

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-0048313

Owner: City of Kansas City
 Address: 4800 East 63rd Street, Kansas City, Missouri 64130

Continuing Authority: Same as above
 Address: Same as above

Facility Name: KC, Fishing River Wastewater Treatment Facility
 Facility Address: 10600 Northeast 118th Street, Kansas City, Missouri 64157

Legal Description: See Page 2
 UTM (X/Y): See Page 2

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

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

FACILITY DESCRIPTION

See Page Two (2). The use or operation of this facility shall be by or under the supervision of a **Certified C Operator**.

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.

November 4, 2011
Effective Date

May 23, 2013
Revised Date


Sara Parker Pauley, Director, Department of Natural Resources

November 3, 2016
Expiration Date


Andrea D. Collier, P.E. Regional Director, Kansas City Regional Office

Facility Description (continued):

Outfall #001 - POTW SIC #4952

Conventional Activated Sludge with Pump Station, Headworks, Aeration Basins, and Clarifiers/UV disinfection/Wet Weather Flow Storage/Sludge holding tank/Sludge is hauled to Blue River Treatment Facility.

UTM Coordinates: x= 375281; y= 4351867

Legal Description: SW ¼, SE ¼, Sec. 13, T52N, R32W, Clay County

Receiving Stream: Fishing River (C)

First Classified Stream and ID: Fishing River (C) (0394)

USGS Basin & Sub-watershed No.: (10300101-0404)

Design population equivalent is 20,000.

Design flow is 2.0 MGD (million gallons per day).

Actual flow is 0.71 MGD.

Design sludge production is 500 dry tons/year.

In-stream Sampling (S1): Route A Bridge

UTM Coordinates: x= 376189; y= 4352252

Legal Description: SE ¼, SE ¼, Sec. 13, T52N, R32W, Clay County

Receiving Stream: Fishing River (C)

First Classified Stream and ID: Fishing River (C) (0394)

USGS Basin & Sub-watershed No.: (10300101-0404)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 3 of 10	
					PERMIT NUMBER MO-0048313	
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 upon issuance 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	MGD	*		*	once/weekday (Note 1)	24 hr. total
Biochemical Oxygen Demand ₅	mg/L		22	15	twice/month	24 hr. composite
Total Suspended Solids	mg/L		22	15	twice/month	24 hr. composite
Oil & Grease	mg/L	15		10	once/month	grab
Temperature	°C	*		*	twice/month	grab
Ammonia as N (April 1 – Sept. 30)	mg/L	3.6		1.4	twice/month	grab
(Oct. 1 – March 31)		7.5		2.9		
pH	SU	**		**	twice/month	grab
Escherichia Coliform (Note 2)	Colonies/100 mL		1,030	206	once/week	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE July 28, 2013 . 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
<u>Outfall #001</u>						
Dissolved Oxygen	mg/L	*		*	twice/month	grab
<u>S1 – In stream</u>						
Dissolved Oxygen	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE July 28, 2013 .						
Whole Effluent Toxicity (WET) test	% Survival	See Special Condition # 9			once/year	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>January 28, 2014</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</u> and <u>AUGUST 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

C. INFLUENT MONITORING REQUIREMENTS

The facility is required to meet a removal efficiency of 85% or more as a monthly average. 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 hr. composite
Total Suspended Solids	mg/L	once/month	24 hr. composite

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE July 28, 2013.

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.

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

Note 1: Once each weekday means: Monday, Tuesday, Wednesday, Thursday & Friday except nine Federal legal holidays (New Years, Martin Luther King Day, Presidents Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving, and Christmas).

Note 2 - 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. 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).

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
 - (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. 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.

D. SPECIAL CONDITIONS (continued)

- (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.
4. Report as no-discharge when a discharge does not occur during the report period.
 5. Water Quality Standards
 - (a) To the extent required by law, 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;
 - (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.
 6. The permittee shall comply with any applicable requirements listed in 10 CSR 20-8 and 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. 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.
 7. The permittee shall develop and implement a program for maintenance and repair of the collection system. The permittee shall submit a report annually by March 31st per the requirements of the Administrative Order of Consent (Civil Action No. 4:10-cv-0497-GAF).
 8. 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.
 9. 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%	once/year	24 hr. composite*	August

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

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

D. SPECIAL CONDITIONS (continued)

(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.
 - (a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
 - (b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
 - (c) 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.
 - (d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.
 - (e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
 - (f) 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.
 - (g) 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.
 - (h) 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.
 - (i) 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.
 - (j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.
 - (k) 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.
 - (l) 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.
 - (m) 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:
 - (a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
- (4) Failure of a WET test is a violation of this permit.
- (5) 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.
- (6) 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.
- (7) 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.

D. SPECIAL CONDITIONS (continued)

9. Wet Test (continued)

(8) 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:

- (a) 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**,
- (b) For facilities with an AEC greater than 30%, the LC₅₀ concentration must be greater than 100%; **AND**,
- (c) 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.

(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:
 - (a) 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;
 - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
 - (c) 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.

10. Sewer Extension Authority

- (a) The Department has approved the Sewer Extension Program for Kansas City to regulate and approve construction of sanitary sewers which are owned and/or operated by Kansas City.
- (b) The approval of the Sewer Extension Program may be modified or revoked by the Department if the sewage collection, transportation, and receiving treatment facility reach their respective design capacity, or if the Department determines that this program is causing or contributing to chronic non-compliance of the receiving treatment facility, or if the permittee fails to follow the terms and conditions of the submitted and approved program.
- (c) The Sewer Extension Program Special Condition may be reopened and modified and reissued, or alternatively revoked to incorporate new or modified conditions to the sewer construction permit authority, if information or regulation or statute indicates changes are necessary to assure compliance with Missouri's Clean Water Law and associated regulations.
- (d) If items b or c of the Sewer Extension Program occur, the permittee will be notified to any modification to this operating permit.

D. SPECIAL CONDITIONS (continued)

10. Sewer Extension Authority (continued)

- (e) The Permittee, as part of their Sewer Extension Program, shall submit an annual report by March 31st of each year, to the Missouri Department of Natural Resources' Kansas City Regional Office. The report shall include, but is not limited to, the following:
 - (1) A list of the name of each individual project and their respective:
 - (2) Length of sewer and force main
 - (3) Capacity of the lift stations constructed under the sewer extension (if applicable);
 - (4) Inspections made of the construction and the findings of each;
 - (5) Results of leakage and deflection test;
 - (6) Population or number of lots to be served by this extension; and
 - (7) Type of wastewater (i.e., domestic or industrial);
 - (8) An annual summary of
 - (a) Number of construction permits issued
 - (b) Number of inspections completed
 - (c) Number of sewer lines tested and/or inspected with Closed Circuit Television
 - (d) Number of warnings, violations, or notices given
 - (e) Capacity remaining at the treatment plant
- (f) The Sewer Extension Authority is valid the length of this operating permit. Upon renewal of the permit, the Sewer Extension Authority for Kansas City will be reevaluated.

11. The permittee shall implement and enforce its approved pretreatment program in accordance with the requirements of 40 CFR Part 403. The approved pretreatment program is hereby incorporated by reference. The permittee shall submit to the Department on or before March 31st of each year a report briefly describing its pretreatment activities during the previous calendar year. At a minimum, the report shall include the following:

- (a) An updated list of the Permittee's Industrial Users, including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Permittee shall provide a brief explanation of each deletion. This list shall identify which Industrial Users are subject to categorical pretreatment Standards and specify which Standards are applicable to each Industrial User. The list shall indicate which Industrial Users are subject to local standards that are more stringent than the categorical Pretreatment Standards. The Permittee shall also list the Industrial Users that are subject only to local Requirements;
- (b) A summary of the status of Industrial User compliance over the reporting period;
- (c) A summary of compliance and enforcement activities (including inspections) conducted by the Permittee during the reporting period; and
- (d) Any other relevant information requested by the Department.

12. RECEIVING WATER MONITORING CONDITIONS

- a. In-stream samples should be taken at the location(s) specified on page 2 of this permit. In the event that a safe, accessible location is not present at this location, a suitable location can be negotiated with the Department. Samples should be taken at least four feet from the bank or from the middle of the stream (whichever is less) and 6-inches below the surface. The upstream receiving water sample should be collected at a point upstream from any influence of the effluent, where the water is visibly flowing down stream.
- b. When conducting in-stream monitoring, the permittee shall record observations that include: the time of day, weather conditions, unusual stream/lake characteristics (e.g., septic conditions, algae growth, etc.), the stream segment (e.g., riffle, pool or run) or the lake depth from where the sample was collected. These observations shall be submitted with the sample results.
- c. Samples shall not be collected from areas with especially turbulent flow, still water or from the stream bank, unless these conditions are representative of the stream reach or no other areas are available for sample collection. Sampling should not be made when significant precipitation has occurred recently. The sampling event should be terminated and rescheduled if any of the following conditions occur:
 - i. If turbidity in the stream increase notably; or
 - ii. If rainfall over the past two weeks exceeds 2.5 inches or exceeds 1 inch in the last 24 hours

D. SPECIAL CONDITIONS (continued)

- d. Always use the correct sampling technique and handling procedure specified for the parameter of interest. Please refer to the latest edition of Standard Methods for the Examination of Water and Wastewater for further discussion of proper sampling technique. All analyses must be conducted in accordance with an approved EPA method. Meters shall be calibrated immediately (within 1 hour) prior to the sampling event.
- e. To obtain accurate measurements, D.O., temperature and pH analyses should be performed on-site in the receiving stream where possible. However, due to high flow conditions, access, etc., it may be necessary to collect a sample in a bucket or other container. When this is necessary, care must be taken not to aerate the sample upon collection. If for any reason samples must be collected from an alternate site from the one listed in the permit, the permittee shall report the location with the sample results.
- f. Dissolved oxygen measurements are to be taken during the period from one hour prior to sunrise to one and one-half hour after sunrise.
- g. If water quality standards are being attained consistently during a three-year period, the Department will confirm the results with an assessment. If the assessment verifies that water quality standards are being achieved, the permit requirement for in-stream monitoring will be removed.
- h. Please contact the Department if you need additional instructions or assistance.

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
FOR THE PURPOSE OF MODIFICATION
OF
MO-0048313
KC, FISHING RIVER WWTF

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution 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 storm water 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)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. This Factsheet is for a Major .

Part I – Facility Information

Facility Type: POTW
Facility SIC Code(s): 4952

Facility Description:

Fishing River WWTP provides secondary treatment for primarily domestic wastewater from 15 square miles around the plant, both inside and outside the city limits of Kansas City. The Fishing River watershed includes the northeastern-most portion of the City. The WWTP utilizes the extended aeration activated sludge process. It was rehabilitated in 2003 and returned to service with an average daily design flow of 1.0 MGD. Aeration diffusers, a manually cleaned bar screen, an influent pump, and aeration blowers were installed. A two-cell lagoon is used for effluent polishing and equalization before discharging treated effluent to the Fishing River.

Facility has a construction permit for the addition of a second outfall (Outfall#002) for effluent to not go to the polishing lagoons prior to discharge. The construction permit was issued October 2010. Outfall #002 will not be necessary after the proposed upgrades.

City of Kansas City has proposed to upgrade the current “extended aeration/two cell polishing lagoons” to a conventional activated sludge system with wet weather flow storage (a.k.a. two cell polishing lagoons). The upgrades will include pump station, headworks, aeration basins, clarifiers, and ultraviolet disinfection.

