STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

The Honorable Robert Sellenriek
Mayorof the City of Jonesburg
106 W Boonslick Road
Jonesburg, MO 63351

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.

February 3, 2021
Effective Date

Edward B. Galbraith
Edward B. Galbraith, Director, Division of Environmental Quality

February 2, 2023
Expiration Date

Chris Wieberg
Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The Jonesburg WWTF is a publically owned treatment works located near the North Service Road and Oakhill Road intersection in Jonesburg, Montgomery County. The existing facility consists of a barscreen, an influent pump station, and a two-cell lagoon. Sludge is stored in the lagoon cells.

The proposal to upgrade the treatment system includes the addition of a high flow splitter structure, a new headworks with mechanical screening and influent flow measurement, replacement of the influent pumping station, replacement of existing lagoon surface aerators with the Nexom optAER® diffuser aeration system, addition of blowers, new manhole box structure and influent line for gravity flow into Lagoon Cell No. 1, new effluent control structure for Lagoon Cell No. 2, addition of a Submerged Attached Growth Reactor (SAGR™) treatment system following Lagoon Cell No. 2, construction of an ultraviolet disinfection structure with bypass, addition of an effluent flow meter, and replacement of the existing standby generator. 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.

The design flow of the wastewater treatment facility will increase from 120,000 gallons per day (gpd) to 160,000 gpd. The existing outfall structure and location will remain with discharge to the Tributary to Little Bear Creek.

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.

Department is not required to determine Cost Analysis for Compliance because the permit contains no new conditions or requirements that convey a new cost to the facility.

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 McClure Engineering Co. 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 St. Louis Regional Office per 10 CSR 20-7.015(9)(G).

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

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

7. 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.

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

    - Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred-(100) year flood elevation. 10 CSR 20-8.140(2)(B). 10 CSR 20-8.130 (2) (A)

- Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140 (2) (D). 10 CSR 20-8.130 (2) (B)
- 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: 10 CSR 20-8.130 (2) (C)
    - 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. Interconnection between the wet well and dry well ventilation systems is not acceptable; 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)
- 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)
- Dry wells, including their superstructure, shall be completely separated from the wet well with gas tight common walls. 10 CSR 20-8.130 (3) (A) 1.
- Suitable and safe means of access to dry wells and to wet wells shall be provided to persons wearing self-contained breathing apparatus. 10 CSR 20-8.130 (3) (A) 2.
- Multiple pumps shall be provided except for design average flows of less than fifteen hundred (1,500) gallons per day. 10 CSR 20-8.130 (3) (B) 1.
- Electrical equipment. Electrical equipment shall be provided with the following requirements:
    - 10 CSR 20-8.130 (3) (B) 2. A. Electrical equipment must comply with 10 CSR 20-8.140(7)(B);
    - Utilize corrosive resistant equipment located in the wet well; 10 CSR 20-8.130 (3) (B) 2. B.
    - Provide a watertight seal and separate strain relief for all flexible cable; 10 CSR 20-8.130 (3) (B) 2. C.
    - Install a fused disconnect switch located above ground for the main power feed for all pumping stations. 10 CSR 20-8.130 (3) (B) 2. D.
    - When such equipment is exposed to weather, it shall comply with the requirements of weather proof equipment; enclosure NEMA 4; NEMA 4X where necessary; and *NEMA Standard 250-2014*, published December 15, 2014. 10 CSR 20-8.130 (3) (B) 2. E.
    - Install lightning and surge protection systems; 10 CSR 20-8.130 (3) (B) 2. F.
    - Install a one hundred ten volt (110 V) power receptacle inside the control panel located outdoors to facilitate maintenance; 10 CSR 20-8.130 (3) (B) 2. G.
    - Provide Ground Fault Circuit Interruption (GFCI) protection for all outdoor receptacles. 10 CSR 20-8.130 (3) (B) 2. H.
- Water level controls must be accessible without entering the wet well. 10 CSR 20-8.130 (3) (C)

- Valves shall not be located in the wet well unless integral to a pump or its housing. 10 CSR 20-8.130 (3) (D)
- Covered wet wells shall have provisions for air displacement to the atmosphere, such as an inverted and screened “j” tube or other means. 10 CSR 20-8.130 (3) (E)
- Interconnection between the wet well and dry well ventilation systems is not acceptable10 CSR 20-8.130 (3) (F)
- There shall be no physical connection between any potable water supply and a wastewater pumping station, which under any conditions, might cause contamination of the potable water supply. If a potable water supply is brought to the station, No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.130 (3) (G)
    - Hot water for any direct connections shall not be taken directly from a boiler used for supplying hot water to a digester heating unit or heat exchanger. 10 CSR 20-8.140 (7) (D) 2.
    - Where a potable water supply is to be used for any purpose in a wastewater treatment facility other than direct connections, a break tank, pressure pump, and pressure tank or a reduced pressure backflow preventer consistent with the department’s Public Drinking Water Branch shall be provided. 10 CSR 20-8.140 (7) (D) 3. A.
    - For indirect connections, a sign shall be permanently posted at every hose bib, faucet, hydrant, or sill cock located on the water system beyond the break tank or backflow preventer to indicate that the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 3. B.
    - Where a separate non-potable water supply is to be provided, a break tank will not be necessary, but all system outlets shall be posted with a permanent sign indicating the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 4.
- Submersible pump stations shall meet the applicable requirements under section (3) of this rule, except as modified in this section. 10 CSR 20-8.130 (5)
    - Pump Removal. Submersible pumps shall be readily removable and replaceable without personnel entering, dewatering, or disconnecting any piping in the wet well. 10 CSR 20-8.130 (5) (A)
    - 10 CSR 20-8.130 (5) (B) Valve Chamber and Valves. Valves required under subsection (3)(D) of this rule shall be located in a separate valve chamber.
    - A minimum access hatch dimensions of twenty-four inches by thirty-six inches (24" x 36") shall be provided. 10 CSR 20-8.130 (5) (B) 1.
- A portable pump connection on the discharge line with rapid connection capabilities shall be provided. 10 CSR 20-8.130 (5) (B) 2.
- Alarm systems with an uninterrupted power source shall be provided for pumping stations. 10 CSR 20-8.130 (6)
- Where independent substations are used for emergency power, each separate substation and its associated distribution lines shall be capable of starting and operating the pump station at its rated capacity. 10 CSR 20-8.130 (7) (B)
- Force main system shall be designed to withstand all pressures (including water hammer and associated cyclic reversal of stresses), and maintain a velocity of at least two feet (2') per second. 10 CSR 20-8.130 (8) (A)

- 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.
- The outfall shall be so constructed and protected against the effects of flood water, ice, or other hazards as to reasonably ensure its structural stability and freedom from stoppage. 10 CSR 20-8.140 (6) (A)
- All sampling points shall be designed so that a representative and discrete twenty-four (24) hour automatic composite sample or grab sample of the effluent discharge can be obtained at a point after the final treatment process and before discharge to or mixing with the receiving waters. 10 CSR 20-8.140 (6) (B)
- All outfalls shall be posted with a permanent sign indicating the outfall number (i.e., Outfall #001). 10 CSR 20-8.140 (6) (C)
- All wastewater treatment facilities shall be provided with an alternate source of electric power or pumping capability to allow continuity of operation during power failures. 10 CSR 20-8.140 (7) (A) 1.
- Disinfection and dechlorination, when used, shall be provided during all power outages. 10 CSR 20-8.140 (7) (A) 2.
- Electrical systems and components in raw wastewater or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors that are normally present, shall comply with the NFPA 70 *National Electric Code (NEC)* (2017 Edition), as approved and published August 24, 2016, requirements for Class I, Division 1, Group D locations. 10 CSR 20-8.140 (7) (B)
- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140 (7) (C)
- 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)
- 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)
- Grease interceptors shall be provided on kitchen drain lines from institutions, hospitals, hotels, restaurants, schools, bars, cafeterias, clubs, and other establishments from which relatively large amounts of grease may be discharged to a wastewater treatment facility owned by the grease producing entity. Grease interceptors are typically constructed from fiberglass reinforced polyester, high density polyethylene (HDPE), or concrete. For corrugated HDPE grease interceptors, follow ASTM F2649 – 14 *Standard Specification for Corrugated High Density Polyethylene (HDPE) Grease Interceptor Tanks*, as approved and published September 1, 2014. For precast concrete grease interceptor tanks, follow ASTM C1613 – 17 *Standard Specification for Precast Concrete Grease Interceptor Tanks*, as approved and published September 1, 2017. 10 CSR 20-8.150 (3)

- All screening devices and screening storage areas shall be protected from freezing. 10 CSR 20-8.150 (4) (A) 1.
- Provisions shall be made for isolating or removing screening devices from their location for servicing. 10 CSR 20-8.150 (4) (A) 2.
- Manually cleaned screen channels shall be protected by guard railings and deck gratings with adequate provisions for removal or opening to facilitate raking. 10 CSR 20-8.150 (4) (A) 3. A. (I)
- Mechanically cleaned screen channels shall be protected by guard railings and deck gratings. 10 CSR 20-8.150 (4) (A) 3. A. (II)
- Mechanical screening equipment shall have adequate removal enclosures to protect facility personnel against accidental contact with moving parts and to prevent dripping in multi-level installations. 10 CSR 20-8.150 (4) (A) 3. B. (I)
- A positive means of locking out each mechanical screening device shall be provided. 10 CSR 20-8.150 (4) (A) 3. B. (II)
- An emergency stop button with an automatic reverse function shall be located in close proximity to the mechanical screening device. 10 CSR 20-8.150 (4) (A) 3. B. (III)
- The minimum berm width shall be eight feet (8') to permit access of maintenance vehicles. 10 CSR 20-8.200 (4) (A) 2.
- Minimum freeboard shall be two feet (2'). 10 CSR 20-8.200 (4) (A) 3.
- An emergency spillway shall be provided. 10 CSR 20-8.200 (4) (A) 4.
- An emergency spillway must have the ability for a representative sample to be collected if a discharge occurs. 10 CSR 20-8.200 (4) (A) 4. C.
- Unlined corrugated metal pipe shall not be used for influent lines due to corrosion problems. 10 CSR 20-8.200 (4) (D) 1.
- A manhole shall be installed with its invert at least six inches (6") above the maximum operating level of the lagoon, prior to the entrance into the primary cell, and provide sufficient hydraulic head without surcharging the manhole. 10 CSR 20-8.200 (4) (D) 2.

9. Upon completion of construction:

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

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

   C. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The purpose of the proposed construction is to improve the collection system and enhance the existing wastewater treatment facility in order to meet final effluent limits for ammonia and *E. coli.*

2. FACILITY DESCRIPTION

The Jonesburg WWTF is located 0.14 mi NW the of N Service Road and Oakhill Road intersection in Jonesburg, Montgomery County. The existing facility has a design average flow of 120,000 gpd and serves a hydraulic population equivalent of approximately 870 people. The existing treatment system consists of a barscreen, an influent pump station, and a two-cell lagoon. Sludge is stored in the lagoon cells.

