



Jeremiah W. (Jay) Nixon, Governor

Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

dnr.mo.gov

City of Carl Junction
PO Box 447
Carl Junction, MO 64834

Dear Permittee:

Pursuant to the Federal Water Pollution Control Act, under the authority granted to the State of Missouri and in compliance with the Missouri Clean Water Law, we have issued and are enclosing your State Operating Permit to discharge from Carl Junction WWTF, Jasper County, Missouri.

Please read your permit and enclosed Standard Conditions. They contain important information on monitoring requirements, effluent limitations, sampling frequencies and reporting requirements.

Monitoring reports required by the special conditions must be submitted on a periodic basis. The required forms are enclosed. Please make copies for your use. Completed forms should be mailed to this office.

Please note that the new effluent limits will take effect on **May 1, 2014**. These new effluent limitations may require an upgrade to the current treatment process. Please refer to **Part E** of the enclosed permit, which outlines the specific schedule you must follow.

The project to upgrade your facility will require careful planning, time and expenditure of capital. State regulations require that you involve a Missouri licensed professional engineer to design your project. The completed design is required to be submitted to this office for review and approval. Once approved, a construction permit is issued and you may begin your construction project to improve your facility.

Please note the Oil & Grease final effluent limits as described in the Statement of Basis was not including in the final table on page three of your permit but was in reference in the statement of basis. This typo has been corrected. The limits will be 15 mg/L daily maximum and 10 mg/L monthly average. The facility should not have an issue with meeting this new Oil & Grease limit. Also, the sample type for pH and ammonia were changed from 24 hour composite to grab and zinc and cyanide were changed from grab to 24 hour composite.

This permit is both your Federal NPDES Permit and your new Missouri State Operating Permit and replaces all previous State Operating Permits issued for this facility under this permit number. In all future correspondence regarding this facility, please refer to your State Operating Permit number and facility name as shown on page one of the permit.



Recycled Paper

Please be aware that nothing in this permit relieves the permittee of any other legal obligations or restrictions, such as other federal or state laws, court orders, or county or other local ordinances or restrictions.

If you were adversely affected by this decision, you may be entitled to an appeal before the administrative hearing commission pursuant to 10 CSR 20-1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the administrative hearing commission 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 administrative hearing commission. Any appeal shall be directed to: Administrative Hearing Commission, Truman Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, MO 65102, Phone: 573-751-2422, Fax: 573-751-5018, website: www.aa.mo.gov/ahc.

If you have questions concerning this permit please contact Ms. Kristen Pattinson of my staff by calling 417-891-4300 or via mail at Southwest Regional Office, 2040 W. Woodland, Springfield, MO 65807-5912.

Sincerely,

SOUTHWEST REGIONAL OFFICE



Cynthia S. Davies
Regional Director

CSD/kpk

Enclosures

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 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No. MO-0025186

Owner: City of Carl Junction
Address: PO Box 447, Carl Junction, MO 64834

Continuing Authority: Same as Above
Address: Same as Above

Facility Name: Carl Junction WWTF **Class B operator needed**
Facility Address: South Joplin Street, Carl Junction MO 64834

Legal Description: NE¼, SW¼, NW¼, Sec. 08, T28N, R33W, Jasper County
UTM (X/Y): 361422 / 411466

Receiving Stream: Unnamed Tributary to Center Creek (U)
First Classified Stream and ID: Center Creek (P) (03203) 303 (d)
USGS Basin & Sub-watershed No.: (11070207-160010)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 - POTW - SIC #4952

Flow equalization basin / oxidation ditch / ultraviolet disinfection / sludge storage lagoon / sludge is land applied.

Design organic population equivalent is 8,670
Design flow is 1.27 MGD
Design sludge production is 185 dry tons/year.

Outfall #002: - Overflow.

Diversion from secondary treatment. Discharge from this outfall shall be considered an unauthorized bypass pursuant to 40 CFR 122.41(m) and shall be reported, pursuant to 40 CFR 122.41(m).

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

May 10, 2011
Effective Date


Sarah Parker Pauley Director Department of Natural Resources

May 9, 2016
Expiration Date


Cynthia S. Davies, Regional Director, Southwest Regional Office

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 2 of 9	
					PERMIT NUMBER MO-0025186	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective upon issuance and remain in effect until April 30, 2014 . Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	GPD	*		*	once/weekday**	24 hr. total
Biochemical Oxygen Demand ₅	mg/L		45	30	twice/month***	****
Total Suspended Solids	mg/L		45	30	twice/month***	****
pH – Units	SU	*****		*****	twice/month***	grab
<i>E. coli</i> (Note 1)	#/100 ml		630	126	once/week*****	grab
Oil & Grease	mg/L	*		*	once/month	grab
Ammonia as N (April – September)	mg/L	7.4		3.7	twice/month***	grab
(October – March)		12.3		6.1		
Zinc, Total Recoverable	µg/L	*		*	once/month	****
Cyanide	µg/L	*		*	once/month	****
Hardness	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>JUNE 28, 2011</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	DAILY MINIMUM	WEEKLY AVERAGE MINIMUM	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Dissolved Oxygen	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>JUNE 28, 2011</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity (WET) Test	% Survival	See Special Conditions #11			once / year	24 hour composite
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> . THE FIRST REPORT IS DUE <u>January 28, 2012</u>						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)					PAGE NUMBER 3 of 9	
					PERMIT NUMBER MO-0025186	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective May 1, 2014 and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	GPD	*		*	once/weekday**	24 hr. total
Biochemical Oxygen Demand ₅	mg/L		45	30	twice/month***	****
Total Suspended Solids	mg/L		45	30	twice/month***	****
pH – Units	SU	*****		*****	twice/month***	grab
<i>E. coli</i> (Note 1)	#/100 ml		630	126	once/week*****	grab
Oil & Grease	mg/L	15		10	once/month	grab
Ammonia as N (April – September) (October – March)	mg/L	4.9 11.0		0.9 2.7	twice/month***	grab
Zinc, Total R	µg/L	*		*	once/month	****
Cyanide	µg/L	8.2 (Note 2) (16 ML)		4.1 (Note 2) (16 ML)	once/month	****
Hardness	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>JUNE 28, 2014</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	DAILY MINIMUM	WEEKLY AVERAGE MINIMUM	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Dissolved Oxygen	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>JUNE 28, 2014</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity (WET) Test	% Survival	See Special Conditions #11			once / year	24 hour composite
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> . THE FIRST REPORT IS DUE <u>January 28, 2012</u>						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Parts I, II & III</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** Sample once per weekday means: Monday, Tuesday, Wednesday, Thursday, and Friday.
- *** Sample twice per month. Have the sampling period during the month be at a minimum of seven (7) days apart.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

**** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

***** pH is measured in pH units and is not to be averaged. The pH for all facilities except lagoons is limited to the range of 6.5-9.0 pH units.

***** Samples shall be collected **weekly** April 1 through October 31 and submitted monthly.

Note 1 – Final 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. Geometric mean for n samples = $[a_1 \times a_2 \times a_3 \dots \times a_n]^{1/n}$ 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)

Note 2 - This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved methods. The department has determined the current acceptable ML for Cyanide amenable to Chlorination to be 16 µg/L when using the Cyanide by Automated Colorimetric Method #335.3 from the U.S.EPA National Exposure Research Laboratory. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values greater than or equal to the minimum quantification level of 16 µg/L will be considered violations of the permit and values less than the minimum quantification level of 16 µg/L will be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of Cyanide in excess of the effluent limits stated in the permit.

C. INFLUENT MONITORING REQUIREMENTS			
The facility is required to meet a removal efficiency of 85% or more. The monitoring requirements shall become effective upon issuance and remain in effect until expiration of the permit. To determine removal efficiencies, the influent wastewater shall be monitored by the permittee as specified below:			
SAMPLING LOCATION AND PARAMETER(S)	UNITS	MONITORING REQUIREMENTS	
		MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Influent</u>			
Biochemical Oxygen Demand ₅	mg/L	once / month**	24 hour composite*****
Total Suspended Solids	mg/L	once /month**	24 hour composite*****

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JUNE 28, 2011.

MO 780-0010 (8/91)

C. INFLUENT MONITORING REQUIREMENTS (continued)

** Reports shall be submitted by the 28th day of the month following the reporting period, e.g. Reporting period is the month of March (samples collected monthly), report due by April 28th.

**** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

D. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:

(a) 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 Clean Water Act, 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

D. SPECIAL CONDITIONS (continued)

(2) controls any pollutant not limited in the permit.

- (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
- (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

- 2. All outfalls must be clearly marked in the field.
- 3. Permittee will cease discharge by connection to a facility with an area-wide management plan per 10 CSR 20-6.010(3)(B) within 90 days of notice of its availability.
- 4. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
 - (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
 - (4) The level established in Part A of the permit by the Director.
- (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

- 5. Report as no-discharge when a discharge does not occur during the report period.

6. Water Quality Standards

- (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
- (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
 - (1) 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;
 - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
 - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
 - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;

D. SPECIAL CONDITIONS (continued)

- (5) There shall be no significant human health hazard from incidental contact with the water;
 - (6) There shall be no acute toxicity to livestock or wildlife watering;
 - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
 - (8) 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.
7. The permittee shall develop and implement a program for maintenance and repair of the collection system.
8. The permittee shall comply with any applicable requirements listed in 10 CSR 20-8 and 10 CSR 20-9. 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. If a modification of the monitoring frequencies listed in 10 CSR 20-9 is needed, the permittee shall submit a written request to the department for review and, if deemed necessary, approval.
9. Bypasses are not authorized at this facility and are subject to 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3)(i), and with Standard Condition Part I, Section B, subsection 2.b.
10. The facility has signed into a settlement agreement due to bypasses from the collection system. This agreement was modified to include the discharges from the peak flow storm water basin (lagoon). The facility shall follow the settlement agreement when a discharge from the overflow basin occurs.
11. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT				
OUTFALL	AEC	FREQUENCY	SAMPLE TYPE	MONTH
001	100%	Annually	24 hr. composite*	Any

* A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampler.

Dilution Series							
AEC%	100%	50%	25%	12.5%	6.25%	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

(a) Test Schedule and Follow-Up Requirements

- (1) Perform a MULTIPLE-dilution acute WET test in the months and at the frequency specified above. For tests which are successfully passed, submit test results using the Department's WET test report form #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.
 - (i) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
 - (ii) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
 - (iii) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation excepting for stormwater samples.
 - (iv) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.
 - (v) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
 - (vi) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (vii) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.

D. SPECIAL CONDITIONS (continued)

- (viii) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.
 - (ix) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
 - (x) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.
 - (xi) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.
 - (xii) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (xiii) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.
- (2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.
- (3) If the effluent fails the test, a multiple dilution test shall be performed for BOTH test species within 30 calendar days and biweekly thereafter (for storm water, tests shall be performed on the next and subsequent storm water discharges as they occur, but not less than 7 days apart) until one of the following conditions are met:
- (i) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (ii) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
- (4) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.
- (5) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
- (6) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
- (7) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
- (b) PASS/FAIL procedure and effluent limitations:
- (1) To pass a multiple-dilution test:
 - (i) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC) OF 30% OR LESS, the AEC must be less than three-tenths (0.3) of the LC₅₀ concentration for the most sensitive of the test organisms; **OR**,
 - (ii) For facilities with an AEC greater than 30%, the LC₅₀ concentration must be greater than 100%; **AND**,
 - (iii) All effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required.

