer to indicate that the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 3. B.

- Where a separate non-potable water supply is to be provided, a break tank will not be necessary, but all system outlets shall be posted with a permanent sign indicating the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 4.

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

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

- Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility:
    - Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140 (8) (A)
    - Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140 (8) (B)
    - First aid equipment; 10 CSR 20-8.140 (8) (C)

- Posted “No Smoking” signs in hazardous areas; 10 CSR 20-8.140 (8) (D)
- Appropriate personal protective equipment (PPE); 10 CSR 20-8.140 (8) (E)
- Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140 (8) (F)
- 10 CSR 20-8.140 (8) (G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
- 10 CSR 20-8.140 (8) (H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
- Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140 (8) (I)
- Ventilation shall include the following:
    - Isolate all pumping stations and wastewater treatment components installed in a building where other equipment or offices are located from the rest of the building by an air-tight partition, provide separate outside entrances, and provide separate and independent fresh air supply; 10 CSR 20-8.140 (8) (J) 1.
    - 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.
    - Dampers are not to be used on exhaust or fresh air ducts. Avoid the use of fine screens or other obstructions on exhaust or fresh air ducts to prevent clogging; 10 CSR 20-8.140 (8) (J) 3.
    - Where continuous ventilation is needed (e.g., housed facilities), provide at least twelve (12) complete air changes per hour. Where continuous ventilation would cause excessive heat loss, provide intermittent ventilation of at least thirty (30) complete air changes per hour when facility personnel enter the area. Base air change demands on one hundred percent (100%) fresh air; 10 CSR 20-8.140 (8) (J) 4.
    - Electrical controls. Mark and conveniently locate switches for operation of ventilation equipment outside of the wet well or building. Interconnect all intermittently operated ventilation equipment with the respective wet well, dry well, or building lighting system. The manual lighting/ventilation switch is expected to override the automatic controls. For a two (2) speed ventilation system with automatic switch over where gas detection equipment is installed, increase the ventilation rate automatically in response to the detection of hazardous concentrations of gases or vapors; 10 CSR 20-8.140 (8) (J) 5.
    - Fabricate the fan wheel from non-sparking material. Provide automatic heating and dehumidification equipment in all dry wells and buildings. 10 CSR 20-8.140 (8) (J) 6.
- Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate. 10 CSR 20-8.140 (8) (K)
- Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140 (8) (L)

  - Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E *Standard for Electrical Safety in the Workplace* (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140 (8) (M)

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

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

- All wastewater treatment facilities must have a screening device, comminutor, or septic tank for the purpose of removing debris and nuisance materials from the influent wastewater. 10 CSR 20-8.150 (2)

- All screening devices and screening storage areas shall be protected from freezing. 10 CSR 20-8.150 (4) (A) 1.

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

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

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

- The 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.

- Open channel UV systems. 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) 1.

- 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.

- 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.

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

- For solids pumping systems, audio-visual alarms shall be provided in accordance with

- 10 CSR 20-8.140(7)(C) for:
    - Pump failure; 10 CSR 20-8.170 (6) (A)
    - Pressure loss; 10 CSR 20-8.170 (6) (B) and
    - High pressure. 10 CSR 20-8.170 (6) (C)

- Alarm systems shall be provided for sludge dewatering processes to notify the operator(s) of conditions that could result in process equipment failure or damage, threaten operator safety, or a solids spill or overflow condition. 10 CSR 20-8.170 (7) (B)

11. Upon completion of construction:

    A. The Village of Sunrise Beach will become the continuing authority for operation and maintenance of these facilities;

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

C. Submit the eDMR permit Holder and Certifier Registration, Form--MO 780-2204 to comply with your operating permit; and

D. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N) and request the draft operating permit public noticed between January 18 to February 17, 2019 to be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

Homes and businesses in Sunrise Beach are relying on on-site disposal and small treatment systems for sewage treatment. A large percentage of these systems are failing or operating very inefficiently. Many gallons of improperly treated wastewater discharges to the Lake of the Ozarks watershed. The Village of Sunrise Beach proposed to build new wastewater collection and treatment facility to provide sewer service to residential homes and commercial businesses with in the Village.

2. FACILITY DESCRIPTION

The proposed treatment plant is 50,000 gallons per day extended aeration treatment plant with flow equalization, aeration, final clarifier, sludge holding followed by a tertiary sand filter and ultraviolet disinfection.

The Sunrise Beach WWTF #2 is located at Jet Ski Drive, Sunrise Beach City, in Camden County, Missouri. The facility has a design average flow of 50,000 gpd and serves a hydraulic population equivalent of approximately 500 people.

3. COMPLIANCE PARAMETERS

The limits will be applicable to the newly constructed facility:

Parameter	Units	Monthly average limit
Biochemical Oxygen Demand$_5$	mg/L	10
Total Suspended Solids	mg/L	15
Ammonia as N-summer	mg/L	1.0
Ammonia as N-winter	mg/L	2.3
pH	SU	6.5-9.0
Oil & Grease	µg/L	10
E. Coli	#/100mL	126

4. ANTIDEGRADATION

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated October 25, 2018, due to a new wastewater treatment facility. See **APPENDIX – ANTIDEGRADATION**.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The treatment process is a modified exended aeration process. The wastewater treatment plant has two identical trains each with a design flow of 25,000 GPD for a total design flow of 50,000 GPD treatment plant. The system includes the following components:

- Influent Receiving Chamber - A influent chamber with a volume of 2,100 gallon (2.5'x12'x11') will be provided. The chamber will receive the incoming flow where it passed through a coarse bar screen. The square shape bar screen basket is mounted at the mouth of the influent pipe and is made of 3/8 inch hot-rolled steel rods, spaced 1.5 inches on centers. Installation of screening devices removes nuisance inorganic materials from raw wastewater before the water enters the flow equalization basin.

- Flow Equalization System - flow equalization is utilized to reduce the variability of influent wastewater flow. The proposed flow equalization tank is 24.83 ft x 9.83 ft x 11 ft deep (17,250 gallons), which is approximately 35% of the average daily flow. Dual blower motor units supply the air to the flow equalization system, each with the capacity of 75 scfm at 6 psi.

- Aeration Chamber – The aeration chambers are designed with a total volume of 50,000 gallons. Two of 29.5 ft x 12 ft x 11 feet sidewater depth aeration chambers with a total volume of 7,788 ft^3 (58,254 gallons) will be provided. Each train is aerated by means of a 10 hp blower capable of supplying 150 scfm air at 6 psi to 8 Wyss Flex -A- Tube diffusers per chamber with a capacity of 18.75 scfm air per diffuser. Both trains will share the third blower unit as a standby. The aeration chambers are designed for an average daily loading of 120 lbs BOD_5. A transfer pipe and elbow allows wastewater from the aeration chambers to move by gravity to the final clarifiers.

