



June 17, 2021

MR. JEFFREY DANKO
JOHNSON CONTROLS, INC
5757 N. GREEN BAY AVENUE
MILWAUKEE, WI 53209

MR. SCOTT WAHL
TYCO FIRE PRODUCTS LP
1 STANTON STREET
MARINETTE, WI 54143

SUBJECT: Response to the Soil Interim Remedial Action Design Report
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI
BRRTS #02-38-580694

Dear Mr. Danko and Mr. Wahl:

On March 15, 2021 the Wisconsin Department of Natural Resources (DNR) received the *Soil Interim Remedial Action Design Report* (Soil RADR) for the above-referenced site submitted by Arcadis U.S., Inc. (Arcadis), on behalf of Johnson Controls, Inc. and Tyco Fire Products LP (JCI/Tyco). The report was accompanied by the appropriate fee of \$1,050, required under Wisconsin Administrative Code (Wis. Adm. Code) § NR 749.04(1) for formal DNR review and response.

The DNR thanks JCI/Tyco for its plans to remove per- and polyfluoroalkyl substances (PFAS) mass from the site. The DNR concurs with JCI/Tyco's interim action plan to excavate and dispose of highly contaminated soils¹ from the site and recommends that JCI/Tyco collect soil and groundwater samples to document the outcomes from this action. The DNR's concurrence does not constitute approval of the engineering design or approval for other permits or permissions that JCI/Tyco must obtain to execute the work. Following completion of this interim action, JCI/Tyco may be required to complete further sampling and take additional actions to address areas of residual soil contamination. This letter provides JCI/Tyco with list of other actions it must take to comply with certain requirements in Wis. Adm. Code chs 700-799 for this soil interim action.

Background

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

Data collected to date by JCI/Tyco indicates PFAS contaminants have spread from the FTC and impacted private and public potable wells and surface water in the town of Peshtigo and the Bay of Green Bay in Lake Michigan. JCI/Tyco's Wis. Adm. Code ch. NR 716 site investigation is on-going.

¹ The term "highly contaminated soils" is a general term from Wis. Adm. Code § NR 708.11(2)(b) for interim actions that occur before completion of a site investigation.

The FTC includes an approximate 9-acre plot referred to as the Outdoor Testing/Training Area (OTA). The OTA is primarily gravel, but also contains concrete and clay pads, steel pans and props where fires were started and extinguished. AFFF was used at the OTA for a variety of activities including research and development, fire testing and firefighting training. PFAS from these and other Site activities were detected in the soil samples in and around the OTA.

Using the current available data, JCI/Tyco identified areas of soil that contain the highest combined concentration of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). The areas are generally associated with the historical outdoor uses of AFFF and surface water runoff from those areas. JCI/Tyco has proposed an interim action to remove these highly contaminated soils from the Site.

Soil Interim Action Design Report Summary

JCI/Tyco's proposed soil interim action is described in the Soil RADR. JCI/Tyco's objective for the soil interim action is to reduce the amount of residual PFAS present in the unsaturated zone at the Site and to reduce the mass flux of PFAS from the soil to groundwater.

JCI/Tyco plans to excavate approximately 1,250 cubic yards (cy) of PFAS-contaminated soils from five areas as summarized in the table below; these areas are also shown on Figures 4 and 5 (**Attachment A**). Each of these areas (A-E) surround a location where a soil sample was collected and soil concentrations of PFOS + PFOA in the sample were greater than 500 parts per billion (ppb), with other PFAS compounds also being detected. JCI/Tyco plans to excavate the soil above the water table (approximate upper 3 feet of soil) in each area (A-E) and to dispose of the soil at the Waste Management facility in Arlington, Oregon.

Excavation Area ID	Historical Site Investigation Data				Excavation Details (estimates)			
	Soil Boring ID	Concentration (ppb)			Area (sf)	Depth (ft)	Volume (cy)	
		PFOA	PFOS	PFOA+PFOS				
Area A	SS-139 (0.5-1.2')	1,100	< 24	1,100	3,818	3	424	
Area B	FTC-77 (0')	18	580	598	2,090	3	232	
Area C	SS-129 (2-3')	87	450	537	2,397	3	266	
Area D	SS-101 (3')	1,300	17	1,317	1,657	3	184	
Area E	SS-133 (0.8-1.4')	32	800	832	1,316	3	147	
TOTAL								1,253

In 2020, JCI/Tyco excavated other PFAS-impacted materials at the Site during construction of a storm water detention pond and as part of the construction of an addition to Building 105 (aka., the Advanced Research and Testing Facility [ARTF]). In total, JCI/Tyco excavated approximately 5,260 cy of PFAS-impacted soils and 154 tons of concrete and debris and stockpiled the material at the Site. The two excavation areas and the stockpile staging areas are shown on Figure 1 (page 3) in **Attachment A**. Twenty-four soil samples were collected from the soil stockpiles, and the results for PFOA + PFOS ranged from 0.2 to 10,500 ppb; other PFAS compounds were also detected.