D. SPECIAL CONDITIONS (continued)

(c) Test Conditions

- (1) Test Type: Acute Static non-renewal
- (2) All tests, including repeat tests for previous failures, shall include both test species listed below.
- (3) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.
- (4) Test period: 48 hours at the "Allowable Effluent Concentration" (AEC) specified above.
- (5) Upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.
- (6) Unless otherwise specified above, multiple-dilution tests will be run with:
 - (i) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, ½ AEC and ¼ AEC;
 - (ii) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
 - (iii) Reconstituted water.
- (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.
- (8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

E. SCHEDULE OF COMPLIANCE

For Sewer Line to Center Creek:

1. The City is proposing to extend a discharge pipe from the wastewater treatment facility to Center Creek. The City proposes to have this completed by the December 31, 2011.
2. The effluent limits proposed in this permit are based on discharge to the Unnamed Tributary to Center Creek. Upon completion of the planned discharge pipe to Center Creek, the final effluent limits for ammonia and cyanide only will be revised to reflect the new discharge point. A modification request will need to be submitted to the Southwest Regional Office. The timeline to meet the new effluent limits does not change and is discussed below.

To meet the new effluent limits:

1. The permittee shall achieve compliance with Final Effluent Limits as soon as practicable, but no later than May 1, 2014.
2. By January 28, 2012, the permittee shall submit a report detailing progress made in attaining compliance with Final Effluent limits.
3. By January 28, 2013, the permittee shall submit a report detailing progress made in attaining compliance with Final Effluent limits.
4. By January 28, 2014, the permittee shall submit a report detailing progress made in attaining compliance with Final Effluent limits.
- 5.

D. SPECIAL CONDITIONS (continued)

SUMMARY OF TEST METHODOLOGY FOR ACUTE WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for Pimephales promelas:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

Missouri Department of Natural Resources
Fact Sheet
Carl Junction WWTF
MSOP #: MO-0025186
Jasper County

A Statement of Basis (Statement) gives pertinent information regarding the applicable regulations and rationale for the development of the NPDES Missouri State Operating Permit (operating permit). This Statement includes Wasteload Allocations, Water Quality Based Effluent Limitations, and Reasonable Potential Analysis calculations as well as any other calculations that effect the effluent limitations of this operating permit. This Statement does not pertain to operating permits that include sewage sludge land application plans and variance procedures, and does not include the public comment process for this operating permit.

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

Part I – Facility Information

Facility Type: POTW

Municipal
 SIC #4952

Facility Description: Flow equalization basin / oxidation ditch / ultraviolet disinfection / sludge storage lagoon / sludge is land applied.

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	1.96	Secondary	Municipal	0.21

Receiving Water Body’s Water Quality & Facility Performance History:

This is for a renewal,

Comments: The facility was last inspected on May 11, 2010. The inspection showed the following unsatisfactory features at the facility that included exceeding 2 dry tons / acre on each field that was land applied and the laboratory procedures for temperature, pH, and BOD methods did not conform to Standard Conditions Part I.

A review of the Discharge Monitoring Reports revealed the following: Missing DO for September 2008, August, 2008 and December 2004 – June 2008; Total Nitrogen missing for April 2005 and December 2004; Total Phosphorus missing December 2004; Ammonia exceedance for April 2010 and missing Ammonia for December 2004. The discharge goes to a dry weather creek and then goes to a drainage ditch and flows about a ¼ mile to the stream.

The facility is currently in a Settlement Agreement with the Department signed on 11/29/2007. The Agreement is to address the bypasses that occur in the collection system (SSOs). The Settlement Agreement is being revised to include language for the Peak Flow Outfall (Outfall #002). The Settlement Agreement was approved by the City on April 19, 2011.

The facility is proposing building a sewer line from the facility to the stream (approximately 1450 lineal feet). This would allow dilution when calculating the Ammonia and Cyanide effluent limits. These new limits are being placed in the permit even though the permit will state the first receiving stream as Unnamed Tributary to Center Creek. A Schedule of Compliance was added to the permit.

Their consultant also provided flow data for the receiving stream. Please see Appendix D for the new Ammonia calculations once the discharge pipe has been extended to the Center Creek. This data was used when calculating the limits. The low flow data is matching to what the Department typically sees in Center Creek and the Spring River. Once the construction is completed with the discharge pipe to Center Creek, the City will need to submit a modification request to change the Ammonia limits to reflect the direct discharge to Center Creek.

Part II – Operator Certification Requirements

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], permittees shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators or supervisors of operations 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 20-9.010(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems, if applicable, as listed below:

Check boxes below that are applicable to the facility;

- Population Equivalent greater than two hundred (200):
- Fifty (50) or more service connections:

- Owned or operated by or for:
 - Municipalities
 - Public Sewer District:
 - County
 - Public Water Supply Districts:
 - Private sewer company regulated by the Public Service Commission:
 - State or Federal agencies:

- Department required:

This facility currently requires an operator with a B, Certification Level. Please see **Appendix A – Classification Worksheet**. Modifications made to the wastewater treatment facility may cause the classification to be modified.

Operator’s Name: Marvin Lundien
 Certification Number: 5588
 Certification Level: 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.

Part III – Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

As per Missouri’s Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall’s Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

- Missouri or Mississippi River [10 CSR 20-7.015(2)]:
- Lake or Reservoir [10 CSR 20-7.015(3)]:
- Losing [10 CSR 20-7.015(4)]:
- Metropolitan No-Discharge [10 CSR 20-7.015(5)]:
- Special Stream [10 CSR 20-7.015(6)]:
- Subsurface Water [10 CSR 20-7.015(7)]:
- All Other Waters [10 CSR 20-7.015(8)]:

10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission water quality objectives in terms of “water uses to be maintained and the criteria to protect those uses.” The receiving

stream and/or 1st classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Unnamed Tributary to Center Creek	U	N/A	General Criteria,	11040207	Ozark / Neosho
Center Creek	P	03203	AQL, CLF, IND, IRR, LWV, SCR, WBC-A		

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND).

