STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Rocky Mount Sewer District
Rocky Mount WWTF
28748 Red Arrow Road
Rocky Mount, MO 65072

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.

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.

October 29, 2024
Effective Date

October 28, 2026
Expiration Date

John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction will include the addition of approximately 26,681 linear feet of gravity sewer and 104 grinder stations as a part of the expansion of the sewer district and to add service to 165 homes and 140 condos. Additionally, a second outfall will be constructed for the existing treatment facility to allow for discharge to a different receiving stream to comply with requirements set on the existing treatment facility outfall. A sludge holding basin will be constructed on site to improve facility operability.

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

II. COST ANALYSIS FOR COMPLIANCE

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

The department is not required to determine a 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 in accordance with the plans and specifications submitted by Alpha Engineering and Survey, LLC on September 19, 2024, and signed and sealed by Jared Wheaton, P.E. on August 15, 2024, and approved by the department on October 29, 2024.

3. Regulation 10 CSR 20-4.040(18)(B)1 requires that projects be publicly advertised, allowing sufficient time for bids to be prepared and submitted. Projects should be advertised at least 30 days prior to bid opening.

4. The department must be contacted in writing prior to making any changes to the approved 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).

5. As per 10 CSR 20-4.040, all changes in contract price or time within the approved scope of work must be by change order in accordance with Section 19 of this rule.

6. 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 electronic Sanitary Sewer Overflow/Bypass Reporting system at https://dnr.mo.gov/mogem/ or Central Field Office per 10 CSR 20-7.015(9)(G).

7. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the department's ePermitting system available online at https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem. See https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting for more information.

8. A United States Army Corps of Engineers (USACE) Section 404 department of the Army permit (§404) along with the department's Section 401 Water Quality Certification or waiver (§401) 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 likely be required. Since the USACE makes determinations on what is jurisdictional, you must contact the USACE to determine permitting requirements. See https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality for more information or or you may contact the department's Water Protection Program at 573-522-4502 or wpsc401cert@dnr.mo.gov.

9. Upon completion of construction:

   A. The Rocky Mount Sewer District will become the continuing authority for operation and maintenance of these facilities;

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

C. Submit the enclosed Statement of Work Completed form 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 proposed project addresses goals for the Rocky Mount Sewer District both in expanding their service to the nearby community in need, as well as addressing needed modifications to their existing treatment facility. The sewer extension being construted will include approximately 26,681 linear feet of gravity and force main and 104 grinder stations. This work will connect an additional 165 homes and 140 condominum units to the Rocky Mount Sewer District's WWTF, replacing the failing on-site treatment units and one treatment facility that serves those residences. The Rocky Mount WWTF has available capacity and treatment level to help improve the water quality for the receiving water body.

Additionally, improvements will be made to the existing treatment facility. A new sludge storage basin will be constructed at the WWTF to help improve plant operability. Additionally, a second outfall will be constructed to discharge to Bogue Bay Cove to address an existing agreement with the Lick Branch Home Owners Association that limits the amount of allowable flow that can be discharged from the existing outfall for the treatment facility.

2. FACILITY DESCRIPTION

The Rocky Mount WWTF is located at 28748 Red Arrow Road, Rocky Mount, Missouri, in Morgan County. The facility has a design average flow of 75,000 gpd and serves a hydraulic population equivalent of approximately 750 people.

3. COMPLIANCE PARAMETERS

The existing facility meets the effluent limits set for Outfall No. 1. The proposed project will set new effluent limits with the addition of Outfall No. 2, which are the same parameters as set for Outfall No. 1. However, the exact limits do vary somewhat due to the differing receiving streams. The treatment facility should be capable of meeting these limits for Outfall No. 2.

The limits following the completion of construction will be applicable to the facility at Outfall No. 2:

Parameter	Units	Monthly average limit
Biochemical Oxygen Demand$_5$	mg/L	10
Total Suspended Solids	mg/L	15
Ammonia as N (January)	mg/L	2.2
Ammonia as N (February)	mg/L	1.8
Ammonia as N (March)	mg/L	1.6
Ammonia as N (April)	mg/L	1.3
Ammonia as N (May)	mg/L	1.0
Ammonia as N (June)	mg/L	0.8
Ammonia as N (July)	mg/L	0.7
Ammonia as N (August)	mg/L	0.6
Ammonia as N (September)	mg/L	0.8
Ammonia as N (October)	mg/L	1.2
Ammonia as N (November)	mg/L	1.5
Ammonia as N (December)	mg/L	1.9
pH	SU	6.5-9.0
E. Coli	#/100mL	126 (Daily Maximum Only)

4. ANTIDEGRADATION

The department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated August 2023, due to the addition of a new outfall location for the Rocky Mount WWTF, as well as the construction of a sludge storage basin. See **APPENDIX – ANTIDEGRADATION**.

5. REVIEW OF MAJOR TREATMENT DESIGN CRITERIA

Construction will cover the following items:

- Second Outfall – The new outfall (Outfall No. 2) discharges to an unclassified tributary to Bogue Creek at the UTM coordinates X = 524981, Y = 4235040. This outfall discharges to a different receiving stream than Outfall No. 1 currently discharges to. This construction also includes a lift station built to manage flows being directed to the second outfall whenever the designated maximum flow to Outfall No. 1 is reached, utilizing a flow splitter with a V-notch weir. The lift station for Outfall No. 2 is a duplex pump station with pumps capable of operating at a flow rate of 175 gallons per minute.
- Sludge Holding Basin – Construction of one sludge holding basin with a 78-ft length, a 58-ft width, a 6-ft operating depth, and a volume of 152,592 gallons. Installation of a floating aerator will provide aeration and mixing of the sludge to prevent anaerobic conditions.
- Collection System – This project's primary focus is on the expansion of the Rocky Mount Sewer District by the construction of force main and grinder pumps to service additional homes. This includes 26,681 linear feet of pressure pipe ranging in size from 1.5 inches to 6 inches, as well as 420 linear feet of 8 inch gravity sewer, 104 grinder stations to service the connected homes, and 2 manholes for access.

6. OPERATING PERMIT

Operating Permit No. MO-0136719 will require a modification to reflect the construction activities. The modified Rocky Mount WWTF permit was successfully public noticed from August 16, 2024, to September 16, 2024, with no comments received. After project completion, 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.

Joshua Brown, P.E.
Financial Assistance Center
joshua.brown@dnr.mo.gov

APPENDICES

- Antidegradation

Missouri Department of Natural Resources
Water Protection Program
Water Pollution Control Branch
Engineering Section

Water Quality and Antidegradation Review

For the Protection of Water Quality
with a
Performance Based Discharge Level Determination for

Tributary to Bogue Creek

Requested by
Jared Wheaton, P.E.
Shoreline Engineering & Surveying, LLC

for the

Rocky Mount WWTF

August 2023

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1. PURPOSE OF ANTIDEGRADATION REVIEW REPORT

The Rocky Mount Wastewater Treatment Facility (WWTF) is a 75,000 gallon per day (gpd) extended aeration facility currently receiving actual flows of about 8,000 gpd based on Discharge Monitoring Report (DMR) data from the past five years of operation. The facility includes a bar screen, grit removal, flow equalization, an extended aeration activated sludge system, clarifiers, ultraviolet disinfection, and tertiary filtration. Sludge is disposed of by a contract hauler. The Rocky Mount WWTF is currently operating well below its design flow, but has reached the 451-home limit set by the Lick Branch Homeowner's Association (HOA). Per the Lick Branch HOA Consent Judgement dated September 21, 2018, the District must relocate the effluent line in order to expand beyond the 451-home limit and utilize the remaining capacity of the facility. The facility is currently discharging to the Presumed Use Stream tributary to the Lick Branch Cove of the Lake of the Ozarks. Shoreline Surveying & Engineering, LLC prepared, on behalf of the Rocky Mount Sewer District, the *Antidegradation Review Report for Discharge Line Relocation for RMSD WWTF*, dated February 14, 2023. The report outlines the District's plan to construct a new effluent line to move the discharge to a tributary of Bogue Bay Cove and to construct a new sludge holding basin. The antidegradation review requirement is triggered by the effluent line relocation (a new discharge), but the design flow of the facility will not be changing. However, a future phase IV of the development is planned for 2026 which would include a plant expansion and new antidegradation review.

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

The AIP specifies that when the proposed activity results in a reduction by ten percent or more of the:

- facility assimilative capacity for any pollutant as a result of any single discharge;
- segment assimilative capacity for any pollutant as a result of all discharges combined after existing water quality (EWQ); or
- any new or expanded discharge that the department determines will likely result in the increased accumulation of pollutants or their degradation products in sediment or fish tissue,

then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required.

The applicant elected to assume that all pollutants of concern (POC) result in a reduction by 10 percent or more of the assimilative capacity of the receiving stream in the absence of existing water quality. An alternatives analysis was conducted to fulfill the requirements of the Antidegradation Implementation Procedure (AIP).

The following is a review of the *Antidegradation Review Report* dated February 2023.

