

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

www.dnr.mo.gov

November 24, 2015

The Honorable James Orr, Mayor
City of Monett
217 5th Street
Monett, MO 65708

RE: C295452-02 City of Monett, MO – Monett Wastewater Treatment Facility (WWTF),
WWTF Ultraviolet (UV) Renovation, MO-0021440, Construction Permit No.
CP0001805

Dear Mayor Orr:

The Department of Natural Resources' Water Protection Program has reviewed and approved the plans and specifications submitted by Allgeier, Martin & Associates, Inc. for the city of Monett, MO. Please find enclosed Construction Permit No. CP0001805 and one set of approved specifications. One set of approved plans has been sent under separate cover by Mr. Conrad Blume of my staff. You must maintain these with your official project file for a minimum of four years following completion of the project.

This permit will terminate 12 months from the date of issuance. In accordance with 10 CSR 20-6.010(4)(G), the department may grant an extension only one time. If you believe that an extension is necessary, you must submit a request and a justification in writing for the extension at least 30 days prior to the permit expiration date.

Nothing in this permit removes any obligations to comply with county or other local ordinances or restrictions.

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



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The Honorable James Orr, Mayor
November 24, 2015
Page 2

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

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

Sincerely,

WATER PROTECTION PROGRAM



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

SM:cbc

Enclosures

c: Mr. Dean Willis, P.E., Allgeier, Martin, and Associates
Southwest Regional Office
Mr. Peter Burch, Water Protection Program, Compliance and Enforcement Section
Mr. Conrad Blume, E.I., Water Protection Program, Financial Assistance Center
Mr. Terry Nelson, Water Protection Program, Financial Assistance Center

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

City of Monett
217 5th Street
Monett, MO 65708

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

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

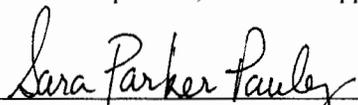
As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

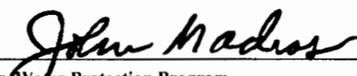
A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

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

November 24, 2015
Effective Date

November 23, 2016
Expiration Date


Sara Parker Pauley, Director, Department of Natural Resources


Director, Water Protection Program

CONSTRUCTION PERMIT

The proposed project consists of the renovation of the existing UV disinfection system by installing new equipment that will provide slightly increased levels of UV intensity, while also moving the ballast to an elevation above the maximum anticipated water level. The project also includes the construction and installation of all necessary appurtenances to make a complete and usable wastewater treatment facility. The project will also include general site work appropriate to the scope and purpose of the project. The improvements to the ultraviolet disinfection system will not impact the design capacity of the facility.

PERMIT CONDITIONS:

The permittee is authorized to construct subject to the following conditions:

1. All construction shall be in accordance with the plans and specifications submitted by Allgeier, Martin & Associates on October 13, 2015 and signed and sealed by Mr. Dean Willis, P.E. on October 7, 2015 and approved by the department on November 24, 2015.
2. Regulation 10 CSR 20-4.040(19)(B)1 requires that projects be publicly advertised, allowing sufficient time for bids to be prepared and submitted. Projects should be advertised at least 30 days prior to bid opening.
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. As per 10 CSR 20-4.040, all changes in contract price or time within the approved scope of work must be by change order in accordance with Section 20 of this rule.
5. This construction permit does not authorize discharge.
6. 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 Southwest Regional Office per 10 CSR 20-7.015(9)(E)2.
7. 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."

- A. 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.
 - B. Sewer mains shall be laid at least ten feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a ten foot separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.
 - C. Manholes should be located at least ten feet horizontally from any existing or proposed water main.
 - 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:
 - 1) 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
 - 2) Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends ten feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.
8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one acre or more to obtain a Missouri State Operating Permit to discharge stormwater. The permit requires Best Management Practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits may only be obtained by means of the department's ePermitting system available online at www.dnr.mo.gov/env/wpp/epermit/help.htm.

