Permit No. CP0001995

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Trenton Municipal Utilities
Trenton Wastewater Treatment Facility
98 Southwest Ash Lane
Trenton, MO 64683

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.

August 16, 2018
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

August 15, 2020
Expiration Date

Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The proposed construction will be the installation of a chlorine/dechlorination disinfection system. The disinfection system is required to be installed by June 30, 2019. The chlorine disinfection system will be sized to handle a peak flow of 7 MGD and to meet the design average flow of 3 MGD. Construction will include installation of 2 chlorine contact basins with a length to width ratio of 40:1 and a 15 minute contact time at peak flow. Sodium bisulfite for dechlorination will be dosed into the basin to provide 30 seconds of contact time. The lagoon pump station will operate with 2 constant speed pumps with a capacity of 2430 gpm and 1 VFD pump with a capacity of 600 gpm. The design average flow will remain at 3.0 MGD and serve a population equivalent of approximately 60,000.

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 required to determine "findings of affordability" because the permit applies to a **combined or separate sanitary sewer system for a publically-owned treatment works.**

Cost Analysis for Compliance - The Department has made a reasonable search for empirical data indicating the permit is affordable. The search consisted of a review of Department records that might contain economic data on the community, a review of information provided by the applicant as part of the application, and public comments received in response to public notices of this draft permit. If the empirical cost data was used by the permit writer, this data may consist of median household income, any other ongoing projects that the Department has knowledge, and other demographic financial information that the community provided as contemplated by Section 644. 145.3. See **APPENDIX – COST ANALYSIS FOR COMPLIANCE** of the operating permit modification.

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 May 9, 2018.

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. 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.

6. 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.

7. Upon completion of construction:

   A. The Trenton Municipal Utilities will become the continuing authority for operation, maintenance, and modernization of these facilities;

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

C. 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.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The proposed construction will be the installation of a chlorine/dechlorination disinfection system. The disinfection system is required to be installed by June 30, 2019. The chlorine disinfection system will be sized to handle a peak flow of 7 MGD and to meet the design average flow of 3 MGD. At this time, the facility is not addressing their ammonia schedule of compliance, which will be reevaluated with the operating permit renewal in 2019.

2. FACILITY DESCRIPTION

The existing treatment facility includes mechanical bar screen/influent pump station/peak flow pumps/storage lagoons/grit removal/oxidation ditch/final clarifiers/aerobic sludge holding/sludge dewatering/sludge thickening. The system is being modified to add disinfection system and a new pump station to allow for blending of wet weather flows with flows from the treatment plant prior to disinfection.

The Trenton WWTF is located at 98 Southwest Ash Lane, Trenton, in Grundy County, Missouri. The facility has a design average flow of 3.0 MGD and serves a population equivalent of approximately 60,000.

3. COMPLIANCE PARAMETERS

The final effluent limits the project is required to meet are the *E. Coli* effluent limits established in the Operating Permit, MO-0039748 issued December 1, 2016. As the result of the proposed chlorine disinfection, the facility will need to meet total residual chlorine (TRC) limits, see table below.

Parameter	Units	Daily Maximum	Weekly Average	Monthly Average Limit
E. Coli	#/100mL		1030	206
Total Residual Chlorine	µg/L	<130		<130

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Existing major components which will remain in use include the following:

- Mechanical bar screen/influent pump station/peak flow pumps/ storage lagoons/grit removal/oxidation ditch/final clarifiers/aerobic sludge holding/sludge dewatering/sludge thickening.
- The wet weather storage lagoons are 38 and 28 acres respectively.
- Design flow of the facility remains at 3.0 MGD.

