

**Jenner Area Joint Sewer Authority STP, Boswell, PA**  
*Effluent probe installation & probe telemetry project.*

**SUMMARY**

Jenner Area Joint Sewer Authority (Jenner) owns and operates a 0.70 MGD wastewater treatment facility located in Boswell Borough of Somerset County and discharging treated effluent to Quemahoning Creek, a cold-water fishery. Within the past few years, the facility had NPDES Permit violations for effluent ammonia. In September 2024, Jenner contacted DEP's technical assistance program (DEP). The request had two parts:

- Assist operators in returning plant to compliance,
- Guidance on installing probes they had bought to monitor aeration tanks.

DEP staff met with the operators and recommended they should do their best have six to twelve months with no ammonia<sup>1</sup> violations to prove to regulators that the plant could do so.

In 2019, the (retired) superintendent at Jenner used grant money to buy monitoring probes. They were to be installed when the plant was upgraded over the next few years. Then, COVID-19 interrupted the construction plans. Estimated costs for materials and labor exceeded the PennVest loan that Jenner had contracted. The upgrade project stopped.

Without probes to monitor aeration dissolved oxygen residual (D.O.) or unaerated oxidation/reduction potential (ORP), the operators were unable to properly regulate the plant to convert ammonia to nitrate or convert nitrate to gas.<sup>2</sup> The plant's treated water began to have ammonia and coliform problems again, placing them on EPA's watchlist for significant non-compliance. Jenner telephoned DEP and asked for help with the ammonia violations and advice on installing the probes. DEP staff met with Jenner in September 2024 and discussed the ammonia problem. The operators were advised to stop using the timers and to run aeration full time until the ammonia violations stopped. DEP staff reviewed the probes and supplies purchased and advised that Jenner should buy accessories for hanging up the probe controllers and cables to reach the office computer. Also, operators were advised to check out maintenance supplies to renew the probes that were stored for over five years.

Because there was delay in buying the extra parts, DEP lent a probe controller, cable, and data converter to Jenner. DEP felt it was vital to use the probes to stop the ammonia violations. The original plan was to install five probes at the effluent,



*Bioreactor #1*

<sup>1</sup> NPDES Permit Concentration Limits for ammonium-nitrogen in effect in 2024 were Oct. 1 to Apr. 30: 23.4 mo. Avg.-35.1 weekly avg.-46.8 grab. May 1 to Sept. 30 limits were 7.8-11.7-15.6

<sup>2</sup> The plant's NPDES Permit does not require dealing with nitrate. The reason why they were doing this was to save money on the costs for magnesium hydroxide chemical and electricity, as complete denitrification returns 3.6 mg of alkalinity (as CaCO<sub>3</sub>) and 2.9 mg of oxygen equivalent are recovered for every 1 mg of nitrate-nitrogen (NO<sub>3</sub>-N) removed.

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including one for testing chlorine residual and one for ammonia, and three probes in aeration tank #1, but some probes could not be used because they had been on the shelf for over five years. The ammonia probe cartridges cost \$3,600 each but expire after six months whether they are used or not, and the pH probes have an effective life of four years if they are well-maintained. Stored on the shelves, the pH probes also dried out. DEP focused



*Photo 2: temporary DEP probe controller*

on installing the D.O. and ORP probes in each aeration tanks and tried reviving one pH probe by replacing its salt bridge and electrolyte solution. That probe was installed, but only its thermometer worked.

DEP did not offer to connect the chlorine residual detector for the effluent. To install it would require adding a pump, power, and plumbing that an skilled tradesman or experienced installer should do.

After providing a copy of a computer program to manage the probe data, DEP wrote a spreadsheet to graph the daily data to make it easier for the operators to monitor the D.O. and ORP. Using the graphs, the operators were able to adjust aeration timers to favor removing ammonia and nitrate, gradually increasing aeration OFF time so long as ammonia remained low. Whenever D.O. appeared to be too low in only one of two aeration tanks, they knew they would have to clean debris off the air diffusers. The D.O. and ORP graphs helped them visualize what happened in the aeration tanks.

Also, DEP lent testing equipment for ammonia to the operators, but after the first package of tests were depleted, the operators found it more useful to continue using their ammonia salicylate tests because their winter permit limit was 23.4 mg/L for effluent ammonia. Jenner posted many ammonia results that were at or below the detection limit.

