

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES  
MISSOURI CLEAN WATER COMMISSION



**MISSOURI STATE OPERATING PERMIT**

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92<sup>nd</sup> Congress) as amended,

Permit No.: MO-0044202

Owner: City of Jasper  
Address: 121 East Grand Avenue, Jasper, MO 64755

Continuing Authority: Same as above  
Address: Same as above

Facility Name: Jasper Wastewater Treatment Facility  
Facility Address: 0.3 miles south of West Morrison Avenue & 14B Road intersection, Jasper, MO 64755

Legal Description: See Page 2  
UTM Coordinates: See Page 2

Receiving Stream: See Page 2  
First Classified Stream and ID: See Page 2  
USGS Basin & Sub-watershed No.: See Page 2

authorizes activities pursuant to the terms and conditions of this permit in accordance with the Missouri Clean Water Law and/or the National Pollutant Discharge Elimination System; it does not apply to other regulated activities.

**FACILITY DESCRIPTION**

See Page 2

April 1, 2023  
Effective Date

March 31, 2028  
Expiration Date

  
\_\_\_\_\_  
John Hoke, Chief, Water Pollution Control Branch

**FACILITY DESCRIPTION (continued):**

**Outfall #002** – POTW

The use or operation of this facility shall be by or under the supervision of a Certified “C” Operator.

Influent lift station / partially mixed baffled three-cell aerated facultative lagoon / anaerobic Lemna settling basin (covered) / flow meter / UV disinfection / reaeration steps / sludge retained in lagoon until biosolids are land applied / secondary stormwater basin lift station / wet weather peak flow basin / wet weather flows irrigated as needed.

Design population equivalent is 1,405.

Design flow is 135,000 gallons per day.

Actual flow is 170,835 gallons per day.

Design sludge production is 280 dry tons/year.

Legal Description:	Sec. 23, T30N, R31W, Jasper County
UTM Coordinates:	X=383874, Y=4132182
Receiving Stream:	Tributary to Cripple Creek
First Classified Stream and ID:	Presumed Use Streams (C) (5079)
USGS Basin & Sub-watershed No.:	(11070207-0306)

**Permitted Feature INF** – Influent Monitoring Location – Influent manhole.

Legal Description:	Sec. 23, T30N, R31W, Jasper County
UTM Coordinates:	X=384245, Y=4132463

**Permitted Feature #003** – Irrigation Field

Legal Description:	Sec. 23, T30N, R31W, Jasper County
UTM Coordinates:	X =383993, Y = 4131958
Receiving Stream:	Tributary to Opossum Creek
First Classified Stream and ID:	Opossum Creek (C) (3190) 303(d) List
USGS Basin & Sub-watershed No.:	(11070207-0306)

**Wastewater Irrigation Design Parameters:**

Irrigation volume per year: 43,800,000 gallons (based on annual irrigation rate)

Irrigation areas: 90 acres at design loading

Irrigation rates: 0.15 inch/hour; 0.45 inch/day; 0.8 inches/week; 22 inches/year

Field slopes: less than 5 percent

Equipment type: traveling gun

Vegetation: grass hay and row crops

Irrigation rate is based on: Hydraulic loading rate

OUTFALL #002	TABLE A-1. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in <b>Table A-1</b> shall become effective on <b>April 1, 2023</b> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
eDMR Limit Set: M						
Flow	MGD	*		*	once/week	24 hr. total
Biochemical Oxygen Demand <sub>5</sub>	mg/L		45	30	once/month	composite**
Total Suspended Solids	mg/L		45	30	once/month	composite**
<i>E. coli</i> ( <b>Note 1</b> )	#/100mL		1,030	206	once/week	grab
Ammonia as N (January)	mg/L	12.1		3.1	once/month	composite**
Ammonia as N (February)	mg/L	10.1		2.7	once/month	composite**
Ammonia as N (March)	mg/L	12.1		3.1	once/month	composite**
Ammonia as N (April)	mg/L	12.1		2.7	once/month	composite**
Ammonia as N (May)	mg/L	12.1		2.2	once/month	composite**
Ammonia as N (June)	mg/L	12.1		1.7	once/month	composite**
Ammonia as N (July)	mg/L	12.1		1.5	once/month	composite**
Ammonia as N (August)	mg/L	10.1		1.3	once/month	composite**
Ammonia as N (September)	mg/L	12.1		1.8	once/month	composite**
Ammonia as N (October)	mg/L	12.1		2.5	once/month	composite**
Ammonia as N (November)	mg/L	12.1		3.1	once/month	composite**
Ammonia as N (December)	mg/L	12.1		3.1	once/month	composite**
EFFLUENT PARAMETER(S)	UNITS	MINIMUM		MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH – Units***	SU	6.5		9.0	once/month	grab
EFFLUENT PARAMETER(S)			UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand <sub>5</sub> – Percent Removal ( <b>Note 2, Page 5</b> )			%	85	once/month	calculated
Total Suspended Solids – Percent Removal ( <b>Note 2, Page 5</b> )			%	85	once/month	calculated
MONITORING REPORTS SHALL BE SUBMITTED <b>MONTHLY</b> ; THE FIRST REPORT IS DUE <u>MAY 28, 2023</u> .						

\* Monitoring requirement only.

\*\* A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

\*\*\* pH is measured in pH units and is not to be averaged.

**Note 1 –** Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

OUTFALL #002	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in <b>Table A-2</b> shall become effective on <b>April 1, 2023</b> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
eDMR Limit Set: Q						
Total Phosphorus	mg/L	*		*	once/quarter****	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/quarter****	calculated
Total Nitrogen (Note 3, Page 5)	mg/L	*		*	once/quarter****	calculated
Nitrite + Nitrate	mg/L	*		*	once/quarter****	composite**
Oil & Grease	mg/L	15		10	once/quarter****	grab
MONITORING REPORTS SHALL BE SUBMITTED <b>QUARTERLY</b> ; THE FIRST REPORT IS DUE <u>JULY 28, 2023</u> .						

\* Monitoring requirement only.

\*\* A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

\*\*\*\* See table below for quarterly sampling requirements.

Quarterly Minimum Sampling Requirements			
Quarter	Months	Quarterly Effluent Parameters	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 <sup>th</sup>
Second	April, May, June	Sample at least once during any month of the quarter	July 28 <sup>th</sup>
Third	July, August, September	Sample at least once during any month of the quarter	October 28 <sup>th</sup>
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 <sup>th</sup>

PERMITTED FEATURE #003 <sup>γ</sup>	TABLE A-3 IRRIGATION SYSTEM LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to conduct irrigation of wastewater as specified in the application for this permit. The final limitations shall become effective on <u>April 1, 2023</u> and remain in effect until expiration of the permit. The irrigation of wastewater shall be controlled, limited and monitored by the permittee as specified below:						
IRRIGATION OPERATIONAL MONITORING PARAMETER(S)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY TOTAL	WEEKLY TOTAL	MONTHLY TOTAL	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: LW						
Irrigation Period	hours	*		*	daily	total
Volume Irrigated	gallons	*		*	daily	total
Irrigation Area	acres	*		*	daily	total
Irrigation Rate	inches	*		*	daily	total
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MAY 28, 2023</u> .						

\* Monitoring requirement only.

<sup>γ</sup> If irrigation did not occur during the report period, report as “No Discharge”.

PERMITTED FEATURE <u>INF</u>	TABLE B-1. INFLUENT MONITORING REQUIREMENTS					
The monitoring requirements in <b>Table B-1</b> shall become effective on <u>April 1, 2023</u> and remain in effect until expiration of the permit. The influent wastewater shall be monitored by the permittee as specified below:						
PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
eDMR Limit Set: IM						
Biochemical Oxygen Demand <sub>5</sub> ( <b>Note 2</b> )	mg/L			*	once/month	composite**
Total Suspended Solids ( <b>Note 2</b> )	mg/L			*	once/month	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MAY 28, 2023</u> .						
eDMR Limit Set: IQ						
Ammonia as N	mg/L	*		*	once/quarter****	composite**
Total Phosphorus	mg/L	*		*	once/quarter****	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/quarter****	calculated
Total Nitrogen ( <b>Note 3</b> )	mg/L	*		*	once/quarter****	calculated
Nitrite + Nitrate	mg/L	*		*	once/quarter****	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>JULY 28, 2023</u> .						

\* Monitoring requirement only.

\*\* A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

\*\*\*\* See table below for quarterly sampling requirements.

**Note 2** – Influent sampling for BOD<sub>5</sub> and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula:  $[(\text{Average Influent} - \text{Average Effluent}) / \text{Average Influent}] \times 100\% = \text{Percent Removal}$ . Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

**Note 3** - Total Nitrogen Consists of Total Kjeldahl Nitrogen and Nitrite + Nitrate.

Quarterly Minimum Sampling Requirements			
Quarter	Months	Quarterly Influent Parameters	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 <sup>th</sup>
Second	April, May, June	Sample at least once during any month of the quarter	July 28 <sup>th</sup>
Third	July, August, September	Sample at least once during any month of the quarter	October 28 <sup>th</sup>
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 <sup>th</sup>

### C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein. Annual reports required per Standard Conditions Part III Section K shall be submitted online to the Department via the Department's eDMR system as an attachment. This supersedes Standard Conditions Part III Section K #4. EPA reports shall continue to be submitted online via the Central Data Exchange system.

## **D. SPECIAL CONDITIONS**

1. **Electronic Discharge Monitoring Report (eDMR) Submission System.** Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program. All reports uploaded into the system shall be reasonably named so they are easily identifiable, such as “WET Test Chronic Outfall 002 Jan 2023,” or “Outfall 004 Daily Data Mar 2025.”
  - (a) eDMR Registration Requirements. The permittee must register with the Department’s eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at <https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem>. Information about the eDMR system can be found at <https://dnr.mo.gov/water/business-industry-other-entities/reporting/electronic-discharge-monitoring-reporting-system-edmr>. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
  - (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: <https://apps5.mo.gov/mogems/welcome.action>. If you experience difficulties with using the eDMR system you may contact [edmr@dnr.mo.gov](mailto:edmr@dnr.mo.gov) or call 855-789-3889 or 573-526-2082 for assistance.
  - (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: <https://dnr.mo.gov/document-search/electronic-discharge-monitoring-report-waiver-request-form-mo-780-2692>. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.
2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
  - (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
    - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
    - (2) controls any pollutant not limited in the permit.
  - (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.
3. All outfalls must be clearly marked in the field.
4. Report as no-discharge when a discharge does not occur during the report period.
5. Reporting of Non-Detects:
  - (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
  - (b) See sufficiently sensitive test method requirements in Standard Conditions Part I, Section A, No. 4 regarding proper testing and method minimum levels used for sample analysis.
  - (c) The permittee shall not report a sample result as “Non-Detect” without also reporting the method minimum level of the test. Reporting as “Non Detect” without also including the method minimum level, will be considered failure to report, which is a violation of this permit.
  - (d) The permittee shall provide the “Non-Detect” sample result using the less than symbol and the method minimum level (e.g., <50 µg/L, if the method minimum level for the parameter is 50 µg/L).
  - (e) Where the permit contains a Department determined Minimum Quantification Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
  - (f) For the daily maximum, the facility shall report the highest value. If the highest value was a non-detect, use the less than “<” symbol and the laboratory’s highest method minimum level.
  - (g) For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.
  - (h) For reporting an average based on a mix of detected and non-detected values (not including *E. coli*), assign a value of “0” for all non-detects for that reporting period and report the average of all the results.
  - (i) When *E. coli* is not detected above the method minimum level, the permittee must report the data qualifier signifying less than detection limit for that parameter (e.g., <1 #/100mL, if the method minimum level is 1 #/100mL).

For reporting a geometric mean based on a mix of detected and non-detected values, use one-half of the detection limit (instead of zero) for non-detects when calculating geometric means.

(j) See the Fact Sheet Appendix - Non-Detect Example Calculations for further guidance.

6. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).
7. The permittee shall comply with any applicable requirements listed in 10 CSR 20-9, unless the facility has received written notification that the Department has approved a modification to the requirements. The monitoring frequencies contained in this permit shall not be construed by the permittee as a modification of the monitoring frequencies listed in 10 CSR 20-9. To request a modification of the operational control testing requirements listed in 10 CSR 20-9, the permittee shall submit a permit modification application and fee to the Department requesting a deviation from the operational control monitoring requirements. Upon approval of the request, the Department will modify the permit.
8. The permittee shall continue to implement and update if necessary, the program for maintenance and repair of its collection system. The permittee may compare collection system performance results and other data with the benchmarks used in the Departments' Capacity, Management, Operation, And Maintenance (CMOM) Model, located at <https://dnr.mo.gov/document-search/capacity-management-operations-maintenance-plan-editable-template>. Additional information regarding the Departments' CMOM Model is available at <https://dnr.mo.gov/print/document-search/pub2574>.

The permittee shall also submit a report via the Electronic Discharge Monitoring Report (eDMR) Submission System annually, by January 28<sup>th</sup>, for the previous calendar year. The report shall contain the following information:

- (a) A summary of the efforts to locate and eliminate specific sources of excessive infiltration and inflow into the collection system serving the facility for the previous year.
  - (b) A summary of the general maintenance and repairs to the collection system serving the facility for the previous year.
  - (c) A summary of any planned maintenance and repairs to the collection system serving the facility for the upcoming calendar year. This list shall include locations (GPS, 911 address, manhole number, etc.) and actions to be taken.
9. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Southwest Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: <https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem> or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.
  10. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.
  11. The permittee shall develop, maintain and implement an Operation and Maintenance (O&M) Manual that includes all necessary items to ensure the operation and integrity of the waste handling and wastewater irrigation systems, including key operating procedures, an aerial or topographic site map with the permitted features, irrigation fields, and irrigation buffer zones marked key operating procedures and a brief summary of the operation of the facility. The O&M manual shall be made available to the operator and shall be reviewed and updated at least every five years or when there is a change in equipment or irrigation sites.
  12. An all-weather access road to the treatment facility shall be maintained.
  13. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably ensure its structural stability, freedom from stoppage, and that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.
  14. The lagoon(s) and storage basin shall be operated and maintained to ensure their structural integrity, which includes maintaining adequate freeboard and keeping the berms free of deep-rooted vegetation, animal dens, or other potential sources of damage.
  15. The facility shall ensure that adequate provisions are provided to prevent or minimize surface water intrusion into the lagoon(s) and storage basin and to divert stormwater runoff around the lagoon(s) and storage basin and protect embankments from erosion.
  16. Wastewater Irrigation System

- (a) General Irrigation Requirements. The wastewater irrigation system shall be operated so as to provide uniform distribution of irrigated wastewater over the entire irrigation site. A complete ground cover of vegetation shall be maintained on the irrigation site unless the system is approved for row crop irrigation. The wastewater irrigation system shall be capable of irrigating the annual design flow during an irrigation period of 100 days or less per year. If the facility determines that night time irrigation is needed, the facility shall submit a night time irrigation plan to the Department's Water Protection Program for review and approval. Night time irrigation shall only occur when the Department has approved the night time irrigation plan.
  - (b) Saturated/Frozen Conditions. There shall be no surface irrigation during ground frost; frozen, snow-covered, or saturated soil conditions; or when precipitation is imminent or occurring.
  - (c) Slope Restrictions. Wastewater irrigation on slopes exceeding 10%, the hourly irrigation rate shall not exceed one-half (1/2) the design sustained permeability and in no case shall exceed one-half (1/2) inch per hour.
  - (d) Set Backs. There shall be no irrigation within:
    - (1) 150 feet of dwelling or public use areas;
    - (2) 50 feet of the property line or public road;
    - (3) 300 feet of any sinkhole, losing stream, or any other feature that may provide a connection to the ground water table and the surface;
    - (4) 300 feet from any existing potable water supply well not located on the property;
    - (5) 100 feet of any gaining streams (classified or unclassified; perennial or intermittent), wetlands, ponds, or lakes. As a compliance alternative a 35-foot vegetative buffer that is permanently covered with perennial vegetation may be substituted for the 100 foot set-back requirement; and
    - (6) If an established vegetated buffer or the wastewater is disinfected, the setbacks established in subsections (1)-(5) above may be decreased if the permittee demonstrates the risk is mitigated.
  - (e) Public Access Restrictions. Public access shall not be allowed to public-use-area surface irrigation sites when irrigation is occurring.
  - (f) Grazing and Harvesting of Forage Crops Restrictions. Grazing of animals shall be deferred as per the following:
    - (1) From May 1 to October 31, the minimum deferment from grazing or forage harvesting shall be 14 days.
    - (2) From November 1 to April 30, the minimum deferment from grazing or forage harvesting shall be 30 days.
  - (g) Irrigated Wastewater Disinfection. Wastewater shall be disinfected prior to irrigation (not storage) to public-use-areas.
  - (h) Equipment Checks during Irrigation. The irrigation system, including application sites, shall be visually inspected during periods of wastewater irrigation to check for equipment malfunctions and runoff from the irrigation site. Inspections shall occur once per day for surface irrigation.
17. Wastewater irrigation records shall be maintained and summarized into an annual operating report for the previous calendar year. This annual report is in addition to the reporting requirements listed in Table A and the report shall be kept onsite and made available to Department personnel upon request. The summarized annual report shall include the following:
- (a) Record of maintenance and repairs performed during the year, average number of times per month the facility is checked to see if it is operating properly, and description of any unusual operating conditions encountered during the year;
  - (b) The number of days the storage basin(s) has discharged during the year, the discharge flow, and the reasons discharge occurred; and
  - (c) A summary of the irrigation operations for the year including: the number of days of irrigation, the total gallons irrigated, the total acres used, the irrigation rate in inches for the year, and the annual precipitation received at the facility.
18. Wastewater Irrigation Sites. To add additional irrigation sites or to convert any of the land to public-use-areas, a construction permit, geohydrologic evaluation, soils report, and permit modification may be required. The facility shall contact the Department for a written determination.

## **E. NOTICE OF RIGHT TO APPEAL**

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty 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 AHC. Any appeal should be directed to:

Administrative Hearing Commission  
U.S. Post Office Building, Third Floor  
131 West High Street, P.O. Box 1557  
Jefferson City, MO 65102-1557  
Phone: 573-751-2422  
Fax: 573-751-5018  
Website: <https://ahc.mo.gov>



**MISSOURI DEPARTMENT OF NATURAL RESOURCES**  
**FACT SHEET**  
**FOR THE PURPOSE OF RENEWAL**  
**OF**  
**MO-0044202**  
**JASPER WASTEWATER TREATMENT FACILITY**

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)(A)2.], a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

### **Part I – Facility Information**

Application Date: 04/25/22  
Expiration Date: 09/30/22

Facility Type and Description: POTW - Influent lift station / partially mixed baffled three-cell aerated facultative lagoon / anaerobic Lemna settling basin (covered) / flow meter / UV disinfection / reaeration steps / sludge retained in lagoon until biosolids are land applied / secondary stormwater basin lift station / wet weather peak flow basin / wet weather flows irrigated as needed.

#### **PERMITTED FEATURE(S) TABLE:**

PERMITTED FEATURE	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
Outfall #002	0.21	Secondary	Domestic
#003	<i>Irrigation Field</i>		

#### **Comments:**

Changes in this permit for Outfall #001 include the revision of ammonia final effluent limits and the removal of Acute WET test requirements. Changes in this permit for Permitted Feature INF include the addition of quarterly nutrient monitoring for Ammonia as N, Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Total Nitrogen. See Part II of the Fact Sheet for further information regarding the addition, revision, and removal of effluent parameters.

Special conditions were updated to include the revision of the Electronic Discharge Monitoring Report (eDMR) Submission System, the revision of reporting Non-Detects, the removal of the requirement to cease discharge and connect to a facility with an area-wide management plan due no higher continuing authority being available, the removal of the special condition regarding changes to existing pollutants or addition of new pollutants to the treatment facility, the removal of special conditions requiring gates and warning signs, but the facility must remain sufficiently secured to restrict access per special condition 10, the removal of the land application of biosolids special condition, however land application of biosolids must occur in accordance with Standard Conditions Part III.

### **Part II – Effluent Limitations and Monitoring Requirements**

#### **OUTFALL #002– MAIN FACILITY OUTFALL**

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

## RECEIVING STREAM(S) TABLES:

### OUTFALL #002 - RECEIVING STREAM INFORMATION

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Tributary to Cripple Creek	--	--	--	11070207-0306	0.05
Presumed Use Streams	C	5079	AHP, IRR, LWP, HHP, SCR, WBC-B		
Opossum Creek	C	3190	AHP, IRR, LWP, HHP, SCR, WBC-B		0.34

### OUTFALL #003 - RECEIVING STREAM INFORMATION

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Tributary to Opossum Creek	--	--	General Criteria	11070207-0306	0.25
Opossum Creek	C	3190	AHP, IRR, LWP, HHP, SCR, WBC-B		

\*As per 10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission's water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1<sup>st</sup> classified receiving stream's beneficial water uses to be maintained are in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses found in the receiving streams table, above:

10 CSR 20-7.031(1)(C)1.:

**AHP** = Aquatic Habitat Protection - To ensure the protection and propagation of fish, shellfish, and wildlife. AHP is further subcategorized as:

**WWH** = Warm Water Habitat;

**CLH** = Cool Water Habitat;

**CDH** = Cold Water Habitat;

**EAH** = Ephemeral Aquatic Habitat;

**MAH** = Modified Aquatic Habitat;

**LAH** = Limited Aquatic Habitat.

This permit uses Aquatic Life Protection effluent limitations in 10 CSR 20-7.031 Table A for all aquatic habitat designations unless otherwise specified.

10 CSR 20-7.031(1)(C)2.: Recreation in and on the water

**WBC** = Whole Body Contact recreation where the entire body is capable of being submerged. WBC is further subcategorized as:

**WBC-A** = Whole body contact recreation that supports swimming uses and has public access;

**WBC-B** = Whole body contact recreation that supports swimming;

**SCR** = Secondary Contact Recreation (like fishing, wading, and boating).

10 CSR 20-7.031(1)(C)3. to 7.:

**HHP** = Human Health Protection as it relates to the consumption of fish;

**IRR** = Irrigation - Application of water to cropland or directly to cultivated plants that may be used for human or livestock consumption;

**LWP** = Livestock and wildlife protection - Maintenance of conditions in waters to support health in livestock and wildlife;

**DWS** = Drinking water supply;

**IND** = Industrial water supply

10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)

**WSA** = Storm- and flood-water storage and attenuation;

**WHP** = Habitat for resident and migratory wildlife species;

**WRC** = Recreational, cultural, educational, scientific, and natural aesthetic values and uses;

**WHC** = Hydrologic cycle maintenance.

10 CSR 20-7.031(6):

**GRW** = Groundwater

**RECEIVING STREAM(S) LOW-FLOW VALUES:**

RECEIVING STREAM	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Tributary to Cripple Creek	0	0	0

**MIXING CONSIDERATIONS**

Mixing Zone: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)].

Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(b)].

Receiving Water Body's Water Quality

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

- ✓ This facility discharges to a 303(d) listed stream. Opossum Creek is listed on the 2020 Missouri 303(d) List for *E. coli*. Additionally, North Fork Spring River is listed on the 2020 Missouri 303(d) list for *E. coli* and Dissolved Oxygen.
  - It is unknown at this time if the facility is a source of the above listed pollutant(s) or considered to contribute to the impairment of Opossum Creek or to the *E. coli* and DO impairment of North Fork Spring River. Once a TMDL is developed, the permit may be modified to include WLAs from the TMDL.
- ✓ This facility discharges to a watershed with an EPA established TMDL. North Fork Spring River has a TMDL for sediment established in 2006. The TMDL sets WLAs for point sources in the watershed, and for this facility the Total Suspended Solids WLAs are 0.04 tons/day (80 lb/day) as a weekly average and 0.025 tons/day (50 lb/day) as a monthly average. The WLAs equate to concentrations of 56 mg/L as a weekly average and 35 mg/L as a monthly average at actual flows of 0.17 MGD, so the secondary technology based effluent limits for TSS in this permit will result in TSS loading below the specified WLAs and are therefore consistent with the assumptions and requirements of the TMDL.

**CHANGES TO EFFLUENT LIMITATIONS TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type *
Ammonia as N (January)	mg/L	2, 3	12.1		3.1	7.5/2.9	1/month	monthly	C
Ammonia as N (February)	mg/L	2, 3	10.1		2.7	7.5/2.9	1/month	monthly	C
Ammonia as N (March)	mg/L	2, 3	12.1		3.1	7.5/2.9	1/month	monthly	C
Ammonia as N (April)	mg/L	2, 3	12.1		2.7	3.8/1.4	1/month	monthly	C
Ammonia as N (May)	mg/L	2, 3	12.1		2.2	3.8/1.4	1/month	monthly	C
Ammonia as N (June)	mg/L	2, 3	12.1		1.7	3.8/1.4	1/month	monthly	C
Ammonia as N (July)	mg/L	2, 3	12.1		1.5	3.8/1.4	1/month	monthly	C
Ammonia as N (August)	mg/L	2, 3	10.1		1.3	3.8/1.4	1/month	monthly	C
Ammonia as N (September)	mg/L	2, 3	12.1		1.8	3.8/1.4	1/month	monthly	C
Ammonia as N (October)	mg/L	2, 3	12.1		2.5	7.5/2.9	1/month	monthly	C
Ammonia as N (November)	mg/L	2, 3	12.1		3.1	7.5/2.9	1/month	monthly	C
Ammonia as N (December)	mg/L	2, 3	12.1		3.1	7.5/2.9	1/month	monthly	C

\* - G = Grab

**Basis for Limitations Codes:**

- |  |                                   |   |
|--|-----------------------------------|---|
| 1. State or Federal Regulation/Law       | 5. Antidegradation Policy         | 9. WET Test Policy                        |
| 2. Water Quality Standard (includes RPA) | 6. Water Quality Model            | 10. Multiple Discharger Variance          |
| 3. Water Quality Based Effluent Limits   | 7. Best Professional Judgment     | 11. Nutrient Criteria Implementation Plan |
| 4. Antidegradation Review                | 8. TMDL or Permit in lieu of TMDL |   |

## OUTFALL #002 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD<sub>5</sub>).** Operating permit retains 45 mg/L as a Weekly Average and 30 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(8) for discharges to All Other Waters.
- **Total Suspended Solids (TSS).** Operating permit retains 45 mg/L as a Weekly Average and 30 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(8) for discharges to All Other Waters, as the technology based effluent limits were found to be more stringent than the limits determined by the North Fork Spring River TMDL for TSS.