Construction will cover the following items:

- Floodplain -The existing treatment plant is located within a Zone A 100-year floodplain, according to FEMA Flood Hazard Boundary Map Panel Number 2901500075, dated December 1, 1983. Burns and McDonnell conducted a hydrologic and hydraulic analysis evaluating the impacts resulting from the proposed improvements and the analysis showed the structures will be located above the 100-year flood elevation.
- Chlorine Contact Basin – Installation of 2 separate contact basins, each with a capacity of 3.5 MGD.
    - The length to width ratio is 40:1 with the basin being 60 ft by 4.5 ft with a sidewater depth of 6 ft.
    - Flow velocity will be approximately 7 fps to reduce solids deposition.
    - The basin will allow for a 15 minute contact time during a peak flow of 7 MGD.
- Dechlorination feed pumps are capable of pumping 125 gpd at peak flow and 35 gpd at average design flow. Sodium bisulfite will be injected 6 feet prior to the basin effluent to provide 30 seconds of detention time.
    - There will be 2 bulk storage tanks for each chemical (total of 4 tanks) which would provide 30 days of storage under average conditions.
        - Sodium hypochlorite tanks will be 5000 gallons
        - Sodium bisulfite will be 2500 gallons
- The chlorine contact basin also includes a sump pit to allow dewatering and maintenance. Water from the sump is collected in the lagoon pump station.
- Lagoon Pump Station- The pump station will be equipped with 2 constant speed pumps with a design capacity of 2430 gpm at a design head of 19 feet.
    - One lagoon return pump operated by VFD with a design capacity of 600 gpm at a design head of 21 feet.
    - The pump station will also act as a high water pump when water on Muddy Creek is high.
- Back-up power-A generator docking station on the back of the chemical feed building will be provided.
- Solids handling improvements include regrading and concrete lining the side slopes of the existing sludge holding basin to stabilize the existing slopes.

- Clarifier #1 and #2 will have with submersible, chopper style pumps installed similar to the existing Clarifier #3 to improve operations in scum removal.

5. <u>OPERATING PERMIT</u>

Operating permit MO-0039748 will require a modification to reflect the construction activities. The modified Trenton WWTF, MO-0039748, was successfully public noticed from June 22, 2018 to July 23, 2018 with one comment letter received, see Appendix A for the comments and responses.

The application for the renewal of the operating permit is required to be submitted to the Department by January 30, 2019. With the renewal application, expanded effluent testing is required as part of Form B-2, https://dnr.mo.gov/forms/780-1805-f.pdf.

When construction is complete, submit the 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.

Leasue Meyers, EI
Engineering Section
leasue.meyers@dnr.mo.gov

Appendix A-Comment responses from public notice period:

Comment #1: Based on feedback from operating staff, the frequency of BOD testing cited in note 3 of the Special Conditions is not attainable with current laboratory capacity for processing BOD samples; space for a maximum of five samples in the incubator at any given time is available. The City respectfully requests that the department consider providing relief in the quantity of tests following the second day of sampling. For example, sampling every other day for BOD following the second day of a blending event.

Response #1: The space limitation for conducting BOD sampling is understood; however the facility be able to demonstrate compliance with the 85% removal requirement. An option that can be explored and discussed as part of the operating permit renewal that will occur in early 2019 are if there are any operational changes that can be utilized to maximize blending operations to reduce the blending timeframes.

Comment #2: It appears that Table A-1 and Table A-2 have differing limits for Total Residual Chlorine. My understanding following commentary on the draft permit was that we would have <130 ug/L for daily maximum and monthly average in the table. The City respectfully requests that the department revise Table A-2 to <130 ug/L in accordance with our prior agreement

Response #2: When the operating permit modification is issued, it will reflect the <130 ug/L for daily maximum and monthly average in Table A-2 for total residual chlorine.

Comment #3: The City recently suspended their pretreatment program. Is it permissible for the department to remove note 25 of the special conditions? If additional information is necessary, the City will provide it upon request.

Response #3: The pretreatment program permit requirement was modified in the Trenton operating permit on July 1, 2018 to reflect the program being inactivated. The condition in the July 1, 2018 permit has replaced the condition in the draft operating permit that reflected the requirements of an active pretreatment program.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER FACILITY

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

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? N/A
☐ YES Date of Approval: _____

1.4 Has the department approved the proposed project's facility plan*?
☐ YES Date of Approval: _____ ☑ NO ☐ N/A (If Not Applicable, complete No. 1.5.) PER is in review

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? Previously submitted 3/22/18
☐ 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
Trenton WWTP S5

