STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor • Harry D. Bozoian, Director
DEPARTMENT OF NATURAL RESOURCES
dnr.mo.gov

October 25, 2016

Mr. David Streeter, District Manager
Johnson County Public Water Supply District No. 3
106 SE 421 Road
Warrensburg, MO 64093

RE: XP977534-01 Johnson County Public Water Supply District (PWSD) No. 3 – Wastewater Collection and Treatment Facility Improvements, Wastewater Treatment Facility, MO-0137600, Construction Permit No. CP0001860

Dear Mr. Streeter:

The Missouri Department of Natural Resources' Water Protection Program had previously reviewed the revised plans and specifications submitted by Allstate Consultants, LLC for Johnson County PWSD No. 3 and issued CP0000159. This permit has since expired and a new permit is being issued. Please find enclosed Construction Permit No. CP0001860.

This permit will terminate 24 months from the date of issuance. In accordance with 10 CSR 20-6.010(4)(G), the department may grant an extension only one time. If you believe that an extension is necessary, you must submit a request and a justification in writing for the extension at least 30 days prior to the permit expiration date.

This construction permit does not supersede any requirements of the operating permit or enforcement actions. Nothing in this permit removes any obligations to comply with county or other local ordinances or restrictions.

If you were adversely affected by this decision, you may appeal to have the matter heard by the Administrative Hearing Commission. To appeal, you must file a petition with the Administrative Hearing Commission within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the Administrative Hearing Commission.

If you have any questions concerning this matter, please contact Mr. Conrad Blume, P.E., of the Water Protection Program, at 573-751-5937 or Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176.

Thank you for your efforts to help ensure clean water in Missouri.

Sincerely,

WATER PROTECTION PROGRAM

Shawn Muenks

Shawn Muenks, P.E., SRF Engineering Unit Chief
Financial Assistance Center

SM:cbc

Enclosures

c: Mr. Cary Sayre, P.E., Allstate Consultants
Kansas City Regional Office
Mr. Conrad Blume, P.E., Water Protection Program, Financial Assistance Center
Mr. Courtney Zimmerman, Water Protection Program, Financial Assistance Center

XP977534-01 Johnson County PWSD No. 3 WWTF, MO-0137600 Permit No. CP0001860
Wastewater Collection and Treatment Facility Improvements

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Johnson County Public Water Supply District No. 3
106 SE 421 Road
Warrensburg, MO 64093

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 25, 2016
Effective Date

Harry D. Bozoian, Director, Department of Natural Resources

October 24, 2018
Expiration Date

Director, Water Protection Program

XP977534-01 Johnson County PWSD No. 3 WWTF, MO-0137600 Permit No. CP0001860
Wastewater Collection and Treatment Facility Improvements

CONSTRUCTION PERMIT

CONSTRUCTION DESCRIPTION:

The Johnson County PWSD No. 3 wastewater treatment facility (WWTF) will consist of a new activated sludge WWTF with a design capacity of 62,000 gallons per day (gpd) and a peak flow capacity of 250,000 gpd. The system will consist of a headworks, two channel oxidation ditch, two clarifiers, aerobic sludge thickener/digester, ultra-violet light (UV) disinfection, cascade re-aeration, supervisory control and data acquisition (SCADA), electrical, site plan, and necessary appurtenances.

The collection system will consist of new gravity sewers, manholes, two sewer pump stations, force mains and appurtenances. The South Pump Station will allow closure of the existing South Lagoon system (MO-0050784) and the North Pump Station will allow closure of the existing North Lagoon system (MO-0082945). Gravity sewers will be eight-inch polyvinyl chloride (PVC) with manholes and other necessary items. The force main will be four-inch PVC and six-inch PVC with other piping, valves, and appurtenances. Both pump stations will be duplex for a total of four pumps.

FINDING OF AFFORDABILITY

An Affordability Determination and Finding was performed in accordance with RSMO §644.145 and is enclosed with this construction permit. The department finds the project is affordable with a high economic burden to the community.

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 Allstate Consultants, LLC Firm received on July 6, 2015 and approved on October 25, 2016.

3. 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(8).

4. State and Federal Law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's Kansas City Regional Office per 10 CSR 20-7.015(9)(E)2.

5. This construction permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"

6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."

7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.

   A. Sewer mains shall be laid at least ten feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a ten foot separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.

   B. Manholes should be located at least ten feet horizontally from any existing or proposed water main.

   C. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:

      a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or

b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends ten feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.

8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one 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 www.dnr.mo.gov/env/wpp/epermit/help.htm.

   See www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.

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

   See www.dnr.mo.gov/env/wpp/401/ for more information.

10. A full closure plan shall be submitted to the department's Kansas City Regional Office for review and approval of any permitted wastewater treatment system being replaced. In accordance with 10 CSR 20-6.010(12), the closure plan must meet the requirements outlined in Standard Conditions Part III, Section I, of the Missouri State Operating Permit No. MO-0050784 and MO-0082945. Closure shall not commence until the submitted closure plan is approved by the department. Form J – Request for Termination of a State Operating Permit, shall be submitted to the department's Kansas City Regional Office for termination of any existing Missouri State Operating Permit, once closure is completed in accordance with the approved closure plan.

11. Upon completion of construction;

    A. The Johnson PWSD 3 will become the continuing authority for operation, maintenance, and modernization of these facilities;

    B. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(D);

C. Submit an electronic copy of the "as built" drawings if the project was not constructed in accordance with previously submitted plans and specifications

APPENDIX

- **MDNR Water Quality & Antidegradation Review**
- **Affordability Determination and Findings**

APPENDIX A – Water Quality & Antidegradation Review
APPENDIX B – AFFORDABILITY DETERMINATION & FINDINGS

APPENDIX B- ANTIDEGRADATION REVIEW:

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

Water Quality and Antidegradation Review

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

March 2013

Johnson County PWSD #3, Hickory Hills Wastewater Treatment Plant
State Highway DD
Warrensburg, MO 64093

Table of Contents

1. Facility Information

FACILITY NAME: Johnson County PWSD #3, Hickory Hills WWTP NPDES #: MO-0082945

FACILITY TYPE/DESCRIPTION: Proposed new extended aeration treatment facility with a design flow of 95,000 gallons per day. This project would serve 160 residences in Hickory Hills Subdivision plus some potential growth in the surrounding area near Warrensburg. The facility will discharge into the Box Branch (Location – See Appendix A).

EDU:	Central Plains/Blackwater/Lamine	ECOREGION:	Plains
LEGAL DESCRIPTION:	SE¼, SW¼, Sec. 27, T46N, R25W	COUNTY:	Johnson
UTM COORDINATES:	X: 442387 Y: 4288582	12-DIGIT HUC:	10300104-0301

2. Water Quality Information

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (MDNR) 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, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1 WATER QUALITY HISTORY:

The existing lagoons (MO-0082945 – North and MO-0050784 – South) have some effluent violations.

MO-0082945 -- BOD – 4/10, 8/10, 9/10, 1/11, 3/11, 4/11, 5/11, 6/11 and 10/11; and TSS -- 4/10, 5/10, 7/10, 11/10, 3/11, 4/11, 5/11, 1/12, and 4/12.