Table 5 of the TMDL assigns WLAs to Outfall 002 as 0.04 tons/day (80 lb/day) as a weekly average and 0.025 tons/day (50 lb/day) as a monthly average. This is based on a design flow of 0.135 MGD and concentration limits of 70 mg/L weekly and 45 mg/L monthly, which were Outfall #002's permitted limits when the TMDL was approved in 2006.

The WLAs equate to concentrations of 56 mg/L as a weekly average and 35 mg/L as a monthly average at actual flows of 0.17 MGD, so the secondary technology based effluent limits for TSS in this permit will result in TSS loading below the specified WLAs and are therefore consistent with the assumptions and requirements of the TMDL.

Additionally, the actual flow through the facility exceeds the design flow. The loading of the increased flow was considered during the drafting of this permit and determined to be within the established wasteload allocation, therefore the permit retains 45 mg/L as a weekly average and 30 mg/L as a monthly average.

- ***Escherichia coli (E. coli)*.** Monthly average of 206 per 100 mL as a geometric mean and Weekly Average of 1,030 per 100 mL as a geometric mean during the recreational season (April 1 – October 31), for discharges within two miles upstream of segments or lakes with Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.015(9)(B). An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d). The Geometric Mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 6, 10, and 5 (#/100mL). Geometric Mean = 5<sup>th</sup> root of (1)(4)(6)(10)(5) = 5<sup>th</sup> root of 1,200 = 4.1 #/100mL.
- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L. No mixing considerations allowed; therefore, WLA = appropriate criterion.

The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation approach. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation:

$$C_e = \frac{(Q_e + Q_s)C - (Q_s \times C_s)}{(Q_e)}$$

Where C = downstream concentration      C<sub>e</sub> = effluent concentration  
Cs = upstream concentration      Q<sub>e</sub> = effluent flow  
Q<sub>s</sub> = upstream flow

In the event that mixing considerations derive an AML less stringent than the MDL, the AML and MDL will be equal and based on the MDL.

Month	Temp (°C)*	pH (SU)*	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
January	8.1	7.8	3.1	12.1
February	9.3	7.9	2.7	10.1
March	13.0	7.8	3.1	12.1
April	16.7	7.8	2.7	12.1
May	20.0	7.8	2.2	12.1
June	24.0	7.8	1.7	12.1
July	26.6	7.8	1.5	12.1
August	26.5	7.9	1.3	10.1
September	23.5	7.8	1.8	12.1
October	18.0	7.8	2.5	12.1
November	14.0	7.8	3.1	12.1
December	10.0	7.8	3.1	12.1

\* Ecoregion data (Ozark Highlands)

### January

Chronic WLA:

$$C_e = ((0.21 + 0.0)3.1 - (0.0 * 0.01))/0.21 = 3.1 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **3.1** mg/L

Acute WLA = MDL = **12.1** mg/L

### March

Chronic WLA:

$$C_e = ((0.21 + 0.0)3.1 - (0.0 * 0.01))/0.21 = 3.1 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **3.1** mg/L

Acute WLA = MDL = **12.1** mg/L

### May

Chronic WLA:

$$C_e = ((0.21 + 0.0)2.2 - (0.0 * 0.01))/0.21 = 2.2 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **2.2** mg/L

Acute WLA = MDL = **12.1** mg/L

### July

Chronic WLA:

$$C_e = ((0.21 + 0.0)1.5 - (0.0 * 0.01))/0.21 = 1.5 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **1.5** mg/L

Acute WLA = MDL = **12.1** mg/L

### February

Chronic WLA:

$$C_e = ((0.21 + 0.0)2.7 - (0.0 * 0.01))/0.21 = 2.7 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)10.1 - (0.0 * 0.01))/0.21 = 10.1 \text{ mg/L}$$

Chronic WLA = AML = **2.7** mg/L

Acute WLA = MDL = **10.1** mg/L

### April

Chronic WLA:

$$C_e = ((0.21 + 0.0)2.7 - (0.0 * 0.01))/0.21 = 2.7 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **2.7** mg/L

Acute WLA = MDL = **12.1** mg/L

### June

Chronic WLA:

$$C_e = ((0.21 + 0.0)1.7 - (0.0 * 0.01))/0.21 = 1.7 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **1.7** mg/L

Acute WLA = MDL = **12.1** mg/L

### August

Chronic WLA:

$$C_e = ((0.21 + 0.0)1.3 - (0.0 * 0.01))/0.21 = 1.3 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)10.1 - (0.0 * 0.01))/0.21 = 10.1 \text{ mg/L}$$

Chronic WLA = AML = **1.3** mg/L

Acute WLA = MDL = **10.1** mg/L

### September

Chronic WLA:

$$C_e = ((0.21 + 0.0)1.8 - (0.0 * 0.01))/0.21 = 1.8 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **1.8** mg/L

Acute WLA = MDL = **12.1** mg/L

### November

Chronic WLA:

$$C_e = ((0.21 + 0.0)3.1 - (0.0 * 0.01))/0.21 = 3.1 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **3.1** mg/L

Acute WLA = MDL = **12.1** mg/L

### October

Chronic WLA:

$$C_e = ((0.21 + 0.0)2.5 - (0.0 * 0.01))/0.21 = 2.5 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **2.5** mg/L

Acute WLA = MDL = **12.1** mg/L

### December

Chronic WLA:

$$C_e = ((0.21 + 0.0)3.1 - (0.0 * 0.01))/0.21 = 3.1 \text{ mg/L}$$

Acute WLA:

$$C_e = ((0.21 + 0.0)12.1 - (0.0 * 0.01))/0.21 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **3.1** mg/L

Acute WLA = MDL = **12.1** mg/L

- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.
- **Total Phosphorus, Ammonia, Total Kjeldahl Nitrogen, Nitrate + Nitrite, and Total Nitrogen.** Effluent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, Nitrate + Nitrite, and Total Nitrogen are required per 10 CSR 20-7.015(9)(D)8. Total Nitrogen consists of Total Kjeldahl Nitrogen, and Nitrate + Nitrite.
- **pH.** 6.5-9.0 SU. pH limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the in-stream Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU.
- **Biochemical Oxygen Demand (BOD<sub>5</sub>) Percent Removal.** In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD<sub>5</sub> and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 85% removal efficiency for BOD<sub>5</sub>.
- **Total Suspended Solids (TSS) Percent Removal.** In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD<sub>5</sub> and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 85% removal efficiency for TSS.

**Sampling Frequency Justification:** The Department has determined that previously established sampling and reporting frequency is sufficient to characterize the facility's effluent and be protective of water quality. Flow sampling was increased from monthly to weekly due to the significant inflow and infiltration issues in the collection system. Quarterly sampling is required for Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrate + Nitrite per 10 CSR 20-7.015(9)(D)8.A. Weekly sampling is required for *E. coli*, per 10 CSR 20-7.015(9)(D)7.A.

**Sampling Type Justification:** This facility is considered to conduct secondary treatment and is an earthen mechanical system. Grab samples are no longer appropriate, except where recommended per analytical method. As per 10 CSR 20-7.015, samples collected for mechanical plants shall be a 24 hour modified composite sample. Grab samples, however, must be collected for pH, *E. coli*, and Oil & Grease in accordance with recommended analytical methods. For further information on sampling and testing methods please review 10 CSR 20-7.015(9)(D) 2.

### **PERMITTED FEATURE #003 – IRRIGATION FIELD**

- **Irrigation Period.** Monitoring requirement only. Monitoring for the Irrigation Period is included to determine if proper irrigation is occurring on the irrigation fields.
- **Volume Irrigated.** Monitoring requirement only. Monitoring for the Volume Irrigated is included to determine if proper irrigation is occurring on the irrigation fields.
- **Irrigation Area.** Monitoring requirement only. Monitoring for the Irrigation Area is included to determine if proper irrigation is occurring on the irrigation fields.
- **Irrigation Rate.** Monitoring requirement only. Monitoring for the Irrigation Rate is included to determine if proper irrigation is occurring on the irrigation fields.

### **PERMITTED FEATURE INF – INFLUENT MONITORING**

The monitoring requirements established in the below Monitoring Requirements Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including the monitoring requirements listed in this table.

### **CHANGES TO INFLUENT MONITORING:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type **
Ammonia as N	mg/L	1	*		*	***	1/quarter	quarterly	C
Total Phosphorus	mg/L	1	*		*	***	1/quarter	quarterly	C
Total Kjeldahl Nitrogen	mg/L	1	*		*	***	1/quarter	quarterly	C
Nitrite + Nitrate	mg/L	1	*		*	***	1/quarter	quarterly	C
Total Nitrogen	mg/L	1	*		*	***	1/quarter	quarterly	M

\* - Monitoring requirement only.

\*\*\* - Parameter not previously established in previous state operating permit.

\*\* - C = Composite

M = Measured/calculated

#### **Basics for Limitations Codes:**

- |  |                                   |   |
|--|-----------------------------------|---|
| 1. State or Federal Regulation/Law       | 5. Antidegradation Policy         | 9. WET Test Policy                        |
| 2. Water Quality Standard (includes RPA) | 6. Water Quality Model            | 10. Multiple Discharger Variance          |
| 3. Water Quality Based Effluent Limits   | 7. Best Professional Judgment     | 11. Nutrient Criteria Implementation Plan |
| 4. Antidegradation Review                | 8. TMDL or Permit in lieu of TMDL |   |

### **Influent Parameters**

- **Biochemical Oxygen Demand (BOD<sub>5</sub>) and Total Suspended Solids (TSS)**. An influent sample is required to determine the removal efficiency. In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD<sub>5</sub> and TSS for Publicly Owned Treatment Works (POTWs)/municipals.
- **Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, Ammonia, and Total Nitrogen**. Influent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, Ammonia, and Total Nitrogen required per 10 CSR 20-7.015(9)(D)8. Total Nitrogen consists of Total Kjeldahl Nitrogen and Nitrite + Nitrate.

**Sampling Frequency Justification:** The sampling and reporting frequencies for Total Phosphorus and Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia parameters were established to match the required sampling frequency of these parameters in the effluent, per 10 CSR 20-7.015(9)(D)8. The sampling and reporting frequencies for influent BOD<sub>5</sub> and TSS have been established to match the required sampling frequency of these parameters in the effluent.

**Sampling Type Justification:** Sample types for influent parameters were established to match the required sampling type of these parameters in the effluent. Samples should be analyzed as soon as possible after collection and/or properly preserved according to method requirements.

### **OUTFALL #002 – GENERAL CRITERIA CONSIDERATIONS:**

In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into the permit for those pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The rule further states that pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect that narrative criterion. In order to comply with this regulation, the permit writer will complete reasonable potential determinations on whether the discharge will violate any of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion (the lettering matches that of the rule itself, under 10 CSR 20-7.031(4)). It should also be noted that Section 644.076.1, RSMo as well as Section D – Administrative Requirements of Standard Conditions Part I of this permit states that it shall be unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri that is in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule or regulation promulgated by the commission.

- (A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses. The discharge from this facility is made up of treated domestic wastewater.

Based upon review of the Report of Compliance Inspection for the inspection conducted on February 26, 2019, no evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, this facility utilizes secondary treatment technology and is currently in compliance with the secondary treatment technology based effluent limits established in this permit and there has been no indication to the Department that the stream has had issues maintaining beneficial uses as a result of this discharge. Based on the information reviewed during the drafting of this permit, these final effluent limitations appear to have protected against the excursion of this criterion in the past. Therefore, the discharge does not have the reasonable potential to cause or contribute to an excursion of this criterion.

- (B) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.
- (D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life. This permit contains final effluent limitations which are protective of both acute and chronic toxicity for various pollutants that are either expected to be discharged by domestic wastewater facilities or that were disclosed by this facility on the application for permit coverage. Based on the information reviewed during the drafting of this permit, it has been determined if the facility meets final effluent limitations established in this permit, there is no reasonable potential for the discharge to cause an excursion of this criterion.
- (E) Waters shall provide for the attainment and maintenance of water quality standards downstream including waters of another state. Please see (D) above as justification is the same.
- (F) There shall be no significant human health hazard from incidental contact with the water. Please see (D) above as justification is the same.
- (G) There shall be no acute toxicity to livestock or wildlife watering. Please see (D) above as justification is the same.
- (H) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community. Please see (A) above as justification is the same.
- (I) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247. The discharge from this facility is made up of treated domestic wastewater. No evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, any solid wastes received or produced at this facility are wholly contained in appropriate storage facilities, are not discharged, and are disposed of offsite. This discharge is subject to Standard Conditions Part III, which contains requirements for the management and disposal of sludge to prevent its discharge. Therefore, this discharge does not have reasonable potential to cause or contribute to an excursion of this criterion.

### **Part III – Rationale and Derivation of Effluent Limitations & Permit Conditions**

#### **ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:**

As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream, and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

- ✓ The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(40)] & [10 CSR 20-7.031(1)(O)].

#### **ANTI-BACKSLIDING:**

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(o); 40 CFR Part 122.44(l)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

- ✓ Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.
  - Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.
    - **Ammonia as N.** Effluent limitations were re-calculated for Ammonia using new DMR data and new ecoregional pH and Temperature data. The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation approach.



Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation. The newly established limitations are still protective of water quality.

- **Acute Whole Effluent Toxicity (WET) test.** The previous permit included requirements to conduct an Acute WET test once during the permit cycle. The permit writer conducted a reasonable potential determination for all anticipated pollutants and established numeric effluent limitations where reasonable potential exists. Also, the facility has passed previous Acute WET tests. The permit writer determined the facility does not have reasonable potential to exceed narrative water quality standards for acute toxicity at this time and the Acute WET testing requirements have been removed from this permit. This determination will be reevaluated during the next permit renewal.
- The Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).
- The previous permit indicated “There Shall Be No Discharge of Floating Solids or Visible Foam in Other Than Trace Amounts” under each table. The statement was not evaluated against actual site conditions therefore, this general criteria was re-assessed. It was determined that this facility does not discharge solids or foam in amounts which would indicate reasonable potential, therefore the statement was removed. Each general criteria was assessed for this facility.

#### **ANTIDEGRADATION:**

In accordance with Missouri’s Water Quality Standard [10 CSR 20-7.031(3)], for domestic wastewater discharge with new, altered, or expanding discharges, the Department is to document by means of Antidegradation Review that the use of a water body’s available assimilative capacity is justified. In accordance with Missouri’s water quality regulations for antidegradation [10 CSR 20-7.031(3)], degradation may be justified by documenting the socio-economic importance of a discharge after determining the necessity of the discharge. Facilities must submit the antidegradation review request to the Department prior to establishing, altering, or expanding discharges. See <https://dnr.mo.gov/document-search/antidegradation-implementation-procedure>.

- ✓ No degradation was proposed in this permit action and no further review necessary. Facility did not apply for authorization to increase pollutant loading or to add additional pollutants to their discharge.

For stormwater discharges, the stormwater BMP chosen for the facility, through the antidegradation analysis performed by the facility, must be implemented and maintained at the facility. Failure to implement and maintain the chosen BMP alternative is a permit violation; see SWPPP.

- ✓ The facility does not have stormwater discharges or the stormwater outfalls onsite have no industrial exposure.

#### **AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:**

As per [10 CSR 20-6.010(2)(C)], an applicant may utilize a lower preference continuing authority when a higher level authority is available by submitting information as part of the application to the Department for review and approval, provided it does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or any other regional sewage service and treatment plan approved for higher preference authority by the Department.

#### **BIOSOLIDS & SEWAGE SLUDGE:**

Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

- ✓ Permittee is authorized to land apply biosolids in accordance with Standard Conditions III.

#### **COMPLIANCE AND ENFORCEMENT:**

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

### Facility Performance History:

- ✓ The facility is currently under enforcement action. The enforcement action is due to violations of permitted effluent limitations. Abatement Order on Consent 2022-WPCB-1708 was executed September 29, 2022, and remains fully in effect until the conditions of the Order are satisfied.

### CONTINUING AUTHORITY:

Each application for an operating permit shall identify the person, as that term is defined in section 644.016(15), RSMo, that is the owner of, operator of, or area-wide management authority for a water contaminant source, point source, wastewater treatment facility, or sewer collection system. This person shall be designated as the continuing authority and shall sign the application. By doing so, the person designated as the continuing authority acknowledges responsibility for compliance with all permit conditions.

10 CSR 20-6.010(2) establishes preferential levels for continuing authorities: Levels 1 through 5 (with Level 1 as the highest level), and generally requires permits to be issued to a higher preference continuing authority if available. A Level 3, 4, or 5 applicant may constitute a continuing authority by showing that Level 1 and Level 2 authorities are not available; do not have jurisdiction; are forbidden by state statute or local ordinance from providing service to the person; or that the Level 3, 4, or 5 applicant has met one of the requirements listed in paragraphs (2)(C)1.–7. of 10 CSR 20-6.010(2). The seven options in paragraphs (2)(C)1.–7. for a lower-level authority to demonstrate that it is the valid continuing authority are:

1. A waiver from the existing higher authority declining the offer to accept management of the additional wastewater or stormwater;
2. A written statement or a demonstration of non-response from the higher authority;
3. A to-scale map showing all parts of the legal boundary of the facility's property are beyond 2000 feet from the collection (sewer) system operated by the higher preference authority;
4. A proposed connection or adoption charge by the higher authority that would equal or exceed what is economically feasible for the applicant, which may be in the range of one hundred twenty percent (120%) of the applicant's cost for constructing or operating a wastewater treatment system;
5. A proposed service fee on the users of the system by the higher authority that is above what is affordable for existing homeowners in that area;
6. Terms for connection or adoption by the higher authority that would require more than two (2) years to achieve full sewer service; or
7. A demonstration that the terms for connection or adoption by the higher authority are not viable or feasible to homeowners in the area.

Permit applicants that are Levels 3, 4, and 5 must, as part of their application, identify their method of compliance with this regulation. The following are the methods to comply.

- No higher level authorities are available to the facility;
- No higher level authorities have jurisdiction;
- Higher level authorities are forbidden by state statute or local ordinance from providing service to the person;
- The existing higher level authority is available to the facility, however the facility has proposed the use of a lower preference continuing authority and has submitted one of the following as part of their application provided it does not conflict with any area-wide management plan approved under section 208 of the Clean Water Act or by the Missouri Clean Water Commission. (See Fact Sheet Appendix - Continuing Authority for more information on these options):
  - A waiver from the existing higher authority;
  - A written statement or a demonstration of non-response from the higher authority;
  - A to-scale map showing all parts of the legal boundary of the facility's property are beyond 2000 feet from the collection (sewer) system operated by the higher preference authority;
  - Documentation that the proposed connection or adoption charge by the higher authority would equal or exceed what is economically feasible for the applicant, which may be in the range of one hundred twenty percent (120%) of the applicant's cost for constructing or operating a wastewater treatment system;
  - Documentation that the proposed service fee on the users of the system by the higher authority is above what is affordable for existing homeowners in that area;
  - Documentation that the terms for connection or adoption by the higher authority would require more than two (2) years to achieve full sewer service;
  - A demonstration that the terms for connection or adoption by the higher authority are not viable or feasible to homeowners in the area;

- ✓ The continuing authority listed on the application is a municipality, and therefore a Level 3 Authority. There is no approved Clean Water Act Section 208 plan in Jasper County. The applicant has shown that:
  - A higher level authority is not available to the facility.

**ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:**

The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. This final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online. In an effort to aid facilities in the reporting of applicable information electronically, the Department has created several new forms including operational control monitoring forms and an I&I location and reduction form. These forms are optional and can be provided upon request to the Department.

Per 40 CFR 127.15 and 127.24, permitted facilities may request a temporary waiver for up to 5 years or a permanent waiver from electronic reporting from the Department. To obtain an electronic reporting waiver, a permittee must first submit an eDMR Waiver Request Form: <https://dnr.mo.gov/document-search/electronic-discharge-monitoring-report-waiver-request-form-mo-780-2692>. Each facility must make a request. If a single entity owns or operates more than one facility, then the entity must submit a separate request for each facility based on its specific circumstances. An approved waiver is non-transferable.

The Department must review and notify the facility within 120 calendar days of receipt if the waiver request has been approved or rejected [40 CFR 124.27(a)]. During the Department review period as well as after a waiver is granted, the facility must continue submitting a hard-copy of any reports required by their permit. The Department will enter data submitted in hard-copy from those facilities allowed to do so and electronically submit the data to the EPA on behalf of the facility.

- ✓ The permittee/facility is currently using the eDMR data reporting system.

**NUMERIC LAKE NUTRIENT CRITERIA:**

- ✓ This facility does not discharge into a lake watershed where numeric lake nutrient criteria are applicable.

**OPERATOR CERTIFICATION REQUIREMENTS:**

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], the permittee shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.020(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems with population equivalents greater than 200 and are owned or operated by or for municipalities, public sewer districts, counties, public water supply districts, private sewer companies regulated by the Public Service Commission and state or federal agencies.

- ✓ This facility is required to have a certified operator as it has a population equivalent greater than 200 and is owned or operated by or for a municipality, public sewer district, county, public water supply district, private sewer company regulated by the PSC, state or federal agency.

This facility currently requires a chief operator with a C Certification Level. Please see **Appendix - Classification Worksheet**. Modifications made to the wastewater treatment facility may cause the classification to be modified.

Operator's Name: Larry Bice  
Certification Number: 3736  
Certification Level: WW-A

The listing of the operator above only signifies that staff drafting this operating permit have reviewed appropriate Department records and determined that the name listed on the operating permit application has the correct and applicable Certification Level.

**OPERATIONAL CONTROL TESTING:**

Missouri Clean Water Commission regulation 10 CSR 20-9.010 requires certain publicly owned treatment works and privately owned facilities regulated by the Public Service Commission to conduct internal operational control monitoring to further ensure proper operation of the facility and to be a safeguard or early warning for potential plant upsets that could affect effluent quality. This requirement is only applicable if the publicly owned treatment works and privately owned facilities regulated by the Public Service Commission has a calculated Population Equivalent greater than two hundred (200).

10 CSR 20-9.010(3) allows the Department to modify the monitoring frequency required in the rule based upon the Department's judgement of monitoring needs for process control at the specified facility.

- ✓ As per [10 CSR 20-9.010(4)], the facility is required to conduct operational monitoring. These operational monitoring reports are to be submitted to the Department along with the MSOP discharge monitoring reports.
  - The facility is a mechanical plant and is required to conduct operational control monitoring as follows:

Operational Monitoring Parameter	Frequency
Precipitation	Daily (M-F)
Flow – Influent or Effluent	Daily (M-F)
pH – Influent	Daily (M-F)
Temperature (Aeration basin)	Daily (M-F)
TSS – Influent	Weekly
TSS – Mixed Liquor	Weekly
Settleability – Mixed Liquor	Daily (M-F)
Dissolved Oxygen – Mixed Liquor	Daily (M-F)
Temperature – Mixed Liquor (sample contact and reaeration basins for contact stabilization)	Daily (M-F)
pH – Anaerobic Digester	Daily (M-F)
Temperature – Anaerobic Digester	Daily (M-F)

#### **PRETREATMENT PROGRAM:**

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Pretreatment programs are required at any POTW (or combination of POTW operated by the same authority) and/or municipality with a total design flow greater than 5.0 MGD and receiving industrial wastes that interfere with or pass through the treatment works or are otherwise subject to the pretreatment standards. Pretreatment programs can also be required at POTWs/municipals with a design flow less than 5.0 MGD if needed to prevent interference with operations or pass through.

Several special conditions pertaining to the permittee's pretreatment program may be included in the permit, and are as follows:

- Implementation and enforcement of the program,
- Annual pretreatment report submittal,
- Submittal of list of industrial users,
- Technical evaluation of need to establish local limitations, and
- Submittal of the results of the evaluation

- ✓ The permittee, at this time, is not required to have a Pretreatment Program or does not have an approved pretreatment program.

#### **REASONABLE POTENTIAL (RP):**

Federal regulation [40 CFR Part 122.44(d)(1)(i)] and State Regulation [10 CSR 20-7.015(9)(A)2] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(1)(iii)] if the permit writer determines that any given pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

A reasonable potential analysis (RPA) is a numeric RP decision calculated using effluent data provided by the facility for parameters that have a numeric Water Quality Standard (WQS).

Reasonable potential determinations (RPD) are based on physical conditions of the site as provided in Sections 3.1.2, 3.1.3, and 3.2 of the TSD using best professional judgement. An RPD consists of evaluating visual observations for compliance with narrative criteria, non-numeric information, or small amounts of numerical data (such as 3 data points supplied in the application). Narrative criteria with RP typically translate to a numeric WQS, so a parameter's establishment being based on narrative criteria does not necessarily make the decision an RPD vs RP—how the data is collected does, however. When insufficient data is received to make a determination on RP based on numeric effluent data, the RPD decisions are based on best professional judgment considering the sources of influent wastewater, type of treatment, and historical overall management of the site.

- ✓ An RPA was conducted on appropriate parameters. Please see **APPENDIX – RPA RESULTS**.

### **REMOVAL EFFICIENCY:**

Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD<sub>5</sub>) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals. Secondary Treatment is 85% removal [40 CFR Part 133.102(a)(3) & (b)(3)].

### **SANITARY SEWER OVERFLOWS (SSO) AND INFLOW AND INFILTRATION (I&I):**

Sanitary Sewer Overflows (SSOs) are defined as untreated sewage releases and are considered bypassing under state regulation [10 CSR 20-2.010(12)] and should not be confused with the federal definition of bypass. SSOs result from a variety of causes including blockages, line breaks, and sewer defects that can either allow wastewater to backup within the collection system during dry weather conditions or allow excess stormwater and groundwater to enter and overload the collection system during wet weather conditions. SSOs can also result from lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs include overflows out of manholes, cleanouts, broken pipes, and other into waters of the state and onto city streets, sidewalks, and other terrestrial locations.

Inflow and Infiltration (I&I) is defined as unwanted intrusion of stormwater or groundwater into a collection system. This can occur from points of direct connection such as sump pumps, roof drain downspouts, foundation drains, and storm drain cross-connections or through cracks, holes, joint failures, faulty line connections, damaged manholes, and other openings in the collection system itself. I&I results from a variety of causes including line breaks, improperly sealed connections, cracks caused by soil erosion/settling, penetration of vegetative roots, and other sewer defects. In addition, excess stormwater and groundwater entering the collection system from line breaks and sewer defects have the potential to negatively impact the treatment facility.