DEP and the operators invited Hach to estimate the costs of installing and maintaining the remainder of the probes they had purchased. The estimate was much too high. The chief operator asked an operator from another plant for his opinion. This operator advised connecting the probes to Jenner's account with Mission Systems, an internet data hosting service monitoring Jenner's pumping stations. The operators contacted a part-time instrumentation technician who would install both the effluent and aeration tank probes in permanent conduit, and they bought a Mission Systems telemetry modem. The chief operator wanted to also connect the aeration D.O. probes to a variable frequency drive (VFD) for one of the blowers, to control aeration D.O., and bought a larger capacity motor, as well.



*Photo 3: Hach probe controllers, the CL17 TRC miniaturized lab, and the Mission Systems telemetry connection.*

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The work progressed slowly because parts were hard to get sometimes and because the contractor was working on his own time, when available. DEP staff continued to check with the operators to see that ammonia did not violate permit limits.

Work was completed in August 2025. The probes were connected to the telemetry device for easier data management and graphing, and the VFD came into service shortly later. The operators continue using gradual timer adjustments for ON/OFF aeration to cut down the amount of chemical and power they were using. Effluent ammonia, for the most part, remained under control. DEP staff retrieved their equipment on August 15.

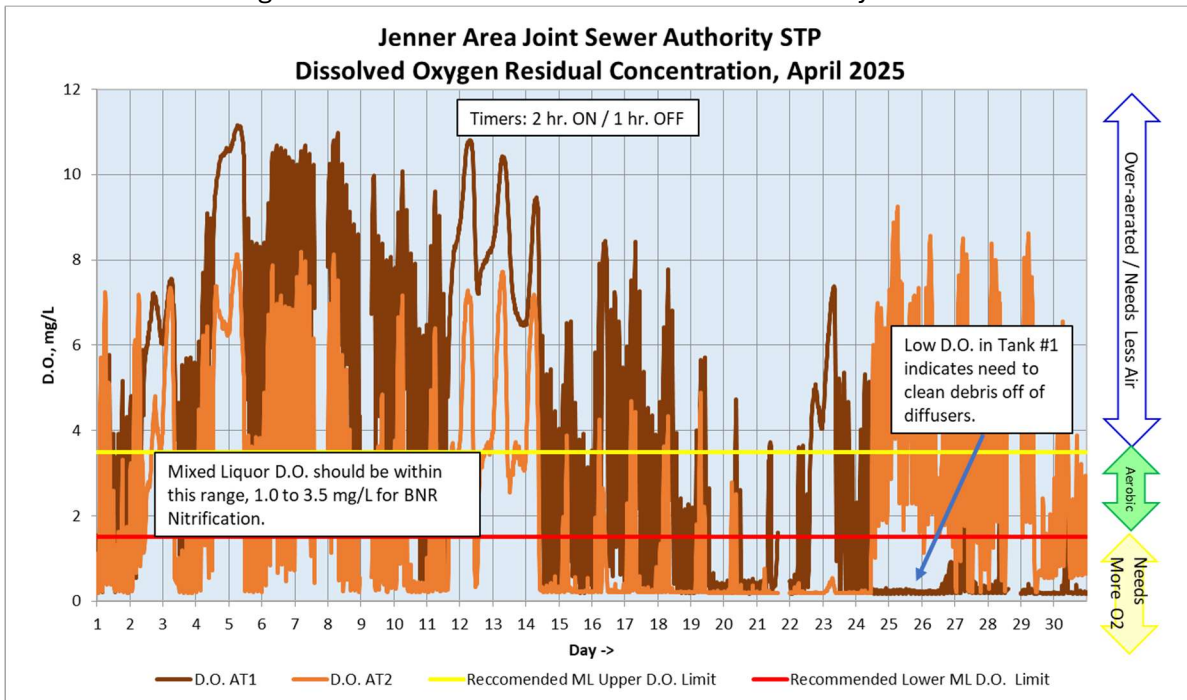
**Photos:**



Effluent sampling and probe connections for continuous monitoring.



View of probes “permanently” installed by Jenner’s telemetry contractor



Example DEP monitoring graph showing need to clean Tank #2 diffusers from 4/25 onward.