The proposed project includes a number of system improvements to upgrade the existing wastewater treatment facility. A high flow splitter structure will be installed prior to a new mechanical screen in the headworks. Flows in excess of 2 MGD will be sent to the existing bar screen. A new 6" parshall flume will measure influent flow. The existing influent pump station will be replaced by a new triplex influent pump station. A new influent manhole box structure will be constructed ahead of Lagoon Cell No. 1 to allow gravity flow into the lagoon. A new effluent structure with adjustable weir will be installed in Lagoon Cell No. 2 to adjust water elevation within the lagoons and control the amount of flow discharging to the SAGR™ unit. Existing lagoon surface aerators will be replaced with Nexom optAER® fine bubble diffusers in Lagoon Cell No. 1 and Lagoon Cell No. 2. Following lagoon treatment, a submerged attached growth reactor (SAGR™) treatment system will be installed to enhance ammonia treatment and provide disinfection. The SAGR™ system will consist of one 170 ft by 50 ft insulated treatment basin. A new ultraviolet (UV) disinfection structure equipped with piping and electrical supply shall be constructed to potentially house a UV disinfection system if necessary in the future. The design average flow of the upgraded treatment system will increase to 160,000 gpd. Effluent will discharge via the existing effluent weir structure to the Tributary to Little Bear Creek.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet final effluent limits as established in in the Antidegradation Review dated September 6, 2018 and the modified Operating Permit MO-0040851.

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

Parameter	Units	Monthly Average Limit
Biochemical Oxygen Demand$_5$	mg/L	30
Total Suspended Solids	mg/L	30
Ammonia as N-summer	mg/L	0.8

Ammonia as N-winter	mg/L	2.3
pH	SU	6.5-9.0
Oil & Grease	mg/L	10
E. coli	#/100mL	206

4. ANTIDEGRADATION

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated September 6, 2018 due to the proposed increase in design flow from 120,000 gpd to 160,000 gpd. See **APPENDIX – ANTIDEGRADATION REVIEW**.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

- Lagoon Cell No. 1 and Lagoon Cell No. 2 – The influent is pumped into Lagoon Cell No. 1 by an existing pump station on the treatment plant site. Lagoon Cell No. 1 is currently equipped with four surface aerators and has a surface area of 2.3 acres and a wastewater volume of 5,216,810 gallons at the 7.5 ft operating level. Lagoon Cell No. 2 is currently non-aerated and has a surface area of 0.7 acres and a wastewater volume of 1,544,796 gallons at the 7.5 ft operating level. The combined storage provides approximately 42 total days of retention at the proposed design flow.

Construction will cover the following items:

- Components are designed for a Population Equivalent of 1,698 with a hydraulic loading of 160,000 gpd and an organic loading of 304 lbs of BOD_5 per day to the system. The design maximum daily flow of the treatment plant is 270,000 gpd.

- Screening – Installation of screening devices removes nuisance inorganic materials from raw wastewater.
  - Mechanical Coarse Screen – One (1) 6 mm perforated spiral mechanical screen installed at an angle of 35 degrees from the horizontal. The screening device shall be capable of treating a design average flow of 160,000 gpd and a peak hourly flow of 2.0 MGD.
  - A new high flow splitter shall divert wet weather flows in excess of 2.0 MGD to the existing manually cleaned coarse bar screen. The inclusion of a manually cleaned coarse bar screen provides redundancy and a means of unit isolation for the mechanically cleaned coarse screen.

- Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis.
  - Parshall Flume – A 6-inch throat influent parshall flume with ultrasonic flow sensor shall measure the raw influent wastewater following screening. Effluent from the headworks shall flow by gravity to the new influent pump station.

- Influent Pump Station – Construction of a triplex influent pump station with each minimum 10 HP submersible pump capable of operating at 868 gpm at 33 feet of TDH. Firm capacity of the pump station is 1,736 gpm with one pump out of service. Three (3) 6-inch ductile iron pipe (DIP) forcemains shall convey wastewater from the influent pump station to a new manhole box structure ahead of Lagoon Cell No. 1.

- Lagoon Cell No. 1 Influent Structure – Construction of concrete manhole box structure prior to Lagoon Cell No. 1 entrance with its invert located at elevation 851 ft, 6 inches above the lagoon maximum operating level. Wastewater will flow from the manhole into Lagoon Cell No. 1 via a new 12-inch gravity flow DIP located along the bottom of the lagoon floor.

- Lagoon Aeration Equipment – Installation of Nexom optAER® fine-bubble diffusers in Lagoon Cell No. 1 and Cell No. 2 to improve BOD_5 and TSS treatment in the lagoon cells prior to tertiary treatment. One (1) minimum 20 HP blower unit shall provide 100% of the required airflow, with standby provided by the SAGR™ standby blower unit.

- Lagoon Cell No. 2 Effluent Structure – Construction of Lagoon Cell No. 2 effluent structure with adjustable weir to control lagoon water elevation. The structure will include a control valve to limit and adjust amount of wastewater flow entering the SAGR™ unit.

- Nexom Submerged Attached Growth Reactor (SAGR™) – The lagoon treated effluent will flow by gravity to one (1) SAGR™ treatment unit. The SAGR™ system is capable of treating a design average flow of 160,000 gpd and a peak flow of 750,000 gpd. The reactor will be a constructed 170 ft x 54 ft x 12 ft earthen basin with a geomembrane liner of 60 mil HDPE. The average water depth in the basin is 7 ft. The reactor is split by the influent piping into two zones. The reactor is layered with 8 inches of top insulating shredded rubber mulch for heat retention, a protective non-woven geotextile fabric acting as a barrier, and 11 ft 8 inches of granular media. The top layer contains the 4-inch HDPE air distribution laterals. The granular media layer contains the two influent 10-inch PVC SDR-35 pipes with drilled orifices surrounded by a chamber to provide clear flow of wastewater, the drop down 1-inch HDPE air distribution diffusers, and the effluent collection chamber. Aeration is provided by means of two (2) rotary positive displacement blowers each capable of supplying 1,567 scfm with 100 HP motors. The effluent from the SAGR™ unit will be collected in a common effluent structure and will flow by gravity to the disinfection system.

- Disinfection – Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
    - An ultraviolet (UV) disinfection housing structure shall be constructed along with necessary piping and electrical supply for the potential to install a UV disinfection system in the future.

- Upon system startup, the SAGR™ unit will be the only means of disinfection and wastewater shall bypass the UV structure via a 10-inch DIP. If the SAGR™ system fails to meet the permitted *E. coli* effluent limits, obtain a construction permit for the UV system installation. Effluent wastewater will discharge to the receiving stream via the existing discharge weir structure.

6. OPERATING PERMIT

Operating permit MO-0040851 will require a modification to reflect the construction activities. The modified Jonesburg WWTF operating permit, MO-0040851, was successfully public noticed from December 4, 2020 to January 4, 2021 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.

V. NOTICE OF RIGHT TO APPEAL

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

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

Ellen Modglin, E.I.
Engineering Section
Ellen.Modglin@dnr.mo.gov

Cailie Carlile, P.E.
Engineering Section
cailie.carlile@dnr.mo.gov

APPENDIX – Antidegradation Review

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to
Tributary to Little Bear Creek
by
Jonesburg Wastewater Treatment Facility

September, 2018

1. Facility Information

FACILITY NAME: Jonesburg Wastewater Treatment Facility (WWTF) NPDES #: MO-0040851

FACILITY TYPE/DESCRIPTION:
FACILITY TYPE: POTW – SIC #4952
FACILITY DESCRIPTION: The current permitted design flow is 120,000 gpd. The proposed upgraded design flow is 160,000 gpd. The existing Jonesburg WWTF includes a bar screen, a two-cell lagoon with aeration in the primary cell. Sludge from the facility is land applied. The proposed upgrade is to construct a mixed-batch bio reactor between the two lagoon cells. UV disinfection will be placed following the second lagoon cell.

COUNTY:	Montgomery	UTM COORDINATES:	X = 647131 Y = 4303005
12- DIGIT HUC:	07110008-0305	LEGAL DESCRIPTION:	SE¼, NE¼, SE¼, Sec. 01, T47 N, R04W
EDU*:	Central Plains/Cuivre/Salt	ECOREGION:	Central Plains

* - Ecological Drainage Unit

2. Water Quality Information

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

***2.1.** Water Quality History:*

The discharge monitoring data over the last five years indicated upgrades to meet final ammonia limits as defined in Table A-2 of the current operating permit are necessary. The median/average monthly values over the sampling period from 2012 to 2018 were as follows: Ammonia – Summer: 4.2/5.3 mg/L and Winter: 7.3/8.7 mg/L, BOD – 14.0/15.1 mg/L, TSS – 16.0/18.1mg/L, Oil & Grease – 6/5.1 mg/L, pH – 8.15/8.20 SU. From 2012 to present the existing facility has been issued one letter of warning (LOW) for exceeding BOD_5 limits in July, 2014. No violations of permit limits have been documented since. Receiving steam is not 303(d) or 305(b) listed.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.25	Secondary	Tributary to Little Bear Creek	0.0

3. Receiving Waterbody Information

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Tributary to Little Bear Creek	C	3960	-	-	-	AQL, HHP, IRR, LWW, SCR, WBC(B)

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

RECEIVING WATER BODY SEGMENT #1: Tributary to Little Bear Creek
Upper end segment* UTM coordinates: X = 647083 / Y = 4303140 (Outfall)
Lower end segment* UTM coordinates: X= 647560/ Y=4304837 (Confluence with Little Bear Creek)

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

4. General Comments

Shafer, Kline & Warren, Inc., prepared, on behalf of the City of Jonesburg, the City of Jonesburg Wastewater Treatment Facility A*ntidegradation Report* received May 29, 2018.

Applicant elected to determine that discharge of BOD_5 and TSS are non-degrading while the other POCs were assumed to be significantly degrading in the absence of water quality data. The alternatives analysis was conducted to fulfill the requirements of the AIP. Information that was provided by the applicant in the submitted report and summary forms in Appendix B was used to develop this review document.

A Geohydrological Evaluation was not submitted for this facility upgrade. The stream is gaining for discharge purposes (Appendix A: Map).

A Missouri Department of Conservation Natural Heritage Review Report was obtained by the applicant; MDC found no known records for Species or Natural Communities of Conservation Concern within the defined Project Area.

5. Antidegradation Review Information

The following is a review of the *Antidegradation* dated May 29, 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, non-degrading demonstrated for BOD5 and TSS while the other POCs were assumed to have significant degradation (see Appendix C).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
BOD_5	**	Non-degrading	
Total Suspended Solids (TSS)	2	Non-degrading	
Ammonia as N	***	Significant	
pH	2	Significant	Permit limits applied
Oil & Grease (mg/L)	**	Significant	Permit limits applied
Escherichia coli (*E. coli*)	**	Significant	Permit limits applied
Nitrogen, total	*	Significant	
Phosphorus, total	*	Significant	

* 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.

5.2. EXISTING WATER QUALITY

No existing water quality data was submitted. All POCs were considered to be Tier 2 with either significant degradation or non-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.

Land application of wastewater was evaluated by the applicant. A detailed cost analysis was submitted (Appendix C). The estimated present worth cost of the system over a 20 year period at 0.2% is $6,454,741. 120 acres would need to be purchased as well as construction of an influent pump station to go with the necessary appurtenances for a functional system. The cost is approximately twice that of the preferred alternative and is cost prohibitive.

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. Four alternatives from non-degrading to less degrading to degrading alternatives were evaluated. Alternative #1, land application, was eliminated as impracticable due to high costs. 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 (Appendix C). The Nitrox (2 basin) system was the preferred alternative based on this analysis.

