

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Mr. William Bright
1101 Sioux Drive
Fulton, MO 65251

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

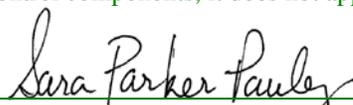
Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

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.

October 3, 2016
Effective Date


Sara Parker Pauley, Director, Department of Natural Resources

October 2, 2018
Expiration Date


John Madras, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Conversion of an existing three cell discharging lagoon to a no-discharge land application system. Existing lagoon and ultraviolet disinfect to remain intact. Addition of a lift station with two 2.0 HP Liberty Model D3696LSG grinder pumps each with a capacity of 36 gpm at a TDH of 72 feet, 1765 lineal feet of 2-inch pvc force main, manhole and entrance piping, new earthen storage basin with a working storage capacity of approximately 2,109,000 gallons. Irrigation equipment utilizing a tractor powered pump and a travelling gun with application capacity of 450 gallons per minute (gpm). A land application site with 15.8 acres. Together with all the necessary appurtenances to make a complete and usable system to serve existing and future homes and businesses and effectively treat, hold and land apply a wastewater flow of 19,500 gallons per day with no-discharge to waters of the state. The site is located in the W 1/2, of the W 1/2, of Section 35, T48N, R11W, Callaway County.

Treatment lagoon UTM, X=575358, Y=4305983
Storage basin UTM, X=575330, Y=4305500
Application field UTM, X=575200, Y=4305100

Vegetation: grass/ hay

Dry weather average annual flow: 19,500 GPD
Wettest 1 in 10 year effluent flow from precipitation: 1775 GPD

Design spray irrigation: up to 1 inch/day, up to 3 inches/week, up to 24 inches/year (wettest 1 in 10)
Application area required for 24 inches/year: 11.9 acres.
Application area available: 15.8 acres.
Sludge will be stored in the treatment lagoon and removed when necessary.

Storage basin and application site is currently fenced and will be fitted with warning signs.

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 complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publically-owned treatment works.

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 Gary Cunningham, P.E., Environmental Management Solutions on July 13, 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 Northeast 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. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit modification be issued;

- B. Submit an electronic copy of the as built if the project was not constructed in accordance with previously submitted plans and specifications; and
- C. Form B for issuance of General Permit MOG823xxx was received by the department on May 11, 2016 (updated July 13, 2016). The General Permit will be issued replacing Missouri State Operating Permit MO0120995 after receipt of the above items.

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>.

Since this is a no-discharge treatment facility, ammonia limitations are not applicable.

2. CONSTRUCTION PURPOSE

The existing Operating Permit requires compliance with ammonia limitations on February 1, 2018. The existing discharging system will not consistently meet the new ammonia limitations, as shown by past monitoring. The new facility will be a no-discharge, land application system. Conversion to a no-discharge system will satisfy or eliminate these requirements.

3. FACILITY DESCRIPTION

The existing treatment facility is a discharging lagoon, two earthen basins with a curtain across one to form a total of three cells, the first two cells are aerated; ultraviolet disinfection follows the lagoon. The design flow of the system is 20,760 GPD. The new treatment facility will use the existing aerated lagoon and ultraviolet disinfection then pump all effluent to an earthen holding basin. Treated wastewater will be land applied to the surface of a hay field. This will be a complete no-discharge system with a dry weather design flow of 19,500 GPD; and a wet-weather design flow of 21,275 GPD. The wet weather design takes into account precipitation that falls onto the lagoon and holding basin surfaces (rainfall minus evaporation for the wettest 1 in 10 years).

4. COMPLIANCE PARAMETERS

The proposed wastewater treatment plant will be a complete no-discharge treatment facility. All liquid waste will be treated and disposed on-site. A Missouri State Operating Permit is

required to be maintained. Monitoring of the facility will be required along with keeping records of land application and maintenance activities. There are currently no sampling requirements of the land applied water.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The total surface area of the two existing basins (first basin is partitioned with a curtain to create two cells) and the new holding basin is reported as 64,200 sq. ft. The wettest 1-in-10 year rainfall is 52 inches and average evaporation is 36 inches for a net precipitation of 16 inches. This additional water (640,330 gallons per year or 1775 gpd) needs to be accounted for land application purposes. The dry weather design flow is considered to be 19,500 GPD (current actual flows are approximately 5000 gpd to 6000 gpd), the wet-weather design flow is 21,275 gpd.

