



November 17, 2023

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 Deep Aquifer Bedrock Well Design and Long-Term Monitoring –
Interim Response Status Update
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI
BRRTS #02-38-580694

Dear Ms. Nelson:

On Aug. 24, 2023, the Wisconsin Department of Natural Resources (DNR) received the *Deep Aquifer Bedrock Well Design and Long-Term Monitoring – Interim Response Status Update* (the “Deep Well Update”) for 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 included the fee required under Wisconsin Administrative Code (Wis. Admin. Code) § NR 749.04(1) for DNR review and response.

Within this letter, the DNR summarizes its review of the Deep Well Update and outlines an approach for JCI/Tyco to document completion of the work it has proposed for this interim remedial action.

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.

PFAS from the FTC have impacted private drinking water wells in the area. JCI/Tyco has defined a boundary and designated it the Potable Well Sampling Area (PWSA)¹. JCI/Tyco provides alternative drinking water (bottled water and/or point of entry treatment [POET] systems) and has offered residents in PWSA the option to replace their existing private well with a new deep well – wells installed to approximately 500 feet below ground surface (bgs) with a casing set to approximately 150 feet bgs.

On Sept. 27, 2022, JCI/Tyco submitted its plans to install new deep private wells and its plan to monitor water quality long-term in the deep aquifer beneath the PWSA using a monitoring well network. The DNR reviewed and responded to these plans on Nov. 18, 2022. In that response, the DNR made recommendations and requested that JCI/Tyco submit an update within 6 months after wells for the deep monitoring network were installed.

¹ The PWSA was designated prior to completion of the site investigation. The area(s) impacted by PFAS from the FTC will be determined when the site investigation that meets all applicable requirements (Wis. Admin. Code ch. NR 716) is complete. The PWSA does not necessarily include all persons whose water supply has been or is likely to be affected by migration of contamination from the FTC (Wis. Admin. Code § NR 708.05(4)(f)).

Summary of the Deep Well Update

Two of the four wells proposed for the deep monitoring network (deep monitoring wells DMW-01 and DMW-02) were completed in Feb. 2023; however, the other two wells (DMW-03 and DMW-04) were delayed pending access agreements and are anticipated to be complete by the end of 2023. Rather than wait for completion of all four wells, JCI/Tyco submitted the Deep Well Update 6 months after completion of DMW-01 and DMW-02. At the time that the Deep Well Update was submitted, 10 deep private wells had also been installed. The construction and initial monitoring results from deep monitoring wells DMW-01, DMW-02 and the 10 new deep private wells were documented in the Deep Well Update. (Leading up to this, JCI/Tyco had also copied the DNR on the notifications to individual residents regarding the construction and testing results from each new deep private well per Wis. Admin. Code § 716.14(1)).

JCI/Tyco's PWAS Deep Well Update included the following:

- Updated well design details to retrofit certain deep wells with a liner to approximately 300 feet below ground surface (bgs). This modification was needed for DMW-01 and possibly other deep wells that encounter a shale seam below the depth of the casing – a seam which produces sulfur rich water with a strong sulfur odor.
- The geophysical well profiling results for deep monitoring wells DMW-01 and DMW-02.
- Well construction forms and unique well IDs for each of the new deep wells.
- Well abandonment forms for the private wells that were removed and replaced with a new deep well.
- Monitoring results for PFAS and other water quality parameters from the new deep private wells and new deep monitoring wells.
- Monitoring results for PFAS and other water quality parameters after water treatment (water softening and reverse osmosis) in the new deep private wells.
- Plans to continue with the installation of deep private wells and the deep monitoring wells per approved plan, with modification to retrofit wells with a deeper liner if needed.
- Plans to report on completion of the deep aquifer monitoring network after completion of deep monitoring wells DMW-03 and DMW-04, including an assessment if the water quality measured in the four wells is a good measure of the overall water quality delivered by the new deep private wells.