Table 2: Alternatives Analysis Comparison

	Nitrox (2 basin)	MBBR Nitrox (3 basin + filter)	SAGR
Ammonia (s/w)	0.8 / 2.3	0.2 / 1.7	0.8 / 2.1
Practical	Y	Y	Y
Economical	Y	Y	Y
Life Cycle Cost*	$3,385,410	$4,166,931	$4,100,772
Ratio	1 : 1	1 : 1.23	1 : 1.21

* Life cycle cost at 20 year design life and 0.2% 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 nearest treatment facility that would be able to accept the flows is located approximately 12 miles. With that length of pipe it is likely many easements would need to be secured. The cost of pumping and forcemain installation would be cost prohibitive. Due to this fact, the applicant was able to eliminate regionalization as a viable option.

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 does not discharge to a losing stream segment and will not discharge with 2 miles of a losing stream segment.

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 within an 8-mile radius from the discharge site. Secondly, a number of relevant factors were identified including affordable housing, needed growth, increased land value and tax base, and environmental factors. 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.

5.3.4 Demonstration of Insignificance

In Section II.A of the *Missouri's Antidegradation Rule and Implementation Procedure,* a demonstration of insignificance of the discharge requires the applicant to show a reduction, or maintenance of loading, i.e., no change in ambient water quality concentrations in the receiving waters. Table 2 below summarizes the results of current loading based on the current permit concentrations and proposed loadings based on the proposed permit concentrations.

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

Pollutants of Concern	Current limits (mg/L)	Proposed Limits (note 1) (mg/L)	Current loading (lbs/day)	Proposed Loading (lbs/day)	Net change (lbs/day)
BOD5	65 (AWL)	45 (AWL)	65.0	60.0	-5.0
	45 (AML)	30 (AML)	45.0	40.0	-5.0
Total Suspended Solids (TSS)	120 (AWL)	45 (AWL)	120.0	60.0	-60.0
	80 (AML)	30 (AML)	80.0	40.0	-40.0

Current design flow (Qd) = 0.12 MGD
Mass conversion -- 1 mg/L = 8.34 lbs/million gallons
Wasteload Allocation (WLA) = maximum daily or weekly average

Existing Load (lbs/day) = Mass conversion * WLA * Qd
Example: 8.34 (lbs/MG)/(mg/L) * 65 mg/L * 0.12 MGD = 65.0 lbs/day

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/Year	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		45	30	FSR	once/month
TOTAL SUSPENDED SOLIDS ***	MG/L		45	30	FSR	once/month
PH	SU	6.5– 9.0		6.5 – 9.0	FSR	once/month
AMMONIA AS N (APR 1 – SEPT 30)	MG/L	2.1		0.8	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	1030**		206**	FSR	once/week
WET TESTING	TU	*		*	FSR	once/year
TOTAL NITROGEN		*		*	FSR	once/quarter
TOTAL PHOSPHORUS		*		*	FSR	once/quarter

NOTE 1 – COLONIES/100 ML
NOTE 2– WATER QUALITY-BASED EFFLUENT LIMITATION – WQBEL; OR MINIMALLY DEGRADING EFFLUENT LIMIT – MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT – PEL; OR TECHNOLOGY-BASED EFFLUENT LIMIT – TBEL; OR
NO DEGRADATION EFFLUENT LIMIT – NDEL; OR FEDERAL/STATE REGULATION – FSR; OR NOT APPLICABLE – N/A.
ALSO, PLEASE SEE THE **GENERAL ASSUMPTIONS OF THE WQAR #4 & #5.**

* Monitoring requirements only.

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

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

9. Receiving Water Monitoring Requirements

No receiving water monitoring requirements recommended at this time.

10. Derivation and Discussion of Limits

Waste load 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). 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. OUTFALL #001 – **MAIN FACILITY OUTFALL**

10.2. LIMIT DERIVATION

- **Flow**. In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.

- **Biochemical Oxygen Demand (BOD5).** BOD5 limits of 30 mg/L monthly average, 45 mg/L average weekly. The table below shows that the expanded loading will be reduced as compared to the current permitted loading. This demonstration of insignificance satisfies the requirements of the AIP. These limitations are non-degrading and protective of existing water quality.

Current Flow (MGD)	Current Concentration (mg/L)	Conversion Factor	Current Load (lbs/day)
0.12	65 MDL	8.34	65
	45 AML	8.34	45

Proposed Flow (MGD)	Proposed Concentration (mg/L)	Conversion Factor	Proposed Load (lbs/day)
0.16	45 MDL	8.34	60
	30 AML	8.34	40

Change in Loading (lbs/day)
-5 MDL/ -5 AML

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

- **Total Suspended Solids (TSS).** TSS limits of 30 mg/L monthly average, 45 mg/L average weekly. The table below shows that the expanded loading will be reduced as compared to the current

permitted loading. This demonstration of insignificance satisfies the requirements of the AIP. These limitations are non-degrading and protective of existing water quality.

Current Flow (MGD)	Current Monthly (mg/L)	Conversion Factor	Current Load (lbs/day)
0.12	120 MDL	8.34	120
	80 AML	8.34	80

Proposed Flow (MGD)	Proposed Concentration (mg/L)	Conversion Factor	Proposed Load (lbs/day)
0.16	45 MDL	8.34	60
	30 AML	8.34	40

Change in Loading (lbs/day)
-60 MDL / -40 AML

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**. The facility did a technology evaluation as part of the submitted Antidegradation Review and selected a treatment technology that meets the economic efficiency and practicability evaluations under the alternatives analysis. In addition, the selected technology could meet the proposed 2013 EPA Ammonia criteria (see Notice to Permittee below). The facility elected to upgrade the treatment plant to meet the expected criteria and to provide a high level of treatment to potentially reduce the need to upgrade in the near future. See Appendix C for further discussion on the preferred alternative effluent limits.

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

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: $C_e = ((0.25 + 0.0)1.5 – (0.0 * 0.01))/0.25$
$C_e = 1.5$ mg/L

Acute WLA: $C_e = ((0.25 + 0.0)12.1 – (0.0 * 0.01))/0.25$
$C_e = 12.1$ 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 = ((0.2 + 0.0)3.1 – (0.0 * 0.01))/0.2
C_e = 3.1 mg/L

Acute WLA: C_e = ((0.2 + 0.0)12.1 – (0.0025 * 0.01))/0.2
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 applicant provided alternative analysis that demonstrated the proposed treatment would be able to produce better than water quality effluent. Limits based off proposed treatment capability are therefore applied in table 3.

Notice to Permittee: On August 22, 2013, the Environmental Protection Agency (EPA) published a notice in the Federal Register announcing the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, *Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013*, is not a rule, nor automatically part of a state's water quality standards. States must adopt new ammonia criteria consistent with EPA's published ammonia criteria into their water quality standards that protect aquatic life in water.
The Water Protection Program (WPP) is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The Department has begun discussions about how these new criteria will be implemented. WPP is suggesting that all permittees consider the lower ammonia criteria if they so choose. Consideration of the future ammonia criteria at this time could avoid a near-future upgrade. More information about the new ammonia criteria for aquatic life protection may be found at: http://dnr.mo.gov/pubs/pub2481.htm.

Limits from alternatives analysis.

AML: 0.8 / 2.3 mg/L

Summer:
LTA = AML / 1.19 = 0.8 / 1.19 = 0.67 mg/L
MDL = LTA (3.11) = 0.67 (3.11) = **2.1 mg/L**

Winter:
LTA = AML / 1.19 = 2.3 / 1.19 = 1.9 mg/L
MDL = LTA (3.11) = 1.9 (3.11) = **6.0 mg/L**

- ***Escherichia coli (E. coli)***. Monthly average of 206 per 100 mL as a geometric mean and Daily Maximum of 1030 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.031(5)(C). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d).

  Rule for monitoring requirements is 10 CSR 20-7.015 (9)(D)6.A, B and C]
  For facilities greater than 100,00 gpd:At a minimum, weekly monitoring is required during the recreational season (April 1 – October 31), with compliance to be determined by calculating the geometric mean of all samples collected during the reporting period (samples collected during the calendar week for the weekly average, and samples collected during the calendar month for the monthly average). The weekly average requirement is consistent with EPA federal regulation 40 CFR 122.45(d). Please see **GENERAL ASSUMPTIONS OF THE WQAR #7.**

- **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 and/or Chronic 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.

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

11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed expanded facility discharge, City of Jonesburg WWTF, 0.16 MGD will result in no degradation of the segment identified in the tributary to Little Bear Creek for BOD and TSS, all other pollutants are considered significantly degrading. A two basin Nitrox system 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 the two basin Nitrox was found to be cost effective and was determined to be the preferred alternative.

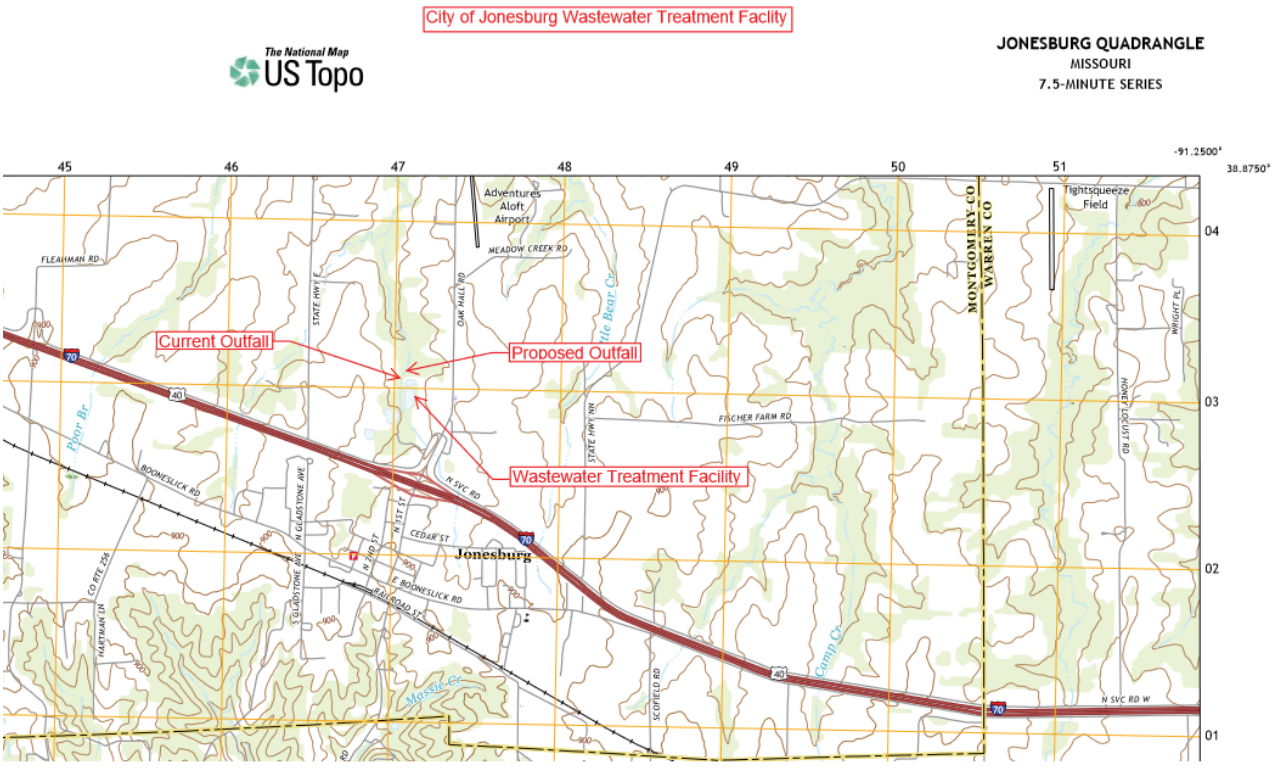
It has also been determined that the other treatment options presented (3 basin Nitrox with filter, SAGR, and land application) may also be considered reasonable alternatives provided they are designed to be capable of meeting the effluent limitations developed based on the preferred alternative. If 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.

