STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Duckett Creek Sanitary District
3550 Highway K
O'Fallon, MO 63368

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

June 13, 2016
Effective Date

Sara Parker Pauley

Sara Parker Pauley, Director, Department of Natural Resources

June 12, 2018
Expiration Date

John Madras

John Madras, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

At DCSD, Treatment Plant No. 1, MO-0085472, the proposed construction includes the replacement of the existing mechanical bar screens with two multi-rake mechanical screens, installation of a washer/compactor and a conveyor for screenings.

At DCSD, WWTP No. 2, MO-0116572, the proposed preliminary treatment construction includes the replacement of the existing mechanical bar screen and manual bar screen with two multi-rake mechanical screens, installation of a washer/compactor and a conveyor for screenings, and replacement of the grit classifier, lamella clarifier, and screw auger. The solids handling construction includes converting the aerobic digester to a waste activated sludge tank/sludge storage basin, converting the sludge storage basin to an aerobic digester, construction of a second aerobic digester, construction of a decanter, installation of a second belt filter press with screw conveyor and chemical feed equipment, and construction of a new biosolids truck loading bay. Improvements will also include the installation of a 2,000 kW standby diesel generator.

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

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 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 Burns & McDonnell on April 1, 2016 and May 31, 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 St. Louis 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 10 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 10 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 10 feet horizontally from any existing or proposed water main.

    C. Manholes shall be located with the top access at or above grade level.

    D. 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 10 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. Upon completion of construction:

A. The DCSD 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 builts if the project was not constructed in accordance with previously submitted plans and specifications; and

D. When the facility applies for their next operating permit renewal, they will be expected to include an updated facility description on their application.

IV. REVIEW SUMMARY

1. AMMONIA

The Water Protection Program is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The department has initiated stakeholder discussions on this topic and at this time, there is no firm target date for starting the rulemaking to adopt new standards. More information can be found at http://dnr.mo.gov/pubs/pub2481.pdf .

The proposed construction will not affect ammonia treatment. Both the DCSD, Treatment Plant No. 1, MO-0085472 and DCSD, WWTP No. 2, MO-0116572 meet their current ammonia effluent limits.

2. CONSTRUCTION PURPOSE

At DCSD, Treatment Plant No. 1, MO-0085472, the two existing reciprocating rake mechanical bar screens have a 3/8-inch clear openings. Replacement with contemporary fine mechanical screens will remove more screenings from the wastewater stream. The existing screens have been in operation since 1988 and have reached the end of their useful life.

At DCSD, WWTP No. 2, MO-0116572, the existing reciprocating rake mechanical bar screen with a clear opening of ¾-inch and a coarse manual bar screen have been in operation since 1997. Replacement with two contemporary fine mechanical screens will remove more screenings from the wastewater stream. The current grit classifier has reached the end of its useful life and will be replaced by a new grit classifier including a grit concentrator, lamella clarifier, and screw auger. Expanding the solids handling systems will provide additional sludge capacity, redundancy, and operational flexibility. The addition of a new standby generator will provide the treatment plant the power for full plant operation in the event of a power failure.

3. FACILITY DESCRIPTION

The DCSD, Treatment Plant No. 1, MO-0085472, existing facility includes mechanical screening, influent pump station, grit removal, two oxidation ditches, two secondary clarifiers, ultraviolet disinfection, effluent pump station during high water events, one aerobic digester, one sludge storage tank, one decanter, two gravity belt thickeners with two belt filter presses, and sludge is land applied. The discharge location remains the same to the receiving waterbody of Duckett Creek which discharges into the Missouri River.

The DCSD, Treatment Plant No. 1, MO-0085472, is located at 2950 Greens Bottom Road, St. Charles, in St. Charles County, Missouri. The facility will remain with the same design flow of 5.0 million gallons per day (MGD) and serving a population equivalent of approximately 50,000 people.

The DCSD, WWTP No. 2, MO-0116572, proposed facility includes mechanical screening, grit removal, two oxidation ditches, two secondary clarifiers, ultraviolet disinfection, one waste activated sludge tank/sludge storage basin, one decanter, two gravity belt thickeners, two aerobic digesters, two belt filter presses, and sludge is land applied. The discharge location remains the same to the receiving waterbody of tributary to Missouri River.