The proposed lift station will have two pumps, each with a capacity of 36 gpd at a TDH of 72 feet. The lift station will be located after the existing ultraviolet disinfection unit. The owner intends to continue disinfecting the effluent from the lagoon. The discharge from the lagoon flows through a valve that is currently set to throttle flow to the UV unit to a maximum of 20 gpm. The valve can also be completely shut if needed. The lift station is not designed to handle theoretical peak discharges from the lagoon due to diurnal use or rainfall because the valve restricts the rate of flow out of the lagoon. The lift station will have an audio-visual high water alarm; flow can be shut off and held in lagoon for several days if necessary.

The holding basin will be constructed and sealed with the clay rich soils at the basin site and from an area near the application field. The basin will have a bottom rectangular dimension of 68 ft. x 88 ft. and will have 3:1 sloping walls; the depth from the top of the berms to the lagoon floor will be 19 feet. There will be an emergency spillway one foot below the berm top. The storage volume is between the two foot depth and the 17 foot depth. The one foot between the maximum storage level and the spillway is reserved for the 25 year, 24 hour storm event. The storage volume is estimated to be 2,109,000 gallons. The storage volume must hold 90 days of flow and the estimated precipitation from the wettest 90 days during the wettest 1 in 10 year. Precipitation for the wettest 90 days is estimated at 9 inches; for the surface area of 62,400 sq. ft. this amounts to approximately 350,000 gallons. The remaining volume divided by 90 days is approximately 19,500 gpd.

Storage volume was calculated using the formula for the volume of a frustum. $V=(H/3)(A1+A2+(A1 \times A2)^{1/2})$ $V=(15ft/3)(8000ft^2+32,300ft^2+(8000ft^2 \times 32,300ft^2)^{1/2})=281,874 ft^3$.

The water from the holding basin will be land applied to a hayfield with an approximate available area of 15.8 acres. The maximum allowable application rate of 24 inches/year requires a minimum of 11.9 acres. Water will be removed from the basin with a pump powered by the PTO from a tractor; the suction line will sit directly in lagoon; water will be pumped through approximately 1500 feet of transfer hose to a travelling gun apparatus, reel with 1250 feet of 4-inch hose and a gun with a spray radius still to be determined. The pump and application rate is intended to be approximately 450 gpm. Maximum application rates are 1 inch per day; and 3 inches per week. At full design flow, yearly application would take approximately 288 hours (36 – 8 hr. days).

6. OPERATING PERMIT MODIFICATION

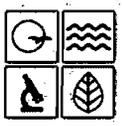
Operating permit MO-0120995 will be replaced with a general permit for land application of wastewater less than 50,000 GPD after the completion of construction. Form B - Application for Operating Permit has been received. The general permit, MOG823xxx will be issued after receipt of the statement of work complete and as-builts if necessary.

Andrew Appelbaum P.E.
Engineering Section
andy.appelbaum@dnr.mo.gov

1110 0120795

C#00001838

C16232



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

RECEIVED

MAY 16 2016

Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
1000.00	1474
DATE RECEIVED	5-10-16

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: 11/10/2016
 - 1.4 Has the department approved the proposed project's facility plan*?
 YES Date of Approval: 11/10/2016 NO N/A (If Not Applicable, complete No. 1.5.)
 - 1.5 [Complete only if answered Not Applicable on No. 1.4] 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?
 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
Lake Breeze Estates Holding Basin and Land Application Project

2.2 PROJECT DESCRIPTION
Remove Outfall 001, replace with pump station, install force main with discharge to a new holding basin, and ^{ultimate} ~~eventual~~ land application on fescue grass field.
PROJECT CONSTRUCTION WILL BE SELF-PERFORMED BY THE OWNER.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Retain within lagoon.

Footnote for next section (2.4) +=This subdivision is a closed, force main system, not typically subject to wet weather events.

2.4 DESIGN INFORMATION
A. Current population: 81; Design population: 207
10,300 (per permit)
B. Actual Flow: 5,128 (per rec) gpd; Design Average Flow: 20,760 gpd;
Actual Peak Daily Flow: ++ gpd; Design Maximum Daily Flow: ++ gpd;
Design Wet Weather Event: ++

2.5 ADDITIONAL INFORMATION
A. Is a topographic map attached? YES NO
B. Is a process flow diagram attached? YES NO ITS A LAGOON, SO ITS VERY BASIC.