Missouri RSMo §644.026.1.(13) mandates that the Department issue permits for discharges of water contaminants into the waters of this state, and also for the operation of sewer systems. Such permit conditions shall ensure compliance with all requirements as established by sections 644.006 to 644.141. Standard Conditions Part I, referenced in the permit, contains provisions requiring proper operation and maintenance of all facilities and systems of treatment and control. Missouri RSMo §644.026.1.(15) instructs the Department to require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities. To ensure that public health and the environment are protected, any noncompliance which may endanger public health or the environment must be reported to the Department within 24 hours of the time the permittee becomes aware of the noncompliance. Standard Conditions Part I, referenced in the permit, contains the reporting requirements for the permittee when bypasses and upsets occur.

- ✓ At this time, the Department recommends the US EPA's Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (Document # EPA 305-B-05-002) or the Departments' CMOM Model located at <https://dnr.mo.gov/document-search/capacity-management-operations-maintenance-plan-editable-template>. For additional information regarding the Departments' CMOM Model, see the CMOM Plan Model Guidance document at <https://dnr.mo.gov/print/document-search/pub2574>. The CMOM identifies some of the criteria used to evaluate a collection system's management, operation, and maintenance and was intended for use by the EPA, state, regulated community, and/or third party entities. The CMOM is applicable to small, medium, and large systems; both public and privately owned; and both regional and satellite collection systems. The CMOM does not substitute for the Clean Water Act, the Missouri Clean Water Law, and both federal and state regulations, as it is not a regulation.

### **SCHEDULE OF COMPLIANCE (SOC):**

Per 644.051.4 RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement, or if prohibited by other statute or regulation. A SOC includes an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. *See also* Section 502(17) of the Clean Water Act, and 40 CFR §122.2. For new effluent limitations, the permit may include interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR § 122.47(a)(1), 10 CSR 20-7.031(11), and 10 CSR 20-7.015(9), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, a SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the permit.

A SOC is not allowed:

- For effluent limitations based on technology-based standards established in accordance with federal requirements, if the deadline for compliance established in federal regulations has passed. 40 CFR § 125.3.
- For a newly constructed facility in most cases. Newly constructed facilities must meet applicable effluent limitations when discharge begins, because the facility has installed the appropriate control technology as specified in a permit or antidegradation review. A SOC is allowed for a new water quality based effluent limit that was not included in a previously public noticed permit or antidegradation review, which may occur if a regulation changes during construction.
- To develop a TMDL, UAA, or other study that may result in site-specific criteria or alternative effluent limits. A facility is not prohibited from conducting these activities, but a SOC may not be granted for conducting these activities.

In order to provide guidance to Permit Writers in developing SOC's, and attain a greater level of consistency, on April 9, 2015 the Department issued an updated policy on development of SOC's. This policy provides guidance to Permit Writers on the standard time frames for schedules for common activities, and guidance on factors that may modify the length of the schedule such as a Cost Analysis for Compliance.

- ✓ This permit does not contain an SOC.

#### **SEWER EXTENSION AUTHORITY SUPERVISED PROGRAM:**

In accordance with [10 CSR 20-6.010(6)(A)], the Department may grant approval of a permittee's Sewer Extension Authority Supervised Program. These approved permittees regulate and approve construction of sanitary sewers and pump stations, which are tributary to this wastewater treatment facility. The permittee shall act as the continuing authority for the operation, maintenance, and modernization of the constructed collection system. See <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/wastewater/construction-engineering>.

- ✓ The permittee does not have a Department approved Sewer Extension Authority Supervised Program.

#### **VARIANCE:**

As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

- ✓ This operating permit is not drafted under premises of a petition for variance.

#### **WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:**

As per [10 CSR 20-2.010(86)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

- ✓ Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C_e = \frac{(Q_e + Q_s)C - (Q_s \times C_s)}{(Q_e)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration      C<sub>e</sub> = effluent concentration  
Cs = upstream concentration              Q<sub>e</sub> = effluent flow  
Q<sub>s</sub> = upstream flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

#### **Number of Samples "n":**

Additionally, in accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance, which should be, at a minimum, be targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is "n = 4" at a minimum. For Total Ammonia as Nitrogen, "n = 30" is used.

#### **WLA MODELING:**

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

- ✓ A WLA study was either not submitted or determined not applicable by Department staff.



### **WHOLE EFFLUENT TOXICITY (WET) TEST:**

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A) and the Water Quality Standards 10 CSR 20-7.031(4)(D),(F),(G),(J)2.A & B are being met. Under [10 CSR 20-6.010(8)(B)], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by facilities meeting the following criteria:

- ☐ Facility is a designated Major.
- ☐ Facility continuously or routinely exceeds its design flow.
- ☐ Facility that exceeds its design population equivalent (PE) for BOD<sub>5</sub> whether or not its design flow is being exceeded.
- ☐ Facility (whether primarily domestic or industrial) that alters its production process throughout the year.
- ☐ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- ☐ Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH<sub>3</sub>)
- ☒ Facility is a municipality with a Design Flow ≥ 22,500 gpd.
- ☐ Other – please justify.

✓ At this time, the permittee is not required to conduct WET test for this facility.

### **40 CFR 122.41(M) - BYPASSES:**

The federal Clean Water Act (CWA), Section 402 prohibits wastewater dischargers from “bypassing” untreated or partially treated sewage (wastewater) beyond the headworks. A bypass is defined as an intentional diversion of waste streams from any portion of a treatment facility, [40 CFR 122.41(m)(1)(i)]. Additionally, Missouri regulation 10 CSR 20-7.015(9)(G) states a bypass means the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending, to waters of the state. Only under exceptional and specified limitations do the federal regulations allow for a facility to bypass some or all of the flow from its treatment process. Bypasses are prohibited by the CWA unless a permittee can meet all of the criteria listed in 40 CFR 122.41(m)(4)(i)(A), (B), & (C). Any bypasses from this facility are subject to the reporting required in 40 CFR 122.41(l)(6) and per Missouri’s Standard Conditions I, Section B, part 2.b. Additionally, Anticipated Bypasses include bypasses from peak flow basins or similar devices designed for peak wet weather flows.

✓ This facility does not anticipate bypassing.

## **Part IV – 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 publicly-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.

The following table summarizes the results of the cost analysis. See **Appendix – Cost Analysis for Compliance** for detailed information.

**Summary Table. Cost Analysis for Compliance Summary for the City of Jasper**

New Permit Requirements			
Quarterly Influent Sampling of Ammonia as N, Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate			
Estimated Annual Cost	Annual Median Household Income (MHI)	Estimated Monthly User Rate	User Rate as a Percent of MHI
\$508	\$49,405	\$45.11	1.10%

**Part V – Administrative Requirements**

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

**WATER QUALITY STANDARD REVISION:**

In accordance with section 644.058, RSMo, the Department is required to utilize an evaluation of the environmental and economic impacts of modifications to water quality standards of twenty-five percent or more when making individual site-specific permit decisions.

- ✓ This operating permit does not contain requirements for a water quality standard that has changed twenty-five percent or more since the previous operating permit.

**PUBLIC NOTICE:**

The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing. The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit. For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- ✓ The Public Notice period for this operating permit was from February 3, 2023 to March 6, 2023. No responses received.

**DATE OF FACT SHEET:** JANUARY 4, 2023

**COMPLETED BY:**

**ASHLEY KNEEMUELLER, ENVIRONMENTAL PROGRAM ASSISTANT**  
**MISSOURI DEPARTMENT OF NATURAL RESOURCES**  
**WATER PROTECTION PROGRAM**  
**OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT**  
**(573) 526-1503**  
**Ashley.Kneemueller@dnr.mo.gov**



## Appendices

### APPENDIX - CLASSIFICATION WORKSHEET:

Item	Points Possible	Points Assigned
Maximum Population Equivalent (P.E.) served , peak day	1 pt./10,000 PE or major fraction thereof. (Max 10 pts.)	0.1
Design Flow (avg. day) or peak month's flow (avg. day) whichever is larger	1 pt. / MGD or major fraction thereof. (Max 10 pts.)	0.1
Effluent Discharge		
Missouri or Mississippi River	0	
All other stream discharges except to losing streams and stream reaches supporting whole body contact recreation	1	
Discharge to lake or reservoir outside of designated whole body contact recreational area	2	
Discharge to losing stream, lake or reservoir area supporting whole body contact recreation	3	
Direct reuse or recycle of effluent	6	
Land Application/Irrigation		
Drip Irrigation	3	
Land application/irrigation	5	5
Overland flow	4	
Variation in Raw Wastes (highest level only)		
Variations do not exceed those normally or typically expected	0	
Reoccurring deviations or excessive variations of 100 to 200 percent in strength and/or flow	2	
Reoccurring deviations or excessive variations of more than 200 percent in strength and/or flow	4	4
Department-approved pretreatment program	6	
Preliminary Treatment		
STEP systems (operated by the permittee)	3	
Screening and/or comminution	3	
Grit removal	3	
Plant pumping of main flow	3	3
Flow equalization	5	
Primary Treatment		
Primary clarifiers	5	
Chemical addition (except chlorine, enzymes)	4	
Secondary Treatment		
Trickling filter and other fixed film media with or without secondary clarifiers	10	
Activated sludge (including aeration, oxidation ditches, sequencing batch reactors, membrane bioreactors, and contact stabilization)	15	
Stabilization ponds without aeration	5	
Aerated lagoon	8	8
Advanced Lagoon Treatment – Aerobic cells, anaerobic cells, covers, or fixed film	10	10
Biological, physical, or chemical	12	
Carbon regeneration	4	
Total from page <b>ONE (1)</b>	----	30.2

**APPENDIX - CLASSIFICATION WORKSHEET (CONTINUED):**

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
<b>Solids Handling</b>		
Sludge Holding	5	
Anaerobic digestion	10	
Aerobic digestion	6	
Evaporative sludge drying	2	
Mechanical dewatering	8	
Solids reduction (incineration, wet oxidation)	12	
Land application	6	6
<b>Disinfection</b>		
Chlorination or comparable	5	
On-site generation of disinfectant (except UV light)	5	
Dechlorination	2	
UV light	4	4
<b>Required Laboratory Control Performed by Plant Personnel (highest level only)</b>		
Lab work done outside the plant	0	
Push – button or visual methods for simple test such as pH, settleable solids	3	
Additional procedures such as DO, COD, BOD, titrations, solids, volatile content	5	5
More advanced determinations, such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	7	
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10	
Total from page <b>TWO (2)</b>	----	15
Total from page <b>ONE (1)</b>	---	30.2
Grand Total	---	45.2

- ☐ - A: 71 points and greater  
☐ - B: 51 points – 70 points  
☒ - C: 26 points – 50 points  
☐ - D: 0 points – 25 points

# APPENDIX – RPA RESULTS:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Ammonia as N – Summer (mg/L)	12.1	26.24	1.5	26.24	30.00	16.3/1.6	0.39	1.61	YES
Ammonia as N – Winter (mg/L)	12.1	31.61	2.9	31.61	27.00	18.2/2.2	0.44	1.74	YES

N/A – Not Applicable

\* - Units are (µg/L) unless otherwise noted.

\*\* - If the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent. If the number of samples is < 10, then the default CV value must be used in the WQBEL for the applicable constituent.

\*\*\* - Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the Mean of the same sample set.

RWC – Receiving Water Concentration. It is the concentration of a toxicant or the parameter toxicity in the receiving water after mixing (if applicable).

n – Is the number of samples.

MF – Multiplying Factor. 99% Confidence Level and 99% Probability Basis.

RP – Reasonable Potential. It is where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

Reasonable Potential Analysis is conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version including calculations of this RPA is available upon request.

## APPENDIX – Non-Detect Example Calculations:

**Example:** Permittee has four samples for Pollutant X which has a method minimum level of 5 mg/L and is to report a Daily Maximum and Monthly Average.

Week 1 = 11.4 mg/L

Week 2 = Non-Detect or <5.0 mg/L

Week 3 = 7.1 mg/L

Week 4 = Non-Detect or <5.0 mg/L

For this example, use subpart (h) - For reporting an average based on a mix of detected and non-detected values (not including *E. coli*), assign a value of “0” for all non-detects for that reporting period and report the average of all the results.

$$11.4 + 0 + 7.1 + 0 = 18.5 \div 4 \text{ (number of samples)} = 4.63 \text{ mg/L.}$$

The Permittee reports a Monthly Average of 4.63 mg/L and a Daily maximum of 11.4 mg/L (Note the < symbol was dropped in the answers).

**Example:** Permittee has five samples for Pollutant Y that has a method minimum level of 9 µg/L and is to report a Daily Maximum and Monthly Average.

Day 1 = Non-Detect or <9.0 µg/L

Day 2 = Non-Detect or <9.0 µg/L

Day 3 = Non-Detect or <9.0 µg/L

Day 4 = Non-Detect or <9.0 µg/L

Day 5 = Non-Detect or <9.0 µg/L

For this example, use subpart (g) - For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.

$$(9 + 9 + 9 + 9 + 9) \div 5 \text{ (number of samples)} = <9 \text{ µg/L.}$$

The Permittee reports a Monthly Average of <9.0 µg/L (retain the ‘less than’ symbol) and a Daily Maximum of <9.0 µg/L.

**Example:** Permittee has four samples for Pollutant Z where the first two tests were conducted using a method with a method minimum level of 4 µg/L and the remaining two tests were conducted using a different method that has a method minimum level of <6 µg/L and is to report a Monthly Average and a Weekly Average.

Week 1 = Non-Detect or <4.0 µg/L

Week 2 = Non-Detect or <4.0 µg/L

Week 3 = Non-Detect or <6.0 µg/L

Week 4 = Non-Detect or <6.0 µg/L

For this example, use subpart (g) - For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.

$$(4 + 4 + 6 + 6) \div 4 \text{ (number of samples)} = <5 \text{ µg/L. (Monthly)}$$

The facility reports a Monthly Average of <5.0 µg/L and a Weekly Average of <6.0 µg/L.

#### APPENDIX – Non-Detect Example Calculations (Continued):

**Example:** Permittee has five samples for Pollutant Z where the first two tests were conducted using a method with a method minimum level of 4 µg/L and the remaining three tests were conducted using a different method that has a method minimum level of <6 µg/L and is to report a Monthly Average and a Weekly Average.

Week 1 = Non-Detect or <4.0 µg/L

Week 2 = Non-Detect or <4.0 µg/L

Week 2 = Non-Detect or <6.0 µg/L

Week 3 = Non-Detect or <6.0 µg/L

Week 4 = Non-Detect or <6.0 µg/L

For this example, use subpart (g) - For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.

$(4 + 4 + 6 + 6 + 6) \div 5$  (number of samples) = <5.2 µg/L. (Monthly)

$(4 + 6) \div 2$  (number of samples) = <5 µg/L. (Week 2)

The facility reports a Monthly Average of <5.2 µg/L and a Weekly Average of <6.0 µg/L (report highest Weekly Average value)

**Example:** Permittee has four samples for Pollutant Z where the tests were conducted using a method with a method minimum level of 10 µg/L and is to report a Monthly Average and Daily Maximum. The permit lists that Pollutant Z has a Department determined Minimum Quantification Level (ML) of 130 µg/L.

Week 1 = 12 µg/L

Week 2 = 52 µg/L

Week 3 = Non-Detect or <10 µg/L

Week 4 = 133 µg/L

For this example, use subpart (h) - For reporting an average based on a mix of detected and non-detected values (not including *E. coli*), assign a value of “0” for all non-detects for that reporting period and report the average of all the results.

For this example,  $(12 + 52 + 0 + 133) \div 4$  (number of samples) =  $197 \div 4 = 49.3$  µg/L.

The facility reports a Monthly Average of 49.3 µg/L and a Daily Maximum of 133 µg/L.

**Example:** Permittee has five samples for *E. coli* which has a method minimum level of 1 #/100mL and is to report a Weekly Average (seven (7) day geometric mean) and a Monthly Average (thirty (30) day geometric mean).

Week 1 = 102 #/100mL

Week 2 (Monday) = 400 #/100mL

Week 2 (Friday) = Non-Detect or <1 #/100mL

Week 3 = 15 #/100mL

Week 4 = Non-Detect or <1 #/100mL

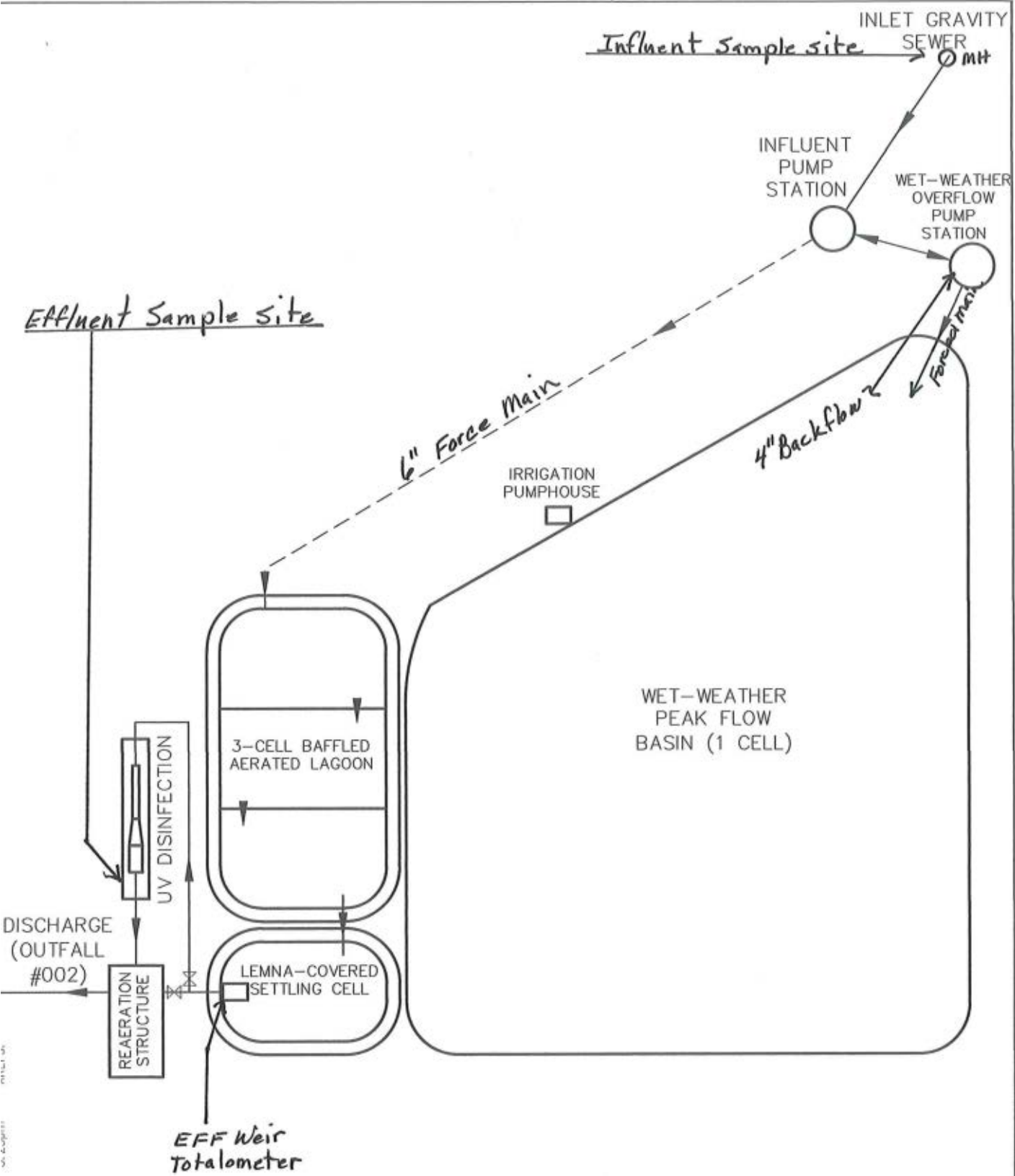
For this example, use subpart (i) - When *E. coli* is not detected above the method minimum level, the permittee must report the data qualifier signifying less than detection limit for that parameter (e.g., <1 #/100mL, if the method minimum level is 1 #/100mL). For reporting a geometric mean based on a mix of detected and non-detected values, use one-half of the detection limit (instead of zero) for non-detects when calculating geometric means. The Geometric Mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected.

The Monthly Average (30 day Geometric Mean) = 5th root of  $(102)(400)(0.5)(15)(0.5) = 5\text{th root of } 153,000 = 10.9$  #/100mL.

The 7 day Geometric Mean = 2nd root of  $(400)(0.5) = 2\text{nd root of } 200 = 14.1$  #/100mL. (Week 2)

The Permittee reports a Monthly Average (30 day Geometric Mean) of 10.9 #/100mL and a Weekly Average (7 day geometric mean) of 102 #/100mL (report highest Weekly Average value)

APPENDIX – ALTERNATIVE: Facility layout.



## APPENDIX – COST ANALYSIS FOR COMPLIANCE:

### Missouri Department of Natural Resources Water Protection Program Cost Analysis for Compliance (In accordance with RSMo 644.145)

#### Jasper Wastewater Treatment Facility, Permit Renewal City of Jasper Missouri State Operating Permit #MO-0044202

Section 644.145 RSMo requires the Department of Natural Resources (Department) to make a “finding of affordability” when “issuing permits under” or “enforcing provisions of” state or federal clean water laws “pertaining to any portion of a combined or separate sanitary sewer system for publicly-owned treatment works.” This cost analysis does not dictate how the permittee will comply with new permit requirements.

#### New Permit Requirements

The permit requires compliance with new quarterly influent monitoring requirements for Ammonia as N, Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate

#### Connections

The number of connections was reported by the permittee on the Financial Questionnaire.

Connection Type	Number
Residential	364
Commercial	20
Industrial	0
<b>Total</b>	<b>384</b>

#### Data Collection for this Analysis

This cost analysis is based on data available to the Department as provided by the permittee and data obtained from readily available sources. For the most accurate analysis, it is essential that the permittee provides the Department with current information about the City’s financial and socioeconomic situation. The financial questionnaire available to permittees on the Department’s website (<https://dnr.mo.gov/document-search/financial-questionnaire-mo-780-2511>) is a required attachment to the permit renewal application. If the financial questionnaire is not submitted with the renewal application, the Department sends a request to complete the form with the welcome correspondence. If certain data was not provided by the permittee to the Department and the data is not obtainable through readily available sources, this analysis will state that the information is “unknown”.

#### Eight Criteria of 644.145 RSMo

The Department must consider the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with new permit requirements.

##### (1) A community’s financial capability and ability to raise or secure necessary funding;

Criterion 1 Table. Current Financial Information for the City of Jasper	
Current Monthly User Rates per 5,000 gallons*	\$45.00
Median Household Income (MHI) <sup>1</sup>	\$49,405
Current Annual Operating Costs (excludes depreciation)	\$197,509

\*User Rates were reported by the permittee on the Financial Questionnaire.

##### (2) Affordability of pollution control options for the individuals or households at or below the median household income level of the community;

The following tables outline the estimated costs of the new permit requirements:

Criterion 2A Table. Estimated Cost Breakdown of New Permit Requirements			
New Requirement	Frequency	Estimated Cost	Estimated Annual Cost
Total Phosphorus – Influent	Quarterly	\$26	\$104
Total Kjeldahl Nitrogen - Influent	Quarterly	\$35	\$140
Nitrate + Nitrite - Influent	Quarterly	\$44	\$176
Ammonia - Influent	Quarterly	\$22	\$88
Total Estimated Annual Cost of New Permit Requirements			\$508

Criterion 2B Table. Estimated Costs for New Permit Requirements		
(1)	Estimated Annual Cost	\$508
(2)	Estimated Monthly User Cost for New Requirements <sup>2</sup>	\$0.11
	Estimated Monthly User Cost for New Requirements as a Percent of MHI <sup>3</sup>	0.003%
(3)	Total Monthly User Cost*	\$45.11
	Total Monthly User Cost as a Percent of MHI <sup>4</sup>	1.10%

\* Current User Rate + Estimated Monthly Costs of New Sampling Requirements

Due to the minimal cost associated with new permit requirements, the Department anticipates an extremely low to no rate increase will be necessary, which could impact individuals or households of this community.

### (3) An evaluation of the overall costs and environmental benefits of the control technologies;

This analysis is being conducted based on new requirements in the permit, which will not require the addition of new control technologies at the facility. However, the new sampling requirements are being established in order to provide data regarding the health of the receiving stream's aquatic life and to ensure that the existing permit limits are providing adequate protection of aquatic life. Improved wastewater provides benefits such as avoided health costs due to water-related illness, enhanced environmental ecosystem quality, and improved natural resources. The preservation of natural resources has been proven to increase the economic value and sustainability of the surrounding communities. Maintaining Missouri's water quality standards fulfills the goal of restoring and maintaining the chemical, physical, and biological integrity of the receiving stream; and, where attainable, it achieves a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water.

### Nutrient Monitoring

Nutrients are mineral compounds that are required for organisms to grow and thrive. Of the six (6) elemental macronutrients, nitrogen and phosphorus are generally not readily available and limit growth of organisms. Excess nitrogen and phosphorus will cause a shift in the ecosystem's food web. Once excess nitrogen and phosphorus are introduced into a waterbody, some species' populations will dramatically increase, while other populations will not be able to sustain life. Competition and productivity are two factors in which nutrients can alter aquatic ecosystems and the designated uses of a waterbody. For example, designated uses, such as drinking water sources and recreational uses, become impaired when algal blooms take over a waterbody. These blooms can cause foul tastes and odors in the drinking water, unsightly appearance, and fish mortality in the waterbody. Some algae also produce toxins that may cause serious adverse health conditions such as liver damage, tumor promotion, paralysis, and kidney damage. The monitoring requirements for nitrogen and phosphorus have been added to the permit to provide data regarding the health of the receiving stream's aquatic life. A healthy ecosystem is beneficial as it provides reduced impacts on human and aquatic health as well as recreational opportunities.