MO-0050784 -- BOD – 4/10, 5/10, 8/10, 9/10, 11/10, 4/11, 5/11, 6/11, 10/11, 4/12 and 10/12; TSS -- 4/10, 5/10, 7/10, 11/10, 3/11, 4/11, 5/11, 1/12, and 4/12; and Oil and Grease – 3/11.

3. Outfall Characteristics

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT
001	0.147	Secondary	Box Branch	2.9

4. Receiving Waterbody Information

WATERBODY	CLASS	WBID	1Q10 (CFS)	7Q10 (CFS)	30Q10 (CFS)	*DESIGNATED USES
Box Branch	U	-	-	-	-	General Criteria
Bear Creek	C	0933	-	-	-	LWW, AQL, WBC(B), General Criteria

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warm water Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

RECEIVING WATER BODY SEGMENT #1: Box Branch
Upper end segment* UTM coordinates: X: 442387 Y: 4288582 (Outfall)
Lower end segment* UTM coordinates: X: 441947 Y: 4291723 (Confluence with Bear Creek)

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

5. General Comments

Allstate Consultants prepared, on behalf of Johnson County Public Water Supply District Number Three, the *Antidegradation Summary for Wastewater Treatment Plant for Hickory Hills Subdivision* (Report) dated January 18, 2013. The Geohydrological Evaluation states this is a gaining stream setting. A Tier Analysis was submitted by the applicant. A dissolved oxygen modeling analysis was submitted showing that the dissolved oxygen will be above 5.0 within 0.5 miles of the outfall and the first classified stream is 2.9 miles downstream (see Appendix C: Dissolved Oxygen Model Results). This discharge is proposed to serve 160 residences in Hickory Hills Subdivision plus some potential growth in the surrounding area near Warrensburg.

The effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. MDNR has determined that the submitted report is sufficient and meets the requirement of the AIP. Information found in the submitted report and in the summary forms provided by the applicant in Appendix B was used to develop this review document. A Missouri Department of Conservation Natural Heritage Review – Level 1 response was obtained by the applicant.

6. Antidegradation Review Information

The following is a review of the *Antidegradation Summary for Wastewater Treatment Plant for Hickory Hills Subdivision.*

6.1 Tier Determination

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix B: Tier Determination and Effluent Limit Summary). Pollutants of concern are defined as those pollutants "proposed for discharge that affect beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge." (AIP, Page 7).

Table 1. Pollutants of Concern and Tier Determination

Pollutants of Concern	Tier	Degradation	Comment
Ammonia as Nitrogen	2	Insignificant	
Biochemical Oxygen Demand	2	Insignificant	*
Dissolved Oxygen	2	Insignificant	
pH	2	Insignificant	**
Oil And Grease	2	Insignificant	
Total Suspended Solids***	2	Insignificant	*

* No in-stream standards for these parameters, therefore tier determination was not possible.
** Standards for these parameters are ranges and therefore tier determination was not possible.
*** Narrative criteria.

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

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

6.2 Existing Water Quality

The stream is assumed to be 100% effluent dominated.

The receiving stream for the proposed treatment plant is also the receiving stream for the existing north and south lagoons. The proposed upgrade and expansion eliminates one discharge and slightly relocates the north discharge location to Box Branch. The upgrade and expansion will reduce concentration and loading to the stream.

Table 2: Overall Change in Hickory Hills Loading to Box Branch

Parameters	Current		Proposed		% Change in Loading
	Concentration *(mg/L)*	Load *(lbs/day)*	Concentration *(mg/L)*	Load *(lbs/day)*	
BOD	45	34.6	30	23.8	-31%
TSS	80	53.8	30	23.8	-56%
Ammonia	1.5*	1.15	1.4	1.11	-3%

* Assumed Water Quality Standard for Current Facilities.

6.3. Demonstration of Insignificance

In Section II.A of the Missouri's Antidegradation Rule and Implementation Procedure, a demonstration of insignificance of the discharge requires the applicant to show a reduction, or maintenance of water quality conditions, i.e., no change in ambient water quality concentrations in the receiving waters.

6.4 Alternative Analysis

Although not required due to the insignificant degradation, the report evaluated alternatives of connection to the City of Warrensburg, a 95,000 gallon per day (gpd) treatment plant for future growth, a smaller 62,000 gpd treatment plant, and a no-discharge lagoon with land application. The preferred alternative was the 95,000 gpd treatment plant. Ultraviolet disinfection is being included in the design and may be an alternative for the construction project.

6.5 Demonstration of Necessity and Social and Economic Importance

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

6.6 Preliminary Determination

The proposed facility will result in insignificant degradation for all POCs in the noted waterbody segment of Box Branch. Allstate Consultants proposed to not significantly increase loading of any POC.

The effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. MDNR has determined that the submitted report is sufficient and meets the requirement of the AIP. No further analysis is needed for this discharge.

7. General Assumptions of the Water Quality and Antidegradation Review

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams]. and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.

8. Mixing Considerations

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

9. Permit Limits and Information

TMDL WATERSHED: (Y OR N) [N] W.L.A. STUDY CONDUCTED: (Y OR N) [Y] DISINFECTION REQUIRED: (Y OR N) [N] USE ATTAINABILITY ANALYSIS: (Y OR N) [N]

9.1 OUTFALL #001– Main Facility Outfall

WET TEST (Y OR N): Y FREQUENCY: ONCE/PERMIT A.E.C. 100% METHOD: MULTIPLE

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	WQBEL (NOTE 1)	MONITORING FREQUENCY
FLOW	MGD	*		*	FSR	ONCE/MONTH
BIOCHEMICAL OXYGEN DEMAND (BOD_5)	MG/L		45	30	MDEL/WQBEL	Once/Month
TOTAL SUSPENDED SOLIDS	MG/L		45	30	MDEL/WQBEL	Once/Month
PH	SU	6.5 – 9.0		6.5 – 9.0	FSR	Once/Month
DISSOLVED OXYGEN	MG/L	5.0 (MINIMUM)		5.0 (MINIMUM)	WQBEL	ONCE/MONTH
OIL AND GREASE	MG/L	15		10	FSR	Once/Month
AMMONIA AS N (APRIL 1- SEPT 30)	MG/L	3.7		1.4	PAL/ WQBEL	Once/Month
AMMONIA AS N (OCT 1 – MARCH 30)	MG/L	7.5		2.9	PAL/ WQBEL	Once/Month
WET TEST	% SURVIVAL				FSR	

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

* – Monitoring Requirement Only
** – colonies/100 mL
*** – The Monthly Average for E. coli shall be reported as a Geometric Mean.

10. Receiving Water Monitoring Requirements

No receiving water monitoring requirements recommended at this time.