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

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

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

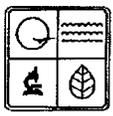
10. Upon completion of construction:
 - A. The city will become the continuing authority for operation, maintenance, and modernization of these facilities;
 - B. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(D); and
 - C. Submit an electronic copy of the as builds.

AP 22223
CP0001805

RECEIVED

OCT 23 2015

Folder Tracking # COR15313



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM Water Protection Program
**APPLICATION FOR CONSTRUCTION PERMIT -
WASTEWATER TREATMENT FACILITY**

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
SEE RECEIVED 3000.00	CHECK NO. 98744
DATE RECEIVED 10-23-15	

JS

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 #: C295452-02
- 1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
 YES Date of Approval: 01/14
- 1.3 Has the department approved the proposed project's facility plan*?
 YES Date of Approval: 01/14 NO N/A (If Not Applicable, complete No. 1.4.)
- 1.4 [Complete only if answered Not Applicable on No. 1.3.] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
 YES NO
- 1.5 Is a copy of the appropriate plans* and specifications* included with this application?
 YES Denote which form is submitted: Hard copy Electronic copy (See instructions.) NO
- 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 submittal. Denote which form: A B B2
 N/A Please explain: No changes to MSOP
- 1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? YES NO
- 1.9 Is the appropriate fee included with this application? YES NO (See instructions for appropriate fee.)

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

2.0 PROJECT INFORMATION

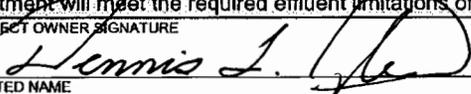
2.1 NAME OF PROJECT
WWTF UV Renovation Project No. C295452-02 for Monett , Missouri

2.2 PROJECT DESCRIPTION
Replacement of existing ultraviolet disinfection equipment with new equipment.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
No changes.

2.4 DESIGN INFORMATION
A. Current population: 8,864 ; Design population: 74,000
B. Actual Flow: 3.15 M gpd; Design Average Flow: 6.0 M gpd;
Actual Peak Daily Flow: 12 M gpd; Design Maximum Daily Flow: 12 M gpd; Design Wet Weather Event: 12 M

2.5 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 Monett Wastewater Treatment Plant		TELEPHONE NUMBER WITH AREA CODE 417-235-7455		E-MAIL ADDRESS dave@cityofmonett.com	
ADDRESS (PHYSICAL) 0.25 mi. NE of S Eisenhower & Hwy 60		CITY Monett	STATE MO	ZIP CODE 65708	COUNTY Barry
Wastewater Treatment Facility: Mo- 0021440 (Outfall 1 Of 1)					
3.1 Legal Description: <u>NW ¼, SE ¼, SE ¼, Sec. 36, T 26, R 28</u> (Use additional pages if construction of more than one outfall is proposed.)					
3.2 UTM Coordinates Easting (X): <u>416243</u> Northing (Y): <u>4086034</u> For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)					
3.3 Name of receiving streams: <u>Clear Cr</u>					
4.0 PROJECT OWNER					
NAME City of Monett		TELEPHONE NUMBER WITH AREA CODE (417) 235-4611		E-MAIL ADDRESS skipschaller@cityofmonett.com	
ADDRESS 217 5th Street		CITY Monett	STATE MO	ZIP CODE 65708	
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 Same as Owner		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS	
ADDRESS		CITY	STATE	ZIP CODE	
5.1 A letter from the continuing authority, if different than the owner, is included with this application. <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> 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? <input type="checkbox"/> YES <input checked="" type="checkbox"/> 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? <input type="checkbox"/> YES <input checked="" type="checkbox"/> 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? <input type="checkbox"/> YES <input checked="" type="checkbox"/> 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? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
6.0 ENGINEER					
ENGINEER NAME / COMPANY NAME Dean A. Willis		TELEPHONE NUMBER WITH AREA CODE (417) 680-7200		E-MAIL ADDRESS dean.willis@amce.com	
ADDRESS 7231 East 24th Street		CITY Joplin	STATE MO	ZIP CODE 64804-3485	
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 Dennis Pyle				DATE 10/20/2015	
TITLE OR CORPORATE POSITION City Administrator		TELEPHONE NUMBER WITH AREA CODE (417) 235-3355		E-MAIL ADDRESS dpyle@cityofmonett.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.					