In a preliminary Materials Management Plan (MMP) submitted to DNR on August 11, 2020, JCI/Tyco indicated plans to keep the stockpiled materials on-site; however, in the Soil RADR, JCI/Tyco identifies plans to transport and dispose of the stockpiled materials at the Waste Management facility in Arlington, Oregon as part of the soil interim action. The stockpiles generated during construction of the ARTF are currently covered and lined with 10-mil polyethylene that has a 12-inch berm of sand around the perimeter. The stockpiles are routinely inspected to ensure the polyethylene cover remains secure and in place².

² On May 10, 2021 the DNR issued a letter of concurrence to JCI/Tyco regarding its temporary stockpiling of these materials generated during construction of the ARTF (**Attachment B**).

JCI/Tyco's Soil RADR included the PFAS soil sampling results from the site investigation work completed to date and from the characterization of the stockpiles from the ARTF construction projects. The Soil RADR identified the five areas of highly contaminated soil to be excavated and plans to backfill the areas with clean fill and finish the surface to match the existing cover type. The report also included information on equipment decontamination and dust monitoring activities that will occur during the excavations, plans to load, transport, and dispose of the soils at the Waste Management facility in Arlington, Oregon, a summary of permitting requirements and a proposed schedule.

To evaluate risk from contaminants detected in soil, the soil concentrations are compared to Wis. Adm. Code ch. NR 720 residual contaminant levels (RCLs) that are protective of human health from direct contact with the soil (e.g., incidental ingestion or dermal absorption) and RCLs that are protective of groundwater (i.e., soil concentrations that will not leach and cause an exceedance of groundwater standards).

- In the Soil RADR, JCI/Tyco presented the direct contact Wis. Adm. Code ch. NR 720 RCLs for PFOA and PFOS, which are 1,260 ppb (non-industrial) and 16,400 ppb (industrial) for each compound³.
- In its Site Investigation and Conceptual Site Model Reports dated June 2020, JCI/Tyco calculated groundwater RCLs (Wis. Adm. Code § NR 720.10) for the Site, which were PFOA = 5 ppb and PFOS = 0.9 ppb. (JCI/Tyco did not include the groundwater RCLs in the Soil RADR.)

For this soil interim action, JCI/Tyco has not established soil cleanup standards and does not plan to collect confirmation soil or groundwater samples. It is expected that soil with PFAS concentrations greater than the JCI/Tyco's calculated groundwater RCLs will remain on Site following the interim action, but that the residual concentrations of PFAS in the soils will be less than the direct contact RCLs.

DNR Review

The DNR reviewed the Soil RADR and concurs with JCI/Tyco's proposed excavation of highly contaminated soils from the OTA as an interim action for the Site under Wis. Adm. Code NR § 708.11(2)(b). The DNR's concurrence does not constitute an approval of the engineering design or an approval of any other permits or permissions that JCI/Tyco must obtain before constructing or implementing the interim action.

Below, the DNR provides JCI/Tyco with technical review comments for the Soil RADR and identifies specific actions JCI/Tyco must take to comply with certain requirements in Wis. Adm. Code chs. 700-799 for this soil interim action. None of these comments or actions should cause delay in JCI/Tyco's ability to proceed with the soil interim action.

Technical Review:

The DNR finds that JCI/Tyco's soil interim action is designed to reduce the amount of PFAS in unsaturated soil at the Site. The DNR agrees with JCI/Tyco's conclusion that PFAS concentrations in the unsaturated soil (upper 3 feet) are generally below concentrations that pose a direct contact risk to human health, and finds that targeting removal of the highly contaminated soils will further reduce the potential for direct contact risk and will remove PFAS mass from the environment at the Site.