Outfall #001 will be relocated with the upgrades. Sludge from the facility is hauled to Blue River Wastewater Treatment Plant (MO-0024911) for incineration or land application

Currently, the facility is discharging to an unnamed tributary to the Fishing River. The new outfall will be located on the Fishing River, less than 0.5 mile upgradient of the confluence with the unnamed tributary. Design flow will be expanded from 1.0 MGD to 2.0 MGD.

Have any changes occurred at this facility or in the receiving water body that effects effluent limit derivation?

- Yes: as documented in the Water Quality and Antidegradation Review Preliminary Determination for the Kansas City Fishing River WWTF included in Appendix B; the weekly and monthly averages were lowered from 45 mg/L and 30 mg/L to 22 mg/L and 15 mg/L for BOD and TSS. pH was changed from a minimum of 6.5 to must be maintained between 6.5 and 9.0. These changes in effluent limits are all associated with the change in treatment system specifically from an extended aeration with two cell polishing lagoon to a conventional activated sludge system with wet weather flow storage.

Last Inspection: 04/02/2010 In Compliance .

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	3.1	Secondary	Domestic	0.0

Outfall #001

Legal Description: SE ¼, NE ¼, NW ¼, Sec. 24, T52N, R32W, Clay County
 UTM Coordinates: x= 375261; y= 4351831
 Receiving Stream: Fishing River (C)
 First Classified Stream and ID: Fishing River (C) (0394)
 USGS Basin & Sub-watershed No.: (10300101-0404)

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

Facility Exceedances: Ammonia: 05/2009; 06/2009; 07/2009; 03/2010; 04/2010

Comments:

City of Kansas City has proposed to upgrade the current “extended aeration/two cell polishing lagoons” to a conventional activated sludge system with wet weather flow storage (a.k.a. two cell polishing lagoons). The upgrades will include pump station, headworks, aeration basins, clarifiers, and ultraviolet disinfection.

KC Water Services believes the two cell polishing lagoon is the source of the high ammonia results, therefore eliminating the lagoons from the treatment train along with new treatment components should improve the water quality of the discharge. Design flow of the treatment facility will change with this modification from 1.0 MGD to 2.0 MGD.

The city of Kansas City has proposed upgrades to comply with disinfection requirements and meet the December 31, 2013 deadline along with the elimination of the wet weather overflows.

For more information on the Administrative Order of Consent (Civil Action No. 4:10-cv-0497-GAF) and the actions to be taken in the Northern Watersheds of Kansas City under the Overflow Control Plan, please visit Kansas City’s website for a copy of the plan, Consent Decree, and proposed schedule. Treatment plants in the Northern Watersheds include Rocky Branch, Fishing River, Todd Creek, and Northland Mobile Home Park: <http://www.kcmo.org/CKCMO/Depts/WaterServices/index.htm>.

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:

- Owned or operated by or for:
 - Municipalities

Each of the above entities are only applicable if they have a Population Equivalent greater than two hundred (200) and/or fifty (50) or more service connections. This facility currently requires an operator with a **C** 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: Randy Williams
 Certification Number: 8660
 Certification Level: A

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 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.

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 identified in the Receiving Stream Table located below, and are in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Fishing River	C	0394	LWW, AQL,WBC(B)***	10300101	Central Plains/ Blackwater/Lamine

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

** - Ecological Drainage Unit

*** - UAA conducted in 2005. WBC (B) remains on the stream.

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Fishing River (C)	0.0	0.0	0.1

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

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

RECEIVING STREAM MONITORING REQUIREMENTS:

Site 02. (Downstream)

PARAMETER(S)	SAMPLING FREQUENCY	SAMPLE TYPE	LOCATION
Dissolved Oxygen	Monthly	Grab	Route A Bridge UTM: 376189 4352252

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 §402(c); 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 operating permit are at least as protective as those previously established; therefore, backsliding does not apply.

ANTIDegradation:

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

- New and/or expanded discharge, please see **APPENDIX B – ANTIDegradation ANALYSIS**.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:

As per [10 CSR 20-6.010(3)(B)], ...An applicant may utilize a lower preference continuing authority by submitting, as part of the application, a statement waiving preferential status from each existing higher preference authority, providing the waiver 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.

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.

Applicable : Permittee has been approved to land apply biosolids in accordance with Standard Conditions III and a Department approved biosolids management plan. However, the facility takes the sludge to the Blue River WWTP (MO-0024911) for incineration or land application.

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.

Not Applicable : The permittee/facility is not currently under Water Protection Program enforcement action.

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

Applicable : This permittee has an approved pretreatment program in accordance with the requirements of [40 CSR Part 403] and [10 CSR 20-6.100] and is expected to implement and enforce its approved program.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] 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)(iii)] if the permit writer determines that any give 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.

Not Applicable : A RPA was not conducted for this facility. Independent application was used for determining there was reasonable potential to exceed Water Quality Standards for ammonia.

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)/municipals. 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 (SSO) AND INFLOW AND INFILTRATION (I&I):

Sanitary Sewer Overflows (SSOs) are defined as an untreated or partially treated sewage release are considered bypassing under state regulation [10 CSR 20-2.010(11)] and should not be confused with the federal definition of bypass. SSO's have a variety of causes including blockages, line breaks, and sewer defects that allow excess storm water and ground water to (1) enter and overload the collection system, and (2) overload the treatment facility. Additionally, SSO's can be also be caused by lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations.

Additionally, Missouri RSMo §644.026.1 mandates that the Department require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities.

- In accordance with Missouri RSMo §644.026.1(15) and 40 CFR Part 122.41(e), the permittee is required to develop and/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. Additionally, 40 CFR Part 403.3(o) defines a POTW to include any device and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW Treatment Plant.

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.

City of Kansas City has developed maintenance and repair plan to address SSO which is documented in the Kansas City, Missouri Overflow Control Plan dated January 30, 2009. On April 14, 2010 the Missouri Department of Natural Resources approved the Overflow Control Plan and the Western District Court of Missouri approved the OCP as memorialized in a US EPA/DOJ Consent Decree on September 27, 2010. The CMOM plan is Appendix C of the Consent Decree. A copy of the requirements of the CMOM report and the overall OCP is available on Kansas City's webpage: <http://www.kcmo.org/CKCMO/Depts/WaterServices/index.htm>.

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.

Not Applicable ; This permit does not contain a SOC.

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 *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], 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.

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.

Not Applicable : 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(78)], 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.

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). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration). 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.

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 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 all facilities meeting the following criteria:**

- Facility is a designated Major.
- Facility is a municipality or domestic discharger with a Design Flow \geq 22,500 gpd.

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 20-2.010(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). The facility is in the process of planning to expand by December 2013 to help handle wet weather overflows. For more information on how Kansas City plans to address peak flows at the treatment plants along with sanitary sewer overflows prior to the facility headworks, please visit the Kansas City’s website for the Overflow Control Plan, its schedule, and the Consent Decree.

<http://www.kcmo.org/CKCMO/Depts/WaterServices/index.htm>.

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

Not Applicable : This facility does not discharge to a 303(d) listed stream.

Part V – Effluent Limits Determination

Outfall #001 – Main Facility Outfall

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*		*	N	
BOD ₅	MG/L	12		22	15	Y	45/30
TSS	MG/L	12		22	15	Y	45/30
pH	SU	1	****		****	Y	>6.5
TEMPERATURE	°C	2,3,5	*		*	Y	***
AMMONIA AS N (MAY 1 – OCT 31)	MG/L	2,3,5	3.7		1.4	Y	3.7/1.9
AMMONIA AS N (NOV 1 – APR 30)	MG/L	2,3,5	7.5		2.9	Y	7.5/3.7
ESCHERICHIA COLI	**	2, 3		1030	206	Y	***
OIL & GREASE (MG/L)	MG/L	1	15		10	N	
DISSOLVED OXYGEN	MG/L	3, 8	*		*	Y	***
WHOLE EFFLUENT TOXICITY (WET) TEST	% Survival	11	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 E. coli is a geometric mean.
- *** - Parameter not previously established in previous state operating permit.
- ****- pH is not to be averaged and is limited to the range of 6.5-9.0 pH units.

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

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).** To maintain the current loading, the existing permit limits were divided by 2, as explained in the Antidegradation analysis in Appendix B. BOD₅ limits of 15 mg/L monthly average and 22 mg/L weekly average.
- **Total Suspended Solids (TSS).** To maintain the current loading, the existing permit limits were divided by 2, as explained in the Antidegradation analysis in Appendix B. TSS limits of 15 mg/L monthly average and 22 mg/L weekly average.
- **Dissolved Oxygen (DO).** Monitoring requirement only. The Department had concerns with the applicability of some DO model inputs to the Fishing River, therefore, the Department has added DO monitoring at the discharge point and in-stream to verify whether reasonable potential to exceed water quality standards exists.
- **pH.** pH shall be maintained in the range from six and one-half to nine (6.5-9.0) standard units [10 CSR 20-7.015(8)(A)2].
- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.
- **Escherichia coli (E. coli).** Monthly average of 206 per 100 ml as a geometric mean and Weekly Average of 1030 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) 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). POTWs if more than one (1) sample is collected in a calendar week, then the result is to be reported as a geometric mean.
- **Temperature.** Monitoring requirement due to the toxicity of Ammonia varies by temperature.
- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3] default pH 7.8 SU Background total ammonia nitrogen = 0.01 mg/L.

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: April 1 – September 30

Chronic WLA: $C_e = ((3.1 + 0.0)1.5 - (0.0 * 0.01))/3.1$
 $C_e = 1.5 \text{ mg/L}$

Acute WLA: $C_e = ((3.1 + 0.0)12.1 - (0.0 * 0.01))/3.1$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 1.5 \text{ mg/L} (0.780) = \mathbf{1.17 \text{ mg/L}}$

$LTA_a = 12.1 \text{ mg/L} (0.321) = 3.88 \text{ mg/L}$

$MDL = 1.17 \text{ mg/L} (3.11) = 3.6 \text{ mg/L}$

$AML = 1.17 \text{ mg/L} (1.19) = 1.4 \text{ mg/L}$

[CV = 0.6, 99th Percentile, 30 day avg.]

[CV = 0.6, 99th Percentile]

[CV = 0.6, 99th Percentile]

[CV = 0.6, 95th Percentile, n=30]

Winter: October 1 - March 31

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

Acute WLA: $C_e = ((3.1 + 0.0)12.1 - (0.0 * 0.01))/3.1$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 3.1 \text{ mg/L (0.780)} = 2.42 \text{ mg/L}$	[CV = 0.6, 99 th Percentile, 30 day avg.]
$LTA_a = 12.1 \text{ mg/L (0.321)} = 3.88 \text{ mg/L}$	[CV = 0.6, 99 th Percentile]
$MDL = 2.42 \text{ mg/L (3.11)} = 7.5 \text{ mg/L}$	[CV = 0.6, 99 th Percentile]
$AML = 2.42 \text{ mg/L (1.19)} = 2.9 \text{ mg/L}$	[CV = 0.6, 95 th Percentile, n =30]

Season	Maximum Daily Effluent Limit (mg/L)	Average Monthly Effluent Limit (mg/L)
Summer	3.6	1.4
Winter	7.5	2.9

- **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. WET testing conditions were revised in 2010 and all facilities which are required to perform WET testing are being required to conduct multiple dilution tests.