** - Ecological Drainage Unit

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed Tributary to Center Creek	0	0	0

MIXING CONSIDERATIONS TABLE:

Mixing Zone not allowed

Zone of Initial Dilution not allowed

Part IV – 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.

Not Applicable ;

The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

ANTI-BACKSLIDING:

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

- All limits in this statement are at least as protective as those previously established; therefore, backsliding does not apply.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:

As per [10 CSR 20-6.010(8)(A)10.], when a Continuing Authority under paragraph 10 CSR 20-6.010(3)(B)1. or 2. is expected to be available for connection within the next five (5) years, any operating permit issued to a permittee under this paragraph, located within the service area of the paragraph (3)(B)1. or 2. facility, shall contain the following special condition... This language is contained in Special Condition #3 of this operating permit.

ANTIDEGRADATION:

Policies which ensure protection of water quality for a particular water body where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as outstanding natural resource waters. Antidegradation requirements are consistent with 40 CFR 131.12 that outlines methods used to assess activities that may impact the integrity of a water and protect existing uses. This policy may compel the state to maintain a level of water quality above those mandated by criteria.

Not Applicable ;

Renewal no degradation proposed and no further review necessary.

APPLICABLE PERMIT PARAMETERS:

Effluent parameters for conventional, non-conventional, and toxic pollutants have been obtained from the previous NPDES operating permit for this facility, technology based effluent limits, and from appropriate sections of the renewal application.

Bio-solids, Sludge, & Sewage Sludge:

Bio-solids are solid materials resulting from wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sludge is any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. 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.

Additional information regarding biosolids and sludge is located at the following web address:

<http://dnr.mo.gov/env/wpp/pub/index.html>, items WQ422 through WQ449.

- Permittee land applies biosolids in accordance with Standard Conditions III and a Department approved biosolids management plan.

COMPLIANCE AND ENFORCEMENT:

Action taken by the Department to resolve violations of the Missouri Clean Water Law, its implementing regulations, and/or any terms and condition of an operating permit.

Applicable ;

The permittee/facility is currently under enforcement action due to bypasses of the collection system (SSOs). The City has signed into a Settlement Agreement.

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)].

Not Applicable ;

At this time, the permittee is not required to implement and enforce a Pretreatment Program.

REASONABLE POTENTIAL ANALYSIS (RPA):

Limitations must control all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above the Missouri Water Quality Standards.

Applicable ;

A RPA was conducted for this facility for (parameters) and determined that this facility has the potential to cause or contribute to violations of Water Quality. Please see **APPENDIX C – 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 (BOD₅) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs). Please see the United States Environmental Protection Agency's (EPA) website for interpretation of percent removal requirements for National Pollutant Discharge Elimination System Permit Application Requirements for Publicly Owned Treatment Works and Other Treatment Works Treating Domestic Sewage @ www.epa.gov/fedrgstr/EPA-WATER/1999/August/Day-04/w18866.htm

Applicable ;

Secondary Treatment is 85% removal [40 CFR Part 133.102(a)(3) & (b)(3)].

SANITARY SEWER OVERFLOWS (SSOs), BYPASSES, INFLOW & INFILTRATION (I&I) – PREVENTION/REDUCTION:

Sanitary Sewer Systems (SSSs) are municipal wastewater collection systems that convey domestic, commercial, and industrial wastewater, and limited amounts of infiltrated groundwater and storm water (i.e. I&I), to a POTW. SSSs are not designed to collect large amounts of storm water runoff from precipitation events.

Untreated or partially treated discharges from SSSs are commonly referred to as SSOs. SSOs have a variety of causes including blockages, line breaks, sewer defects that allow excess storm water and ground water to overload the system, lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. A SSO is defined as an untreated or partially treated sewage release from a SSS. SSOs can occur at any point in an SSS, during dry weather or wet weather. SSOs include overflows that reach waters of the state. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations. SSSs can back up into buildings, including private residences. When sewage backups are caused by problems in the publicly-owned portion of an SSS, they are considered SSOs.

Applicable ;

The permittee is required to develop or implement a program for maintenance and repair of the collection system and shall be required in this operating permit by either means of a Special Condition or Schedule of Compliance. In addition, the Department considers the development of this program as an implementation of this condition.

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). The CMOM identifies some of the criteria used by the EPA 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):

A schedule of remedial measures included in a permit, including 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.

Applicable ;

The time given for effluent limitations of this permit listed under Interim Effluent Limitation and Final Effluent Limitations where established in accordance with [10 CSR 20-7.031(10)].

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of storm water discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* [EPA 832-R-92-006] (Storm Water Management), BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Storm Water Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of storm water discharges.

Not Applicable ;

At this time, the permittee is not required to develop and implement a SWPPP.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined to total amount of pollutant that may be discharged into that stream without endangering its water quality.

Applicable .

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

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

Where C = downstream concentration

C_s = upstream concentration

Q_s = upstream flow

C_e = effluent concentration

Q_e = effluent 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:

Not Applicable ;

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

WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

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.

Applicable .

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 are also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A)7. and the Water Quality Standards 10 CSR 20-7.031(3)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], 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 RSMo 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 all facilities meeting the following criteria:

- Facility is a designated Major.
- Facility continuously or routinely exceeds its design flow.
- Facility (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 NH₃)
- Facility is a municipality or domestic discharger with a Design Flow ≥ 22,500 gpd.
- Other – please justify.

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, which includes blending, 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 20-2.010(11) defines a bypass as the diversion of wastewater from any portion of wastewater treatment facility or sewer system 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.