### (4) Inclusion of ongoing costs of operating and maintaining the existing wastewater collection and treatment system, including payments on outstanding debts for wastewater collection and treatment systems when calculating projected rates:

The community reported that their outstanding debt for their current wastewater collection and treatment systems is \$40,000. The community reported that each user pays \$45.00 monthly, of which, \$10.00 is used toward payments on the current outstanding debt.

As shown in Criterion 2, the projected user rate plus the amount of the current user rate used toward payments on outstanding debt is \$45.11 for additional sampling requirements.

### (5) An inclusion of ways to reduce economic impacts on distressed populations in the community, including but not limited to low and fixed income populations. This requirement includes but is not limited to:



- (a) Allowing adequate time in implementation schedules to mitigate potential adverse impacts on distressed populations resulting from the costs of the improvements and taking into consideration local community economic considerations.
- (b) Allowing for reasonable accommodations for regulated entities when inflexible standards and fines would impose a disproportionate financial hardship in light of the environmental benefits to be gained.

The following table characterizes the current overall socioeconomic condition of the community as compared to the overall socioeconomic condition of Missouri. The following information was compiled using the latest U.S. Census data.

**Criterion 5 Table. Socioeconomic Data <sup>1, 5-9</sup> for the City of Jasper**

No.	Administrative Unit	Jasper City	Missouri State	United States
1	Population (2020)	950	6,124,160	326,569,308
2	Percent Change in Population (2000-2020)	-6.0%	9.5%	16.0%
3	2020 Median Household Income (in 2021 Dollars)	\$49,405	\$59,981	\$68,047
4	Percent Change in Median Household Income (2000-2020)	9.9%	-2.8%	-0.4%
5	Median Age (2020)	37.5	38.7	38.2
6	Change in Median Age in Years (2000-2020)	-0.5	2.6	2.9
7	Unemployment Rate (2020)	8.9%	4.5%	5.4%
8	Percent of Population Below Poverty Level (2020)	20.1%	13.0%	12.8%
9	Percent of Household Received Food Stamps (2020)	13.1%	10.5%	11.4%
10	(Primary) County Where the Community Is Located	Jasper County		

**(6) An assessment of other community investments and operating costs relating to environmental improvements and public health protection;**

The community reported the following investments for environmental improvements: an upgrade to meet ammonia limits at the wastewater treatment facility estimated at \$1,000,000 and improvements to the water system estimated at \$5,000,000.

**(7) An assessment of factors set forth in the United States Environmental Protection Agency's guidance, including but not limited to the "Combined Sewer Overflow Guidance for Financial Capability Assessment and Schedule Development" that may ease the cost burdens of implementing wet weather control plans, including but not limited to small system considerations, the attainability of water quality standards, and the development of wet weather standards;**

The new requirements associated with this permit will not impose a financial burden on the community, nor will they require the City of Jasper to seek funding from an outside source.

**(8) An assessment of any other relevant local community economic conditions.**

The community did not report any other relevant local economic conditions.

The Department contracted with Wichita State University to complete an assessment tool that would allow for predictions on rural Missouri community populations and future sustainability. The purpose of the study is to use a statistical modeling analysis in order to determine factors associated with each rural Missouri community that would predict the future population changes that could occur in each community. A stepwise regression model was applied to 19 factors which were determined as predictors of rural population change in Missouri. The model established a hierarchy of the predicting factors which allowed the model to place a weighted value on each of the factors. A total of 745 rural towns and villages in Missouri received a weighted value for each of the predicting factors. The weighted values for each town / village were then added together to determine an overall decision score. The overall decision scores were then divided into five categories and each town was assigned to a different categorical group based on the overall decision score. The categorical groups were developed from the range of overall scores across all rural towns and villages within Missouri.

Based on the assessment tool, the City of Jasper has been determined to be a category 2 community. This means that the City of Jasper could potentially face more challenging socioeconomic circumstances over time and may have significant declines in population in the future. The Department has determined an adequate schedule of compliance that will alleviate the potential financial burdens that the City of Jasper may face due to the necessary upgrades required to meet the new permit requirements. If this community experiences a decline in population, which results in the inability to secure the necessary funding for an upgrade to meet the new requirements within this permit, a modification to the schedule of compliance may be necessary. The community may contact the Department and

send an application for a modification to the schedule of compliance with justification for the time necessary to comply with this permit.

## Conclusion and Finding

As a result of new regulations, the Department is proposing modifications to the current operating permit that may require the permittee to increase monitoring. The Department has considered the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with the new permit requirements.

This analysis examined whether the new sampling requirements affect the ability of an individual customer or household to pay a utility bill without undue hardship or unreasonable sacrifice in the essential lifestyle or spending patterns of the individual or household. After reviewing the above criteria, the Department finds that the new sampling requirements may result in a low burden with regard to the community's overall financial capability and a low financial impact for most individual customers/households; therefore, the new permit requirements are affordable.

## References

1. 2020 MHI in 2020 Dollar: United States Census Bureau. 2016-2020 American Community Survey 5-Year Estimates, Table B19013: Median Household Income in the Past 12 Months (in 2020 Inflation-Adjusted Dollars). <https://data.census.gov/cedsci/table?q=B19013&tid=ACSDT5Y2020.B19013>.  
(B) 2000 MHI in 1999 Dollar: (1) For United States, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-1 Part 1. United States Summary, Table 5. Work Status and Income in 1999: 2000, Washington, DC. <https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf>.  
(2) For Missouri State, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-27, Missouri, Table 10. Work Status and Income in 1999: 2000, Washington, DC. <https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf>.  
(C) (C) 2021 CPI, 2020 CPI and 1999 CPI: U.S. Department of Labor Bureau of Labor Statistics (2021) Consumer Price Index - All Urban Consumers, U.S. City Average. All Items. 1982-84=100 (unadjusted) - CUUR0000SAO. <https://data.bls.gov/cgi-bin/surveymost?bls>.  
(D) 2020 MHI in 2021 Dollar = 2020 MHI in 2020 Dollar x 2021 CPI / 2020 CPI; 2000 MHI in 2020 Dollar = 2000 MHI in 1999 Dollar x 2021 CPI / 1999 CPI.  
(E) Percent Change in Median Household Income (2000-2020) = (2020 MHI in 2021 Dollar - 2000 MHI in 2021 Dollar) / (2000 MHI in 2021 Dollar).
2.  $(\$508/384)/12 = \$0.11$  (Estimated Monthly User Cost for New Requirements)
3.  $(\$0.11/(\$49,405/12))100\% = 0.003\%$  (New Sampling Only)
4.  $(\$45.11/(\$49,405/12))100\% = 1.10\%$  (Total User Cost)
5. Total Population in 2020: United States Census Bureau. 2016-2020 American Community Survey 5-Year Estimates, Table B01003: Total Population - Universe: Total Population. <https://data.census.gov/cedsci/table?q=B01003&tid=ACSDT5Y2020.B01003>.  
(B) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC. <https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf>.  
(2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC. <https://www2.census.gov/library/publications/2003/dec/phc-2-1-pt2.pdf>.  
(C) Percent Change in Population (2000-2020) = (Total Population in 2020 - Total Population in 2000) / (Total Population in 2000).
6. Median Age in 2020: United States Census Bureau. 2016-2020 American Community Survey 5-Year Estimates, Table B01002: Median Age by Sex - Universe: Total population. <https://data.census.gov/cedsci/table?q=B01002&tid=ACSDT5Y2020.B01002>.  
(B) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC., Page 2. <https://www.census.gov/content/dam/Census/library/publications/2003/dec/phc-2-1-pt1.pdf>.  
(2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC., Pages 64-92. <https://www2.census.gov/library/publications/2003/dec/phc-2-1-pt2.pdf>.  
(C) Change in Median Age in Years (2000-2020) = (Median Age in 2020 - Median Age in 2000).
7. United States Census Bureau. 2016-2020 American Community Survey 5-Year Estimates, S2301: Employment Status for the Population 16 Years and Over - Universe: Population 16 years and Over. <https://data.census.gov/cedsci/table?q=unemployment&tid=ACSST5Y2020.S2301>.
8. United States Census Bureau. 2016-2020 American Community Survey 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months. <https://data.census.gov/cedsci/table?q=S1701&tid=ACSST5Y2020.S1701>.
9. United States Census Bureau. 2016-2020 American Community Survey 5-Year Estimates, Table S2201: Food Stamps/Supplemental Nutrition Assistance Program (SNAP) - Universe: Households. <https://data.census.gov/cedsci/table?q=S2201&tid=ACSST5Y2020.S2201>.



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These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

## Part I – General Conditions

### Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
  - a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
  - b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.
2. **Monitoring Requirements.**
  - a. Records of monitoring information shall include:
    - i. The date, exact place, and time of sampling or measurements;
    - ii. The individual(s) who performed the sampling or measurements;
    - iii. The date(s) analyses were performed;
    - iv. The individual(s) who performed the analyses;
    - v. The analytical techniques or methods used; and
    - vi. The results of such analyses.
  - b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.
3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.
4. **Test Procedures.** The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is “sufficiently sensitive” when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility’s discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.
5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee’s sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
  - a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
  - b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

### Section B – Reporting Requirements

1. **Planned Changes.**
  - a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
    - i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
    - ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42;
    - iii. The alteration or addition results in a significant change in the permittee’s sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
    - iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.
2. **Non-compliance Reporting.**
  - a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.



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- b. The following shall be included as information which must be reported within 24 hours under this paragraph.
    - i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
    - ii. Any upset which exceeds any effluent limitation in the permit.
    - iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.
  - c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.
3. **Anticipated Noncompliance.** The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.
  4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.
  5. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, and 6 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.
  6. **Other Information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.
  7. **Discharge Monitoring Reports.**
    - a. Monitoring results shall be reported at the intervals specified in the permit.
    - b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
    - c. Monitoring results shall be reported to the Department no later than the 28<sup>th</sup> day of the month following the end of the reporting period.
- b. Notice.
    - i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
    - ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
  - c. Prohibition of bypass.
    - i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
      1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
      2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
      3. The permittee submitted notices as required under paragraph 2. b. of this section.
    - ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.
3. **Upset Requirements.**
    - a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
    - b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      - i. An upset occurred and that the permittee can identify the cause(s) of the upset;
      - ii. The permitted facility was at the time being properly operated; and
      - iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
      - iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
    - c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

## Section C – Bypass/Upset Requirements

1. **Definitions.**
  - a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending.
  - b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
  - c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
2. **Bypass Requirements.**
  - a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.

## Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
  - a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
  - b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed \$25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement





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- imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.
- c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed \$10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$25,000. Penalties for Class II violations are not to exceed \$10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$125,000.
- d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed \$10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.
2. **Duty to Reapply.**
- a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
- b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
- c. A permittee with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
5. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
6. **Permit Actions.**
- a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
- i. Violations of any terms or conditions of this permit or the law;
- ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
- iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
- iv. Any reason set forth in the Law or Regulations.
- b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
7. **Permit Transfer.**
- a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
- b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
- c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.
8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.



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10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.
11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
  - a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.
12. **Closure of Treatment Facilities.**
  - a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
  - b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.
13. **Signatory Requirement.**
  - a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
  - b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
  - c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.
14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.



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PART II - SPECIAL CONDITIONS – PUBLICLY OWNED  
TREATMENT WORKS  
SECTION A – INDUSTRIAL USERS

**1. Definitions**

Definitions as set forth in the Missouri Clean Water Laws and approved by the Missouri Clean Water Commission shall apply to terms used herein.

Significant Industrial User (SIU). Except as provided in the *General Pretreatment Regulation* 10 CSR 20-6.100, the term Significant Industrial User means:

1. All Industrial Users subject to Categorical Pretreatment Standards; and
2. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the Publicly-Owned Treatment Works (POTW) (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's or for violating any Pretreatment Standard or requirement.

Clean Water Act (CWA) is the the federal Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002).

**2. Identification of Industrial Discharges**

Pursuant to 40 CFR 122.44(j)(1), all POTWs shall identify, in terms of character and volume of pollutants, any Significant Industrial Users discharging to the POTW subject to Pretreatment Standards under section 307(b) of the CWA and 40 CFR 403.

**3. Application Information**

Applications for renewal or modification of this permit must contain the information about industrial discharges to the POTW pursuant to 40 CFR 122.21(j)(6)

**4. Notice to the Department**

Pursuant to 40 CFR 122.42(b), all POTWs must provide adequate notice of the following:

1. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging these pollutants; and
2. Any substantial change into the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
3. For purposes of this paragraph, adequate notice shall include information on:
  - i. the quality and quantity of effluent introduced into the POTW, and
  - ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

For POTWs without an approved pretreatment program, the notice of industrial discharges which was not included in the permit application shall be made as soon as practicable. For POTWs with an approved pretreatment program, notice is to be included in the annual pretreatment report required in the special conditions of this permit. Notice may be sent to:

Missouri Department of Natural Resources  
Water Protection Program  
Attn: Pretreatment Coordinator  
P.O. Box 176  
Jefferson City, MO 65102

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**PART III – BIOSOLIDS AND SLUDGE FROM DOMESTIC TREATMENT FACILITIES**

**SECTION A – GENERAL REQUIREMENTS**

1. PART III Standard Conditions pertain to biosolids and sludge requirements under the Missouri Clean Water Law and regulations for domestic and municipal wastewater and also incorporates federal sludge disposal requirements under 40 CFR Part 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR Part 503 for domestic biosolids and sludge.
2. PART III Standard Conditions apply only to biosolids and sludge generated at domestic wastewater treatment facilities, including public owned treatment works (POTW) and privately owned facilities.
3. Biosolids and Sludge Use and Disposal Practices:
  - a. The permittee is authorized to operate the biosolids and sludge generating, treatment, storage, use, and disposal facilities listed in the facility description of this permit.
  - b. The permittee shall not exceed the design sludge/biosolids volume listed in the facility description and shall not use biosolids or sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
  - c. For facilities operating under general operating permits that incorporate Standard Conditions PART III, the facility is authorized to operate the biosolids and sludge generating, treatment, storage, use and disposal facilities identified in the original operating permit application, subsequent renewal applications or subsequent written approval by the department.
4. Biosolids or Sludge Received from other Facilities:
  - a. Permittees may accept domestic wastewater biosolids or sludge from other facilities as long as the permittee's design sludge capacity is not exceeded and the treatment facility performance is not impaired.
  - b. The permittee shall obtain a signed statement from the biosolids or sludge generator or hauler that certifies the type and source of the sludge
5. Nothing in this permit precludes the initiation of legal action under local laws, except to the extent local laws are preempted by state law.
6. This permit does not preclude the enforcement of other applicable environmental regulations such as odor emissions under the Missouri Air Pollution Control Law and regulations.
7. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable biosolids or sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act or under Chapter 644 RSMo.
8. In addition to Standard Conditions PART III, the Department may include biosolids and sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Exceptions to Standard Conditions PART III may be authorized on a case-by-case basis by the Department, as follows:
  - a. The Department may modify a site-specific permit following permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR § 124.10, and 40 CFR § 501.15(a)(2)(ix)(E).
  - b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR Part 503.



## **SECTION B – DEFINITIONS**

1. Best Management Practices are practices to prevent or reduce the pollution of waters of the state and include agronomic loading rates (nitrogen based), soil conservation practices, spill prevention and maintenance procedures and other site restrictions.
2. Biosolids means organic fertilizer or soil amendment produced by the treatment of domestic wastewater sludge.
3. Biosolids land application facility is a facility where biosolids are spread onto the land at agronomic rates for production of food, feed or fiber. The facility includes any structures necessary to store the biosolids until soil, weather, and crop conditions are favorable for land application.
4. Class A biosolids means a material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR Part 503.
5. Class B biosolids means a material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR Part 503.
6. Domestic wastewater means wastewater originating from the sanitary conveniences of residences, commercial buildings, factories and institutions; or co-mingled sanitary and industrial wastewater processed by a (POTW) or a privately owned facility.
7. Feed crops are crops produced primarily for consumption by animals.
8. Fiber crops are crops such as flax and cotton.
9. Food crops are crops consumed by humans which include, but is not limited to, fruits, vegetables and tobacco.
10. Industrial wastewater means any wastewater, also known as process wastewater, not defined as domestic wastewater. Per 40 CFR Part 122.2, process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. Land application of industrial wastewater, residuals or sludge is not authorized by Standard Conditions PART III.
11. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological contact systems, and other similar facilities. It does not include wastewater treatment lagoons or constructed wetlands for wastewater treatment.
12. Plant Available Nitrogen (PAN) is nitrogen that will be available to plants during the growing seasons after biosolids application.
13. Public contact site is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
14. Sludge is the solid, semisolid, or liquid residue removed during the treatment of wastewater. Sludge includes septage removed from septic tanks or equivalent facilities. Sludge does not include carbon coal byproducts (CCBs), sewage sludge incinerator ash, or grit/screenings generated during preliminary treatment of domestic sewage.
15. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen or concrete lined basin that receives sludge that has been removed from a wastewater treatment facility. It does not include a wastewater treatment lagoon or sludge treatment units that are not a part of a mechanical wastewater treatment facility.
16. Septage is the sludge pumped from residential septic tanks, cesspools, portable toilets, Type III marine sanitation devices, or similar treatment works such as sludge holding structures from residential wastewater treatment facilities with design populations of less than 150 people. Septage does not include grease removed from grease traps at a restaurant or material removed from septic tanks and other similar treatment works that have received industrial wastewater. The standard for biosolids from septage is different from other sludges. See Section H for more information.

## **SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES**

1. Biosolids or sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and the requirements of Standard Conditions PART III or in accordance with Section A.3.c., above.
2. The permittee shall operate storage and treatment facilities, as defined by Section 644.016(23), RSMo, so that there is no biosolids or sludge discharged to waters of the state. Agricultural storm water discharges are exempt under the provisions of Section 644.059, RSMo.
3. Mechanical treatment plants shall have separate biosolids or sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove biosolids or sludge from these storage compartments on the required design schedule is a violation of this permit.

## **SECTION D – BIOSOLIDS OR SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR BY CONTRACT HAULER**

1. Permittees that use contract haulers, under the authority of their operating permit, to dispose of biosolids or sludge, are responsible for compliance with all the terms of this permit. Contract haulers that assume the responsibility of the final disposal of biosolids or sludge, including biosolids land application, must obtain a Missouri State Operating Permit unless the hauler transports the biosolids or sludge to another permitted treatment facility.
2. Testing of biosolids or sludge, other than total solids content, is not required if biosolids or sludge are hauled to a permitted wastewater treatment facility, unless it is required by the accepting facility.

## **SECTION E – INCINERATION OF SLUDGE**

1. Please be aware that sludge incineration facilities may be subject to the requirements of 40 CFR Part 503 Subpart E, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Permittee may be authorized under the facility description of this permit to store incineration ash in lagoons or ash ponds. This permit does not authorize the disposal of incineration ash. Incineration ash shall be disposed in accordance with 10 CSR 80; or, if the ash is determined to be hazardous, with 10 CSR 25.
3. In addition to normal sludge monitoring, incineration facilities shall report the following as part of the annual report, mass of sludge incinerated and mass of ash generated. Permittee shall also provide the name of the ash disposal facility and permit number if applicable.

## **SECTION F – SURFACE DISPOSAL SITES AND BIOSOLIDS AND SLUDGE LAGOONS**

1. Please be aware that surface disposal sites of biosolids or sludge from wastewater treatment facilities may be subject to other laws including the requirements in 40 CFR Part 503 Subpart C, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Biosolids or sludge storage lagoons are temporary facilities and are not required to obtain a permit as a solid waste management facility under 10 CSR 80. In order to maintain biosolids or sludge storage lagoons as storage facilities, accumulated biosolids or sludge must be removed routinely, but not less than once every two years unless an alternate schedule is approved in the permit. The amount of biosolids or sludge removed will be dependent on biosolids or sludge generation and accumulation in the facility. Enough biosolids or sludge must be removed to maintain adequate storage capacity in the facility.
  - a. In order to avoid damage to the lagoon seal during cleaning, the permittee may leave a layer of biosolids or sludge on the bottom of the lagoon, upon prior approval of the Department; or
  - b. Permittee shall close the lagoon in accordance with Section I.

## **SECTION G – LAND APPLICATION OF BIOSOLIDS**

1. The permittee shall not land apply biosolids unless land application is authorized in the facility description, the special conditions of the issued NPDES permit, or in accordance with Section A.3.c., above.
2. This permit only authorizes “Class A” or “Class B” biosolids derived from domestic wastewater to be land applied onto grass land, crop land, timber, or other similar agricultural or silviculture lands at rates suitable for beneficial use as organic fertilizer and soil conditioner.
3. Class A Biosolids Requirements: Biosolids shall meet Class A requirements for application to public contact sites, residential lawns, home gardens or sold and/or given away in a bag or other container.
4. Class B biosolids that are land applied to agricultural and public contact sites shall comply with the following restrictions:
  - a. Food crops that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
  - b. Food crops below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
  - c. Food crops below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
  - d. Animal grazing shall not be allowed for 30 days after application of biosolids.
  - e. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
  - f. Turf shall not be harvested for one year after application of biosolids if used for lawns or high public contact sites in close proximity to populated areas such as city parks or golf courses.
  - g. After Class B biosolids have been land applied to public contact sites with high potential for public exposure, as defined in 40 CFR § 503.31, such as city parks or golf courses, access must be restricted for 12 months.
  - h. After Class B biosolids have been land applied public contact sites with low potential for public exposure as defined in 40 CFR § 503.31, such as a rural land application or reclamation sites, access must be restricted for 30 days.
5. Pollutant limits
  - a. Biosolids shall be monitored to determine the quality for regulated pollutants listed in Table 1, below. Limits for any pollutants not listed below may be established in the permit.
  - b. The number of samples taken is directly related to the amount of biosolids or sludge produced by the facility (See Section J, below). Samples should be taken only during land application periods. When necessary, it is permissible to mix biosolids with lower concentrations of biosolids as well as other suitable Department approved material to achieve pollutant concentration below those identified in Table 1, below.
  - c. Table 1 gives the ceiling concentration for biosolids. Biosolids which exceed the concentrations in Table 1 may not be land applied.

**TABLE 1**

Biosolids ceiling concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

- d. Table 2 below gives the low metal concentration for biosolids. Because of its higher quality, biosolids with pollutant concentrations below those listed in Table 2 can safely be applied to agricultural land, forest, public contact sites, lawns, home gardens or be given away without further analysis. Biosolids containing metals in concentrations above the low metals concentrations but below the ceiling concentration limits may be land applied but shall not exceed the annual loading rates in Table 3 and the cumulative loading rates in Table 4. The permittee is required to track pollutant loading onto application sites for parameters that have exceeded the low metal concentration limits.

**TABLE 2**

Biosolids Low Metal Concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

- e. Annual pollutant loading rate.

**Table 3**

Biosolids Annual Loading Rate	
Pollutant	Kg/ha (lbs./ac) per year
Arsenic	2.0 (1.79)
Cadmium	1.9 (1.70)
Copper	75 (66.94)
Lead	15 (13.39)
Mercury	0.85 (0.76)
Nickel	21 (18.74)
Selenium	5.0 (4.46)
Zinc	140 (124.96)

- f. Cumulative pollutant loading rates.

**Table 4**

Biosolids Cumulative Pollutant Loading Rate	
Pollutant	Kg/ha (lbs./ac)
Arsenic	41 (37)
Cadmium	39 (35)
Copper	1500 (1339)
Lead	300 (268)
Mercury	17 (15)
Nickel	420 (375)
Selenium	100 (89)
Zinc	2800 (2499)

6. Best Management Practices. The permittee shall use the following best management practices during land application activities to prevent the discharge of biosolids to waters of the state.
- Biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under § 4 of the Endangered Species Act or its designated critical habitat.
  - Apply biosolids only at the agronomic rate of nitrogen needed (see 5.c. of this section).
  - The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop

nitrogen removal when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kgTN; or 2) When biosolids are land applied at an application rate greater than two dry tons per acre per year.

- i. PAN can be determined as follows:  
(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor<sup>1</sup>).  
<sup>1</sup> Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
- ii. Crop nutrient production/removal to be based on crop specific nitrogen needs and realistic yield goals. **NOTE:** There are a number of reference documents on the Missouri Department of Natural Resources website that are informative to implement best management practices in the proper management of biosolids, including crop specific nitrogen needs, realistic yields on a county by county basis and other supporting references.
- iii. Biosolids that are applied at agronomic rates shall not cause the annual pollutant loading rates identified in Table 3 to be exceeded.
- d. Buffer zones are as follows:
  - i. 300 feet of a water supply well, sinkhole, water supply reservoir or water supply intake in a stream;
  - ii. 300 feet of a losing stream, no discharge stream, stream stretches designated for whole body contact recreation, wild and scenic rivers, Ozark National Scenic Riverways or outstanding state resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;
  - iii. 150 feet of dwellings or public use areas;
  - iv. 100 feet (35 feet if biosolids application is down-gradient or the buffer zone is entirely vegetated) of lake, pond, wetlands or gaining streams (perennial or intermittent);
  - v. 50 feet of a property line. Buffer distances from property lines may be waived with written permission from neighboring property owner.
  - vi. For the application of dry, cake or liquid biosolids that are subsurface injected, buffer zones identified in 5.d.i. through 5.d.iii above, may be reduced to 100 feet. The buffer zone may be reduced to 35 feet if the buffer zone is permanently vegetated. Subsurface injection does not include methods or technology reflective of combination surface/shallow soil incorporation.
- e. Slope limitation for application sites are as follows:
  - i. For slopes less than or equal to 6 percent, no rate limitation;
  - ii. Applied to a slope 7 to 12 percent, the applicator may apply biosolids when soil conservation practices are used to meet the minimum erosion levels;
  - iii. Slopes > 12 percent, apply biosolids only when grass is vegetated and maintained with at least 80 percent ground cover at a rate of two dry tons per acre per year or less.
  - iv. Dry, cake or liquid biosolids that are subsurface injected, may be applied on slopes not to exceed 20 percent. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation.
- f. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
- g. Biosolids may be land applied to sites with soil that are snow covered, frozen, or saturated with liquid when site restrictions or other controls are provided to prevent pollutants from being discharged to waters of the state during snowmelt or stormwater runoff. During inclement weather or unfavorable soil conditions use the following management practices:
  - i. A maximum field slope of 6% and a minimum 300 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be utilized for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
  - ii. A maximum field slope of 2% and 100 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be used for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
  - iii. Other best management practices approved by the Department.