11. Derivation and Discussion of Limits

Wasteload allocations were calculated using water quality criteria or water quality model results and the dilution equation below:

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

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

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

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

11.1 OUTFALL #001 – MAIN FACILITY OUTFALL – LIMIT DERIVATION

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

- **Biochemical Oxygen Demand (BOD_5)**. BOD_5 limits of 30 mg/L monthly average, 45 mg/L average weekly limits were proposed. This is a decrease in loading (10.8 lb/day) to Box Branch. Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Total Suspended Solids (TSS)**. Applicant proposed water quality standard effluent limits of 30 mg/L monthly average, 45 mg/L average weekly. This is a reduction in loading on Box Branch. The influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **pH**. pH shall be maintained in the range from 6.5 – 9.0 standard units [10 CSR 20-7.015(3)(A)1.B.].

- **Dissolved Oxygen.** Dissolved oxygen in the stream is dependent upon the wastewater treatment plant effluent concentration of dissolved oxygen. The model proposed a discharges D.O. level of 5.0 mg/L.

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

- **Total Ammonia Nitrogen.** Hickory Hills elected to show that water quality based effluent limits would be insignificantly degrading. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/l.

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

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

Summer

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

Chronic WLA: $C_e = ((0.095+ 0.0)1.5 – (0.0 * 0.01))/0.095$ $C_e = 1.5$ mg/L
Acute WLA: $C_e = ((0.095 + 0.0)12.1 – (0.0 * 0.01))/0.095$ $C_e = 12.1$ mg/L

LTA_c = 1.5 mg/L (0.780) = **1.2 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
LTA_a = 12.1 mg/L (0.321) = 3.88 mg/L [CV = 0.6, 99th Percentile]
MDL = 1.2 mg/L (3.11) = 3.7 mg/L [CV = 0.6, 99th Percentile]
AML = 1.2 mg/L (1.19) = 1.4 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter

Chronic WLA: $C_e = ((0.095 + 0.0)3.1 – (0.0 * 0.01))/0.095$ $C_e = 3.1$ mg/L
Acute WLA: $C_e = ((0.095 + 0.0)12.1 – (0.0 * 0.01))/0.095$ $C_e = 12.1$ mg/L

LTA_c = 3.1 mg/L (0.780) = **2.4 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]
MDL = 2.4 mg/L (3.11) = 7.5 mg/L [CV = 0.6, 99th Percentile]
AML = 2.4 mg/L (1.19) = 2.9 mg/L [CV = 0.6, 95th Percentile, n = 30]

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

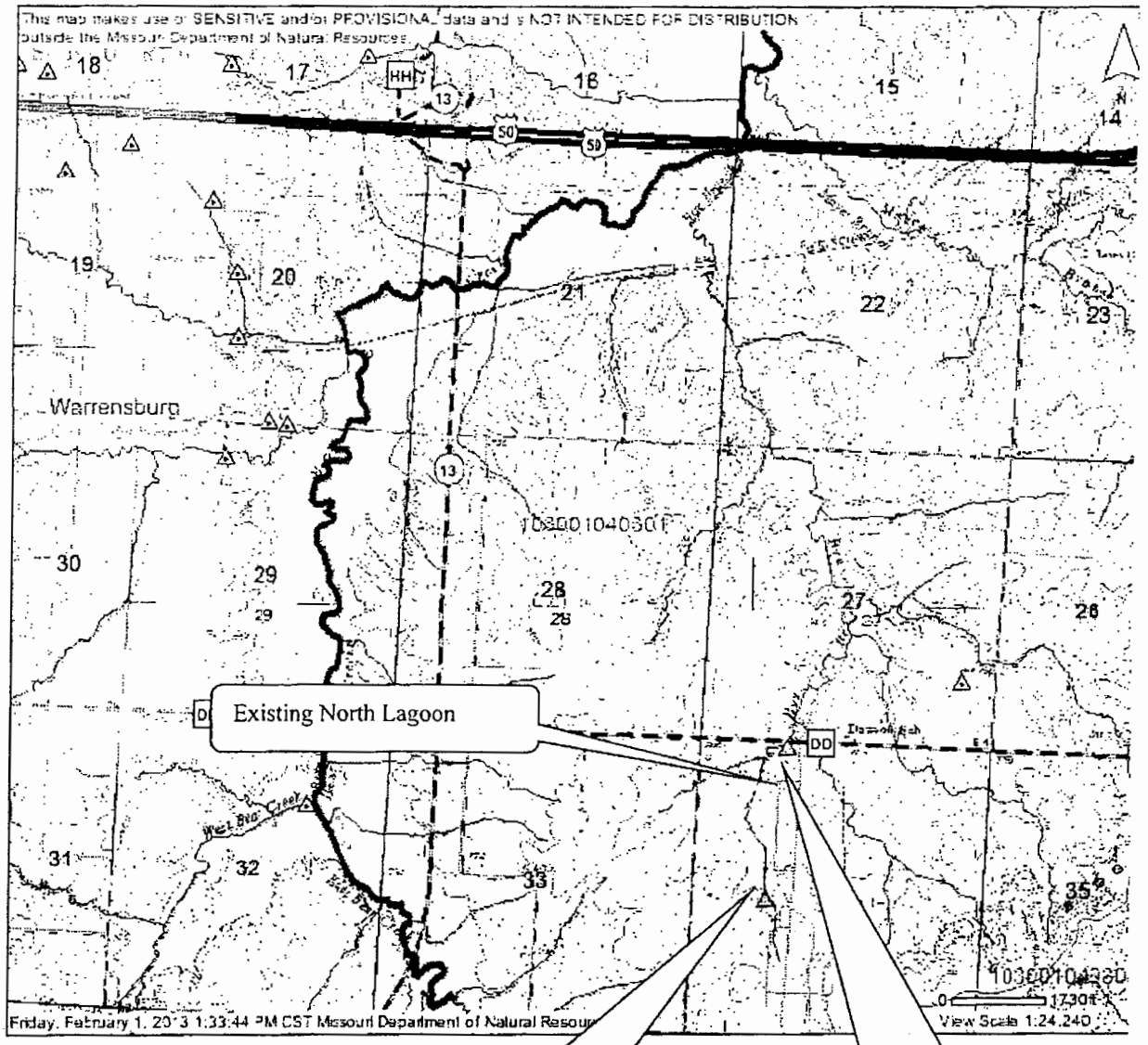
- **WET Test**. WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring.* It is recommended that WET testing be conducted during the period of lowest stream flow
  - ☒ Acute
    - ☒ No less than **ONCE/PERMIT CYCLE:**
      - ☒ Municipality or domestic facility with a design flow ≥ 22,500 gpd, but less than 1.0 MGD.

Reviewer: Keith Forck
Date: March 11, 2013
Unit Chief: John Rustige

Monitoring and effluent limits contained within this document have been developed in accordance with EPA guidelines using the best available data and are believed to be consistent with Missouri's Water Quality Standards and Effluent Regulations. If additional water quality data or anecdotal information are available that may affect the recommended monitoring and effluent limits, please forward these data and information to the author.