- Final Clarifier Chamber – The two hopper type clarifiers will have a surface area of 98 square feet. The total volume of the clarifiers is 8,333 gallons with an average overflow rate of 510 gpd/square foot. The hydraulic retention time is 4 hours which meets the minimum requirements of 10 CSR 20-8.160(2)(B)1. The clarifier has the dimensions of 7 feet wide by 7 feet long with a sidewater depth of 13.5 feet. The detention capacity of the hopper is calculated by using only the top third (by height). The weir loading rate is 893 gpd/lf which meets the requirements of 10 CSR 20-8.160(3)(C)2 of being less than 10,000 gpd/sf. The clarifier is equipped with a sludge return system and a scum wasted system. The clarifiers are equipped with an effluent weir trough to allow the flow to pass to the tertiary filter.

- Rapid Sand Tertiary Filter – The tertiary filter manufactured by Aeromix Systems, Inc. is split into two filter cells with a common wall. Each filter cell area is approximately 3'6" x 5'11" and a total surface area is 41.6 ft^2 which gives a total hydraulic loading of 1,200 gpd/ft^2 at design average flow. The clearwell volume is 3,120 gallons when the mudwell volume is 3,500 gallons. Two (2) backwash pumps will be provided. Each pump is designed to provide backwash at a rate of 15 gpm per square feet and total 312 gpm per cell at 15 feet TDH. A duplex set of pumps in the mudwell will return the backwash water to the begining wastewater treatment. The capacity for each pump should be 50 gpm at 20 feet TDH.

- Post Aeration – a fine air diffuser system is installed adjacent to the effluent weir trough located in the clear well of the tertiary filter. This diffused aire system will assure the dissolved oxygen levels of the effluent to be maintained greater than 5.0 mg/L.

- Disinfection system – an open channel, gravity flow, low pressure high intensity UV disinfection system is capable of treating a peak flow of 100,000 gpd (2x the average daily designflow) while delivering a minimum UV intensity of 30 mJ/cm^2 with an expected ultraviolet transmissivity of 65% or greater. The UV system consists of two banks with 2 modules per bank and 4 lamps per module. The disinfected effluent will flow by gravity through flow measurement equipment and to Outfall No. 001.

- Flow Measuring – after the UV system, a parshall flume and flow meter will be provided to measure the flow rate passing through the system. The effluent flow rate is measured by an ultrasonic type of flow meter with recorder.

- Sludge Holding Chamber –Construction of two (2) sludge holding basin with a 12 ft long, 4.5 ft width, a 11 ft sidewater depth, and a volume of 4,000 gallons each. Installation of Wyss Flex -A- Tube diffusers will provide aeration and mixing of the sludge to prevent anaerobic conditions. An ultrasonic level sensor will measure the volume of sludge present. The sludge will be received from the secondary clarifiers, aerobic digesters.

- Emergency Power – A 125 kW standby diesel stationary generator set and manual transfer switch will be provided to operate the treatment facility in event of power failure.

6. OPERATING PERMIT

Draft Operating permit MO-0139131 for the new wastewater treatment plant was successfully public noticed from January 18 to February 17, 2019 with no comments received. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued.

Lei Hou, PE
Engineering Section
lei.hou@dnr.mo.gov

Water Quality and Antidegradation Review

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

by

Sunrise Beach Wastewater Treatment Facility #2

October 2018

Table of Contents

1. Facility Information

FACILITY NAME: Sunrise Beach WWTF #2 NPDES #: NEW FACILITY

FACILITY TYPE: POTW –SIC #4952
FACILITY DESCRIPTION: As a result of the submitted alternative analysis, the applicant's preferred alternative is 50,000 gallons per day extended aeration treatment plant with flow equalization followed by a tertiary sand filter and ultraviolet disinfection.

COUNTY:	Camden	UTM COORDINATES:	X = 517180 / Y = 4225847
12- DIGIT HUC:	10290109-0207	LEGAL DESCRIPTION:	NE ¼ , SW ¼, Section 34, T40N, R17W
EDU*:	Ozark / Osage	ECOREGION:	Ozark Highlands

* - 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:*

No history - new facility.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.078	Secondary	Tributary to Lake of the Ozarks	-
			Lake of the Ozarks	0.15

3. Receiving Waterbody Information

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Tributary to Lake of the Ozarks	-	-	0.0	0.0	0.0	General Criteria
Lake of the Ozarks	L2	7205	-	-	-	AQL, HHP, IRR, LWW, SCR, WBC(A)

** 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 Lake of the Ozarks
Upper end segment* UTM coordinates: X = 517172 / Y = 4225847 (Outfall)
Lower end segment* UTM coordinates: X = 516602 / Y = 4225061 (Small finger meets centerline of cove)

* 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

Shoreline Surveying & Engineering, LLC prepared, on behalf of Village of Sunrise Beach, the *Antidegradation Report for the Proposed Sunrise Beach Wastewater Treatment Facility #2* dated October 18, 2018. Applicant elected to assume that all pollutants of concern (POC) are significantly degrading the receiving stream in the absence of existing water quality. An alternative analysis was conducted to fulfill the requirements of the AIP. Information that was provided by the applicant in the submitted report and summary forms in Appendix C was used to develop this review document.

Geohydrological Evaluation was submitted with the request and the receiving stream is gaining for discharge purposes (Appendix A: Map).

A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant; and records of endangered species were found for the project area. It is recommended that the U.S. Fish and Wildlife Service and the Missouri Department of Conservation be contacted for further coordination (see Appendix B).

5. Antidegradation Review Information

The following is a review of the *Antidegradation Report* dated July 30, 2018.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix C). 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 was assumed for all POCs (see Appendix C).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
BOD_5/DO	2	Significant	
Total Suspended Solids (TSS)	**	Significant	
Ammonia	2	Significant	
pH	***	Significant	Permit limits applied
Escherichia coli (*E. coli*)	2	Significant	Permit limits applied
Oil & Grease	2	Significant	Permit limits applied

* Tier assumed. Tier determination not possible: ** No in-stream standards for these parameters. *** Standards for these parameters are ranges

The following Antidegradation Review Summary attachments in Appendix D were used by the applicant:

For pollutants of concern, the attachments are:
☒ Attachment A, Tier 2 with significant degradation.
☐ Attachment B, Tier 2 with minimal degradation.
☐ Attachment D, Tier 1 Review. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment

5.2. EXISTING WATER QUALITY

No existing water quality data was submitted. All POCs were considered to be Tier 2 and significantly degrading in the absence of existing water quality.