Acute

No less than **ONCE/YEAR:**

Facility is designated as a Major facility or has a design flow ≥ 1.0 MGD.

Acute and/or Chronic Allowable Effluent Concentrations (AECs) for facilities that discharge to unclassified streams are 100%, 50%, 25%, 12.5%, & 6.25%.

- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit.

PART VI: Finding of Affordability

Pursuant to Section 644.145, RSMo., the Department is required to determine whether a permit or decision is affordable and makes a finding of affordability for certain permitting and enforcement decisions. This requirement applies to discharges from combined or separate sanitary sewer systems or publically-owned treatment works.

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

Finding of affordability - 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 department is hereby making a finding based from the following facts:

- 1) The applicant states that the terms and conditions are affordable for the community. OR; This permit action was taken at the discretion of the facility, therefore the department assumes the applicant already determined it is affordable;
- 2) The permit action is taken at the discretion of the system itself (e.g., sewer extension construction permits, or the relocation of an outfall in lieu of otherwise upgrading a system in order to comply with a permit issued prior to July 11, 2011);
- 3) This permit contains no new or expanded terms and conditions;
- 4) The department is not aware of any significant economic impacts this permit would cause on distressed populations;
- 5) No comments indicating such impact were received during the public comment period on the draft permit;
- 6) The department is not aware of any other more cost effective wastewater treatment options that would achieve the required effluent quality;
- 7) The Facility Plan on the construction permit contained an affordability finding;
- 8) The applicant provided increased effluent discharge monitoring costs due to expanded monitoring frequency for certain permit parameters;
- 9) An affordability analysis was performed as part of the Long Term Control Plan on Combined Sewer Overflows;
- 10) An affordability analysis was performed as part of an Antidegradation Review Determination;
- 11) The applicant has entered into a Voluntary Compliance Agreement (VCA) for the purpose of eliminating inflow and infiltration into the plant. The applicant entered into the VCA after due consideration, therefore the department assumes that the applicant has determined it is affordable.
- 12) Others: explain.

Section 644.145 of HB 89 as signed by the Governor on July 11, 2011, requires the Department to make a finding of affordability, with respect to the community and its residents, in connection with the issuance of certain permits under the Missouri Clean Water Law.

The affordability analysis of the requirements for disinfection was evaluated in the operating permit, MO-0048313 renewal issued in November 2011 and in the Overflow Control Plan submitted to the Department, Kansas City conducted a financial analysis that addresses elements of Section 644.145 for the construction and operation of addition of disinfection. The cost associated to constructing and adding ultraviolet disinfection to Fishing River is \$2.2 million. [OCP, 11-4]The Department has reviewed this submittal and hereby finds that the installation of the proposed upgrade is an affordable option and its community to meet the requirements established by the City's Missouri State Operating Permit.

There are no new environmental requirements being added to this operating permit as part of this modification. The City of Kansas City has proposed the modifications to the Fishing River treatment facility to meet existing effluent limitations for ammonia and to improve wet weather capacity.

Part VII – 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.

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 April 12, 2013 to May 13, 2013. The city of Kansas City, Missouri submitted a comment on May 10, 2013 requesting that wording within the Fishing River WWTF Fact Sheet be revised to be consistent with current legal interpretation concerning blending. The Fishing River WWTF operating permit fact sheet was revised accordingly.

FACT SHEET
MO-0048313
KC, FISHING RIVER WWTF
PAGE 12

DATE OF FACT SHEET: MAY 10, 2013

COMPLETED BY:

SCOTT F. HONIG, ENVIRONMENTAL ENGINEER III
KANSAS CITY REGIONAL OFFICE
SCOTT.HONIG@DNR.MO.GOV

Part VII – Appendices

APPENDIX A - CLASSIFICATION WORKSHEET:

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
Maximum Population Equivalent (P.E.) served (Max 10 pts.)	1 pt./10,000 PE or major fraction thereof.	2
Maximum: 10 pt Design Flow (avg. day) or peak month; use greater (Max 10 pts.)	1 pt. / MGD or major fraction thereof.	2
EFFLUENT DISCHARGE RECEIVING WATER SENSITIVITY:		
Missouri or Mississippi River	0	
All other stream discharges except to losing streams and stream reaches supporting whole body contact	1	1
Discharge to lake or reservoir outside of designated whole body contact recreational area	2	
Discharge to losing stream, or stream, lake or reservoir area supporting whole body contact recreation	3	
PRELIMINARY TREATMENT – Headworks		
Screening and/or comminution	3	3
Grit removal	3	3
Plant pumping of main flow (lift station at the headworks)	3	3
PRIMARY TREATMENT		
Primary clarifiers	5	
Combined sedimentation/digestion	5	
Chemical addition (except chlorine, enzymes)	4	
REQUIRED LABORATORY CONTROL – performed by plant personnel (highest level only)		
Lab work conducted outside of 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	
More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	7	7
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10	
ALTERNATIVE FATE OF EFFLUENT		
Direct reuse or recycle of effluent	6	
Land Disposal – low rate	3	
High rate	5	
Overland flow	4	
Total from page ONE (1)	----	21

APPENDIX A - CLASSIFICATION WORKSHEET (CONTINUED):

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
VARIATION IN RAW WASTE (highest level only) (DMR exceedances and Design Flow exceedances)		
Variation do not exceed those normally or typically expected	0	
Recurring deviations or excessive variations of 100 to 200 % in strength and/or flow	2	2
Recurring deviations or excessive variations of more than 200 % in strength and/or flow	4	
Raw wastes subject to toxic waste discharge	6	
SECONDARY TREATMENT		
Trickling filter and other fixed film media with secondary clarifiers	10	
Activated sludge with secondary clarifiers (including extended aeration and oxidation ditches)	15	15
Stabilization ponds without aeration	5	
Aerated lagoon	8	
Advanced Waste Treatment Polishing Pond	2	
Chemical/physical – without secondary	15	
Chemical/physical – following secondary	10	
Biological or chemical/biological	12	
Carbon regeneration	4	
DISINFECTION		
Chlorination or comparable	5	
Dechlorination	2	
On-site generation of disinfectant (except UV light)	5	
UV light	4	4
SOLIDS HANDLING - SLUDGE		
Solids Handling Thickening	5	
Anaerobic digestion	10	
Aerobic digestion	6	6
Evaporative sludge drying	2	
Mechanical dewatering	8	
Solids reduction (incineration, wet oxidation)	12	
Land application	6	
Total from page TWO (2)	----	27
Total from page ONE (1)	---	21
Grand Total	---	48

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

KC Fishing River WWTF, MO0048313
Clay County



Jeremiah W. (Jay) Nixon, Governor

Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

dnr.mo.gov

MAR - 2 2011

Mr. Terry Leeds, Acting Water Services Director
4800 E 63 Street
Kansas City, MO 64130

**RE: Water Quality and Antidegradation Review Preliminary Determination for The
Kansas City Fishing River WWTF**

Dear Mr. Leeds:

In accordance with the *Missouri Antidegradation Rule and Implementation Procedure (AIP)*, your proposed discharge is subject to an Antidegradation Review. The enclosed *Water Quality and Antidegradation Review (WQAR)* summarizes this preliminary determination based upon your *Water Quality and Antidegradation Review for the KC Fishing River Wastewater Treatment Plant* Report dated September 2010, that proposed expansion of existing wastewater treatment facility from 1.0 MGD to 2.0 MGD.

The WQAR contains pertinent antidegradation review information based on the use of existing water quality, effluent limitations and monitoring requirements for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Rule and Implementation Procedure (AIP)* dated May 7, 2008, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions of the Water Quality and Antidegradation Review* section of the enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resources (Department) initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

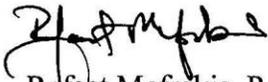
You may proceed with submittal of an application for an operating permit and antidegradation review public notice, an engineering report, or a complete application for a construction permit to the Department's Kansas City Region Office or to the Financial Assistance Center for projects that are seeking funding assistance from the Department of Natural Resources. These submittals must reflect the design flow, facility description, and general treatment components of this WQAR or this preliminary determination may have to be revisited.

Following the Department's public notice of draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination, the department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are received or comments are resolved without another public notice, these findings and determinations will be considered final. Following issuance of the construction permit and completion of the actual facility construction, the Department will proceed with the issuance of the operating permit.

If you should have questions, please feel free to contact Jalal El-Jayyousi by telephone at (573) 751-6982, by e-mail at jalal.el-jayyousi@dnr.mo.gov, or by mail at P.O. Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

WATER PROTECTION PROGRAM



Refaat Mefrakis, P.E., Chief
NPDES Permits and Engineering Section

Enclosures

RM:jen

c: Mr. Jeffrey Keller, Burns & McDonnell
Mr. Tom Wallace, Geosyntec
Kansas City Regional Office

**Missouri Department of Natural Resources
Water Protection Program
Water Pollution Control Branch
NPDES Permits and Engineering Section**

Draft Water Quality and Antidegradation Review

*For the Protection of Water Quality
And Determination of Effluent Limits for Discharge to
Fishing River*



February, 2010

Kansas City Fishing River Wastewater Treatment Plant

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Facility Information

FACILITY NAME: Kansas City Fishing River Wastewater Treatment Plant (WWTP) NPDES #: MO-0048313

FACILITY TYPE/DESCRIPTION: As a result of the submitted alternative analysis, the applicant's preferred alternative is to upgrade the current "extended aeration / two cell polishing lagoons" to conventional activated sludge. The project will involve the addition of pump station, headworks, aeration basins, clarifiers, and ultraviolet disinfection. The existing polishing lagoons will be converted to wet weather flow storage. Due to the upgrade, the outfall will be relocated. Currently, the facility is discharging to an unnamed tributary to the Fishing River. The new outfall will be located on the Fishing River, less than 0.5 mile upgradient of the confluence with the unnamed tributary. Design flow will be expanded from 1.0 MGD to 2.0 MGD.

EDU*:	Central Plains/ Blackwater/Lamine	ECOREGION:	Plains
COUNTY:	Clay	LEGAL DESCRIPTION:	SE¼, NE¼, NW¼, Sec 24, T52N, R32W
8-DIGIT HUC:	10300101	UTM COORDINATES:	X=375261; Y= 4351831

* - Ecological Drainage Unit

1. WATER QUALITY INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (MDNR) developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review which documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, a facility is required to use *Missouri's Antidegradation Rule and Implementation Procedure (AIP)* for new and expanded wastewater discharges.

1.1. WATER QUALITY HISTORY:

During the current permit cycle, Ammonia limits were exceeded 5 times; in May, June, July of 2009, and March, April of 2010.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	3.1	Secondary	Fishing River	0.0

3. RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Fishing River	C	394	0.0	0.0	0.1	LWW, AQL, WBC(B)

** 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)

RECEIVING WATER BODY SEGMENT #1: Fishing River

Upper end segment* UTM coordinates: X= 375261.06 / Y= 4351831.27 (Outfall)

Lower end segment* UTM coordinates: X= 377324.30 / Y= 4353544.64 (Confluence with Brushy Cr.)