2. PERMIT LIMITS AND MONITORING INFORMATION

Table 1-1: Performance Based Levels

PARAMETER	Unit	Basis for Limits	Monthly Average
Flow	MGD	1	*
BOD_5	mg/L	1	10
TSS	mg/L	1	15
*Escherichia coli***	#/100mL	1	*
Ammonia as N			
(January)			2.2
(February)			1.8
(March)			1.6
(April)			1.3
(May)			1.0
(June)	mg/L	4	0.8
(July)			0.7
(August)			0.6
(September)			0.8
(October)			1.2
(November)			1.5
(December)			1.9
Oil & Grease	mg/L	1,3	10
PARAMETER	**Unit**	**Basis for Limits**	**Minimum/ Maximum**
pH	SU	1	6.5/9.0
PARAMETER	**Unit**	**Basis for Limits**	**Monthly Avg. Min**
BOD_5 Percent Removal	%	1	85
TSS Percent Removal	%	1	85

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

Basis for Limitations Codes:

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

3. FACILITY INFORMATION

Facility Name:	Rocky Mount WWTF
Address:	P.O. Box 920, Rocky Mount, MO 65072
Permit #:	MO-0136719
County:	Morgan
Facility Type:	POTW
Owner:	Rocky Mount Sewer District
Continuing Authority:	Same as Owner
UTM Coordinates:	X = 524981 ; Y = 4235040
Legal Description:	Sec. 32, T41N, R16W
Ecological Drainage Unit:	Ozark/Osage

4. FACILITY HISTORY

The Rocky Mount WWTF is constructed on an eleven-acre site purchased by the District in 2012. It is owned and operated by the District. The facility was most recently inspected March 16, 2018 and no violations were reported.

A. FACILITY PERFORMANCE HISTORY:

A review of the past 5 years of Discharge Monitoring Report data show exceedances in the following parameters: BOD_5 (12/31/21, 11/30/21, 2/28/21, 6/30/19, 3/31/19, 2/28/19), BOD_5 percent removal (11/30/21, 2/28/21), TSS (2/28/21, 3/31/19, 2/28/19), TSS percent removal (2/28/21, 9/30/20), *E. coli* (2/28/22, 3/31/21, 2/28/21, 1/31/21, 2/29/20, 1/31/20, 3/31/19, 12/31/18, 9/30/18, 7/31/18), pH (4/30/21), ammonia (2/28/21).

B. RECEIVING WATERBODY INFORMATION

Table 4-1: Outfall(s)

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
001	0.11625	Tertiary	Domestic

Table 4-2: Receiving Stream(s)

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Tributary to Bogue Creek	-	-	General Criteria	10290109-0407	0.0
Bogue Creek (Presumed Use Stream)	C	5059	AQL, WBC-B, SCR, HHP, IRR, LWW		0.58
Lake of the Ozarks	L2	7205	AQL, WBC-A, SCR, HHP, IRR, LWW		0.96

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

Table 4-3: Receiving Stream Segments

Receiving Water Body Segment Outfall #1:		
Upper end segment* UTM coordinates:	X = 524856 ; Y = 4236119	outfall
Lower end segment* UTM coordinates:	X = 522667 ; Y = 4237099	downstream confluence at the Lake of the Ozarks

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

A Geohydrologic Evaluation was requested for the Water Quality Review and the receiving stream is losing for discharge purposes (see Appendix D).

C. EXISTING WATER QUALITY

No existing water quality data was submitted. The facility discharges to the tributary to Bogue Creek, within the Lake of the Ozarks watershed. The Lake of the Ozarks is listed on the most current 2020 Missouri 303(d) List for Chlorophyll-a, an indicator for nutrient impairments.

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

- It is unknown at this time if the facility is a source of the above listed pollutant(s) or considered to contribute to the impairment of Stream name. Once a TMDL is developed, the permit may be modified to include WLAs from the TMDL.

D. MIXING CONSIDERATIONS

The proposed receiving waterbody is the tributary to Bogue Creek, which is an unclassified stream. The Applicant elected to use USGS StreamStats to establish low flow values. See Appendix E for Stream Stats summary.

Table 4-4: Receiving Stream(s) Low-Flow Values

RECEIVING STREAM	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Tributary to Bogue Creek	0.0	0.0	0.0

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

5. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

6. ANTIDEGRADATION REVIEW INFORMATION

A. TIER DETERMINATION

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

Tier 1 protection is applied to a waterbody on a pollutant by pollutant basis for pollutants which may cause or contribute to the impairment of a beneficial use or violation of Water Quality Criteria (WQC); and prohibit further degradation of Existing Water Quality (EWQ) where additional pollutants of concern (POCs) would result in the water being included on the 303(d) List. According to the AIP, the waters may receive the POCs that are causing impairments if 1) the discharge would not cause or contribute to a violation of the WQS, 2) all other conditions of the state permitting requirements are met (i.e., no discharge options are explored and technology based requirements (including ELGs) are met); and 3) the permit is issued with the highest statutory and regulatory requirements.

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

The proposed discharge is to Lake of the Ozarks, which is on the 2020 303(d) list for chlorophyll-a impairments. Chlorophyll-a is an indicator for total phosphorus and total nitrogen exceedances in the waterbody. The Department has not developed a total maximum daily load (TMDL) for the Lake of the Ozarks. The Department's Nutrient Criteria Implementation Plan calls for watershed modeling when a new or expanded discharge is proposed within a watershed that contains a lake with a nutrient impairment, but also states "This plan does not prohibit establishing alternative methods of analysis, permit limits, or requirements provided that the alternatives are technically sound, consistent with state and federal regulations, and are protective of water quality." The Department has opted not to conduct watershed modeling for this discharge since there is no increase in pollutant loading to the lake as a whole. It is not anticipated that relocating the effluent line from a tributary of one cove to a tributary of a neighboring cove without any increase in design flow will precipitate a change in the nutrient loading to the lake. In lieu of modeling, the applicant evaluated the addition of phosphorus treatment to the facility. The applicant estimated that the addition of phosphorus treatment would raise the present worth of the base case from approximately $528,000 to $785,000. Because the present worth of this alternative is greater than 120% of the base case (effluent line relocation and no phosphorus treatment added), the implementation of a total phosphorus reduction system in addition to the existing plant design has been determined to be economically inefficient at this time. Once a TMDL is developed, the permit may be modified to include WLAs from the TMDL.

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

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

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

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

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

Table 5-1: Pollutants of Concern and Tier Determination

Pollutants of Concern	Tier	Review Type	Comment
Biological Oxygen Demand (BOD_5)/DO	2*	Significant	
Total Suspended Solids (TSS)	**	Significant	
Escherichia coli (E. coli)	2*	Significant	
Ammonia as N	2*	Significant	
Total Nitrogen	1		
Total Phosphorus	1		
Oil & Grease	2*	Significant	
pH	***	Significant	

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

B. NECESSITY OF DEGRADATION

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

The applicant has the option of assuming discharge will result in a reduction by ten percent or more of the assimilative capacity and proceeding directly to the alternatives analysis, thereby avoiding the determination of the assimilative capacity of the receiving water. The applicant has elected this option.

i. Regionalization

Regionalization eliminates the need to operate and maintain a wastewater treatment facility by sending flows to a capable regional facility. The closest potential connection point to a regional collection system is located approximately seven miles from the proposed treatment plant. Furthermore, the City of Lake Ozark and the Joint Sewer Board has requested a $1 million contribution in order to allow the facility to connect due to concerns about the capacity of the receiving facility and the potential need to provide upgrades to accommodate the connection. Although flows for this facility are currently only approximately 10,000 gpd, it is anticipated that with future expansions the facility will eventually grow to 1 MGD. Therefore the cost of this alternative along with the difficulty of obtaining the necessary easements make this alternative impracticable.

ii. No Discharge Evaluation

Two non-discharging alternatives were evaluated for this project and are discussed below.

Land Application

For the land application alternative, wastewater would be stored in a lagoon which would provide primary treatment and allow for flows to be retained when application is not suitable. Per Missouri's Minimum Design Standards, the storage basin would need to provide at least 75 days of storage considering wastewater flows as well as rainfall and evaporation. The engineer estimates that approximately 38 acres of land would be required to accommodate the storage lagoon and land application area. Because of the lack of suitable land in the vicinity, along with the cost of attaining the land required, this alternative is considered impracticable.

Subsurface Irrigation

The installation of a subsurface drip irrigation system was evaluated as a second non-discharging alternative for the project. This alternative would utilize septic tanks with pumps to move effluent to pressurized laterals for subsurface dispersal. The engineer estimates that approximately 13 acres of land would be required to accommodate this alternative. As with the land application alternative, the lack of suitable land near the Lake of the Ozarks and cost of attaining the land means that this alternative is considered impracticable.

iii. Alternatives to No discharge

Effluent Line Relocation

Relocation of the effluent line from the Lick Branch Cove to the Bogue Bay Cove basin serves as the base case scenario for the project. The Lick Branch Home Owners Association Consent Judgement states the facility is required to relocate the effluent line if more than 451 connections are made to the facility. Per the agreement, the new discharge point shall be to a location outside the Lick Branch Cove, or a location acceptable to the Homeowners' Association. This alternative therefore recommends moving the effluent line such that the new discharge would be to a Tributary to Bogue Bay Cove, allowing the facility to expand beyond 451 connections. This alternative also recommends the construction of a new sludge basin. The 20 year present worth of this alternative is estimated at $528,161.

Gaining Stream Discharge

Relocation of the outfall by extending the effluent line to the main channel of the Lake of the Ozarks would move the facility from a losing stream discharge, to a gaining stream discharge. While discharge to gaining streams is generally environmentally preferred the 20 year present worth of this alternative is estimated to exceed $950,000. Therefore this alternative is rejected as impracticable on the basis of its high cost relative to the base case scenario.

C. LOSING STREAM ALTERNATIVE DISCHARGE LOCATION

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

Per the Lick Branch HOA Consent Judgement dated September 21, 2018, the District must relocate the effluent line in order to expand beyond the 451-home limit and utilize the remaining capacity of the facility. Shoreline Engineering & Engineering, LLC evaluated non-discharging alternatives, discharge to a gaining stream, and connection to a regional facility as alternatives to discharging to the losing stream. All of these options, as discussed above in *B. Necessity of Degradation*, were determined to be impracticable.

D. SOCIAL AND ECONOMIC IMPORTANCE

The affected community consists of the residents at the Lake of the Ozarks, and more specifically the residents within the area of the Rocky Mount Sewer District in Morgan County. The District's boundaries include approximately 2,000 homes and 50 businesses, with a permanent population of about 1,600 people.

