Permit No. CP0002086

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Ms. Tabitha Schmidt
CEO/President
Powell Gardens, Inc.
1609 NW Highway 50
Kingsville, MO 64061

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.

December 11, 2019
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

December 10, 2021
Expiration Date

Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Add two no-discharge subsurface adsorption drip systems. New systems will replace existing wastewater systems; a discharging wetlands system; and a lagoon with a surface irrigation system.

Visitors Center:

Conversion of an existing septic tank to a 9,000 gallon flow equalization tank equipped with a 0.5 HP effluent pump to feed an existing Smith & Loveless, Inc.–Modular FAST treatment plant with a nominal stated capacity of 9,000 gpd; a pump tank equipped with two, 1.5 HP effluent pumps, approximately 2960 lf of 2-inch PVC SDR-21 force main with cleanouts and air release valves. Drainfield dosing tanks with a combined working volume of approximately 9,000 gallons, two 2.0 HP effluent dosing pumps with a capacity of 55 gpm, 2.5-inch pvc supply lines and manifolds, a soil absorption field with an area of 76,224 square feet, separated into 8 zones, each zone with typically 4764 lineal feet of 0.5-inch drip irrigation pipe, 2.5-inch pvc return lines, headworks with vortex filters and manually operated backflush system, and all the necessary appurtenances to make the facilities complete and usable to treat the waste from a population equivalent of 75, with an average daily flow of 7,500 gallons. This is a non-discharging facility to be located in the SE 1/4, of the NW 1/4, of Section 20, T47N, R28W, Johnson County, Missouri.

Visitors Center Drainfield approximate location: UTM (zone 15) X=410344, Y=4302753.

Barn Area:

A 1,500 gallon trash tank, a 6,000 gallon flow equalization tank equipped with a 0.3 HP effluent pump to feed a Bio-Macrobiotics treatment system with three MicroFAST 0.9 FAST units each with a treatment capacity of 900 gpd, for a total nominal treatment capacity of 2,700 gpd; a pump tank equipped with two, 0.5 HP effluent pumps, approximately 1,280 lf of 2-inch PVC SDR-21 force main with cleanouts and air release valves. Drainfield dosing tanks with a combined working volume of approximately 3,000 gallons, two 1.0 HP effluent dosing pumps with a capacity of 35 gpm, 2.0-inch pvc supply lines and manifolds, a soil absorption field with an area of 28,800 square feet, separated into 4 zones, each zone with 3,600 lineal feet of 0.5-inch drip irrigation pipe, 2.0-inch pvc return lines, headworks with vortex filters and manually operated backflush system, and all the necessary appurtenances to make the facilities complete and usable to treat the waste from a population equivalent of 22, with an average daily flow of 2,133 gallons. This is a non-discharging facility to be located in the SW 1/4, of the SW 1/4, of Section 18, T47N, R28W, Johnson County, Missouri.

Barn Area Drainfield approximate location: UTM (zone 15) X=409350, Y=4303570.

A closure plan will need to be submitted to the Kansas City Regional Office for review and approval prior to any closure activities.

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

II. COST ANALYSIS FOR COMPLIANCE

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

The Department is not required to 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 consistent with plans and specifications signed and sealed by Allstate Consultants and as described in this permit.

3. The Department must be contacted in writing prior to making any changes to the plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

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

5. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment, per 10 CSR 20-8.140(C)(2)

6. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.

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

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

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

10. In accordance with 10 CSR 20-6.010(12), 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. The closure plan must meet the requirements outlined in Standard Conditions Part III of the Missouri State Operating Permit No. MO-0123501. Closure shall not commence until the submitted closure plan is approved by the Department.

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

    10 CSR 20-8.130 Pumping Stations

    - Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation. 10 CSR 20-8.140(2)(B). 10 CSR 20-8.130 (2) (A)
    - Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility: 10 CSR 20-8.130 (2) (C)
      - o Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140 (8) (B)
      - o First aid equipment; 10 CSR 20-8.140 (8) (C)