## SECTION H – SEPTAGE

1. Haulers that land apply septage must obtain a state permit. An operating permit is not required for septage haulers who transport septage to another permitted treatment facility for disposal.
2. Do not apply more than 30,000 gallons of septage per acre per year or the volume otherwise stipulated in the operating permit.
3. Septic tanks are designed to retain sludge for one to three years which will allow for a larger reduction in pathogens and vectors, as compared to mechanical treatment facilities.
4. Septage must comply with Class B biosolids regarding pathogen and vector attraction reduction requirements before it may be applied to crops, pastures or timberland. To meet required pathogen and vector reduction requirements, mix 50 pounds of hydrated lime for every 1,000 gallons of septage and maintain a septage pH of at least 12 pH standard units for 30 minutes or more prior to application.
5. Lime is to be added to the pump truck and not directly to the septic tanks, as lime would harm the beneficial bacteria of the septic tank.
6. As residential septage contains relatively low levels of metals, the testing of metals in septage is not required.

## SECTION I– CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical and lagoons) and sludge or biosolids storage and treatment facilities. It does not apply to land application sites.
2. Permittees of a domestic wastewater facility who plan to cease operation must obtain Department approval of a closure plan which addresses proper removal and disposal of all sludges and/or biosolids. Permittee must maintain this permit until the facility is closed in accordance with the approved closure plan per 10 CSR 20 – 6.010 and 10 CSR 20 – 6.015.
3. Biosolids or sludge that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:
  - a. Biosolids and sludge shall meet the monitoring and land application limits for agricultural rates as referenced in Section G, above.
  - b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
  - c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre. Alternative, site-specific application rates may be included in the closure plan for department consideration.
    - i. PAN can be determined as follows:
$$(\text{Nitrate} + \text{nitrite nitrogen}) + (\text{organic nitrogen} \times 0.2) + (\text{ammonia nitrogen} \times \text{volatilization factor}^1).$$
<sup>1</sup> Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
4. Domestic wastewater treatment lagoons with a design treatment capacity less than or equal to 150 persons, are “similar treatment works” under the definition of septage. Therefore the sludge within the lagoons may be treated as septage during closure activities. See Section B, above. Under the septage category, residuals may be left in place as follows:
  - a. Testing for metals or fecal coliform is not required.
  - b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
  - c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Biosolids or sludge left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, and unless otherwise approved, the lagoon berm shall be demolished, and the site shall be graded and contain  $\geq 70\%$  vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion. Alternative biosolids or sludge and soil mixing ratios may be included in the closure plan for department consideration.
6. Lagoon and earthen structure closure activities shall obtain a storm water permit for land disturbance activities that equal or exceed one acre in accordance with 10 CSR 20-6.200.
7. When closing a mechanical wastewater plant, all biosolids or sludge must be cleaned out and disposed of in accordance with the Department approved closure plan before the permit for the facility can be terminated.
  - a. Land must be stabilized which includes any grading, alternate use or fate upon approval by the Department, remediation, or other work that exposes sediment to stormwater per 10 CSR 20-6.200. The site shall be graded and contain  $\geq 70\%$  vegetative density over 100% of the site, so as to avoid ponding of storm water and provide adequate

- surface water drainage without creating erosion.
- b. Hazardous Waste shall not be land applied or disposed during mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations pursuant to 10 CSR 25.
  - c. After demolition of the mechanical plant, the site must only contain clean fill defined in Section 260.200.1(6) RSMo as uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinderblocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the Department for fill, reclamation, or other beneficial use. Other solid wastes must be removed.
8. If biosolids or sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or I, a landfill permit or solid waste disposal permit must be obtained if the permittee chooses to seek authorization for on-site sludge disposal under the Missouri Solid Waste Management Law and regulations per 10 CSR 80, and the permittee must comply with the surface disposal requirements under 40 CFR Part 503, Subpart C.

## SECTION J – MONITORING FREQUENCY

1. At a minimum, biosolids or sludge shall be tested for volume and percent total solids on a frequency that will accurately represent sludge quantities produced and disposed. Please see the table below.

**TABLE 5**

Biosolids or Sludge produced and disposed (Dry Tons per Year)	Monitoring Frequency (See Notes 1, and 2)		
	Metals, Pathogens and Vectors, Total Phosphorus, Total Potassium	Nitrogen TKN, Nitrogen PAN <sup>1</sup>	Priority Pollutants <sup>2</sup>
319 or less	1/year	1 per month	1/year
320 to 1650	4/year	1 per month	1/year
1651 to 16,500	6/year	1 per month	1/year
16,501+	12/year	1 per month	1/year

<sup>1</sup> Calculate plant available nitrogen (PAN) when either of the following occurs: 1) when biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.

<sup>2</sup> Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) are required only for permit holders that must have a pre-treatment program. Monitoring requirements may be modified and incorporated into the operating permit by the Department on a case-by-case basis.

Note 1: Total solids: A grab sample of sludge shall be tested one per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of sludge applied per acre.

Note 2: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

2. Permittees that operate wastewater treatment lagoons, peak flow equalization basins, combined sewer overflow basins or biosolids or sludge lagoons that are cleaned out once a year or less, may choose to sample only when the biosolids or sludge is removed or the lagoon is closed. Test one composite sample for each 319 dry tons of biosolids or sludge removed from the lagoon during the reporting year or during lagoon closure. Composite sample must represent various areas at one-foot depth.
3. Additional testing may be required in the special conditions or other sections of the permit.
4. Biosolids and sludge monitoring shall be conducted in accordance with federal regulation 40 CFR § 503.8, Sampling and analysis.

## SECTION K – RECORD KEEPING AND REPORTING REQUIREMENTS

1. The permittee shall maintain records on file at the facility for at least five years for the items listed in Standard Conditions PART III and any additional items in the Special Conditions section of this permit. This shall include dates when the biosolids or sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
  - a. By February 19<sup>th</sup> of each year, applicable facilities shall submit an annual report for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and biosolids or sludge disposal facilities.
  - b. Permittees with wastewater treatment lagoons shall submit the above annual report only when biosolids or sludge are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Form. The annual report shall be prepared on report forms provided by the Department or equivalent forms approved by the Department.
4. Reports shall be submitted as follows:  
Major facilities, which are those serving 10,000 persons or more or with a design flow equal to or greater than 1 million gallons per day or that are required to have an approved pretreatment program, shall report to both the Department and EPA if the facility land applied, disposed of biosolids by surface disposal, or operated a sewage sludge incinerator. All other facilities shall maintain their biosolids or sludge records and keep them available to Department personnel upon request. State reports shall be submitted to the address listed as follows:

DNR regional or other applicable office listed in the  
permit (see cover letter of permit)  
ATTN: Sludge Coordinator

Reports to EPA must be electronically submitted online via the Central Data Exchange at: <https://cdx.epa.gov/> Additional information is available at: <https://www.epa.gov/biosolids/compliance-and-annual-reporting-guidance-about-clean-water-act-laws>

5. Annual report contents. The annual report shall include the following:
  - a. Biosolids and sludge testing performed. If testing was conducted at a greater frequency than what is required by the permit, all test results must be included in the report.
  - b. Biosolids or sludge quantity shall be reported as dry tons for the quantity produced and/or disposed.
  - c. Gallons and % solids data used to calculate the dry ton amounts.
  - d. Description of any unusual operating conditions.
  - e. Final disposal method, dates, and location, and person responsible for hauling and disposal.
    - i. This must include the name and address for the hauler and sludge facility. If hauled to a municipal wastewater treatment facility, sanitary landfill, or other approved treatment facility, give the name of that facility.
    - ii. Include a description of the type of hauling equipment used and the capacity in tons, gallons, or cubic feet.
  - f. Contract Hauler Activities:

If using a contract hauler, provide a copy of a signed contract from the contractor. Permittee shall require the contractor to supply information required under this permit for which the contractor is responsible. The permittee shall submit a signed statement from the contractor that he has complied with the standards contained in this permit, unless the contract hauler has a separate biosolids or sludge use permit.
  - g. Land Application Sites:
    - i. Report the location of each application site, the annual and cumulative dry tons/acre for each site, and the landowners name and address. The location for each spreading site shall be given as a legal description for nearest ¼, ¼, Section, Township, Range, and county, or UTM coordinates. The facility shall report PAN when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.
    - ii. If the “Low Metals” criteria are exceeded, report the annual and cumulative pollutant loading rates in pounds per acre for each applicable pollutant, and report the percent of cumulative pollutant loading which has been reached at each site.
    - iii. Report the method used for compliance with pathogen and vector attraction requirements.
    - iv. Report soil test results for pH and phosphorus. If no soil was tested during the year, report the last date when tested and the results.



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM

**FORM B2 – APPLICATION FOR OPERATING PERMIT FOR FACILITIES THAT  
RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN  
100,000 GALLONS PER DAY**

FACILITY NAME

*Jasper Wastewater Treatment Facility*

PERMIT NO.

*MO-0044202*

COUNTY

*Jasper*

**APPLICATION OVERVIEW**

Form B2 has been developed in a modular format and consists of Parts A, B and C and a Supplemental Application Information (Parts D, E, F and G) packet. All applicants must complete Parts A, B and C. Some applicants must also complete parts of the Supplemental Application Information packet. The following items explain which parts of Form B2 you must complete. Submittal of an incomplete application may result in the application being returned.

**BASIC APPLICATION INFORMATION**

- A. Basic application information for all applicants. All applicants must complete Part A.
- B. Additional application information for all applicants. All applicants must complete Part B.
- C. Certification. All applicants must complete Part C.

**SUPPLEMENTAL APPLICATION INFORMATION**

- D. Expanded Effluent Testing Data. A treatment works that discharges effluent to surface water of the United States and meets one or more of the following criteria must complete *Part D - Expanded Effluent Testing Data*:
  - 1. Has a design flow rate greater than or equal to 1 million gallons per day.
  - 2. Is required to have or currently has a pretreatment program.
  - 3. Is otherwise required by the permitting authority to provide the information.
- E. Toxicity Testing Data. A treatment works that meets one or more of the following criteria must complete *Part E - Toxicity Testing Data*:
  - 1. Has a design flow rate greater than or equal to 1 million gallons per day.
  - 2. Is required to have or currently has a pretreatment program.
  - 3. Is otherwise required by the permitting authority to provide the information.
- F. Industrial User Discharges and Resource Conservation and Recovery Act / Comprehensive Environmental Response, Compensation and Liability Act Wastes. A treatment works that accepts process wastewater from any significant industrial users, also known as SIUs, or receives a Resource Conservation and Recovery Act or CERCLA wastes must complete *Part F - Industrial User Discharges and Resource Conservation and Recovery Act / CERCLA Wastes*.  
SIUs are defined as:
  - 1. All *Categorical Industrial Users*, or CIUs, subject to *Categorical Pretreatment Standards* under 40 Code of Federal Regulations 403.6 and 40 Code of Federal Regulations 403.6 and 40 CFR Chapter 1, Subchapter N.
  - 2. Any other industrial user that meets one or more of the following:
    - i. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions).
    - ii. Contributes a process waste stream that makes up 5% or more of the average dry weather hydraulic or organic capacity of the treatment plant.
    - iii. Is designated as an SIU by the control authority.
    - iv. Is otherwise required by the permitting authority to provide the information.
- G. Combined Sewer Systems. A treatment works that has a combined sewer system must complete *Part G - Combined Sewer Systems*.

RECEIVED

**ALL APPLICANTS MUST COMPLETE PARTS A, B and C**

APR 25 2022



RECEIVED  
APR 25 2022

AP 39205



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
**FORM B2 – APPLICATION FOR AN OPERATING PERMIT FOR  
FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND  
HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY**

Water Protection Program

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED
4/25/22	\$0
JET PAY CONFIRMATION NUMBER	
544	

**PART A – BASIC APPLICATION INFORMATION****1. THIS APPLICATION IS FOR:**

- ☐ An operating permit for a new or unpermitted facility. Construction Permit # \_\_\_\_\_  
(Include completed Antidegradation Review or request to conduct an Antidegradation Review, see instructions)  
☒ An operating permit renewal: Permit #MO- 0044202 Expiration Date 09-30-2022  
☐ An operating permit modification: Permit #MO- \_\_\_\_\_ Reason: \_\_\_\_\_

1.1 Is the appropriate fee included with the application (see instructions for appropriate fee)? ☐ YES ☐ NO

**2. FACILITY**

NAME <u>Jasper Wastewater Treatment Facility</u>		TELEPHONE NUMBER WITH AREA CODE <u>417-394-2532</u>	
ADDRESS (PHYSICAL) <u>121 East Grand Avenue</u>	CITY <u>Jasper</u>	STATE <u>MO</u>	ZIP CODE <u>64755</u>
2.1 LEGAL DESCRIPTION (Facility Site): Sec <u>23</u> T <u>30N</u> R <u>31W</u>		COUNTY <u>Jasper</u>	
2.2 UTM Coordinates Easting (X): <u>883877</u> Northing (Y): <u>4132180</u> For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)			
2.3 Name of receiving stream: <u>Tributary to Cripple Creek</u>			
2.4 Number of Outfalls: <u>1</u> wastewater outfalls: <u>1</u> stormwater outfalls: _____ instream monitoring sites: _____			

**3. OWNER**

NAME <u>City of Jasper</u>		EMAIL ADDRESS <u>jcityhall@keinet.net</u>		TELEPHONE NUMBER WITH AREA CODE <u>417-394-2532</u>	
ADDRESS <u>121 East Grand Avenue</u>	CITY <u>Jasper</u>	STATE <u>MO</u>	ZIP CODE <u>64755</u>		
3.1 Request review of draft permit prior to Public Notice?		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
3.2 Are you a Publically Owned Treatment Works (POTW)? If yes, is the Financial Questionnaire attached?		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO See: <a href="https://dnr.mo.gov/forms/780-2511-f.pdf">https://dnr.mo.gov/forms/780-2511-f.pdf</a>			
3.3 Are you a Privately Owned Treatment Facility?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
3.4 Are you a Privately Owned Treatment Facility regulated by the Public Service Commission (PSC)?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			

**4. CONTINUING AUTHORITY**

NAME		EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
ADDRESS		CITY		STATE ZIP CODE	

If the Continuing Authority is different than the Owner, include a copy of the contract agreement between the two parties and a description of the responsibilities of both parties within the agreement.

**5. OPERATOR**

NAME <u>Larry Bice</u>		TITLE <u>Chief Operator</u>		CERTIFICATE NUMBER (IF APPLICABLE) <u>3736</u>	
EMAIL ADDRESS <u>larryb1293@yahoo.com</u>		TELEPHONE NUMBER WITH AREA CODE <u>417-456-1211</u>			

**6. FACILITY CONTACT**

NAME <u>Mark Baird</u>		TITLE <u>Superintendent</u>			
EMAIL ADDRESS <u>jasperwastewater@gmail.com</u>		TELEPHONE NUMBER WITH AREA CODE <u>417-499-1964</u>			
ADDRESS <u>301 North 4<sup>th</sup> Street</u>	CITY <u>Jasper</u>	STATE <u>MO</u>	ZIP CODE <u>64755</u>		

FACILITY NAME <b>J.W.T.F</b>	PERMIT NO. MO- <b>0044202</b>	OUTFALL NO. <b>002</b>
<b>PART A – BASIC APPLICATION INFORMATION</b>		
<b>7. FACILITY INFORMATION</b>		
<p><b>7.1 Process Flow Diagram or Schematic.</b> Provide a diagram showing the processes of the treatment plant. Show all of the treatment units, including disinfection (e.g. – Chlorination and Dechlorination), influents, and outfalls. Specify where samples are taken. Indicate any treatment process changes in the routing of wastewater during dry weather and peak wet weather. Include a brief narrative description of the diagram. Attach sheets as necessary.</p> <p style="text-align: center;"><i>See attachment: (Exhibit 7-3)</i></p>		

Inlet Gravity Sewer  
Influent Sample site

INFLUENT PUMP STATION

WET-WEATHER OVERFLOW PUMP STATION

Effluent Sample Site

6" Force Main

IRRIGATION PUMPHOUSE

4" Backflow

Force Main

WET-WEATHER PEAK FLOW BASIN (1 CELL)

3-CELL BAFFLED AERATED LAGOON

LEMNA-COVERED SETTLING CELL

UV DISINFECTION

REAERATION STRUCTURE

DISCHARGE (OUTFALL #002)

EFF Weir Totalometer

# FLOW DIAGRAM - WASTEWATER TREATMENT FACILITY

DWC: F:\2016\3501-4000\016-3568\40-Design\Reports\For Permits\OA PROCESS FLOW 7-3.dwg  
DATE: Feb 21, 2017 5:25pm  
USER: jjesky  
XREFS:

PROJECT NO:	2016-3568
DRAWN BY:	HSM
DATE:	02.21.17

JASPER,  
MISSOURI

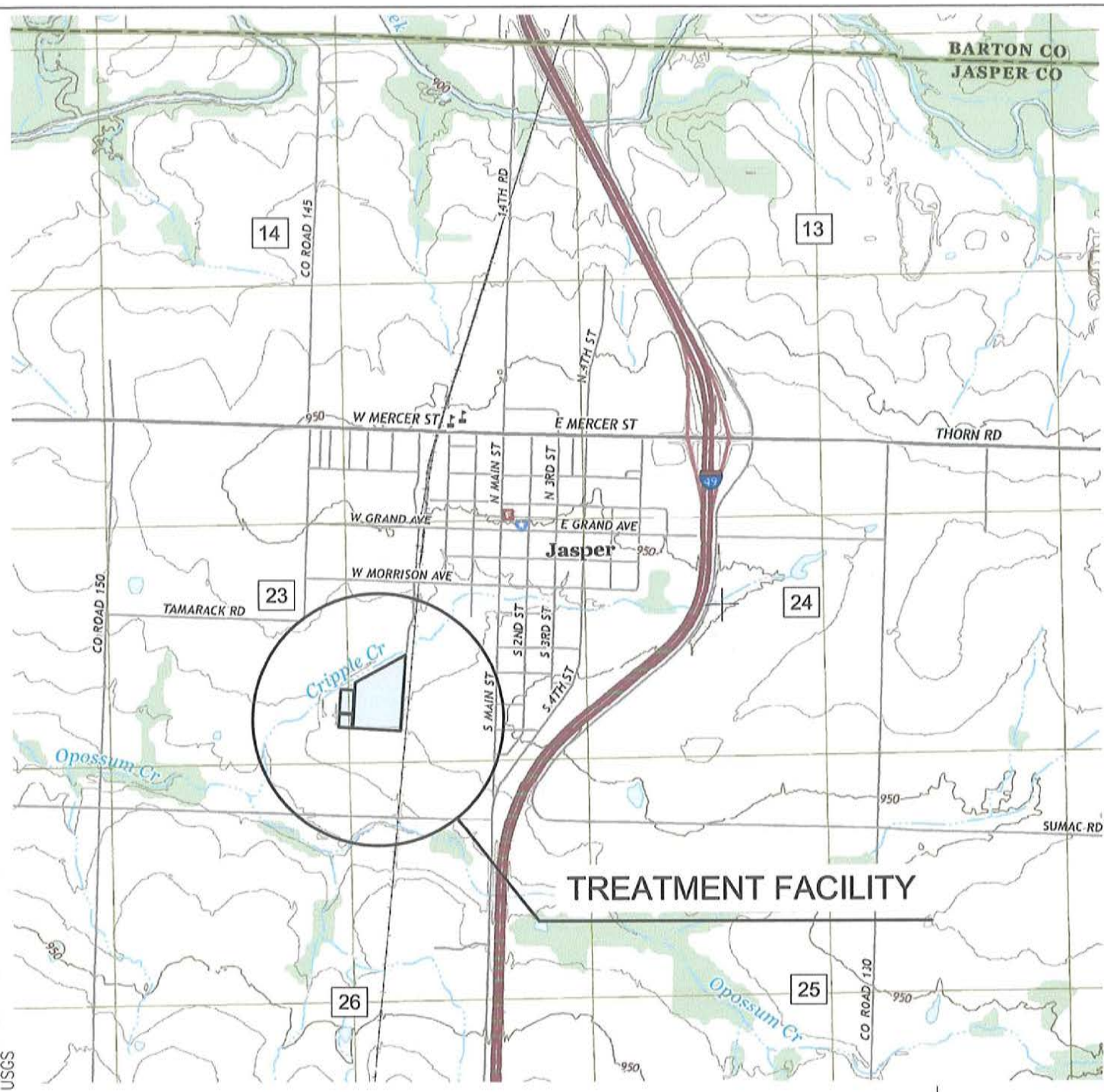
**MOLSSON**  
ASSOCIATES

550 St. Louis Street  
Springfield, MO 65806  
TEL 417.890.8802  
FAX 401.890.8805

EXHIBIT
7-3



DWG: F:\2016\3501-4000\016-3568\40-Design\Reports\For Permits\OA TOPO MAP 7-2.dwg  
DATE: Feb 10, 2017 11:31am  
USER: smarrs  
XREFS: USGS



**LOCATION MAP**

**(TOPOGRAPHIC MAP)**

**WASTEWATER TREATMENT FACILITY**



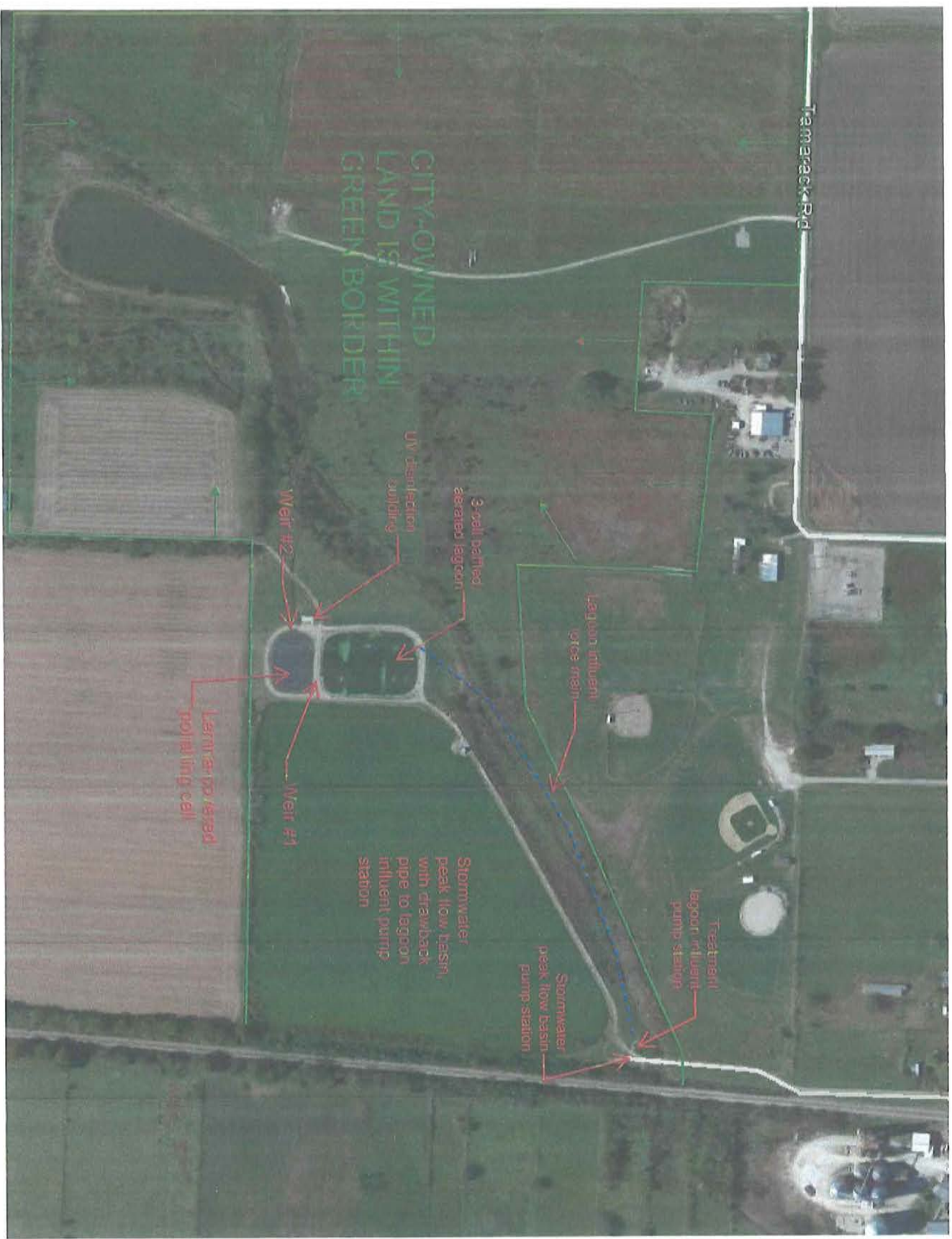
PROJECT NO:	2016-3568
DRAWN BY:	HSM
DATE:	02.10.17