2.6 ESTIMATED PROJECT CONSTRUCTION COST
\$ 127,140.00

3.0 WASTEWATER TREATMENT FACILITY

NAME Lake Breeze Estates		TELEPHONE NUMBER WITH AREA CODE		EMAIL ADDRESS	
ADDRESS (PHYSICAL) State Road J		CITY Millersburg	STATE MO	ZIP CODE 65251	COUNTY Callaway
Wastewater Treatment Facility: Mo- (Outfall Of)					
3.1 Legal Description: SW ¼, NE ¼, NW ¼, Sec. 35, T 48N, R 11W (Use additional pages if construction of more than one outfall is proposed.)					
3.2 UTM Coordinates Easting (X): Northing (Y): For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)					
3.3 Name of receiving streams: Unnamed Tributary to Owl Creek (U)					

4.0 PROJECT OWNER

NAME William Bright		TELEPHONE NUMBER WITH AREA CODE (573) 219-6173		EMAIL ADDRESS wjbright@sbcglobal.net	
ADDRESS 1101 Sioux Drive		CITY Fulton	STATE MO	ZIP CODE 65251	

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 Mid MO Sanitation, LLC		TELEPHONE NUMBER WITH AREA CODE (573) 219-6173		EMAIL ADDRESS wjbright@sbcglobal.net	
ADDRESS P.O. Box 6247		CITY Fulton	STATE MO	ZIP CODE 65251	

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.

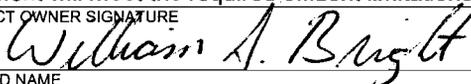
A. Is a copy of the certificate of convenience and necessity included with this application? YES NO

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 NOB. 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 NOC. 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 NOD. 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 Gary Cunningham, P.E., EMS, LLC		TELEPHONE NUMBER WITH AREA CODE (573) 814-9260		EMAIL ADDRESS fourgirlsdad@gmail.com	
ADDRESS 2000 East Broadway, No. 188		CITY Columbia	STATE MO	ZIP CODE 65201	

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
William BrightDATE
05/05/16TITLE OR CORPORATE POSITION
OwnerTELEPHONE NUMBER WITH AREA CODE
(573) 219-6173EMAIL ADDRESS
wjbright@sbcglobal.net

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.

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): RESIDENTIAL SUBDIVISION

8.3 This system is designed for:
 No-discharge Subsurface
 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: ¹ _____ (Use additional pages if greater than two 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 202 Width 182 Depth 19 Freeboard 2 Depth 2 Safety 25 % Slope 3:1
Basin #2: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____

9.4 Storage Basin operating levels (report as feet below emergency overflow level).
Basin #1: Maximum operating water level 17 ft Minimum operating water level 2 ft
Basin #2: Maximum operating water level _____ ft Minimum operating water level _____ ft

9.5 Design depth of sludge in storage basins.
Basin #1: 0 ft Basin #2: _____ ft

9.6 Existing sludge depth, if the basins are currently in operation.
Basin #1: 0 ft Basin #2: _____ ft

9.7 Total design sludge storage: 0 dry tons and 0 cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 Type of land application: Fixed Head Sprinklers Center Pivot Traveling Gun Drip Dispersal
 Subsurface Low Pressure Pipe Other (describe) _____

10.2 Number of irrigation sites ¹ _____ Total Acres 16 Maximum % field slopes 2
Location: nw 1/4, sw 1/4, se 1/4, 35 Sec. 48N T 11W R Callawav County 16 (max) Acres
Location: _____ 1/4, _____ 1/4, _____ 1/4, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ 1/4, _____ 1/4, _____ 1/4, _____ Sec. _____ T _____ R _____ County _____ Acres
(Use additional pages if greater than three irrigation sites.)

10.3 Type of vegetation: Grass hay Pasture Timber Row crops
 Other (describe)

10.4 Wastewater flow (dry weather) gallons per day: Average annual 5128 per Actual RECORDS.
Seasonal _____ Off-season _____

10.5 Land application rate (design flow including 1-in-10 year storm water flows):
Design: 24 inches/year 0.15 inches/hour 1.0 inches/day 3.0 inches/week
Actual: 24 inches/year 0.1 inches/hour 0.7 inches/day 2.0 inches/week

10.6 Total irrigation per year (gallons): Design: 5,400,000 gal Actual: 2,100,000 gal

10.7 Actual months used for irrigation (check all that apply):
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec w/ PERMITTING CONDITIONS

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