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September 24, 2020

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SUBJECT: Response to Interim Site Investigation Report - Additional Investigation Needed
JCI/Tyco Fire Technology Center, 2700 Industrial Parkway South, Marinette
WDNR BRRTS #: 02-38-580694

Dear Mr. Wahl & Mr. Bethel:

On June 5, 2020, the Wisconsin Department of Natural Resources (DNR) received the *Interim Site Investigation Report* (Report) for the above-referenced site, dated May 2020, and submitted by your consultant, Arcadis U.S., Inc. (Arcadis), on your behalf. The report was accompanied by the appropriate fee of $1050, required under Wisconsin Administrative Code § NR 749.04(1), for formal DNR review and response. Based on review of the submittal, DNR has determined that additional investigation is needed.

Background

On January 17, 2018, Johnson Controls, Inc and Tyco Fire Products, LP (JCI/Tyco) reported a discharge of per- and polyfluoroalkyl substances PFAS compounds to the environment. The discharge occurred as the result of PFAS-containing aqueous film forming foams (AFFF) being discharged as part of firefighting training activities conducted at the JCI/Tyco Fire Technology Center (FTC) commencing in the 1960s through the fall of 2017.

Data collected as part of site investigation activities indicate PFAS contaminants have spread from the FTC via surface water and groundwater, impacting private potable wells and private surface water features in the Town of Peshtigo. Data appears to indicate PFAS contaminants have spread east to the Bay of Green Bay (Lake Michigan).

Interim Site Investigation Report Summary

The Report is a comprehensive data report that provides a summation of data collected as part of the site investigation process for the FTC site through December 2019. The site investigation has been conducted in multiple phases and consisted of data collection to investigate the nature and extent of PFAS contamination in soil, groundwater, surface water, stormwater and sediment within and around the FTC site area and obtain geologic and hydrogeologic data to characterize site conditions.

The Report was produced in conjunction with the Conceptual Site Model (CSM) Report (Arcadis, May 2020). The CSM was composed to "provide a framework for data completeness determination to prepare a Comprehensive Site Investigation Report (CSIR), and to summarize the current understanding of relationships among PFAS sources, nature and extent, fate and transport, and exposures and receptors at the site."

The conclusions of the report include the following:

- The delineation of combined perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) concentrations in groundwater exceeding the proposed enforcement standard (ES) of 20 nanograms per liter (ng/L) is complete;
- Delineation of PFOA and PFOS in surface water streams and ditches at concentrations exceeding DNR surface water quality guidelines is complete;
- Sediment data collected to date from surface water streams and ditches is sufficient to evaluate the nature and extent of PFAS in sediment;
- Stormwater data collected to date is sufficient to evaluate the nature and extent of PFAS in stormwater;
- Delineation of PFAS compounds in soil at the FTC in concentration above the DNR NR 720 residual contaminant levels (RCLs) is complete;
- On-going interim remedial actions involving distribution of drinking water and application of point of entry treatment (POET) systems will continue for public safety until a long-term solution is in place;
- The operation of surface water treatment systems on Ditches A and B to mitigate PFAS compounds in surface water will remain in operation until a final remedy is in place at the FTC;
- Data collected and summarized in the Report will be used to determine future site actions to address other potential PFAS-impacted media associated with the FTC.

Report Review

Wis. Admin. Code § NR 716.11(3)(a) states "the purpose of a field investigation shall be to: determine the nature, degree and extent, both areal and vertical, of the hazardous substances or environmental pollution in all affected media." Additional investigation (and/or documentation) is needed to fully define the degree and extent of per- and polyfluoroalkyl substances (PFAS) contamination at the site. Specifically, the following deficiencies were noted during review of the report.

<u>PFAS Nature and Extent</u>

The Report states that the nature and extent of PFAS contamination in groundwater, surface water, sediment, and soil in and around the FTC is complete based on data collected for those media through December 2019. DNR comments on nature and extent as it relates to each of these media are as follows:

- Groundwater:
    - The DNR does not concur with the conclusion that extent of PFAS contamination in groundwater is adequately delineated. Figure 15 of the Report presents a single 20 ng/L line to depict the perceived area of groundwater impacts extending radially from the FTC. Per Wis. Admin. Code § NR 716.15(4)(c), an isoconcentration map is required depicting concentrations in each environmental media. In addition, the plume should be plotted to the proposed Wis. Admin Code ch. NR 140 preventative action level (PAL) of 2 ng/l, as remedial actions are being decided based on PFAS detections below 20 ng/l. The report indicates detailed plume plots are being deferred to a planned subsequent submittal of a three dimensional groundwater flow and contaminant transport model; however, preliminary drawings of the PFAS plume data/extent are necessary in

order to help visualize the plume based on current data and analysis, and to allow comparison of the current interpretation to future modeled results.

- Nature and extent in groundwater cannot be adequately assessed until the piezometer or monitoring well network is sampled and other investigation activities are complete based on data gaps identified with the three-dimensional model and other data requested by the DNR, per the May 27, 2020 Southern Area Groundwater Report and Response Letter. This includes installation and sampling of permanent groundwater monitoring wells where only vertical aquifer profile (VAP) sampling has been completed, as VAP sampling should be confirmed with permanent well data (Wis. Admin. Code § NR 716.13(10)). The DNR does not concur with any approach where a single round of VAP sampling is utilized to define the degree and extent of PFAS contamination given the large geographic area of this site.