  - o Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate.; 10 CSR 20-8.140 (8) (K)
  - o Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140 (8) (L)
  - o Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E Standard for Electrical Safety in the Workplace (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140 (8) (M)
- The distance between wastewater pumping stations and all potable water sources shall be at least fifty feet (50') in accordance with 10 CSR 23-3.010(1)(B). 10 CSR 20-8.130 (2) (D).
- Multiple pumps shall be provided except for design average flows of less than fifteen hundred (1,500) gallons per day. 10 CSR 20-8.130 (3) (B) 1.
- Electrical equipment. Electrical equipment shall be provided with the following requirements:
  - o 10 CSR 20-8.130 (3) (B) 2. A. Electrical equipment must comply with 10 CSR 20-8.140(7)(B);
  - o Utilize corrosive resistant equipment located in the wet well; 10 CSR 20-8.130 (3) (B) 2. B.
  - o Provide a watertight seal and separate strain relief for all flexible cable; 10 CSR 20-8.130 (3) (B) 2. C.
  - o Install a fused disconnect switch located above ground for the main power feed for all pumping stations. 10 CSR 20-8.130 (3) (B) 2. D.
  - o When such equipment is exposed to weather, it shall comply with the requirements of weather proof equipment; enclosure NEMA 4; NEMA 4X where necessary; and NEMA Standard 250-2014, published December 15, 2014. 10 CSR 20-8.130 (3) (B) 2. E.
  - o Install lightning and surge protection systems; 10 CSR 20-8.130 (3) (B) 2. F.
  - o Install a one hundred ten volt (110 V) power receptacle inside the control panel located outdoors to facilitate maintenance; 10 CSR 20-8.130 (3) (B) 2. G.
  - o Provide Ground Fault Circuit Interruption (GFCI) protection for all outdoor receptacles. 10 CSR 20-8.130 (3) (B) 2. H.
- Water level controls must be accessible without entering the wet well. 10 CSR 20-8.130 (3) (C)
- Valves shall not be located in the wet well unless integral to a pump or its housing. 10 CSR 20-8.130 (3) (D)
- Covered wet wells shall have provisions for air displacement to the atmosphere, such as an inverted and screened "j" tube or other means. 10 CSR 20-8.130 (3) (E)
- There shall be no physical connection between any potable water supply and a wastewater pumping station, which under any conditions, might cause contamination of the potable water supply. If a potable water supply is brought to the station, no piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.130 (3) (G)

- Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation. CSR 20-8.140(2)(B). 10 CSR 20-8.130 (2) (A)
- Submersible pump stations shall meet the applicable requirements under section (3) of this rule, except as modified in this section. 10 CSR 20-8.130 (5)
  - o Pump Removal. Submersible pumps shall be readily removable and replaceable without personnel entering, dewatering, or disconnecting any piping in the wet well. 10 CSR 20-8.130 (5) (A)
  - o 10 CSR 20-8.130 (5) (B) Valve Chamber and Valves. Valves required under subsection (3)(D) of this rule shall be located in a separate valve chamber.
  - o A minimum access hatch dimensions of twenty-four inches by thirty-six inches (24" x 36") shall be provided. 10 CSR 20-8.130 (5) (B) 1.
- A portable pump connection on the discharge line with rapid connection capabilities shall be provided. 10 CSR 20-8.130 (5) (B) 2.
- Alarm systems with an uninterrupted power source shall be provided for pumping stations. 10 CSR 20-8.130 (6)
- Where independent substations are used for emergency power, each separate substation and its associated distribution lines shall be capable of starting and operating the pump station at its rated capacity. 10 CSR 20-8.130 (7) (B)
- Force main system shall be designed to withstand all pressures (including water hammer and associated cyclic reversal of stresses), and maintain a velocity of at least two feet (2') per second. 10 CSR 20-8.130 (8) (A)

10 CSR 20-8.140 Wastewater Treatment Facilities

- Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation. 10 CSR 20-8.140 (2) (B)
- Unless another distance is determined by the Missouri Geological Survey or by the department's Public Drinking Water Branch, the minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300'). 10 CSR 20-8.140 (2) (C) 1.
- No treatment unit with a capacity of twenty-two thousand five hundred gallons per day (22,500 gpd) or less shall be located closer than the minimum distance of 200' to a neighboring residence and 50' to property line for lagoons; 200' to a neighboring residence for open recirculating media filters following primary treatment; and 50' to a neighboring residence for all other discharging facilities. See 10 CSR 20-2.010(68) for the definition of a residence. 10 CSR 20-8.140 (2) (C) 2
- The alarm shall be activated in cases of high water levels. Follow the provisions in subsection (7)(C) of this rule for alarm systems. 10 CSR 20-8.140 (4) (D)
- All wastewater treatment facilities shall be provided with an alternate source of electric power or pumping capability to allow continuity of operation during power failures. 10 CSR 20-8.140 (7) (A) 1.