As of 2021, Morgan County had a population of 20,883 with a median household income of $46,078. The unemployment rate was 4.6%, approximately equivalent to the state average. 20% of the population is considered to be below the poverty level, which is significantly higher than the state average.

No.	Administrative Unit	Morgan County	Missouri State	United States	Comparison (County vs. State)
1	Population (2021)	20,883	6,141,534	329,726,481	
2	Percent Change in Population (2000-2021)	8.2%	9.8%	17.2%	Slightly lower than state average
3	2021 Median Household Income (in 2022 Dollars)	$46,078	$65,928	$74,545	Significantly lower than state average
4	Percent Change in Median Household Income (2000-2021)	-14.4%	-1.1%	1.1%	Significantly lower than state average
5	Median Age (2021)	46.1	38.8	38.4	Significantly older than state average
6	Change in Median Age in Years (2000-2021)	8.5	2.7	3.1	Slightly higher than state average
7	Unemployment Rate (2021)	4.6%	4.5%	5.5%	Slightly higher than state average
8	Percent of Population Below Poverty Level (2021)	20.0%	12.8%	12.6%	Significantly higher than state average
9	Percent of Household Received Food Stamps (2021)	12.8%	10.1%	11.4%	Slightly higher than state average

Because the Rocky Mount WWTF has reached the 451-home limit set by the Lick Branch HOA, the district is currently unable to add new connections despite having additional capacity. The relocation of the effluent line will allow the District to add additional connections per the Lick Branch HOA Consent Judgement dated September 21, 2018. Of the roughly 2,000 homes in the area, the engineer estimates that approximately 200 are equipped with centralized wastewater treatment. Many of these homes without centralized treatment are served by older septic systems which present the risk of introducing contamination to the Lake of the Ozarks. A properly operated and maintained surface discharging treatment facility would provide increased protection for water quality in the area. In addition to providing centralized treatment for the existing homes in the region, the District must account for population growth. The population of Morgan County has grown about 40% since 1980, and growth is expected to continue as retirees and others purchase lakefront property or convert vacation homes to permanent residences.

E. NATURAL HERITAGE REVIEW

A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant. Three species of bats, Indiana, Gray, and Northern Long-Eared, may be present in the project area. The following recommendations were made for construction activities:

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

7. DERIVATION AND DISCUSSION OF PARAMETERS AND PERFORMANCE BASED EFFLUENT LEVELS

Wasteload allocations and limits were calculated using two methods:

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

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

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

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

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

B. **Alternative Analysis-based** – Using the preferred alternative's treatment capacity for conventional pollutants such as BOD_5 and TSS that are provided by the consultant as the WLA, the significantly-degrading effluent average monthly and average weekly limits are determined by applying the WLA as the average monthly (AML) and multiplying the AML by 1.5 to derive the average weekly limit (AWL).

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

Outfall #001 – Main Facility Outfall

- **Flow.** Though not limited itself, the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations [40 CFR Part 122.44(i)(1)(ii)]. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification. Influent monitoring has been and will be required for this facility in its Missouri State Operating Permit.

- **Biochemical Oxygen Demand (BOD_5).** Water Quality Review establishes 15 mg/L as a Weekly Average and 10 mg/L as a Monthly Average. Effluent limits were established in accordance with 10 CSR 20-7.015(4) for discharges to Losing Streams.

  Dissolved Oxygen Modeling
  Dissolved oxygen modeling was not completed since the proposed scope of construction will not increase the design flow of the discharge and because the facility will retain losing stream limits for biochemical oxygen demand.

- **Total Suspended Solids (TSS).** Water Quality Review retains 20 mg/L as a Weekly Average and 15 mg/L as a Monthly Average. Effluent limits were established in accordance with 10 CSR 20-7.015(4) for discharges to Losing Streams.

- ***Escherichia coli (E. coli)***. Discharges to losing streams shall not exceed 126 per 100 mL as a Daily Maximum at any time, as per 10 CSR 20-7.031(5)(C). Monitoring only for a monthly average. No more than ten percent of samples over the course of the calendar year shall exceed 126 #/100 mL daily maximum as per 10 CSR 20-7.015(9)(B)1.G.

- **Total Ammonia Nitrogen.** Performance based effluent levels were established as a result of a discharging technology alternatives analysis conducted by the applicant. The performance based levels were proposed to set the facility up for future compliance with ammonia limits based upon EPA's 2013 aquatic life criteria for ammonia. While Missouri has not yet adopted these updated standards and is still utilizing EPA's 1999 criteria in water quality-based calculations, it is anticipated that these limits will be implemented in the future. Based on

performance data for the facility from the discharge monitoring reports, it is anticipated that the facility will be able to reliably meet these performance based levels.

The proposed alternative analysis performance based levels are:

Month	Units	AML
January	mg/L	2.2
February	mg/L	1.8
March	mg/L	1.6
April	mg/L	1.3
May	mg/L	1.0
June	mg/L	0.8
July	mg/L	0.7
August	mg/L	0.6
September	mg/L	0.8
October	mg/L	1.2
November	mg/L	1.5
December	mg/L	1.9

To verify that the proposed alternative analysis performance based levels provided by the facility are protective of the water quality based effluent limits, below is the following calculation of water quality based effluent limits. It demonstrates that the proposed alternative analysis performance based levels proposed by the applicant are more protective.

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

Table 6-1: Ammonia Criteria as of 7/21/23

Month	Temp (°C)*	pH (SU)*	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
January	8.1	7.8	3.1	12.1
February	9.3	7.9	2.7	10.1
March	13.0	7.8	3.1	12.1
April	16.7	7.8	2.7	12.1
May	20.0	7.8	2.2	12.1
June	24.0	7.8	1.7	12.1
July	26.6	7.8	1.5	12.1
August	26.5	7.9	1.3	10.1
September	23.5	7.8	1.8	12.1
October	18.0	7.8	2.5	12.1
November	14.0	7.8	3.1	12.1
December	10.0	7.8	3.1	12.1

* Ecoregion Data (Ozark Highlands)

WQBEL equation

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

January

Chronic WLA: Ce = ((0.11625 + 0.0)3.1 – (0.0 * 0.01)) / 0.11625 Ce = 3.1
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 3.1 mg/L
MDL = WLAa = 12.1 mg/L

February
Chronic WLA: Ce = ((0.11625 + 0.0)2.7 – (0.0 * 0.01)) / 0.11625 Ce = 2.7
Acute WLA: Ce = ((0.11625 + 0.0)10.1 – (0.0 * 0.01)) / 0.11625 Ce = 10.1
AML = WLAc = 2.7 mg/L
MDL = WLAa = 10.1 mg/L

March
Chronic WLA: Ce = ((0.11625 + 0.0)3.1 – (0.0 * 0.01)) / 0.11625 Ce = 3.1
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 3.1 mg/L
MDL = WLAa = 12.1 mg/L

April
Chronic WLA: Ce = ((0.11625 + 0.0)2.7 – (0.0 * 0.01)) / 0.11625 Ce = 2.7
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 2.7 mg/L
MDL = WLAa = 12.1 mg/L

May
Chronic WLA: Ce = ((0.11625 + 0.0)2.2 – (0.0 * 0.01)) / 0.11625 Ce = 2.2
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 2.2 mg/L
MDL = WLAa = 12.1 mg/L

June
Chronic WLA: Ce = ((0.11625 + 0.0)1.7 – (0.0 * 0.01)) / 0.11625 Ce = 1.7
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 1.7 mg/L
MDL = WLAa = 12.1 mg/L

July
Chronic WLA: Ce = ((0.11625 + 0.0)1.5 – (0.0 * 0.01)) / 0.11625 Ce = 1.5
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 1.5 mg/L
MDL = WLAa = 12.1 mg/L

August
Chronic WLA: Ce = ((0.11625 + 0.0)1.3 – (0.0 * 0.01)) / 0.11625 Ce = 1.3
Acute WLA: Ce = ((0.11625 + 0.0)10.1 – (0.0 * 0.01)) / 0.11625 Ce = 10.1
AML = WLAc = 1.3 mg/L
MDL = WLAa = 10.1 mg/L

September
Chronic WLA: Ce = ((0.11625 + 0.0)1.8 – (0.0 * 0.01)) / 0.11625 Ce = 1.8
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 1.8 mg/L
MDL = WLAa = 12.1 mg/L

October
Chronic WLA: Ce = ((0.11625 + 0.0)2.5 – (0.0 * 0.01)) / 0.11625 Ce = 2.5
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 2.5 mg/L
MDL = WLAa = 12.1 mg/L

November

Chronic WLA: Ce = ((0.11625 + 0.0)3.1 – (0.0 * 0.01)) / 0.11625 Ce = 3.1
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 3.1 mg/L
MDL = WLAa = 12.1 mg/L

December

Chronic WLA: Ce = ((0.11625 + 0.0)3.1 – (0.0 * 0.01)) / 0.11625 Ce = 3.1
Acute WLA: Ce = ((0.11625 + 0.0)12.1 – (0.0 * 0.01)) / 0.11625 Ce = 12.1
AML = WLAc = 3.1 mg/L
MDL = WLAa = 12.1 mg/L

Table 6-1: Comparison of WQBEL and Performance Based Levels

Month	Monthly Average Limit	
	WQBEL (mg/L)	PBL (mg/L)
January	3.1	**2.2**
February	2.7	**1.8**
March	3.1	**1.6**
April	2.7	**1.3**
May	2.2	**1.0**
June	1.7	**0.8**
July	1.5	**0.7**
August	1.3	**0.6**
September	1.8	**0.8**
October	2.5	**1.2**
November	3.1	**1.5**
December	3.1	**1.9**

- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum. According to 10 CSR 20-7.031(4)(B), waters shall be free from oil, scum, and floating debris in sufficient amounts to be unsightly or prevent full maintenance of designated uses.