The System is not covered in 10 CSR 20-8 Design Guides and is considered a new treatment technology. To proceed with a new technology, your construction permit application must address approvability of the technology in accordance with the *New Technology Definitions and Requirements* factsheet available at http://dnr.mo.gov/pubs/pub2453.htm. If you have any questions regarding the new technology factsheet, please contact Cindy LePage of the Water Protection Program. The permittee will need to work with the review engineer to ensure equipment is sized properly and that the technology will consistently achieve the proposed effluent limits. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation.

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.

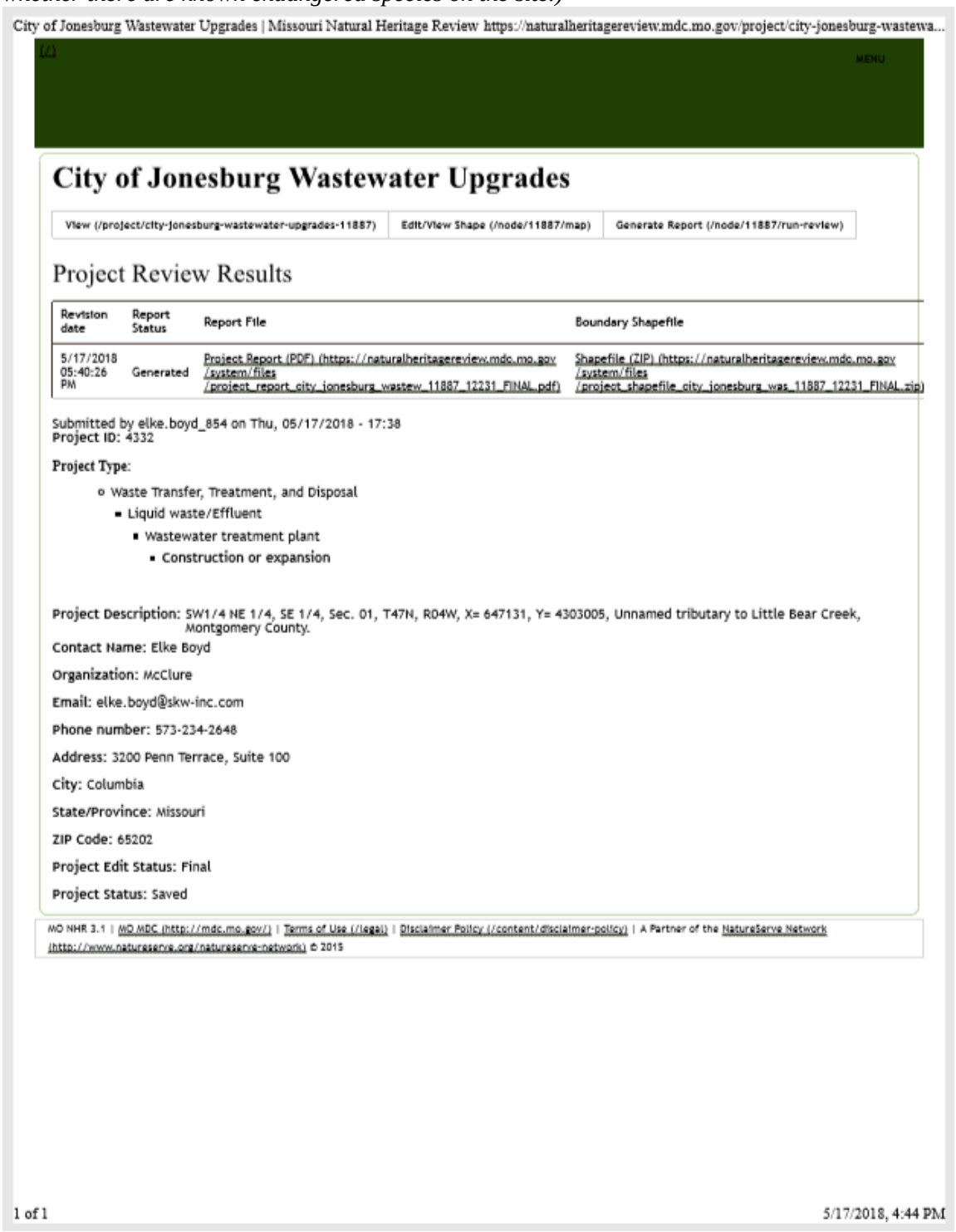
Reviewer: Aaron Sawyer
Date: 9/6/2018
Unit Chief: John Rustige, P.E. JR

Appendix A: Map of Discharge Location



Appendix B: Natural Heritage Review

(*Applicant must check for rare and endangered aquatic species that may be affected by the discharge by using the following web link: http://mdcgis.mdc.mo.gov/heritage/. The results of the survey must indicate whether there are known endangered species on the site.)*



City of Jonesburg Wastewater Upgrades | Missouri Natural Heritage Review https://naturalheritagereview.mdc.mo.gov/project/city-jonesburg-wastewa...

MENU

City of Jonesburg Wastewater Upgrades

View (/project/city-jonesburg-wastewater-upgrades-11887) | Edit/View Shape (/node/11887/map) | Generate Report (/node/11887/run-review)

Project Review Results

Revision date	Report Status	Report File	Boundary Shapefile
5/17/2018 05:40:26 PM	Generated	Project Report (PDF) (https://naturalheritagereview.mdc.mo.gov/system/files/project_report_city_jonesburg_wastew_11887_12231_FINAL.pdf)	Shapefile (ZIP) (https://naturalheritagereview.mdc.mo.gov/system/files/project_shapefile_city_jonesburg_was_11887_12231_FINAL.zip)

Submitted by elke.boyd_854 on Thu, 05/17/2018 - 17:38
Project ID: 4332

Project Type:

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

Project Description: SW1/4 NE 1/4, SE 1/4, Sec. 01, T47N, R04W, X= 647131, Y= 4303005, Unnamed tributary to Little Bear Creek, Montgomery County.

Contact Name: Elke Boyd

Organization: McClure

Email: elke.boyd@skw-inc.com

Phone number: 573-234-2648

Address: 3200 Penn Terrace, Suite 100

City: Columbia

State/Province: Missouri

ZIP Code: 65202

Project Edit Status: Final

Project Status: Saved

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Missouri Department of Conservation

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

Natural Heritage Review Level One Report: No Known Records

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

PROJECT INFORMATION

Project Name and ID Number: City of Jonesburg Wastewater Upgrades #4332
Project Description: SW1/4 NE 1/4, SE 1/4, Sec. 01, T47N, R04W, X= 647131, Y= 4303005, Unnamed tributary to Little Bear Creek, Montgomery County.
Project Type: Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Construction or expansion
Contact Person: Elke Boyd
Contact Information: elke.boyd@skw-inc.com or 573-234-2648

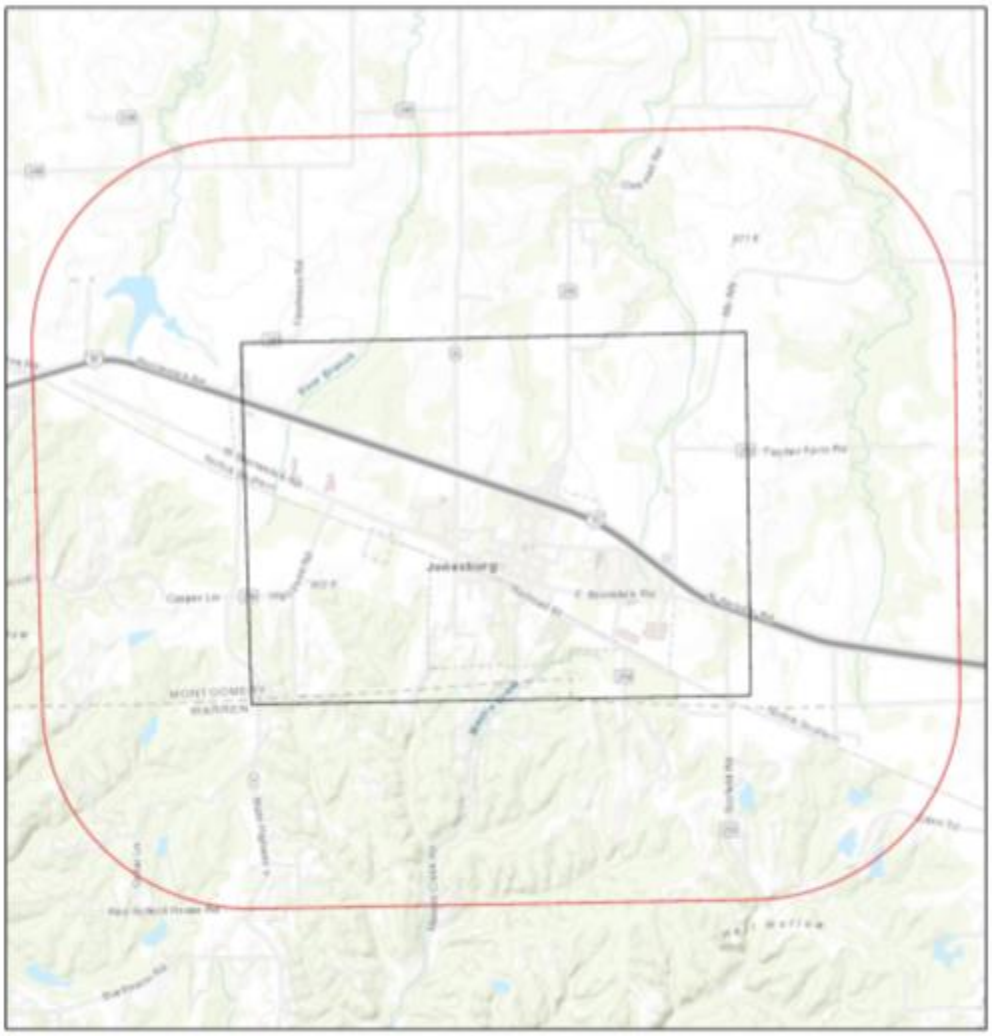
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive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

City of Jonesburg Wastewater Upgrades



May 17, 2018

1:39,603

0 0.325 0.65 1.3 mi
0 0.5 1 2 km

Project Boundary

Buffered Project Boundary

Species or Communities of Conservation Concern within the Area:

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

Other Special Search Results:

No results have been identified for this project location.

Project Type Recommendations:

Waste Transfer, Treatment and Disposal -Wastewater treatment plant: New or Maintenance; Clean Water Act permits issued by other agencies regulate both construction and operation of wastewater systems, and provide many important protections for fish and wildlife resources throughout the project area and at some distance downstream. Fish and wildlife almost always benefit when unnatural pollutants are removed from water, and concerns are minimal if construction is managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any "Clean Water Permit" conditions.

Revegetation of disturbed areas is recommended to minimize erosion, as is restoration with of native plant species compatible with the local landscape and for wildlife needs. Annuals like ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch and sericea lespedeza.