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. Because Missouri's antidegradation implementation procedures specify that if the proposed activity results in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Part of that analysis as shown below is the non-degrading or no discharge evaluation. See Section 5.4.1 discussion for the regionalization alternative.

The non-degrading alternatives of regionalization and irrigation were considered not practicable.

5.4. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

Missouri's antidegradation implementation procedures specify that if the proposed activity does result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Seven alternatives from non-degrading to less degrading to degrading alternatives were evaluated. Alternative #1, non-degrading surface irrigation, was eliminated as impracticable due to land availability and cost. Alternative #2, non-degrading sub-surface irrigation, was eliminated as impracticable due to land availability and cost. Alternative #3, non-degrading connection to a regional facility, was eliminated as impracticable due to distance and legal concerns. Only those alternatives that were considered practicable were included in the economic efficiency analysis. This analysis showed that the return on environmental benefits with increasing cost of treatment did not justify more expenditure beyond the base case treatment alternative (see Appendix D, Attachment A). The extended aeration mechanical treatment plant with flow equalization and tertiary filtration followed by ultraviolet disinfection was the preferred alternative based on this analysis with the additional benefit of the selected technology being the same as utilized at the first Sunrise Beach Wastewater Treatment Facility.

Table 2: Alternatives Analysis Comparison

	Extended Aeration with Tertiary Filtration	Recirculating Sand Filter	Advantex Textile Filter	Membrane Bioreactor
BOD	10	15	10	10
TSS	15	10	10	10
Ammonia (s/w)	1.0/2.3	3.0/4.6	3.0/4.6	1.0/1.0
Practical	Y	Y	Y	Y
Economical	Y	Y	Y	Y
Life Cycle Cost*	$1,357,492	$1,510,486	$1,489,416	$1,787,300
Ratio	1.0:1.0	1.0:1.11	1.0:1.08	1.0:1.20

* Life cycle cost at 20 year design life and 5% interest

5.4.1. REGIONALIZATION ALTERATIVE

Within Section II B 1. of the AIP, discussion of the potential for discharge to a regional wastewater collection system is mentioned. The applicant provided discussion of this alternative. The alternative analysis mentions that the Village of Sunrise Beach as the regional authority. No other authority is available so a waiver required under 10 CSR 20-6.010(3) (B) 1 Continuing Authorities cannot be obtained.

NEEDS A WAIVER TO PREVENT CONFLICT WITH AREA WIDE MANAGEMENT PLAN APPROVED UNDER SECTION 208 OF THE CLEAN WATER ACT AND/OR UNDER 10 CSR 20-6.010(3) (B) 1 OR 2 CONTINUING AUTHORITIES? (Y OR N) N

5.3.2 LOSING STREAM ALTERATIVE DISCHARGE LOCATION

Under 10 CSR 20-7.015(4) (A), *discharges to losing stream shall be permitted only after other alternatives including land application, discharge to gaining stream and connection to a regional facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons*. The discharge is considered to be gaining due to the close proximity to the Lake of the Ozarks. The elevation of the facility is approximately ten feet above the lake level.

5.3.3 SOCIAL AND ECONOMIC IMPORTANCE EVALUATION

The applicant first identified the community that will be affected by the proposed degradation of water quality. The affected community is likely the Sunrise Beach community and those that recreate at the Lake of the Ozarks. Secondly, a number of relevant factors were identified including improved water quality as this system will replace failing septic systems, availability of second or third tier lots for development, the associated employment opportunities due to this growth for developers, contractors, realtors, etc., increased sales tax and increased property tax base. Within a Social and Economic Benefits section each factor was evaluated. Appendix D, Attachment A: Tier 2 with Significant Degradation form contains a summary of this information.

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)].

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

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

OUTFALL #001

Wet Test (Y or N): Y Frequency: Once/Permit Cycle AEC: 100% Method: Multiple

Table 3. Effluent Limits – Outfall 001

Parameter	Units	Daily Maximum	Weekly Average	Monthly Average	Basis for Limit (Note 2)	Monitoring Frequency
Flow	MGD	*		*	FSR	Once/Month
Biochemical Oxygen Demand$_5$ ***	MG/L		15	10	PEL	Once/Month
Total Suspended Solids***	MG/L		20	15	PEL	Once/Month
pH	SU	6.5– 9.0		6.5 – 9.0	FSR	Once/Month
Ammonia as N (Apr 1 – Sept 30)	MG/L	2.6		1.0	PEL	Once/Month
Ammonia as N (Oct 1 – Mar 31)	MG/L	6.0		2.3	PEL	Once/Month
Escherichia coliform (*E. coli*)	Note 1		630**	126**	FSR	Once/Month
WET Testing	TUa	*			FSR	Once/Permit Cycle
Oil & Grease	MG/L	15		10	FSR	once/Month

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:

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

Where C = downstream concentration
C_s = upstream concentration
Q_s = upstream flow
C_e = effluent concentration
Q_e = effluent flow

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

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

2) Alternative Analysis-based – Using the preferred alternative's treatment capacity for conventional pollutants such as BOD_5 and TSS that are provided by the consultant as the WLA, the significantly-degrading effluent average monthly and average weekly limits are determined by applying the WLA as the average monthly (AML) and multiplying the AML by 1.5 to derive the average weekly limit (AWL). For toxic and nonconventional pollutant such as ammonia, the treatment capacity is applied as the significantly-degrading effluent monthly average (AML). A maximum daily can be derived by dividing the AML by 1.19 to determine the long-term average (LTA). The LTA is then multiplied by 3.11 to obtain the maximum daily limitation. This is an accepted procedure that is defined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

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

10.1. 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 10 mg/L monthly average, 15 mg/L average weekly limits were proposed. The proposed limits are more stringent than lakes effluent limits of 20 mg/L monthly average and 30 mg/L weekly average found in 10 CSR 20-7.015(3)(B).

  Per the Biochemical Oxygen Demand and Dissolved Oxygen Policy, dated December 31, 2009, the BOD effluent limits are protective of water quality and dissolved oxygen modeling and effluent limits are not required at this time.

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

- **Total Suspended Solids (TSS).** The applicant proposed preferred alternative effluent limits of 15 mg/L monthly average and 20 mg/L average weekly limits for TSS was proposed in the Antidegradation Report. The proposed limits are more stringent than lake effluent limits of 20 mg/L monthly average and 30 mg/L weekly average found in 10 CSR 20-7.015(3)(B).

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

- **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.

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

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: April 1 – September 30, Winter: October 1 – March 31.