Antidegradation Review Appendix A: Map of Discharge Location

Hickory Hills Subdivision



Antidegradation Review Appendix B: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant

1) Attachment B: Tier 2 – Minimal Degradation

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY
ATTACHMENT B: TIER 2 – MINIMAL DEGRADATION

1. FACILITY

NAME		TELEPHONE WITH AREA CODE	
Johnson County Public Water Supply District No. 3		660-429-2494	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
106 Southeast 421 Road	Warrensburg	MO	64093

2. RECEIVING WATER BODY SEGMENT #1

NAME
Unclassified Tributary to Box Branch

3. WATER BODY SEGMENT #2 (IF APPLICABLE)

NAME

4. ASSIMILATIVE CAPACITY TABLE

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

Pollutant of Concern	Facility Assimilative Capacity (lbs/day)	New Load (lbs/day)	Percent of Facility Assimilative Capacity (%)
BOD5		load will be capped	
TSS		load will be capped	
Ammonia		load will be capped	

Pollutant of Concern	Water Body Segment #1 SAC	Cumulative Net Increase in Load	Cumulative % of Water Body Segment #1 SAC	Water Body Segment #2 SAC	Cumulative Net Increase in Load	Cumulative % of Water Body Segment #2 SAC
				JAN 18 2013		

Assimilative Capacity Summary

Is degradation considered minimal for all Pollutants of Concern? ☑ Yes ☐ No

Degradation is considered minimal if the new or proposed loading is less than 10 percent of the FAC and the cumulative degradation is less than 20 percent of the SAC according to the Antidegradation Implementation Procedure Section II.A.3. If yes, an alternatives analysis and a social and economic importance analysis are not required.

Comments/Discussion
The new facility will have higher effluent quality than the 2 lagoons it will replace and only a 3% increase in design average flow.

MINIMAL DEGRADATION CALCULATIONS
N/A - Loading will be capped.

MO 780-2022 (01/09)

5. OIL AND GREASE

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

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

6. DECHLORINATION

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

☐ Yes ☐ No

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

7. PROPOSED PROJECT SUMMARY

Johnson County PWSD No. 3 proposes to construct a new 0.095 MGD WWTF to replace 2 lagoon systems. Ultra violet disinfection will be proposed as an alternate bid item. Chlorination/Dechlorination is not proposed.

Attach the Antidegradation Review report and all supporting documentation.

CONSULTANT: I have prepared or reviewed this from and all attached reports and documentation. The conclusion proposed in consistent with the AIP and current state and federal regulations.

SIGNATURE	DATE
Cary D. Sayre	1/7/2013

PRINT NAME
Cary D. Sayre

TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
660-376-2941	carysayre@allstateconsultants.net

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

SIGNATURE	DATE
David Stanley MGR	1-10-2013

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

SIGNATURE	DATE

Antidegradation Review Appendix C: Dissolved Oxygen Model Results

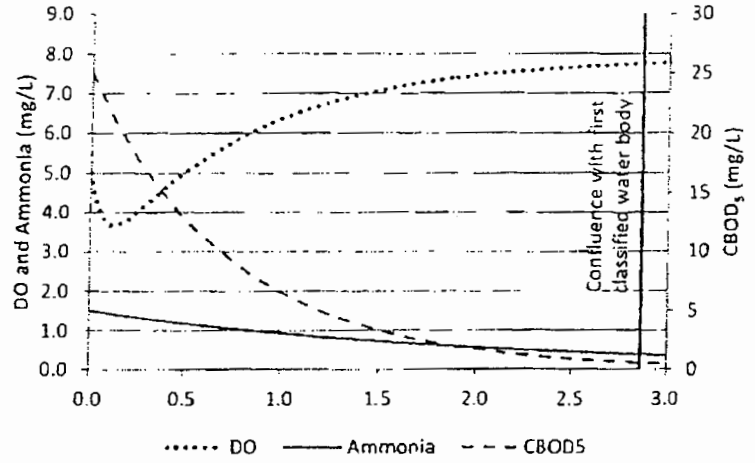


FIGURE A1. Summer Water Quality Model Output for the Proposed Hickory Hills WWTF.

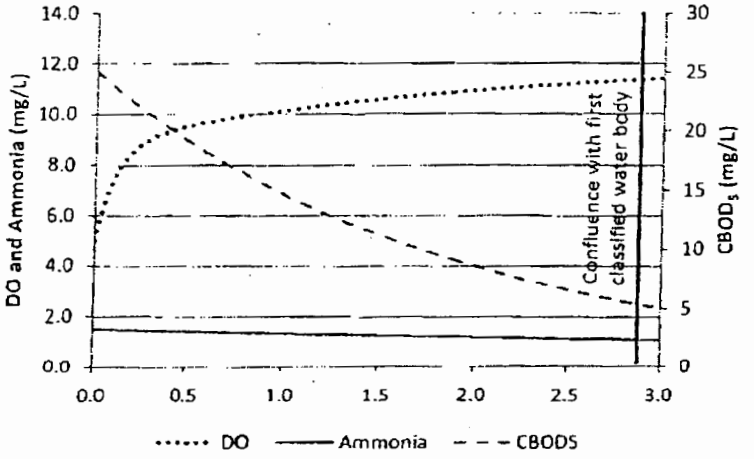


FIGURE A2. Winter Water Quality Model Output for the Proposed Hickory Hills WWTF.

APPENDIX B – AFFORDABILITY DETERMINATION & FINDINGS

Missouri Department of Natural Resources
Water Protection Program
Affordability Determination and Finding
(In accordance with RSMo 644.145)

Johnson County PWSD #3, New Permit
Public Water Supply District #3 of Johnson County
Missouri State Operating Permit #MO-0137600

Section 644.145 RSMo requires DNR to make a "finding of affordability" when "issuing permits under" or "enforcing provisions of" state or federal clean water laws "pertaining to any portion of a combined or separate sanitary sewer system for publicly-owned treatment works."

This affordability analysis is based on data available to the Department as provided by the permittee and what can be obtained from readily available sources. A request for information was sent to the permittee, seeking data for input into this analysis prior to its development.

Facility Description: Automated Bar Screen/Grit removal/ Extended Aeration (oxidation ditch)/Ultraviolet (UV) Disinfection/Aerobic sludge digestion/sludge disposal at off- site solid waste landfill or by on-site & off-site land application

Receiving Stream: Box Branch (U)
First Classified Stream and ID: Bear Creek (C) (0933)
USGS Basin & Sub-watershed No.: (10300104-0301)

Residential Connections:	160
Commercial Connections:	0
Total Connections for this facility[1]:	160
Total Connections served by the District	NA
Design Flow Evaluated (gpd)	95,000

New Permit Requirements or Requirements Now Being Enforced:

Permit No. MO-0137600 is a new permit. The Department received an application for the new facility on November 5, 2013. The cost assumptions in this affordability analysis anticipate complete new treatment facility. Because the methods used to derive the analysis estimate costs that are greater than actual costs associated with an upgrade, it reflects a conservative estimate anticipated for a community. This is because it is not possible to determine if existing equipment will be reused in the new facility.

The size of the facility (95,000 gpd) evaluated was obtained from the Facility Plan prepared by the permittee's consulting engineer.

[1] The number of connections was obtained from Form B of the application for permit renewal.

Range of Anticipated Costs Associated with Complying with the New Requirements:

The Engineering Report submitted by the permittee estimates the cost for proposed treatment facility is between $2,400,000 and $2,900,000. This cost, if financed through user fees, might cost each household between $75.00 and $90.00 per month.