Management Recommendations for Construction Projects Affecting Missouri Streams and Rivers is a Conservation Department publication available at http://mdc.mo.gov/sites/default/files/resources/2013/02/constprojnearstreams_2013.pdf

Project Location and/or Species Recommendations:

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

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

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

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

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

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

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

Miscellaneous Information

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

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

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

Appendix C: Antidegradation Review Summary Attachments—Antidegradation Report:

City of Jonesburg Wastewater Treatment Upgrades

Project Summary

The City of Jonesburg maintains a sewage collection and treatment facility to serve the City of Jonesburg. While the facility generally meets current permit requirements, recent and anticipated NPDES permit changes and hydraulic overloading are requiring the City to explore potential plant upgrades. The treatment facility processes mainly domestic wastewater and no pretreatment program exists nor is anticipated.

The City has opted to upgrade its two-cell aerated lagoon to meet future permit requirements and to increase the capacity to adequately treat current and anticipated wastewater flows. Jonesburg is also planning to upgrade its collection system at the same time. The voters approved the sale of bonds to fund the improvements in April of 2017. A Facility Plan has been prepared and has been submitted to funding agencies. The design and construction of the sewer improvements and upgrades to the wastewater treatment facility (WWTF) is planned to commence as soon as funding has been secured, in the summer of 2018.

The preferred treatment alternative is the insertion of a mix-batch bio reactor (MBBR) between the two lagoon cells. The aeration system in the primary cell will be upgraded. The lagoon will be preceded by screening and followed by ultraviolet disinfection. Sludge storage will be provided in the lagoon. The design average daily flow capacity of the facility will be 160,000 gpd. The design will make allowance for peak flows from the aging collection systems. The planned point of discharge is an unnamed tributary to Little Bear Creek, about 6.9 stream miles from the confluence with Little Bear Creek. The outfall is to be relocated about 200 feet downstream of the current location to allow room for the addition of the disinfection system.

Neither Little Bear Creek nor the unnamed tributary as listed on Tables D or E in the Water Quality Standards and are therefore not a Tier 3 Outstanding State Resource Water (OSRW) or Outstanding National Resource Water (ONRW). The streams are not listed in the current 303(d) list of impaired waters and therefore not a Tier 1 waters. Neither stream is a Metropolitan No-Discharge Stream from Table F. The streams are neither a Biocriteria Reference Location (Table I) nor a Losing Stream (Table J).

The unnamed tributary to Little Bear Creek is a recently classified intermittent stream and as such is not listed in Table H of 10 CSR 20.7. The creek is protected for Aquatic Habitat Protection – Human Health Protection, Whole Body Contact Recreation – Category B, Secondary Contact Recreation, Livestock and Wildlife Protection, and Irrigation. It is assumed that the stream falls under Tier 2 review. There are no USGS gauging stations nearby and, as an intermittent stream, flow is assumed to be so low that no mixing zone exists.

No known water quality data exists for the stream. However, the planned project will reduce the loadings of the Pollutants of Concern (POCs) by 33% to 70%. Therefore, it is the conclusion of this report, that less than minimal degradation will result from the planned improvements. The pollutant reduction is shown in Table 1.

	Current				Proposed		Percent Reduction	
	Design ADF 120,000 gpd		Actual ADF 116,662 gpd		Design ADF 160,000 gpd		Current to Proposed Design Flow	
Parameter	Permit AML (mg/l)	Stream Loadings (lb/d)	DMR Data (mg/l)	Stream Loadings (lb/d)	Permit AML (mg/l)[2]	Stream Loadings (lb/d)	Permit AML (mg/l)[2]	Stream Loadings (lb/d)
BOD_5	45	45.0	45	43.8	30	40.0	33%	11%
TSS	80	80.1	80	77.8	30	40.0	63%	50%
NH_3, Summer[1]	5.0	5.0	5.0	4.9	1.5	2.0	70%	60%
NH_3, Winter[1]	9.3	9.3	9.3	9.0	2.9	3.9	69%	58%

[1] Current concentrations use DMR data averaged from Monthly Average data, June 2011 to October 2016.

[2] Limits for ammonia are the future limits from the current permit.

Table 1 – Anticipated Changes in Pollutant of Concern Stream Loadings

The Jonesburg Wastewater Upgrades project will thus result in a net gain to the environment and bringing the new facility online as quickly as possible will result in the greatest gain.

The Facility Plan shows that several treatment alternatives were investigated. The alternatives included land application, a Submerged Attached Growth Reactor (SAGR), and the chosen MBBR systems. Regionalization was not considered a viable option, due to the great distance to the next community with enough capacity to treat Jonesburg's flows Land application is considered non-degrading to water quality by the MDNR due to the eliminating of the discharge. The SAGR and MBBR system were found to achieve similar effluent quality.

When comparing the anticipated 20-year present worth costs of these core treatment upgrades, land application was found to be unaffordable. The treatment upgrades alone would cost about $4,300,000, due to the fact that a large tract of land would have to be purchased and the pumping distance could be great. The SAGR system cost estimate was about $1,200,000 and the MBBR about $750,000. Without grant funding, the total project cost for the cheapest option would result in a sewer rate equal to about 3.8% of Median Household Income (MHI). Jonesburg's 2006-2010 ACS 5-Year Estimate 2010 MHI was $28,375. The EPA considers 2% of MHI to be the upper threshold of affordability. The City could not afford to build either of the more expensive treatment options.

The Jonesburg WWTF must be operational no later than January 31, 2021 to meet future ammonia limits. However, the current NPDES permit expires in December of 2018. The receiving stream was recently protected for recreation and it is possible that the forthcoming permit will require disinfection at an earlier date.

1) Cost Analysis of Alternatives:

Shafer, Kline & Warren, Inc.
SKW Project No. 160294-010
City of Jonesburg, MO
February 22, 2018

Wastewater System Improvements
Estimated Total Project Cost
Land Application System

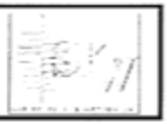
TOTAL PROJECT ESTIMATE (without financing costs)							**$ 7,462,850**
Wastewater Treatment System Total Construction Cost							**$ 4,728,000**
Item	Description:	Qty	Units	Unit Cost	Total Cost		
Influent Pump Station						$	345,000
1	Submersible Pump, high flow, existing wetwell	3	EA	$ 50,000	$ 150,000		
2	Submersible Pump, low flow, inlcuding wetwell	1	EA	$ 100,000	$ 100,000		
3	Control panel and floats	1	EA	$ 25,000	$ 25,000		
4	Piping and structural changes	1	LS	$ 50,000	$ 50,000		
5	Influent Flow Meter	4	EA	$ 5,000	$ 20,000		
Electric Supply Upgrades						$	185,000
6	Electric Supply Upgrades	1	LS	$ 100,000	$ 100,000		
7	New Automatic Transfer Switch	1	EA	$ 10,000	$ 10,000		
8	New Generator, 40 KW	1	EA	$ 75,000	$ 75,000		
Headworks						$	215,000
9	Mechanical Bar Screen	1	LS	$ 100,000	$ 100,000		
10	Structure Modifications	1	EA	$ 40,000	$ 40,000		
11	Headworks Building and Drive	1	EA	$ 75,000	$ 75,000		
Treatment Upgrades						$	3,983,000
12	Lagoon Sludge Removal	322	DT	$ 300	$ 100,000		
13	Pond Construction	1	EA	$ 500,000	$ 500,000		
14	Land Application Pump Station, 2500 gpm VTP	1	LS	$ 250,000	$ 250,000		
15	Forcemain to Land Application Site, 18" PVC	52,800	LF	$ 50	$ 2,640,000		
16	Forcemain Highway Bores, 2 locations	120	LF	$ 400	$ 48,000		
17	Land Application Site Preparation, Earthwork, Grading	1	LS	$ 50,000	$ 50,000		
18	Land Application Sprinkler System	1	LS	$ 350,000	$ 350,000		
19	Control Panel and Wiring	2	EA	$ 10,000	$ 20,000		
20	Site Electric Work	1	EA	$ 25,000	$ 25,000		
UV System						$	-
21	UV Disinfection System	1	LS	$ -	$ -		
Effluent Flow Meter						$	-
22	Parshall Flume	1	LS	$ -	$ -		
Other Costs						$	2,734,850
Construction Contingence Costs							
	Contingencies, as % of Total Construction Cost:			20%	$ 945,600		
Services Costs							
	Legal/Administration, % of Total Construction Cost			2%	$ 94,560		
	Environmental Reports				$ 10,000		
	Legal Survey				$ 10,000		
	Sanitary Sewer Evaluation Study & Report Update				$ 278,650		
	Engineering, Design and Construction Phases			15%	$ 851,040		
	Land Purchase, 120 acres required				$ 500,000		
	Land and Forcemain Easements and Negotiations				$ 25,000		
	Other Costs				$ 20,000		
Financing Costs						$	-
Financing Costs, per financial advisor							PENDING

NOTE 1: THIS ESTIMATE DOES NOT INCLUDE INFLATION.

NOTE 2: COSTS PROVIDED HEREIN ARE MADE ON THE BASIS OF ENGINEER'S EXPERIENCE AND QUALIFICATIONS AND REPRESENT THE ENGINEER'S BEST JUDGMENT. HOWEVER, THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT ACTUAL TOTAL COSTS WILL NOT VARY FROM THE ESTIMATE. THIS ESTIMATE IS INTENDED TO ASSIST IN BUDGETARY ASSESSMENT AND DOES NOT GUARANTEE THAT ACTUAL COSTS WILL NOT EXCEED OR BE LOWER THAN THE AMOUNTS STATED IN THIS ESTIMATE.

Shafer, Kline & Warren, Inc.
SKW Project No. 160294-010
City of Jonesburg, MO
February 22, 2018

Wastewater System Improvements
Estimated OMR Cost, Salvage Value and Present Worth
Land Application Treatment System



Total Annual OMR Cost							**$19,985**
Annual Operating Cost - Power Consumption							**$6,742**
Item	Quantity (at once)	Power Draw	Unit	Run Time hrs/yr	kW-hr / Year	Cost per kW-hr	Total Cost
Influent Liftstation Pumps	1	1.5	HP				
(low flow)		1.1	kW	2,190	2,450	$0.10	$245
Influent Liftstation Pumps	1	5.0	HP				
(high flow)		3.7	kW	2,190	8,165	$0.10	$817
Land Application Pump	1	160.0	HP				
		119.3	kW	402	48,011	$0.10	$4,801
UV System	0	2.0	HP				
(N/A)		1.5	kW	5,110	0	$0.10	$0
Miscellaneous Power Costs	15%	of sum all other					$879

Additional Annual Operating Cost - Labor & Parts Costs					**$11,000**
Item	Qty	Units	Unit Cost	Item Cost	
Treatment System Operations and Maintenance, Labor	200	hrs	$30	$6,000	
Treatment System Operations and Maintenance, Materials	1	LS	$5,000	$5,000	

Annualized Cost of Replacement Items						**$2,243**
Item	Design Live (yrs)	Qty	Units	Unit Cost	Item Cost	
VTP Oil	1	1	EA	$70	$70	
VTP Rebuild	20	1	EA	$25,000	$1,250	
Sprinkler Replacement	20	615	EA	$30	$923	

Present Worth of Salvage Value						**$1,399,527**
Item	Initial Cost	Useful Life (yrs)	Evaluation Period (yrs)	Federal Discount Rate	Item Value	
Treatment System	$4,728,000	25	20	0.2%	$899,527	
Land Application Site	$500,000				$500,000	

TOTAL PRESENT WORTH PROJECT COST SUMMARY			**$6,454,741**
Item	Evaluation Period (yrs)	Federal Discount Rate	Item Cost
Total Project Estimate (without financing costs)			$7,462,850
Plus Present Worth of Annual OMR Costs	20	0.2%	$391,418
Minus Present Worth of Salvage Value			$1,399,527

NOTE: COSTS PROVIDED HEREIN ARE MADE ON THE BASIS OF ENGINEER'S EXPERIENCE AND QUALIFICATIONS AND REPRESENT THE ENGINEER'S BEST JUDGMENT. HOWEVER, THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT ACTUAL TOTAL COSTS WILL NOT VARY FROM THE ESTIMATE. THIS ESTIMATE IS INTENDED TO ASSIST IN BUDGETARY ASSESSMENT AND DOES NOT GUARANTEE THAT ACTUAL COSTS WILL NOT EXCEED OR BE LOWER THAN THE AMOUNTS STATED IN THIS ESTIMATE.