2.2 PROJECT DESCRIPTION
Construction of a chlorination (with sodium hypochlorite) and dechlorination (with sodium bisulfite) system, including bulk chemical storage, a chemical feed building with chemical metering pumps, and a chlorine contact basin. A dual-purpose pump station will be constructed to (1) return lagoon holding to the disinfection system or plant headworks, or (2) pump plant effluent to Muddy Creek during periods of high creek levels.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
The solids handling process serves to convey, dewater, stabilize, and store solids wasted from the activated sludge treatment process. Critical processes and equipment include waste sludge pumping, aerobic sludge holding, sludge feed pumping, polymer feed, sludge dewatering, lime stabilization, and a thickened sludge storage pad. The solids handling process meets the EPA Part 503 regulations for Class B biosolids; therefore waste solids are land applied on local agricultural sites.

2.4 DESIGN INFORMATION
A. Current population: 6,000; Design population: 60,000
B. Actual Flow: 1,650,000 gpd; Design Average Flow: 3,000,000 gpd;
Actual Peak Daily Flow: 1,500,000 gpd; Design Maximum Daily Flow: 10,000,000 gpd;
Design Wet Weather Event: 10 MGD

2.5 ADDITIONAL INFORMATION
A. Is a topographic map attached? ☐ YES ☑ NO Refer to Bypass Elimination Plan
B. Is a process flow diagram attached? ☑ YES ☐ NO

2.6 ESTIMATED PROJECT CONSTRUCTION COST
$ 4,700,000.00

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Trenton Municipal Utilities WWTP	(660) 359-3801	wwtp@trentonmo.com

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
98 Southwest Ash Lane	Trenton	MO	64683	Grundy

Wastewater Treatment Facility: Mo- 0039748 (Outfall 001 Of 001)

3.1 Legal Description: NE ¼, NW ¼, NW ¼, Sec. 27 , T 61N , R 24W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 449620 Northing (Y): 4434676
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Muddy Creek

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Trenton Municipal Utilities (Ron Urton)	(660) 359-2281	cityadmin@trentonmo.com

ADDRESS	CITY	STATE	ZIP CODE
1100 Main Street	Trenton	MO	64683

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
Trenton Municipal Utilities (Bob Hutchinson)	(660) 359-2281	wwtp@trentonmo.com

ADDRESS	CITY	STATE	ZIP CODE
1100 Main Street	Trenton	MO	64683

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 N/A

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 N/A

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 N/A

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 N/A

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
Jeff Barnard, Burns & McDonnell	(314) 682-1626	jbarnard@burnsmcd.com

ADDRESS	CITY	STATE	ZIP CODE
425 South Woods Mill Road, Suite 300	Chesterfield	MO	63017

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.