- The permittee has meet the criteria as established in 40 CFR 122.41(m)(4)(i)(A), (B), and (C). A separate VCA will not be offered to the City. Instead conditions of the VCA will be added to the current Settlement Agreement. The City will review, sign, and return to the Department.

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

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

Applicable ;

Center Creek is listed on the 2008 Missouri 303(d) List for Cadmium, Lead, Zinc, and Bacteria.

– This facility is not considered to be a source of the above listed pollutant(s) for Cadmium, Lead, Zinc because from abandoned mine tailings however the facility is a source for Bacteria, but the facility has disinfection.

Adjusted Design Flow:

10 CSR 20-6.011(1)(B)1. provides for an Adjusted Design Flow when calculating permit fees on human sewage treatment facilities. If the average flow is sixty percent (60%) or less than the system’s design flow, the average flow may be substituted for the design flow when calculating the permit fee on human sewage treatment facilities. If the facility’s actual average flow is consistently 60% or less than the permitted design flow, the facility may qualify for a reduction in your fee when:

- The facility has a valid permit, or has applied for re-issuance, is in compliance with the terms, conditions and effluent limitations of the permit, and the facility has a good compliance history; and
- Flow is not expected to exceed 60% of design flow for the remaining term of the existing operating permit.

Not Applicable ;

Municipalities, POTWs, and Industrials do not qualify for Adjusted Design flows.

Outfall #001 – Main Facility Outfall

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	1	*		*	NO	S
BOD ₅	MG/L	1		45	30	NO	S
TSS	MG/L	1		45	30	NO	S
pH (S.U.)	SU	1	6.5-9.0		6.5-9.0	YES	6.0-9.0
AMMONIA AS N (OCTOBER – MARCH)	MG/L	5	11		2.7	YES	12.3, 6.1
AMMONIA AS N (APRIL – SEPTEMBER)	MG/L	5	4.9		0.9	YES	7.4, 3.7
ESCHERICHIA COLI	***	1, 2, 3	Please see Escherichia Coli (E. coli) in the Derivation and Discussion Section below.				

DISSOLVED OXYGEN	MG/L	11	*		*	YES	S
TOTAL PHOSPHORUS	MG/L		-		-	YES	*
TOTAL NITROGEN	MG/L		-		-	YES	*
OIL & GREASE	MG/L	3, 8	15		10	YES	NONE
ZINC	µG/L	3, 8	*		*	YES	NONE
CYANIDE	µG/L	3, 8	8.2		4.1	YES	NONE
HARDNESS	MG/L	8	*		*	YES	NONE
WHOLE EFFLUENT TOXICITY (WET) TEST	Please see WET Test in the Derivation and Discussion Section below.						
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

*** - Monitoring requirement only**

*** - # of colonies/100mL; the Monthly Average for Fecal Coliform is a geometric mean.

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

N/A – Not applicable

S – Same as previous operating permit

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 6. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 7. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 8. Best Professional Judgment |
| 4. Lagoon Policy | 9. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 10. WET test Policy |
| | 11. Dissolved Oxygen Policy |

OUTFALL #001 – 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 (BOD₅).

- Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information**.

Total Suspended Solids (TSS).

- Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information**.

pH.

- pH is limited to the range of 6.5 – 9.0 pH units, as per [10 CSR 20-7.031(4)(E)]. pH is measured in pH units and is not to be averaged.

Total Ammonia Nitrogen. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L. Decay for Ammonia is believed to be nonexistence because the distance to the stream is 0.21 miles away. However, if the City would like to submit time of travel to the stream

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Oct. 1 – March 31	6	7.8	3.1	12.1

April 1 – Sept. 30	27	7.8	1.4	12.1
--------------------	----	-----	-----	------

Winter: Oct 1 – March 31, Summer: April 1 – Sept. 30

Summer – Chronic WLA = 1.4 mg N/L, Acute WLA = 12.1 mg N/L. No mixing zone is allowed. Discharges to Unclassified Stream.

$$\begin{aligned} LTA_c &= 1.4 \text{ mg/L } (0.3020) = 0.4228 \text{ mg N/L} && [\text{CV} = 3.53, 99^{\text{th}} \text{ Percentile, 30 day average}] \\ LTA_a &= 12.1 \text{ mg/L } (0.0862) = 1.044 \text{ mg N/L} && [\text{CV} = 3.53, 99^{\text{th}} \text{ Percentile}] \end{aligned}$$

$$\begin{aligned} \text{MDL} &= 0.4228 \text{ mg/L} * 11.594 = 4.9 \text{ mg N/L} && [\text{CV} = 3.53, 99^{\text{th}} \text{ Percentile}] \\ \text{AML} &= 0.4228 \text{ mg/L} * 2.216 = 0.9 \text{ mg N/L} && [\text{CV} = 3.53, 95^{\text{th}} \text{ Percentile, } n = 30] \end{aligned}$$

Winter – Chronic WLA = 3.1 mg N/L, Acute WLA = 12.1 mg N/L. No mixing zone is allowed. Discharges to Unclassified Stream.

$$\begin{aligned} LTA_c &= 3.1 \text{ mg/L } (0.6200) = 1.92 \text{ mg N/L} && [\text{CV} = 1.19, 99^{\text{th}} \text{ Percentile, 30 day average}] \\ LTA_a &= 12.1 \text{ mg/L } (0.1749) = 2.12 \text{ mg N/L} && [\text{CV} = 1.19, 99^{\text{th}} \text{ Percentile}] \end{aligned}$$

$$\begin{aligned} \text{MDL} &= 1.92 \text{ mg/L} * 5.717 = 11.0 \text{ mg N/L} && [\text{CV} = 1.19, 99^{\text{th}} \text{ Percentile}] \\ \text{AML} &= 1.92 \text{ mg/L} * 1.391 = 2.7 \text{ mg N/L} && [\text{CV} = 1.19, 95^{\text{th}} \text{ Percentile, } n = 30] \end{aligned}$$

Season	Maximum Daily Limit (mg N/L)	Average Monthly Limit (mg N/L)
Oct 1 – March 31	11.0	2.7
April 1 – Sept 30	4.9	0.9

Escherichia coli (E. coli). Monthly average of 126 per 100 ml as a geometric mean and Weekly Average of 630 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (A) designated use of the receiving stream, as per 10 CSR 20-7.031(4)(C). Weekly Average effluent variability will be evaluated in development of a future effluent limit. An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d).

