



November 22, 2022

MS. DENICE NELSON
JOHNSON CONTROLS, INC
5757 N. GREEN BAY AVENUE
MILWAUKEE, WI 53209

Via Email Only to denice.karen.nelson@jci.com

SUBJECT: Response to Semi-Annual Operation, Maintenance, and Optimization Progress Report #7
Ditch A Interim Action Treatment System (January 1, 2023 – June 30, 2022)
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI
BRRTS #02-38-580694

Dear Ms. Nelson:

On November 9, 2022, the Wisconsin Department of Natural Resources (DNR) received the *Semi-Annual Operation, Maintenance and Optimization Progress Report #7* (O&M Progress Report #7) for the Ditch A interim action at the above-referenced site (the "Site"). The report was submitted by Arcadis U.S., Inc. (Arcadis) on behalf of Johnson Controls, Inc. and Tyco Fire Products LP (JCI/Tyco) and was accompanied by the appropriate fee required under Wisconsin Administrative Code (Wis. Admin. Code) § NR 749.04(1) for DNR review and response.

The DNR reviewed JCI/Tyco's O&M Progress Report #7. Because the concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) in the surface water in Ditch A remain above the Wis. Admin. Code § NR 102.04 surface water criteria of 95 parts per trillion (ppt) for PFOA and 8 ppt for PFOS, the DNR recommends continued operation of the Ditch A treatment system. At this time, no changes are recommended to the O&M Progress Reports for Ditch A, but potential future considerations are included in this letter.

Background

JCI/Tyco is investigating and responding to the discharge of per- and polyfluoroalkyl substances (PFAS) to the environment at the JCI/Tyco Fire Technology Center (FTC), located at 2700 Industrial Parkway South in Marinette, Wisconsin. The discharge occurred as the result of training, testing, research and development of PFAS-containing aqueous film forming foams (AFFF) at the Site starting in the early 1960s.

A surface water drainage feature identified as Ditch A flows south through the FTC property, continues south to the Little River and eventually discharges to the Bay of Green Bay in Lake Michigan. Elevated PFAS concentrations were detected in the surface water of Ditch A on the FTC property - PFOS up to 1,100 ppt and PFOA up to 6,000 ppt. In January 2019, JCI/Tyco began an interim action to reduce the concentration of PFAS in the surface water in this ditch.

The interim action includes a treatment system constructed adjacent to Ditch A on the southern boundary of the FTC property. The system captures surface water flowing in Ditch A at a check dam, and treats the captured water using suspended solids settling, bag filtration and granular activated carbon (GAC). The treated water is then discharged back to Ditch A downstream of the check dam under a Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit (WI-0046566-07-0) and the associated coverage letter, which specifies the effluent criteria and monitoring requirements.

Operation of the Ditch A treatment system reduces the amount of PFAS in the surface water at the point where the ditch exits JCI/Tyco's FTC property. The system is designed to treat a maximum flow rate of 100 gallons per minute (gpm). The surface water in the ditch occasionally freezes, runs dry or flows at a rate lower than 100 gpm, such that the system captures and treats most of the surface water migrating from the FTC property in Ditch A. There may be occasional high flow events or system downtime where surface water overtops the check dam and is not captured by the Ditch A system, and therefore goes untreated as it migrates downstream, but these events are minimal.

NR 205 WPDES Permit

The effluent from the Ditch A treatment system is regulated under WPDES General Permit No. WI-0046566-07-0 and the associated coverage letter (updated June 4, 2021). The DNR's Wastewater Program administers the WPDES permit and reviews the monthly electronic discharge monitoring reports submitted by JCI/Tyco. A review of the permit reporting is not included with this letter.

Summary of O&M Progress Report #7

Operation and Maintenance

JCI/Tyco's O&M Progress Report #7 covered the period from January 1 to June 30, 2022. There was no flow in Ditch A during the winter months and flow resumed on March 23, 2022. During the flow period, the system treated over 13 million gallons of water. The system was able to capture all the surface water flowing in Ditch A water, except for four occasions in April and May 2022, when the streamflow overtopped the check dam, resulting in approximately 6,000 gallons of surface water going untreated.

Between January and March 2022, when there was no flow in Ditch A, the system was used to treat 430,605 gallons of water that was collected from dewatering for construction of the Groundwater Extraction and Treatment System (GETS). The water was transported from the GETS construction site, run through the treatment system and then discharged into Ditch A.

Routine system maintenance during this reporting period included removal of accumulated sediment, replacement of spent bag filters and replacement of spent GAC. The spent bag filters were collected in drums and disposed by End Point Solutions, and the spent GAC was shipped to a Cabot Corporation facility in Pryor, Oklahoma to be reactivated and reused in the treatment system. Documentation of the handling of these waste materials was included in Appendix E of O&M Progress Report #7.