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

Current User Rates:	$45.00/month
Rate Capacity or Pay as You Go Option:	NA
Municipal Bond Rating (if applicable):	NA
Bonding Capacity: *(General Obligation Bond capacity allowed by constitution: cities=up to 20% of taxable tangible property sewer districts=up to 5% of taxable tangible property)*	NA
Current outstanding debt:	$0.00
Other indicators:	NA

If the community increases user costs to finance and operate an upgrade, the cost per household may need to be between $75 and $90 per month, which may make each household cost as high as**Error! Reference source not found.**% of the community's median household income (MHI). Percentages above 2% could create a high burden for a community.

(2) Affordability of pollution control options for the individuals or households of the community;

Annual operating costs (exclude depreciation):	$187,500
Current user rate:	$45
Estimated capital cost of pollution control options:	$2,400,000 - $2,900,000
Annual Cost of Operation and Maintenance:	$100,000
Estimated Resulting User Cost per Household per Month[2]:	$75 - $90
Median Household Income	$35,391
Cost per Household as a Percent of Median Household Income:	2.5% - 3.1%

The Estimated User Cost is composed of three factors, Operation & Maintenance (O&M), and Debt Retirement Costs.

[2] User Cost = Operation & Maintenance + Debt Retirement, as calculated by CapDet.

O&M cost includes operations, maintenance, materials, and electrical costs for the facility on an annual basis. It includes items that are expected to be replaced during operations, such as pumps. O&M was estimated to be approximately $100,000 in the Engineering Plan.

Debt retirement[3] is associated with capital cost (CC) of this project, not existing debt the facility may have. Debt retirement is estimated to be approximately 35% of the user cost according to the Engineering Plan.

Check Appropriate Box	Financial Impact	Residential Indicator (Usage cost as a percent of MHI = annual cost/MHI)
☐	Low	Less than 1% MHI
☐	Medium	Between 1% and 2% MHI
☒	High	Greater than 2% MHI

If an increase in the user cost is required to finance the new permit requirements, the estimated future cost could be between **Error! Reference source not found.**% and **Error! Reference source not found.**% of the MHI, and result in a high financial impact. The high range cost that has been estimated is for either an oxidation ditch or sequencing batch reactor. These two technologies are capable of meeting the new water quality criteria set for as described by the EPA. User costs are based on the assumption that only connections to the facility will pay for upgrades.

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

On August 22, 2013, the U.S. Environmental Protection Agency (EPA) finalized new water quality criteria for ammonia, based on toxicity studies of mussels and gill breathing snails. Missouri's current ammonia criteria are based on toxicity testing of several species, but did not include data from mussels or gill breathing snails. Missouri is home to 69 of North America's mussel species, which are spread across the state. According to the Missouri Department of Conservation nearly two-thirds of the mussel species in Missouri are considered to be "of conservation concern". Nine species are listed as federally endangered, with an additional species currently proposed as endangered and another species proposed as threatened. When new water quality criteria are established by the EPA, states must adopt them into their regulations in order to keep their authorization to issue permits under the National Pollutant Discharge Elimination System.. An oxidation ditch or sequencing batch reactor, when designed appropriately, has demonstrated capability in meeting the ammonia limits described in the new water quality criteria finalized by the EPA. Please see the Water Protection Program fact sheet titled "Changes to the Water Quality Standard for Ammonia" at http://dnr.mo.gov/pubs/pub2481.pdf.

The new permit limits are anticipated to cost between $2,400,000 and $2,900,000. The environmental benefit of increased organics, solids, ammonia and *E. coli* removal is that conditions for aquatic life in the receiving stream will improve.

This permit renewal requires final effluent limitations for Ammonia as N based on Missouri Water Quality Standards (WQS) 10 CSR 20-7 and the Clean Water Act. Ammonia (NH_3) is toxic to early stages of aquatic life. NH_3 removal prevents damage to aquatic life and enables the receiving stream to support a healthier and diverse aquatic life community.

[3] Debt retirement per user per month: (-PMT(IR, EL, CC))/EL/12 months/# of users

E. coli is an indicator of the presence of fecal contamination in water and possible disease-causing bacteria and viruses in water and wastewater. The receiving stream has a WBC (B) designated use to protect human health in accordance with Water Quality Standards (10 CSR 20-7) and the Clean Water Act. Disinfection benefits human health by reducing exposure to disease-causing bacteria and viruses.

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

(a) Allowing adequate time in implementation schedules to mitigate potential adverse impacts on distressed populations resulting from the costs of the improvements and taking into consideration local community economic considerations.

(b) Allowing for reasonable accommodations for regulated entities when inflexible standards and fines would impose a disproportionate financial hardship in light of the environmental benefits to be gained.

Potentially Distressed Populations – City of Warrensburg (nearest city)	
Unemployment [4]	6.8%
Median Household Income (MHI)[5]	$35,391 **Error! Reference source not found.**
Percent Change in MHI (1990-2011)	+102.2%
Percent Population Growth/Decline (1990-2011)[6]	+22.5%
Change in Median Age in Years (1990-2011)	-8.3
Percent of Households in Poverty[7]	27.1%
Percent of Households Relying on Food Stamps	9.9%

Opportunity for cost savings or cost avoidance:

The permittee anticipates funding from the USDA through a Rural Development grant and loan in the amounts of $855,000 and $1,123,000, respectively. The permittee also anticipates a Missouri Department of Economic Development Community Development Block Grant in the amount of $500,000.

(5) An assessment of other community investments relating to environmental improvements;

The receiving stream for the proposed treatment plant is also the receiving stream for the existing north and south lagoons. The proposed upgrade and expansion eliminates one discharge and slightly relocates the north discharge location to Box Branch. It is estimated the upgrade and expansion will reduce concentration and loading to the stream by 31% for BOD, 56% for TSS, and 3% for ammonia.

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[4] Unemployment data was obtained from Missouri Department of Economic Development (October 2013) – http://www.missourieconomy.org/pdfs/urel1310.pdf

[5] Median Household Income data from American Community Survey – Median income in the past 12 months – http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?fpt=table

[6] Population trend data was obtained from online at;
2011 Census Bureau Population Data - http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?fpt=table
2000 Census Bureau Population Data - http://www.census.gov/popest/data/cities/totals/2009/tables/SUB-EST2009-04-29.xls
1990 Census Bureau Population Data - http://www.census.gov/prod/cen1990/cp1/cp-1-27.pdf

[7] Poverty data – American Community Survey - http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

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

Secondary indicators for consideration:

Indicators	Strong (3 points)	Mid-Range (2 points)	Weak (1 point)	Score
Bond Rating Indicator	Above BBB or Baa	BBB or Baa	Below BBB or Baa	NA
Overall Net Debt as a % of Full Market Property Value	Below 2%	2% - 5%	Above 5%	NA
Unemployment Rate	>1% below Missouri average	± 1% of Missouri average	>1% above Missouri average	2
Median Household Income	More than 25% above Missouri MHI	± 25% of Missouri MHI	More than 25% below Missouri average	2
Property Tax Revenues as a % of Full Market Property Value	Below 2%	2% - 4%	Above 4%	NA
Property Tax Collection Rate	Above 98%	94% - 98%	Below 94%	NA

Secondary Indicators Average Score: (2+2)/2=2

Residential Indicator (from Criteria #2 above): **Error! Reference source not found.% -Error! Reference source not found.%**

Financial Capability Matrix:

Financial Capability Indicators Score from above ↓	**Residential Indicator (User cost as a % of MHI)**		
	Low (Below 1%)	Mid-Range (Between 1.0% and 2.0%	High (Above 2.0%)
Weak (below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (1.5 – 2.5)	Low Burden	Medium Burden	High Burden
Strong (above 2.5)	Low Burden	Low Burden	Medium Burden

Estimated Financial Burden: High Burden

(7) An assessment of any other relevant local community economic condition.