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: 0 (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 1 Total Acres 75 Maximum % field slopes 10
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
(Use additional pages if greater than three irrigation sites.)

10.2 Type of vegetation: Grass hay Pasture Timber Row crops
 Other (describe) Golf course

10.3 Wastewater flow (dry weather) gallons per day: Average annual 3.18 mgd Seasonal NA Off-season NA

10.4 Land application rate (design flow including 1-in-10 year storm water flows):
Design: _____ inches/year _____ inches/hour 0.25 inches/day _____ inches/week
Actual: _____ inches/year _____ inches/hour 0.08 inches/day _____ inches/week

10.5 Total irrigation per year (gallons): Design: NA gal Actual: 20 M gal

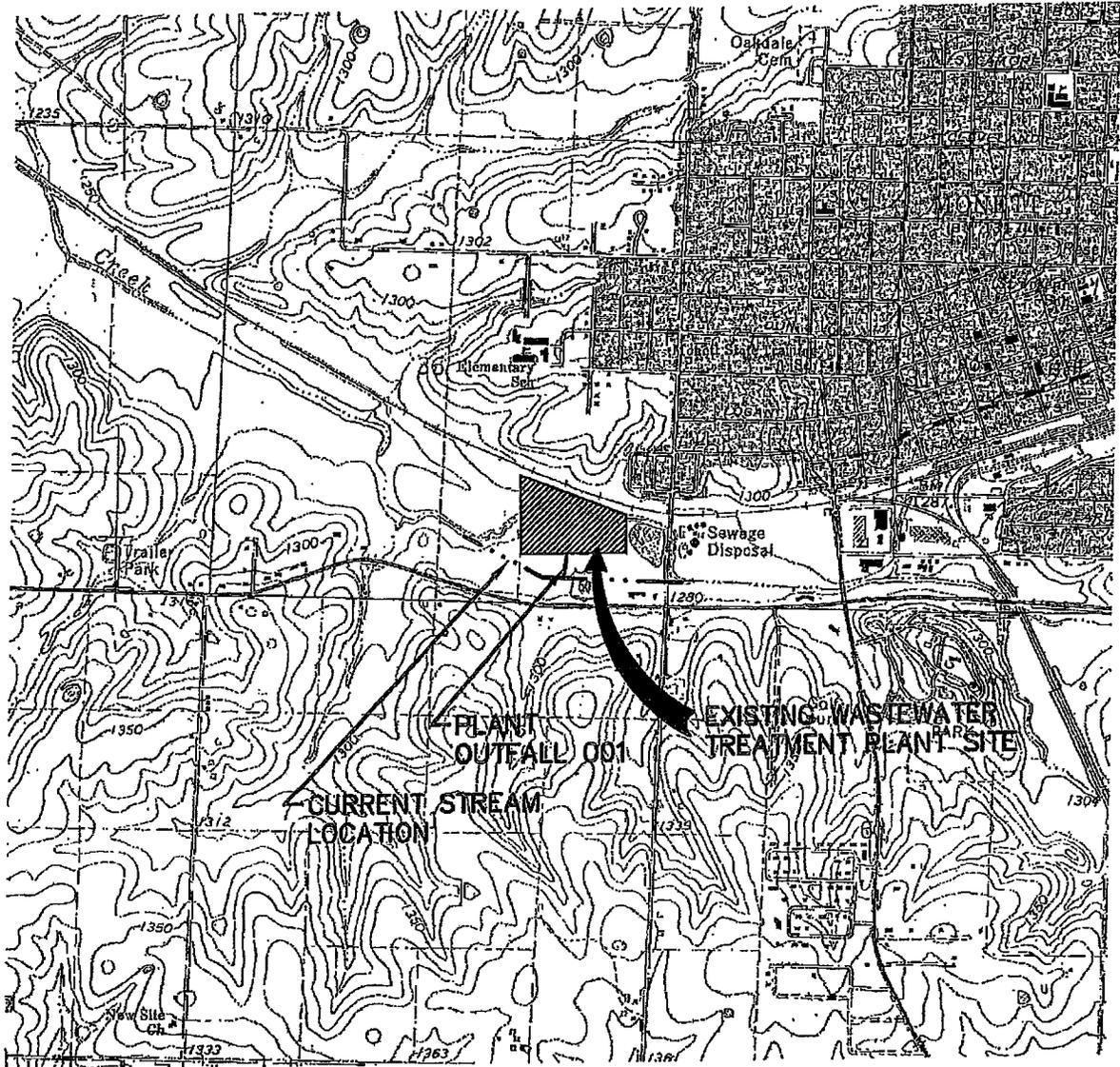
10.6 Actual months used for irrigation (check all that apply):
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

