FACT SHEET

DATE:	August 27, 2014
FACILITY:	Cedar Creek Wastewater Treatment Plant
KANSAS PERMIT No.:	M-KS52-O006
FEDERAL PERMIT No.:	KS0081299
LOCATION:	NW¼, Section 20, Township 13S, Range 23E, Johnson County, Kansas Latitude: 38.91088 Longitude: -94.88856

PROPOSED ACTION: This action consists of reissuance of a Kansas/NPDES Water Pollution Control permit for the existing facility at Cedar Creek WWTP.

EXISTING PERMIT: The existing permit was issued for a design flow of 7.75 MGD and a design peak wet weather flow of 23.25 MGD The existing permit includes technology based effluents limits for total suspended solids and pH, with water based limits for biochemical oxygen demand, ammonia, E.coli, dissolved oxygen (as a minimum concentration), and whole effluent toxicity testing (WET). Flow, total phosphorus, total nitrogen (TKN + NO_3 + NO_2), and lead were monitored, with effluent limits and goals for total nitrogen and total phosphorus as a result of the Antidegradation Review process. A Priority Pollutant Scan was conducted once during the permit period.

FACILITY DESCRIPTION: This existing wastewater treatment plant is a mechanical plant consisting of two major trains of treatment. The first major train includes two activated sludge oxidation basins operating in parallel with ferric chloride addition for phosphorus removal. The second major train of treatment process operates in parallel with the oxidation basins and consists of two parallel 5-stage BNR activated sludge treatment basin trains with the capability to add ferric chloride as required to meet effluent limits for phosphorus removal. The facility features are:

Common Facilities

1. Ferric Chloride Feed to Raw Sewage Flow into WWTP
2. Influent Pump Station (5 Pumps)
3. Influent Flow Meter
4. Mechanical Bar Screens (2)
5. Grit Removal System (2)
6. Peak Flow Equalization Basin No. 1 (3.3 MG Volume)
7. Peak Flow Equalization Basin No. 2 (6.0 MG Volume)
8. Chemical Storage and Feed Systems
9. UV Disinfection System
10. Effluent Reaeration via Diffused Aeration
11. Effluent Pump Station
12. Aerated Sludge Holding Basin
13. Biosolids Dewatering (centrifuge)
14. Engine Generator
15. Flow Divider to Two Trains

Oxidation Basins

(Two Oxidation Basins in Parallel)
Average Daily Design Flow = - 2.5 MGD

1. Oxidation Basins
2. Mechanical Surface Aerators
3. Ferric Chloride Feed Prior to Final Clarifiers
4. Two Final Clarifiers in Parallel - No. 1 and No. 2
5. Sludge Pump Station No. 1
6. Gravity Sludge Thickener
7. Thickened Sludge Pumping Station
8. Final Clarifier No. 3 (Operates in parallel with clarifiers No. 1 and No. 2)
9. Sludge Pump Station No. 2

Effluent from the existing oxidation basin combines with effluent from the BNR trains and subsequently flows into the effluent disinfection UV building

(Two BNR Trains in Parallel)
Average Daily Design Flow = - 5.25 MGD

1. Fermenter
2. 5-Stage BNR Basins
   1.)Anaerobic Zone
   2.)First Anoxic Zone
   3.)First Oxic Zone
   4.)Second Anoxic Zone
   5.)Second Oxic Zone
3. BNR Blowers
4. Pre-Final Clarifiers Ferric Chloride Feed
5. Two Final Clarifiers in Parallel (No. 4 & No. 5)
6. Sludge Pump Station No. 3

BNR train effluent combines with effluent from the existing oxidation basins and subsequently flows into the effluent disinfection UV building.

RECEIVING STREAM: The Cedar Creek wastewater treatment plant discharges to the Kansas River by the way of Cedar Creek HUC 10270104 (Segment 38). Pursuant to the Kansas Surface Water Quality Standards K.A.R 28-16-28 (b-g), the first classified stream is Cedar Creek. Cedar Creek is a general purpose water, designated for expected aquatic life use, domestic water supply, food procurement, groundwater recharge, industrial water supply, livestock watering use, irrigation, and primary "B" contact recreation. correct ✓ 10mgk

PROPOSED PERMIT LIMITS: The proposed permit limits are based on a design average discharge flow capacity of 7.75 MGD from the combined outfall to Cedar Creek. The permit retains the existing technology based effluent limits for total suspended solids and pH. Water quality based limits are required for BOD, E.coli, ammonia, and whole effluent toxicity (WET) testing. In keeping with the Kansas Nutrient Management Plan, the permittee in the new permit will be encouraged to attain the goal of 10.0 mg/l for total nitrogen and a limit of 1.5 mg/l for total phosphorus as annual average concentrations at the combined outfall to Cedar Creek. The permit contains certain limits for total nitrogen and total phosphorus based on the Antidegradation Review process for the expanded capacity permit. The previous sample results for dissolved oxygen provided by the permittee demonstrates levels for dissolved oxygen are above 7.3 mg/l as an average and the facility has effluent reaeration by diffused aeration. The in-stream water quality standard is 5 mg/l dissolved oxygen, and so dissolved oxygen will no longer be monitored. The water quality review does not list lead (Pb) as an impairment and therefore lead will no longer be monitored. Monitoring is required for total nitrogen and total phosphorus at several locations in the treatment processes, with both goals and limitations in the permit. A Priority Pollutant Scan will be required to be conducted once before the proposed permit expires. The permit requires monitoring for the combined discharge flow to Cedar Creek. The average daily flow for the past four years has been 3.6 MGD and a median of 3.2 MGD to Cedar Creek.