- Electrical systems and components in raw wastewater or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors that are normally present, shall comply with the NFPA 70 National Electric Code (NEC) (2017 Edition), as approved and published August 24, 2016, requirements for Class I, Division 1, Group D locations. 10 CSR 20-8.140 (7) (B)
- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140 (7) (C).
- No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140 (7) (D) 1.
- Where a potable water supply is to be used for any purpose in a wastewater treatment facility other than direct connections, a break tank, pressure pump, and pressure tank or a reduced pressure backflow preventer consistent with the department's Public Drinking Water Branch shall be provided. 10 CSR 20-8.140 (7) (D) 3. A.
- For indirect connections, a sign shall be permanently posted at every hose bib, faucet, hydrant, or sill cock located on the water system beyond the break tank or backflow preventer to indicate that the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 3. B.
- Where a separate non-potable water supply is to be provided, a break tank will not be necessary, but all system outlets shall be posted with a permanent sign indicating the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 4.
- A means of flow measurement shall be provided at all wastewater treatment facilities. 10 CSR 20-8.140 (7) (E)

10 CSR 20-8.150 Preliminary Treatment

- Grease interceptors shall be provided on kitchen drain lines from institutions, hospitals, hotels, restaurants, schools, bars, cafeterias, clubs, and other establishments from which relatively large amounts of grease may be discharged to a wastewater treatment facility owned by the grease producing entity. Grease interceptors are typically constructed from fiberglass reinforced polyester, high density polyethylene (HDPE), or concrete. For corrugated HDPE grease interceptors, follow ASTM F2649 – 14 Standard Specification for Corrugated High Density Polyethylene (HDPE) Grease Interceptor Tanks, as approved and published September 1, 2014. For precast concrete grease interceptor tanks, follow ASTM C1613 – 17 Standard Specification for Precast Concrete Grease Interceptor Tanks, as approved and published September 1, 2017. 10 CSR 20-8.150 (3)

10 CSR 20-8.200 Wastewater Treatment Lagoons and Wastewater Irrigation Alternatives

- Subsurface systems shall—
  - o Exclude unstabilized fill and soils that have been highly compacted and/or disturbed, such as old road beds, foundations, or similar things; 10 CSR 20-8.200 (7) (A) 1. A.
  - o Provide adequate surface drainage where slopes are less than two percent (2%);10 CSR 20-8.200 (7) (A) 1. B

  - o Provide surface and subsurface water diversion where necessary, such as a curtain or perimeter drain; 10 CSR 20-8.200 (7) (A) 1. C and
  - o Have a ten foot (10') buffer from the property line. 10 CSR 20-8.200 (7) (A) 1. D
- Subsurface systems shall be, at a minimum, preceded by preliminary treatment. 10 CSR 20-8.200 (7) (B)
- Loading rates shall not exceed the values assigned by the site and soil evaluation. 10 CSR 20-8.200 (7) (C)
- All network piping and low pressure distribution piping and fittings with polyvinyl chloride (PVC) shall meet ASTM Standard D 1785 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, or 120 as approved and published August 1, 2015, or equivalent rated to meet or exceed ASTM D2466 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings as approved and published August 1, 2017. These standards shall hereby be incorporated by reference into this rule, as published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. This rule does not incorporate any subsequent amendments or additions. 10 CSR 20-8.200 (8) (A) 2
- The location and size of the drains and buffers must be factored into the total area required for the drip dispersal system. 10 CSR 20-8.200 (9) (A) 1
- Emitters and drip dispersal lines shall be placed at a minimum on a two foot (2') spacing to achieve even distribution of the wastewater and maximum utilization of the soil. 10 CSR 20-8.200 (9) (B)

12. 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

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

    C. An application for Operating Permit (Form B) was submitted to the Department and received on 6-21-2019. After receipt of the final Statement of Work Completed a General Permit will be issued for operation of the new treatment facilities. The General Permit, MO-G823146, will replace permit MO-0123501.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

Two treatment systems are being replaced. The discharging system has ammonia limits that will not be able to be met. The other system includes a lagoon and overflow land application system that the owners feel should be updated.

2. FACILITY DESCRIPTION

The existing discharging system (outfall #1) includes a Smith and Loveless fixed film FAST system followed by a flow through wetlands, it has a design flow of 7,500 gpd. Flow equalization will be added prior to the FAST system then flow will be intercepted prior to the wetland and directed to a new subsurface drip irrigation system. The design flow for the Visitor Center system will be 7,500 gpd.

The existing no-discharge system (features #002 and #003) includes a single cell lagoon followed by an surface irrigation system involving gated pipes and overland flow irrigation, it has a design flow of 2,133 gpd. The new system will have flow equalization, a new MicroFast fixed film treatment system, followed by a new subsurface drip irrigation system. The design flow for the Barn Area system will be 2,133 gpd.

There is another existing onsite no-discharge subsurface drip system that is not currently reflected in operating permit MO-0123501. It had been constructed and operates under approval of Johnson County Health Department. This system called East Side treatment facility has a design flow of 1700 gpd and will be added to the new operating permit at completion of construction.