Summer

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

Chronic WLA: $C_e = ((0.078 + 0.0)1.5 – (0.0 * 0.01))/0.078$

$C_e = 1.5$ mg/L

Acute WLA: $C_e = ((0.078 + 0.0)12.1 – (0.0 * 0.01))/0.078$

$C_e = 12.1$ mg/L

LTA_c = 1.5 mg/L (0.780) = **1.2 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
LTA_a = 12.1 mg/L (0.321) = 3.88 mg/L [CV = 0.6, 99th Percentile]

MDL = 1.2 mg/L (3.11) = 3.7 mg/L [CV = 0.6, 99th Percentile]
AML = 1.2 mg/L (1.19) = 1.4 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter

Chronic WLA: C_e = ((0.078 + 0.0)3.1 – (0.0 * 0.01))/0.078
C_e = 3.1 mg/L

Acute WLA: C_e = ((0.078 + 0.0)12.1 – (0.0025 * 0.01))/0.078
C_e = 12.1 mg/L

LTA_c = 3.1 mg/L (0.780) = **2.4 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 2.4 mg/L (3.11) = 7.5 mg/L [CV = 0.6, 99th Percentile]
AML = 2.4 mg/L (1.19) = 2.9 mg/L [CV = 0.6, 95th Percentile, n = 30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	3.7	1.4
Winter	7.5	2.9

The facility proposed ammonia effluent limits of 1.0 mg/L summer and 2.3 mg/L winter in their antidegradation request. Using these as the average monthly limits, the maximum daily limits would be 2.6 mg/L summer and 6.0 mg/L winter. These effluent limits are more protective than the water quality based effluent limits. In review of the sister facility's discharge monitoring reports, the facility can meet the proposed effluent limits.

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	2.6	1.0
Winter	6.0	2.3

- ***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).

  For facilities less than 100,000 gpd: Per the effluent regulations the E. coli sampling/monitoring frequency shall be set to match the monitoring frequency of wastewater and sludge sampling program for the receiving water category in 7.015(1)(B)3. 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**

- **Acute Whole Effluent Toxicity**. Monitoring requirement only. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards.

  Acute Allowable Effluent Concentrations (AECs) for facilities that discharge to Waters of the State lacking designated uses, Class C, Class P (with default Mixing Considerations), or Lakes [10 CSR 20-7.031(5)(A)4.B.(IV)(b)] are 100%, 50%, 25%, 12.5%, & 6.25%.

- **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.

11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed new facility discharge, Sunrise Beach WWTF #2, 0.050 MGD is assumed to result in significant degradation of the segment identified in the Tributary to the Lake of the Ozarks. The extended aeration treatment plant with tertiary filtration was determined to be the base case technology (lowest cost alternative that meets technology and water quality based effluent limitations). The cost effectiveness of the other technologies were evaluated, and extended aeration treatment plant with tertiary filtration was found to be cost effective and was determined to be the preferred alternative. This alternative is also preferred as it is the same technology as constructed for the first Sunrise Beach WWTF.

It has also been determined that the other treatment options presented (recirculating sand filter, recirculating textile filter, and membrane bioreactor) may also be considered reasonable alternatives provided they are designed to be capable of meeting the effluent limitations developed based on the preferred alternative. If any of these options are selected, you may proceed with the appropriate facility plan, construction permit application, or other future submittals without the need to modify this Antidegradation review document.

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

Reviewer: Keith Forck
Date: 10/15/2018
Unit Chief: John Rustige, P.E. JR

Appendix A: Map of Discharge Location

(*A USGS topographic map can be obtained on the web at http://www.dnr.mo.gov/internetmapviewer/.)*

Appendix B: Natural Heritage Review

Missouri Department of Conservation

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

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

There are records 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: Sunrise Beach Sewer District - Phase II #4541
User Project Number: 9425-18:E1
Project Description: Phase II facilities will collect sewage from the residential and commercial properties using gravity collection where possible and supplement that with a series of small grinder pumps and small-diameter force mains. Treatment will be handled by construction of a new WWTF on the property donated by a local businessman.
Project Type: Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Construction or expansion
Contact Person: Colt Schulte
Contact Information: colt@shorelinese.com or 5733923312

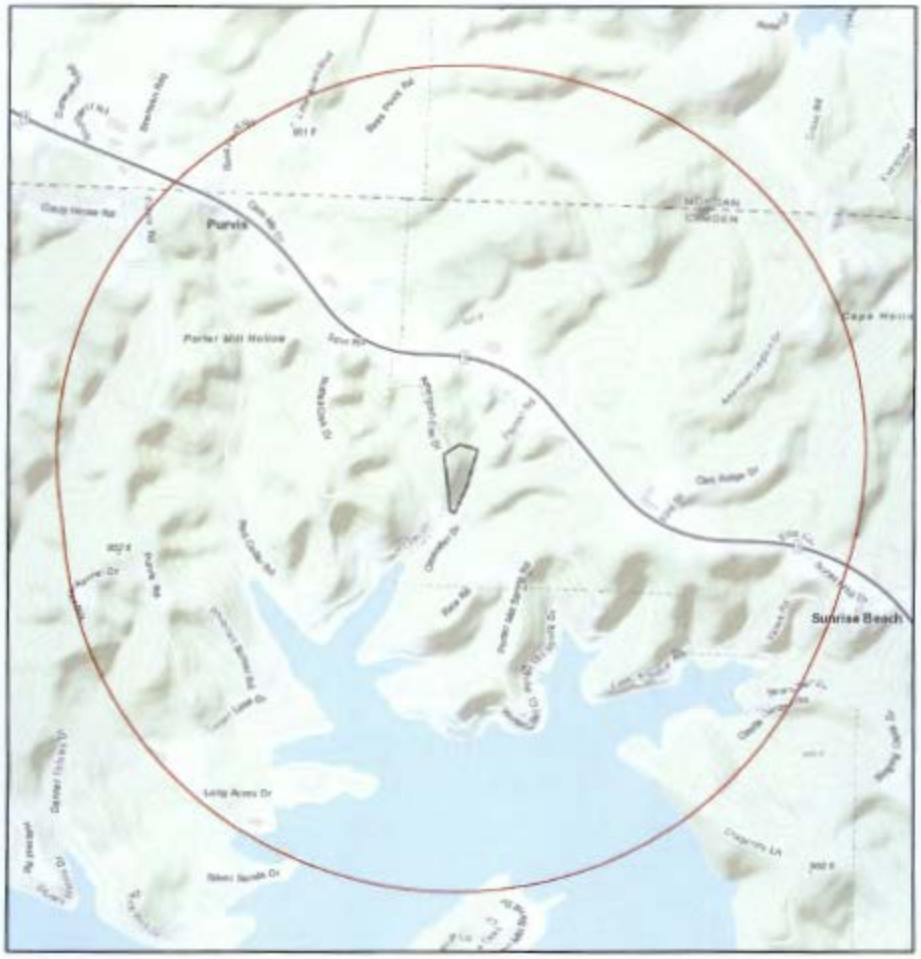
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive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