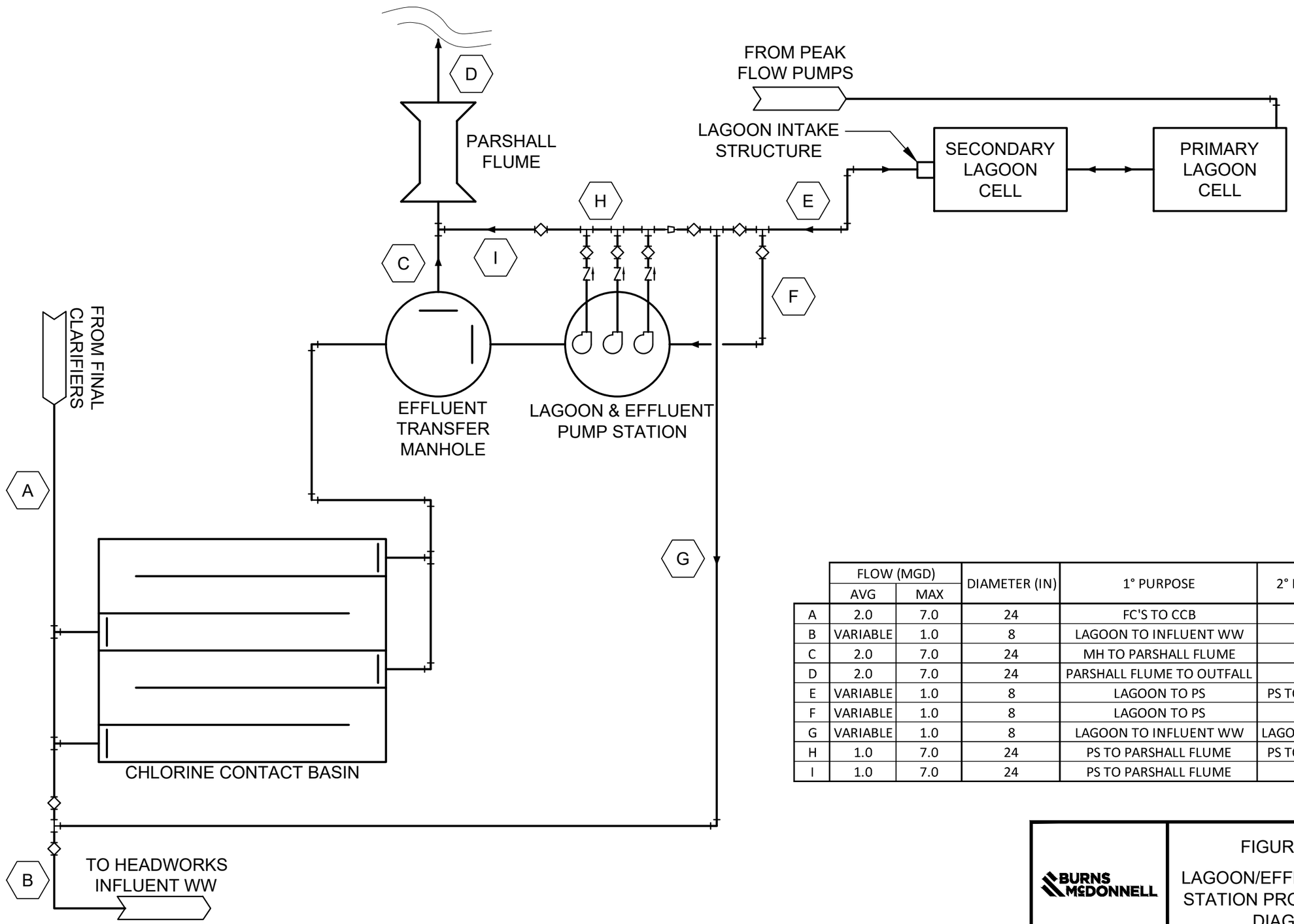
PROJECT OWNER SIGNATURE: Ronald R Urton Jr

PRINTED NAME	DATE
Ron Urton	4/17/18

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
City Administrator & Utility Director	(660) 359-2281	cityadmin@trentonmo.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.



	FLOW (MGD)		DIAMETER (IN)	1° PURPOSE	2° PURPOSE
	AVG	MAX			
A	2.0	7.0	24	FC'S TO CCB	N/A
B	VARIABLE	1.0	8	LAGOON TO INFLUENT WW	N/A
C	2.0	7.0	24	MH TO PARSHALL FLUME	N/A
D	2.0	7.0	24	PARSHALL FLUME TO OUTFALL	N/A
E	VARIABLE	1.0	8	LAGOON TO PS	PS TO LAGOON
F	VARIABLE	1.0	8	LAGOON TO PS	N/A
G	VARIABLE	1.0	8	LAGOON TO INFLUENT WW	LAGOON TO CCB
H	1.0	7.0	24	PS TO PARSHALL FLUME	PS TO LAGOON
I	1.0	7.0	24	PS TO PARSHALL FLUME	N/A

BURNS McDONNELL

FIGURE 2-10

LAGOON/EFFLUENT PUMP STATION PROCESS FLOW DIAGRAM

Memorandum

BURNS McDONNELL

Date: April 13, 2018

To: Ms. Leasue Meyers
Water Protection Program, Engineering Section

From: Caitlin Collins
Burns & McDonnell

Subject: Trenton Municipal Utilities WWTP – Summary of Design

Below is a summary of design, as required for the application for a construction permit and 10 CSR 20-8.110(5). This design summary is applicable to the design of a chlorination and dichlorination process (including a chlorine contact basin) and an effluent/lagoon return pump station. Chlorination will be accomplished with chemical injection of sodium hypochlorite, and dichlorination will be accomplished by injection of sodium bisulfite.

The Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers' 2014 Recommended Standard for Wastewater Facilities, more commonly known as the "Ten States Standards" is used as a guide for design of the Trenton WWTP. The Missouri Department of Natural Resources Design Guides, 10 CSR 20-8.190 is used in establishing the design basis.

Hydraulic Loadings

- Design average flow: 2.0 MGD
- Design peak hourly flow: 10 MGD.
- Impact from industrial sources: Conagra is shutting down in May 2018, and industrial loading will be significantly reduced.
- Floodplain impact: The existing WWTP is located within a Zone A 100-year floodplain, according to FEMA Flood Hazard Boundary Map Panel Number 2901500075, dated December 1, 1983. Hydrologic and hydraulic analysis was prepared to evaluate the floodplain impacts resulting from the proposed improvements within the Zone A regulatory floodplain (refer to attached figure). The analysis verifies that the proposed grading, fill, and structures will not have an adverse impact on the floodplain, and structures will be located above the 100-year flood elevation.

Chlorination

- Dosing rate: Jar testing was conducted to determine the required dose to meet an effluent E. coli limit of 206 CFU/100 mL. The jar testing yielded an initial chlorine demand of 0.5 mg/L and a chlorine residual of 0.8 mg/L. The required dose according to the jar testing results is 115 gpd at peak flow and 35 gpd at average day flow. However, the dosing system will be designed to provide a dose of 8 mg/L, as recommended by 10 CSR 20-8.190, which equates to a dosing rate of 380 gpd at peak flow and 110 gpd at average day flow.

- Chemical concentration: A 12.5% solution of sodium hypochlorite will be used.
- Storage Volume: Storage volume was calculated using a dose of 8 mg/L, a flow of 3.0 MGD (1.5 times the average day flow), and a storage time of 30 days. This design criteria necessitates a storage volume of 6,600 gallons of 12.5% sodium hypochlorite. Two, 5,000-gallon tanks will be provided for redundancy and to facilitate ease of chemical delivery/unloading.
- Unit flexibility: The pumps will have a minimum turndown ratio of 100:1.

Dechlorination

- Dosing rate: Dosing rate was calculated using a chlorine residual of 0.8 mg/L and a bisulfite to hypochlorite ratio of 1.6. The feed pumps will be capable of pumping 125 gpd at peak flow and 35 gpd at average day flow.
- Detention time: Sodium bisulfite will be injected 6 feet prior to the basin effluent to provide 30 seconds of detention time.
- Chemical concentration: A 38-40% solution of sodium bisulfite will be used.
- Storage Volume: Storage volume was calculated using a chlorine residual of 0.8 mg/L and a bisulfite to hypochlorite ratio of 1.6. This design criteria necessitates a storage volume of 2,000 gallons of 38-40% sodium bisulfite for the disinfection season. Two, 2,500-gallon tanks will be provided for redundancy and to facilitate ease of chemical delivery/unloading.
- Unit flexibility: The pumps will have a minimum turndown ratio of 100:1.

Chlorine Contact Basin

- Flow rates/velocities: The chlorine contact basin will be divided into two sub-basins, each capable of accommodating 3.5 MGD (half of the peak flow). Under normal operation, one sub-basin will be used, but under peak conditions, both sub-basins will be used.
- Detention time: The chlorine contact basin is sized to provide 15 minutes of contact time at peak flow.
- Mixing: Mixing will be provided to ensure adequate dispersion of the chemicals.
- Process control: Downward opening gates on the downstream side of the contact basin will be used to control water level within the basin.

Effluent/Lagoon Pump Station

- Dimensions: The pumps will be installed in a 14-ft by 12-ft rectangular wet well that is 21 feet deep. Valves will be housed in a 16-ft by 12-ft valve vault.
- Flow rates: The pump station will be equipped with two constant speed pumps capable of pumping 3.5 MGD each and one variable speed pump capable of pumping 600 gpm.
- Flow metering: Effluent flow metering will be accomplished by a 12-inch Parshall flume.

Please contact me at cacollins@burnsmcd.com or Jeff Barnard at jbarnard@burnsmcd.com if you have any questions.