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



LOCATION MAP

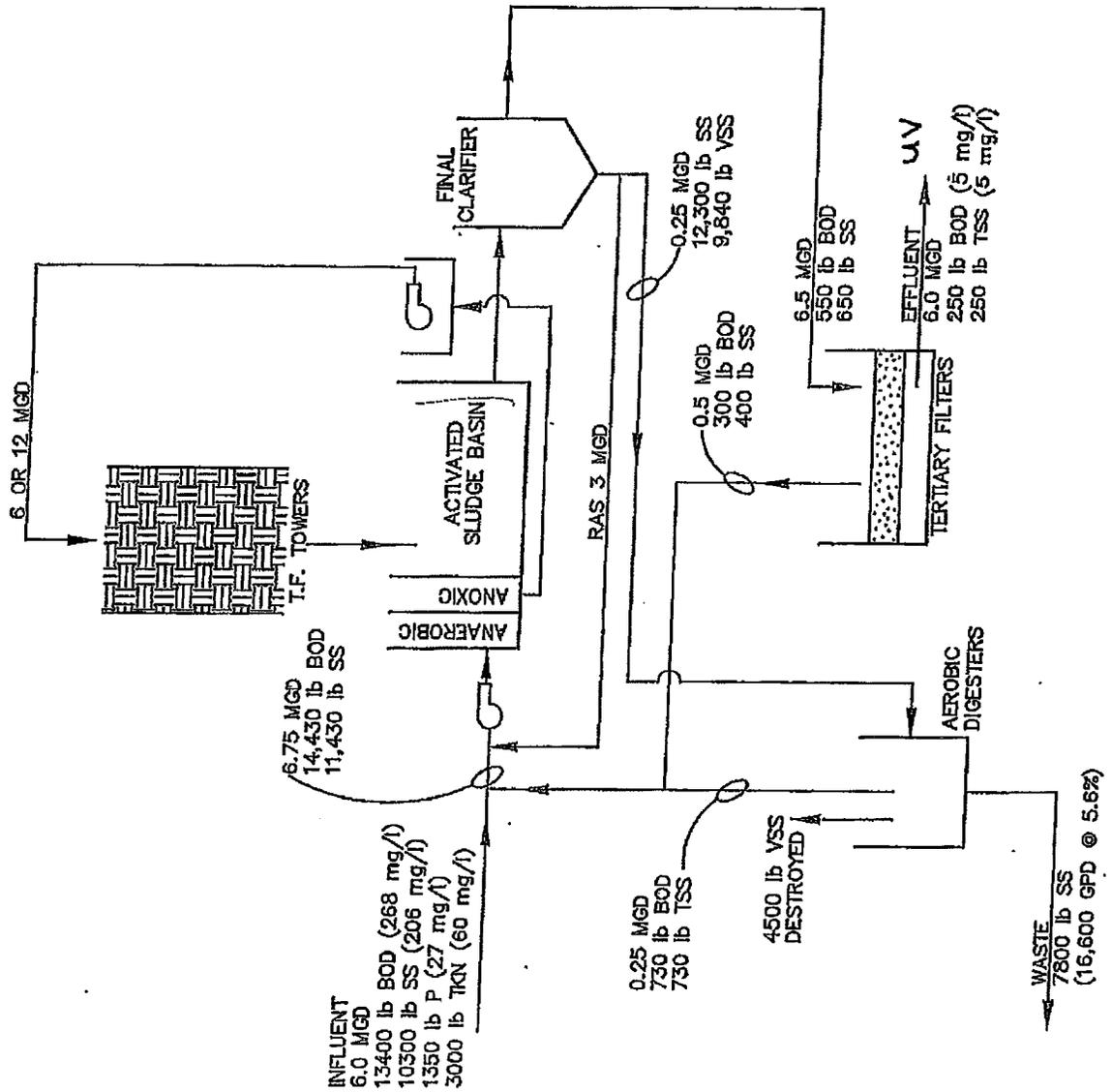
1" = 2000'-0"