Sunrise Beach Sewer District - Phase II



July 18, 2018

1:19,740

0 0.15 0.3 0.6 mi

0 0.275 0.55 1.1 km

☐ Project Boundary

☐ Buffered Project Boundary

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 activites, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April. **If any trees need to be removed for your project, please contact the U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 ext. 100 for Ecological Services) for further coordination under the Endangered Species Act.**

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

The project location submitted and evaluated is within the range of the Gray Myotis (i.e., Gray Bat) in Missouri. Depending on habitat conditions of your project's location, Gray Myotis (*Myotis grisescens*, federal and state-listed endangered) could occur within the project area, as they forage over streams, rivers, lakes, and reservoirs. Avoid entry or disturbance of any cave inhabited by Gray Myotis and when possible retain forest vegetation along the stream and from the cave opening to the stream. See http://mdc.mo.gov/104 for best management recommendations.

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.

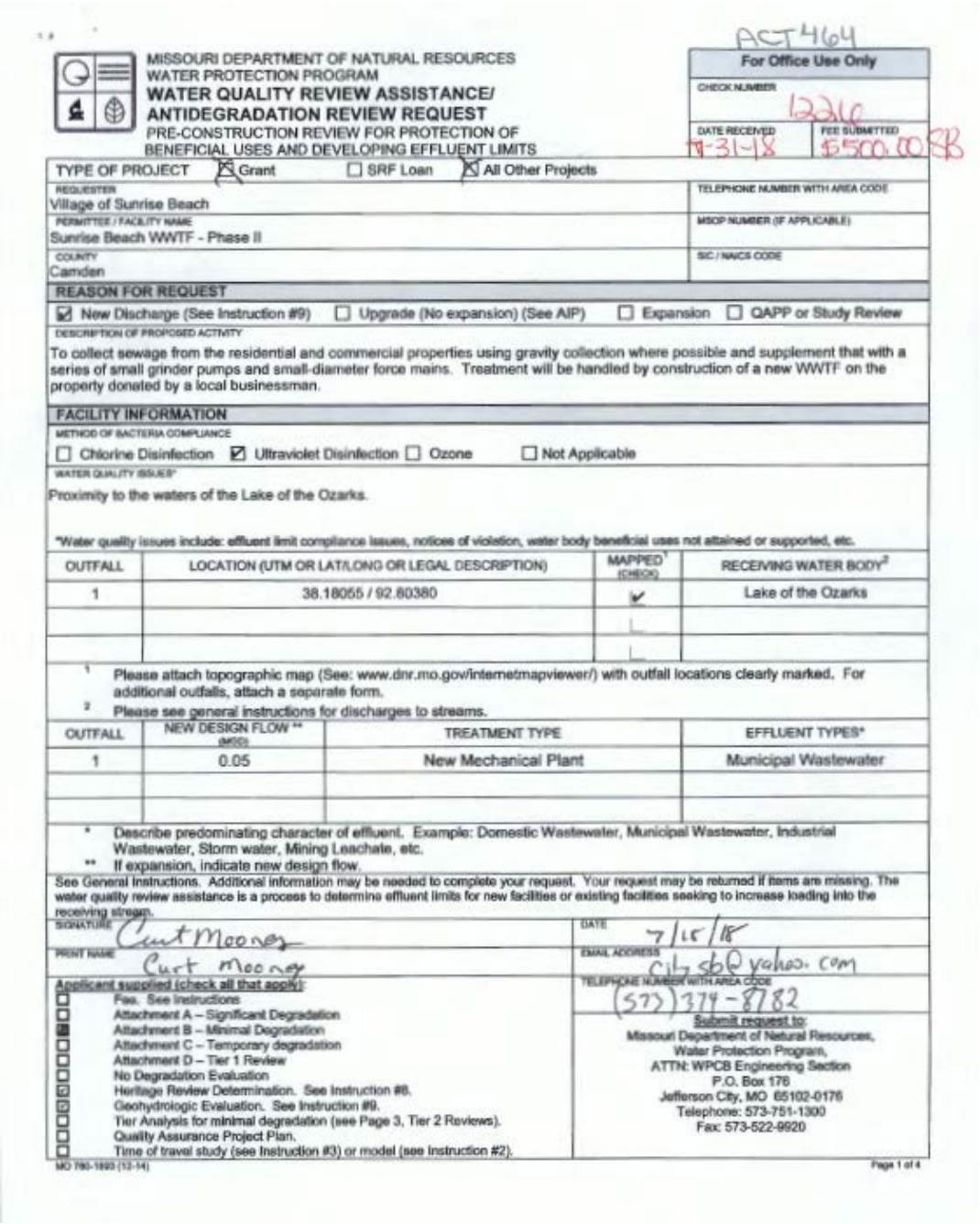
STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements 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.

Appendix C: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant, Sunrise Beach WWTF #2. Department staff determined that changes must be made to the information contained within these attachments. The following were modified and can be found within the Department WQAR:

1) Attachment A: No changes needed.



ACT 464

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
WATER QUALITY REVIEW ASSISTANCE/ ANTIDEGRADATION REVIEW REQUEST
PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

For Office Use Only	
CHECK NUMBER	1216
DATE RECEIVED	FEE SUBMITTED
7-31-18	$500.00 SB

TYPE OF PROJECT ☒ Grant ☐ SRF Loan ☒ All Other Projects

REQUESTER: Village of Sunrise Beach
TELEPHONE NUMBER WITH AREA CODE:
PERMITTEE / FACILITY NAME: Sunrise Beach WWTF - Phase II
MSOP NUMBER (IF APPLICABLE):
COUNTY: Camden
SIC / NAICS CODE:

REASON FOR REQUEST

☑ New Discharge (See Instruction #9) ☐ Upgrade (No expansion) (See AIP) ☐ Expansion ☐ QAPP or Study Review

DESCRIPTION OF PROPOSED ACTIVITY

To collect sewage from the residential and commercial properties using gravity collection where possible and supplement that with a series of small grinder pumps and small-diameter force mains. Treatment will be handled by construction of a new WWTF on the property donated by a local businessman.

FACILITY INFORMATION

METHOD OF BACTERIA COMPLIANCE

☐ Chlorine Disinfection ☑ Ultraviolet Disinfection ☐ Ozone ☐ Not Applicable

WATER QUALITY ISSUES*

Proximity to the waters of the Lake of the Ozarks.

*Water quality issues include: effluent limit compliance issues, notices of violation, water body beneficial uses not attained or supported, etc.