- **pH.** 6.5-9.0 SU. pH limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the in-stream Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU.

- **Biochemical Oxygen Demand (BOD_5) Percent Removal.** In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD_5 and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 85% removal efficiency for BOD_5.

- **Total Suspended Solids (TSS) Percent Removal.** In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD_5 and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 85% removal efficiency for TSS.

8. GENERAL ASSUMPTIONS OF THE WATER QUALITY REVIEW

A. A Water Quality Review (WQR) assumes that [10 CSR 20-6.010(2) Continuing Authorities and 10 CSR 20-6.010(4)(A)5.B., consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
B. A WQR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
C. Changes to Federal and State Regulations (FSR) made after the drafting of this WQR may alter Water Quality Based Effluent Limits (WQBEL).

D. Effluent limitations derived from FSR may be WQBEL or Effluent Limit Guidelines (ELG).
E. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
F. A WQR does not allow discharges to waters of the State, and shall not be construed as a National Pollution Discharge Elimination System (NPDES) or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
G. Limitations and other requirements in a WQR may change as Water Quality Standards (WQS), Methodology, and Implementation procedures change.
H. Nothing in this WQR removes any obligations to comply with county or other local ordinances or restrictions.

9. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

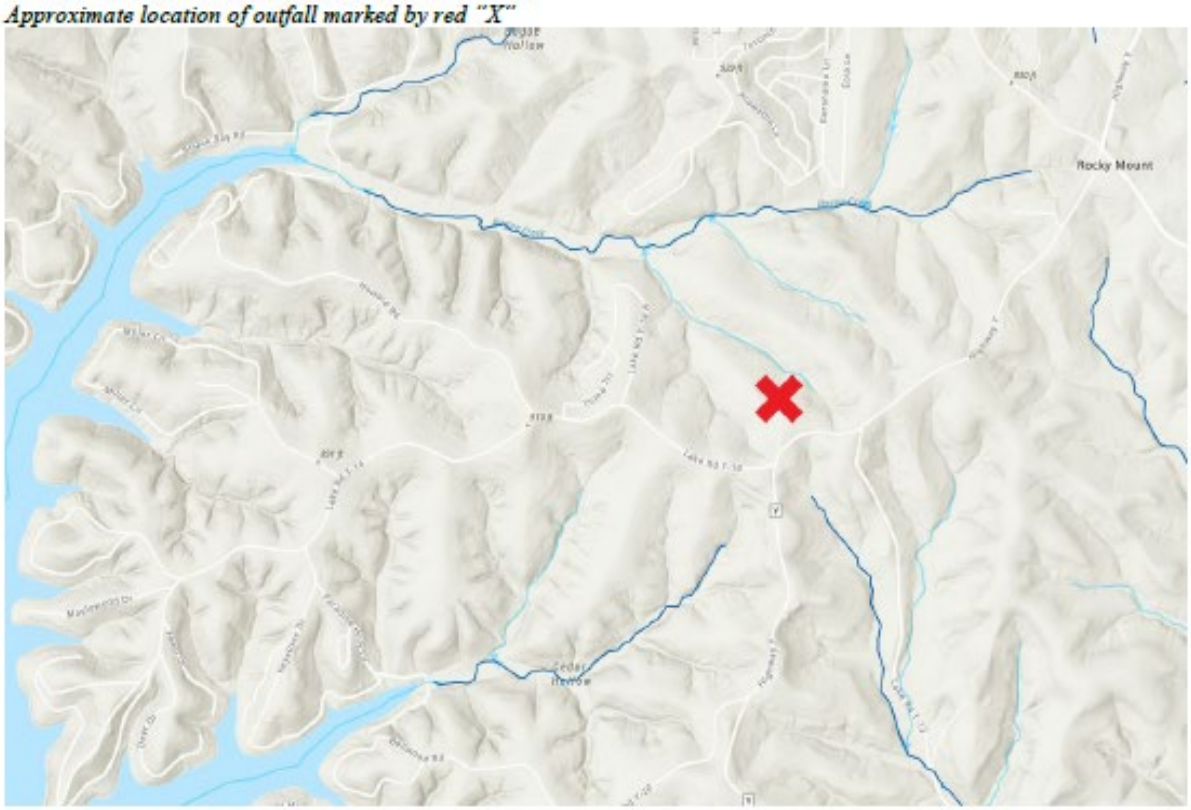
The proposed relocated facility discharge will result in a reduction by ten percent or more of the pollutant assimilative capacity of the unnamed tributary to Bogue Creek. Relocation of the effluent line to the tributary to Bogue Creek was determined to be the base case alternative. The antidegradation report included an alternatives analysis which evaluated regionalization, no-discharge systems, and relocation of the outfall to a gaining stream. However, these alternatives were determined to be impracticable and the report recommends the base case alternative for implementation.

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 will not require an Antidegradation review. No further analysis is needed for this discharge.

Reviewer: Steve Hamm, P.E.
Reviewer: Thomas Silkwood
Date: August 2023
Reviewer: Cailie Carlile, P.E.

10. Appendix A: Map of Discharge Location

Approximate location of outfall marked by red "X"



11. Appendix B: Natural Heritage Review

Missouri Department of Conservation

Natural Heritage Review Report

January 16, 2023

Science Branch
P. O. Box 180
Jefferson City, MO 65102
Prepared by: Hannah Roos
NaturalHeritageReview@mdc.mo.gov
(573) 522 - 4115 ext. 3182

Tony Cobb
Shoreline Surveying & Engineering, LLC
tony@shorelinese.com

NHR ERT ID:	12054	NHR ERT Level:	3
Project type:	Utility - Sewer		
Location/Scope:	T41NR16WS32/33, T40NR16WS05/04/08/09, T40NR16WS16		
County:	Morgan		
Query reference:	Rocky Mount Sewer District, Phase 3 Project		
Query received:	12/6/2022		

This NATURAL HERITAGE REVIEW is not a site clearance letter. Rather, it identifies public lands and records of sensitive resources located close to and/or potentially affected by the proposed project. If project plans or location change, this report may no longer be valid. 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. Lack of an occurrence record does not mean that a sensitive species or natural community is not present on or near the project area. On-site verification is the responsibility of the project. These records serve as one reference and additional information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Look for additional information about the biological and habitat needs of records listed to avoid or minimize impacts. More information is at Natural Areas | Missouri Department of Conservation (mo.gov) and Missouri Fish and Wildlife Information System (MOFWIS).

Level 3: Records of federal-listed (also state-listed) species or critical habitats near the project site:

Natural Heritage records indicate a Bald Eagle nest occurs within the project area at approximately 92.7146477°W 38.2538997°N. Please contact USFWS (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132).

- **Bald Eagles:** Bald Eagles (*Haliaeetus leucocephalus*) nest near streams or water bodies in the project area. Nests are large and fairly easy to identify. While no longer listed as endangered, eagles continue to be protected by the federal government under the Bald and Golden Eagle Protection Act. Work managers should be alert for nesting areas within 1500 meters of project activities, and follow federal guidelines at: Do I need an eagle take permit? | U.S. Fish & Wildlife Service (fws.gov) if eagle nests are seen.

  Following USFWS Incidental Take Guidelines: To avoid the incidental take of bald eagles we recommend:
  - a buffer of at least 660 feet between project activities and the nests (including active and inactive nests).
  - If project activities are within 660 feet of the nest, please restrict activities to outside the nesting season. The nesting season in Missouri is January 1 – July 15.
  - If these recommendations cannot be implemented, incidental take of bald eagles may occur and a permit from USFWS may be necessary.
  - Do not clear nests or nest trees.

- **Lake of the Ozarks:** The Lake of the Ozarks, is an important fishery, but is not known to include any aquatic federal or state monitored species of concern. However, Bald Eagles nest, roost and feed and Gray Bats forage and use several known caves along its shores. While we have no records of these at the project site, if you encounter them at the site you should contact the U. S. Fish & Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132).

- The project should be managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any Clean Water Act permit conditions (Missouri DNR or US Army Corps of Engineers). Pollutants, including sediment, can have significant impacts far downstream. Use silt fences and/or vegetative filter strips to buffer streams and drainages, and monitor those after rain events and until a well-rooted ground cover is reestablished. Revegetate areas in which the natural cover is disturbed to minimize erosion using native plant species compatible with the local landscape and wildlife needs.

FEDERAL LIST species/habitats are protected under the Federal Endangered Species Act. **Contact U.S. Fish & Wildlife Service** (101 Park DeVille Drive Suite A, Columbia, Missouri 65203-0007; 573-234-2132) for Endangered Species Act coordination and concurrence information).

Level 2: Records of state-listed (not federal-listed) endangered species AND / OR state-ranked (not state-listed endangered) species and natural communities of conservation concern. The Department tracks these species and natural communities due to population declines and/or apparent vulnerability.

Natural Heritage records identify no state-listed endangered species within the project area.

Natural Heritage records identify no state-ranked species/natural communities within the project area.

There are no regulatory requirements associated with this status, however we encourage voluntary stewardship to minimize the risk of further decline that could lead to listing.

STATE ENDANGERED species are protected under the Wildlife Code of Missouri (3CSR10-4.111).
See the 2022 Missouri Species and Communities of Conservation Concern Checklist for a complete list.

General recommendations related to this project or site, or based on information about the historic range of species (unrelated to any specific Natural Heritage records):

- **Wastewater:** Clean Water Act permits issued by other agencies (Missouri DNR or US Army Corps of Engineers) 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 Act 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.
  - Please see Best Management Practices for Construction and Development Projects Affecting Missouri Rivers and Streams (mo.gov).

- **Karst:** Morgan County has known karst geologic features (e.g. caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in Natural Heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are species of conservation concern) are influenced by changes to water quality, so check your project site for any karst features and make every effort to protect groundwater in the project area. Please see Management Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat (mo.gov).