**OUTFALL SITE PLAN
MONETT, MO.**



ALLGEIER, MARTIN and ASSOCIATES, INC.
CONSULTING ENGINEERS and SURVEYORS
7231 EAST 24th STREET JOPLIN, MISSOURI 64804 (417) 680-7200



PROCESS FLOW DIAGRAM
 W/ PLANT LOADINGS

DESIGN MEMORANDUM
WWTP UV RENOVATION - PROJECT C295452-02
MONETT, MISSOURI

WWTP DESIGN LOADINGS

Average Daily Design Flow =	6.0 mgd
Maximum Flow Through WWTP =	12.0 mgd
Average Design BOD =	13,400 lb/d
Average Design TSS =	10,300 lb/d

ANTICIPATED MONTHLY AVERAGE PERMIT LIMITS

Ammonia as N	
(Apr. 1 - Sept. 30)	1.4 mg/l
(Oct. 1 - Mar. 31)	2.1 mg/l
BOD(5)	10 mg/l
TSS	15 mg/l
pH	6.5 – 9.0 S.U.
E. Coli	126 Colonies/100 ml
Copper, T.R.	12.9 ug/l
Cadmium, T.R.	0.40 ug/l
Cyanide	4.1 ug/l
Selenium, T.R.	4.1 ug/l

FACILITIES DESIGN

General

The improvements to the ultraviolet disinfection equipment proposed for the Monett WWTP will not impact the design capacity of the facility, but will instead address issues with the reliability of the aging UV equipment. The existing equipment has worked successfully over the years, but the periodic inundation of the ballasts has resulted in significant costs to keep all units operational. The new equipment will provide slightly increased levels of UV intensity, while also moving the ballasts to an elevation above the maximum anticipated water level.

Ultraviolet Disinfection Equipment

The existing UV disinfection equipment that is being replaced is of a vertical lamp design, consisting of six 40-lamp modules, with three channels having two modules per channel. The existing lamps have an output of 60 watts per lamp, yielding a total output of 14,400 watts with all units in service. The existing modules are constructed with the lamp ballasts located within the top of the assembly, making them susceptible to inundation when and if the channels flood. When operational, the existing lamps have proven themselves capable of providing adequate disinfection under peak flow conditions.

In looking at manufacturers of replacement UV equipment it is important that the new equipment fit within the existing concrete channels and that the lamp ballasts be located above the highest water level that might be encountered during flooding of the channel. It is also required that the equipment provide a UV dose in excess of 30 mJ/sq.cm based on third-party bioassay testing using a UVT of 65 percent at a peak flow per channel of 4.0 mgd, and using MS2 test microorganisms. The replacement UV system must also provide the needed hydraulic capacity. After review of the equipment provided by various manufacturer's, two UV manufacturers have been identified that meet these requirements. Others will also be considered if they can show an ability to meet these conditions. The Calgon Carbon UV equipment is of a horizontal lamp configuration, and the Glasco equipment is of a vertical lamp design. Each fits within the existing channels and has the required remote ballasts.