- Ditch Surface Water and Sediment:
  - The DNR does not concur with the conclusion that nature and extent of PFAS impacts in surface water and sediment are adequately investigated. Surface water and sediment sampling in the site ditches and some off-site ponds has been completed and the ditch sampling has served to delineate the majority of current PFAS concentrations in the ditches. However, additional sampling in Ditch A is necessary should be conducted south of both Madsen Road and sampling location SW-12. Currently, there are two sampling locations (SW-10 and SW-34) south of SW-12. Surface water sampling should also be conducted in the Little River, east of its confluence with Ditch A, to Green Bay with at least one surface water and sediment location west of the confluence. This is important as PFAS concentrations in this "Southern Area" (see Southern Area Report, Arcadis, March 2020) are being assessed, and the impacts to surface water and sediment in the ditch and river in this area should be investigated (Wis. Admin. Code § NR 716.11(3)(a)).

  - The ditch sampling has generally served to delineate PFAS concentrations in the ditches (current) but does not assess historical concentrations, which are likely an important factor related to PFAS transport and resultant nature and extent associated with historically high PFAS concentrations in ditch surface water. Similarly, as referenced in the CSM, Ditch A historically flowed to the north and therefore additional investigation to the north of the FTC will be required to address data gaps to the north (Wis. Admin. Code § NR 716.11(3)(a)).

- Wetlands Surface Water and Sediment:
  - Wetlands across the FTC are mapped in the CSM. To date, no surface water or sediment sampling has been conducted in the wetlands that provide a potential pathway for PFAS migration. Wetlands of interest primarily include those south of the FTC adjacent to and along Ditch A; however, wetlands extending in any direction from the FTC source area and along other ditches should be evaluated to further determine the nature and extent of PFAS in surface water and sediment. Further explanation of wetland conditions in potential PFAS contaminant fate and transport should be provided and assessed (Wis. Admin. Code § NR 716.11(3)(a)).

- Soil:
  - Delineation of PFAS in the presumed FTC source area cannot currently be considered complete. The conclusion in the Report is based on sampling results at 47 on-site locations, none of which were collected from areas where a 2006 excavation to remove petroleum impacts was conducted. The extent of these excavation activities should be mapped to validate this conclusion. In addition, the report does not indicate if any other activities, such as the 2006 excavation, have

been conducted at the Site that may have disturbed surface soil (Wis. Admin. Code § NR 716.11(3)(a)).

- Other potential source areas at the FTC (i.e., other historical training areas [potentially west of the current OTA], outdoor storage or potential locations of spills, former soil stockpile areas, and similar relevant areas), should be identified, mapped, and evaluated. Both the historical and current operational areas should be evaluated based on the soil data collected to date. An analysis should then be provided that discusses how each area is characterized for PFAS nature and extent. Until this is completed, a determination as to whether the on-site soil contamination has been fully characterized and delineated cannot be made (Wis. Admin. Code § NR 716.11(3)(a)).

Geology and Hydrogeology Characterization

- The Report fails to adequately provide interpretation of site geology and hydrogeology (Wis. Admin. Code § NR 716.15(3)(h)). Groundwater investigations that provide data relevant to geology and hydrogeology are described, however that data has not been interpreted and fit into a comprehensive site characterization, especially in relation to contaminant transport and nature and extent in the subsurface. Additional site cross-sections should be provided through the western side of the site area, from west to east on the south side of the area and along the Green Bay shoreline. Cross-sections should contain PFAS concentrations in groundwater where available along the sections (Wis. Admin. Code § NR716.15(4)d)).

- The Report should provide discussion to indicate locations of perceived preferential flow in the unconsolidated deposits based on aquifer heterogeneity in order to better understand contaminant flow and transport, and contaminant nature and extent on a more local scale, including along plume edges (Wis. Admin. Code § NR 716.15(3)(h)).

- Different techniques were described for bedrock characterization related to the on-site production well and select bedrock borings, that generally concluded negligible groundwater flow in the bedrock; however, no regional or local geologic structural features are discussed and/or shown (i.e., faulting) in the bedrock or unconsolidated deposits along with discussion of potential influence on groundwater and contaminant transport. A discussion of this data/analysis should be included in the Report (Wis. Admin. Code § NR 716.15(3)(h)).

Aquifer Profiling Methods

- A high percentage of the groundwater data collected through December 2019 was obtained through vertical aquifer profile (VAP) borings/methodology, which is generally considered a screening process at remedial action sites in Wisconsin and should be confirmed with permanent monitoring well installation and sampling. Therefore, to adequately assess aquifer profiling methods, the site investigation requires the existing piezometer/monitoring well network be sampled and the installation of additional piezometer/monitoring wells where the current array does not adequately cover the area (Wis. Admin. Code § NR 716.13(10)).

Conclusion

Future site investigation workplans must address and incorporate site investigation activities aimed at addressing the data gaps and deficiencies identified above and in the CSM response letter, dated September xx 2020.

Be aware that during your investigation, you are required to comply with Wis. Admin. Code chs. NR 700-754 and all other applicable statutes and administrative rules, including those pertaining to solid and hazardous waste management and/or wastewater discharges. Wis. Admin. Code ch. NR 716 details specific requirements for site investigations and for interpretation and presentation of your findings.

Thank you for submitting this Report with a fee. As a reminder, this site is subject to an enforcement action and therefore all submittals to the DNR under Wis. Admin. Code chs. NR 700-754 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. 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.

The DNR appreciates your efforts to investigate and remediate this property. If you have any questions or concerns, please feel free to contact me at (920) 362-2072 or via email at david.neste@wisconsin.gov.

Sincerely,

David Neste
Hydrogeologist
Northeast Region Remediation & Redevelopment Program

cc:

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