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

4. GENERAL COMMENTS

Geosyntec Consultants prepared, on behalf of Kansas City Water Services Department (WSD), the *KC Fishing River Wastewater Treatment Plant Water Quality and Antidegradation Review* dated September, 2010. The city is planning to upgrade and expand its wastewater treatment facility. With the exception of Ammonia, the current loadings will be maintained or reduced for pollutants of concern (POC). In the absence of existing water quality data, the applicant elected to assume that Ammonia is significantly degrading the receiving stream while determining that the rest of POCs are minimally degrading. As a result, an alternative analysis was conducted for Ammonia to fulfill the requirements of the AIP. Conventional Activated Sludge was selected as the preferred alternative.

Dissolved oxygen (DO) modeling (Appendix C) analysis was submitted for review. Although the analysis results did not show negative impacts to water quality standards, some concerns were raised during the review regarding the applicability of some model inputs to the Fishing River. Therefore, staff recommends that in-stream monitoring be required in the facility's operating permit to confirm protection of water quality standards.

A Geohydrological Evaluation conducted for the facility concluded that the receiving stream is gaining. A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant. The review did not find any endangered species in the vicinity of the discharge. Information that was provided by the applicant in the submitted report and summary forms in Appendix D was used to develop this review document.

5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *KC Fishing River Wastewater Treatment Plant Water Quality and Antidegradation Review* dated September, 2010.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix D: Tier Determination and Effluent Limit Summary). Pollutants of concern are defined as those pollutants "proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge." (AIP, Page 7). Tier 2 was assumed for all POCs (see Appendix D).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
BOD5/DO	2	Minimal	
Total Suspended Solids (TSS)	**	Minimal	
Ammonia	2	Significant	
pH	***	Minimal	Permit limits applied
Oil and Grease			Permit limits applied
Escherichia coli (E. coli)	2	Minimal	Disinfection required

* Tier assumed. Tier determination not possible: ** No in-stream standards for these parameters. *** Standards for these parameters are ranges

The following Antidegradation Review Summary attachments in Appendix D were used by the applicant:

Tier Determination and Effluent Summary

For pollutants of concern, the attachments are:

Attachment A, Tier 2 with significant degradation.

Attachment B, Tier 2 with minimal degradation.

5.2. EXISTING WATER QUALITY

No existing water quality data was submitted. All POCs were considered to be Tier 2.

5.3. ALTERNATIVE ANALYSIS

Missouri's AIP specify that if the proposed activity does result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. To satisfy AIP requirements, five alternatives were evaluated for ammonia treatment including a base case, two non-degrading and two less degrading alternatives:

- Base Case - Conventional activated sludge was selected as the base case technology capable of achieving the proposed ammonia water quality based effluent limits of 1.4 mg/L and 2.9 mg/L for summer and winter, respectively. The activated sludge process is well-established and widely used. Further, the Kansas City WSD has many existing facilities that use similar processes, making this option very practical from an operations and maintenance basis.
- Lagoon with Land Application: Under this no discharge alternative, wastewater is treated in a lagoon system prior to land application. It is estimated that a total of 240 acres would be needed; 140 acres for land application based on maximum allowable nutrient load, in addition to 100 acres for storage when weather makes it impossible to irrigate. This option was considered impracticable as adjacent land does not appear to be appropriate for land application due to its use as residential development. Significant siting hurdles are anticipated if this alternative is to be pursued.
- Pump to Adjacent Drainage Basin: This alternative involves pumping the flow currently reaching the facility to the nearest sanitary sewer system. As a result, the wastewater would be treated at the Kansas City Rocky Branch Plant. The increased flow would require an upgrade to the collection system and Rocky Branch Plant, as well as a plant expansion triggering the need for a new Antidegradation Review. Therefore, this alternative was considered impracticable.
- Membrane Bioreactor (MBR) with Total Ammonia Removal: This is a less degrading alternative capable of achieving effluent ammonia levels less than 1.0 mg/L and 2.0 mg/L for summer and winter, respectively. This is an activated sludge process with a membrane solids separation phase to improve effluent quality. It requires more mechanical equipment, aeration power, and maintenance. Nonetheless, this option is considered practicable.
- Integrated Fixed Film / Activated Sludge (IFAS) Reactor: This is a less degrading alternative capable of achieving effluent ammonia levels less than 1.0 mg/L and 2.0 mg/L for summer and winter, respectively. It combines activated sludge treatment with the incorporation of static and suspended media, allowing a larger amount of biomass and longer residence time. Although this alternative is generally considered practicable, it introduces additional operational complexities (relative to conventional activated sludge) due to the simultaneous presence of suspended and attached growth biology. Further, it is more energy intensive.

Present worth analysis was conducted to evaluate the economic efficiency of alternatives. Table 2 presents the results of the analysis and a comparison of practicability and projected ammonia treatment level. According to the AIP, alternatives that have a present worth cost greater than 120% of the base case cost are generally considered not to be economically efficient. Based on this evaluation, the base case was selected as the preferred alternative. Conventional activated sludge is the most economically efficient alternative capable of achieving water quality standards.

The non-degrading alternatives are not economically efficient and do not appear to be practicable. The less degrading alternatives require significantly more capital and operating expenditures. Further, although they are generally considered practicable, they pose operational risk. WSD operators constantly move from one facility to another. As a result, there is a concern that operation and maintenance would be inconsistent due to the unfamiliarity of the operators with the new technologies.

TABLE 2: COMPARISON OF ALTERNATIVES

	ACTIVATED SLUDGE	LAND APPLICATION	PUMP TO ADJACENT SYSTEM	MBR	IFAS
AMMONIA (MG/L)					
SUMMER	<1.4	NA	NA	<1.0	<1.0
WINTER	<2.9			<2.0	<2.0
PRACTICABLE	YES	NO	NO	YES	YES
CAPITAL COST (\$1000)	13,900	19,600	20,900	21,700	20,500
ANNUAL COST (\$1000)	730	830	1,090	1,180	1,180
PRESENT WORTH* (\$1000)	21,100	27,700	31,600	33,300	32,100
PERCENT OF BASE CASE (%)	100	131	150	158	152

NA= not applicable

*20 year design life, with 8.0% interest

5.4. SOCIAL AND ECONOMIC IMPORTANCE

The existing KC Fishing River WWTP is running at capacity under average day conditions and exceeds the rated capacity during peak flows associated with wet weather. Furthermore, the facility is experiencing difficulties in meeting the new ammonia effluent limits as highlighted in section 2.1. Therefore, the upgrade/expansion is needed to protect water quality standards and to accommodate current wastewater demand for the service area, in addition to supporting projected growth.

The facility is located in unincorporated Clay County, Missouri and serves an area of 15 square miles the majority of which extends outside the city limits. During the last ten years, the population of Clay County grew by 24.1%, far exceeding the general population growth in the State of Missouri (7%).

It is anticipated that Kansas City and Clay County will be impacted favorably by the project by allowing for additional growth in the Fishing River watershed. The additional growth should increase the tax base for the city, the county, and surrounding communities. Further, a new high school to serve students from Liberty, Clay County, and parts of Kansas City was recently constructed and will be discharging to the Fishing River facility.

6. GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDegradation REVIEW

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.

7. MIXING CONSIDERATIONS

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

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

8. PERMIT LIMITS AND MONITORING INFORMATION

WASTELOAD ALLOCATION
 STUDY CONDUCTED (Y OR N): N

USE ATTAINABILITY
 ANALYSIS CONDUCTED (Y OR N): Y*

WHOLE BODY CONTACT
 USE RETAINED (Y OR N): Y

- Use Attainability Analysis was conducted in March, 2005.

OUTFALL #001

WET TEST (Y OR N): Y FREQUENCY: ONCE/YEAR AEC: 100% METHOD: MULTIPLE

TABLE 3. EFFLUENT LIMITS

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 2)	MONITORING FREQUENCY
FLOW	MGD	*		*	N/A	ONCE/DAY
BOD ₅ ***	(MG/L)		22	15	NDEL	ONCE/WEEK
TSS	(MG/L)		22	15	NDEL	ONCE/WEEK
PH	SU	6.5 – 9.0		6.5 – 9.0	FSR	ONCE/WEEK
TEMPERATURE	°C	*		*	N/A	ONCE/WEEK
OIL & GREASE	(MG/L)	15		10	FSR	ONCE/WEEK
ESCHERICHIA COLIFORM (E. COLI)	NOTE 1		1030**	206**	FSR	ONCE/WEEK
AMMONIA AS N (APR 1 – SEPT 30)	(MG/L)	3.6		1.4	WQBEL	ONCE/WEEK
AMMONIA AS N (OCT 1 – MAR 30)	(MG/L)	7.5		2.9	WQBEL	ONCE/WEEK

NOTE 1 – COLONIES/100 ML

NOTE 2-- WATER QUALITY-BASED EFFLUENT LIMITATION --WQBEL; OR MINIMALLY DEGRADING EFFLUENT LIMIT--MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT-PEL; TECHNOLOGY-BASED EFFLUENT LIMIT-TBEL; OR NO DEGRADATION EFFLUENT LIMIT--NDEL; OR FSR --FEDERAL/STATE REGULATION; OR N/A--NOT APPLICABLE. ALSO, PLEASE SEE THE **GENERAL ASSUMPTIONS OF THE WQAR #4 & #5.**

* - Monitoring requirements only.

** - The Weekly and Monthly Average for E. coli shall be reported as a Geometric Mean.

***This facility is required to meet a removal efficiency of 85% or more for BOD₅ and TSS. Influent BOD₅ and TSS data should be reported to ensure removal efficiency requirements are met.

9. RECEIVING WATER MONITORING REQUIREMENTS

In-stream monitoring is recommended to document that the water quality standard for DO is being met. Department staff recommends the following conditions for in-stream monitoring:

- Parameter: Dissolved Oxygen
- Frequency: monthly
- Sample type: Grab sample
- Sampling time: Early morning before sunrise, during low flow conditions.
- Location: Route A Bridge.

Route A Bridge is in the proximity of the "sag point" for the dissolved oxygen model. This is the point where minimum dissolved oxygen concentration is expected to occur. If the monitoring location is determined to be unsafe or uncharacteristic of water quality conditions in Fishing River due to channelization at the bridge site, the Department will consider relocating the monitoring location if sufficient justification is provided by the City.

In-stream monitoring will require an approved quality assurance project plan. In addition, special requirements and conditions may be specified in the operating permit.

10. DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations and limits were calculated using two methods:

1) Water quality-based – Using water quality criteria 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
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = 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).

2) No degradation-based – To ensure that in-stream pollutant concentrations do not increase (no degradation) following the expansion, new effluent limits for BOD and TSS were calculated such that the pollutant mass loadings are maintained or reduced. Final effluent limits in the current operating permit were used to calculate the loadings. Since the design flow will be doubled (1.0 MGD to 2.0 MGD), "no degradation" effluent limits were calculated by dividing the existing limits by 2.

Note: Significantly-degrading effluent limits have been based on the authority included in Section III. Permit Consideration of the AIP. Also under 40 CFR 133.105, permitting authorities shall require more stringent limitations than equivalent to secondary treatment limitations for 1) existing facilities if the permitting authority determines that the 30-day average and 7-day average BOD₅ and SS effluent values that could be achievable through proper operation and maintenance of the treatment works, and 2) new facilities if the permitting authority determines that the 30-day average and 7-day average BOD₅ and SS effluent values that could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process.