- **Gray Bats:** Gray Bats (*Myotis grisescens*, federal and state-listed endangered) occur in Morgan County and could occur in the project area, as they forage over streams, rivers, and reservoirs. Avoid entry or disturbance of any cave inhabited by gray bats and when possible retain forest vegetation along the stream and from the gray bat cave opening to the stream. Please see Best Management Practices for Construction and Development Projects Gray bat (mo.gov).

- **Indiana Bats and Northern Long-eared Bats: If this project has the potential to alter habitat (e.g. tree removal, projects in karst habitat) or cause direct mortality of bats, please coordinate directly with 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.**

  Though Indiana and Northern Long-eared bats are not known to occur in the project area, these species should be assumed present wherever habitat exists. These species occur in nearby Camden/Morgan Counties and could occur in the project area. Indiana Bats *(Myotis sodalis*, federal and state-listed endangered) and Northern Long-eared Bats (*Myotis septentrionalis,* federal-listed threatened) hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in 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 and/or Northern Long-eared Bats, especially from September to April.

- Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, larvae, and aquatic plant material may be moved to new sites on boats or construction equipment, so inspect and clean equipment thoroughly before moving between project sites.
  - Remove any mud, soil, trash, plants (or plant material) or animals from equipment before leaving any water body or work area.
  - Drain water from boats and machinery that has 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 carwash sites), and dry in the hot sun before using again.

These recommendations are ones project managers might prudently consider based on a general understanding of species needs and landscape conditions. Natural Heritage records largely reflect sites visited by specialists in the last 30 years. Many privately owned tracts have not been surveyed and could host remnants of species once but no longer common.

12. Appendix C: Antidegradation Review Summary Attachments

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

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

1. FACILITY

NAME			COUNTY
ROCKY MOUNT SEWER DISTRICT			Morgan
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
3,800 ft South of Hwy Y on Red Arrow Rd	ROCKY MOUNT	MO	65072
PERMIT NUMBER	PROPOSED DESIGN FLOW	SIC / NAICS CODE	
MO-0136719	75000 GPD		

2. OWNER

NAME			
Rocky Mount Sewer District			
ADDRESS	CITY	STATE	ZIP CODE
PO Box 920	Rocky Mount	MO	65072
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
rockymountmosewerdistrict@gmail.com		573-410-2460	

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

NAME	SECRETARY OF STATE CHARTER NUMBER		
Rocky Mount Sewer District			
ADDRESS	CITY	STATE	ZIP CODE
PO Box 920	Rocky Mount	MO	65072
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
rockymountmosewerdistrict@gmail.com		573-410-2460	

4. CONSULTANT

PREPARER NAME	COMPANY NAME		
Jared Wheaton	Shoreline Surveying and Engineering		
ADDRESS	CITY	STATE	ZIP CODE
3048 S Hwy 52	Eldon	MO	65026
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
jared@shorelinese.com		573-714-0366	

5. RECEIVING WATER BODY SEGMENT #1

NAME
Lake of the Ozarks (L)100K Extent-Remaining Streams (C) (3960) (losing). Below is the location of the new proposed discharge area

5.1 Upper end of segment – Location of discharge
UTM: X= _____, Y= _____ OR Lat 38°16'22"N, Long 92°42'57"W

5.2 Lower end of segment –
UTM: X= _____, Y= _____ OR Lat 38°16'54"N, Long 92°44'27"W

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

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

NAME
n/a

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

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

7. DECHLORINATION

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

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

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

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

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

Regional Sewer Connection - All facility's that are within building distance or bordering the Rocky Mount Sewer District are smaller in operation and could not feasible handle the flow without significant impact and upgrade fees. The District successfully constructed the first stage of a regional treatment plant with its Phase 1 and 2 projects and now has a collection network that reaches most areas of its vast service area.

Subsurface Irrigation-Based on preliminary calculations, approximately 13 acres of land would be necessary to provide the septic tank storage and subsurface irrigation for this WWTF application. Again, the cost and availability of land in this area make this alternative impractical.

Land Applications-Based on preliminary calculations for this application, approximately 38 acres of land would be required to facilitate the lagoon storage and land application. Land availability in this area as well as the land cost make this alternative non-practicable.

9. ADDITIONAL REQUIREMENTS

Complete and submit the following with this submittal:

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

10. PATH / TIER REVIEW ATTACHMENTS ENCLOSED

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

11. APPLICANT PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS

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

Applicable Pollutants of Concern	Concentration* mg/L	Concentration* µg/L	Path / Tier Review Attachment Used for POC Evaluation	Average Monthly Limit	Daily Maximum Limit or Average Weekly Limit
BOD_5	X			10	15
TSS	X			20	15
Ammonia (Summer)	X			1.7	n/a
Ammonia (Winter)	X			2.9	n/a
Total Phosphorus	X			n/a	n/a
Oil & Grease	X			10	n/a

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

12. PROPOSED PROJECT SUMMARY

The proposed project shall include the installation of 3,800 feet of sewer main and one lift station all from the 75,000 gallon per day Mechanical Treatment Facility. The Facility will discharge to Bogue Bay Cove of the Lake of the Ozarks. This will also include the installation of a sludge basin at the WWTF. The plant shall meet all MODNR effluent limits for pollutants of concerns as detailed in the anti degradation review. The plant will serve the three phases for the Rocky Mount Sewer District. The phase IV project that will take place in 2026 will include another anti degradation review for a plant expansion

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

13. CONTINUING AUTHORITY WAIVER (For New Discharges)

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

14. APPLICATION FEE

☑ CHECK NUMBER ☐ JETPAY CONFIRMATION NUMBER

15. SIGNATURE

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

SIGNATURE	DATE
	2/14/23
PRINT NAME	TITLE
Jared Wheaton, Shoreline Surveying and Engineering	President

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

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

ANTIDEGRADATION REVIEW SUMMARY
PATH C: TIER 2 – SIGNIFICANT DEGRADATION

1. FACILITY

NAME	COUNTY
Rocky Mount Sewer District	Morgan

2. SUMMARY OF THE POLLUTANTS OF CONCERN

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

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

Pollutants of Concern*	Concentration*		Base Case Limit	Basis (WQS, WLA, ELG, Other)**
	mg/L	µg/L		
BOD_5	X		10	MO-0136719
TSS	X		15	MO-0136719
Ammonia (Summer)	X		1.7	MO-0136719
Ammonia (Winter)	X		2.9	MO-0136719
Total Nitrogen	X		n/a	
Total Phosphorus	X		n/a	

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

** Provide the Basis for the Base Case Limit: WQS – Water Quality Standard, WLA – Wasteload Allocation, ELG – Effluent Limit Guideline, or describe other.

3. IDENTIFYING ALTERNATIVES

Supply a summary of the non-discharging alternatives considered. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the Antidegradation Implementation Procedure Section II.B.1. These alternatives include no-discharge. Attach all supportive documentation in the Antidegradation Review report.

Feasibility of non-discharging alternatives (regionalization, land application, subsurface irrigation, and recycling or reuse):

Non Practicable alternatives based on preliminary calculations, the District does not have access to the amount of land required for a land application (38 acres) or a subsurface irrigation (13 acres)- Discharge to Gaining Stream can be obtained by extending the outfall to the main channel of the Lake of the Ozarks or to the connection of the regional /district sanitary sewer service from the City of Lake Ozark. A rough estimate to accomplish this would be around $35.00 a foot at 6.75 miles of sewer main. The cost of this could range from $1,250,000 without the cost of lift stations and connection/improvements fees from the City of Lake Ozark. Provided that easements are obtained at no cost to the District. The City of Lake Ozark requires a $1 million contribution for the right to hook onto their system, plus upgrades to an existing lift station and for the users to pay 1.5 times the normal rate for treatment. As this District customers is of the utmost importance. The cost of the line work would not return or be affordable to the customers. This could easily equate to 180 to 200 customers not receiving sewer service. Due to the cost and this is the third phase of the overall plan for the Rocky Mount Sewer District, The ability to repay funds it is not practicable to discharge to a gaining stream, The current customers base of the District is not large enough to scour an 8" sewer main to the City of Lake Ozark. When the district is at a fuller customer base. Where the line size can be placed once without replacement would be the time to renegotiation with the regional /district sanitary sewer service from the City of Lake Ozark.

Minimum of three (preferably five or more) discharging alternatives* ranging from less-degrading to degrading including Preferred Alternative (All treatment levels for POCs must at a minimum meet water quality standards):

Discharging Alternative #	Treatment Type	Description
1	Relocate Dischage to Bogue Bay	BOD5 - ≤ 10, TSS -≤ 15, AMMONIA AS N- ≤ 1.7 to 3.1
2	Relocate Discharge to Graining St	Non Practicable
3	Land Applacation	Non Practicable
4	Subsurface Irrigation	Non Practicable
5	Connection to City of Lake Ozark	Non Practicable, BOD5 - ≤ 30, TSS -≤ 30, AMMONIA AS N- ≤ 3.1
6		

* Same technology may be multiple alternatives as you have the base unit and add to it with more capacity to provide additional treatment.

4. DETERMINATION OF THE REASONABLE ALTERNATIVE

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

Practicability Summary:

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

Based on preliminary calculations, the District does not have access to the amount of land required for a land application (38 acres) or a subsurface irrigation (13 acres). Also, with the closest existing plant being 6.75 miles outside the corporate limits and the customer base not big enough to scour a sewer main at that length, along with the other concerns listed above, including cost, these alternatives have been determined non-practicable.

The potential environmental impacts of discharging to the Bogue Bay stream is the risk to existing wells in the area. The District recognizes the risk and would plan to discharge to the gaining stream as soon as funds were available or the renegotiation with the regional /district sanitary sewer service from the City of Lake Ozark. This could occur once the RMSD customer base is large enough to scour an 8" sewer main.