**JASPER,  
MISSOURI**



550 St. Louis Street  
Springfield, MO 65806  
TEL 417.890.8802  
FAX 401.890.8805

EXHIBIT
<b>7-2</b>







**PROPOSED ALTERNATIVE 4B**  
**LEMNA LPR LAYOUT**

PROJECT NO:	016-3568
DRAWN BY:	HSM
DATE:	08.16.2018

**JASPER,  
MISSOURI**

**MOLSSON<sup>®</sup>**  
ASSOCIATES

550 St. Louis Street  
Springfield, MO 65806  
TEL 417.890.8802  
FAX 401.890.8805

EXHIBIT
2

FACILITY NAME <b>J.W.T.F</b>	PERMIT NO. MO- <b>0044302</b>	OUTFALL NO. <b>002</b>
<b>PART A - BASIC APPLICATION INFORMATION</b>		
<b>7. FACILITY INFORMATION (continued)</b>		
<b>7.2 Map.</b> Attach to this application an aerial or topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information. A map can be obtained by visiting the following website: <a href="https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=1d81212e0854478ca0dae87c33c8c5ce">https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=1d81212e0854478ca0dae87c33c8c5ce</a> <ol style="list-style-type: none"> <li>The area surrounding the treatment plant, including all unit processes.</li> <li>The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.</li> <li>The actual point of discharge.</li> <li>Wells, springs, other surface water bodies and drinking water wells that are: 1) within ¼ mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.</li> <li>Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.</li> <li>If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored, or disposed.</li> </ol>		
<b>7.3</b> Number of people presently connected or population equivalent (P.E.): <b>448 P.E.</b> Design P.E. <b>1,405</b>		
<b>7.4</b> Connections to the facility: Number of units presently connected: <b>389</b> Residential: <b>365</b> Commercial: <b>24</b> Industrial <b>0</b>		
<b>7.5</b> Design Flow <b>135,000 gpd</b>		Actual Flow <b>188,902 Inc. I<sup>1</sup>I</b>
<b>7.6</b> Will discharge be continuous through the year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Discharge will occur during the following months: <b>Jan - Dec</b> How many days of the week will discharge occur? <b>7</b>		
<b>7.7</b> Is industrial wastewater discharged to the facility? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, describe the number and types of industries that discharge to your facility. Attach sheets as necessary		
Refer to the APPLICATION OVERVIEW to determine whether additional information is needed for Part F.		
<b>7.8</b> Does the facility accept or process leachate from landfills?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>7.9</b> Is wastewater land applied? If yes, please attach Form I See: <a href="https://dnr.mo.gov/forms/780-1686-f.pdf">https://dnr.mo.gov/forms/780-1686-f.pdf</a>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>7.10</b> Does the facility discharge to a losing stream or sinkhole?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>7.11</b> Has a wasteload allocation study been completed for this facility?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>8. LABORATORY CONTROL INFORMATION</b>		
<b>LABORATORY WORK CONDUCTED BY PLANT PERSONNEL</b>		
Lab work conducted outside of plant.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Push-button or visual methods for simple test such as pH, settleable solids.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Additional procedures such as Dissolved Oxygen, Chemical Oxygen Demand, Biological Oxygen Demand, titrations, solids, volatile content.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>



FACILITY NAME <b>J. W. T. F.</b>	PERMIT NO. MO- <b>DD44202</b>	OUTFALL NO. <b>002</b>
<b>PART A - BASIC APPLICATION INFORMATION</b>		
<b>9. SLUDGE HANDLING, USE AND DISPOSAL</b>		
9.1 Is the sludge a hazardous waste as defined by 10 CSR 25? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
9.2 Sludge production (Including sludge received from others): Design Dry Tons/Year <b>280</b> Actual Dry Tons/Year <b>16.4 estimated</b>		
9.3 Sludge storage provided: _____ Cubic feet; _____ Days of storage; _____ Average percent solids of sludge; <input type="checkbox"/> No sludge storage is provided. <input checked="" type="checkbox"/> Sludge is stored in lagoon.		
9.4 Type of storage: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Holding Tank  <input type="checkbox"/> Basin  <input type="checkbox"/> Concrete Pad </div> <div> <input type="checkbox"/> Building  <input checked="" type="checkbox"/> Lagoon  <input type="checkbox"/> Other (Describe) _____ </div> </div>		
9.5 Sludge Treatment: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Anaerobic Digester  <input type="checkbox"/> Aerobic Digester </div> <div> <input type="checkbox"/> Storage Tank  <input type="checkbox"/> Air or Heat Drying </div> <div> <input type="checkbox"/> Lime Stabilization  <input type="checkbox"/> Composting </div> <div> <input checked="" type="checkbox"/> Lagoon  <input type="checkbox"/> Other (Attach Description) </div> </div>		
9.6 Sludge use or disposal: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Land Application  <input checked="" type="checkbox"/> Surface Disposal (Sludge Disposal Lagoon, Sludge Held For More Than Two Years)  <input type="checkbox"/> Other (Attach Explanation Sheet) _____ </div> <div> <input type="checkbox"/> Contract Hauler  <input type="checkbox"/> Hauled to Another Treatment Facility  <input type="checkbox"/> Solid Waste Landfill  <input type="checkbox"/> Incineration </div> </div>		
9.7 Person responsible for hauling sludge to disposal facility: <input type="checkbox"/> By Applicant <input type="checkbox"/> By Others (complete below)		
NAME		EMAIL ADDRESS
ADDRESS	CITY	STATE    ZIP CODE
CONTACT PERSON	TELEPHONE NUMBER WITH AREA CODE	PERMIT NO. MO-
9.8 Sludge use or disposal facility: <input type="checkbox"/> By Applicant <input type="checkbox"/> By Others (Complete below)		
NAME		EMAIL ADDRESS
ADDRESS	CITY	STATE    ZIP CODE
CONTACT PERSON	TELEPHONE NUMBER WITH AREA CODE	PERMIT NO. MO-
9.9 Does the sludge or biosolids disposal comply with Federal Sludge Regulation 40 CFR 503? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Explain)		
<b>END OF PART A</b>		



FACILITY NAME <b>J.W.T.F</b>	PERMIT NO. MO- <b>0044202</b>	OUTFALL NO. <b>002</b>
<b>PART B – ADDITIONAL APPLICATION INFORMATION</b>		
<b>10. COLLECTION SYSTEM</b>		
<b>10.1</b> Are there any municipal satellite collection systems connected to this facility? ____ Yes <input checked="" type="checkbox"/> No If yes, please list all connected to this facility, contact phone number and length of each collection system		
FACILITY	CONTACT PHONE NUMBER	LENGTH OF SYSTEM (FEET OR MILES)
<b>10.2</b> Length of sanitary sewer collection system in miles (If available, include totals from satellite collection systems) <b>8.3</b> miles		
<b>10.3</b> Does significant infiltration occur in the collection system? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, briefly explain any steps underway or planned to minimize inflow and infiltration:		
<b>11. BYPASSING</b>		
Does any bypassing occur anywhere in the collection system or at the treatment facility? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, explain:		
<b>12. OPERATION AND MAINTENANCE PERFORMED BY CONTRACTOR(S)</b>		
Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of the contractor? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes, list the name, address, telephone number and status of each contractor and describe the contractor's responsibilities. (Attach additional pages if necessary.)		
NAME		
MAILING ADDRESS		
TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS	
RESPONSIBILITIES OF CONTRACTOR		
<b>13. SCHEDULED IMPROVEMENTS AND SCHEDULES OF IMPLEMENTATION</b>		
Provide information about any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses for each.		
<p style="font-size: 1.2em;">Please see: Adendum to the Wastewater System Facility Plan.</p> <p style="font-size: 1.2em;">Also see: Correspondence between DNR, Engineering and Jasper.</p>		

FACILITY NAME <b>J.W.T.F</b>		PERMIT NO. MO- <b>0044202</b>		OUTFALL NO. <b>002</b>		
<b>PART B - ADDITIONAL APPLICATION INFORMATION</b>						
<b>14. EFFLUENT TESTING DATA</b>						
Applicants must provide effluent testing data for the following parameters. Provide the indicated effluent data <b>for each outfall through which effluent is discharged</b> . Do not include information of combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least <b>three samples</b> and must be no more than four and one-half years apart. See 40 CFR 136.3 for sufficiently sensitive methods: <a href="https://www.ecfr.gov/cgi-bin/text-id.x?SID=2d29852e2dcdf91badc043bd5fc3d4df&amp;mc=true&amp;node=se40.25.136_13&amp;rgn=div8">https://www.ecfr.gov/cgi-bin/text-id.x?SID=2d29852e2dcdf91badc043bd5fc3d4df&amp;mc=true&amp;node=se40.25.136_13&amp;rgn=div8</a>						
Outfall Number						
PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE			
	Value	Units	Value	Units	Number of Samples	
pH (Minimum)	<b>6.5</b>	S.U.	<b>7.0</b>	S.U.	<b>12</b>	
pH (Maximum)	<b>8.8</b>	S.U.	<b>8.0</b>	S.U.	<b>12</b>	
Flow Rate	<b>0.35568</b>	MGD	<b>0.188,902</b>	MGD	<b>AVG 12 MOS</b>	
*For pH report a minimum and a maximum daily value						
POLLUTANT	MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE		ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Conc.	Units		
Conventional and Nonconventional Compounds						
BIOCHEMICAL OXYGEN DEMAND (Report One)	BOD <sub>5</sub>	<b>19.6</b>	mg/L	<b>9.4</b>	mg/L	<b>SM 5210 B</b>
	CBOD <sub>5</sub>		mg/L		mg/L	
E. COLI	<b>146</b>	#/100 mL	<b>18.3</b>	#/100 mL	<b>SM 9223 B</b>	
TOTAL SUSPENDED SOLIDS (TSS)	<b>17.8</b>	mg/L	<b>10.8</b>	mg/L	<b>SM 2540 D</b>	
TOTAL PHOSPHORUS	<b>2.9</b>	mg/L	<b>1.2</b>	mg/L	<b>EPA 365.4</b>	
TOTAL KJELDAHL NITROGEN	<b>17.3</b>	mg/L	<b>9.2</b>	mg/L	<b>Calculation TKN + NO<sub>3</sub> + NO<sub>2</sub></b>	
NITRITES + NITRATES		mg/L		mg/L		
AMMONIA AS N	<b>13.3</b>	mg/L	<b>8.4</b>	mg/L	<b>EPA 350.1</b>	
CHLORINE* (TOTAL RESIDUAL, TRC)		mg/L		mg/L		
DISSOLVED OXYGEN	<b>11.4</b>	mg/L	<b>4.2</b>	mg/L		
OIL and GREASE	<b>20.8</b>	mg/L	<b>8.9</b>	mg/L	<b>EPA 1664 A</b>	
OTHER: _____		mg/L		mg/L		
*Report only if facility chlorinates						
<b>END OF PART B</b>						

See attached: Annual monitoring & Treatment Summary.



FACILITY NAME <b>J.W.T.F</b>	PERMIT NO. <b>MO- 0044202</b>	OUTFALL NO. <b>002</b>
<b>PART C - CERTIFICATION</b>		
<b>15. ELECTRONIC DISCHARGE MONITORING REPORT (eDMR) SUBMISSION SYSTEM</b>		
<p>Per 40 CFR Part 127, National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure a timely, complete, accurate, and nationally-consistent set of data. One of the following options must be checked in order for this application to be considered complete. Visit <a href="https://dnr.mo.gov/env/wpp/edmr.htm">https://dnr.mo.gov/env/wpp/edmr.htm</a> to for information on the department's eDMR system and how to register.</p> <p> <input type="checkbox"/> I will register an account online to participate in the department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before any reporting is due, in compliance with the Electronic Reporting Rule.  <input checked="" type="checkbox"/> I have already registered an account online to participate in the department's eDMR system through MoGEM.  <input type="checkbox"/> I have submitted a written request for a waiver from electronic reporting. See instructions for further information regarding waivers.  <input type="checkbox"/> The permit I am applying for does not require the submission of discharge monitoring reports.         </p>		
<b>16. JETPAY</b>		
<p>Permit fees may be payed online by credit card or eCheck through a system called JetPay. Use the URL provided to access JetPay and make an online payment.</p> <p>           New Site Specific Permit: <a href="https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/591/">https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/591/</a>            Construction Permits: <a href="https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/592/">https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/592/</a>            Modification Fee: <a href="https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/596/">https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/596/</a> </p>		
<b>17. CERTIFICATION</b>		
<p>All applicants must complete the Certification Section. This certification must be signed by an officer of the company or city official. All applicants must complete all applicable sections as explained in the Application Overview. By signing this certification statement, applicants confirm that they have reviewed the entire form and have completed all sections that apply to the facility for which this application is submitted.</p>		
<b>ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.</b>		
<p>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.</p>		
PRINTED NAME <b>Mary L. McNary</b>	OFFICIAL TITLE (MUST BE AN OFFICER OF THE COMPANY OR CITY OFFICIAL) <b>City Clerk</b>	
SIGNATURE <b>Mary L. McNary</b>		
TELEPHONE NUMBER WITH AREA CODE <b>417-394-2532</b>		
DATE SIGNED <b>4/22/2022</b>		
<p>Upon request of the permitting authority, you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.</p>		
<p>Send Completed Form to: <a href="mailto:cleanwaterpermits@dnr.mo.gov">cleanwaterpermits@dnr.mo.gov</a></p> <p style="text-align: center;"><b>OR</b></p> <p style="text-align: center;">             Department of Natural Resources              Water Protection Program              ATTN: NPDES Permits and Engineering Section              P.O. Box 176              Jefferson City, MO 65102-0176           </p>		
<b>END OF PART C</b>		
<b>REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH PARTS OF FORM B2 YOU MUST COMPLETE.</b>		
<p>Do not complete the remainder of this application, unless at least one of the following statements applies to your facility:</p> <ol style="list-style-type: none"> <li>1. Your facility design flow is equal to or greater than 1,000,000 gallons per day.</li> <li>2. Your facility is a pretreatment treatment works.</li> <li>3. Your facility is a combined sewer system.</li> </ol>		
<p>Submittal of an incomplete application may result in the application being returned. Permit fees for returned applications shall be forfeited. Permit fees for applications being processed by the department that are withdrawn by the applicant shall be forfeited.</p>		

**Submittal of an incomplete application may result in the application being returned.**

This completed form and any attachments along with the applicable permit fees, should be submitted to:

[cleanwaterpermits@dnr.mo.gov](mailto:cleanwaterpermits@dnr.mo.gov)  
or  
Department of Natural Resources  
Water Protection Program  
ATTN: NPDES Permits and Engineering Section  
P.O. Box 176  
Jefferson City, MO 65102-0176

Map of regional offices with addresses and phone numbers are available on the web at <http://dnr.mo.gov/regions/>. If there are any questions concerning this form, contact the appropriate regional office or the Department of Natural Resources, Water Protection Program, Operating Permits Section at 800-361-4827 or 573-522-4502.

# CITY OF JASPER

## WASTEWATER TREATMENT FACILITY

### ANNUAL MONITORING AND TREATMENT SUMMARY

PERMIT #MO-0044202

**2021**

<u>MONTH</u>	<u>(INF)</u>		<u>(EFF)</u>		<u>(NH3-N)</u>	<u>OIL &amp;</u>		<u>(GPD)</u>
	<u>BOD</u>	<u>TSS</u>	<u>BOD</u>	<u>TSS</u>	<u>AMMONIA</u>	<u>GREASE</u>	<u>DO</u>	<u>EFF FLOW</u>
January	95.7	58.0	19.6	11.6	13.3	5.0	6.8	203,700
February	23.9	81.2	12.1	17.4	5.7		9.3	175,984*
March	82.6	68.8	8.5	13.2	9.4		9.0	222,292
April	96.5	150	9.1	13.4	7.3	5.0	5.4	103,943*
May	21.6	50.3	13.8	13.4	12.9		6.6	158,958*
June	31.8	48.4	8.1	17.8	11.5		5.4	168,279*
July	52.7	79.5	7.1	6.7	7.5	20.8	4.1	164,615*
August	11.5	132	3.6	6.4	10.7		0.6	181,774*
September	80.4	51.2	5.2	9.2	7.5		0.1	212,137
October	93.8	151	5.5	7.1	4.1	5.0	0.2	181,518
November	48.9	57.5	6.3	5.7	2.5		1.7	275,419
December	172	180	14.1	7.2	8.9		1.1	218,209
<b>AVERAGE</b>	<b>67.6</b>	<b>92.3</b>	<b>9.4</b>	<b>10.8</b>	<b>8.4</b>	<b>7.2</b>	<b>4.2</b>	<b>188,902</b>

Average daily flow not effected by I&I      **158,925\***

**Annual Rain fall   59.23"**

#### SUMMARY:

**EFFICIENCY** = 86.1 % BOD removal and 88.3 % TSS removal

**ORGANIC LOADING** = 89.6 lbs/day (67.6 mg/l x 0.158925 MGD x 8.34)  
= 16.4 tons/yr (89.6 lbs/day x 365 days / 2000 lbs)

**HYD. LOADING** = 4.42 % of design (158,925 avg/gpd / 3,599,900 gal x 100)  
= 5.25 % including I&I flows (188,902 avg/gpd / 3,599,900 gal x 100)

**P.E.** = 31.9 % of design (89.6 #/day / 0.2 #/person) = (448 People / 1405 x 100)

**WASTING** = 00.00 lbs/day or 0.00 dry tons/yr (0,000 lbs/yr / 365days) Organic Loading

**LOADING/WASTING** = 1.00 ratio (0.00 dry tons/yr / 0.00 tons/yr/organic loading)

**SOLIDS REDUCTION** = -0.0 % (1.00 - 1.00 = -0.00 x 100)



**CITY OF JASPER, MISSOURI**

**ADDENDUM TO THE  
WASTEWATER SYSTEM FACILITY PLAN  
(P.N. 016-3568)  
TO PROVIDE UPDATED PROJECT SCOPE  
AND OPINION OF PROBABLE  
CONSTRUCTION COST**



JERRY G. JESKY JR.-CIVIL ENGINEER  
PE-2004000803

2-17-22

February 2022

OLSSON  
550 ST. LOUIS STREET  
SPRINGFIELD, MISSOURI 65806  
417-890-8802 FAX 417-890-8805  
www.olsson.com

RECEIVED

APR 25 2022

P.N. 019-3078

Water Protection Program

olsson

February 17, 2022

P.N. 019-3078

Mr. Shane Graupman, Project Manager  
Water Protection Program – Financial Assistance Center  
Missouri Department of Natural Resources  
P.O. Box 176  
Jefferson City, Missouri 65102-0176

**RE: ADDENDUM TO THE CITY OF JASPER, MISSOURI WASTEWATER  
SYSTEM FACILITY PLAN**

Dear Mr. Graupman:

This letter represents an addendum to the previously reviewed October 11, 2018 Wastewater System Facility Plan for Jasper, Missouri (City). This letter accompanies the City's re-application for CWSRF funding to finance the project detailed within this addendum. The current proposed project is very similar to the recommended alternative in the 2018 Facility Plan, with just minor changes as a result of the City's recent sludge-removal efforts along with revised treatment equipment design and costs.

Accordingly, this addendum updates only the affected sections from the 2018 Facility Plan. We request that this addendum be included with the facility plan documents needed for the Department's approval for CWSRF funding.

To reflect the current project strategy, the following sections of the 2018 Wastewater System Facility Plan developed by Olsson Associates (now Olsson, Inc.) and sealed 10-11-2018 are being amended:

- I.B. Conclusions
- III.A. Identification
- III.B. Personnel
- VI.C. Billing Rates and Debt Service
- IX.A.4 Fixed Bed Biological Reactor (FBBR)
- X. Recommended Project Alternatives, Funding, and Schedule
- Appendix w new LPR layout/info
- Appendix w lagoon sludge sampling points

Only these amended sections are included in this addendum, as the alternatives analysis presented in the previous facility plan are still applicable.

Sincerely,  
OLSSON, INC.



Jerry G. Jesky Jr., PE

## **I. SUMMARY**

### **B. Conclusions**

1. Four alternatives were considered to enable the treatment facility to meet the upcoming ammonia limits: land application, a moving bed biological reactor (MBBR), a submerged media reactor, and a fixed bed biological reactor (FBBR).
2. The installation of a LemTec Polishing Reactor (LPR) from Lemna Environmental Technologies is the recommended alternative (Alt. 4B – LemTec LPR without Aeration Basin Cover). This alternative does not include adding a cover on the existing aerated lagoon cell, as the increase in cost for a slightly larger LPR is still less than the cost of the aerated cell cover.
3. The advantages of the LPR include: requires minimal routine maintenance and cleaning, can discharge directly to the outfall or disinfection system, fits well within the facility's existing footprint, and minimizes the amount of piping and the amount of headloss through the facility. Additionally, the existing aeration basin and settling basin were designed by Lemna with the anticipation that an FBBR could be added in the future if regulations required increased ammonia removal.
4. It is also recommended that the city's wastewater treatment improvement project include general maintenance on the aerated cell with regards to the aerator and baffle positionings and mooring. Some of this equipment will need to be replaced.
5. Due to a lack of available data, collection system analysis and evaluation was limited to discussions with city staff, who indicate infiltration between the clay pipe joints in the collection system is thought to be the biggest contributor of wet-weather flows. It is recommended that the city budget time and/or money to update its mapping for the collection system. Subsequent to the mapping updates, a combination of manhole inspections, smoke testing, and closed-caption televising (CCTV) efforts are recommended to quantify the degree of deterioration of each manhole and sewer line before prioritizing specific improvements to budget for. Because the city has treatment and storage capacity to handle occasional wet-weather flows, the focus of this report centered around treatment process modifications to allow the city to meet upcoming ammonia limits, rather than to reduce infrequent high flows.
6. The city is advised to submit this report and a funding application to the Missouri Clean Water State Revolving Fund program to obtain direction on a viable funding strategy for the recommended improvements.



### **III. CONTINUING AUTHORITY AND SERVICE AREA**

#### **A. Identification**

The name and mailing address of the wastewater system's continuing operating authority is:

Ms. Amy Sisseck, Mayor  
City of Jasper  
121 E. Grand St. PO Box 247  
Jasper, Missouri 64755

Mayor Amy Sisseck and City Clerk Mary McNary can be contacted at 417-394-2532. The city's wastewater system is regulated by the MoDNR central office in Jefferson City, Missouri. Regional MoDNR regulatory authority is provided by personnel staffed in the Southwest Regional Office of MoDNR, located in Springfield, Missouri.

#### **B. Personnel**

Jasper's wastewater system is operated and maintained by Mr. Larry Bice, a contract operator. MoDNR regulations require Jasper's current wastewater treatment system to be operated by at least a Class C certified operator. Mr. Bice has a Class A wastewater license. The city is required to keep track of irrigation practices and collect samples of the wastewater influent and effluent, and has an independent laboratory perform the analysis.

## **VI. EXISTING WASTEWATER TREATMENT EVALUATION**

### **C. Billing Rates and Debt Service**

In the summer of 2021, the city increased its sewer rate to include a base rate of \$10.00 with an additional \$7.00 per 1,000 gallons of metered water use thereafter. The average metered customer water use in 2021 was approximately 3,700 gallons per month, corresponding to an average sewer bill of \$35.90 per month. A customer who uses 5,000 gallons per month would have a monthly sewer bill of \$45.00.

With an average of 380 sewer customers over the last year, the city's 2021 annual sewer revenue, including miscellaneous fees, was approximately \$140,000. This compares with 2021 annual expenses of \$163,390 due to some needed equipment repairs. This last year the city needed to supplement its sewer budget from reserve funds to make up the difference. By comparison, sewer revenues in 2020 were about \$130,000 and expenses were around \$131,000. The recent increase in sewer rates will help future year's revenues better match annual expenses. The city's existing sewer system debt service, used to finance the construction of the aeration basin and polishing cells, will be paid in full by the Fall of 2022.

Jasper's 2010 median household income (MHI) was reported as \$30,573. For comparison, the State of Missouri MHI is \$46,262. Accordingly, Jasper's MHI is less than 75% of the State MHI. With a 5,000 gallon per month sewer bill of \$45, this corresponds to 1.8% of the city's MHI. In general, sewer rates are not considered burdensome to customers until they have reached 2% of the city's MHI. This would correspond to an average monthly sewer rate of \$50.96. The city's low to moderate income (LMI) percentage is greater than 51% (55% in 2015). Accordingly, Jasper should be positioned to take advantage of low-interest loan and grant opportunities offered by State and Federal agencies to fund the recommended wastewater system improvements.

## **IX. PROJECT ALTERNATIVE ANALYSIS**

### **A. Treatment Facility Improvement Alternatives**

#### **4. Fixed Bed Biological Reactor (FBBR)**

The fourth alternative is adding a LemTec™ Polishing Reactor (LPR) from Lemna Environmental Technologies. This process utilizes an FBBR. Wastewater would flow through a reactor containing submerged media modules. Biofilm grows on the media modules and consumes ammonia from the passing wastewater. Rack-mounted diffusers located under the media supply oxygen to the biofilm.

The existing aeration basin and settling basin were designed by Lemna with the anticipation that an FBBR could be added in the future if regulations required increased ammonia removal. Lemna has provided two designs for the addition of an FBBR. Both would be constructed downstream of the existing settling basin and would discharge to either the disinfection system or the facility's outfall, depending on the time of year.

The first design includes adding an LPR to the existing treatment process and covering the existing aeration basin with a LemTec™ Insulated Floating Cover. The main advantage of covering the aeration basin is that it allows for a smaller LPR to be constructed. The cover prevents algae growth in the aeration basin, which reduces TSS, BOD, and ammonia and it retains heat in the aeration basin during winter months, further reducing BOD and ammonia levels in the aeration basin. The improved quality of the wastewater entering the LPR reduces the size of the LPR needed to achieve the required effluent quality.

With a cover over the existing aeration basin, the two-train LPR would be approximately 20 feet long, 20 feet wide, and 12 feet deep. Air would be supplied to the diffusers by two 5-hp blowers. The LPR would be covered by a LemTec™ insulated cover to prevent algae growth in the basin, which would reduce the need for maintenance. The estimated initial construction cost for this alternative is included in Table IX-6.



**Table IX-6. Estimated Project Cost for Alternative 4A – LemTec™ LPR with Aeration Basin Cover**

ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT	UNIT COST	EXTENDED COST
1	Bonding, Insurance, Mobilization	1	LS	\$ 37,000	\$ 37,000
2	Replace the 2 Existing Baffles in Aeration Lagoon, Complete	1	LS	\$ 55,000	\$ 55,000
3	Replace the 6 Aerators in Aeration Lagoon, Complete	1	LS	\$ 73,000	\$ 73,000
4	Replace Cover for Settling Pond, Complete	1	LS	\$ 75,000	\$ 75,000
5	Ductile Iron Yard Piping, Complete	1	LS	\$ 25,000	\$ 25,000
6	Aeration Piping, Installed	1	LS	\$ 15,000	\$ 15,000
7	Construct Concrete Polishing Reactor Basin and Blower Pad, Complete	78	CY	\$ 1,000	\$ 78,000
8	Cover Over Aerated Lagoon Cell	1	LS	\$ 136,000	\$ 136,000
9	Polishing Reactor Equipment, Blowers, Installation Supervision/Startup by Vendor	1	LS	\$ 168,000	\$ 168,000
10	Aerated Lagoon Cell Cover Installation, Complete	1	LS	\$ 68,000	\$ 68,000
11	Polishing Reactor Equipment & Blowers Installation, Elec./Controls, Complete	1	LS	\$ 30,000	\$ 30,000
12	Final Grading, Seeding, Cleanup	1	LS	\$ 4,000	\$ 4,000
ITEM NO.	NON-CONSTRUCTION COSTS	QTY.	UNIT	UNIT COST	EXTENDED COST
1	Survey, Engineering, Funding Assistance, Bidding, and Construction Admin.	1	LS	\$ 199,000	\$ 199,000
<b>Construction Sub-Total</b>					<b>\$ 764,000</b>
<b>Construction Contingency</b>				<b>10%</b>	<b>\$ 76,000</b>
<b>Non-Construction Sub-Total</b>					<b>\$ 199,000</b>
<b>OPINION OF PROBABLE PROJECT COST</b>					<b>\$ 1,039,000</b>

The second design does not include a cover over the aeration basin, which would increase the concentration of TSS, BOD, and ammonia in the LPR influent. As such, this design requires a larger reactor. It would be approximately 40 feet long, 20 feet wide, and 12 feet deep. Air would be supplied to the diffusers by two 7.5-hp blowers and the LPR would be covered. Although construction and equipment costs would be higher for this design because the reactor would be larger, overall this option is more cost effective. The LemTec™ Insulated Floating Cover would be an expensive purchase and would increase the facility's operations and maintenance costs. The estimated initial construction cost for this alternative is included in Table IX-7.