OUTFALL	LOCATION (UTM OR LAT/LONG OR LEGAL DESCRIPTION)	MAPPED[1] (CHECK)	RECEIVING WATER BODY[2]
1	38.18055 / 92.80380	✔	Lake of the Ozarks

1 Please attach topographic map (See: www.dnr.mo.gov/internetmapviewer/) with outfall locations clearly marked. For additional outfalls, attach a separate form.
2 Please see general instructions for discharges to streams.

OUTFALL	NEW DESIGN FLOW ** (MGD)	TREATMENT TYPE	EFFLUENT TYPES*
1	0.05	New Mechanical Plant	Municipal Wastewater

* Describe predominating character of effluent. Example: Domestic Wastewater, Municipal Wastewater, Industrial Wastewater, Storm water, Mining Leachate, etc.
** If expansion, indicate new design flow.

See General Instructions. Additional information may be needed to complete your request. Your request may be returned if items are missing. The water quality review assistance is a process to determine effluent limits for new facilities or existing facilities seeking to increase loading into the receiving stream.

SIGNATURE: Curt Mooney
DATE: 7/15/18
PRINT NAME: Curt Mooney
EMAIL ADDRESS: city sbq yahoo. com
TELEPHONE NUMBER WITH AREA CODE: (573) 374-8782

Applicant supplied (check all that apply):

- ☐ Fee. See Instructions
- ☐ Attachment A – Significant Degradation
- ☒ Attachment B – Minimal Degradation
- ☐ Attachment C – Temporary degradation
- ☐ Attachment D – Tier 1 Review
- ☐ No Degradation Evaluation
- ☑ Heritage Review Determination. See Instruction #8.
- ☑ Geohydrologic Evaluation. See Instruction #9.
- ☐ Tier Analysis for minimal degradation (see Page 3, Tier 2 Reviews).
- ☐ Quality Assurance Project Plan.
- ☐ Time of travel study (see Instruction #3) or model (see Instruction #2).

Submit request to:
Missouri Department of Natural Resources,
Water Protection Program,
ATTN: WPCB Engineering Section
P.O. Box 176
Jefferson City, MO 65102-0176
Telephone: 573-751-1300
Fax: 573-522-9920

MO 780-1893 (12-14) Page 1 of 4

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

ANTIDEGRADATION REVIEW SUMMARY FOR PUBLIC NOTICE
ATTACHMENT B: TIER 2 – MINIMAL DEGRADATION

1. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
Sunrise Beach WWTF - Phase II		(573) 374-8782	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
Jet Ski Drive	Sunrise Beach	MO	65079

2. OWNER

NAME AND OFFICIAL TITLES			
Village of Sunrise Beach - Curt Mooney, Board Chairman			
ADDRESS	CITY	STATE	ZIP CODE
16363 MO-5	Sunrise Beach	MO	65079
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		
(573) 374-8782			

3. CONTINUING AUTHORITY
The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf.

NAME AND OFFICIAL TITLES			
"Same as Owner"			
ADDRESS	CITY	STATE	ZIP CODE
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		

4. RECEIVING WATER BODY SEGMENT #1

NAME
Unnamed Tributary to Lake of the Ozarks

4.1 UPPER END OF SEGMENT (Location of discharge)
UTM _____ OR Lat *38.17929*, Long *92.80467*

4.2 LOWER END OF SEGMENT
UTM _____ OR Lat *38.17851*, Long *92.80591*

Per the Missouri Antidegradation Rule and Implementation Procedure, or 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."

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

NAME

5.1 Upper end of segment
UTM _____ OR Lat _____, Long _____

5.2 Lower end of segment
UTM _____ OR Lat _____, Long _____

6. WET WEATHER ANTICIPATIONS

If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Attach the feasibility analysis to this report.

What is the Wet Weather Flow Peaking Factor in relation to design flow?

Wet Weather Design Summary:

7. OIL AND GREASE

Is this a publicly owned treatment works, or POTW, restaurant, school or other domestic wastewater treatment facility with oil and grease as a pollutant of concern? ☒ Yes ☐ No

In accordance with 10 CSR 20-7.031(3)(B), waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. In accordance with 10 CSR 20-7.031 Table A, oil and grease has a chronic toxicity of 10 mg/L for protection of aquatic life. This facility will meet the effluent limits (MDL and AML of 15 mg/L and 10 mg/L, respectively).

8. 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 A of 10 CSR 20-7.031?

☑ Yes ☐ No

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.

9. EXISTING WATER QUALITY DATA OR MODEL SUMMARY

Obtaining existing water quality is possible by three methods according to the Antidegradation Implementation Procedure, Section II.A.1:
(1) Using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP
(2) Collecting water quality data approved by the Missouri Department of Natural Resources methodology or
(3) Using an appropriate water quality model. QAPPs must be submitted to the department for approval in advance (six months) of the proposed activity.
Provide all corresponding data and reports that were approved by the department's Water Protection Program.

Date that existing water quality data was provided by the Water Protection Program:

Tier Analysis submitted with antidegradation review report (see AIP Section II 1.d., Page 21):

Approval date of the QAPP by the Water Protection Program:

Approval date of the project sampling plan by the Water Protection Program:

Approval date of the data collected for all appropriate pollutants of concern by the Water Protection Program:

Comments/Discussion:

10. ASSIMILATIVE CAPACITY / LOAD REDUCTION TABLE

Determining the facility assimilative capacity, or FAC, and the segment assimilative capacity, or SAC for each pollutant of concern is explained in detail in the Antidegradation Implementation Procedure, Section II.A.3, and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure, Section II.A. Provide all calculations in the Antidegradation Review Report.

Pollutant of Concern	Facility Assimilative Capacity OR Current Load	New Load	Percent of Facility Assimilative Capacity OR Percent Load Reduction
	(lbs/day)	(lbs/day)	(%)

Pollutant of Concern	Water Body Segment #1 SAC (Use another form if a second segment is needed)	Cumulative Net Increase in Load	Cumulative % of Water Body Segment #1 SAC

Assimilative capacity/loading reduction summary

Is degradation considered minimal for all pollutants of concern? ☑ Yes ☐ No

Degradation is considered minimal if the new or proposed loading is less than 10 percent of the FAC and the cumulative degradation is less than 10 percent of the SAC according to the Antidegradation Implementation Procedure, Section II.A.3. If yes, an alternatives analysis and a social and economic importance analysis are not required.