The DNR further agrees that removal of highly contaminated soils will reduce the mass flux of PFAS to groundwater at the Site. However, the DNR finds it important to note that soil having PFAS concentrations greater than JCI/Tyco's previously calculated groundwater pathway RCLs of PFOA = 5 ppb and PFOS = 0.9 ppb (Figure 4 in **Attachment A**) will remain over much of the OTA following the completion of the soil interim action. Although PFAS-mass flux to groundwater will be reduced by the soil interim action, the residual soil contamination may continue to be a source of PFAS to the groundwater at the Site. A groundwater monitoring

³ Direct contact Wis. Adm. Code ch. NR 720 RCLs are also available for perfluorobutane sulfonic acid (PFBS), which are 1,260,000 ppb (non-industrial) and 16,400,000 ppb (industrial). PFBS is not a contaminant of concern in soil at the site (i.e., it is generally less than the reporting limit or less than 1 ppb in the soil samples).

program designed to evaluate the risk to groundwater from the residual soil contamination would help to address if additional actions or performance standards established under Wis. Adm. Code § NR 720.08(2) are needed to achieve the final remedial goals for the site.

The DNR understands that JCI/Tyco has not established soil cleanup standards for the soil interim action. Following completion of the site investigation, JCI/Tyco will be required to determine soil cleanup standards per Wis. Adm. Code ch. NR 720, which include RCLs protective of groundwater. The DNR further understands that JCI/Tyco does not intend to collect soil confirmation samples or groundwater samples for the soil interim action. Although not required, the DNR recommends JCI/Tyco complete the following sampling for the soil interim action to provide data to support conclusions and reduce future sampling efforts:

- Collect soil samples from the sidewalls and base of the excavations during the interim action to document the residual soil concentrations. If confirmation soil samples are not collected at the time of the interim action, then soil sampling will likely be required in the future to complete the Wis. Adm. Code ch. NR 716 site investigation in those areas and to make decisions on the need for additional remedial actions or soil performance standards per Wis. Adm. Code ch. NR 720.
- Collect groundwater samples to evaluate PFAS concentrations in the shallow groundwater near the OTA prior to and on a routine basis (e.g., semi-annually) following the soil excavation. This could be done with a small network of existing monitoring wells. The results from the groundwater sampling could be used to support conclusions on the effect the soil interim action had on PFAS concentrations in groundwater and to make decision on future potential remedial actions for soil (e.g., this data could inform if the residual soil contamination is or is not acting as a continuing source of PFAS to groundwater).

One final note, in Section 6 of the Soil RADR, JCI/Tyco lists plans to obtain a Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit for storm water runoff during construction. If JCI/Tyco anticipates it will need to dewater the excavations during the soil interim action, it must also obtain a WPDES General Permit for Contaminated Groundwater prior to start of the work.

Required Actions:

The DNR has identified the following action that JCI/Tyco must complete to comply with certain requirements in Wis. Adm. Code chs. 700-799 for this soil interim action:

- 1) Provide public notification on the soil interim action⁴ that aligns with the information submitted to the DNR in the Soil RADR per Wis. Adm. Code § NR 714.07.
- 2) Comply with requirements in Wis. Adm. Code § NR 718.05 for temporary on-site storage of any soil excavated from Areas A -E if the soil cannot be directly loaded for off-site disposal at time of excavation.
- 3) Submit an interim action documentation report meeting the requirements of Wis. Adm. Code § NR 708.15 within 60 days after completion of the work. Work is considered complete when all the soil included in the interim action has been received by the disposal facility and the site restoration is complete.

Further information on the *Wis. Adm. Code ch. NR 714 Public Notification* requirements follows:

JCI/Tyco shared its plans to excavate and dispose of soils at the OTA in public presentations and factsheets. In these public communications, JCI/Tyco states the remediation goal is to “ensure clean soil and protect

⁴ In the May 18, 2021 conditional approval of JCI/Tyco’s Groundwater Extraction and Treatment System (GETS) RADR, the DNR required that prior to initial startup of the GETS, JCI/Tyco must revise its GETS factsheet(s) and host at least one public meeting to notify the public of the expected outcomes and operations of the GETS consistent with those submitted to the DNR in the GETS RADR. The DNR recommends that JCI/Tyco complete the required public notifications for the soil interim action in coordination with public notifications for the GETS.

groundwater” (e.g., JCI/Tyco’s factsheet titled “Path to Permanent PFAS Solution Phase 2: Soil Remediation” currently posted to its website). These goals are not included in the Soil RADR and JCI/Tyco has not submitted specific criteria and a monitoring program it would use to test these outcomes. **The DNR directs JCI/Tyco to revise its soil remediation factsheet(s) and host at least one public meeting to notify the public of the what the soil interim action will accomplish, consistent with the information that JCI/Tyco submitted to the DNR in the Soil RADR (Wis. Adm. Code § NR 714.07).** The JCI/Tyco’s updates to the public notifications for the Soil RADR should occur in coordination with (i.e., near or at same time as) the updates to the public notifications for the GETS RADR.