**Table IX-7. Estimated Project Cost for Alternative 4B – LemTec LPR without Aeration Basin Cover**

ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT	UNIT COST	EXTENDED COST
1	Bonding, Insurance, Mobilization	1	LS	\$ 34,000	\$ 34,000
2	Replace the 2 Existing Baffles in Aeration Lagoon, Complete	1	LS	\$ 55,000	\$ 55,000
3	Replace the 6 Aerators in Aeration Lagoon, Complete	1	LS	\$ 73,000	\$ 73,000
4	Replace Cover for Settling Pond, Complete	1	LS	\$ 75,000	\$ 75,000
5	Ductile Iron Yard Piping, Complete	1	LS	\$ 25,000	\$ 25,000
6	Aeration Piping, Installed	1	LS	\$ 15,000	\$ 15,000
7	Construct Concrete Polishing Reactor Basin and Blower Pad, Complete	130	CY	\$ 1,000	\$ 130,000
8	Polishing Reactor Equipment, Blowers, Installation Supervision/Startup by Vendor	1	LS	\$ 240,000	\$ 240,000
9	Polishing Reactor Equipment Installation, Elec./Controls, Complete	1	LS	\$ 50,000	\$ 50,000
10	Final Grading, Seeding, Cleanup	1	LS	\$ 4,000	\$ 4,000
ITEM NO.	NON-CONSTRUCTION COSTS	QTY.	UNIT	UNIT COST	EXTENDED COST
1	Survey, Engineering, Funding Assistance, Bidding, and Construction Admin.	1	LS	\$ 199,000	\$ 199,000
	<b>Construction Sub-Total</b>				<b>\$ 701,000</b>
	<b>Construction Contingency</b>			<b>10%</b>	<b>\$ 70,000</b>
	<b>Non-Construction Sub-Total</b>				<b>\$ 199,000</b>
	<b>OPINION OF PROBABLE PROJECT COST</b>				<b>\$ 970,000</b>

An LPR has the advantages of being a cost-effective alternative that can be discharged directly to the disinfection system or to the facility's outfall. It would be a relatively simple process addition that requires minimal routine maintenance and cleaning. Due to its proposed location in the process train, it would minimize the amount of piping required and the amount of headloss through the process and would cause minimal disruptions to the treatment process during construction.

Lemna has made some design upgrades since 2020 that have reduced the overall footprint of the LPR, lessened the anticipated frequency of media cleaning, now allow for in-place cleaning of the media, while maintaining nitrification performance. In fact, the design proposed for the City of Jasper is expected to allow the city to meet future 0.6 mg/L ammonia limits in the summer months and 1.8 mg/L ammonia limits in the winter months.



## **X. RECOMMENDED PROJECT ALTERNATIVES, FUNDING, AND SCHEDULE**

### **A. Recommended Project Alternative**

In order to preserve treatment facility capacity, it is recommended that the city irrigate the wastewater stored in the peak flow basin instead of sending it through the treatment process. This will reduce flows through the treatment process, prolonging the life of the system. If the city does not invest in the necessary staff and resources to irrigate wastewater from the peak flow basin, the facility's maximum capacity will be exceeded before the end of the planning period. A detailed plan to remediate wet weather flows is outside the scope of this report. The city's irrigation system may need to be studied in the future to determine if equipment replacement or upgrades are necessary.

A summary of the initial construction costs, annual operation and maintenance costs, and the 20-year present worth costs for each treatment alternative is included in Table X-1.

**Table X-1. Treatment Alternatives Cost Comparison\***

Alternative	Description	Initial Construction Cost	Estimated Annual O&M Cost	20-Year Present Worth Cost
1	Land Application	\$ 1,432,600	\$ 45,600	\$ 1,847,600
2A	Kruger MBBR	\$ 1,333,800	\$ 21,341	\$ 1,375,000
2B	Triplepoint Environmental NitrOx	\$ 1,496,300	\$ 37,310	\$ 1,761,100
3A	Nexom SAGR	\$ 1,300,000	\$ 37,310	\$ 1,610,100
3B	EDI SMART	\$ 1,179,100	\$ 27,455	\$ 1,355,900
4A	Lemna LPR with Aeration Basin Cover	\$ 1,039,000	\$ 25,528	\$ 1,456,400
4B	Lemna LPR without Aeration Basin Cover	\$ 970,000	\$ 16,213	\$ 1,235,100

\* For Alternatives 1, 2A, 2B, 3A, and 3B, the initial construction cost was increased 30% to adjust for inflation since the initial Facility Plan report. However, for Alternatives 4A and 4B, these costs updates were verified with the equipment manufacturer and reflect a 38% increase since the initial Facility Plan report.

The Lemna LPR, an FBBR, without an aeration basin cover (Alternative 4B) is the recommended treatment system. It is the most cost-effective option. It has the lowest initial construction cost, estimated annual O&M cost, and 20-year present worth cost. Additionally, this system requires minimal routine maintenance and cleaning, can discharge directly to the outfall or disinfection system without further clarification, fits well within the treatment facility's existing footprint, and minimizes the amount of piping required and the amount of headloss through the treatment process. Additionally, the existing aeration basin and settling basin were designed by Lemna with the anticipation that an FBBR for ammonia polishing could be added in the future if regulations required increased ammonia removal. Adding an FBBR to the existing treatment facility is not expected to require a higher wastewater operator classification. The proposed layout of the system is shown in Exhibit 2.

In 2020, the city contracted with a company that used microorganisms to reduce the volume of sludge in the baffled aerated cell of the treatment lagoon. This cell was gridded off to

produce 46 sampling points, which prior to microbial treatment had an average sludge depth of 20". After treatment, the average sludge depth was a little over 4", with several sampling points showing no sludge remaining. This data is included in Appendix C to this report. Accordingly, this baffled aerated cell has been prepared for a resetting of the Lemna equipment per manufacturer's recommendations with regards to the aerator and baffle positions and moorings to ensure appropriate treatment as originally designed. A cost estimate that includes the recommended lagoon improvements along with the proposed FBBR is shown in Table X-2. The cost estimate has been updated to include the anticipated 2023 equipment costs for the LPR equipment.

**Table X-2. Estimated Project Cost – Proposed Alternative and Lagoon Improvements**

ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT	UNIT COST	EXTENDED COST
1	Bonding, Insurance, Mobilization	1	LS	\$ 35,000	\$ 35,000
2	Replace the 2 Existing Baffles in Aeration Lagoon,	1	LS	\$ 55,000	\$ 55,000
3	Replace the 6 Aerators in Aeration Lagoon, Complete	1	LS	\$ 73,000	\$ 73,000
4	Replace Cover for Settling Pond, Complete	1	LS	\$ 75,000	\$ 75,000
5	Ductile Iron Yard Piping, Complete	1	LS	\$ 25,000	\$ 25,000
6	Aeration Piping, Installed	1	LS	\$ 15,000	\$ 15,000
7	Construct Concrete Polishing Reactor Basin and Blower Pad, Complete	130	CY	\$ 1,000	\$ 130,000
8	Polishing Reactor Equipment, Blowers, Installation Supervision/Startup by Vendor	1	LS	\$ 240,000	\$ 240,000
9	Polishing Reactor Equipment Installation, Elec./Controls, Complete	1	LS	\$ 50,000	\$ 50,000
10	Reset Lagoon Equipment (Aerators, Baffles)	1	LS	\$ 26,000	\$ 26,000
11	Final Grading, Seeding, Cleanup	1	LS	\$ 4,000	\$ 4,000
ITEM NO.	NON-CONSTRUCTION COSTS	QTY.	UNIT	UNIT COST	EXTENDED COST
1	Survey, Engineering, Funding Assistance, Bidding, and Construction Admin.	1	LS	\$ 199,000	\$ 199,000
	<b>Construction Sub-Total</b>				<b>\$ 728,000</b>
	<b>Construction Contingency</b>			<b>10%</b>	<b>\$ 73,000</b>
	<b>Non-Construction Sub-Total</b>				<b>\$ 199,000</b>
	<b>OPINION OF PROBABLE PROJECT COST</b>				<b>\$ 1,000,000</b>

The preliminary design proposal and process layout from Lemna for the LPR without an aeration basin cover is provided in Appendix B.

## **B. Funding Strategy**

As discussed in Section IV, the city will not be able to fund the necessary improvements to comply with the anticipated ammonia limits without financial assistance. The facility was upgraded in 2003 and 2011 to comply with modifications to the facility's NPDES permit. The



City is still paying for the debt associated with the 2003 improvements, limiting its ability to pay off additional debt.

The city's current sewer rates, in combination with its MHI and LMI percentage standing, put Jasper in a position to apply for low-interest loans and grant opportunities to fund the proposed improvements. Two potential funding strategies have been developed. The first would consist of funding the entire \$1,000,000 project through a loan, either through a private source or through the Clean Water State Revolving Fund (CWSRF). This strategy is summarized in Table X-3. Assuming the loan would have a 20-year repayment period and a 2.0% interest rate, the estimated increase to customers' monthly bills would be approximately \$18.31 with a 10% reserve included. This would bring the average monthly sewer bill to approximately \$63.31, which corresponds to 2.5% of the city's MHI.

**Table X-3. Potential Funding Strategy No. 1**

<b>POTENTIAL FUNDING STRATEGY NO. 1</b>	
Grant - None	\$ -
Loan - CWSRF	\$ 1,000,000
<b>TOTAL PROJECT FUNDS</b>	<b>\$ 1,000,000</b>
<b>USER RATE IMPACT OF LOAN</b>	
Loan Amount	\$ 1,000,000
Annual Debt Service and 10% Reserve (20 years @ 2%)	\$ 67,272
Annual Increase in O&M Cost	\$ 16,213
Annual Debt Service and O&M Cost per Customer (380)	\$ 203.60
Monthly Debt Service and O&M Cost per Customer (380)	\$ 16.97
<b>Potential Increase in Monthly Bill</b>	<b>\$ 18.31</b>
<b>Average Monthly Bill (5,000 Gallon Water Use)</b>	<b>\$ 63.31</b>

A double-digit sewer bill increase that results in an average sewer bill of more than \$63/month is not expected to gain support amongst city officials and sewer customers, especially since the project's motivation stems from increased effluent limit requirements placed on a system that has been upgraded twice within the last 20 years.

Accordingly, a second potential funding strategy would consist of maximizing the funds available (\$750,000) through a Community Development Block Grant (CBDG), and dividing the remaining \$250,000 project cost between a 50/50 CWSRF loan and grant. This strategy is summarized in Table X-4. Assuming the loan would have a 20-year repayment period and a 2.0% interest rate, the estimated increase to customers' monthly bills would be \$5.40 with a 10% reserve. This would bring the average monthly sewer bill to approximately \$50.40, which corresponds to 2% of the city's MHI.

As part of the CWSRF program's Due Diligence Questionnaire, a more detailed evaluation of the city's finances may determine that the existing sewer rates can support a \$125,000



loan, especially once the city's existing debt service is paid off. If approved to participate in the CWSRF program, a more detailed sewer rate analysis will be performed to determine appropriate CDBG gap financing and the associated CWSRF loan/grant percentages.

**Table X-4. Potential Funding Strategy No. 2**

<b>POTENTIAL FUNDING STRATEGY NO. 2</b>	
Grants - CWSRF and CDBG	\$ 875,000
Loan - CWSRF	\$ 125,000
<b>TOTAL PROJECT FUNDS</b>	<b>\$ 1,000,000</b>
<b>USER RATE IMPACT OF LOAN</b>	
Loan Amount	\$ 125,000
Annual Debt Service and 10% Reserve (20 years @ 2%)	\$ 8,409
Annual Increase in O&M Cost	\$ 16,213
Annual Debt Service and O&M Cost per Customer (380)	\$ 62.78
Monthly Debt Service and O&M Cost per Customer (380)	\$ 5.23
<b>Potential Increase in Monthly Bill</b>	<b>\$ 5.40</b>
<b>Average Monthly Bill (5,000 Gallon Water Use)</b>	<b>\$ 50.40</b>

### **C. Proposed Schedule for Improvements**

The schedule for the recommended improvements is contingent upon MoDNR's approval of the proposed plan of action detailed in this report addendum. Although the city initially had until July 1, 2021 to comply with the upcoming ammonia effluent limits, circumstances have resulted in the need to negotiate a later compliance date with MoDNR. Upon MoDNR approval of this report addendum and CWSRF re-application by March 1<sup>st</sup>, 2022, the city can begin to finalize a funding strategy for the proposed improvements.

The city passed a \$1,000,000 bond issue in November of 2019 to cover the entire estimated cost of the project, prior to seeking grant funds. It is anticipated that the city will qualify for CDBG grant funding and plans to proceed with utilizing the Harry S. Truman regional planning commission to apply for grant funds and fulfill the necessary application paperwork. Once a funding strategy is finalized, the city can complete the funding compliance and design elements of the project before seeking approval of a construction permit (CP) and operating permit (OP) modification through MoDNR.

Once the construction permit and operating permit modification is approved by MoDNR and the necessary funding pieces are in place, the city can proceed with bidding and constructing the project. An estimated schedule is provided in Table X-5. A best-case scenario for completing the proposed improvements would be by the end of 2023. It may require several months into 2024 to get a suitable bacteria population established to meet the permitted ammonia limit requirements. Accordingly, meeting permitted ammonia limits by Summer of 2024 is a reasonable milestone to work toward.

**Table X-5. Estimated Schedule**

<b>Event</b>	<b>Completion Date</b>
Submit Facility Plan Addendum and Re-Application to CWSRF	1 <sup>st</sup> Qtr 2022
Draft CWSRF Intend Use Plan (IUP)	2 <sup>nd</sup> / 3 <sup>rd</sup> Qtr 2022
Complete Engineering Design of Project	3 <sup>rd</sup> Qtr 2022
Final CWSRF IUP	4 <sup>th</sup> Qtr 2022
Submit Plans and Specifications to MoDNR for Construction Permit Application (CP and OP Modification)	4 <sup>th</sup> Qtr 2022
Complete CWSRF and CDBG Paperwork, Obtain Construction Permit	1 <sup>st</sup> Qtr 2023
Advertise for Construction Bids	2 <sup>nd</sup> Qtr 2023
Construct Improvements	3 <sup>rd</sup> Qtr 2023
Complete Construction and Start-Up Services	4 <sup>th</sup> Qtr 2023
Develop Nitrification Bacteria to Meet Ammonia Limits	2 <sup>nd</sup> Qtr 2024

## **APPENDIX B**

---

Lemna Design Proposal and Preliminary Process Plans for LPR

# **LEMNA ENVIRONMENTAL TECHNOLOGIES JASPER, MO DESIGN REVIEW**

Jasper, Missouri

October 1, 2021

## JASPER DESIGN REVIEW



## JASPER DESIGN REVIEW

Jasper, Missouri

---

Jim Martin  
President and CEO

Prepared by:  
Lemna Environmental Technologies, Inc.  
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Vadnais Heights, MN 55110  
Tel: (612) 253-1963  
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Date:  
October 1, 2021

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## 1. INTRODUCTION

This detailed review is designed to provide the client, the consulting engineer and the Missouri DNR with sufficient technical information required to evaluate and approve the Lemna Polishing Reactor (LPR) for the Jasper, MO Project.

## 2. OVERVIEW

The LPR is a submerged attached growth reactor that is engineered to optimize the growth of biofilm. Empirically derived "areal" loading rates are used for reactor sizing. In general, the sizing of an LPR reactor is controlled by influent ammonia concentrations and the loading rates (<1 g-N/m<sup>2</sup>/d) are consistent with rates for moving bed biological reactors used for tertiary treatment.

The LPR influent loading is divided by the temperature-corrected areal loading rates to determine the required biofilm surface areas in the reactor. This area is divided by the surface area per volume ratio of LPR media to determine the media volume required.

### 2.1 Lemna Polishing Reactor - Nitrification

LPR media requirements for NH<sub>3</sub> removal are calculated according to the following equation:

$$A = \frac{\Delta \text{NH}_3 \times Q \times 8.34}{G_T}$$

Where:

A = Media surface area (ft<sup>2</sup>)  
 $\Delta \text{NH}_3$  = Ammonia removed (mg/L)  
 Q = Flow rate (MGD)  
 $G_T$  = NH<sub>3</sub> removal rate (lb NH<sub>3</sub>/ft<sup>2</sup>-media/day)

LPR NH<sub>3</sub> removal rate,  $G_{20}$  at 20 degrees Celsius is 0.0003 lbs/ft<sup>2</sup>-media/day. The removal rate is adjusted for wastewater temperature using the following equation:

$$G_T = G_{20}(1.072)^{T-20}$$

Where:

$G_{20}$  = Reaction rate at 20°C  
 T = Design wastewater temperature, °C

For LPR influent wastewater temperature of 4.0 °C and ammonia concentration of 40 mg NH<sub>3</sub>-N/L:

$$G_T = \frac{0.0003 \text{ lb NH}_3 - \text{N}}{\text{ft}^2 \cdot \text{d}} (1.072)^{4.0^\circ\text{C} - 20^\circ\text{C}} = \frac{0.00010 \text{ lb NH}_3 - \text{N}}{\text{ft}^2 \cdot \text{d}}$$

$$A = \frac{\left( \frac{40 \text{ mg NH}_3 - \text{N}}{\text{L}} - \frac{2.9 \text{ mg NH}_3 - \text{N}}{\text{L}} \right) \times \frac{0.135 \text{ Mgal}}{\text{day}} \times \frac{8.34 \text{ lb}}{\text{MG} \cdot \text{mg}}}{\frac{0.00010 \text{ lb NH}_3 - \text{N}}{\text{ft}^2 \cdot \text{d}}} = 423500 \text{ ft}^2$$

LPR media with a density of 102 ft<sup>2</sup>/ft<sup>3</sup> are used for ammonia removal. The volume of ammonia removal media needed is then:

$$\text{Vol}_{\text{NH}_3} = \frac{A}{102}$$

Where:

$\text{Vol}_{\text{NH}_3}$  = Volume of ammonia removal media needed, ft<sup>3</sup>

$$\text{Vol}_{\text{NH}_3} = \frac{423500 \text{ ft}^2}{\frac{102 \text{ ft}^2}{\text{ft}^3}} = 4152 \text{ ft}^3$$

Two parallel trains are proposed: each train with media dimensions of 8' x 8' x 34' (W x H x L).

## 2.2 Lemna Polishing Reactor – Oxygen Requirement

### 2.2.1 Mass of NH<sub>3</sub> Removed

The first step in assessing aeration requirements is the determination of the mass load (NH<sub>3</sub>) removed by the process during summer and winter conditions. This simply requires accounting for the flow and concentration of ammonia entering and leaving the LPR.

$$L_{\text{NH}_3} = 8.34 \times Q \times \Delta \text{NH}_3$$

Where:

$L_{\text{NH}_3}$  = NH<sub>3</sub> removed (lb-NH<sub>3</sub>/day)

$\Delta \text{NH}_3$  = Difference in NH<sub>3</sub> entering and leaving the process (mg-NH<sub>3</sub>/L)

$Q$  = Flow entering the process (MGD)

Summer:

$$L_{\text{NH}_3} = \frac{8.34 \text{ L}}{\text{Mgal} \cdot \text{mg}} \times \frac{0.135 \text{ Mgal}}{\text{day}} \times \left( \frac{40 \text{ mg NH}_3}{\text{L}} - \frac{1.4 \text{ mg NH}_3}{\text{L}} \right) = \frac{43 \text{ lb NH}_3}{\text{day}}$$

Winter:

$$L_{\text{NH}_3} = \frac{8.34 \text{ L}}{\text{Mgal} \cdot \text{mg}} \times \frac{0.135 \text{ Mgal}}{\text{day}} \times \left( \frac{40 \text{ mg NH}_3}{\text{L}} - \frac{2.9 \text{ mg NH}_3}{\text{L}} \right) = \frac{42 \text{ lb NH}_3}{\text{day}}$$



### 2.2.2 Actual Oxygen Requirements for NH<sub>3</sub> Removal

The next step is to determine the amount of oxygen that must be supplied to support the removal of NH<sub>3</sub> in the LPR as calculated in step 1. It is assumed that it is necessary to supply 4.6 pounds of O<sub>2</sub> per pound of NH<sub>3</sub> to be removed. The amount of oxygen required to support the removal of NH<sub>3</sub> as calculated above can be calculated by the following equations:

$$AOR_{NH_3} = 4.6 \times L_{NH_3}$$

Where:

$$AOR_{NH_3} = \text{Required oxygen for NH}_3 \text{ removal (lb-O}_2 \text{ / day)}$$

$$4.6 = \text{lb-O}_2 \text{ required / lb NH}_3 \text{ removed}$$

Summer:

$$AOR_{NH_3} = \frac{4.6 \text{ lb O}_2}{\text{lb NH}_3} \times \frac{43 \text{ lb NH}_3}{\text{day}} = \frac{200 \text{ lb O}_2}{\text{day}}$$

Winter:

$$AOR_{NH_3} = \frac{4.6 \text{ lb O}_2}{\text{lb NH}_3} \times \frac{42 \text{ lb NH}_3}{\text{day}} = \frac{192 \text{ lb O}_2}{\text{day}}$$

### 2.2.3 Standardized Oxygen Requirement for NH<sub>3</sub> Removal

When O<sub>2</sub> is supplied to wastewater in the LPR, transfer of the oxygen to the water is not perfect due to characteristics of the wastewater. For this reason, it is necessary to adjust (increase) the actual oxygen requirement (AOR) as calculated above to a standardized oxygen requirement (SOR) which accounts for the conditions of the stream to which the oxygen is being transferred. This standard oxygen requirement (SOR) can be calculated as:

$$SOR = \frac{AOR}{CF}$$

$$CF = \alpha \times \left( \frac{(\beta \times C_s \times \delta) - RO}{C_{s,20}} \right) \times F \times \theta_{MT}^{T-20}$$

$$P_{eff} = P + \left( 0.433 \times \frac{WD}{2} \right)$$

Where:

$$SOR = \text{Standardized oxygen requirement (lb-O}_2 \text{ / day)}$$

$$AOR = \text{Actual oxygen requirement (lb-O}_2 \text{ / day)}$$

$$CF = \text{Correction Factor}$$

$$\alpha = \text{Surface tension correction factor (0.75)}$$

$$\beta = \text{Solubility correction factor (0.95)}$$

$$C_{s,20} = \text{O}_2 \text{ saturation concentration in water at standard conditions (9.09 mg / L)}$$

$C_s$ =	Oxygen saturation concentration at the water surface (mg / L)
RO =	Residual oxygen in basin (3.0 mg / L)
$\Theta_{MT}$ =	Temperature – Mass transfer correction factor, 1.024 (generally accepted value)
T =	Design water temperature (°C)
F =	Diffuser factor (0.9)
$\delta$ =	$P_{eff} / P$ = Pressure correction factor
$P_{eff}$ =	Effective pressure of aeration (psia)
P =	Site barometric pressure (psia) (14.2)
WD =	Water depth (ft)
0.433 =	Conversion factor for depth in feet to psia

$$P_{eff} = 14.2 \text{ psi} + \left( \frac{0.433 \text{ psi}}{\text{ft}} \times \frac{10.0 \text{ ft}}{2} \right) = 16.4 \text{ psi}$$

Summer:

$$CF = 0.75 \times \left( \frac{\left( 0.95 \times \frac{8.8 \text{ mg}}{\text{L}} \times \frac{16.4 \text{ psi}}{14.2 \text{ psi}} \right) - \frac{3.0 \text{ mg}}{\text{L}}}{\frac{9.09 \text{ mg}}{\text{L}}} \right) \times 0.9 \times 1.024^{20^\circ\text{C} - 20^\circ\text{C}} = 0.49$$

$$SOR = \frac{\frac{200 \text{ lb O}_2}{\text{day}}}{0.49} = \frac{407 \text{ lb O}_2}{\text{day}}$$

Winter:

$$CF = 0.75 \times \left( \frac{\left( 0.95 \times \frac{12.7 \text{ mg}}{\text{L}} \times \frac{16.4 \text{ psi}}{14.2 \text{ psi}} \right) - \frac{3.0 \text{ mg}}{\text{L}}}{\frac{9.09 \text{ mg}}{\text{L}}} \right) \times 0.9 \times 1.024^{4.0^\circ\text{C} - 20^\circ\text{C}} = 0.55$$

$$SOR = \frac{\frac{192 \text{ lb O}_2}{\text{day}}}{0.55} = \frac{348 \text{ lb O}_2}{\text{day}}$$

The diffusers used for aeration are generally placed on the LPR floor. Since oxygen solubility in water is directly related to pressure, a correction factor is included to attempt to account for the difference in solubility at the basin bottom and the water surface. For this correction factor, the mid-depth of the basin is used to estimate the pressure since this is the average pressure that the oxygen is exposed to.

Solubility and conversion factor data and values for these formulas are generally found in standard tables or determined from site conditions and laboratory studies.