Powell Gardens is located at 1609 NW Highway 50, Kingville, in Johnson County, Missouri. The three wastewater systems will be located on Powell Gardens property and will have a combined design flow 11,333 gpd and serve a hydraulic population equivalent of approximately 114 people.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet the requirements of MOG823146 with an expiration date of August 24, 2022. The facility will be required to follow Subsurface Dispersal Operational Requirements and keep records of maintenance activities for at least five years.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Visitors Center

Conversion of an existing septic tank to a 9,000 gallon flow equalization tank equipped with a 0.5 HP effluent pump with a capacity of 25 gpm at a TDH of 18 ft., gravity flow is available as back-up, FE goes to an existing Smith & Loveless, Inc.– Modular FAST fixed film treatment plant with a nominal stated capacity of 9,000 gpd; adequate secondary treatment is expected for soil absorption system; 2000 gallon pump tank equipped with two, 1.5 HP Clarus, Model 5031-0008 effluent pumps, each having a capacity of 25 GPM at a TDH of 99.3 feet, emergency storage in the pump tank, a high water level alarm, approximately 2960 lf of 2-inch PVC SDR-21 force main with cleanouts and air release valves.

Drainfield dosing tanks three, 3,000 gallon tanks with a combined working volume of approximately 9,000 gallons, two 2.0 HP Clarus, Model 5034-0010 effluent dosing pumps with a capacity of 55 gpm, actual dosing is approximately 21 gpm, flushing flow is approximately 40 gpm, 2.5-inch PVC SDR-21 supply lines and manifolds, a soil absorption field with an area of 76,224 square feet, separated into 8 zones, approximate zone size of 9,528 sq. ft. each, automatic distributing valves for zone selection, a typical zone has 4764 lineal feet of drip irrigation pipe, 32 lines of approximately 150 feet each, placed 2 feet on center, each zone has a different layout, irrigation dripline pipe has a nominal diameter of 0.5-inch, emitters are placed every two feet and have an emitter rate of 0.53 gallons per hour per, bury depth is between 6 and 10 inches, excess water is returned to the dosing tank through 2.5-inch PVC return lines, headworks with BioDisc Battery 2 filters and manually operated backflush system, and all the necessary appurtenances to make the facilities complete and usable to treat the waste from a population equivalent of 75, with an average daily flow of 7,500 gallons. This is a non-discharging facility to be located in the SE 1/4, of the NW 1/4, of Section 20, T47N, R28W, Johnson County, Missouri. Drainfield approximate location: UTM (zone 15) X=410344, Y=4302753.

Absorption field size is based on a loading rate of 0.10 gallons per square foot per day. Detailed soil analysis was performed by Randall J. Miles, Soil Scientist. The soil loading rate is in accordance with the recommended rates in the soil report. In the soils investigation there were 7 pits dug over the proposed site. The selected absorption field is represented by two of the soil pits. Depth to limiting layer is acceptable.

Setback distances from the absorption field to the property line exceeds 200 feet in all directions. This satisfies the minimum required setback distance per 10 CSR 20-8.200(7).

Barn Area

A 1,500 gallon trash tank, followed by a 6,000 gallon flow equalization tank consisting of two 3,000 gallon concrete sewage tanks, equipped with a with a 0.3 HP Zoeller, Model 53 effluent pump with a capacity of 20 gpm at a TDH of 13.7 ft., gravity flow is available as back-up, flow equalization connects to a Bio-Microbiotics fixed film treatment system with three MicroFAST 0.9 FAST units each with a treatment capacity of 900 gpd, units are arranged in parallel with a total nominal treatment capacity of 2,700 gpd; adequate secondary treatment is expected for soil absorption system; a 1,500 gallon pump tank equipped with two, 0.5 HP Clarus, Model 5032-0006 effluent pumps, each having a capacity of 20 GPM at a TDH of 53.8 feet, emergency storage in the pump tank, a high water level alarm, approximately 1280 lf of 2-inch PVC SDR-21 force main with cleanouts and air release valves.

Drainfield dosing tanks, two, 1,500 gallon tanks with a combined working volume of approximately 3,000 gallons, two 1.0 HP Clarus, Model 5033-0008 effluent dosing pumps with a capacity of 35 gpm, actual dosing is approximately 15.9 gpm, flushing flow is approximately 29 gpm, 2.0-inch PVC SDR-21 supply lines and manifolds, a soil absorption field with an area of 28,000 square feet, separated into 4 zones, each zone size of 7,200 sq. ft. each, automatic distributing valves for zone selection, a typical zone has 3,600 lineal feet of drip irrigation pipe, 36 lines of approximately 100 feet each, placed 2 feet on center, one of the zones has a different layout, irrigation dripline pipe has a nominal diameter of 0.5-inch, emitters are placed every two feet and have an emitter rate of 0.53 gallons per hour per, bury depth is between 6 and 10 inches, excess water is returned to the dosing tank through 2.0-inch PVC return lines, headworks with BioDisc Battery 2 filters and manually operated backflush system, and all the necessary appurtenances to make the facilities complete and usable to treat the waste from a population equivalent of 22, with an average daily flow of 2,133 gallons. This is a non-discharging facility to be located in the SW 1/4, of the SW 1/4, of Section 18, T47N, R28W, Johnson County, Missouri. Drainfield approximate location: UTM (zone 15) X=409350, Y=4303570.