During this reporting period, JCI/Tyco documented that the system removed approximately 0.09 pounds of PFOA and 0.04 pounds of PFOS from the treated water. Cumulatively, since initial startup in January 2019, the system has removed approximately 0.81 pounds of PFOA and 0.43 pounds of PFOS. These mass estimates were calculated by JCI/Tyco based on the weekly measurements of volume treated and system influent and effluent concentrations.

Long-Term Monitoring

The concentrations measured weekly in the surface water coming into the treatment system were between 250 and 1,200 ppt for PFOA and between 130 and 560 ppt for PFOS (consistently *above* the Wis. Admin. Code § NR 102.04 surface water criteria of 95 ppt for PFOA and 8 ppt for PFOS). The concentrations measured weekly in the treated water leaving the treatment system was between < 0.72 and 1.5 ppt for PFOA and between < 0.46 and 0.97 ppt for PFOS (consistently *below* the Wis. Admin. Code § NR 102.04 surface water criteria).

JCI/Tyco collected four monthly surface water samples immediately downstream of the treatment system (SW-40); the surface water concentrations were between 0.98 and 33 ppt for PFOA and between 0.75 and 16 ppt for PFOS. Except for PFOS detected in the March 2022 sample, all the results were below the Wis. Admin. Code § NR 102.04 surface water criteria for PFOA and PFOS. The elevated PFOS detected in March was attributed to the sample being collected right at the time when flow and treatment resumed in Ditch A, and thus JCI/Tyco concluded it was not representative of surface water conditions following sustained streamflow and treatment.

JCI/Tyco also included a revision of the Operation, Monitoring and Maintenance Plan (OM&M Plan) for the Ditch A in this report; JCI/Tyco removed the calculation to estimate the amount of PFOA and PFOS migrating downstream from the treatment system in the ditch.

DNR Review of O&M Progress Report #7

The DNR agrees that the Ditch A treatment system, as currently maintained, is removing PFAS from the captured surface water and is reducing the amount of PFAS in the environment. Data demonstrating these conclusions were included in the O&M Progress Report #7.

Because the system was reported to capture almost all the streamflow in Ditch A, the low to non-detectable concentrations of PFOA and PFOS measured weekly in the system's effluent are expected to be representative of the surface water concentrations in Ditch A immediately downstream of the treatment system. Based on this, JCI/Tyco's revision to the OM&M Plan, in which it removed the mass calculation for PFAS migrating downstream from the treatment system, is acceptable provided that the overtopping events at the check-dam remain minimal and almost all the surface water in Ditch A continues to be treated.

The DNR has observed that the concentrations of PFOA and PFOS in Ditch A, farther downstream from the treatment system (e.g., at SW-26), remain above the Wis. Admin. Code § NR 102.04 standards even though the samples collected immediately downstream of the treatment system at SW-40 generally met standards. This suggests that PFAS-impacted groundwater, or another PFAS migration path from the Site, contributes to PFAS contamination in Ditch A at locations downstream of where the surface water is treated on the FTC property.

Next Steps

Because the concentrations of PFOA and PFOS in the surface water in Ditch A remain above the Wis. Admin. Code § NR 102.04 surface water standards, the DNR recommends that JCI/Tyco continue to operate the treatment system and submit semi-annual O&M Progress Reports (Wis. Admin. Code § NR 724.13(3)). At this time, no changes are recommended, but the following comments are noted for potential future consideration:

- If larger volumes of water go untreated in Ditch A, then an evaluation of the resulting concentrations in the downstream surface water during the times of high flow will need to be added to the OM&M Plan. (An example of such an evaluation is presented in the DNR's June 8, 2022, letter for Ditch B.)
- In the future, if the PFAS concentrations at SW-40 are greater than the Wis. Admin. Code § NR 102.04 surface water criteria, then additional evaluation may be warranted to determine the cause.
- If the PFAS concentrations measured farther downstream in Ditch A (e.g., at SW-26), continue to be greater than the Wis. Admin. Code § NR 102.04 surface water criteria, then JCI/Tyco may need to evaluate additional interim actions to address the downstream PFAS migration in Ditch A.

As a reminder, this Site is subject to an enforcement action and therefore all submittals to the DNR under Wis. Admin. Code chs. NR 700-799 and submittals directed by the DNR must be accompanied by an Wis. Admin. Code ch. NR 749 fee per Wis. Stat. § 292.94. These fees are not pro-ratable or refundable per Wis. Admin. Code § NR 749.04(1). If you have any questions about whether to include a fee with a submittal, please contact DNR staff prior to submitting a document without a fee.

If you have any questions about this letter, please contact me, the DNR Project Manager, at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov.

Sincerely,

A handwritten signature in black ink that reads "Alyssa Sellwood". The signature is written in a cursive style with a large, looped initial "A".

Alyssa Sellwood, PE
Complex Sites Project Manager
Remediation & Redevelopment Program

cc: Jodie Peotter, DNR (via email: Jodie.Peotter@wisconsin.gov)