Dissolved Oxygen. Monitoring requirement only. Monitoring for dissolved oxygen are included to determine whether “reasonable potential” to exceed water quality standards exists after the discharge begins.

Oil & Grease. Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

Cyanide, Amenable to Chlorination. Protection of Aquatic Life CCC = 5 µg/L, CMC = 22 µg/L, Background CN = 0 µg/L. The one sample analysis provided in Form B2 application Section D 0.034 mg/L = 34 µg/L. Even though it was one sample it violated the water quality standard for this parameter. Therefore limits are imposed.

$$\begin{aligned} \text{Chronic WLA: } C_c &= ((1.96 + 0.0)5 - (0.0 * 0.0))/1.96 \\ C_c &= 5 \text{ } \mu\text{g/L} \end{aligned}$$

$$\begin{aligned} \text{Acute WLA: } C_c &= ((1.96 + 0.0)22 - (0.0 * 0.0))/1.96 \\ C_c &= 22 \text{ } \mu\text{g/L} \end{aligned}$$

$$\begin{aligned} LTA_c &= 5 (0.527) = \mathbf{2.64} \text{ } \mu\text{g/L} && [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}] \\ LTA_a &= 22 (0.321) = 7.06 \text{ } \mu\text{g/L} && [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}] \end{aligned}$$

$$\begin{aligned} \text{MDL} &= 2.64 (3.11) = 8.2 \text{ } \mu\text{g/L} && [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}] \\ \text{AML} &= 2.64 (1.55) = 4.1 \text{ } \mu\text{g/L} && [\text{CV} = 0.6, 95^{\text{th}} \text{ Percentile, } n = 4] \end{aligned}$$

Metals

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in EPA/505/2-90-001 and "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" (EPA 823-B-96-007). General warm-water fishery criteria apply and water hardness = 162 mg/L.

Due to the absence of contemporaneous effluent and instream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and absorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the Department, partitioning evaluations may be considered and site-specific translators developed.

METAL	CONVERSION FACTORS	
	ACUTE	CHRONIC
Cadmium	0.924	0.889
Chromium III	0.316	0.860
Chromium VI	0.982	0.962
Copper	0.960	0.960
Lead	0.720	0.720
Nickel	0.998	0.997
Silver	0.85	N.A.
Zinc	0.978	0.986

Conversion factors for Cd and Pb are hardness dependent. Values calculated using equation found in Section 1.3 of EPA 823-B-96-007 and hardness = 162 mg/L.

Zinc, Total Recoverable Monitoring only. On Form B2 Section D showed a results below water quality standards for this parameter. Therefore monitoring only is appropriate to determine at the next renewal if there is a reasonable potential to violate the water quality standards.

Hardness. Zinc is dependent upon hardness. Therefore monitoring only is required.

WET Test. WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.

- Chronic
 Acute

No less than ONCE/YEAR:

- Facility is designated as a Major facility or has a design flow ≥ 1.0 MGD.
 Facility continuously or routinely exceeds their design flow.
 Facility exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
 Facility has Water Quality-based effluent limitations for toxic substances (other than NH₃).

Allowable Effluent Concentration (AEC) calculations determine if the facility is to conduct single dilution or multiple dilution WET testing. Facilities that discharge to unclassified or Class C receiving streams, the AEC% is 100%. Facilities with less than 100% for an AEC% will have multiple dilution WET testing. Facilities that

discharge to Lakes and have Acute WET testing, the AEC% is 100% due to [10 CSR 20-7.031(4)(A)4.B.(IV)(b)] ZID not allowed for Lakes.

$$\text{Acute AEC\%} = ((1.96 + 0) / 1.96)^{-1} \times 100 = 100\%$$

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
FLOW	WEEKDAY	MONTHLY
BOD ₅	WEEKLY	MONTHLY
TSS		
PH		
AMMONIA AS N		
FECAL COLIFORM	WEEKLY	
TOTAL RESIDUAL CHLORINE		
DISSOLVED OXYGEN		
OIL & GREASE		
TOTAL PHOSPHORUS		

Sampling Frequency Justification:

This facility has a design flow of 1,270,000. Per 10 CSR 7.015, sample frequency is determined by taking the design flow and dividing it by 50,000 to equal 25.4 samples are needed throughout the year at a minimum. To have the sample frequency even twice per month sample will be required. Except for *E. coli*, weekly sampling is required per 10 CSR 7.015.

Sampling Type Justification

As per 10 CSR 20-7.015 samples collected for mechanical plants shall be 24 hour composites.

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.

Date of Factsheet: January 27, 2011

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Appendix A

10 CSR 20-9.020

All wastewater treatment systems serving a population equivalent greater than two hundred (200) or with fifty (50) or more service connections, 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 the state or federal agencies.