Economic Efficiency Basis:

What is the design life cycle for the comparison? 20 years

What interest rate was used in the present worth calculations? 1,5

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 proposed project shall include the installation of 3,800 feet of sewer main and one lift station all from the 75,000 gallon per day Mechanical Treatment Facility. The Facility will discharge to Bogue Bay Cove of the Lake of the Ozarks. This will also include the installation of a sludge basin at the WWTF. The plant shall meet all MODNR effluent limits for pollutants of concerns as detailed in the Anti degradation Review Summary. The plant will serve the three phases for the Rocky Mount Sewer District. The phase IV project that will take place in 2026 will include another Anti degradation review for a plant expansion.

TABLE OF THE ALTERNATIVES EVALUATION (Attach additional page if necessary)						
PARAMETERS	**Alternatives #**					
	1	**2**	**3**	**4**	**5**	**6**
BOD_5 – mg/L	≤ 10	n/a	n/a	n/a	≤ 30	
TSS – mg/L	≤ 15	n/a	n/a	n/a	≤ 30	
Ammonia (Summer) – mg/L	≤ 1.7	n/a	n/a	n/a	n/a	
Ammonia (Winter) – mg/L	≤ 3.1	n/a	n/a	n/a	≤ 3.1	
E. Coli – #/100 mL	126	n/a	126	n/a	126	
Total Nitrogen – mg/L	n/a	n/a	n/a	n/a	n/a	
Total Phosphorus – mg/L	n/a	n/a	n/a	n/a	n/a	
Construction Cost – $	$250,000.00	>$950,000	Not Practicable	Not Practicable	>$2,250,000	
Operating Cost – $	$ 30,763.00					
Present Worth – $	$528,161.00					
Ratio present worth to base case	$778,161.00					

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."

For a more detailed cost estimate see the attached Anti-Degradation Review Report

Justification for Preferred Alternative:

The discharge line relocation to Bogue Bay was determined to be the most affordable alternative for the District. It was the only alternative that was both practicable and efficient. The other alternative's would place the customers in a unreasonable amount of dept.

Reasons for Rejecting the other Evaluated Alternatives:

The other chosen alternatives required more annual maintenance cost and initial start up cost. The District already has one mechanical plant and is familiar with its operation and maintenance.

Comments/Discussion:

After the phase III project is complete. The next phase IV project take place in 2026 will include another Anti-degradation review for a plant expansion or possible reach out for renegotiation with the regional /district sanitary sewer service from the City of Lake Ozark.

5. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

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

Identify the affected community:

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

Recreation brings thousands of visitors to the Lake area each summer weekend. The communities around the lake swell from a few hundred residents to several thousand each weekend. Community provided water and sewer is present only around the cities of Gravois Mills, Laurie, Lake Ozark, Osage Beach, and Camdenton as well as about 180 private systems. It is estimated that about 40,000 on-site wastewater treatment systems exist in the Lake area. Sixty to seventy percent of these systems are thought to be failing. So, approximately 10 million gallons of improperly treated wastewater is entering the Lake of the Ozarks watershed some days.

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

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

The Missouri State Water Patrol sponsored a Recreation Use Study of the Lake in 1998 to determine the best way to manage not only boat traffic but also growth at the Lake in general. The study found varying levels of contamination from human/animal waste but did not find the problems concentrated in any one certain area. Test results vary depending on time of year sampled, the water level of the Lake at the time of testing, as well as the actual location of the tests. Although inconclusive that the problem is caused by failing septic tanks, much of the testing has pointed to elevated levels of BOD and coliform bacteria in the back end of coves during the busy summer season.

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.

Growth may very well be stymied if the District cannot move forward with construction a central system because the cost of on-site systems have averaged five to ten thousand dollars recently with many alternative systems costing $28,000+. Homeowners cringe at having to pay this much for an on-site disposal system knowing the District is working quickly to bring sewers to the area. Centralized sewer in the area would encourage development. With development comes needed employment for development companies, contractors, management personnel, service providers and all of their employees.

PROPOSED PROJECT SUMMARY:

After months of negotiation fair terms could not be agreed with the Lick Branch HOA. Because of this fact the Rocky Mount Sewer District as Continuing Authority has decided to pursue construction of the line relocation from their own regional treatment facility. In the first two phases of the District expansion project's they have reached the 451 home limit set by the Lick Branch HOA. The current treatment facility is capable of treating additional customer for wastewater but is still held accountable of the judgment. Ultimately the District desires to provide community sewer to 2,000 plus homes in their District.

The facility has initially discharge to a losing stream with future plans of constructing a line 3,800 feet out of the Lick Branch to meet the needs of the HOA. It is estimated to cost a minimum of $250,000 for the 3,800 feet. That's provided easements are granted at no cost to the District.

The proposed project shall include the installation of 3,800 feet of sewer main and one lift station all from the 75,000 gallon per day Mechanical Treatment Facility. The Facility will discharge to Bogue Bay Cove of the Lake of the Ozarks. This will also include the installation of a sludge basin at the WWTF. The plant shall meet all MODNR effluent limits for pollutants of concerns as detailed in the Antidegradation Review Summary Attachment A: Tier 2. The plant will serve the three phases for the Rocky Mount Sewer District. The phase IV project that will take place in 2026 will include another Antidegradation Review for a plant expansion

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

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

ANTIDEGRADATION: REGIONALIZATION AND NO-DISCHARGE EVALUATION

REGIONALIZATION AND NO-DISCHARGE EVALUATION

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

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

Additional pages may be attached if more room is needed.

1. FACILITY:

NAME	COUNTY
Rocky Mount Sewer District	Morgan

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

2.1 Regionalization Feasibility:

A. What is the distance to connect to the closest municipality's line or other facility's line? 20 years

B. List facilities contacted about possible regionalization. City of Lake Ozark, Missouri

C. Is there any planning or zoning in the area regarding development and services? yes, in the city of Lake Ozark

D. Who would have the responsibility to maintain the sewer connection line? Rocky Mount Sewer District

E. What is the estimated cost for piping and pumps to regionalize? $1,250,000 plus lift stations and impact fees

F. Explain any engineering challenges with the regionalization connection – topography, rivers, highways, or other issues.
All other possible locations are smaller facility's than the current treatment plant of Rocky Mount Sewer District.

G. Does a regional facility have the capacity to treat the additional effluent from this project? NO

H. Were land owners contacted for rights to an easement? ☑ Yes ☑ No

I. Describe the easement issues:
The land owners who's easements would need to be obtained from are on central sewer with the neighboring facility's and have no need for additional service. The properties are also outside of the Jurisdiction of Morgan County, Missouri. The line would go through Miller County, Missouri and the bond issue in this county failed when voted on.

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

All facility's that are within building distance or boarding the Rocky Mount Sewer District are smaller in operation and could not feasible handle the flow. The District successfully constructed the first stage of a regional treatment plant with its Phase 1 and 2 and now has a collection network that reaches most areas of its vast service area. In Phase III project with an addition to the sludge basin would allow for some flexibility of the large flow in the summer months.

3. EVALUATION OF NO-DISCHARGE LAND APPLICATION

Check all applicable reasons why no-discharge land application was not pursued:

☑ **3.1 Land Availability and Cost:**

A. Is land available for land application? ☐ Yes ☑ No

If not, explain: The land in the area that would be aviable is not suitable for land application, because of the hill sides.

If yes, answer the following:

B. How many acres are required for land application of the effluent? n/a

C. Provide a breakdown of the capital cost for any necessary additional land, piping, pumps, and irrigation equipment?

n/a

D. Were long-term costs evaluated and compared for upgrading to a mechanical plant with future Water Quality Standards changes (i.e. mussel ammonia, bacteria, TP, TN) versus cost for a land application system? ☐ Yes ☑ No

E. Were land owners contacted for rights to an easement? ☐ Yes ☑ No

F. Describe the easement issues:

Not practicable for land around the Lake of the Ozarks

☑ **3.2 Zoning or Suitability of Site in Proximity to Neighboring Sites or Waterbodies:**

A. Was drip or subsurface irrigation evaluated as opposed to surface application? ☐ Yes ☑ No

B. Does the county ordinance specifically restrict land application, surface and subsurface? ☐ Yes ☑ No

C. Can a vegetated buffer be installed to reduce necessary buffer distances? ☐ Yes ☑ No

D. Are there other steps or considerations that can be made?

☐ **3.3 Unsuitability of Geology or Soils**

A. Is a geohydrologic evaluation, county soils survey map, or other resource showing suitability and application rates included with this application? ☐ Yes ☐ No

B. Is it cost-effective to bring in additional soils? ☐ Yes ☐ No

C. Can the application rate be decreased to a suitable rate? ☐ Yes ☐ No

D. Were subsurface application alternatives (e.g. low pressure pipe, drip) considered? ☐ Yes ☐ No

E. If collapse potential is a concern, was using a liner or alternative site evaluated? ☐ Yes ☐ No

3.4 Summarize why no-discharge land application was not a practicable or economically efficient alternative

The District successfully constructed the first stage of a regional treatment plant with its Phase 1 project. Now with phase 1 and phase 2 complete they District has a collection network that reaches most areas of its vast service area. A no discharge application can not be used around the Lake of the Ozarks for there is no affordable flat land in the area.

4. DOCUMENTATION

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

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

13. Appendix D: Geohydrologic Evaluation

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

LWE23068
Morgan County

July 17, 2023

Tony Cobb
Shoreline Surveying and Engineering
3048 South Highway 52
Eldon, MO 65026

RE: Rocky Mount Sewer District Discharge Relocation

Dear Tony Cobb:

On February 07, 2023, the Missouri Geological Survey received a request to perform a geohydrologic evaluation for the above referenced project located in Morgan County. Included with this letter is a report that details the geologic and hydrologic conditions at the site and the potential for groundwater contamination in the event of wastewater treatment failure.