Shafer, Kline & Warren, Inc.
SKW Project No. 160294-010
City of Jonesburg, MO
February 9, 2018

Wastewater System Improvements
Estimated Total Project Cost
OPTAER / SAGR Treatment System Upgrades

TOTAL PROJECT ESTIMATE (without financing costs)					**$ 3,280,126**
Wastewater Treatment System Total Construction Cost					**$ 2,115,340**
Item Description:	Qty	Units	Unit Cost	Total Cost	
Influent Pump Station					$ 345,000
1 Submersible Pump, high flow, existing wetwell	3	EA	$ 50,000	$ 150,000	
2 Submersible Pump, low flow, inlcuding wetwell	1	EA	$ 100,000	$ 100,000	
3 Control panel and floats	1	EA	$ 25,000	$ 25,000	
4 Piping and structural changes	1	LS	$ 50,000	$ 50,000	
5 Influent Flow Meter	4	EA	$ 5,000	$ 20,000	
Electric Supply Upgrades					$ 185,000
6 Electric Supply Upgrades	1	LS	$ 100,000	$ 100,000	
7 New Automatic Transfer Switch	1	EA	$ 10,000	$ 10,000	
8 New Generator, 40 KW	1	EA	$ 75,000	$ 75,000	
Headworks					$ 215,000
9 Mechanical Bar Screen	1	LS	$ 100,000	$ 100,000	
10 Structure Modifications	1	EA	$ 40,000	$ 40,000	
11 Headworks Building and Drive	1	EA	$ 75,000	$ 75,000	
Lagoon Upgrades					$ 1,190,340
12 OPTAER Cells 1 & 2 Aeration System (per Nexom)	1	EA	$ 68,000	$ 68,000	
13 OPTAER Cells 1 & 2 Aeration System Installation	1	LS	$ 27,200	$ 27,200	
14 OPTAER Aeration Piping to Cells 1 & 2, DIP	1	LS	$ 5,000	$ 5,000	
15 OPTAER Aeration Piping to Cells 1 & 2, HDPE	1	LS	$ 10,000	$ 10,000	
16 SAGR Reactor, supplied components (per Nexom)	1	EA	$ 326,000	$ 326,000	
17 SAGR Reactor, additional components (per Nexom)	1	LS	$ 95,350	$ 95,350	
18 SAGR Installation	1	LS	$ 168,540	$ 168,540	
19 SAGR Rock Media (per Nexom)	1	LS	$ 183,750	$ 183,750	
20 SAGR Basin Construction, excluding walls	1	LS	$ 50,000	$ 50,000	
21 Aeration Piping to Cells 1, DIP	1	LS	$ 5,000	$ 5,000	
22 Aeration Piping to Cells 1, HDPE	1	LS	$ 5,000	$ 5,000	
23 Aeration Piping to SAGR, DIP	1	LS	$ 5,000	$ 5,000	
24 Aeration Piping to SAGR, HDPE	1	LS	$ 5,000	$ 5,000	
25 Blower Building	1	LS	$ 75,000	$ 75,000	
26 Control Panel and Wiring	2	EA	$ 5,000	$ 10,000	
27 Site Electric Work	1	EA	$ 50,000	$ 50,000	
28 Recirculation Line, 8" DIP, incl fittings	600	LF	$ 125	$ 75,000	
29 Yard and Outfall Piping, 12" PVC	500	LF	$ 50	$ 25,000	
30 Boat and Trailer	1	LS	$ 1,500	$ 1,500	
UV System					$ 150,000
31 UV Disinfection System	1	LS	$ 150,000	$ 150,000	
Effluent Flow Meter					$ 30,000
32 Parshall Flume	1	LS	$ 30,000	$ 30,000	
Other Costs					**$ 1,164,786**
Construction Contingence Costs					
Contingencies, as % of Total Construction Cost:			20%	$ 423,068	
Services Costs					
Legal/Administration, % of Total Construction Cost			2%	$ 42,307	
Environmental Reports				$ 10,000	
Legal Survey				$ 10,000	
Sanitary Sewer Evaluation Study & Report Update				$ 278,650	
Engineering, Design and Construction Phases			15%	$ 380,761	
Other Costs				$ 20,000	
Financing Costs					**$ -**
Financing Costs, per financial advisor					PENDING

NOTE 1: THIS ESTIMATE DOES NOT INCLUDE INFLATION.

NOTE 2: COSTS PROVIDED HEREIN ARE MADE ON THE BASIS OF ENGINEER'S EXPERIENCE AND QUALIFICATIONS AND REPRESENT THE ENGINEER'S BEST JUDGMENT. HOWEVER, THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT ACTUAL TOTAL COSTS WILL NOT VARY FROM THE ESTIMATE. THIS ESTIMATE IS INTENDED TO ASSIST IN BUDGETARY ASSESSMENT AND DOES NOT GUARANTEE THAT ACTUAL COSTS WILL NOT EXCEED OR BE LOWER THAN THE AMOUNTS STATED IN THIS ESTIMATE.

Shafer, Kline & Warren, Inc.
SKW Project No. 160294-010
City of Jonesburg, MO
February 9, 2018

Wastewater System Improvements
Estimated OMR Cost, Salvage Value and Present Worth
SAGR Treatment System

Total Annual OMR Cost							$62,447
Annual Operating Cost - Power Consumption							**$23,632**
Item	Quantity (at once)	Power Draw	Unit	Run Time hrs/yr	kW-hr / Year	Cost per kW-hr	Total Cost
Influent Liftstation Pumps	1	1.5	HP				
(low flow)		1.1	kW	2,190	2,450	$0.10	$245
Influent Liftstation Pumps	1	5.0	HP				
(high flow)		3.7	kW	2,190	8,165	$0.10	$817
OPTAER Aeration Blower	1	14.1	HP				
		10.5	kW	8,760	92,106	$0.10	$9,211
SAGR Aeration Blower	1	14.4	HP				
		10.7	kW	8,760	94,066	$0.10	$9,407
Recirculation Pump	1	1	HP				
		0.7	kW	1,460	1,089	$0.10	$109
UV System	1	2.0	HP				
		1.5	kW	5,110	7,621	$0.10	$762
Miscellaneous Power Costs	15%	of sum all other					$3,082

Additional Annual Operating Cost - Labor & Parts Costs					$11,000
Item	Qty	Units	Unit Cost	Item Cost	
Treatment System Operations and Maintenance, Labor	200	hrs	$30	$6,000	
Treatment System Operations and Maintenance, Materials	1	LS	$5,000	$5,000	

Annuallized Cost of Short-lived Assets						$27,815
Item	Design Live (yrs)	Qty	Units	Unit Cost	Item Cost	
Blower Oil	1	3	EA	$70	$210	
Blower Belt	2	3	EA	$250	$375	
Blower Filter	0.5	3	EA	$80	$480	
Blower Rebuild	10	3	EA	$5,000	$1,500	
OPTAER Aeration Membranes	7	248	EA	$30	$1,063	
Rock Filter Media	20	1	EA	$183,750	$9,188	
Sludge Removal	15	748	DT	$300	$15,000	

Present Worth of Salvage Value						$402,455
Item	Initial Cost	Useful Life (yrs)	Evaluation Period (yrs)	Federal Discount Rate	Item Value	
Treatment System	$2,115,340	25	20	0.2%	$402,455	

TOTAL PRESENT WORTH PROJECT COST SUMMARY			$4,100,772
Item	Evaluation Period (yrs)	Federal Discount Rate	Item Cost
Total Project Estimate (without financing costs)			$3,280,126
Plus Present Worth of Annual OMR Costs	20	0.2%	$1,223,101
Minus Present Worth of Salvage Value			$402,455

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McClure
Project No. 160294-010
City of Jonesburg, MO
August 17, 2018

Wastewater System Improvements
Estimated OMR Cost, Salvage Value and Present Worth
NitrOx Treatment System - Enhanced Ammonia Removal

MCCLURE

Total Annual OMR Costs							**$55,616**
Annual Operating Cost - Power Consumption							**$24,965**
Item	Quantity (at once)	Power Draw	Unit	Run Time hrs/yr	kW-hr / Year	Cost per kW-hr	Total Cost
Influent Liftstation Pumps	1	1.5	HP				
(low flow)		1.1	kW	2,190	2,450	$0.10	$245
Influent Liftstation Pumps	1	5.0	HP				
(high flow)		3.7	kW	2,190	8,165	$0.10	$817
MARS Aeration Blower	1	10.21	HP				
		7.6	kW	8,760	66,695	$0.10	$6,670
NitrOx Aeration Blower	1	13.8	HP				
		10.3	kW	8,760	90,146	$0.10	$9,015
Heater	1						
		73.33	kW	336	24,639	$0.10	$2,464
UV System	1	2.0	HP				
		1.5	kW	5,110	7,621	$0.10	$762
Miscellaneous Power Costs	25%	of sum all other (incr. to 25% to allocate for drum filter)					$4,993

Additional Annual Operating Cost - Labor & Parts Costs					**$11,000**
Item	Qty	Units	Unit Cost	Item Cost	
Treatment System Operations and Maintenance, Labor	200	hrs	$30	$6,000	
Treatment System Operations and Maintenance, Materials	1	LS	$5,000	$5,000	

Annualized Cost of Short-lived Assets						**$19,651**
Item	Design Live (yrs)	Qty	Units	Unit Cost	Item Cost	
Blower Oil	1	4	EA	$70	$280	
Blower Belt	2	4	EA	$250	$500	
Blower Filter	0.5	4	EA	$80	$640	
Blower Rebuild	10	4	EA	$5,000	$2,000	
Heater Cleaning	1	1	EA	$200	$200	
Heater Replacement	10	1	EA	$7,500	$750	
MARS Aeration Membranes	7	9	EA	$250	$321	
Sludge Removal	15	748	DT	$300	$14,960	

Present Worth of Salvage Value						**$433,902**
Item	Initial Cost	Useful Life (yrs)	Evaluation Period (yrs)	Federal Discount Rate	Item Value	
Treatment System	$2,280,632	25	20	0.2%	$433,902	

TOTAL PRESENT WORTH PROJECT COST SUMMARY			**$4,166,931**
Item	Evaluation Period (yrs)	Federal Discount Rate	Item Cost
Total Project Estimate (without financing costs)			$3,511,534
Plus Present Worth of Annual OMR Costs	20	0.2%	$1,089,299
Minus Present Worth of Salvage Value			$433,902

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McClure
Project No. 160294-010
City of Jonesburg, MO
August 17, 2018

Wastewater System Improvements
Estimated Total Project Cost
MARS / NitrOx Treatment Enhanced Ammonia