Next Steps and Conclusions:

The DNR thanks JCI/Tyco for its submittal of the Soil RADR and its plans to implement an interim action designed to reduce the amount of PFAS in unsaturated soil at the Site. **JCI/Tyco can proceed with the soil interim action and complete the required actions identified in this letter.**

JCI/Tyco is reminded that it must complete the site investigation per Wis. Adm. Code ch. NR 716 and develop soil cleanup standards for the Site per Wis. Adm. Code ch. NR 720. JCI/Tyco may be required to complete remedial actions and/or implement performance standards to address the residual soil contamination following this interim action.

Should JCI/Tyco elect to collect the recommended confirmation soil samples, these results must be submitted to DNR in the Wis. Adm. Code § NR 708.15 interim action documentation report. Should JCI/Tyco elect to complete the recommended groundwater monitoring to evaluate response to groundwater following the soil interim action, then JCI/Tyco should submit a long-term monitoring plan and report results in accordance with Wis. Adm. Code §§ NR 716.14(2) and 724.17. (The groundwater monitoring results could be submitted semi-annually in coordination with the progress reports planned for the GETS.)

As a reminder, this Site is subject to an enforcement action and therefore all submittals to the DNR under Wis. Adm. Code chs. NR 700-799 and submittals directed by the DNR must be accompanied by an Wis. Adm. Code ch. NR 749 fee per Wis. Stat. § 292.94 and NR § 728.06. These fees are not pro-ratable or refundable per Wis. Adm. 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 Site. If you have any questions about this letter, please contact me, the DNR Project Manager, at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov.