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

Conclusion and Finding

As a result of new regulations, the Department is proposing modifications to the current operating permit that may require the permittee to upgrade the facility and construct new control technologies. The Department identified the actions for which an affordability analysis is required under Section 644.145 RSMo.

The Department estimates the cost for complete replacement of the existing treatment facility in order to meet new effluent limits will cost the PWSD #3 of Johnson County an estimated $2,400,000 - $2,900,000. Should these costs be financed through user fees, it may require user fees between**Error! Reference source not found.**% and**Error! Reference source not found.**% of the community's MHI. Considering that several of the economic factors show a weak financial capability in this community, this analysis concludes that the evaluated permit action may result in user fees above 2% of the community's median household income.

The Department considered all seven (7) of the criteria presented in subsection 644.145.3 when evaluating the affordability of the relevant actions. Taking into consideration these criteria, this analysis examined whether the above referenced permit modifications affects the ability of an individual customer or household to pay a utility bill without undue hardship or unreasonable sacrifice in the essential lifestyle or spending patterns of the individual or household. As a result of reviewing the above criteria, the Department hereby finds that the action described above may result in a High burden with regard to the community's overall financial capability and a High financial impact for most individual customers/households. The effluent control technologies examined would result in this high financial impact, and may not be characterized by the community as "affordable." However, the Department is required to issue a permit that implements the current Water Quality Standards.

However, this determination is based on readily available data and may over-estimate the financial impact on the community, when the community submits their facility plan as part of the construction permit process, the plan includes a discussion of community details, what the community can afford, existing obligations, future growth potential, an evaluation of options available to the community with cost information, and a discussion on no-discharge alternatives. The cost information provided through the facility plan process, which is developed by the community and their engineer, is more comprehensive of the community's individual factors in relation to selected treatment technology and costing information. Additionally, the Department recognizes communities of all sizes will find it challenging to upgrade wastewater treatment facilities to meet new water quality requirements. Considering these challenges as well as the many other challenges that your community faces, the Department will continue to work to identify some ways that can help you look at your options and decide what makes the most sense for the future. In instances where a high financial impact has been noted, the Department has intentionally included a long schedule of compliance in your permit to allow for planning, financing and other activities that may be necessary to achieve a successful outcome. In this longer time frame, the Department will work with you to explore the wastewater treatment options that make the most sense for your community. By working more closely with your community, the Department and permittees will be able to identify opportunities to extend the schedule of compliance, if appropriate. Because each community is unique, we want to make sure that you have the opportunity to consider all your options and tailor solutions to best meet your community's needs.

Missouri Department of Natural Resources
Water Protection Program
Affordability Determination and Finding
(In accordance with RSMo 644.145)

Johnson County PWSD #3, New Permit
Public Water Supply District #3 of Johnson County
Missouri State Operating Permit #MO-0137600

Section 644.145 RSMo requires DNR to make a "finding of affordability" when "issuing permits under" or "enforcing provisions of" state or federal clean water laws "pertaining to any portion of a combined or separate sanitary sewer system for publicly-owned treatment works."

This affordability analysis is based on data available to the Department as provided by the permittee and what can be obtained from readily available sources. A request for information was sent to the permittee, seeking data for input into this analysis prior to its development.

Facility Description: Automated Bar Screen/Grit removal/ Extended Aeration (oxidation ditch)/Ultraviolet (UV) Disinfection/Aerobic sludge digestion/sludge disposal at off-site solid waste landfill or by on-site & off-site land application

Receiving Stream: Box Branch (U)
First Classified Stream and ID: Bear Creek (C) (0933)
USGS Basin & Sub-watershed No.: (10300104-0301)

Residential Connections:	160
Commercial Connections:	0
Total Connections for this facility	160
Total Connections Served by the District	NA
Design Flow Evaluated (gpd)	62,000

New Permit Requirements or Requirements Now Being Enforced:

Permit No. MO-0137600 is a new permit. The Department received an application for the new facility on November 5, 2013. The cost assumptions in this affordability analysis anticipate complete new treatment facility. Because the methods used to derive the analysis estimate costs that are greater than actual costs associated with an upgrade, it reflects a conservative estimate anticipated for a community. This is because it is not possible to determine if existing equipment will be reused in the new facility.

The size of the facility (62,000 gpd) evaluated was obtained from the Facility Plan prepared by the permittee's consulting engineer.

[1] The number of connections was obtained from Form B of the application for permit renewal.

Range of Anticipated Costs Associated with Complying with the New Requirements:

The Department estimates the cost for proposed treatment facility is between $2,400,000 and $2,900,000 (based on the Engineering Report submitted by the permittee). This cost, if financed through user fees, might cost each household between $75.00 and $90.00 per month.

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

Current User Rates:	$45.00/month
Rate Capacity or Pay as You Go Option:	NA
Municipal Bond Rating (if applicable):	NA
Bonding Capacity: *(General Obligation Bond capacity allowed by constitution: cities=up to 20% of taxable tangible property sewer districts=up to 5% of taxable tangible property)*	NA
Current outstanding debt:	$0.00
Other indicators:	NA

If the community increases user costs to finance and operate an upgrade, the cost per household may need to be between $75 and $90 per month, which may make each household cost as high as **Error Reference source not found.**% of the community's median household income (MHI). Percentages above 2% could create a high burden for the community.

(2) Affordability of pollution control options for the individuals or households of the community;

Annual operating costs (exclude depreciation):	$187,500
Current user rate:	$45
Estimated capital cost of pollution control options:	$2,400,000 - $2,900,000
Annual Cost of Operation and Maintenance:	$100,000
Estimated Resulting User Cost per Household per Month[2]:	$75 - $90
Median Household Income	$35,391
Cost per Household as a Percent of Median Household Income:	2.5% - 3.1%

The Estimated User Cost is composed of three factors, Operation & Maintenance (O&M), and Debt Retirement Costs.

[2] User Cost = Operation & Maintenance + Debt Retirement, as calculated by CapDet.

O&M cost[3] is includes operations, maintenance, materials, and electrical costs for the facility on an annual basis. It includes items that are expected to replace during operations, such as pumps. O&M is estimated between 15% and 45% of the user cost.