Horizontal Lamp Design: The Calgon Carbon UV design utilizes modules consisting of eight amalgam, low pressure, high intensity lamps, with each lamp having a rated output of 205 watts UV-C (254 nm). Four modules are proposed per channel, yielding a total maximum output per channel of 6,560 watts, and a maximum overall output for the three channels of 19,680 watts. As an energy-conserving measure, the lamp output can be automatically varied in relation to the treated flow rate and water UV transmittance, from about 60% to 100% of its rated capacity. Utilization of the horizontal lamp design requires that the floor of the UV channel be raised somewhat to accommodate the design depth of the eight-lamp modules. The Calgon Carbon UV equipment provides approximately 36% more UV energy for disinfection than the existing system

Vertical Lamp Design: The Glasco design utilizes modules consisting of twenty-four amalgam, low pressure, high intensity lamps, with each lamp having a rated output of 110 watts UV-C (254 nm). Two modules are proposed per channel, yielding a total maximum output per channel of 5,280 watts, and a maximum overall output for the three channels of 15,840 watts. To conserve energy, individual rows of lamps can be automatically shut off in relation to effluent flow rate and UV transmittance of the water. The Glasco vertical design closely matches the configuration of the existing equipment that is being removed, and provides approximately 10% more UV energy for disinfection than the existing system.

DESIGN MEMORANDUM
WWTP UV RENOVATION - PROJECT C295452-02
MONETT, MISSOURI

WWTP DESIGN LOADINGS

Average Daily Design Flow =	6.0 mgd
Maximum Flow Through WWTP =	12.0 mgd
Average Design BOD =	13,400 lb/d
Average Design TSS =	10,300 lb/d

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BOD(5)	10 mg/l
TSS	15 mg/l
pH	6.5 – 9.0 S.U.
E. Coli	126 Colonies/100 ml
Copper, T.R.	12.9 ug/l
Cadmium, T.R.	0.40 ug/l
Cyanide	4.1 ug/l
Selenium, T.R.	4.1 ug/l

FACILITIES DESIGN

General

The improvements to the ultraviolet disinfection equipment proposed for the Monett WWTP will not impact the design capacity of the facility, but will instead address issues with the reliability of the aging UV equipment. The existing equipment has worked successfully over the years, but the periodic inundation of the ballasts has resulted in significant costs to keep all units operational. The new equipment will provide slightly increased levels of UV intensity, while also moving the ballasts to an elevation above the maximum anticipated water level.

Ultraviolet Disinfection Equipment

The existing UV disinfection equipment that is being replaced is of a vertical lamp design, consisting of six 40-lamp modules, with three channels having two modules per channel. The existing lamps have an output of 60 watts per lamp, yielding a total output of 14,400 watts with all units in service. The existing modules are constructed with the lamp ballasts located within the top of the assembly, making them susceptible to inundation when and if the channels flood. When operational, the existing lamps have proven themselves capable of providing adequate disinfection under peak flow conditions.

In looking at manufacturers of replacement UV equipment it is important that the new equipment fit within the existing concrete channels and that the lamp ballasts be located above the highest water level that might be encountered during flooding of the channel. It is also required that the equipment provide a UV dose in excess of 30 mJ/sq.cm based on third-party bioassay testing using a UVT of 65 percent at a peak flow per channel of 4.0 mgd, and using MS2 test microorganisms. The replacement UV system must also provide the needed hydraulic capacity. After review of the equipment provided by various manufacturer's, two UV manufacturers have been identified that meet these requirements. Others will also be considered if they can show an ability to meet these conditions. The Calgon Carbon UV equipment is of a horizontal lamp configuration, and the Glasco equipment is of a vertical lamp design. Each fits within the existing channels and has the required remote ballasts.

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