10.1. OUTFALL #001 – MAIN FACILITY OUTFALL

10.2. LIMIT DERIVATION

- **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).** To maintain the current loading, the existing permit limits were divided by 2, as explained above under method No. 2. BOD₅ limits of 15 mg/L monthly average and 22 mg/L weekly average were proposed.

To protect beneficial uses within the Fishing River, the consultant used Streeter-Phelps Model to simulate DO concentrations downstream of the discharge. Water quality for summer and wintertime conditions was simulated for three successive stream reaches. Model output from each reach was used as input into subsequent reaches. Hydrogeometry and transport parameters were based on results of a time of travel study. Streeter Phelps modeling simulated using the proposed design flow indicated that DO will not drop below the 5 mg/L water quality standard. DO analysis results are included in Appendix C.

Although the results of the model did not show negative impacts to water quality standards and beneficial uses, some concerns were raised during the review regarding the applicability of some model inputs to the Fishing River. Therefore, staff recommends that in-stream monitoring be required in the facility's operating permit to confirm protection of water quality standards.

Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Dissolved Oxygen (DO).** The effluent will be post-aerated to ensure a minimum DO level of 5.0 mg/L (as assumed in the DO model inputs).

- **Total Suspended Solids (TSS).** To maintain the current loading, the existing permit limits were divided by 2, as explained above under method No. 2. TSS limits of 15 mg/L monthly average and 22 mg/L average weekly were proposed.

Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **pH.** pH shall be maintained in the range from six and one-half to nine (6.5– 9) standard units [10 CSR 20-7.015(8)(A)2.].
- **Temperature.** Monitoring requirement only. Temperature affects the toxicity of Ammonia.
- **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

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: April 1 – September 30, Winter: October 1 – March 31.

Summer

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

Chronic WLA: $C_e = ((0.2 + 0.0)1.5 - (0.0 * 0.01)) / 0.2$
 $C_e = 1.5 \text{ mg/L}$

Acute WLA: $C_e = ((0.2 + 0.0)12.1 - (0.0 * 0.01)) / 0.2$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 1.5 \text{ mg/L (0.780)} = 1.17 \text{ mg/L}$ [CV = 0.6, 99th Percentile, 30 day avg.]
 $LTA_a = 12.1 \text{ mg/L (0.321)} = 3.88 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

MDL = 1.17 mg/L (3.11) = 3.6 mg/L [CV = 0.6, 99th Percentile]
 AML = 1.17 mg/L (1.19) = 1.4 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter

Chronic WLA: $C_e = ((0.2 + 0.0)3.1 - (0.0 * 0.01)) / 0.2$
 $C_e = 3.1 \text{ mg/L}$

Acute WLA: $C_e = ((0.2 + 0.0)12.1 - (0.0025 * 0.01)) / 0.2$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 3.1 \text{ mg/L (0.780)} = 2.42 \text{ mg/L}$ [CV = 0.6, 99th Percentile, 30 day avg.]
 $LTA_a = 12.1 \text{ mg/L (0.321)} = 3.88 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

MDL = 2.42 mg/L (3.11) = 7.5 mg/L [CV = 0.6, 99th Percentile]
 AML = 2.42 mg/L (1.19) = 2.9 mg/L [CV = 0.6, 95th Percentile, n = 30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	3.6	1.4
Winter	7.5	2.9

- **E. coli.** Effluent limitations for WBCR(B) are 206 colonies per 100 ml monthly average and 1030 colonies per 100 ml weekly average [10 CSR 20-7.015 (8)(A)4.] and [10 CSR 20-7.031(4)(C), Table A]. At a minimum, weekly monitoring is required during the recreational season (April 1 – October 31) with compliance to be determined by calculating the geometric mean of all samples collected during the reporting period (samples collected during the calendar week for the weekly average, and samples collected during the calendar month for the monthly average). The weekly average requirement is consistent with EPA federal regulation 40 CFR 122.45(d). Further, the limit may change depending on the outcome of future state effluent regulation revision. Please see **GENERAL ASSUMPTIONS OF THE WQAR #7.**
- **Oil & Grease.** Conventional pollutant, [10 CSR 20-7.031, Table A]. Effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

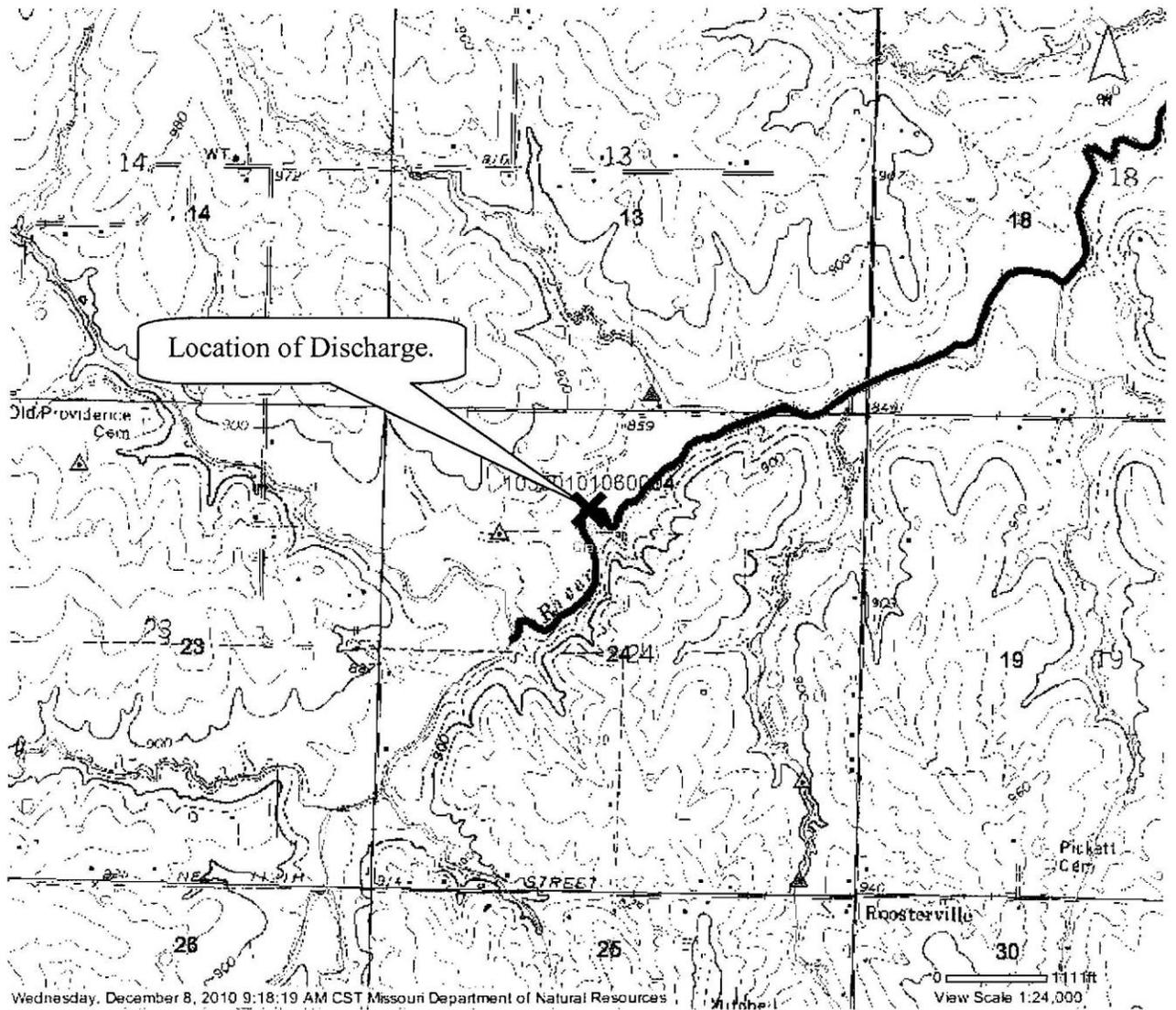
11. ANTIDegradation REVIEW PRELIMINARY DETERMINATION

The proposed Kansas City Fishing River WWTP expansion to 2.0 MGD will result in significant degradation, with respect to Ammonia Nitrogen, of the segment identified in Fishing River. Conventional Activated Sludge was identified as the base case alternative capable of achieving effluent limitations. The cost effectiveness and practicability of non-degrading and less degrading alternatives were evaluated. The base case was concluded to be the most economically efficient alternative capable of achieving water quality standards. Therefore, Conventional Activated Sludge is the preferred alternative.

Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. MDNR has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

Reviewer: Jalal El-Jayyousi *J.J.*
Date: February 2010
Unit Chief: John Rustige, P.E.

Appendix A: Map of Discharge Location



Appendix B: Natural Heritage Review



Missouri Department of Conservation Heritage Review Report

April 6, 2010 -- Page 1 of 1

Policy Coordination Unit
P. O. Box 180
Jefferson City, MO 65102
Prepared by: Shannon Cave
shannon.cave@mdc.mo.gov
573-522-4115/3250

John Christiansen
Geosyntec Consultants
1123 Wilkes Blvd., Suite 400
Columbia, Missouri 65201
www.geosyntec.com

Project type:	Wastewater treatment plant expansion
Location/Scope:	Section 13 of T52N R32W
County:	Clay
Query reference:	Fishing River Wastewater Treatment Plant
Query received:	March 31, 2010

Authenticity may be confirmed by Policy Coordination Unit, Missouri Department of Conservation, 573-522-4115.

This NATURAL HERITAGE REVIEW is not a site clearance letter. Rather, it identifies public lands and sensitive resources known to have been located close to and/or potentially affected by the proposed project. On-site verification is the responsibility of the project. Heritage records were identified at some date and location. This report considers records near but not necessarily at the project site. Animals move and, over time, so do plant communities. To say "there is a record" does not mean the species/habitat is still there. To say that "there is no record" does not mean a protected species will not be encountered. These records only provide one reference and other information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Look for additional information about the biological and habitat needs of records listed in order to avoid or minimize impacts. More information may be found at www.mdc.mo.gov/nathis/endangered/ and mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx. Contact information for the department's Natural History Biologist is online at <http://www.mdc.mo.gov/nathis/contacts/>.

Level 3 issues and Level 2 issues: Records of federal-listed or state-listed species or critical habitats near the project site:

Heritage records identify no wildlife preserves, no designated wilderness areas or critical habitats, no state or federal endangered-list species records within one mile of the site, or in the public land survey section listed above or sections adjacent, or within five miles downstream on the Fishing River.

The project should be managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any "Clean Water Permit" conditions. Revegetate areas in which the natural cover is disturbed to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Pollutants, including sediment, can have significant impacts far downstream. Use silt fences and/or vegetative filter strips to buffer streams and drainages, and monitor those after rain events and until a well-rooted ground cover is reestablished.

FEDERAL LIST species/habitats are protected under the Federal Endangered Species Act. Consult with the U.S. Fish and Wildlife Service (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; 573-234-2132).

General recommendations related to this project or site, or based on information about the historic range of species (unrelated to any specific heritage records):

- Streams in the area should be protected from soil erosion, water pollution and in-stream activities that modify or diminish aquatic habitats. Best management recommendations relating to streams and rivers may be found at <http://mdc.mo.gov/79>.
- Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment, so inspect and clean equipment thoroughly before moving between project sites.