Column A			Column B		
Item	Points	Points Assigned	Item	Points	Points Assigned
Maximum population equivalent (P.E.) served, peak day	1 pt. Per 10,000 PE or major fraction thereof	1	EFFLUENT DISCHARGE RECEIVING WATER SENSITIVITY		
Design flow (avg. day) or peak month's flow, (avg. day) whichever is larger	Maximum: 10 Points 1 pt. Per MGD or major fraction thereof	1	Missouri or Mississippi River	0	
REQUIRED LABORATORY CONTROL Performed by plant personnel (highest level only)			All other stream discharges except to losing streams and stream reaches supporting whole body contact reaction	1	
Lab work done outside the plant	0		Discharge to lake or reservoir outside of designated whole body contact recreational area	2	
Push – button or visual methods for simple tests such as pH, settleable solids	3		Discharge to losing stream, or stream, lake or reservoir area supporting whole body contact recreation	3	3
			HEADWORKS - PRELIMINARY TREATMENT		
Additional procedures such as DO, COD, BOD, titrations, solids, volatile content	5		Raw wastes subject to toxic waste discharges	6	
More advanced determinations such as BOD seeding procedure, fecal coliform, nutrients, total oils, phenols, etc.	7	7	Screening and/or comminution	3	3
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10		Grit removal	3	
			Plant pumping of main flow (If 51% or greater flow comes into plant)	3	
			PRIMARY TREATMENT		
			Primary clarifiers (Flow EQ basins)	5	5
			Combined sedimentation/digestion (includes big septic tank or if cities clean out STEP system)	5	
			Chemical addition (except chlorine, enzymes)	4	
TOTAL Page 1 Column A		9	TOTAL Page 1 Column B		11

APPENDIX B – RPA RESULTS:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Total Ammonia as Nitrogen (Summer) mg/L	12.1	44.35	1.4	44.5	42	0.1-13.2	3.5	3.36	Yes
Total Ammonia as Nitrogen (Winter) mg/L	12.1	15.16	3.1	15.16	28	0.1-4.7	1.19	3.22	Yes

N/A – Not Applicable

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

** - If the number of samples is greater than 10, then the 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 C: Ammonia and Cyanide Calculations if Discharge goes to Center Creek.

Total Ammonia Nitrogen. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L. Decay for Ammonia is believed to be nonexistence because the distance to the stream is 0.21 miles away. However, if the City would like to submit time of travel to the stream

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Oct. 1 – March 31	6	7.8	3.1	12.1
April 1 – Sept. 30	27	7.8	1.4	12.1

Winter: Oct 1 – March 31, Summer: April 1 – Sept. 30

Summer – Chronic WLA = 1.4 mg N/L, Acute WLA = 12.1 mg N/L.
 $((Q_e + Q_s) * C - (Q_s * C_s)) / Q_e$

Chronic
 $((1.96 + 6.7) * 1.4 - (6.7 * 0.01)) / 1.96 = 6.152$
 LTA_c = 6.152 mg/L (0.3020) = 1.858 mg N/L [CV = 3.53, 99th Percentile, 30 day average]

Acute
 $((1.96 + 0.4875) * 12.1 - (0.4875 * 0.01)) / 1.96 = 15.11$
 LTA_a = 15.11 mg/L (0.0862) = **1.302** mg N/L [CV = 3.53, 99th Percentile]

MDL = 1.302 mg/L * 11.594 = 15.1 mg N/L [CV = 3.53, 99th Percentile]
 AML = 1.302 mg/L * 2.216 = 2.9 mg N/L [CV = 3.53, 95th Percentile, n = 30]

Winter – Chronic WLA = 3.1 mg N/L, Acute WLA = 12.1 mg N/L.

$((Q_e + Q_s) * C - (Q_s * C_s)) / Q_e$

Chronic
 $((1.96 + 6.7) * 3.1 - (6.7 * 0.01)) / 1.96 = 13.663$
 LTA_c = 13.663 mg/L (0.6200) = 8.47 mg N/L [CV = 1.19, 99th Percentile, 30 day average]

Acute
 $((1.96 + 0.4875) * 12.1 - (0.4875 * 0.01)) / 1.96 = 15.11$
 LTA_a = 15.11 mg/L (0.1749) = **2.64** mg N/L [CV = 1.19, 99th Percentile]

MDL = 2.64 mg/L * 5.717 = 15.1 mg N/L [CV = 1.19, 99th Percentile]
 AML = 2.64 mg/L * 1.391 = 3.7 mg N/L [CV = 1.19, 95th Percentile, n = 30]

Season	Maximum Daily Limit (mg N/L)	Average Monthly Limit (mg N/L)
Oct 1 – March 31	15.1	3.7
April 1 – Sept 30	15.1	2.9

Cyanide, Amenable to Chlorination. Protection of Aquatic Life CCC = 5 µg/L, CMC = 22 µg/L, Background CN = 0 µg/L. The one sample analysis provided in Form B2 application Section D 0.034 mg/L = 34 µg/L. Even though it was one sample it violated the water quality standard for this parameter. Therefore limits are imposed.