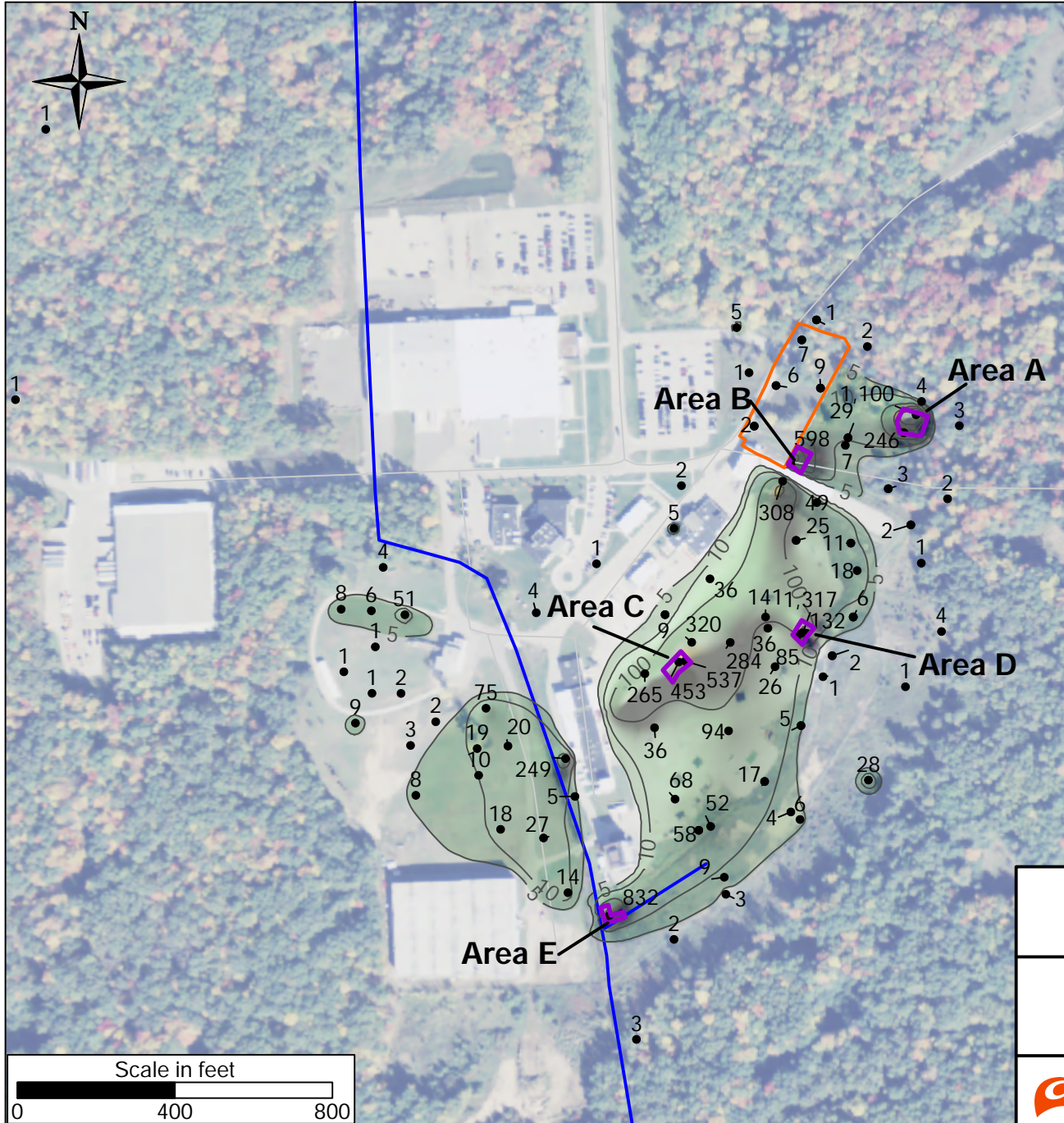
Sincerely,



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

Attachments: Attachment A: Figures from Soil RADR (3-15-2021) and MMP (8-11-2020)
Attachment B: Waste Storage Concurrence for Stockpiled Soil, Concrete, and Debris (5-10-21)

cc: Scott Potter, Arcadis (via email: Scott.Potter@arcadis.com)
Bridget Kelly, DNR (via email: bridgetb.kelly@wisconsin.gov)
Jodie Peotter, DNR (via email: Jodie.peotter@wisconsin.gov)



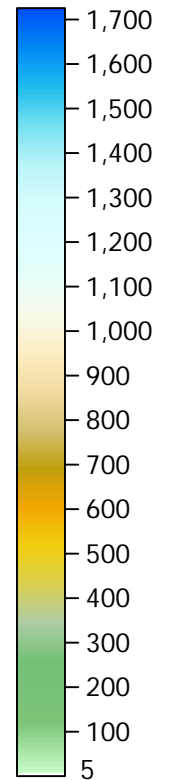
Legend

- 832 ● Soil Boring Location (PFOA +PFOS Concentration shown)
- Remediation Area
- Ditch
- Building 105 Excavation

Notes:

1. µg/kg = microgram per kilogram
2. Aerial map from USGS.
3. Soil data represent depths ranging from existing ground surface to the groundwater table (0 to 4 ft below ground surface).
4. PFOA+PFOS concentrations represent the concentrations at a given location.