Debt retirement[4] is associated with capital cost (CC) of this project, not existing debt the facility may have. Debt retirement is estimated between 2.0% and 5% of the user cost.

Check Appropriate Box	Financial Impact	Residential Indicator (Usage cost as a percent of MHI = annual cost/MHI)
☐	Low	Less than 1% MHI
☐	Medium	Between 1% and 2% MHI
☒	High	Greater than 2% MHI

If an increase in the user cost is required to finance the new permit requirements, the estimated future cost could be between **Error Reference source not found.**% and **Error Reference source not found.**% of the MHI, and result in a high financial impact. The high range cost that has been estimated is for either an oxidation ditch or sequencing batch reactor. These two technologies are capable of meeting the new water quality criteria set for as described by the EPA. User costs are based on the assumption that only connections to the facility will pay for upgrades.

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

On August 22, 2013, the U.S. Environmental Protection Agency (EPA) finalized new water quality criteria for ammonia, based on toxicity studies of mussels and gill breathing snails. Missouri's current ammonia criteria are based on toxicity testing of several species but did not include data from mussels or gill breathing snails. Missouri is home to 6[illegible] of North America's mussel species, which are spread across the state. According to the Missouri Department of Conservation nearly two-thirds of the mussel species in Missouri are considered to be "of conservation concern". Nine species are listed as federally endangered, with an additional species currently proposed as endangered and another species proposed as threatened. When new water quality criteria are established by the EPA, states must adopt them into their regulations in order to keep their authorization to issue permits under the National Pollutant Discharge Elimination System. The technologies evaluated by CapDet scope from an aerated lagoon as the least expensive technology to an oxidation ditch or sequencing batch reactor as the most expensive technology. These costs are utilized in determining the percent of MHI range used in this analysis. An oxidation ditch or sequencing batch reactor, when designed appropriately, has demonstrated capability in meeting the ammonia limits described in the new water quality criteria finalized by the EPA. Please see the Water Protection Program fact sheet titled "Changes to the Water Quality Standard for Ammonia" at http://dnr.mo.gov/pubs/pub2481.pdf.

The new permit limits are anticipated to cost between $2,400,000 and $2,900,000. The environmental benefit of increased organics, solids, ammonia and *E. coli* removal is that conditions for aquatic life in the receiving stream will improve.

[3] O&M costs per user per month: ((O&M/365days)/ gpd)*5,000 g
[4] Debt retirement per user per month: (-PMT(IR, EL, CC))/EL/12 months/# of users

This permit renewal requires final effluent limitations for Ammonia as N based on Missouri Water Quality Standards (WQS) 10 CSR 20-7 and the Clean Water Act. Ammonia (NH_3) is toxic to early stages of aquatic life. NH_3 removal prevents damage to aquatic life and enables the receiving stream to support a healthier and diverse aquatic life community.

E. coli is an indicator of the presence of fecal contamination in water and possible disease-causing bacteria and viruses in water and wastewater. The receiving stream has a WBC (B) designated use to protect human health in accordance with Water Quality Standards (10 CSR 20-7) and the Clean Water Act. Disinfection benefits human health by reducing exposure to disease-causing bacteria and viruses.

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

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

Potentially Distressed Populations – City of Warrensburg (nearest city)	
Unemployment [5]	6.8%
Median Household Income (MHI) [6]	$35,391
Percent Change in MHI (1990-2011)	+102.2%
Percent Population Growth/Decline (1990-2011) [7]	+22.5%
Change in Median Age in Years (1990-2011)	-8.3
Percent of Households in Poverty [8]	27.1%
Percent of Households Relying on Food Stamps	9.9%

Opportunity for cost savings or cost avoidance:

The permittee intends to utilize the USDA Rural Development program as a funding source.

(5) An assessment of other community investments relating to environmental improvements;

The community did not report any other investments relating to environmental improvements.

(6) An assessment of factors set forth in the United States Environmental Protection Agency's guidance, including but not limited to the "Combined Sewer Overflow Guidance for Financial Capability Assessment and Schedule Development" that may ease the cost burdens of implementing wet weather

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[5] Unemployment data was obtained from Missouri Department of Economic Development (October 2013) – http://www.missourieconomy.org/pdfs/urel1310.pdf

[6] Median Household Income data from American Community Survey – Median income in the past 12 months – http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?fpt=table

[7] Population trend data was obtained from online at:
2011 Census Bureau Population Data - http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?fpt=table
2000 Census Bureau Population Data - http://www.census.gov/popest/data/cities/totals/2009/tables/SUB-EST2009-04-29.xls
1990 Census Bureau Population Data - http://www.census.gov/prod/cen1990/cp1/cp-1-27.pdf

[8] Poverty data – American Community Survey - http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

control plans, including but not limited to small system considerations, the attainability of water quality standards, and the development of wet weather standards;

Secondary indicators for consideration:

Indicators	Strong (3 points)	Mid-Range (2 points)	Weak (1 point)	Score
Bond Rating Indicator	Above BBB or Baa	BBB or Baa	Below BBB or Baa	NA
Overall Net Debt as a % of Full Market Property Value	Below 2%	2% - 5%	Above 5%	NA
Unemployment Rate	>1% below Missouri average	± 1% of Missouri average	>1% above Missouri average	2
Median Household Income	More than 25% above Missouri MHI	± 25% of Missouri MHI	More than 25% below Missouri average	2
Property Tax Revenues as a % of Full Market Property Value	Below 2%	2% - 4%	Above 4%	NA
Property Tax Collection Rate	Above 98%	94% - 98%	Below 94%	NA

Secondary Indicators Average Score: 2.67

Residential Indicator (from Criteria #4 above): 2.5% - **Error Reference source not found.**%

Financial Capability Matrix

Financial Capability Indicators Score from above	**Residential Indicator (User cost as a % of MHI)**		
	Low (Below 1%)	Mid-Range (Between 1.0% and 2.0%	High (Above 2.0%)
Weak (below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (1.5 - 2.5)	Low Burden	Medium Burden	High Burden
Strong (above 2.5)	Low Burden	Low Burden	Medium Burden

Estimated Financial Burden: High Burden

(7) An assessment of any other relevant local community economic condition.

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

Conclusion and Finding

As a result of new regulations, the Department is proposing modifications to the current operating permit that may require the permittee to upgrade the facility and construct new control technologies. The Department identified the actions for which an affordability analysis is required under Section 644.145 RSMo.

The Department estimates the cost for complete replacement of the existing treatment facility in order to meet new effluent limits will cost the PWSD #3 of Johnson County an estimated $2,400,000 - $2,900,000. Should these costs be financed through user fees, it may require user fees between **Error Reference source not found.**% and **Error Reference source not found.**% of the community's MHI. Considering that several of the economic factors show a weak financial capability in this community, this analysis concludes that the evaluated permit action may result in user fees above 2% of the community's median household income.