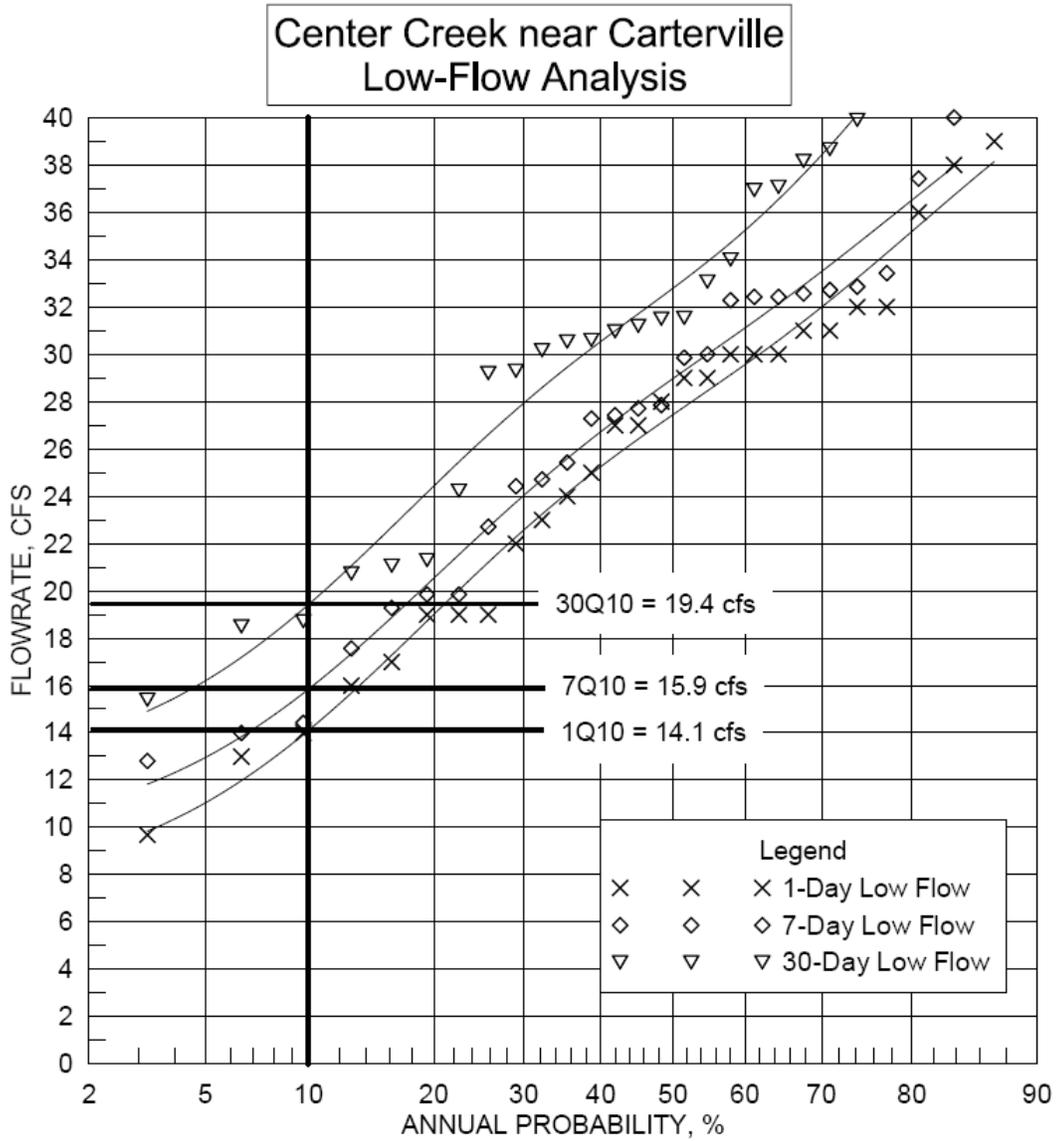
Chronic WLA: $C_e = ((1.96 + 5.5)5 - (5.5 * 0.0)) / 1.96$
 $C_e = 19.031$ µg/L

Acute WLA: $C_e = ((1.96 + 0.55)22 - (0.55 * 0.0)) / 1.96$
 $C_e = 28.173$ µg/L

LTA_c = 19.031 (0.527) = 10 µg/L [CV = 0.6, 99th Percentile]
 LTA_a = 28.173 (0.321) = **9.04** µg/L [CV = 0.6, 99th Percentile]

MDL = 9.04 (3.11) = 28.1 µg/L [CV = 0.6, 99th Percentile]
 AML = 9.04 (1.55) = 14.0 µg/L [CV = 0.6, 95th Percentile, n = 4]

Appendix D: Low Flow Calculations Presented by Allgeier, Martin, and Associates, therefore new mixing zone information.



USGS 07186400 Center Creek near Carterville, MO
 Latitude 37°08'26", Longitude 94°22'57" NAD27
 Jasper County, Missouri, Hydrologic Unit 11070207
 Drainage area: 232 square miles
 Datum of gage: 913.21 feet above sea level NGVD29

Carl Junction WWTP Low Flow Computations
jpw 2/22/2011

At Carterville

$$\text{Flow1Q10} := 14.1 \quad \text{Flow7Q10} := 15.9 \quad \text{Flow30Q10} := 19.4$$

Drainage area at Carterville = 232 square miles
Drainage area at Carl Junction WWTP = 292 square miles

$$A_c := 232 \quad A_{cj} := 292$$

Use discharge transfer method to compute low flow values at Carl Junction based on values at Carterville. (Mertes 1968, Wiitala et al. 1961, Walesh, 1989)

$$\frac{Q_a}{Q_b} := \left(\frac{A_a}{A_b} \right)^n$$

The exponent n is computed using average annual flows from a similar nearby stream. Using Spring River at La Russel and at Carthage to determine n.

$$\text{At La Russel} \quad A_1 := 306 \quad Q_{1\text{avg}} := 266$$

$$\text{At Carthage} \quad A_2 := 425 \quad Q_{2\text{avg}} := 422$$

$$n := \frac{\ln\left(\frac{Q_{1\text{avg}}}{Q_{2\text{avg}}}\right)}{\ln\left(\frac{A_1}{A_2}\right)} \quad n = 1.405$$

For Carl Junction

$$\text{CJ1Q10} := \frac{\text{Flow1Q10}}{\left(\frac{A_c}{A_{cj}}\right)^n} \quad \text{CJ1Q10} = 19.5$$

$$\text{CJ7Q10} := \frac{\text{Flow7Q10}}{\left(\frac{A_c}{A_{cj}}\right)^n} \quad \text{CJ7Q10} = 22.0$$

$$\text{CJ30Q10} := \frac{\text{Flow30Q10}}{\left(\frac{A_c}{A_{cj}}\right)^n} \quad \text{CJ30Q10} = 26.8$$

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Center Creek (P)	19.5	22	26.8

MIXING CONSIDERATIONS TABLE:

MIXING ZONE (CFS) [10 CSR 20-7.031(4)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(4)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
4.875	5.5	6.7	0.4875	0.55	N/A