The DCSD, WWTP No. 2, MO-0116572, is located at 13 Research Park Drive, St. Charles, in St. Charles County, Missouri. The facility will remain with the same design flow of 7.0 million gallons per day (MGD) and serving a population equivalent of approximately 62,500 people.

4. COMPLIANCE PARAMETERS

These improvements are not designed or intended to affect loadings, treatment capabilities of the system, nor the average or peak design flows.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Construction will cover the following items at DCSD, Treatment Plant No. 1, MO-0085472:

- Screening. Replacement of the two existing mechanical bar screens with two mechanically cleaned fine screens with a maximum plate spacing of ¼-inch. The new screens shall be capable of treating a peak flow of 13 MGD each. The addition of a new washer/compactor and screenings conveyor will mitigate the increased volume of screenings captured by washing, dewatering, and compacting the screenings prior to disposal.

Construction will cover the following items at DCSD, WWTP No. 2, MO-0116572:

- Screening. Replacement of the existing mechanical bar screen and coarse manual bar screen with two mechanically cleaned fine screens with a maximum plate spacing of ¼-inch. The new screens shall be capable of treating a peak flow of 15 MGD each. The addition of a new washer/compactor and screenings conveyor will mitigate the increased volume of screenings captured by washing, dewatering, and compacting the screenings prior to disposal.

- Grit Classifier. Replacement of the existing grit classifier with a grit concentrator with a minimum flow of 250 gallons per minute (gpm) and grit classifier with a maximum flow capacity from the grit concentrator of 40 gpm. The addition of a 9-inch diameter screw auger to transport grit from the classifier to the disposal unit with a 1.5 horsepower (HP) motor.

- Solids Handling Improvements:

    - Waste Activated Sludge (WAS) Pump. The addition of a fourth WAS self-priming, positive displacement, progressive cavity pump capable of 550 gpm at 45 ft total dynamic head (TDH) with a 20 HP motor. The WAS pumps are utilized to pump WAS from the two secondary clarifiers to the WAS tank.

    - WAS Tank/Sludge Storage Basin. Conversion of the existing aerobic digester basin into a WAS tank/sludge storage basin to store 30,000 lbs of solids. This conversion will include an additional 176 fine bubble diffusers. Sludge is pumped from the WAS tank to the gravity belt thickeners by means of the gravity belt thickener feed pumps during the weekdays. On weekends and holidays, the WAS tank acts as a sludge storage basin. Passive overflow from the sludge storage basin will discharge to the decanter for sludge thickening. Following the weekend, the stored sludge will be pumped to the gravity belt thickeners.

    - Aerobic Digester No. 1. Conversion of the existing sludge storage basin into Aerobic Digester No. 1 to treat 370,000 pounds (lbs) of solids. This conversion will include an additional 232 fine bubble diffusers. Sludge is pumped by the belt filter press feed pumps to the belt filter presses.

    - Aerobic Digester No. 2. Construction of Aerobic Digester No. 2 with a 20 ft side water depth and installation of 324 fine bubble diffusers for a total maximum air rate of 3,600 standard cubic feet per minute (scfm) to treat 370,000 lbs of solids. The two

aerobic digesters will have the flexibility to operate in parallel or in series. Sludge is pumped from the gravity belt thickeners by means of the digester feed pumps to the two aerobic digesters.

- Blowers. Installation of three positive displacement rotary lobe blowers each capable of 1,800 scfm at 10.5 pounds per square inch (psi) with a 150 HP motor. Modifications to the existing three blowers are included as well. These blowers supply air to the WAS tank and aerobic digesters.

- Decanter. Construction of a decanter basin with a 45 foot diameter and 12 foot side water depth to store 14,000 lbs of solids. The decanter includes the installation of a circular spiral scraper sludge thickener with a flow rate of 550 gpm, two sludge rake arms, and two scum skimming arms. Scum shall be discharged to Clarifier No. 1. Supernatant will flow to the in-plant pump station which discharges to the head of the plant. Sludge shall be pumped to the aerobic digesters by means of the sludge storage feed pumps when weekday operation resumes.

- Belt Filter Press Feed Pump. Installation of a third belt filter press feed pump of the self-priming, positive displacement, progressive cavity type capable of 175 gpm at 40 ft TDH with a 15 HP motor. The belt filter press feed pumps are utilized to pump sludge from the aerobic digesters to the belt filter presses.