DNR Review

JCI/Tyco's Deep Well Update provided the information requested in the DNR's Nov. 2022 letter. The data presented in the Deep Well Update demonstrate:

- PFAS concentrations in the deep aquifer are currently below levels recommended by the Wisconsin Department of Health Services (DHS) for safe drinking water.
- The concentrations of naturally-occurring contaminants in the deep aquifer (radium and strontium) often exceed levels recommended for safe drinking water, and thus the DNR recommends that water treatment systems designed to remove these naturally-occurring contaminants continue to be offered and installed for residents receiving new deep private wells.
- Water treatment that has been installed to date on the new deep private wells (water softener for the house and reverse osmosis at the tap) is effective, upon installation, at removing the radium and strontium to recommended safe drinking water levels and improving the aesthetic water quality.
- The long-term effectiveness of the treatment systems and adequacy of the routine maintenance schedule in sustaining effective treatment will be determined in future monitoring.

- Sulfur-rich water may impact some wells and a deep liner retrofit is planned for those wells to prevent sulfur rich water from entering the well. Data to document the effectiveness of this modification were not available at the time of the Deep Well Update.

Next Steps

The DNR appreciates the opportunity to review JCI/Tyco's Deep Well Update, which included a plan to document completion of the deep monitoring well network. To ensure the DNR has timely access to information and to streamline future submittals, the DNR requests that JCI/Tyco use the following approach to document the remaining work.

Deep Monitoring Wells:

Submit a report to the DNR documenting completion of the deep well monitoring network within **60 days** after receipt of the laboratory data from initial testing of deep monitoring wells DMW-03 and DMW-04 (Wis. Admin. Code § 716.15(1)(a)). A DNR technical review fee is not required for this report. The following information is requested for the report:

- As-built design schematic for deep monitoring well DMW-01 (with liner), and an evaluation about the effectiveness of the design modification in preventing sulfur rich water from entering the well.
- Well construction reports, geophysical logs and laboratory reports.
- Table with well construction details and map showing the as-built locations of the four wells.
- Summary of the testing results for the four deep monitoring wells.
- A plan for reporting long-term monitoring results for the deep monitoring network. If JCI/Tyco would like these with other long-term monitoring for Site, that would be agreeable, with two conditions:
 - Maintain separate summary tables and evaluation of the deep aquifer in the reports.
 - If results from sampling indicate migration of PFAS into the deep aquifer or that the water quality has shifted toward conditions that may be less safe to drink, then these results should be reported and discussed *immediately* to the DNR and should not wait for a future documentation report.

Deep Private Wells:

Document progress and completion for the deep private drinking water wells with the following three tasks:

- Continue to copy the DNR on the notifications sent to property owners with well construction details and sampling results (Wis. Admin. Code § 716.14(1)).
- Update Figure 1 and Table x.4 and submit the updates **quarterly** to the DNR starting in Feb. 2024 until installation of the deep private wells are complete. Please add the well depth to the table and note if a well required a retrofit with deeper liner.
- Submit a final interim action report (Wis. Admin. Code § NR 724.15) within **60 days** after receipt of laboratory data of raw water and initial post-treatment water from the last well to be installed. The following information is requested, at a minimum, for the report:
 - Final versions of Table x.4 and Figure 1.
 - Schematics of the wells construction details and specifications for the water treatment system(s).
 - Table summarizing the raw water sampling results for each new deep private well.
 - An assessment if the results of monitoring from the four deep monitoring wells (DMW-01 to DMW-04) are representative of the water quality observed in the new deep private wells.

- Table summarizing the post-treatment results available to date for each new deep private well.
- Evaluation on effectiveness and operation and maintenance plans for the water treatment systems installed on the new deep private wells.
- Well construction logs for each of the deep private wells.
- Well abandonment forms for each well that was replaced and description or summary of any wells that were not abandoned and why.

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 (unless otherwise directed by the DNR) must be accompanied by a 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, please contact me at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov.

Sincerely,



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

cc: Christine Sieger, DNR (via email: Christine.Sieger@wisconsin.gov)
Jodie Thistle, DNR (via email: Jodie.Thistle@wisconsin.gov)
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