Comments/Discussion

11. SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS

What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:

Pollutants of Concern*	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	mg/l	375	20	
TSS	mg/l	250	20	
pH		6.5-9	6.5-9	
Ammonia as N	mg/l	25	1.4 (April 1 - Sept 30)	
Ammonia as N	mg/l	25	2.9 (Oct 1 - March 31)	
Oil and Grease	mg/l	15	10	
FOG	mg/l	15	10	
E Coli	ml		126 colonies	
Dissolved Oxygen			Greater than 5.0	
Total Nitrogen			Monitored Only	
Total Phosphorous			Monitored Only	

These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve the highest statutory and regulatory requirements.

*A Tier Analysis must be submitted to demonstrate that the POCs are Tier 2 with minimal degradation.

12. PROPOSED PROJECT SUMMARY

Phase II facilities is to collect sewage from the residential and commercial properties using gravity collection where possible and supplement that with a series of small grinder pumps and small-diameter force mains. Treatment will be handled by construction of a new WWTP on the property donated by a local businessman.

Attach the Antidegradation Review Report and all supporting documentation, including minimal degradation calculations.

CONSULTANT: I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulations.

SIGNATURE	DATE
	7/18/2018

NAME AND OFFICIAL TITLES / LICENSE #	COMPANY NAME
Jared Wheaton, PE / 2011000963	Shoreline Surveying & Engineering

ADDRESS	CITY	STATE	ZIP CODE
3048 Hwy 52	Eldon	MO	65026

TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
(573) 392-3312	jared@shorelinese.com

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE	DATE
X Curt Moore	7/18/18

CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE	DATE
Curt Moore	7/18/18

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY

RECEIVED
MAY 30 2019
Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO. AP 32558	CP NO. CP0002079
FEE RECEIVED $1000.00	CHECK NO. 1249
DATE RECEIVED 5-30-19	

SB

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Treatment Facility form has been developed in a modular format and consists of Part A and B. **All applicants must complete Part A.** Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. **Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.**

PART A – BASIC INFORMATION

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

1.1 Is this a Federal/State funded project? ☑ YES ☐ N/A Funding Agency: USDA Project #: _____

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☑ YES Date of Approval: _____ ☐ 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	2.2 ESTIMATED PROJECT CONSTRUCTION COST
Sunrise Beach Sewer District - Phase II	$ 3,384,050.00

2.3 PROJECT DESCRIPTION

Construction of a new 50,000 GPD Mechanical Treatment Plant and an extension of the collection services to approximately 96 dwelling units and 69 commercial buildings.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Sludge storage with aerated digestion is employed to further reduce Volatile Organic Compounds (VOC's) and maintain a low odor, oxygenated sludge for disposal by a hired disposal company.

2.5 DESIGN INFORMATION

A. Current population: 346 ; Design population: 500

B. Actual Flow: 34600 gpd; Design Average Flow: 50000 gpd;
Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: _____ gpd; Design Wet Weather Event: _____

2.6 ADDITIONAL INFORMATION

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

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

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Sunrise Beach WWTF #2	5733748782	

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
Jet Ski Drive	Sunrise Beach	MO	65079	Camden

Wastewater Treatment Facility: Mo-0139131 (Outfall Of)

3.1 Legal Description: SE ¼, NW ¼, SW ¼, Sec. 34, T 40, R 17
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 1553060 Northing (Y): 854745.3
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Unnamed Tributary to Lake of the Ozarks

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Village of Sunrise Beach	5733748782	

ADDRESS	CITY	STATE	ZIP CODE
16363 MO-5	Sunrise Beach	MO	65079

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 Owner		

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
Jared W. Wheaton / Shoreline Surveying & Engineerin	5733923312	jared@shorelinese.com

ADDRESS	CITY	STATE	ZIP CODE
3048 Hwy 52	Eldon	MO	65026

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 Curt Mooney

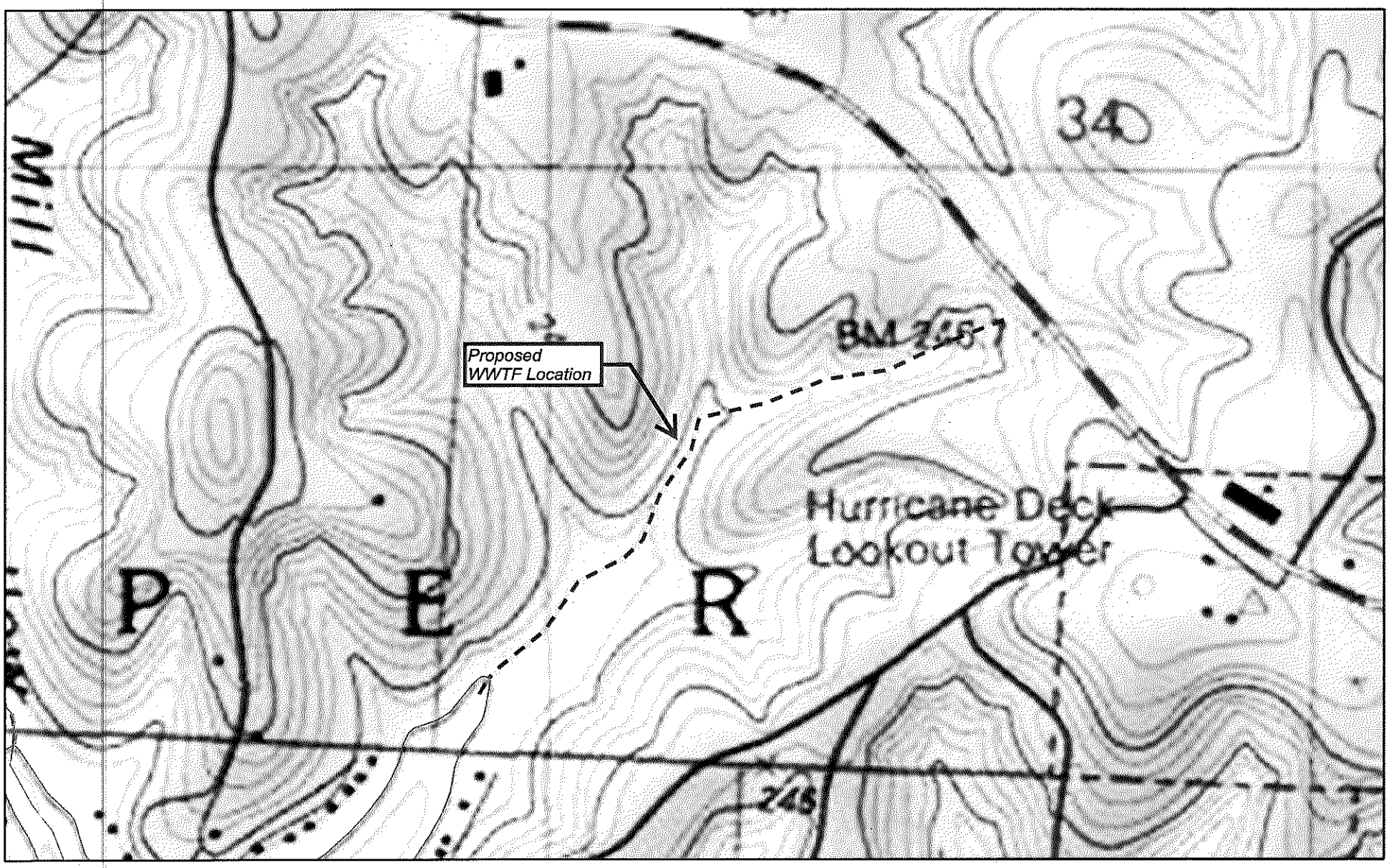
PRINTED NAME	DATE
Curt Mooney	05/13/2019

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Board Chairman/Mayor - Village of Sunrise Beach	5733748782	

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.