Absorption field size is based on a loading rate of 0.075 gallons per square foot per day. Detailed soil analysis was performed by Randall J. Miles, Soil Scientist. The soil loading rate is in accordance with the recommended rates in the soil report. In the soils investigation there were 6 pits dug over the proposed site. The selected absorption field is represented by four of the pits. Depth to limiting layer is acceptable.

Setback distances from the absorption field to the property line exceeds 200 feet in all directions. This satisfies the minimum required setback distance per 10 CSR 20-8.200(7).

5. OPERATING PERMIT

An application for Operating Permit (Form B) was submitted to the Department and received on 6-21-2019 along with a permit modification fee of $62.50. After receipt of the final Statement of Work Completed a General Permit will be issued for operation of the new treatment facilities. The General Permit, MO-G823146, will replace permit MO-0123501. It is current policy to not charge for a conversion of an individual operating permit to a domestic General operating permit. Therefore the submitted fee ($62.50) has been applied to future annual fees.

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

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY

RECEIVED
JUN 21 2019
Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO. PR 327863	CP NO.
FEE RECEIVED $1000.00	CHECK NO. 5120
DATE RECEIVED 6/21/19	

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: _____ Project #: _____

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

1.3 Has the department approved the proposed project's facility plan*?
☐ YES Date of Approval: _____ ☑ NO (If No, complete No. 1.4.)

1.4 [Complete only if answered No on No. 1.3.] Is a copy of the facility plan* for wastewater treatment facilities included with this application?
☑ YES ☐ NO ☐ Exempt because _____

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

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

1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?
☐ YES Date of submittal: _____
☑ Enclosed is the appropriate operating permit application and fee submittal. Denote which form: ☐ A ☑ B ☐ B2
☐ N/A: However, In the event the department believes that my operating permit requires revision to permit limitation such as changing equivalent to secondary limits to secondary limits or adding total residual chlorine limits, please share a draft copy prior to public notice? ☐ YES ☐ NO

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

1.9 Is the appropriate fee or JetPay confirmation included with this application? ☑ YES ☐ NO
See Section 7.0

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

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT
Wastewater Treatment System Improvements - Powell Gardens

2.2 ESTIMATED PROJECT CONSTRUCTION COST
$

2.3 PROJECT DESCRIPTION
Project consists of converting the Visitors Center WWTF (Outfall #001) into a no-discharge drip irrigation disposal system and construction a new no-discharge drip irrigation disposal system for The Missouri Barn WWTF (Permitted Feature #002 & #003)

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Sludge retained in tanks and removed by contract hauler.

2.5 DESIGN INFORMATION Visitors Center WWTF

A. Current population: 39 ; Design population: 112

B. Actual Flow: 2,600 gpd; Design Average Flow: 7,500 gpd;
Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: _____ gpd; Design Wet Weather Event: _____

2.6 ADDITIONAL INFORMATION

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

B. Is a process flow diagram attached? ☑ YES ☐ NO

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Powell Gardens Wastewater Treatment Facilities	(816) 697-2600	tschmidt@powellgardens.org

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
1609 NW Highway 50	Kingsville	MO	64061	Johnson

Wastewater Treatment Facility: Mo- 0123501 (Outfall 1 Of 1)

3.1 Legal Description: NW ¼, SW ¼, NW ¼, Sec. 20, T 47N, R 28W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 409686 Northing (Y): 4302869
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Tributary to South Fork Blackwater River

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Powell Gardens, Inc.	(816) 697-2600	tschmidt@powellgardens.org

ADDRESS	CITY	STATE	ZIP CODE
1609 NW Highway 50	Kingsville	MO	64061

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

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Powell Gardens, Inc.	(816) 697-2600	tschmidt@powellgardens.org

ADDRESS	CITY	STATE	ZIP CODE
1609 NW Highway 50	Kingsville	MO	64061

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
Stephen Lin, P.E. - Allstate Consultants LLC	(573) 875-8799	slin@allstateconsultants.net

ADDRESS	CITY	STATE	ZIP CODE
3312 LeMone Industrial Blvd.	Columbia	MO	65201

7.0 APPLICATION FEE

☑ CHECK NUMBER ☐ JETPAY CONFIRMATION NUMBER

8.0 PROJECT OWNER: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE

PRINTED NAME	DATE
Tabitha Schmidt	6-10-19

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
CEO/President	(816) 697-2600	tschmidt@powellgardens.org