These monitoring requirements reflect the best professional judgement of the permit writer considering design and process reliability, and past operational and effluent quality information. Effluent Biochemical Oxygen Demand and Total Suspended Solids have an average of 5.7 mg/l and 4.8 mg/l respectively for the past four years. E.coli has a geomean of 5.5 colonies per 100 milliliters with a median of 3.0 colonies per 100 milliliters for the past four years. This permit is being reissued in accordance with the Basinwide Permit Planning Procedure with consideration for the process reliability for effluent Biochemical Oxygen Demand, Total Suspended Solids and pH; and is being reissued as before with sampling frequencies of twice monthly for influent Biochemical Oxygen Demand, Total Suspended Solids and sampling frequencies of twice monthly with limits for effluent Biochemical Oxygen Demand and Total Suspended Solids and pH. Also, in consideration of the past available quality information, this permit is being reissued with sampling frequencies of weekly with limits for ammonia and E.Coli, and sampling frequencies of weekly with an annual average goal for total nitrogen and an annual average limit for effluent phosphorus.

The permit imposes a requirement to operate the 5-stage Bardenpho type BNR activated sludge treatment train (average daily design flow capacity of 5.25 MGD) to achieve nutrient removal with limits from this treatment train of an average annual total nitrogen concentration of 8.0 mg/l and an average annual total phosphorus concentration of 1.5 mg/l plus monitoring the discharge flow from the BNR activated sludge treatment train. Also, the permit imposes a requirement to operate the activated sludge oxidation basins treatment train (average daily design flow capacity of 2.5 MGD) to achieve nutrient removal from this treatment train of an average annual total nitrogen concentrations goal of 10.0 mg/l and an average annual total phosphorus concentration limit of 1.5 mg/l and monitor the discharge flow from the activated sludge oxidation basins treatment train.

EXPLANATION OF NUTRIENT PROPOSED LIMITS: The TMDL for Cedar Creek indicates the Cedar Creek plant will upgrade to BNR removal. However, this was a phased construction and operation plan. KDHE has recognized the current non-BNR trains will be operated in parallel with the BNR trains during this phase of operation. Therefore, the current permit reflects, and the draft permit will continue to reflect, this approved operation by setting the TN/TP concentration limits from the BNR plant at 8.0/1.5 mg/l, respectively, as annual averages; and setting the non-BNR oxidation ditch TP concentration limit at 1.5 mg/l with monitoring and goals for TN from the non-BNR oxidation ditch. The draft permit also requires monitoring at the combined outfall 00X1. This is the current permit setup. The TMDL shows examples of mass calculations for mass loadings under various scenarios but does not set mass loadings limits for either TN or TP.

DOWNSTREAM WATER QUALITY:
The wastewater treatment plant will continue to discharge to Cedar Creek (Segment 38). Monitoring will continue upstream near the 127th Street Bridge and downstream near 119th Street for E.coli, nitrate + nitrite, total Kjeldahl nitrogen and total phosphorus. In addition E.coli and nitrate + nitrite will be monitored downstream near 111th Street.

PERMIT BASIS
The basis of the effluent limits applied in this NPDES permit is as follows:

PARAMETER	BASIS
Biochemical Oxygen Demand	KS Surface Water Quality Standards (KSWQS)
Total Suspended Solids	EPA Secondary Treatment Regulation
Ammonia	KS Surface Water Quality Standards
E. coli	KS Surface Water Quality Standards
pH	EPA Secondary Treatment Regulation
Nutrients	Kansas Nutrient Reduction Plan, 303d List, Antidegradation Review process

303(d) and TMDL LIST: The Kansas Water Quality Limited Segments 303(d) List shows the downstream Cedar Creek is impaired. Cedar Creek has 303d listing for total phosphorus and total suspended solids, both which have limits in the proposed permit. Individual TMDLs have been written for Cedar Creek, for the impairments of fecal coliform bacteria, biological sediment conditions, and nitrate + nitrite impairments. E.coli limits have been established, and nitrate + nitrite as well as total nitrogen will be monitored in the proposed permit. The nitrate + nitrite impairment is resolved by the goals and limits for Total Nitrogen.

SLUDGE: Grit and screenings produced by this facility are landfilled. Liquid waste activated sludge is dewatered with a centrifuge. The sludge produced at this facility is composted with wood chips at an offsite facility to produce Class A compose for general use by the city and the public. The facility has been in full compliance with the 40 CFR Part 503 Sludge Regulations.

CERTIFIED OPERATOR: The permittee presently employs multiple certified operators with the correct level of certification (Class IV minimum) for this size of treatment facility.

Prepared By: Frank R. Weinhold
Date: August 27, 2014