- Belt Filter Presses. Installation of a second belt filter press two meters wide and of the two belt press type. The maximum solids loading rate of 1,600 lbs/hour delivering a minimum dewatered solids concentration of 16%. The dewatered sludge transported to the loading bay by means of sludge conveyors.

- Polymer Feed Equipment. Installation and replacement of four polymer feed systems each capable of feeding 0-6 gallons per hour (gph). Polymer is fed to the two gravity belt thickeners and the two belt filter presses.

- Coagulant Feed Equipment. Installation of two coagulant feed peristaltic pumps with a maximum feed rate of 15 gph. Coagulant is fed to the discharge end of the belt filter press feed pumps.

- Sludge Conveyors. Installation and replacement of four sludge conveyors to transport dewatered sludge from the belt filter presses to the Truck Loading Bay and ultimately to be land applied.

- Emergency Power. The existing generator has the capacity to power critical portions of the treatment plant. The addition of a 2,000 kW diesel standby generator would provide full plant operation in the event of power failure.

6. OPERATING PERMIT MODIFICATION

It is expected that the facility owner will include a new facility description in their next operating permit renewal application to reflect the improvements at DCSD Treatment Plant Nos. 1 and 2.

Emily Carpenter
Engineering Section
emily.carpenter@dnr.mo.gov

RECEIVED

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER FACILITY

Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $3000.00	CHECK NO. 51709
DATE RECEIVED 4-1-16	

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Facility form is for construction pertaining to domestic wastewater treatment facilities, agrichemical facilities, and components thereof. This 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: _____ Project #: _____

1.2 Is this an application for an agrichemical? ☐ YES (See instructions.) ☒ N/A

1.3 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☐ YES Date of Approval: NA

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

1.5 [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

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

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

1.8 Is a general operating permit applicable? Not Applicable
☐ YES Submit the appropriate operating permit application to the Regional Office at least 60 days prior to operation.
☐ NO Enclose the appropriate operating permit application and fee submittal. Denote which form: ☐ B ☐ B2

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

1.10 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
Duckett Creek Sanitary District Treatment Plant No. 1 (TP1) and Treatment Plant No. 2 (TP2) Improvements

2.2 PROJECT DESCRIPTION
TP1*: Installation of new screening equipment, headworks HVAC upgrades, and update plant control system.
TP2*: Installation of new screening equipment, new grit classifier, headworks HVAC upgrades, UV equipment replacement, and solids handling improvements.
*Reference attached Preliminary Engineering Report for additional information.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
No change from current handling, use, and disposal operations at TP1 and TP2. Improvements serve to enhance existing thickening, digestion, dewatering, and land disposal capability.

2.4 DESIGN INFORMATION
A. Current population: *_____; Design population: *_____
B. Actual Flow: *_____ gpd; Design Average Flow: *_____ gpd;
Actual Peak Daily Flow: *_____ gpd; Design Maximum Daily Flow: *_____ gpd; Design Wet Weather Event: *_____

*Reference Preliminary Engineering Report for TP1 and TP2 Design Information

2.5 ADDITIONAL INFORMATION
A. Is a topographic map attached? ☑ YES ☐ NO
B. Is a process flow diagram attached? ☑ YES ☐ NO

2.6 ESTIMATED PROJECT CONSTRUCTION COST
$ 15,000,000.00

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Treatment Plant No. 2 (TP2)		

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
13 Research Park Drive	St. Charles	MO	63303	St. Charles County

Wastewater Treatment Facility: Mo- 0116572 (Outfall 1 Of 1)

3.1 Legal Description: NW ¼, SW ¼, SW ¼, Sec. 34 , T 46N , R 3E
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): Northing (Y): Reference Prelim. Eng. Rept. for TP1 Info.
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Unnamed tributary to the Missouri River

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Duckett Creek Sanitary District	(636) 441-1244	

ADDRESS	CITY	STATE	ZIP CODE
3550 Highway K	O'Fallon	MO	63368

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	EMAIL ADDRESS
Same as above		

ADDRESS	CITY	STATE	ZIP CODE

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

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

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

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

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

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

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

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

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Burns & McDonnell	(816) 333-9400	jbarnard@burnsmcd.com

ADDRESS	CITY	STATE	ZIP CODE
9400 Ward Parkway	Kansas City	MO	64114

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

PRINTED NAME	DATE
KEITH Arbuckle	1/22/16

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
DIRECTOR OF ENGINEERING	636-441-1244	karbuckle@ducketfranch.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.