



Permit Amendment Rationale

Date: July 20, 2021

Permit Writer: Ben Hucka

Facility Name: Boone, City of STP

Location: County: Boone
Latitude: 42 degrees 2 minutes 26.52 seconds
Longitude: 93 degrees 53 minutes 26.736 seconds

Region/ FO: DNR FO # 5, Des Moines

Design: Discharge from an activated sludge wastewater treatment facility to Honey Creek
Date Constructed: May 31, 1994
Flow: ADW: 2.10 MGD; AWW: 7.00 MGD; MWW: 15.10 MGD
BOD5: 4000 lbs/day
P.E.: 23952
Sources: Construction Permit No. 94-243-S dated May 31, 1994

Treatment Plant Description: The City of Boone utilizes an activated sludge system that includes an automatic bar screen and four vertical loop reactor aeration tanks that operate in a series. All pretreated wastewater and return activated sludge enters a series of tanks equipped with brushes and blowers. The wastewater is discharged to Honey Creek which flows to the Des Moines River.

Nutrient Reduction Feasibility Report: The NPDES permit issued August 1, 2019 required the city of Boone to submit a Feasibility Study (Study) for reducing total nitrogen (TN) and total phosphorus (TP) by August 1, 2021, per requirements in Section 3 of Iowa’s Nutrient Reduction Strategy (NRS). The facility submitted the Study dated May 2021.

Results of weekly sampling included in the Study show Boone’s treatment plant achieves an average TN removal of 44% (ranging from 18% to 66%) and average TP removal of 36% (ranging from 22% to 76%). Boone investigated treatment technologies to reach the NRS goals of 75% removal for TP and 66% removal for TN.

Granular media filters, VertiCel System, and addition of anaerobic tanks were evaluated with an estimated cost ranging from \$5.22 to \$13.73 million. The city already has high sewer rates and extensive debt load due to past wastewater projects that taking on additional debt at this time is not reasonable. A substantial amount of the debt will be paid by 2030. The city proposes to start the facility planning process in 2031 with an approximate completion date of 2037.

Therefore, the department is amending the Boone NPDES permit to require the submittal of a new NRS feasibility study in five years. By that time, the city will be closer to retiring significant debts and other options for nutrient removal or nutrient credit trading may become available.