#### 2.2.4 Required Airflow to Meet Bacterial Oxygen Demand

Finally, the SOR is used in combination with manufacturer supplied aeration efficiencies to compute the required air flow to meet the bacterial oxygen demand. The following equation is used for calculating air flow requirement:

$$Q_{\text{air}} = f \times \frac{\text{SOR}}{\text{SOTE}}$$

$$\text{SOTE} = 1.44 \times \text{WD}$$

Where:

$Q_{\text{air}}$  = Air requirement in standard cubic feet per minute (SCFM)

SOTE = Manufacturer's standard oxygen transfer efficiency for the diffusers (%)

$f$  = Conversion factor from lbs- $\text{O}_2$  /day to SCFM of air

$$\text{SOTE} = \frac{1.4\%}{\text{ft}} \times (10.0\text{ft} - 0.5\text{ft}) = 13.3\%$$

Summer:

$$Q_{\text{air}} = \frac{4.025 \text{ SCFM}}{\frac{\text{lb } \text{O}_2}{\text{day}}} \times \frac{\frac{407 \text{ lb } \text{O}_2}{\text{day}}}{13.3\%} = 123 \text{ SCFM}$$

Winter:

$$Q_{\text{air}} = \frac{4.025 \text{ SCFM}}{\frac{\text{lb } \text{O}_2}{\text{day}}} \times \frac{\frac{348 \text{ lb } \text{O}_2}{\text{day}}}{13.3\%} = 105 \text{ SCFM}$$

#### 2.2.5 Required Airflow to Meet Mixing Requirements for the LPR

For the purpose of sizing aeration to achieve complete mix conditions and sufficient advection through the media within the LPR, a dissipated energy of 0.25 SCFM per square foot of media top is used.

$$Q_{\text{airmix}} = \frac{0.25 \text{ SCFM}}{\text{ft}^2} \times A_{\text{top}}$$

Where:

$Q_{\text{airmix}}$  = Air required for LPR mixing (SCFM)

$A_{\text{top}}$  = surface area of the top or bottom of the LPR media ( $\text{ft}^2$ )

$$Q_{\text{airmix}} = \frac{0.25 \text{ SCFM}}{\text{ft}^2} \times 544 \text{ ft}^2 = 136 \text{ SCFM}$$

## 2.2.6 Equipment Selection

Equipment selection is based on aeration and/or mixing, whichever requires the highest aeration requirement.

LPR air requirement equals:  $Q_{air} = 136$  SCFM

The blower power motor requirement is calculated using the following equations:

$$BHP = \frac{\dot{m} \times \frac{53.3 \text{ ft} \cdot \text{lb}}{\text{lb}_{air} \cdot R} \times 595 R}{\frac{550 \text{ ft} \cdot \text{lb}}{\text{HP} \cdot s} \times n \times E_{blow}} \times \left( \left( \frac{P_{amb} + P_{blow}}{P_{amb}} \right)^n - 1 \right)$$

$$\dot{m} = \frac{Q_{air} \times \frac{0.068 \text{ lb}}{\text{ft}^3}}{\frac{60s}{\text{min}}}$$

$$P_{blow} = \frac{0.433 \text{ psi}}{\text{ft H}_2\text{O}} (WD + 3)$$

$$E_{blow} = 78.7\% - \left( \frac{2.11\%}{\text{psi}} \times P_{blow} \right)$$

Where:

BHP =	Blower power motor requirement (HP, horsepower)
$\dot{m}$ =	Mass flow of air, lb/s
$n$ =	Specific heat factor, 0.283
$E_{blow}$ =	Blower efficiency (%)
$P_{blow}$ =	Pressure at Blower outlet, psig
$Q_{air}$ =	Air flow rate at atmospheric pressure, ft <sup>3</sup> /min (CFM)
$P_{amb}$ =	Ambient air pressure, psia

$$P_{blow} = \frac{0.433 \text{ psi}}{\text{ft H}_2\text{O}} (10 \text{ ft} + 3 \text{ ft}) = 5.63 \text{ psig}$$

$$E_{blow} = 78.7\% - \left( \frac{2.11\%}{\text{psi}} \times 5.63 \text{ psig} \right) = 66.8\%$$

$$\dot{m} = \frac{\frac{136 \text{ ft}^3}{\text{min}} \times \frac{0.075 \text{ lb}}{\text{ft}^3}}{\frac{60s}{\text{min}}} = \frac{0.170 \text{ lb}}{s}$$



$$\text{BHP} = \frac{\frac{0.170 \text{ lb}}{\text{s}} \times \frac{53.3 \text{ ft} \cdot \text{lb}}{\text{lb}_{\text{air}} \cdot \text{R}} \times 528 \text{ R}}{\frac{550 \text{ ft} \cdot \text{lb}}{\text{HP} \cdot \text{s}} \times 0.283 \times 0.668} \times \left( \left( \frac{14.2 \text{ psi} + 5.63 \text{ psi}}{14.2 \text{ psi}} \right)^{0.283} - 1 \right) = 5.1 \text{ HP}$$

Suggested Blower Size: Two 7.5 HP Blowers (one operating, one stand by)

### 3. LPR OPERATION AND MAINTENANCE

Periodic cleaning of the LPR modules may be required to ensure optimum performance. This is easily performed with an air-scouring procedure that is described in the LPR O&M manual. Proper maintenance of the LPR blowers and diffusers is also required.

### 4. REFERENCES

Metcalf & Eddy | AECOM, (2014) *Wastewater Engineering: Treatment and Resource Recovery* (5<sup>th</sup> ed). New York, NY: McGraw-Hill

U.S. Environmental Protection Agency: *Design Manual – Nitrogen Control*, EPA/625/R-93/010, Cincinnati, OH, September 1993.

U.S. Environmental Protection Agency: *Design Manual – Fine Pore Aeration Systems*, EPA/625/1-89/023, Cincinnati, OH, September 1989.

Water Environment Federation and American Society of Civil Engineers (2018), *Design of Water Resource Recovery Facilities* (6th Ed), New York, NY: McGraw-Hill.



# JASPER, MISSOURI

## LEMTEC™ BIOLOGICAL TREATMENT PROCESS

### PLANS

AERATION SYSTEM BLOWERS  
LEMNA POLISHING REACTOR™

01. COVER SHEET  
02. POLISHING REACTOR  
03. BLOWER AND CONTROLS

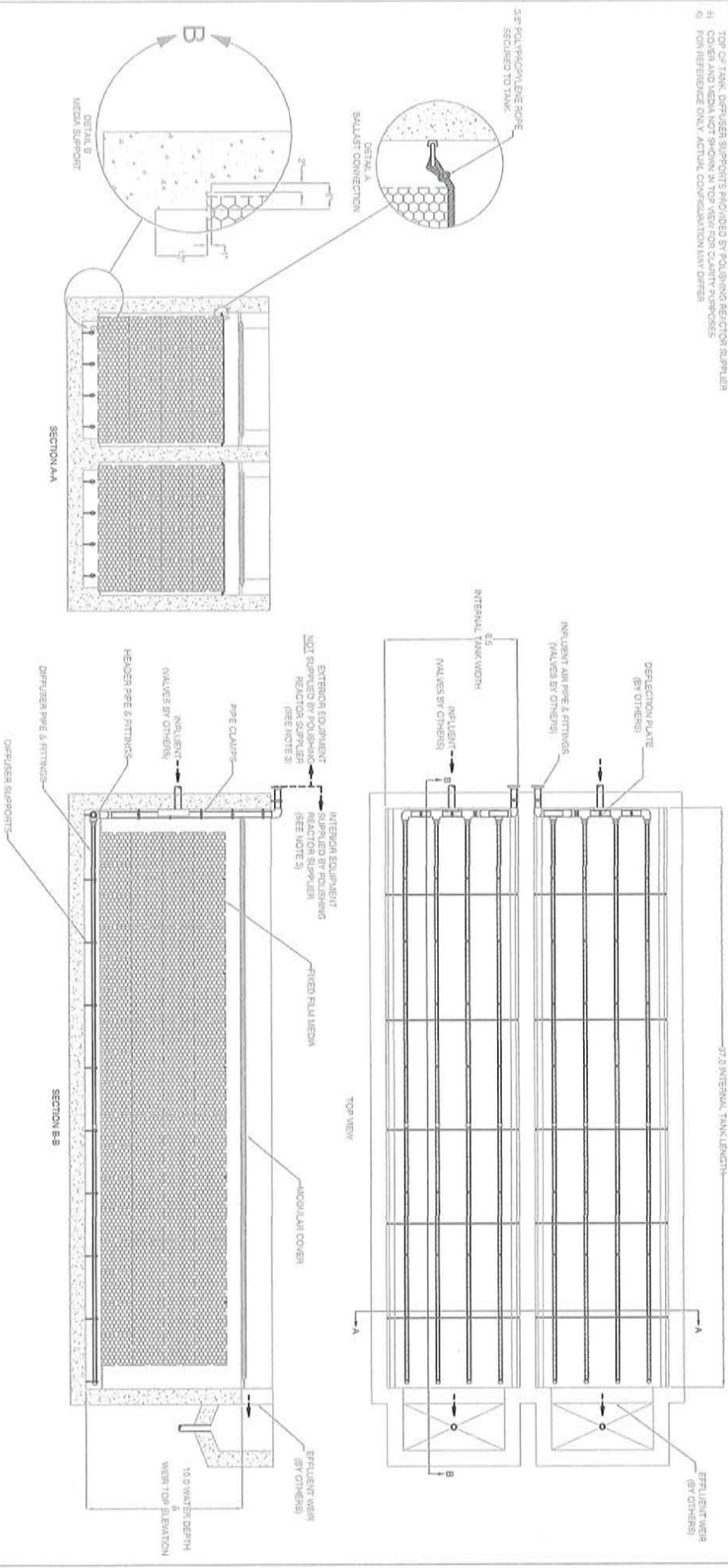
OCTOBER 2021

PREPARED BY:

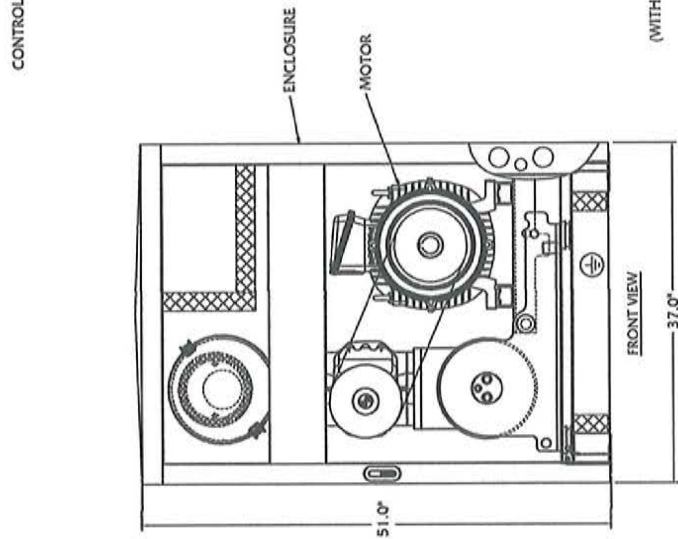
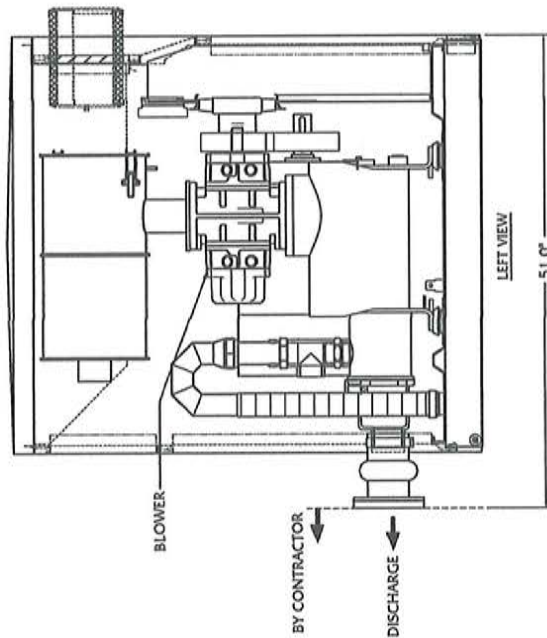
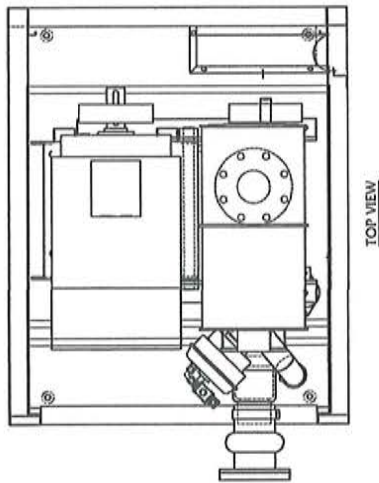
L·E·T

LEMNA ENVIRONMENTAL TECHNOLOGIES, INC.  
8275 WHITE BLAKE PARKWAY, SUITE 200 • WADSWORTH, MN 55110  
PHONE: 612-251-2088 FAX: 612-251-2083 WWW.LEMNAENVIRONMENTAL.COM

- NOTES:
- 1) UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE FEET
  - 2) THIS DRAWING IS A REPRESENTATION OF THE POLISHING REACTOR SUPPLIER'S SCOPE OF SUPPLY TO TERMINATE AT FLANGE AS SHOWN IN SECTION B-B. ALL OTHER EXTERNAL PIPE, FITTINGS, AND RELATED FASTENERS & HARDWARE BY CONTRACTOR
  - 3) CONTRACTOR TO SUPPLY PIPE CLAMPS TO SECURE INFLUENT AIR PIPE TO WALL AND TOP OF TANK. DIFFUSER SUPPORTS PROVIDED BY POLISHING REACTOR SUPPLIER
  - 4) COVER AND MEDIA NOT SHOWN IN TOP VIEW FOR CLARITY PURPOSES
  - 5) FOR REFERENCE ONLY, ACTUAL COMPARTMENT LAM DETERMINE



<p>THIS DESIGN IS PROPRIETARY TO LEMTEC. IT IS TO BE USED ONLY FOR THE POLISHING REACTOR SUPPLIER'S SCOPE OF SUPPLY TO TERMINATE AT FLANGE AS SHOWN IN SECTION B-B. ALL OTHER EXTERNAL PIPE, FITTINGS, AND RELATED FASTENERS &amp; HARDWARE BY CONTRACTOR</p> <p>THIS DESIGN IS PROPRIETARY TO LEMTEC. IT IS TO BE USED ONLY FOR THE POLISHING REACTOR SUPPLIER'S SCOPE OF SUPPLY TO TERMINATE AT FLANGE AS SHOWN IN SECTION B-B. ALL OTHER EXTERNAL PIPE, FITTINGS, AND RELATED FASTENERS &amp; HARDWARE BY CONTRACTOR</p>		<p>DESIGNED: RAY</p> <p>CHECKED: JG</p> <p>PROJECT NUMBER:</p> <p>SCALE: NOT TO SCALE</p> <p>DATE: OCTOBER 2021</p>	
<p>LEMTEC™ BIOLOGICAL TREATMENT PROCESS</p> <p>JASPER, MO</p> <p>POLISHING REACTOR</p>		<p>DATE: 10/01/2021</p> <p>REV: 0</p> <p>DESIGNED: RAY</p> <p>CHECKED: JG</p> <p>PROJECT NUMBER:</p> <p>SCALE: NOT TO SCALE</p> <p>DATE: OCTOBER 2021</p>	
<p>LEMTEC™ BIOLOGICAL TREATMENT PROCESS</p> <p>JASPER, MO</p> <p>POLISHING REACTOR</p>		<p>SHEET NUMBER:</p> <p>JAS-02</p>	



# NOTES:

1. BLOWER SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL BLOWER AND CONFIGURATION MAY DIFFER
2. ALL DIMENSIONS ARE APPROXIMATE
3. APPROXIMATE TOTAL WEIGHT 1000 LBS
4. PIPING TO BE SUPPLIED AND SUPPORTED BY CONTRACTOR

DRAWING STATUS	REV	DATE
PLANS	0	10/07/2021

THIS DESIGN IS PROPRIETARY TO LEMTEC. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED FOR APPLICATION AS SHOWN. NO OTHER REUSE OR MODIFICATION IS PERMITTED WITHOUT THE WRITTEN CONSENT OF LEMTEC. THIS DESIGN SHALL BE USED BY A THIRD PARTY FOR REPRODUCTION, IN FULL OR IN PART, WITHOUT THE WRITTEN CONSENT OF LEMTEC. LEMTEC TECHNOLOGIES, INC.

## LEMTEC™ BIOLOGICAL TREATMENT PROCESS JASPER, MO BLOWER AND CONTROLS

**LEET**  
LEEMAN COMMUNICATIONS, TECHNOLOGIES, INC.  
400 WEST 84th STREET, SUITE 100, JASPER, MO 64503  
PHONE: 816.471.1000 FAX: 816.471.1001 WWW.LEETCOMMUNICATIONS.COM

DRAWING: RAV	DESIGNED: LET	CHECKED: JC
PROJECT NUMBER:	SCALE: NOT TO SCALE	DATE: OCTOBER 2021

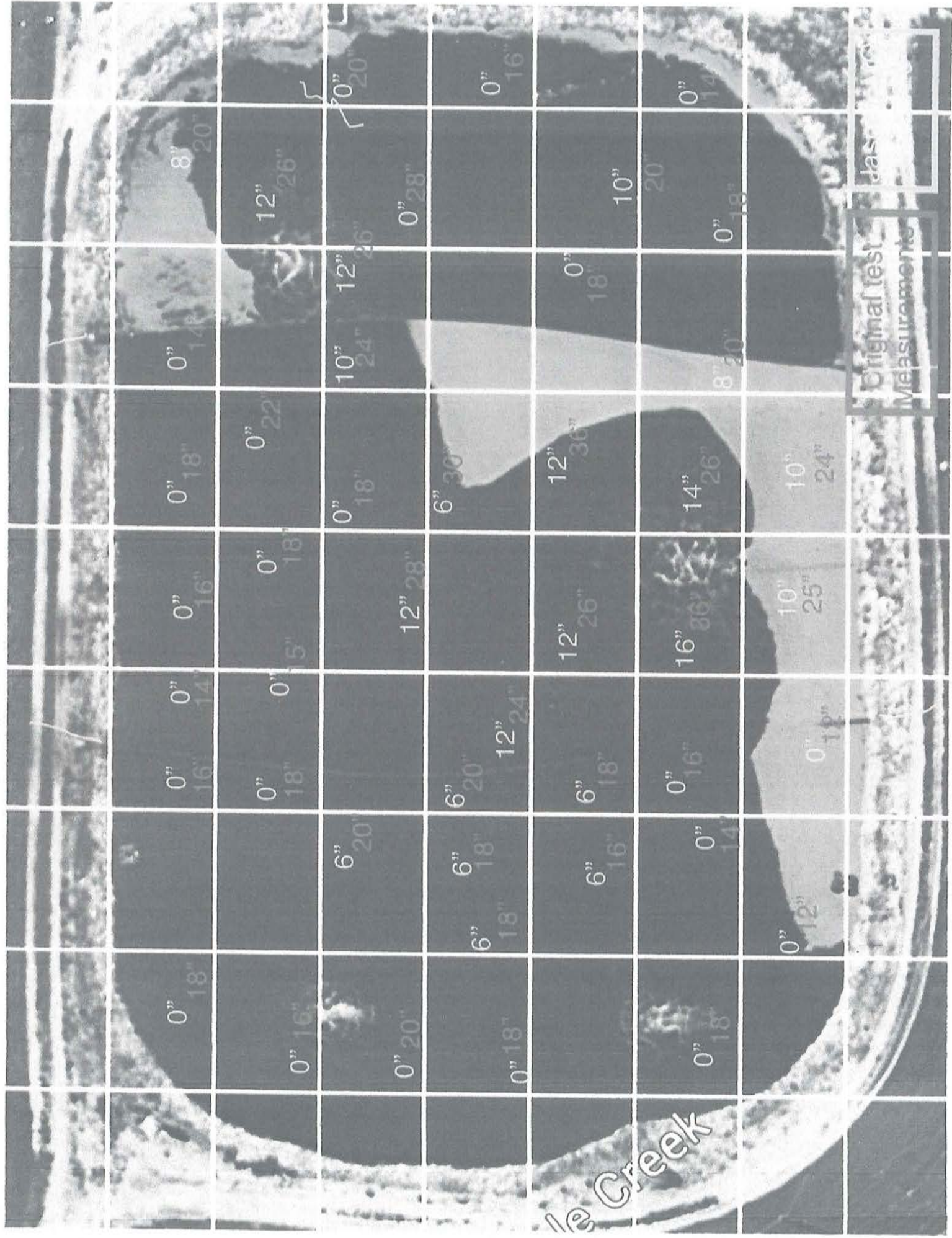
SHEET NUMBER:  
JAS-03

## APPENDIX C

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### Pre- and Post-Microbial Treatment Sludge Measurements for the Jasper WWTF





Creek

Original test  
Measurements

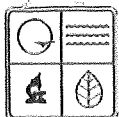


# Jasper Spreadsheet

Start Numbers 11/12/2020

18	0
16	0
20	0
18	0
18	0
20	6
18	6
18	6
16	6
14	0
12	0
16	0
14	0
18	0
15	0
20	6
24	12
18	6
16	0
12	0
16	0
18	0
28	12
26	12
36	16
25	10
18	0
22	0
18	0
30	6
36	12
26	14
24	10
14	0
24	10
26	12
18	0
20	8
20	8
26	12
28	0
20	10
18	0

	20	0
	16	0
	14	0
Average Inches	20.17	4.35



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
**FORM I – PERMIT APPLICATION FOR  
OPERATION OF WASTEWATER IRRIGATION SYSTEMS**

**FOR AGENCY USE ONLY**

PERMIT NUMBER

MO -

DATE RECEIVED

**INSTRUCTIONS:** The following forms must be submitted with Form I: **FORM B** or **B2** for domestic wastewater.  
**FORM A** for industrial wastewater.

**1. FACILITY INFORMATION**

1.1 Facility Name

1.2 Permit Number

Jasper Wastewater Treatment Facility

MO- 0044202

1.3 Type of wastewater to be irrigated: ☐ Domestic ☐ Municipal ☐ State/National Park ☐ Seasonal business

☐ Municipal with Pretreatment Program or Significant Industrial Users

☒ Other (explain) Excess Wet weather flow

SIC Codes (list all that apply, in order of importance) \_\_\_\_\_

1.4 Months when the business or enterprise will operate or generate wastewater: Only when necessary during extreme weather events.  
☒ 12 months per year ☐ Part of year (list Months): \_\_\_\_\_

1.5 This system is designed for:

☐ No-discharge ☒ Partial irrigation when feasible and discharge rest of time.

☐ Irrigation during recreation season (April – October) and discharge during November – March.

☐ Other (explain) \_\_\_\_\_

1.6 List the Facility outfalls which will be applicable to the irrigation system.

Outfall Numbers: 003

**2. STORAGE BASINS**

2.1 Number of storage basins: 1

Type of basin: ☐ Steel

☐ Concrete

☐ Fiberglass

☒ Earthen

☐ Earthen with membrane liner

**3. LAND APPLICATION SYSTEM**

3.1 Number of irrigation sites \_\_\_\_\_ Total Acres \_\_\_\_\_

Location: \_\_\_\_\_ 1/4, \_\_\_\_\_ 1/4, SE 1/4, Sec 23 T 36N R 31W Jasper County 90 Acres

Location: \_\_\_\_\_ 1/4, \_\_\_\_\_ 1/4, \_\_\_\_\_ 1/4, Sec \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres

Attach pages as needed.

3.2 Attach a site map showing topography, storage basins, irrigation sites, property boundary, streams, wells, roads, dwellings, and other pertinent features.

3.3 Type of vegetation: ☒ Grass hay ☐ Pasture ☐ Timber ☐ Row crops ☐ Other (describe) \_\_\_\_\_

3.4 Wastewater flow (dry weather) gallons/day:

Average annual: \_\_\_\_\_ Seasonal \_\_\_\_\_ Off-season \_\_\_\_\_

Months of seasonal flow: \_\_\_\_\_ Dependent on extreme weather conditions

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APR 25 2022

Water Protection Program

### 3. LAND APPLICATION SYSTEM (continued)

3.5 Land Application rate per acre (design flow including 1 in 10 year stormwater flows):

Design: 22 inches/year 0.15 inches/hour 0.45 inches/day 0.8 inches/week

Actual: \_\_\_\_\_ inches/year \_\_\_\_\_ inches/hour \_\_\_\_\_ inches/day \_\_\_\_\_ inches/week

Total Irrigation per year (gallons): 43,800,000 Design \_\_\_\_\_ Actual \_\_\_\_\_

Actual months used for Irrigation (check all that apply):

☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec (When necessary) No records

3.6 Land Application Rate is based on:

☐ Nutrient Management Plan (N&P)

☒ Hydraulic Loading

☐ Other (describe) \_\_\_\_\_

3.7 Equipment type: ☐ Sprinklers ☐ Gated pipe ☐ Center pivot ☒ Traveling gun ☐ Other (describe) \_\_\_\_\_

Equipment Flow Capacity: 39,000 Gallons per hour \_\_\_\_\_ Total hours of operation per year (Have not needed to irrigate in several years.)

3.8 **Public Use Areas.** Public access shall not be allowed to public use area irrigation sites when application is occurring. Method of Public Access Restriction:

☒ Site is Fenced

☐ Wastewater disinfection prior to irrigation

☒ Site is not for public use

☐ Other (describe): \_\_\_\_\_

3.9 Separation distance (in feet) from the outside edge of the wetted irrigation area to nearby down gradient features:

> 50' Permanent flowing stream \_\_\_\_\_ Losing Stream \_\_\_\_\_ Intermittent (wet weather) stream > 50' Lake or pond

> 50' Property boundary > 150' Dwellings > 300' Water supply well \_\_\_\_\_ Other (describe) Slopes < 5 percent

3.10 The facility must develop and retain an Operation and Maintenance (O&M) Plan for the irrigation system.

Date of O&M Plan: 2017

### 4. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment.

OWNER OR AUTHORIZED REPRESENTATIVE

OFFICIAL TITLE

EMAIL ADDRESS

TELEPHONE NUMBER WITH AREA CODE

SIGNATURE

DATE SIGNED

780-1686 (08-14)