These recommendations are ones project managers might prudently consider based on a general understanding of species needs and landscape conditions. Heritage records largely reflect only sites visited by specialists in the last 30 years. This means that many privately owned tracts could host remnants of species once but no longer common.

Pre-screen heritage data requests at <http://tinyurl.com/heritagereview>. A "Level 1 response" makes further submission to MDC or USFWS unnecessary.

Appendix C: Streeter Phelps Model Results Proposed Design Flow



A2. Streeter-Phelps Model Setup

Department guidance requires that applicants submit a dissolved oxygen (DO) analysis for new or expanded treatment facilities using an approved model such as Streeter-Phelps or QUAL2K/QUAL2E². Based on Department guidance, Geosyntec utilized the following Streeter-Phelps model in a spreadsheet to determine the 5-day biochemical oxygen demand (BOD₅) wasteload allocation:

$$[D_t] = D_0 e^{-k_a t} + \left(\frac{k_d L_0}{k_a - k_d} \right) (e^{-k_d t} - e^{-k_a t}) + \left(\frac{k_n N_0}{k_a - k_n} \right) (e^{-k_n t} - e^{-k_a t})$$

where:

- k_a = reaeration coefficient, 1/day
- k_d = carbonaceous BOD (CBOD) decay coefficient, 1/day
- k_n = nitrogenous BOD (NBOD) decay coefficient, 1/day
- L_0 = initial CBOD (at time = 0), mg/L
- N_0 = initial NBOD (at time = 0), mg/L
- D_0 = initial dissolved oxygen deficit (at time = 0), mg/L
- D_t = dissolved oxygen deficit (at time = t), mg/L

This model simulates steady-state dissolved oxygen concentrations along a single reach receiving stream having average hydraulic characteristics input by the user.

Geosyntec simulated water quality for summer and wintertime conditions (i.e., temperature = 26°C and 6°C, respectively) in four separate model reaches (**Figure A1**). Model output from each reach was used as input into subsequent reaches (e.g., model reach output from reach 1 was used as model input for reach 2). Hydrogeometry and transport parameters were based on results of the time of travel study (**Table A3**).

TABLE A3. Reach average velocities and depths at design average flow for Peruque Creek.

Reach	Distance (ft)	Flow (cfs)	Slope (ft/ft)	Reach Average Velocity at DAF (fps)	Reach Average Depth at DAF (ft)
1	3,543	3.1	0.003	0.15	0.68
2	2,937	3.1	0.003	0.08	0.93
3	4,496	3.1	0.003	0.18	0.66

Notes: Time of travel reach distances may differ from model reach distances due to locations of slug injection and placement of recovery sondes. Flows from tributaries and the upstream flow were assumed to be zero during critical conditions; therefore, flow is equal to design average flow (DAF).

Key model inputs and assumptions are described below.

0.0025 for all (avg. of 0.002 - 0.003)

² MDNR memorandum dated December 30, 2009. DO Modeling & BOD Effluent Limit Development Administrative Guidance for the Purpose of Conducting Water Quality Assistance Reviews.
 KC Fishing River WQAR | City of Kansas City | September 8, 2010

CBOD₅

The reach 1 5-day carbonaceous biochemical oxygen demand (CBOD₅) is a user defined value. CBOD₅ was set equal to a value such that DO did not drop below 5 mg/L in Fishing River. Subsequent reach values were determined from prior reach model output.

NBOD

Approximately 4.57 grams of oxygen are required to satisfy the oxygen demand of 1 gram of oxidizable nitrogen. Therefore, the NBOD was estimated by multiplying the ammonia wasteload allocation (WLA) by 4.57.

NH₃N

The reach 1 ammonia (NH₃N) value is a user defined value. The reach 1 ammonia value was set equal to the ammonia criterion of 1.5 and 3.1 mg/L for the summer and wintertime model simulations, respectively. Subsequent reach values were determined from prior reach model output.

Temperature

A temperature of 26°C and 6°C was assumed for both reaches to represent summer and wintertime conditions, respectively.

Temperature Correction Factors

The following temperature correction factors were used:

- Reaeration – 1.024
- CBOD decay – 1.047
- NBOD decay – 1.08

CBODU:CBOD₅

The CBODU to CBOD₅ ratio was assumed equal to 2.0.

CBOD Oxidation

The CBOD oxidation rate was calculated based on the Hydrosience (1971)³ equation. The following CBOD oxidation were modeled for reaches 1, 2, and 3: 0.87, 0.76 and 0.89, respectively.

NBOD Oxidation

The nitrogenous BOD (NBOD) oxidation rate was set equal to the MDNR default ammonia decay rate (i.e., 0.3 day⁻¹).

Reaeration Rate

The Krenkel and Orlob (1962)⁴ predictive formula was selected for calculating reach average reaeration rates based on results from a diurnal oxygen curve analysis approach (Delta Method) described by

³ Hydrosience, Inc. 1971. Simplified Mathematical Modeling of Water Quality, prepared for the Mitre Corporation and the USEPA, Water Programs, Washington, D.C., March 1971.

⁴ Krenkel, P.A. and Orlob, G.T. 1962. Turbulent diffusion and the reaeration coefficient. *J. Sanit. Engng Div. ASCE*. 88(SA2), 53-83.

McBride⁵ and Chapra and Di Toro⁶. The following reaeration rates were calculated for reaches 1, 2, and 3: 12.5, 7.9 and 13.7 day⁻¹, respectively.

A3. Streeter-Phelps Model Results

The Streeter-Phelps water quality model indicates that a summer and winter CBOD₅ WLA of 17 mg/L and 61 mg/L, respectively, are protective of water quality standards. Additionally, the summer and winter ammonia WLAs are 1.5 and 3.1 mg/L, respectively (Table A4 and Figures A2 and A3). Complete model output is included in table format in Table A5.

TABLE A4. Water quality model results for the proposed Wright City South WWTP.

Season	Parameter	Units	Wasteload Allocation
Summer	CBOD ₅	mg/L	17
Winter	CBOD ₅	mg/L	61
Summer	NH ₃ N	mg/L	1.5
Winter	NH ₃ N	mg/L	3.1

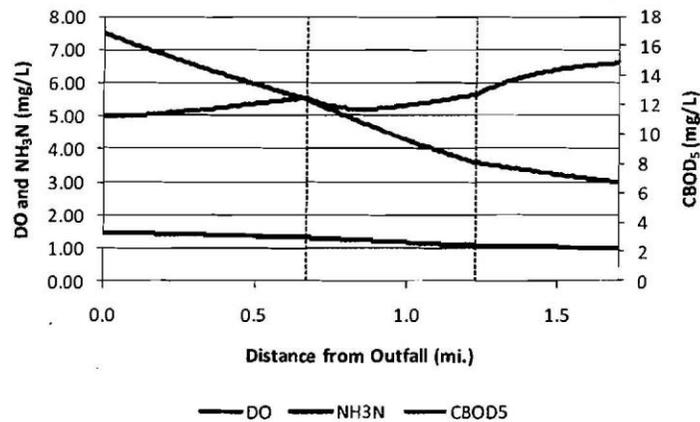


FIGURE A2. Summer Water Quality Model Output for the KC Fishing River WWTP. Dashed lines denote reach boundaries.

⁵ McBride, G.B., 2002 "Calculating Stream Reaeration Coefficients from Oxygen Profiles", *Journal of Environmental Engineering*, April 2002, 384-386.

⁶ Chapra, S.C. and Di Toro, D.M., 1991 "Delta Method for Estimating Primary Production, Respiration, and Reaeration in Streams", *Journal of Environmental Engineering*, 117(5), 640-655.

Geosyntec[®]
consultants

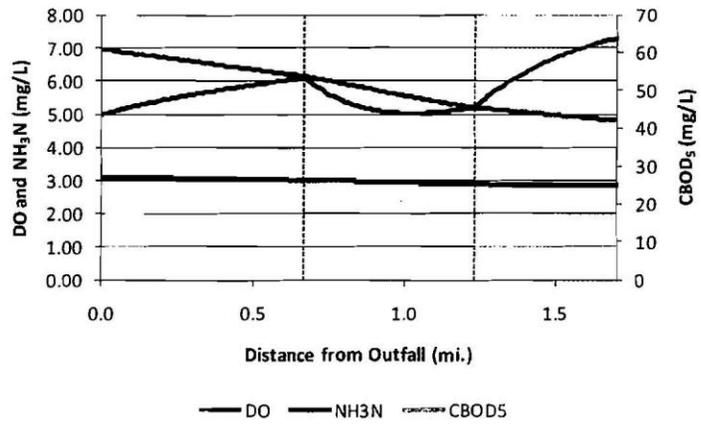
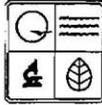


FIGURE A3. Winter Water Quality Model Output for the Fishing River WWTP. Dashed lines denote reach boundaries.

Appendix D: Antidegradation Review Summary Attachments

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 SEP 24 2010
 WATER PROTECTION PROGRAM



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
WATER QUALITY REVIEW ASSISTANCE/ANTIDEGRADATION REVIEW REQUEST
 PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

TYPE OF PROJECT <input type="checkbox"/> Grant <input type="checkbox"/> SRF Loan <input checked="" type="checkbox"/> All Other Projects			
REQUESTER CITY OF KANSAS CITY, MISSOURI		TELEPHONE NUMBER WITH AREA CODE (816) 513-0382	
PERMITTEE SAME		TELEPHONE NUMBER WITH AREA CODE SAME	
REASON FOR REQUEST			
<input type="checkbox"/> New Discharge (See Instruction #9) <input type="checkbox"/> Upgrade (No expansion) (See AIP) <input checked="" type="checkbox"/> Expansion			
DESCRIPTION OF PROPOSED ACTIVITY: Addition of influent pump station, headworks, aeration basins, clarifiers, and ultraviolet disinfection. Convert existing aeration basin and clarifier to aerated sludge holding and convert existing polishing lagoons to wet weather flow storage.			
FACILITY INFORMATION			
FACILITY NAME KC, FISHING RIVER WASTEWATER TREATMENT PLANT		MSOP NUMBER (IF APPLICABLE) MO-0048313	
COUNTY CLAY		SIC / NAICS CODE 4952	
METHOD OF BACTERIA COMPLIANCE <input type="checkbox"/> Chlorine Disinfection <input checked="" type="checkbox"/> Ultraviolet Disinfection <input type="checkbox"/> Ozone <input type="checkbox"/> Not Applicable			
WATER QUALITY ISSUES			
Water quality issues include: effluent limit compliance issues, notice (s) of violation, water body beneficial uses not attained or supported, etc.			
OUTFALL	LOCATION (LAT/LONG OR LEGAL DESCRIPTION)	MAPPED ¹ (CHECK)	RECEIVING WATER BODY ²
1	SECTION 24, T52N, R32W	<input checked="" type="checkbox"/>	FISHING RIVER (WBID 0394)
		<input type="checkbox"/>	
		<input type="checkbox"/>	
¹ Attach topographic map (See www.dnr.mo.gov/internetmapviewer/) with outfall location(s) clearly marked. For additional outfalls, attach a separate form.			
² See general instructions for discharges to streams.			
OUTFALL	NEW DESIGN FLOW ** (MGD)	TREATMENT TYPE	EFFLUENT TYPES*
1	2.0	CONVENTIONAL ACTIVATED SLUDGE	DOMESTIC
* Describe predominating character of effluent. Example: domestic wastewater, municipal wastewater, industrial wastewater, storm water, mining leachate, etc.			
** If expansion, indicate new design flow.			
<input checked="" type="checkbox"/> Checked for rare or endangered species and provided determination with this request. See Instruction #8.			
ANTIDEGRADATION REVIEW SUBMISSION:			
See attached Antidegradation instructions. Applicant supplied a summary within:			
<input checked="" type="checkbox"/> Tier Determination and Effluent Limit Summary			
<input checked="" type="checkbox"/> Attachment A – Significant Degradation			
<input checked="" type="checkbox"/> Attachment B – Minimal Degradation			
<input type="checkbox"/> Attachment C – Temporary degradation			
<input type="checkbox"/> Attachment D – Tier 1 Review			
<input type="checkbox"/> No Degradation Evaluation – Conclusion of Antidegradation Review			

MO 780-1893 (03-09)

See general instructions. Additional information may be needed to complete your request. Your request may be returned if items are missing. Revised submittal will be considered a new submittal.