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

Sincerely,

MISSOURI GEOLOGICAL SURVEY

Fletcher N. Bone
Geologist
Environmental Geology Section

STATE OF MISSOURI
FLETCHER N BONE
NG
2019001287
REGISTERED GEOLOGIST

07/17/2023

c: Pam Bess
WPP
Central Field Operations

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

Project ID Number
LWE23068
County
Morgan County

Request Details

Project: Rocky Mount Sewer District Discharge Relocation

Legal Description: 32 T41N R16W
Quadrangle: ROCKY MOUNT
Latitude: 38 16 6.15
Longitude: -92 42 55.7

Organization Official
Name: Pam Bess
Address: P.O. Box 920
City: Rocky Mount
State: MO Zip: 65072
Phone: 573-410-2460
Email: jared@shorelinese.com

Preparer
Name: Tony Cobb
Address: 3048 South Highway 52
City: Eldon
State: MO Zip: 65026
Phone: 573-480-5405
Email: tony@shorelinese.com

Project Details

Report Date: 07/17/2023
Date of Field Visit: 07/06/2023
Previous Reports: Not Applicable

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

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

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

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

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

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

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

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

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

Bedrock: The uppermost bedrock is Ordovician-age Gasconade Dolomite.

Surficial Materials: Surficial materials consist of moderately to highly permeable alluvium and colluvium derived from the Roubidoux and Gasconade Dolomite formations.

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

Project ID Number
LWE23068
County
Morgan County

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

Remarks:

On July 6, 2023, a geologist from the Missouri Geological Survey conducted a geohydrologic evaluation for an existing wastewater treatment facility (WWTF), proposed discharge relocation, and proposed storage basin for the Rocky Mount Sewer District in Morgan County, Missouri. The existing facility consists of a mechanical treatment plant which discharges to a tributary of Lick Branch that has been previously classified as a losing stream. The proposed improvements include a storage basin that is less than 1 acre in size and they are also proposing to move the discharge approximately 1 mile north of the existing facility into a tributary of Bogue Creek. The approximate location for the discharge is -92 43'0.99 West, 38' 16'24.95 North. The purpose of the site visit is to observe the geologic and hydrologic elements and determine the potential for groundwater contamination in the event of liner or wastewater treatment failure.

The uppermost bedrock onsite is moderately permeable Ordovician-age Gasconade Dolomite. Surficial materials consist of moderately to highly permeable alluvium and colluvium derived from the Roubidoux and Gasconade Dolomite formations. Well logs documented for the area, and observations at the site indicate that approximately 10 feet of Gasconade dolomite residuum exists in the area. The residuum on the site is a cherty, silty, clay.

Surface water runoff from the existing and proposed facility is south into a tributary of Lick Branch. Discharge from the WWTF is, currently, to the south into a tributary of Lick Branch and is proposed to be relocated to a tributary of Bogue Creek. During the site visit, the tributary of Bogue Creek and Bogue Creek were evaluated and classified as losing from the proposed discharge point, downstream to the confluence with Lake of the Ozarks, which is approximately 1.6 miles. Losing characteristics include, poorly sorted materials, erratic stream gradient, karst bedrock, and flow loss.

There are no known springs, sinkholes, or geologic structures located within 1 mile of the site. There is at least 1 public drinking water well located approximately 1/4 mile southwest of the proposed discharge location.

Based on the characteristics observed, the site receives a severe geologic limitations rating and a moderate collapse potential rating. In the event of wastewater treatment failure, the local, shallow, and regional groundwater, and surface waters of the tributary of Bogue Creek, Bogue Creek, and Lake of the Ozarks, may be adversely impacted.

14. Appendix E: StreamStats Report

StreamStats Report

Region ID: MO
Workspace ID: MO20230721173451158000
Clicked Point (Latitude, Longitude): 38.27596, -92.72146
Time: 2023-07-21 12:35:14 -0500

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0658	square miles
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.45	dimensionless

Low-Flow Statistics

Low-Flow Statistics Parameters [LowFlow Region 2 SIR 2013 5090]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0658	square miles	0.21	7380
STREAM_VARG	Streamflow Variability Index from Grid	0.45	dimensionless	0.273	0.926

Low-Flow Statistics Disclaimers [LowFlow Region 2 SIR 2013 5090]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [LowFlow Region 2 SIR 2013 5090]

Statistic	Value	Unit
1 Day 10 Year Low Flow	0.000349	ft^3/s
2 Day 10 Year Low Flow	0.000401	ft^3/s
3 Day 10 Year Low Flow	0.000445	ft^3/s
7 Day 10 Year Low Flow	0.000575	ft^3/s
10 Day 10 Year Low Flow	0.000641	ft^3/s
30 Day 10 Year Low Flow	0.000874	ft^3/s
60 Day 10 Year Low Flow	0.00118	ft^3/s

Low-Flow Statistics Citations

Southard, R.E.,2013, Computed statistics at streamgages, and methods for estimating low-flow frequency statistics and development of regional regression equations for estimating low-flow frequency statistics at ungaged locations in Missouri: U.S. Geological Survey Scientific Investigations Report 2013–5090, 28 p. (http://pubs.usgs.gov/sir/2013/5090/)

Application Version: 4.16.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

CPSE01114 AP44819

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
APPLICATION FOR CONSTRUCTION PERMIT – SEWER EXTENSION

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED 300	CHECK NO. 3337
DATE RECEIVED 2.27.24 MH	

NOTE ► Please Read the accompanying instructions before completing this form

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: SRF Project #:

1.2 Has the Department of Natural Resources approved the proposed project's engineering report*?
☐ YES Date of Approval: ☑ NO ☐ N/A

1.3 Is a copy of the appropriate plans* and specifications* included with this application? ☑ YES ☐ NO
If the project is using standard specifications, name of community: _____

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

1.5 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
Rocky Mount Sewer District Phase III Extension

ADDRESS	CITY	STATE	ZIP CODE	COUNTY
PO Box 920	Rocky Mount	MO	65072	Morgan

2.2 Legal Description: w ¼, se ¼, se ¼, Sec. 40 , T 16 , R 9

2.3 Project Components (check all that apply):
☑ Gravity sewers ☑ Pumping stations ☑ Force mains ☐ Alternative sewer system ☐ Other (Describe below.)

2.4 PROJECT DESCRIPTION
The project consists of approximately 190 new residential connections and the regionalization of the Timber Lake Village HOA consisting of 140 condos and townhomes. The WWTF serving Timber Lake will be taken offline and operating permit closed. The collection system will include 104 grinder pump stations and a pressurized force main system for a total of 26,681 linear feet of 1½-in to 6-in small diameter pressure pipe. Also, including 420 LF of 8-in SDR-35 gravity sewer with 2 manholes and all necessary appurtenances to make a complete and usable wastewater collection system. The second part of the project at the WWTF will include a flow EQ/Sludge holding tank, dewatering slab, and an additional outfall (Outfall No. 2) which requires a new lift station at the treatment facility.

2.5 DESIGN INFORMATION
A. Population or number of lots to be served by this extension: 190 residents plus 140 Condos.
B. Estimated flow to be contributed by this extension: Design Average Flow: 43,750 gpd Design Peak Hourly Flow: 7300 gph
C. Industrial Wastes: Type: Flow: 0 gpd
D. Receiving Sewer: Size: 8 inches Capacity: 300 gpm
E. Does this project (check all that apply):
☑ Connect to an existing treatment plant ☐ Resolve enforcement issue ☐ Eliminate or consolidate an existing treatment plant
F. Estimated number of onsite systems being removed: 190
G: Estimated costs associated with piping: $ 2,300,000 Estimated costs associated with lift station(s): $ 140,000

3.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Rocky Mount Sewer District	573 410-2460	rockymountsewerdistrict@gmail.com

ADDRESS	CITY	STATE	ZIP CODE
PO Box 920	Rocky Mount	MO	65079

CHARTER NUMBER (SECRETARY OF STATE) or REGISTERED AGENT
RECEIVED

MO 780-1632 (10-22)

4.0 CONTINUING AUTHORITY: A continuing authority is a company, business, entity, or person(s) that will be legally responsible for ensuring compliance with the permit requirements and provide continuous stable oversight of the permitted facility or activity. The Continuing authority should be a relatively permanent entity responsible for the ongoing operation, maintenance and modernization, when needed, of the permitted facility or activity. A continuing authority is not, however, an entity or individual that is contractually hired by the permittee to sample or operate and maintain the system for a defined time period, such as a certified operator or analytical laboratory. To access the regulatory requirement regarding continuing authority, 10 CSR 20-6.010(2), please visit Clean Water Commission Chapter 6. A continuing authority's name must be listed exactly as it appears on the Missouri Secretary of State's (SoS's) webpage: Missouri Secretary of State, unless the continuing authority is an individual(s), government entity, or otherwise not required to register with the SoS.