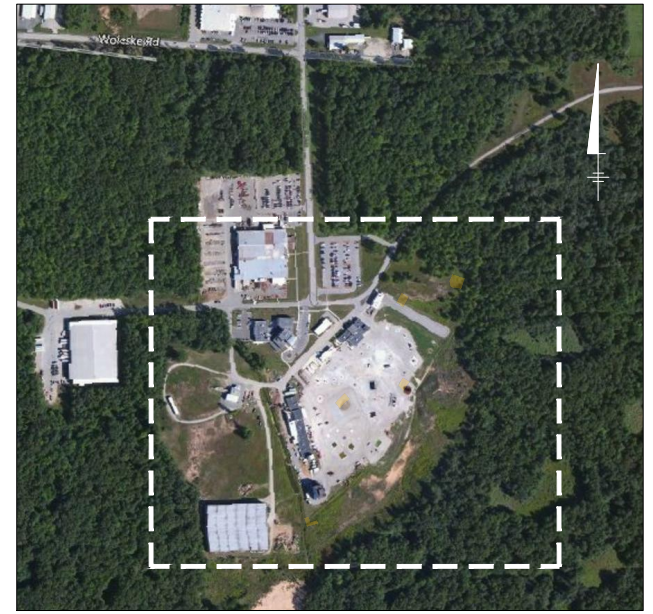
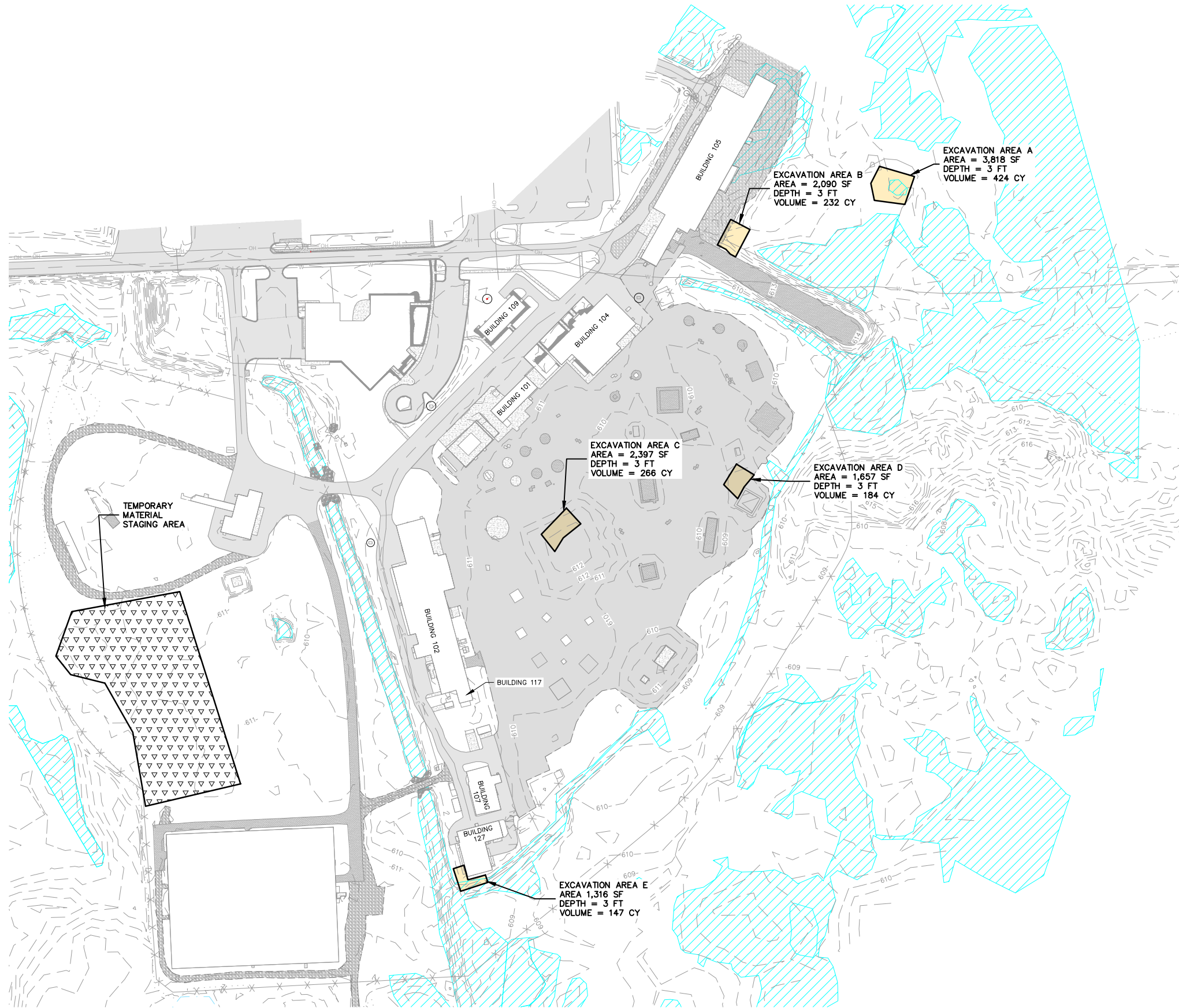
PFOA+PFOS
Soil Concentration
(µg/kg)



TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN
SOIL INTERIM REMEDIAL ACTION DESIGN REPORT

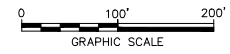
OTA SOIL SAMPLE RESULTS

XREFS: PROJECTNAME: ---
 IRM-SOIL-X-PROPOSED
 IRM-SOIL-X-WETLANDS
 IRM-SOIL-X-BASEMAP
 IRM-SOIL-X-REPORT-TITLE
 IRM-SOIL-X-PROPOSED-PATT