Topographic Map Showing Outfall



7/17/2018, 4:24:06 PM

1:9,028

0 0.05 0.1 0.2 mi

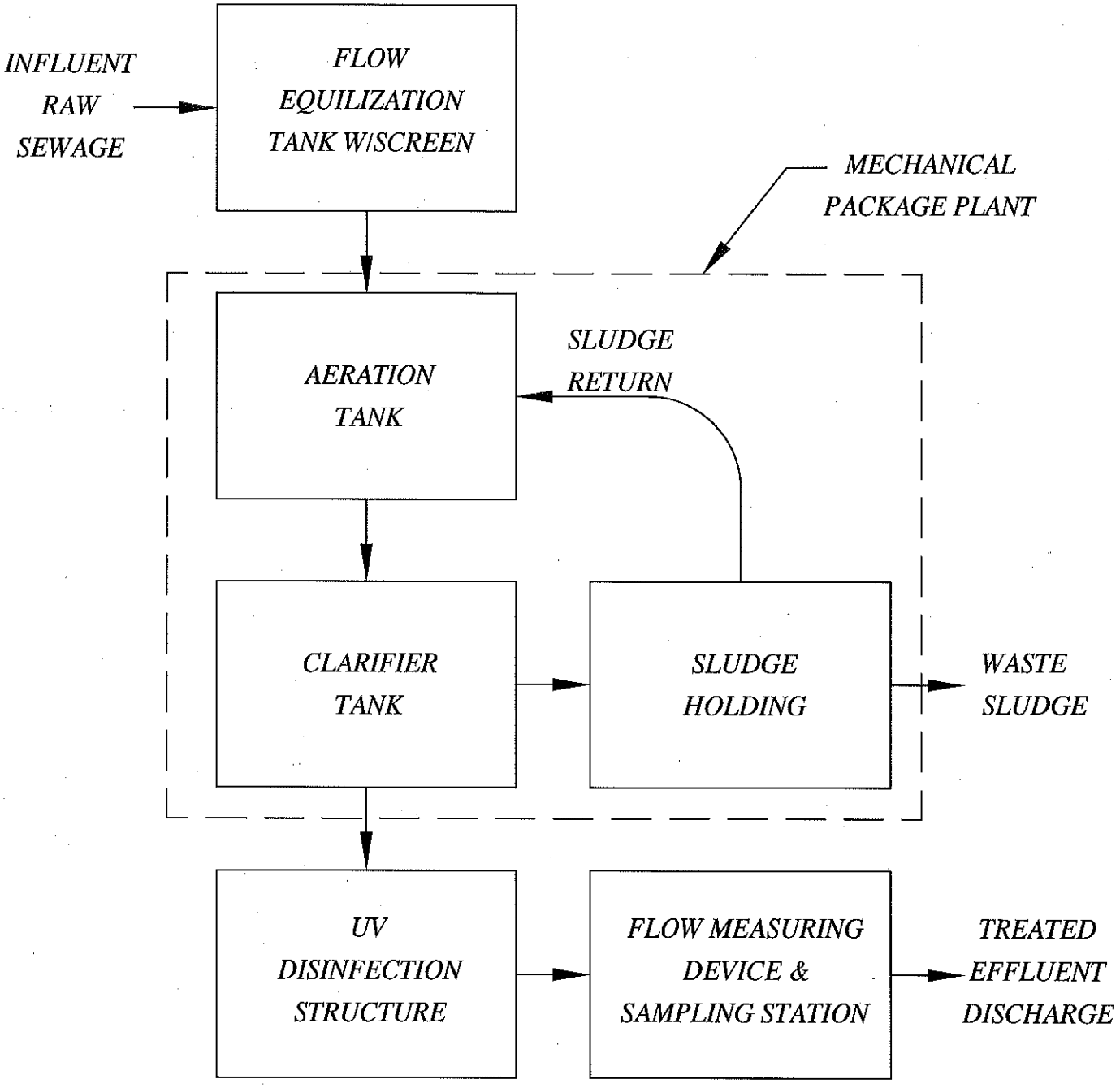
0 0.07 0.15 0.3 km

USA Detailed Streams

Stream Classifications and Use Designations

Lake Classifications and Use Designations

Losing



Date: 07/18/2018	Scale: N/A	Project: SUNRISE BEACH PHASE II WWTF FLOW DIAGRAM VILLAGE OF SUNRISE BEACH, MO CAMDEN COUNTY
Project Number: 9425-18:E1		
Sheet Number: 1		
2017		

SHORELINE
SURVEYING & ENGINEERING
3048 Hwy. 52 Eldon, MO 65026 PH: (573) 392-3312

Shoreline Surveying & Engineering, LLC
3048 Hwy. 52
Eldon, MO 65026
PH: (573) 392-3312

Civil & Structural Engineering *Land Surveying* *Materials Testing*

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MAY 30 2019
Water Protection Program

May 30, 2019

Missouri Department of Natural Resources
Water Protection Program
1101 Riverside Dr.
Jefferson City, MO 65101

RE: Construction Permit Application for Sunrise Beach Phase II Sewer Improvements

Dear DNR Staff:

Thank you for your assistance with the engineering report and anti-degradation portion of this project. Please find the following enclosed in regards to the above referenced project for the procurement of a construction permit:

- (2) copies Engineering Plans
- (2) copies Technical Specifications
- (1) copy Summary of Design
- (1) Electronic copy (on Disc) of the Plans, Specifications, and Summary of Design in PDF format
- Construction Permit Application
- Application Fee for Construction Permit (Operating fee to be provided during construction activities)

Again, thank you for your diligence. If you have any questions, please contact me directly at 573-714-0366.

Very Truly Yours,
Shoreline Surveying & Engineering, LLC

Jared Wheaton, PE