SIGNATURE	<i>Terry Leeds</i>	DATE	9/17/10
PRINT NAME	Terry Leeds		
E-MAIL ADDRESS	Terry_Leeds@kcme.org		

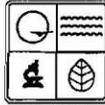
Submit request to: Missouri Department of Natural Resources
 Water Protection Program
 Attn: Permits and Engineering Section
 P.O. Box 176
 Jefferson City, MO 65102-0176
 Phone: 573-751-1300
 Fax: 573-522-9920

The water quality review assistance is a process to determine effluent limits for new facilities or existing facilities seeking to increase loading into the receiving stream. Limits can be calculated by the permittee and submitted for review the department.

GENERAL INSTRUCTIONS

1. Please attach:
 - A. A list of pollutants expected to be discharged.
 - B. The location of each outfall clearly shown on map(s). A U.S. Geological Survey topographic map is available at www.dnr.mo.gov/internetmapviewer/.
2. Discharge(s) to all gaining streams: Applicant must submit dissolved oxygen analysis (i.e., using Missouri Department of Natural Resources approved models such as Streeter Phelps (www.ecy.wa.gov/programs/eap/pwsread/pwsread.html) or Qual2K/Qual2E (Q2K/Q2E) stream water quality study (www.epa.gov/athens/wwqts/index.html)) indicating that the preferred alternative's BOD₅ effluent limitations from the alternative analysis or the technology-based/regulatory BOD₅ effluent limits are protective of Missouri's water quality standard for dissolved oxygen. **Note:** If Q2K/Q2E is used, wasteload allocation for ammonia must be assumed. All Q2K/Q2E studies must have department approved Quality Assurance Project Plans. Recommended modeling procedures from the department (may differ with discharge) for this analysis are available upon request.
3. Discharge(s) to unclassified gaining stream: Applicant may provide the time of travel to the confluence with the classified stream segment for modeling pollutant decay (See *Total Ammonia Nitrogen Criteria Implementation Guidance Policy* at www.dnr.mo.gov/env/wpp/permits/antideg-implementation.htm). Otherwise, the applicant may determine limits based on no decay of discharge pollutants, which typically results in lower permit limits. Please use the TR-55 method (*Natural Resource Conservation Service, Urban Hydrology for Small Watersheds, Technical Release No. 55, June 1986*) for time of travel determination (<http://directives.sc.egov.usda.gov/22162.wba>). Please include a map, schematic or description of flow segments with your calculations. A worksheet with instructions is available upon request.
4. For all discharges, the chronic water quality criteria point of compliance is the classified stream or the confluence with the classified stream. No mixing is allowed for streams with seven-day Q10 low flow less than 0.1 cfs (10 CSR 20-7.031(4)(A)B(I)), while mixing is allowed for streams with seven-day Q10 low flow greater than 0.1 cfs (10 CSR 20-7.031(4)(A)B(II)).
5. For industrial facilities, a list of all chemicals, compounds, elements, etc. found in the discharge must be submitted with the request. Proprietary names of chemicals are not sufficient, as these chemicals may contain several pollutants for which the department must evaluate separate effluent limits. A pre-construction review meeting is highly recommended.
6. Do not submit water quality review assistance requests for renewals. All water quality-based effluent limits will be determined during the renewal process.
7. 10 CSR 20-7.015(8)(B)3. allows alternative limitations (i.e., lagoon or trickling filters) if a water quality impact study is conducted. This impact study should indicate that equivalent to secondary treatment for lagoons or trickling filters are protective of Missouri Water Quality standards for dissolved oxygen and ammonia.
8. Applicant must check for rare and endangered aquatic species that may be affected by the discharge at <http://mdcgis.mdc.mo.gov/heritage/newheritage/heritage.htm>.
9. Additional requirements for new facilities:
 - A. Division of Geology and Land Survey Geohydrologic Evaluations must be submitted with the request.
 - B. Coordinates of outfall (s) in lat/long or in the public land survey system must be provided.
 - C. Please submit a letter with project timeframe.

Note: Lack of response for additional informational within a reasonable timeframe will result in return of request.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM
ANTIDEGRADATION REVIEW SUMMARY
TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY

1. FACILITY			
NAME KC FISHING RIVER WASTEWATER TREATMENT FACILITY		TELEPHONE NUMBER WITH AREA CODE	
ADDRESS (PHYSICAL) 10600 N.E. 118TH STREET		CITY KANSAS CITY	STATE MO
		ZIP CODE 64157	
2. RECEIVING WATER BODY SEGMENT #1			
NAME KC FISHING RIVER			
2.1 UPPER END OF SEGMENT (Location of discharge) UTM ___ OR Lat 39.30689, Long -94.44678			
2.2 LOWER END OF SEGMENT UTM ___ OR Lat 39.32262, Long -94.42317			
Per the Missouri Antidegradation Rule and Implementation Procedure, or AIP, the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."			
3. WATER BODY SEGMENT #2 (IF APPLICABLE)			
NAME			
3.1 UPPER END OF SEGMENT UTM ___ OR Lat ___, Long ___			
3.2 LOWER END OF SEGMENT UTM ___ OR Lat ___, Long ___			
4. WATER BODY SEGMENT #3 (IF APPLICABLE)			
NAME			
4.1 UPPER END OF SEGMENT UTM ___ OR Lat ___, Long ___			
4.2 LOWER END OF SEGMENT UTM ___ OR Lat ___, Long ___			
5. PROJECT INFORMATION			
Is the receiving water body an Outstanding National Resource Water, an Outstanding State Resource Water, or drainage thereto? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
In Tables D and E of 10 CSR 20-7.031, Outstanding National Resource Waters and Outstanding State Resource Water are listed. Per the Antidegradation Implementation Procedure Section 1.B.3., "any degradation of water quality is prohibited in these waters unless the discharge only results in temporary degradation." Therefore, if degradation is significant or minimal, the Antidegradation Review will be denied.			
Will the proposed discharge of all pollutants of concern, or POCs, result in no net increase in the ambient water quality concentration of the receiving water after mixing? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, submit a summary table showing the levels of each pollutant of concern before and after the proposed discharge in the receiving water and then complete Attachment B for the first downstream classified water body segment.			
Will the discharge result in temporary degradation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If yes, complete Attachment C.			
Has the project been determined as non-degrading? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If yes, complete No Degradation Evaluation – Conclusion of Antidegradation Review form. Submit with the appropriate Construction Permit Application as no antidegradation review is required.			
If yes to one of the above questions, skip to Section 8 - Wet Weather. Note: Although the proposed discharge will result in no net increase in ambient water quality concentrations based on average monthly limits, an alternatives analysis is being submitted for ammonia only.			

6. EXISTING WATER QUALITY DATA OR MODEL SUMMARY

Obtaining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section II.A.1.: (1) using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP (2) collecting water quality data by approved the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. QAPPs must be submitted to the department for approval well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Water Quality Monitoring and Assessment Section.

Date existing water quality data was provided by the Water Quality Monitoring and Assessment Section:

Approval date of the QAPP by the Water Quality Monitoring and Assessment Section:

Approval date of the project sampling plan by the Water Quality Monitoring and Assessment Section:

Approval date of the data collected for all appropriate pollutants of concern by the Water Quality Monitoring and Assessment Section:

Comments/Discussion:

NA

7. POLLUTANTS OF CONCERN AND TIER DETERMINATION(S)

Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.S. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (2).

Water Body Segment One Pollutants of Concern and Tier Determination(s)		
Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
	BOD5	
	TSS	
	OIL & GREASE	
	E. COLI	
		AMMONIA

Note: Add an asterisk to items that you only assume are Tier 2 with significant degradation.

Water Body Segment Two Pollutants of Concern and Tier Determination(s)		
Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation

- For pollutants of concern that are Tier 2 with significant degradation, complete Attachment A.
- For pollutants of concern that are Tier 2 with minimal degradation, complete Attachment B.
- For pollutants of concern that are Tier 1, complete Attachment D. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment.

8. WET WEATHER ANTICIPATIONS

If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Attach the feasibility analysis to this report.

What is the Wet Weather Flow Peaking Factor in relation to design flow? 2.0

Wet Weather Design Summary:

FLOWS GREATER THAN 4.0 MGD WILL BE DIVERTED TO A PEAK FLOW HOLDING BASIN.

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9. SUMMARY OF THE PROPOSED ANTIDegradation REVIEW EFFLUENT LIMITS

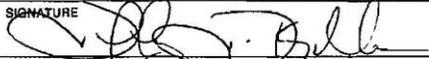
What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:

Pollutant of Concern	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5 (Summer)	MG/L	22	15	22(AWL)
BOD5 (Winter)	MG/L	66	15	22(AWL)
TSS	MG/L		15	22(AWL)
Ammonia (Summer)	MG/L	1.5	1.4	3.6
Ammonia (Winter)	MG/L	3.1	2.9	7.5
Bacteria (E. Coli)	CFU/100 ML		206 (GEOMEAN)	
OIL & GREASE	MG/L		10	15

These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve the highest statutory and regulatory requirements.

Attach the Antidegradation Review report and all supporting documentation.

CONSULTANT: I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulation.

SIGNATURE  DATE 9/18/2010

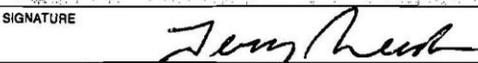
NAME AND OFFICIAL TITLES
 Jeffrey J. Keller, Project Manager

COMPANY NAME
 Burns & McDonnell Engineering Co

ADDRESS 9400 Ward Parkway CITY Kansas City STATE MO ZIP CODE 64114

TELEPHONE NUMBER WITH AREA CODE 816-822-4371 E-MAIL ADDRESS jkeller@burnsmcd.com

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE 9/17/10

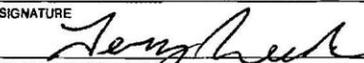
NAME AND OFFICIAL TITLES
 Terry Leeds - Acting Water Services Director

ADDRESS 4800 E 63rd Str CITY Kansas City STATE MO ZIP CODE 641

TELEPHONE NUMBER WITH AREA CODE 816-513-0203 E-MAIL ADDRESS Terry-Leeds@kcmo.org

CONTINUING AUTHORITY: Continuing Authority is the permanent organization that will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf.