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Rocky Mount Sewer District	573-410-2460	rockymountsewerdistrict@gmail.com

ADDRESS	CITY	STATE	ZIP CODE
PO Box 920	Rocky Mount	Mo	65079

CHARTER NUMBER (SECRETARY OF STATE)

4.1 Has appropriate continuing authority acceptance been provided as follows:
A letter from the continuing authority accepting responsibility for continued maintenance of the sewer (if the continuing authority is different than the original owner of the construction), or a properly executed "Continuing Authority and Receiving Wastewater Treatment Facility Acceptance" Form 780-2584. ☐ YES ☑ NO ☑ N/A

5.0 ENGINEER

ENGINEER NAME / COMPANY NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Jared Wheaton, Alpha Engineering & Surveying	573-714-0366	jared@alphaes.net

ADDRESS	CITY	STATE	ZIP CODE
3048 S Hwy 52	Eldon	MO	65026

6.0 RECEIVING WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Rocky Mount Sewer District	573 410-2460	rockymountsewerdistrict@gmail.com
MISSOURI STATE OPERATING PERMIT #	COUNTY	REMAINING CAPACITY (GPD)
MO-0136719	Morgan	

6.1 If different from the owner, has a letter been provided from the receiving treatment facility demonstrating that they agree to accept the expanded flow **or** has a properly executed Continuing Authority and Receiving Wastewater Treatment Facility Acceptance MO 780-2584 form been provided? ☐ YES ☑ NO ☑ N/A

6.2 A letter from the receiving wastewater treatment facility, if different than the continuing authority, is included with this application. ☐ YES ☑ NO ☑ N/A

6.3 If the receiving treatment plant or continuing authority is regulated by the Public Service Commission (PSC) for sewer activities, a Certificate of Convenience and Necessity has been received? ☐ Yes – Date: ☑ No ☑ N/A

OPTIONAL QUESTIONS REGARDING MILITARY SERVICE

Have you or an immediate family member ever served in the U.S. Armed Forces?	☑ Yes	☐ No
If yes, would you like information about military-related services in Missouri?	☐ Yes	☑ No

7.0 Application Fee

☑ Check Number	☐ JetPay Confirmation Number

8.0 PROJECT OWNER: I certify under penalty of law this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE

PRINTED NAME: Pam Bess

DATE: 1/16/24

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Chairman of the Rocky Mount Sewer District	573-410-2460	rockymountsewerdistrict@gmail.com

Mail completed copy to:	Submit completed electronic copy to:
MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM PO BOX 176 JEFFERSON CITY, MO 65102-0176	Missouri Department of Natural Resources at **DNR.WPPEngineerSection@dnr.mo.gov**

MO 780-1632 (10-22)

9.0 SEWER EXTENSION CHECKLIST				
SEWER EXTENSION DESIGN CERTIFICATION: Answer all questions yes or N/A. Answer N/A only if the question is clearly not applicable to the design of the proposed sewer extension.				
	REGULATION		YES	N/A
1.	8.110(3)(A)	Is the design flow based on actual flow data for an existing system?	☐	☑
2.	8.110(3)(B)	Are average design flows, peak hourly flows and I&I contributions for new systems calculated?	☑	☐
3.	8.110(9)(B)	Is there a detailed plan showing tributary area, boundaries, pertinent elevations, topography, existing and proposed facilities?	☑	☐
4.	8.120(2)	Does the sewer exclude water from roofs, streets, groundwater from foundation drains and combined wastewater?	☑	☐
5.	8.120(3)(A)	Is the pipe installation, embedment and backfill designed to prevent damage to the pipe and its joints?	☑	☐
6.	8.120(3) (A)1	Is all sewer pipe constructed with a slope to obtain mean velocities of not less than 2 feet per second?	☑	☐
7.	8.120(3)(A)2	Is the pipe covered with at least 36" of soil or sufficiently insulated to prevent freezing?	☑	☐
8.	8.120(3)(B)	Is deflection testing specified to ensure no pipe exceeds a deflection of 5% of the inside diameter?	☑	☐
9.	8.120(4)(A)	Are manholes located at the end of each line, at all changes in grade, size or alignment and at all intersections?	☑	☐
10.	8.120(4)(C)	Are manholes at least 42 inches in diameter with a clear opening of 22 inches on sewer line larger than 8"?	☑	☐
11.	8.120(4)(C)	Where cleanouts are used at the end of a lateral instead of a manhole, they are a minimum diameter of 8 inches or larger and equal to the diameter for pipes < 8"?	☑	☐
12.	8.120(4)(E)	Are the manholes watertight, constructed and installed in accordance with the manufacturer's recommendations and procedures?	☑	☐
13.	8.120(4)(F)	Do the specifications include a requirement for inspection and testing for manholes?	☑	☐
14.	8.120(5)(A)	Is the sewer free from physical connections to a potable water supply system and no water pipes come in contact with a sewer manhole?	☑	☐
15.	8.120(5)(B)	Are sewers and manholes located at least 50 feet horizontally from any existing or proposed water supply well, sources, structures?	☑	☐
10.0 PRESSURE SEWERS, GRINDER PUMP, STEP AND STEG SEWER CHECKLIST				
	REGULATION		YES	N/A
16.	8.125(5)(A)1.	Does the cleaning velocity of ≥ 2 ft/s happen more than once per day?	☑	☐
17.	8.125(5)(A)2.	Is the diameter of the pressure sewer main pipe at least 1.5"?	☑	☐
18.	8.125(5)(B)	Are appurtenances compatible with the piping system?	☑	☐
19.	8.125(5)(B)2.	Are isolation valves located: upstream of major pipe intersections; both sides of stream, bridge and RR crossings; at terminal end of system?	☑	☐
20.	8.125(5)(C)	Do service line pipes have a minimum diameter of 1.25"?	☑	☐
21.	8.125(5)(D)1.A.	Do simplex grinder pump stations service only a single equivalent dwelling unit (EDU)? i.e. 1 residence – 1 grinder pumpt.	☐	☑
22.	8.125(5)(D)1.B.	Are multiple unit pump stations owned, operated and maintained by an approved continuing authority?	☑	☐
23.	8.125(5)(D)3.	Is there at least 70 gallons of storage in the grinder pump unit?	☑	☐
24.	8.125(5)(D)4.	Do grinder pump stations have shutoff valves, check valves and anti-siphon valves (where siphoning could occur) that are accessible from the ground surface?	☑	☐
25.	8.125(5)(D)7., 8.130(3)(B)2.	Are units serviceable and replaceable under wet conditions without electrical hazard and is electrical equipment suitable for hazardous locations (National Electrical Code, Class I, Group D, Division 1 location)?	☑	☐
26.	8.125(5)(D)8., 8.125(2)(F)6.	Are provisions in place to avoid interruption of service due to mechanical or power failure by providing standby power, storage capacity, or interconnection with another disposal system?	☑	☐
27.	8.125(6)(D)	In a STEP system is at least one septic tank (1,000 gallons or more) provided for each EDU with 20% of tank volume dedicatied to freeboard and ventillation?	☐	☑
28.	8.125(6)(F)	Are duplex pumps provided for the design flow of 1,500 gallons or greater?	☑	☐

11.0 PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
29.	8.125(7)(C)	Is the minimum diameter sewer main pipe and service line of STEG sewer at least 4"?	☑	☐
30.	8.130(2)(A) 8.140(2)(B)	Is the pump station designed to withstand the 100-year flood?	☑	☐
31.	8.130(3)(A)	Is the dry well completely separate from the wet well and is a suitable and safe means of access provided to each?	☑	☐
32.	8.130(3)(B)	If the design flow is 1,500 gpd or more, are there at least 2 pumps or pneumatic ejectors provided?	☑	☐
33	8.130(3)(D)	Are valves located outside wet well unless integral to a pump or its housing?	☑	☐
34.	8.130(3)(F) 8.140(8)(J)	Do wet and dry wells have separate ventilation systems?	☑	☐
35.	8.130(3)(G)	Does all potable water brought to pump stations comply with 8.140(7)(D)?	☐	☑
36.	8.130(6)	Is an alarm system provided with uninterrupted power?	☑	☐
37.	8.130(7)(A)	Is there 2 hours retention of the peak hourly flow for a design flow > 100,000 gpd or 4 hrs retention of the peak hourly flow for a design flow < 100,000 gpd?	☑	☐
38.	8.130(7)(B)	Are there independent utility substations provided for emergency power capable of starting and operating the pump station at its rated capacity?	☑	☐
39.	8.130(8)(A)	Is the force main velocity of ≥ 2 ft/s maintained?	☑	☐
40.	8.130	Are there complete operation instructions for the pumpting stations provided that include emergency procedures, maintenance schedules, special tools and spare parts that may be necessary?	☑	☐

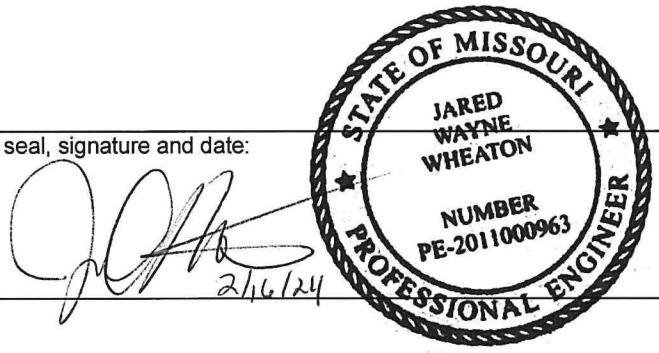
12.0 SUCTION LIFT PUMP AND SUBMERSIBLE PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
41.	8.130(4)	Are the suction lift pumps of the self priming or vacuum priming type?	☐	☑
42.	8.130(4)(A)	Is the combined total of dynamic suction lift at the "pump off" elevation and required net positive suction head at design operating conditions less than or equal to 22 feet?	☐	☑
43.	8.130(4)(B)	Are there dual vacuum pumps capable of removing air from the suction lift pump?	☐	☑
44.	8.130(5)(A)	Are submersible pumps readily removable and replaceable without personnel entering, or disconnecting any pipe in the wet well?	☑	☐

13.0 SEWER EXTENSION CHECKLIST -- CERTIFICATION STATEMENT

For any questions answered "N/A" provide an explanation. Also provide any useful general comments regarding design for review engineer.

No. 1, Design flow is based on design flow per DNR guidelines, not actual flow.
No. 21, The District has continuing authority over the grinder pumps.
No. 27, No step tanks are designed for this project.
No. 35, No water at pump station.
No. 42, 43, 44, Project is designed for submersible pumps within the grinder tanks .

Missouri Professional Engineer's seal, signature and date:



2/16/24

Name: Jared Wheaton

Address: 3048 S Hwy 52

City: Eldon | State: MO | ZIP Code: 65026

Telephone Number with Area Code: 573-714-0366 | Email: Jared@alphaes.net