MCCLURE

Item	Description:	Qty	Units	Unit Cost	Total Cost	
Total Project Estimate (without financing costs)						**$ 3,511,534**
Wastewater Treatment System Construction Cost						**$ 2,280,632**
Influent Pump Station						$ 345,000
1	Submersible Pump, high flow, existing wetwell	3	EA	$ 50,000	$ 150,000	
2	Submersible Pump, low flow, inlcuding wetwell	1	EA	$ 100,000	$ 100,000	
3	Control panel and floats	1	EA	$ 25,000	$ 25,000	
4	Piping and structural changes	1	LS	$ 50,000	$ 50,000	
5	Influent Flow Meter	4	EA	$ 5,000	$ 20,000	
Electric Supply Upgrades						$ 185,000
6	Electric Supply Upgrades	1	LS	$ 100,000	$ 100,000	
7	New Automatic Transfer Switch	1	EA	$ 10,000	$ 10,000	
8	New Generator, 40 KW	1	EA	$ 75,000	$ 75,000	
Headworks						$ 215,000
9	Mechanical Bar Screen	1	LS	$ 100,000	$ 100,000	
10	Structure Modifications	1	EA	$ 40,000	$ 40,000	
11	Headworks Building and Drive	1	EA	$ 75,000	$ 75,000	
Lagoon Upgrades						$ 1,355,632
12	MARS, supplied components (per triplepoint)	1	EA	$ 108,310	$ 108,310	
13	NitrOx, supplied components (per triplepoint)	1	EA	$ 306,624	$ 306,624	
14	NitrOx Blower Probes (per triplepoint)	1	LS	$ 18,160	$ 18,160	
15	NitrOx Blower Startup (per triplepoint)	1	LS	$ 2,000	$ 2,000	
16	Mars & NitrOx System Construction and Installation	1	LS	$ 174,038	$ 174,038	
17	NitrOx Tanks	3	EA	$ 60,000	$ 180,000	
18	Aeration Piping to Cells 1, DIP	1	LS	$ 5,000	$ 5,000	
19	Aeration Piping to Cells 1, HDPE	1	LS	$ 5,000	$ 5,000	
20	Aeration Piping to NitrOx Reactor, DIP	1	LS	$ 15,000	$ 15,000	
21	Aeration Piping to NitrOx, HDPE	1	LS	$ 25,000	$ 25,000	
22	Blower Building	1	LS	$ 75,000	$ 75,000	
23	Site Electric Work	1	EA	$ 50,000	$ 50,000	
24	Drum Filter, Piping, Misc	1	LS	$ 350,000	$ 350,000	
25	Process Piping, to NitrOx Tanks, 12" DIP, incl fittings	100	LF	$ 150	$ 15,000	
26	Yard and Outfall Piping, 12" PVC	500	LF	$ 50	$ 25,000	
27	Boat and Trailer	1	LS	$ 1,500	$ 1,500	
UV System						$ 150,000
28	UV Disinfection System	1	LS	$ 150,000	$ 150,000	
Effluent Flow Meter						$ 30,000
29	Parshall Flume	1	LS	$ 30,000	$ 30,000	
Other Costs						**$ 1,230,902**
Construction Contingence Costs						
	Contingencies, as % of Total Construction Cost:			20%	$ 456,126	
Services Costs						
	Legal/Administration, % of Total Construction Cost			2%	$ 45,613	
	Environmental Reports				$ 10,000	
	Legal Survey				$ 10,000	
	Sanitary Sewer Evaluation Study & Report Update				$ 278,650	
	Engineering, Design and Construction Phases			15%	$ 410,514	
	Other Costs				$ 20,000	
Financing Costs						**$ -**
Financing Costs, per financial advisor						PENDING

NOTE 1: THIS ESTIMATE DOES NOT INCLUDE INFLATION.

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Shafer, Kline & Warren, Inc.
SKW Project No. 160294-010
City of Jonesburg, MO
February 9, 2018

Wastewater System Improvements
Estimated Total Project Cost
MARS / NitrOx Treatment System Upgrades

Item	Description:	Qty	Units	Unit Cost	Total Cost	
Total Project Estimate (without financing costs)						**$ 2,652,373**
	Wastewater Treatment System Construction Cost					$ 1,666,945
Influent Pump Station						$ 345,000
1	Submersible Pump, high flow, existing wetwell	3	EA	$ 50,000	$ 150,000	
2	Submersible Pump, low flow, inicuding wetwell	1	EA	$ 100,000	$ 100,000	
3	Control panel and floats	1	EA	$ 25,000	$ 25,000	
4	Piping and structural changes	1	LS	$ 50,000	$ 50,000	
5	Influent Flow Meter	4	EA	$ 5,000	$ 20,000	
Electric Supply Upgrades						$ 185,000
6	Electric Supply Upgrades	1	LS	$ 100,000	$ 100,000	
7	New Automatic Transfer Switch	1	EA	$ 10,000	$ 10,000	
8	New Generator, 40 KW	1	EA	$ 75,000	$ 75,000	
Headworks						$ 215,000
9	Mechanical Bar Screen	1	LS	$ 100,000	$ 100,000	
10	Structure Modifications	1	EA	$ 40,000	$ 40,000	
11	Headworks Building and Drive	1	EA	$ 75,000	$ 75,000	
Lagoon Upgrades						$ 741,945
12	MARS, supplied components (per triplepoint)	1	EA	$ 108,310	$ 108,310	
13	NitrOx, supplied components (per triplepoint)	1	EA	$ 207,562	$ 207,562	
14	NitrOx Blower Probes (per triplepoint)	1	LS	$ 18,160	$ 18,160	
15	NitrOx Blower Startup (per triplepoint)	1	LS	$ 2,000	$ 2,000	
16	Mars & NitrOx System Construction and Installation	1	LS	$ 134,413	$ 134,413	
17	NitrOx Tanks	2	EA	$ 40,000	$ 80,000	
18	Aeration Piping to Cells 1, DIP	1	LS	$ 5,000	$ 5,000	
19	Aeration Piping to Cells 1, HDPE	1	LS	$ 5,000	$ 5,000	
20	Aeration Piping to NitrOx Reactor, DIP	1	LS	$ 5,000	$ 5,000	
21	Aeration Piping to NitrOx, HDPE	1	LS	$ 10,000	$ 10,000	
22	Blower Building	1	LS	$ 75,000	$ 75,000	
23	Site Electric Work	1	EA	$ 50,000	$ 50,000	
24	Process Piping, to NitrOx Tanks, 12" DIP, incl fittings	100	LF	$ 150	$ 15,000	
25	Yard and Outfall Piping, 12" PVC	500	LF	$ 50	$ 25,000	
26	Boat and Trailer	1	LS	$ 1,500	$ 1,500	
UV System						$ 150,000
27	UV Disinfection System	1	LS	$ 150,000	$ 150,000	
Effluent Flow Meter						$ 30,000
28	Parshall Flume	1	LS	$ 30,000	$ 30,000	
	Other Costs					$ 985,428
Construction Contingence Costs						
	Contingencies, as % of Total Construction Cost:			20%	$ 333,389	
Services Costs						
	Legal/Administration, % of Total Construction Cost			2%	$ 33,339	
	Environmental Reports				$ 10,000	
	Legal Survey				$ 10,000	
	Sanitary Sewer Evaluation Study & Report Update				$ 278,650	
	Engineering, Design and Construction Phases			15%	$ 300,050	
	Other Costs				$ 20,000	
	Financing Costs					$ -
Financing Costs, per financial advisor						PENDING

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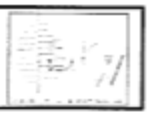
Shafer, Kline & Warren, Inc.
SKW Project No. 160294-010
City of Jonesburg, MO
February 9, 2018

Wastewater System Improvements
Estimated OMR Cost, Salvage Value and Present Worth
NitrOx Treatment System



Total Annual OMR Costs							**$53,619**
Annual Operating Cost - Power Consumption							**$22,967**
Item	Quantity (at once)	Power Draw	Unit	Run Time hrs/yr	kW-hr / Year	Cost per kW-hr	Total Cost
Influent Liftstation Pumps	1	1.5	HP				
(low flow)		1.1	kW	2,190	2,450	$0.10	$245
Influent Liftstation Pumps	1	5.0	HP				
(high flow)		3.7	kW	2,190	8,165	$0.10	$817
MARS Aeration Blower	1	10.21	HP				
		7.6	kW	8,760	66,695	$0.10	$6,670
NitrOx Aeration Blower	1	13.8	HP				
		10.3	kW	8,760	90,146	$0.10	$9,015
Heater	1						
		73.33	kW	336	24,639	$0.10	$2,464
UV System	1	2.0	HP				
		1.5	kW	5,110	7,621	$0.10	$762
Miscellaneous Power Costs	15%	of sum all other					$2,996

Additional Annual Operating Cost - Labor & Parts Costs					**$11,000**
Item	Qty	Units	Unit Cost	Item Cost	
Treatment System Operations and Maintenance, Labor	200	hrs	$30	$6,000	
Treatment System Operations and Maintenance, Materials	1	LS	$5,000	$5,000	

Annualized Cost of Short-lived Assets					**$19,651**
Item	Design Live (yrs)	Qty	Units	Unit Cost	Item Cost
Blower Oil	1	4	EA	$70	$280
Blower Belt	2	4	EA	$250	$500
Blower Filter	0.5	4	EA	$80	$640
Blower Rebuild	10	4	EA	$5,000	$2,000
Heater Cleaning	1	1	EA	$200	$200
Heater Replacement	10	1	EA	$7,500	$750
MARS Aeration Membranes	7	9	EA	$250	$321
Sludge Removal	15	748	DT	$300	$14,960

Present Worth of Salvage Value					**$317,145**
Item	Initial Cost	Useful Life (yrs)	Evaluation Period (yrs)	Federal Discount Rate	Item Value
Treatment System	$1,666,945	25	20	0.2%	$317,145

TOTAL PRESENT WORTH PROJECT COST SUMMARY			**$3,385,410**
Item	Evaluation Period (yrs)	Federal Discount Rate	Item Cost
Total Project Estimate (without financing costs)			$2,652,373
Plus Present Worth of Annual OMR Costs	20	0.2%	$1,050,183
Minus Present Worth of Salvage Value			$317,145

NOTE: COSTS PROVIDED HEREIN ARE MADE ON THE BASIS OF ENGINEER'S EXPERIENCE AND QUALIFICATIONS AND REPRESENT THE ENGINEER'S BEST JUDGMENT. HOWEVER, THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT ACTUAL TOTAL COSTS WILL NOT VARY FROM THE ESTIMATE. THIS ESTIMATE IS INTENDED TO ASSIST IN BUDGETARY ASSESSMENT AND DOES NOT GUARANTEE THAT ACTUAL COSTS WILL NOT EXCEED OR BE LOWER THAN THE AMOUNTS STATED IN THIS ESTIMATE.

Attachment A: Significant Degradation

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY FOR PUBLIC NOTICE
ATTACHMENT A: TIER 2 – SIGNIFICANT DEGRADATION

1. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
City of Jonesburg WWTF		(636) 448-5508	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
NW of Boonslick and Oakhill Road	Jonesburg	MO	63351

2. OWNER

NAME AND OFFICIAL TITLES			
City of Jonesburg			
ADDRESS	CITY	STATE	ZIP CODE
PO Box 256	Jonesburg	MO	63351
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		
(636) 488-5508	joneburg1@yahoo.com		

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			
City of Jonesburg			
ADDRESS	CITY	STATE	ZIP CODE
PO Box 256	Jonesburg	MO	63351
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		
(636) 488-5508	jonesburg1@yahoo.com		

4. RECEIVING WATER BODY SEGMENT #1

NAME
Unnamed Tributary to Little Bear Creek

4.1 UPPER END OF SEGMENT (Location of discharge)
UTM _____ OR Lat _____, Long _____ x= 647045; y= 4303055

4.2 LOWER END OF SEGMENT
UTM _____ OR Lat _____, Long _____ x= 646965; y= 4303990

Per the Missouri Antidegradation 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
N/A

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 the antidegradation review report.