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): _____

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 _____ Depth _____ Safety _____ % Slope _____
Basin #2: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____
Basin #3: 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 _____ 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 2 Total Acres 1.65 Maximum % field slopes 8%
Location: SE ¼, SE ¼, NW ¼, 20 Sec. 47 T 28 R John County 1.15 Acres Visitors Ctr. WWTF
Location: SW ¼, SE ¼, SE ¼, 18 Sec. 47 T 28 R John County 0.50 Acres MO Barn WWTF
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 3,516,045 Seasonal _____ Off-season _____

10.4 Land application rate (design flow including 1-in-10 year storm water flows): See Attached
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: 3,516,045 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

The Missouri Barn WWTF – Permitted Feature #002 & #003

2.5 Design Information

A. Current Population: 10
   Design Population: 20

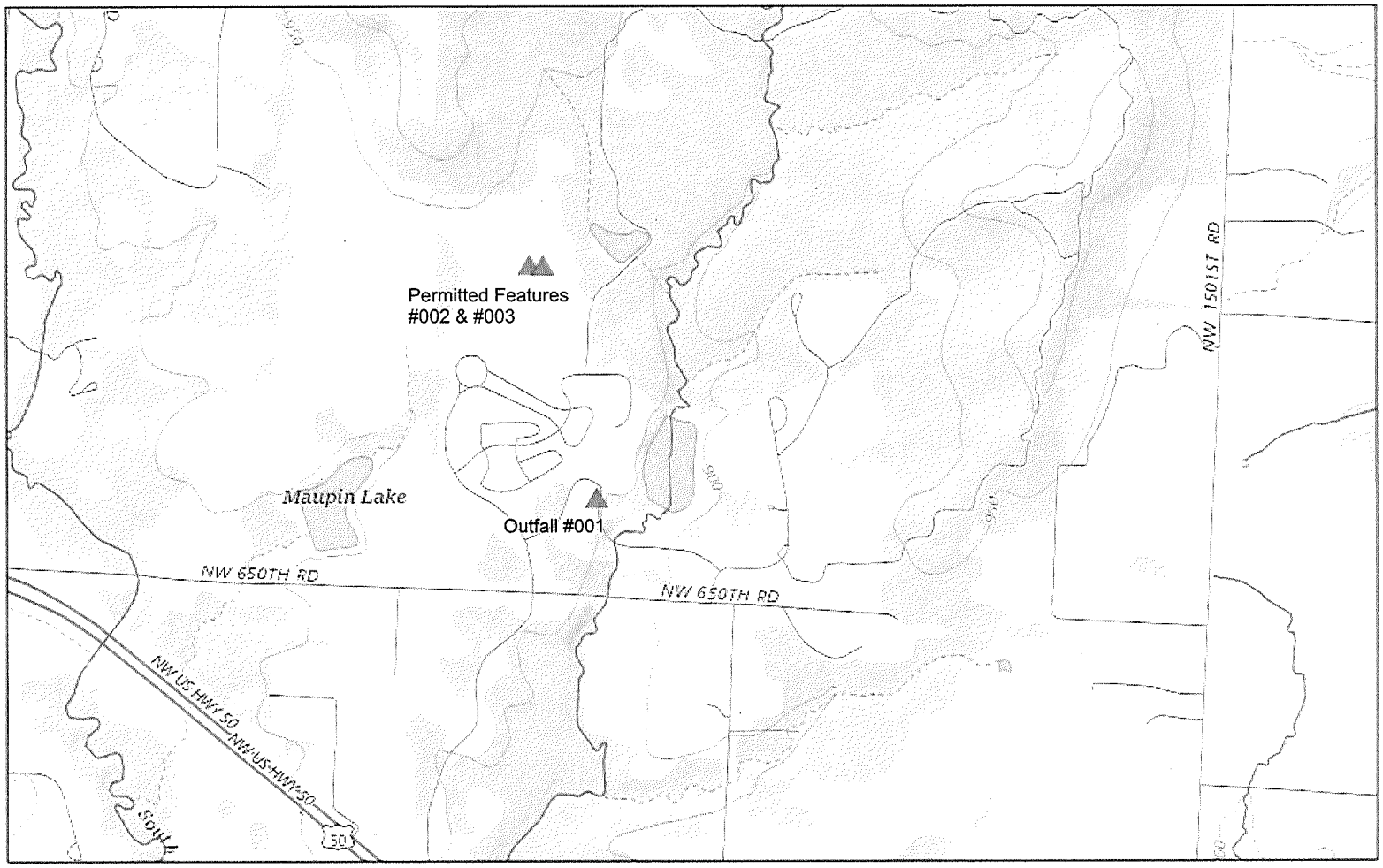
B. Design Average Flow: 2,133 gpd

3.1 Legal Description: SW ¼, SE ¼, SE ¼, Sec. 18, T47N, R28W

3.2 UTM Coordinates: Easting (X): 409518, Northing (Y): 4303480

3.3 Name of Receiving Stream: Tributary to South Fork Blackwater River

Powell Gardens Wastewater Treatment Facilities



4/24/2019, 10:34:32 AM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

▲ NPDES Waste Water Outfalls

Stream Classifications and Use Designations

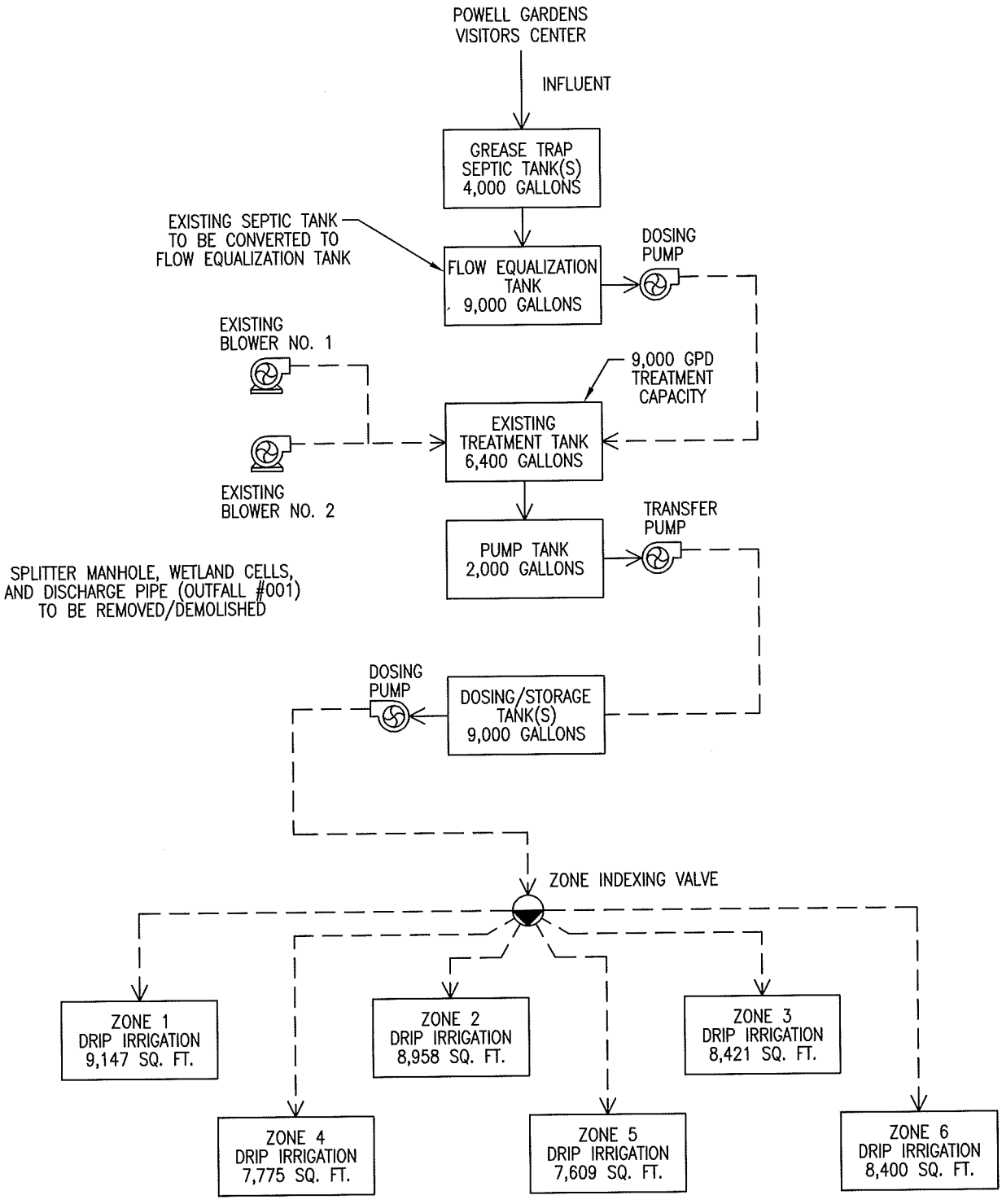
County Boundaries

USGS The National Map: National Boundaries Dataset, 3DEP Elevation

Missouri DNR

Although all data in this map have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials.

