



September 24, 2020

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MARINETTE WI 54143

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MARINETTE WI 54142

SUBJECT: Response to Conceptual Site Model  
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 letter titled *Conceptual Site model* (CSM) for the above-referenced site, dated May 26, 2020, and submitted by your consultant, Arcadis U.S., Inc. (Arcadis), on your behalf. The letter was accompanied by the appropriate fee of \$700, required under Wisconsin Administrative Code § NR 749.04(1), for formal DNR review and response.

### Background

On January 17, 2018, 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) from approximately 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).

### Conceptual Site Model Summary

The CSM was submitted at the request of the DNR in order to provide a working model of the site geology, hydrogeology, and nature, and extent of PFAS impacts in soil, groundwater, surface water and sediment at the FTC based on site investigation data collected through December 2019. This includes discussion of the primary PFAS source area, contaminant transport pathways, and potential receptors.

The stated objective of the CSM is to “provide a framework for data completeness determination to prepare a Comprehensive Site Investigation Report (SIR) and to summarize the current understanding of relationships among sources, nature and extent, fate and transport, and exposures and receptors at the site.”

The CSM was submitted in conjunction with the *Interim Site Investigation Report* (Arcadis, May 2020). The *Interim Site Investigation Report* is a comprehensive data report that provides a summation of data collected as part of the site investigation process for the FTC through December 2019. The CSM focuses on the portions of the City of Marinette and the Town of Peshtigo where the investigations described in the ISIR were conducted.

The CSM states the following:

- AFFF application on the Outdoor Training Area (OTA) is the primary PFAS source at the FTC;
- PFAS compounds have migrated into groundwater via infiltration through the soil at the OTA and from surface water in the losing segment of Ditch A from approximately University Avenue Drive to Madsen Road;
- The surface flow features identified as Ditches A and B are the most impacted surface water associated with the site. Impacts to these ditches occur from overland flow and discharge of impacted groundwater to the ditch surface water. Other ditches (C, D and E) are also impacted by discharge of groundwater to ditch surface water downgradient of the site;
- The highest sediment concentrations of PFAS have been detected in Ditches A and B, and sediment concentrations drop off quickly with distance from the OTA source area;
- The only potential aerial release mechanism of PFAS at the OTA source area is historical migration of foam from outdoor AFFF testing and training activities. This is not considered a significant transport mechanism to media off-site.

## Report Review

Based on the DNR's review of the submitted CSM, the DNR concludes the following:

### General

- The CSM is reported to provide a framework for data completeness determination; however, a determination has not been made in this CSM. Data has been presented and conclusions given without any evaluation of remaining data gaps. The CSM should identify data gaps and make recommendations or provide general approaches for how these data gaps are to be addressed.
- A revised and updated CSM should include a flow chart of Primary Media, Primary Release Mechanisms, Secondary Media, Secondary Release Mechanisms, Pathways and Contaminated Media, and Receptors. This will allow identification of data gaps by media and pathways to evaluate progress and determination as to when the site investigation is complete.
- The CSM lacks a detailed discussion of all site operations through time. A chronology of activities including history of fire training activities along with types of foams used/stored should be included.

- The CSM lacks consideration of historical processes on site and historical hydrology. The report briefly describes historical development of structures on site but does not include historical aerial imagery or descriptions of site development and excavations.
- The CSM should provide consideration to the 34 PFAS compounds in the Wis. Admin. Code NR 140 Cycle 11. These additional PFAS analytes should be considered based on likelihood for proposed enforcement standards in the fall of 2020.

### Plume Interpretation

- The DNR does not concur with the conclusion that extent of PFAS contamination in groundwater is adequately delineated. Figure 27 of the CSM 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 iso-concentration map is required to depict concentrations in each environmental media. In addition, the plume should be plotted to the proposed DNR 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 future submittal of a three dimensional groundwater flow and contaminant transport model; however, preliminary drawings of the PFAS plume data/extent should be provided 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.
- The northeast lobe of the plume extends well beyond Ditch B which is defined as predominately a gaining stream. Additional explanation should be provided regarding the extent of the plume beyond this ditch if the ditch were not losing during certain periods of time.
- The CSM lacks a statistical evaluation of site data including a geostatistical evaluation of PFAS concentrations in groundwater both horizontally and vertically. At minimum, a plume concentration map should be developed showing the full range of PFAS concentrations detected.

### Wetlands

- Wetlands across the general site area are depicted on Figure 5. Further discussion as to their role in potential PFAS contaminant fate and transport should be provided in the CSM. To date, no surface water, sediment or pore water samples have been collected 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 east and southeast of the FTC should also be considered in the CSM.

### Geology/Hydrogeology

- More description and definition of the site area geology/hydrogeology has been provided in the CSM than in previous reports. This has been done with text description and through the portrayal of two cross-sections. 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 soil and groundwater concentrations where available along the sections.

- 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.
- Regional and local geologic structural features should be discussed and shown (i.e., faulting) in the unconsolidated deposits and bedrock along with discussion of any influence on groundwater and contaminant flow.

#### PFAS Composition vs. Plume Demarcation

- Various statements are made in the text relating plume position associated with only the OTA as opposed to other potential sources. Additional data regarding PFAS contaminant fate and transport is required to support the current CSM regarding plume demarcation, along with detailed plume plots, a PFAS source inventory and PFAS signature analysis related to the mixture of AFFF used on the OTA over the operational history of the OTA.

#### Air Source

- With respect to the CSM, aerial deposition was not fully evaluated as surface soil sampling has only been conducted on-site. Additional surface soil sampling should be conducted in off-site locations particularly in areas where other PFAS migration pathways are incomplete (i.e., upgradient areas) and in undisturbed areas where development or erosion has not altered the depositional area.

## Conclusion

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. Submit an updated CSM in conjunction with the next site investigation report that addresses the comments and data gaps presented in this response letter.

Thank you for submitting this CSM 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](mailto:david.neste@wisconsin.gov).

Sincerely,



David Neste  
Hydrogeologist  
Northeast Region Remediation & Redevelopment Program

cc:

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