LEGEND

- LIMITS OF WETLANDS
- FTC DITCH A
- EXISTING CONTOUR
- LIMITS OF PROPOSED EXCAVATION
- TEMPORARY MATERIAL STAGING AREA
- LIMITS OF EXISTING GRAVEL AREA
- LIMITS OF EXISTING ASPHALT PAVING

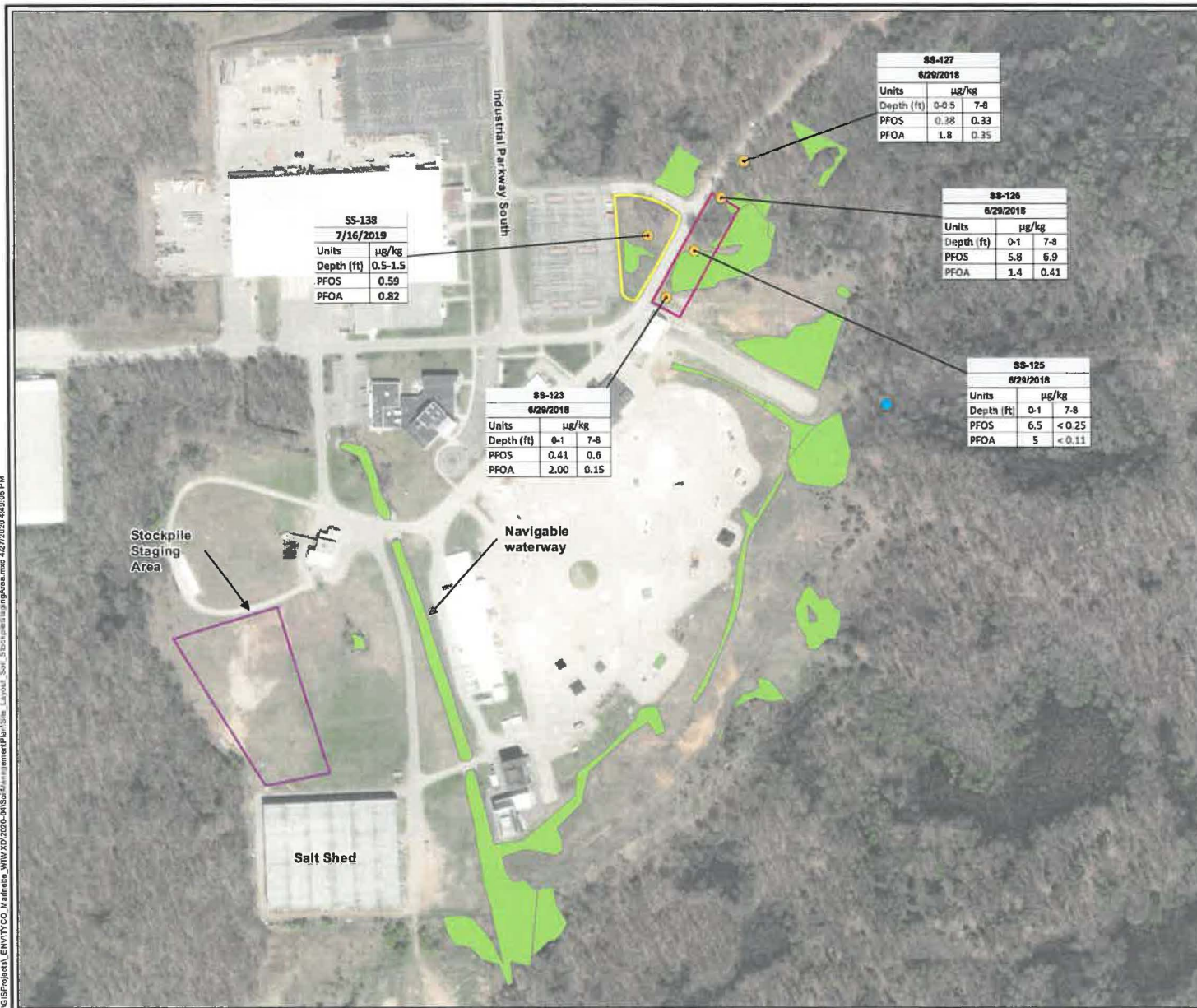


TYCO FIRE TECHNOLOGY CENTER
 MARINETTE, WISCONSIN
SOIL INTERIM REMEDIAL ACTION DESIGN REPORT

PROPOSED LIMITS OF EXCAVATION

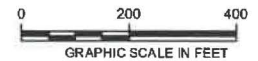
ARCADIS Design & Consultancy
for natural and built assets