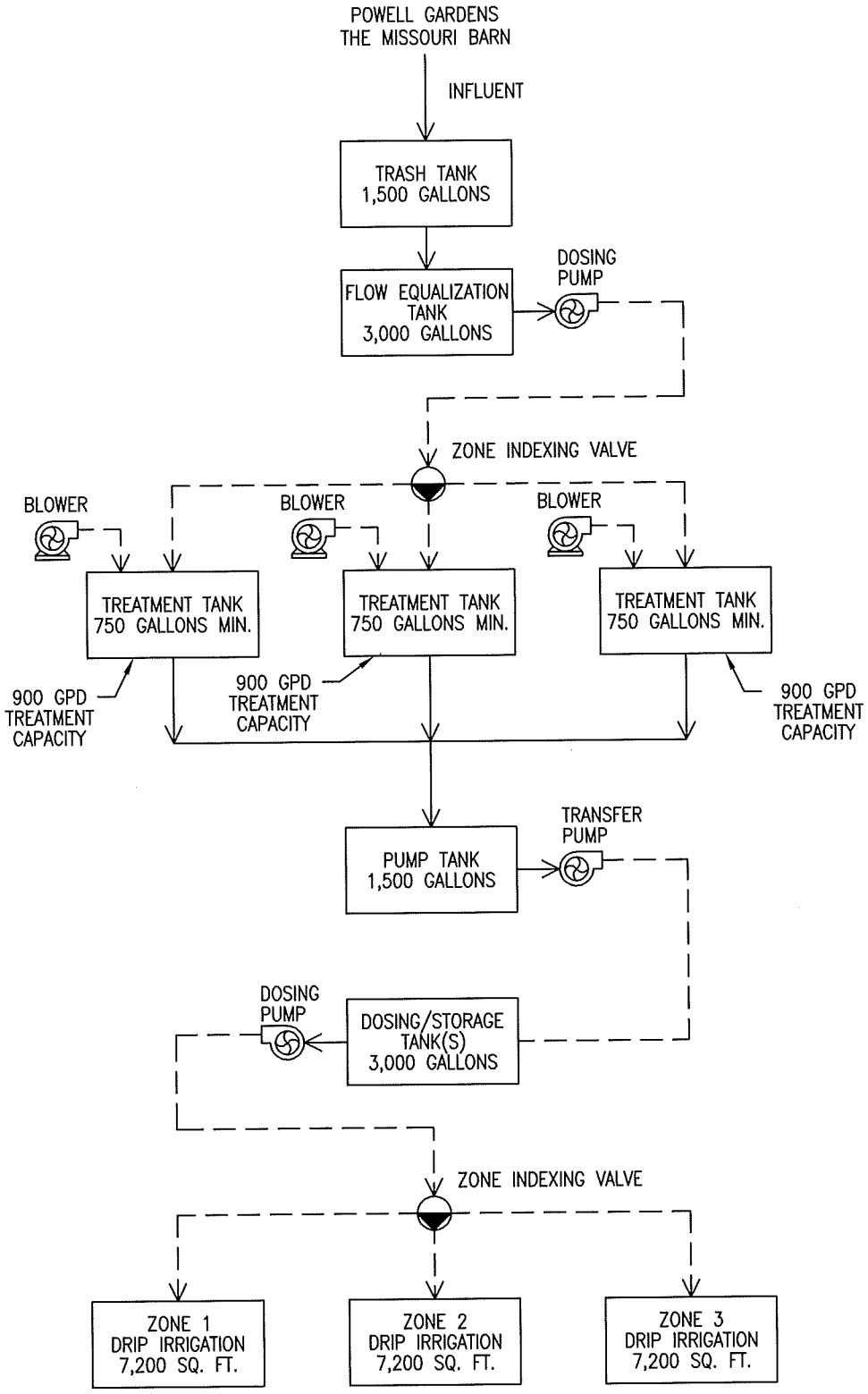
DESIGN FLOW 7,500 GALLONS PER DAY
CURRENT FLOW 2,600 GALLONS PER DAY



PROCESS FLOW DIAGRAM
VISITORS CENTER WASTEWATER TREATMENT FACILITY
POWELL GARDENS
MO-0123501
OUTFALL #001

ALLSTATE
CONSULTANTS
3312 LEMONE INDUSTRIAL BLVD.
COLUMBIA, MO 65201
(573) 875-8799
allstateconsultants.net

DESIGN FLOW 2,133 GALLONS PER DAY



PROCESS FLOW DIAGRAM
THE MISSOURI BARN EVENT CENTER WASTEWATER TREATMENT FACILITY
POWELL GARDENS
MO-0123501
PERMITTED FEATURE #002 & #003

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