The Department considered all seven (7) of the criteria presented in subsection 644.145.3 when evaluating the affordability of the relevant actions. Taking into consideration these criteria, this analysis examined whether the above referenced permit modifications affects the ability of an individual customer or household to pay a utility bill without undue hardship or unreasonable sacrifice in the essential lifestyle or spending patterns of the individual or household. As a result of reviewing the above criteria, the Department hereby finds that the action described above may result in a High burden with regard to the community's overall financial capability and a High financial impact for most individual customers/households. The effluent control technologies examined would result in this high financial impact, and may not be characterized by the community as "affordable." However, the Department is required to issue a permit that implements the current Water Quality Standards.

However, this determination is based on readily available data and may over-estimate the financial impact on the community, when the community submits their facility plan as part of the construction permit process, the plan includes a discussion of community details, what the community can afford, existing obligations, future growth potential, an evaluation of options available to the community with cost information, and a discussion on no-discharge alternatives. The cost information provided through the facility plan process, which is developed by the community and their engineer, is more comprehensive of the community's individual factors in relation to selected treatment technologies and costing information. The Department understands the economic challenges associated with achieving compliance and is committed to using all available tools to make an accurate and practical finding of affordability for the communities in the State. Additionally, the Department recognizes communities of all sizes will find it challenging to upgrade wastewater treatment facilities to meet new water quality requirements. Considering these challenges as well as the many other challenges that your community faces, the Department will continue to work to identify some ways that can help you look at your options and decide what makes the most sense for the future. In instances where a high financial impact has been noted, the Department has intentionally included a long schedule of compliance in your permit to allow for planning, financing and other activities that may be necessary to achieve a successful outcome. In this longer time frame, the Department will work with you to explore the wastewater treatment options that make the most sense for your community. By working more closely with your community, the Department and permittees will be able to identify opportunities to extend the schedule of compliance, if appropriate. Because each community is unique, we want to make sure that you have the opportunity to consider all your options and tailor solutions to best meet your community's needs.

RECEIVED

JUL 29 2016

Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $1000.00	CHECK NO. 15524
DATE RECEIVED 7-29-16	

APPLICATION OVERVIEW

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

PART A – BASIC INFORMATION

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

1.1 Is this a Federal/State funded project? ☑ YES ☐ N/A Funding Agency: USDA, EPA, CDBG Project #: XP977534-01

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☑ YES Date of Approval: 03/2016 First Time at 95,000 gpd, Rev. 12/17/2015 at 62,500 gpd
☐ Attached is the No Degradation Evaluation Conclusion of Antidegradation Review form

1.3 Has the department approved the proposed project's facility plan*?
☑ YES Date of Approval: 12/17/2015 ☐ NO ☐ N/A (If Not Applicable, complete No. 1.4.)

1.4 [Complete only if answered Not Applicable on No. 1.3.] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
☐ YES ☐ NO

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

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

1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?
☑ YES Date of submittal: 07/2016 Time Extension
☐ Enclosed is the appropriate operating permit application submittal. Denote which form: ☐ A ☑ B ☐ B2
☐ N/A Please explain: _____

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

1.9 Is the appropriate fee included with this application? ☑ YES ☐ NO (See instructions for appropriate fee.)

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

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT

Wastewater Collection and Treatment Facility Improvements, CP 0001599

2.2 PROJECT DESCRIPTION

The wastewater treatment facility will consist of a new activated sludge wastewater treatment facility. The collection system will consist of new gravity sewers, manholes, two sewer pump stations, force mains and appurtenances. Possible Lab/Office Building being built.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Aerobic sludge thickening basin is being provided. Sludge will be hauled to a POTW or landfill.

2.4 DESIGN INFORMATION

A. Current population: 592 ; Design population: 950

B. Actual Flow: 59200 gpd; Design Average Flow: 62500 gpd;
Actual Peak Daily Flow: 250,000 gpd; Design Maximum Daily Flow: 250,000 gpd

2.5 ADDITIONAL INFORMATION

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

B. Is a process flow diagram attached? ☐ YES ☑ NO Design Summary Previously Approved

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

8.0 FACILITY INFORMATION

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

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

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

9.0 STORAGE BASINS

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

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

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.

Basin #1:	Length _____	Width _____	Depth _____	Freeboard _____	Berm Width _____	% Slope _____
Basin #2:	Length _____	Width _____	Depth _____	Freeboard _____	Berm Width _____	% Slope _____
Basin #3:	Length _____	Width _____	Depth _____	Freeboard _____	Berm Width _____	% Slope _____

9.4 Storage Basin operating levels (report as feet below emergency overflow level).

Basin #1:	Maximum operating water level _____ ft	Minimum operating water level _____ ft
Basin #2:	Maximum operating water level _____ ft	Minimum operating water level _____ ft
Basin #3:	Maximum operating water level _____ ft	Minimum operating water level _____ ft

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

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

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

10.0 LAND APPLICATION SYSTEM

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

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

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

10.4 Land application rate (design flow including 1-in-10 year storm water flows):

Design:	_____ inches/year	_____ inches/hour	_____ inches/day	_____ inches/week
Actual:	_____ inches/year	_____ inches/hour	_____ inches/day	_____ inches/week

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

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

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

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Johnson County PWSD No. 3	660-429-2494	david@pwsd3.com

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
106 Southeast 421 Road	Warrensburg	Missouri	64093	Johnson

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

3.1 Legal Description: ____ ¼, SE ¼, SW ¼, Sec. 27, T 46N, R 25W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 442387 Northing (Y): 4288582
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Box Branch

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Johnson County PWSD No. 3	(660) 429-2494	david@pwsd3.com

ADDRESS	CITY	STATE	ZIP CODE
106 Southeast 421 Road	Warrensburg	Missouri	64093

5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Johnson County PWSD No. 3	(660) 429-2494	david@pwsd3.com

ADDRESS	CITY	STATE	ZIP CODE
106 Southeast 421 Road	Warrensburg	Missouri	64093

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

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

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

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

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

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

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

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

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Cary D. Sayre - Allstate Consultants LLC	(660) 376-2941	carysayre@allstateconsultants.net

ADDRESS	CITY	STATE	ZIP CODE
30601 Highway 5, P.O. Box 156	Marceline	Missouri	64658

7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.

PROJECT OWNER SIGNATURE: David Streeter MBR

PRINTED NAME	DATE
David Streeter	7-22-16

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
District Manager	(660) 429-2494	david@pwsd3.com

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

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

RECEIVED

JUL 29 2016

Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

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ORIGINAL DOCUMENT PRINTED ON CHEMICAL REACTIVE PAPER WITH HEAT SENSITIVE INK HAND ICON AND MICROPRINTED BORDER

15524

PUBLIC WATER SUPPLY DISTRICT #3 OF JOHNSON COUNTY
106 SE 421 Road Ph. 660-429-2494
Warrensburg, MO 64093

EQUITY BANK
WARRENSBURG, MO 64093
660-747-9530
80-535/1011
VOID AFTER 90 DAYS

7/25/2016

DETAILS ON BACK

PAY TO THE ORDER OF Missouri Department of Natural Resources $ **1,000.00

One Thousand and 00/100********** DOLLARS

Missouri Department of Natural Resources
Water Protection Program
P O Box 176
Jefferson City, MO 65102-0176

MEMO WWTP CONSTRUCTION PERMIT 07-25-2016

SECURITY FEATURES INCLUDED