I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE 9/21/10

NAME AND OFFICIAL TITLES
 Terry Leeds, Acting Water Services Director

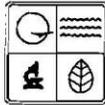
ADDRESS 4800 E 63rd Str CITY Kansas City STATE MO ZIP CODE 64130

KC Fishing River WWTP

Dec. 2010

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TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
MO 780-2025 (05-09)	



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY
ATTACHMENT A: TIER 2 – SIGNIFICANT DEGRADATION

1. FACILITY

NAME KC FISHING RIVER WASTEWATER TREATMENT PLANT		TELEPHONE NUMBER WITH AREA CODE	
ADDRESS (PHYSICAL) 10600 N.E. 118TH STREET	CITY KANSAS CITY	STATE MO	ZIP CODE 64157

2. RECEIVING WATER BODY SEGMENT #1

NAME FISHING RIVER (WBID 0394)

3. WATER BODY SEGMENT #2 (IF APPLICABLE)

NAME

4. IDENTIFYING ALTERNATIVES

Supply a summary of the alternatives considered and the level of treatment attainable with regards to the alternative. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the Antidegradation Implementation Procedure Section II.B.1. Per 10 CSR 20-6.010(4)(D)1., the feasibility of a no-discharge system must be considered. Attach all supportive documentation in the Antidegradation Review report.

Non-degrading alternatives: LAND APPLICATION AND PUMPING TO ADJACENT WATERSHED

Alternatives ranging from less-degrading to degrading including Preferred Alternative (All must meet water quality standards):

Alternatives	Level of Treatment Attainable for each Pollutant of Concern					
	BOD	TSS	Ammonia as N (summer/winter)	Bacteria (E. Coli)		
	(mg/L)	(mg/L)	(mg/L)	(#/100mL)		
ACTIVATED SLUDGE (BASE CASE)			1.4/2.9			
IFAS			1.0/2.0			
MBR			1.0/2.0			

Identifying Alternatives Summary: NOTES: ALTERNATIVES ANALYSIS IS FOR AMMONIA ONLY. ALL OTHER PARAMETERS ARE INSIGNIFICANT.

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5. DETERMINATION OF THE REASONABLE ALTERNATIVE

Per the Antidegradation Implementation Procedure Section II.B.2, "a reasonable alternative is one that is practicable, economically efficient and affordable." Provide basis and supporting documentation in the Antidegradation Review report.

Practicability Summary:

"The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the Antidegradation Implementation Procedure Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the Antidegradation Implementation Procedure Section II.B.2.a.

CONVENTIONAL ACTIVATED SLUDGE IS THE MOST PRACTICABLE ALTERNATIVE. LESS DEGRADING ALTERNATIVES ARE CONSIDERABLY MORE ENERGY INTENSIVE AND LOGISTIC ISSUES PROHIBIT USE OF NON-DEGRADING OPTION. SEE REPORT FOR DETAILS.

Economic Efficiency Summary:

Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the Antidegradation Implementation Procedure Section II.B.2.b.

CONVENTIONAL ACTIVATED SLUDGE IS THE ONLY ECONOMICALLY EFFICIENT ALTERNATIVE. ALL OTHER PRACTICABLE ALTERNATIVES ARE AT LEAST 130% OF THE BASE COST. SEE REPORT FOR DETAILS.

Affordability Summary:

Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the Antidegradation Implementation Procedure Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."

NOT APPLICABLE.

Preferred Chosen Alternative:

CONVENTIONAL ACTIVATED SLUDGE IS THE PREFERRED CHOSEN ALTERNATIVE. IT IS THE ONLY PRACTICABLE AND ECONOMICALLY EFFICIENT ALTERNATIVE.

Reasons for Rejecting the other Evaluated Alternatives:

OTHER ALTERNATIVES ARE EITHER NOT PRACTICABLE AND/OR ECONOMICALLY EFFICIENT. SEE REPORT FOR DETAILS.

Comments/Discussion:

THE ALTERNATIVES ANALYSIS IS FOR AMMONIA ONLY. ALL OTHER PARAMETERS ARE INSIGNIFICANT. THE PREFERRED ALTERNATIVE WILL RESULT IN A HIGHER AMMONIA EFFLUENT QUALITY THAN IS CURRENTLY PERMITTED USING CONSIDERABLY LESS ENERGY THAN THE LESS DEGRADING ALTERNATIVES.

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6. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

If the preferred alternative will result in significant degradation, then it must be demonstrated that it will allow important economic and social development in accordance to the Antidegradation Implementation Procedure Section II.E. Social and Economic Importance is defined as the social and economic benefits to the community that will occur from any activity involving a new or expanding discharge.

Identify the affected community:

The affected community is defined in 10 CSR 20-7.031(2)(B) as the community "in the geographical area in which the waters are located.: Per the Antidegradation Implementation Procedure Section II.E.1, "the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project."

THE FISHING RIVER WWTP IS LOCATED IN UNINCORPORATED CLAY COUNTY. SEE REPORT FOR DETAILS.

Identify relevant factors that characterize the social and economic conditions of the affected community:

Examples of social and economic factors are provided in the Antidegradation Implementation Procedure Section II.E.1., but specific community examples are encouraged.

CLAY COUNTY STATISTICS: GREW BY 24.1% FROM APRIL 1, 2000 TO JULY 1, 2009; MEDIAL HOUSE VALUE = \$104, 900; MEDIAN HOUSEHOLD INCOME = \$58,803, AND PERCENT BELOW POVERTY LEVEL = 7.4%.

Describe the important social and economic development associated with the project:

Determining benefits for the community and the environment should be site specific and in accordance with the Antidegradation Implementation Procedure Section II.E.1.

THE PROJECT WILL ACCOMMODATE ANTICIPATED GROWTH, WHICH WILL ALLOW FOR AN EXPANDED TAX BASE. SEE REPORT FOR DETAILS.

PROPOSED PROJECT SUMMARY:

THE CITY IS PROPOSING TO UPGRADE AND EXPAND THE FISHING RIVER WWTP FROM 1 TO 2 MGD WITH CONVENTIONAL ACTIVATED SLUDGE. THE PROPOSED UPGRADES WILL RESULT IN SIGNIFICANT IMPROVEMENTS TO EFFLUENT WATER QUALITY. BOD AND TSS LOADING WILL BE CAPPED AND THE AMMONIA AML WILL DECREASE.

Attach the Antidegradation Review report and all supporting documentation. This is a technical document, which must be signed, sealed and dated by a registered professional engineer in Missouri.

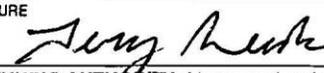
CONSULTANT: I have prepared or reviewed this form and attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulations.

SIGNATURE  DATE 9/8/2010

PRINT NAME Jeffrey J. Keller NUMBER E-2002003188 LICENSE #: 2002003188

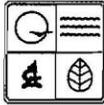
TELEPHONE NUMBER WITH AREA CODE 816-822-4371 E-MAIL ADDRESS: jkeller@burnsmcd.com

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE 9/17/10

CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE 9/21/10



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY
ATTACHMENT B: TIER 2 – MINIMAL DEGRADATION

1. FACILITY

NAME KC FISHING RIVER WASTEWATER TREATMENT PLANT		TELEPHONE WITH AREA CODE	
ADDRESS (PHYSICAL) 10600 N.E. 118TH STREET	CITY KANSAS CITY	STATE MO	ZIP CODE 64157

2. RECEIVING WATER BODY SEGMENT #1

NAME
FISHING RIVER (WBID 0394)

3. WATER BODY SEGMENT #2 (IF APPLICABLE)

NAME

4. ASSIMILATIVE CAPACITY TABLE

Determining the facility assimilative capacity, or FAC, and the segment assimilative capacity, or SAC for each pollutant of concern is explained in detail in the Antidegradation Implementation Procedure Section II.A.3. and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.A. Provide all calculations in the Antidegradation Review report.

Pollutant of Concern	Facility Assimilative Capacity	New Load	Percent of Facility Assimilative Capacity
	(lbs/day)	(lbs/day)	(%)

Pollutant of Concern	Water Body Segment #1 SAC	Cumulative Net Increase In Load	Cumulative % of Water Body Segment #1 SAC	Water Body Segment #2 SAC	Cumulative Net Increase In Load	Cumulative % of Water Body Segment #2 SAC

Assimilative Capacity Summary
 THE CITY IS PROPOSING NO INCREASE IN LOADING FOR BOD5 AND TSS.

Is degradation considered minimal for all Pollutants of Concern? Yes No

Degradation is considered minimal if the new or proposed loading is less than 10 percent of the FAC and the cumulative degradation is less than 20 percent of the SAC according to the Antidegradation Implementation Procedure Section II.A.3. If yes, an alternatives analysis and a social and economic importance analysis are not required.

Comments/Discussion
 THE PROPOSED EXPANSION IS CONSIDERED INSIGNIFICANT FOR BOD, TSS, E. COLI, AND OIL & GREASE. AMMONIA EFFLUENT QUALITY WILL IMPROVE, BUT THE MASS LOADING WILL NOT BE CAPPED.

MINIMAL DEGRADATION CALCULATIONS
 NA

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5. OIL AND GREASE

Is this a publicly owned treatment works, or POTW, restaurant, school or other domestic wastewater treatment facility with oil and grease as a Pollutant of Concern? Yes No

In accordance with 10 CSR 20-7.031(3)(B), waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. In accordance with 10 CSR 20-7.031 Table A, oil and grease has a chronic toxicity of 10 mg/L for protection of aquatic life. This facility will meet the effluent limits (MDL and AML of 15 mg/L and 10 mg/L, respectively).

6. DECHLORINATION

If Chlorination and Dechlorination is the existing or proposed method of disinfection treatment, will the effluent discharged be equal to or less than the Water Quality Standards for Total Residual Chlorine stated in Table A of 10 CSR 20-7.031?

Yes No

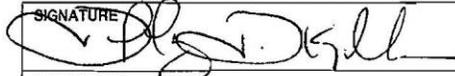
Based on the disinfection treatment system being designed for total removal of Total Residual Chlorine, minimal degradation for Total Residual Chlorine is assumed and the facility will be required to meet the water quality based effluent limits. These compliance limits for Total Residual Chlorine are much less than the method detection limit of 0.13 mg/L.

7. PROPOSED PROJECT SUMMARY

THE CITY IS PROPOSING TO UPGRADE AND EXPAND THE FISHING RIVER WWTP FROM 1 TO 2 MGD WITH CONVENTIONAL ACTIVATED SLUDGE. THE PROPOSED UPGRADES WILL RESULT IN SIGNIFICANT IMPROVEMENTS TO EFFLUENT WATER QUALITY. BOD AND TSS LOADING WILL BE CAPPED AND THE AMMONIA AML WILL DECREASE.

Attach the Antidegradation Review report and all supporting documentation.

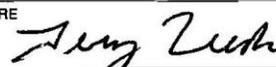
CONSULTANT: I have prepared or reviewed this from and all attached reports and documentation. The conclusion proposed in consistent with the AIP and current state and federal regulations.

SIGNATURE  DATE 9/8/2010

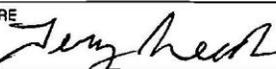
PRINT NAME Jeffrey J. Keller

TELEPHONE NUMBER WITH AREA CODE 816-822-4371 E-MAIL ADDRESS jkeller@burnsmed.com

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE 9/17/10

CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE 9/21/10

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Appendix C – Outfall Map