What is the Wet Weather Flow Peaking Factor in relation to design flow? 3.7

Wet Weather Design Summary:
equalization storage in lagoon.

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7. 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 well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Watershed Protection Section. **Additional information needed with the EWQ data includes**: 1) Date existing water quality data was provided by the Watershed Protection Section, 2) Approval date by the Watershed Protection Section of the QAPP, project sampling plan, and data collected for all appropriate POCs.

Comments/Discussion: Effluent dominated by intermittent receiving stream, no representative water quality data available/obtainable.

8. SUMMARY OF THE POLLUTANTS OF CONCERN AND THE PROPOSED EFFLUENT LIMITS

Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.A. and assumed or demonstrated to cause significant degradation. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (2).

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

Pollutants of Concern*	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	MG/L	45	45	30
TSS	MG/L	80.1	60	30
DISSOLVED OXYGEN	MG/L			
AMMONIA	MG/L	5.8/7.8	1.5/2.9	5.8/7.8
BACTERIA (E. COLI)	CFUS	206		206

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

*Assumed Tier 2.

9. IDENTIFYING ALTERNATIVES

Supply a summary of the alternatives considered and the level of treatment attainable with regards to the alternative. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the Antidegradation Implementation Procedure Section II.B.1. Per 10 CSR 20-6.010(4)(D)1., the feasibility of a no-discharge system must be considered. Attach all supportive documentation in the Antidegradation Review report.

Applicants choosing to use a new wastewater technology that are considered an "unproven technology" in Missouri in their Tier 2 Reviews with alternative analysis must comply with the requirements set forth in the *New Technology Definitions and Requirements Factsheet* that can be found at: http://dnr.mo.gov/pubs/pub2453.pdf.

Non-degrading alternatives:

Alternatives ranging from less-degrading to degrading including Preferred Alternative
(All treatment levels for POCs must at a minimum meet water quality standards):

Alternatives	**Level of Treatment Attainable for each Pollutant of Concern**					
	BOD5	TSS	AMMONIA AS N	Ammonia as N		
	(MG/L)	MG/L	MG/L	MG/L (winter)		
MARS/Nitrox (two basin)	5	15	0.6	2.1		
MARS/Nitrox (3 basin+filter)	5	15	0.2	1.7		
OPTAER/SAGR	25	25	0.8	2.1		
Land Application	N/A	N/A	N/A	N/A		

10. DETERMINATION OF THE REASONABLE ALTERNATIVE

Per the Antidegradation Implementation Procedure Section II.B.2, "a reasonable alternative is one that is practicable, economically efficient and affordable." Provide basis and supporting documentation in the Antidegradation Review report. **Please do not write "See Report" for any box below.**

Practicability Summary:

"The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the Antidegradation Implementation Procedure Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the Antidegradation Implementation Procedure Section II.B.2.a.

The reason for the selected alternative is that it allows the use of the existing facility with modifications. The modifications will allow for the significant reductions in effluent ammonia concentration as well as BOD and TSS from the existing facility's capability. Furthermore, the alternative will disinfect the wastewater effluent. This is all in combination with the increased flow from the current facility.

Although land application has the least impact, due to the large amount of land required for this facility and the proximity to the outlying St. Louis Metro area, available contiguous land plus land costs per acre become prohibitive.

Economic Efficiency Summary:

Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the Antidegradation Implementation Procedure Section II.B.2.b.

The selected alternative, while requiring an increase in operational and maintenance costs, balances these increases while maintaining an acceptable effluent water quality. The annual O&M increase combined with the capital costs are the lowest cost alternatives for the system to meet all of the goals. The present worth of the selected alternative is $3,385,410 the others are as follows: MARS/Nitrox three basin with filter - $4,166,931; OPTAER/SAGR - $4,100,772; Land application - $6,454,741.

Affordability Summary:

Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the Antidegradation Implementation Procedure Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."

The selected alternative has been determined to be within the range of affordability of the City of Jonesburg. It is the most practicable and economically efficient.

Preferred Chosen Alternative:

The proposed alternative is the MARS/Nitrox system with two basins and UV disinfection.

This alternative will allow the community to meet higher effluent quality and increase design capacity. It will also allow the city to utilize it's existing lagoon for partial treatment and flow equalization.

Reasons for Rejecting the other Evaluated Alternatives:

MARS/Nitrox with three basins - this was not selected as it achieves the same BOD and TSS reduction as the selected alternative. While ammonia reduction was higher, the increase in capital costs of $859,000 (32%) was not seen as justified for the reduction of only 0.4 mg/L of ammonia in the summer.

SAGR - this was not selected due to similar effluent limits to the selected alternative and a higher capital cost of $628,000 and a higher annual O&M cost of $8,800.

Land Application - this was not selected due to the extremely high capital costs ($4,810,477 HIGER than the selected alternative - 280%)

Comments/Discussion:

11. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

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

Identify the affected community:

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

N/A

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

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

N/A

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

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

N/A

PROPOSED PROJECT SUMMARY:

The proposed project will convert the existing lagoon to an aerated lagoon with two MBBR tanks. The tanks will be covered and heated for ammonia removal during the winter months. The effluent will be disinfected by UV prior to discharge into the receiving stream.

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

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
Michael Melvin Hall, P.E., M.ASCE	8-20-2018

NAME AND OFFICIAL TITLES / LICENSE #	COMPANY NAME		
Michael M. Hall, P.E., M.ASCE 30044	McClure		
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
1901 Pennsylvania Dr.	Columbia	MO	65202
TELEPHONE NUMBER WITH AREA CODE	**E-MAIL ADDRESS**		
(573) 814-1568	mhall@mecresults.com		

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

SIGNATURE	DATE

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

SIGNATURE	DATE

Attachment B: Minimal Degradation

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	
City of Jonesburg Wastewater Treatment Facility		(636) 488-5508	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
NW of Booneslick and Oakhill Road	Jonesburg	MO	63351

2. OWNER

NAME AND OFFICIAL TITLES			
City of Jonesburg			
ADDRESS	CITY	STATE	ZIP CODE
P.O. Box 256	Jonesburg	MO	63351
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		
(636) 488-5508	jonesburg1@yahoo.com		

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			
City of Jonesburg			
ADDRESS	CITY	STATE	ZIP CODE
P.O. Box 256	Jonesburg	MO	63351
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		
(636) 488-5508	jonesburg1@yahoo.com		

4. RECEIVING WATER BODY SEGMENT #1

NAME
Unnamed tributary to Little Bear Creek

4.1 UPPER END OF SEGMENT (Location of discharge)
UTM _____ OR Lat _____, Long _____ x = 647045, y = 4303055

4.2 LOWER END OF SEGMENT
UTM _____ OR Lat _____, Long _____ x = 646965, y = 4303990

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
N/A

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? 3.7

Wet Weather Design Summary:
Buffer storage in lagoon.

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? [V] 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: Effluent dominated intermittent receiving stream, no representative water quality data obtainable.

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 (lbs/day)	New Load (lbs/day)	Percent of Facility Assimilative Capacity OR Percent Load Reduction (%)
BOD5	45.0	40.0	11
TSS	80.1	40.0	50
NH3, Summer	5.0	2.0	60
NH3, Winter	9.3	3.9	58

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
BOD5	N/A	-11%	N/A
TSS	N/A	-50%	N/A
NH3, Summer	N/A	-60%	N/A
NH3, Winter	N/A	-58%	N/A

Assimilative capacity/loading reduction summary Future limits will reduce loadings for all POCs even with increased design flow.

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 The planned improvements will significantly reduce stream loadings, hence the cumulative degradation of the FAC and SAC is negative for each parameter. See attached Stream Loadings Table.

11. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

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

Identify the affected community:

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

N/A

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

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

N/A

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

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

N/A

PROPOSED PROJECT SUMMARY:

The proposed project will convert the existing lagoon to an aerated lagoon with two MBBR tanks. The tanks will be covered and heated for ammonia removal during the winter months. The effluent will be disinfected by UV prior to discharge into the receiving stream.

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

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
Michael Melvin Hall, P.E., M.ASCE	8-20-2018

NAME AND OFFICIAL TITLES / LICENSE #	COMPANY NAME		
Michael M. Hall, P.E., M.ASCE 30044	McClure		
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
1901 Pennsylvania Dr.	Columbia	MO	65202
TELEPHONE NUMBER WITH AREA CODE	**E-MAIL ADDRESS**		
(573) 814-1568	mhall@mecresults.com		

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

SIGNATURE	DATE
Robert Sellers	8-23-2018

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

SIGNATURE	DATE
Robert Sellers	8-23-2018

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY

RECEIVED
SEP 18 2020
Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $1000.00	CHECK NO. 24906
DATE RECEIVED 9-18-20	

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/CDBG Project #: CDBG 2018-PF-026

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☑ YES Date of Approval: 9/6/18 ☐ N/A

1.3 Has the department approved the proposed project's facility plan*?
☑ YES Date of Approval: 5-2-19 ☐ 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
Wastewater Treatment Facility Improvements City of Jonesburg, Missouri

2.2 ESTIMATED PROJECT CONSTRUCTION COST
$ 1,848,284

2.3 PROJECT DESCRIPTION
WWTP improvements to meet ammonia and E. coli limits on permit. Lagoon fine bubble diffusers, SAGR, mechanical screen, influent pumping station, and yard piping installation.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Sludge to be held in the lagoon of Cell #1 and Cell #2.

2.5 DESIGN INFORMATION

A. Current population: 827 ; Design population: 939

B. Actual Flow: 160,000 gpd; Design Average Flow: 160,000 gpd;
Actual Peak Daily Flow: 2,500,000 gpd; Design Maximum Daily Flow: 475,000 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
City of Jonesburg	636-488-5508	smeyer@cityofjonesburg.com

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
0.14 Mi NW of N Service Rd / Oakhill Rd	Jonesburg	MO	63351	Montgomery

Wastewater Treatment Facility: Mo- 0040851 (Outfall 001 Of 001)

3.1 Legal Description: _____ ¼, _____ ¼, _____ ¼, Sec. 1, T 47N, R 4W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 647053 Northing (Y): 4303074
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Tributary to Little Bear Creek

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
City of Jonesburg	636-488-5508	smeyer@cityofjonesburg.com

ADDRESS	CITY	STATE	ZIP CODE
106 W Boonslick Road	Jonesburg	MO	63351

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

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

ADDRESS	CITY	STATE	ZIP CODE

5.1 A letter from the continuing authority, if different than the owner, is included with this application. ☐ YES ☐ NO ☑ N/A

5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.

A. Is a copy of the certificate of convenience and necessity included with this application? ☐ YES ☐ NO

5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.

A. Is a copy of the as-filed restrictions and covenants included with this application? ☐ YES ☐ NO

B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? ☐ YES ☐ NO

C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? ☐ YES ☐ NO

D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? ☐ YES ☐ NO

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Dennis E. Stith, P.E., McClure	660-385-6441	dstith@mecresults.com

ADDRESS	CITY	STATE	ZIP CODE
107 Butler Street	Macon	MO	63552

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 Robert Sellenriek

PRINTED NAME	DATE
Robert Sellenriek	Sept 2, 2020

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Mayor	636-488-5508	smeyer@cityofjonesburg.com

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

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