

### QUICK FACTS

- ◆ **INDUSTRY:** Municipal
- ◆ **PROCESS TYPE:** Activated Sludge
- ◆ **TECHNOLOGY:** Ideal IFAS™
- ◆ **DESIGN:** 3.8 MGD; 10,063 lb/day BOD  
1,650 lb/day TN
- ◆ **STARTUP DATE:** AUGUST 2018

### BACKGROUND

The City of Emporia, in East Central Kansas, recently experienced an increase in population and more stringent effluent permit requirements resulting in a strained wastewater treatment plant. Emporia retained the services of a local engineering firm to evaluate the current and future needs of the system and recommend an economical, sustainable, and effective solution.

Like many other WWTPs nationwide, Emporia was tasked with new effluent permit requirements relating to Total Nitrogen (TN) and Total Phosphorous, (TP). Due to both space and budget restrictions, engineers focused on treatment solutions that could be retrofitted into existing tanks. After evaluating several options, World Water Works' Integrated Fixed Film Activated Sludge (IFAS) conformed to all the requirements and was selected.

### SOLUTION

IFAS incorporates specialized bio-media into portions of the existing aerobic zones to cultivate the slower growing nitrifying bacteria to aid in the reduction of ammonia thus allowing the MLSS bacteria to perform the bio-P and denitrification. The addition of IFAS equips Emporia with reliable and stable operations under varying loads.



### CONCLUSION

Over six months, starting in late 2018, the IFAS system was introduced at Emporia and became fully operational. The first process train treated 100% of the flow while the second process train was under construction and commissioning. As expected, the biomass developed quickly on the media and immediately aided in the nitrification.

The figures below indicate influent loadings and effluent quality. Outside of a couple of unexpected and atypical peak loads in early 2020, the IFAS system has been operating successfully and produced high quality effluent meeting all the permitted requirements.

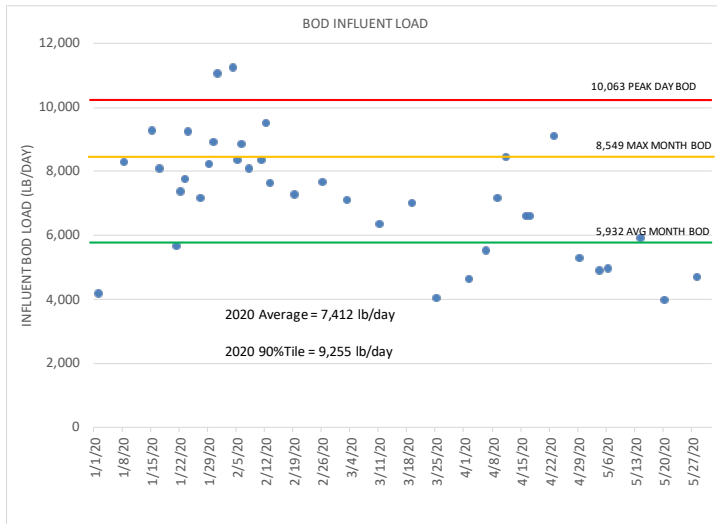


Figure 1 – Influent BOD Load for 2020

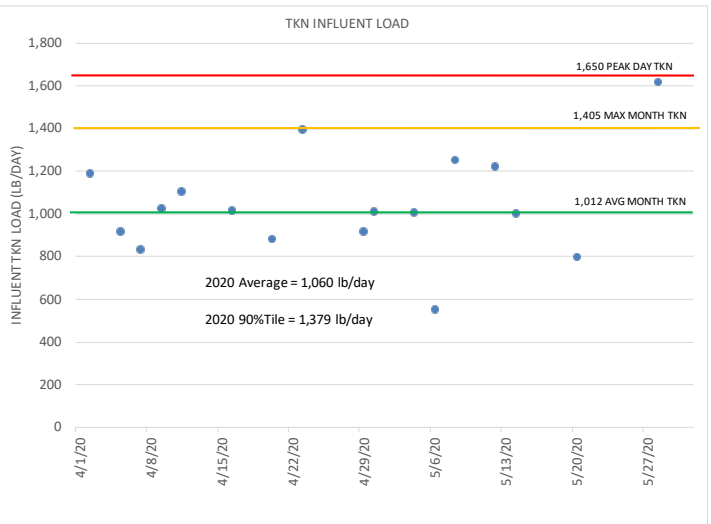


Figure 2 – Influent TKN Load for 2020

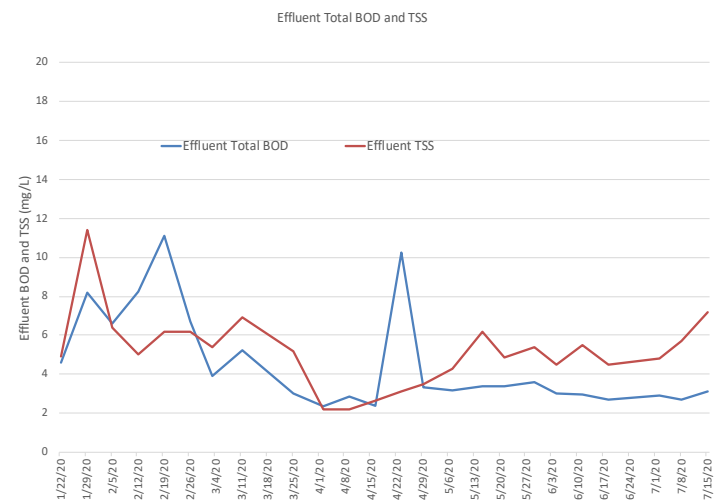


Figure 3 – Effluent BOD and TSS for 2020

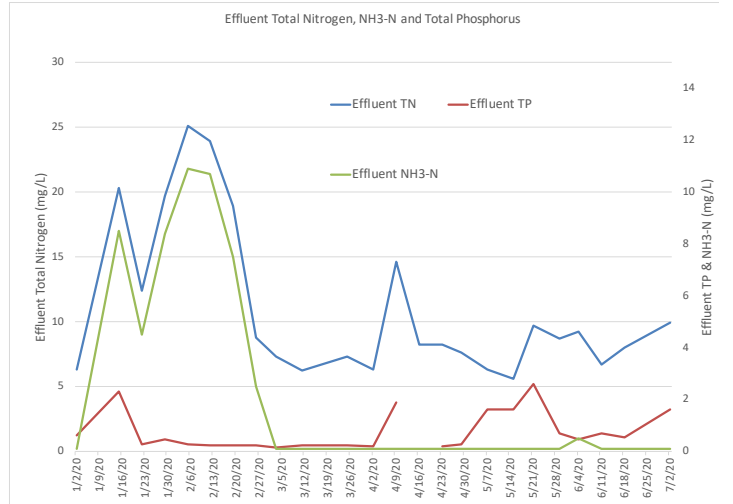


Figure 4 – Effluent Total Nitrogen, Total Phosphorus and NH3-N for 2020