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 TYCO Marinette, WI
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LEGEND:

- SOIL SAMPLE LOCATION
- PROPOSED DISCHARGE LOCATION
- StockPileStagingArea
- BUILDING EXCAVATION AREA
- DETENTION POND EXCAVATION AREA
- EXISTING WETLANDS



NOTES:

1. IMAGERY SOURCE: 4/27/2016, DIGITALGLOBE, VIVID - USA.
2. EXPECTED DEPTH OF EXCAVATION FOOTPRINT TO BE APPROXIMATELY 2 FEET. EXPECTED DEPTH OF FOUNDATION AND FOOTINGS TO BE APPROXIMATELY 4 FEET.
3. EXPECTED DEPTH OF DETENTION POND TO BE MAXIMUM 8 FEET.
4. ESTIMATED DEPTH TO GROUNDWATER 2-5 FEET.
5. TYCO COORDINATED WITH WDNR AND USACE AND RECEIVED APPROVAL PRIOR TO ANY WETLAND DISTURBANCE.

TYCO FIRE PRODUCTS LP
 MARINETTE, WISCONSIN

SITE LAYOUT
 WITH STOCKPILE STAGING AREA

ARCADIS

FIGURE
 1



May 10, 2021

MR. JEFFREY DANKO
JOHNSON CONTROLS, INC
5757 N GREEN BAY AVENUE
MILWAUKEE, WI 53209

MR. SCOTT WAHL
TYCO FIRE PRODUCTS LP
1 STANTON STREET
MARINETTE, WI 54143

SUBJECT: Waste Storage Concurrence for Stockpiled Soil, Concrete, and Debris Generated from Construction of Building 105, JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, Wisconsin

Dear Mr. Danko and Mr. Wahl:

The Department of Natural Resources (department) has completed our review of the Soil Interim Remedial Action Design Report prepared by ARCADIS and dated March 2021. The report pertains to the storage of per- and poly-fluoroalkyl substances (PFAS) impacted soil, concrete, and debris generated from the construction of Building 105 located at 2700 Industrial Parkway South in Marinette, Wisconsin (the site). The department is in concurrence with the proposed solid waste storage, prior to disposal.

Approximately 5,260 cubic yards of soil and 154 tons of concrete and debris were generated and stockpiled onsite from the construction of Building 105. Soil, concrete, and debris are covered with 10-mil polyethylene liners and overlapped at the edge of each stockpile by at least 1 foot and contain a 12-inch berm of clean sand around the perimeter to prevent wind and water erosion and movement of PFAS in impacted waste. Additional hot spot excavations, which are estimated to generate another 1,250 cubic yards of soil, are planned to take place in the upcoming months at the site. Once the hot spot materials have been excavated, all of the PFAS impacted waste referenced in this letter will be removed and disposed of at the Waste Management facility in Arlington, Oregon. Waste disposal is anticipated to take place in Summer 2021.

If the soil, concrete, and debris are stored in accordance with the submitted Soil Interim Remedial Action Design Report, the storage of waste is exempt from licensing under s. NR 502.05(3)(j), Wis. Adm. Code.

Report any changes to the Soil Interim Remedial Action Design Report to the department as further approval may be required.

Please keep in mind this letter does not relieve you of obligations to meet all other applicable federal, state and local permits as well as zoning, and regulatory requirements.

If you have any questions about this letter, please contact Alyssa Sellwood, Project Manager, at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov or Dan Kroll, Waste Management Specialist at (920) 401-1314 or Daniel.Kroll@wisconsin.gov.

May 10, 2021
Waste Storage Concurrence

Page 2 of 2

Sincerely,

A handwritten signature in black ink that reads "Dan Kroll". The signature is written in a cursive style with a large, looped "D" and "K".

Dan Kroll
Waste Management Specialist
Waste and Materials Management Program
Northeast Region

cc: Alyssa Sellwood – DNR – Remediation and Redevelopment Program
Natasha Gwidt – DNR – Waste and Materials Management Program