ARCADIS Design & Consultancy for natural and built assets

Mr. David Neste
Remediation and Redevelopment Program
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ENVIRONMENT

Subject:
Engineering Review and Feasibility Analysis Framework of Remedial Alternatives for Soil and Groundwater
Tyco Fire Technology Center, PFCs,
2700 Industrial Parkway South, Marinette, Wisconsin
BRRTS Activity#: 02-38-580694

Date:
July 8, 2019

Contact:
Mike Bedard

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267.685.1821

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Michael.Bedard
@arcadis.com

Dear Mr. Neste:

On behalf of Tyco Fire Products, LP (Tyco), Arcadis US, Inc. (Arcadis) submits the attached engineering review and feasibility analysis framework of remedial alternatives for soil and groundwater at the referenced site. The Wisconsin Department of Natural Resources (WDNR) provided comments to the September 2018 Site Investigation Report on December 7, 2018. Pursuant to the request from the WDNR, Arcadis, on behalf of Tyco, formally responded to those comments on February 5, 2019. Comment 6 and response to comment 6 discussed the remedial alternative framework and is repeated below.

"**Comment 6:** In accordance with Wis. Admin. Code§§ NR 708.11 (2) (c), the Department requests JCI/Tyco prepare an Interim Action Options Report (IAOR) to address PFAS contamination migrating beyond the boundaries of the FTC property via groundwater flow. The Department can provide assistance in selecting and evaluating interim action options if the IAOR is submitted with Form 4400-237 and the technical assistance review fee.

> ***Tyco Response:*** Tyco will develop a framework for an engineering review and feasibility analysis of potentially appropriate options, identification of additional pre-design data needs, and potential bench and/or pilot testing. This framework of steps will focus on soil and groundwater and will be provided to the Department in mid-2019.
>
> As requested by the WDNR during recent discussions, Tyco will provide a written work plan for the interim action to the Department approximately 60 days prior to the anticipated start date for implementation of the selected measure. Note that Tyco will work closely with the WDNR throughout the evaluation process."

The activities presented in the framework are in progress. Remedial alternatives will be evaluated as interim remedial actions until site delineation is completed. Upon completion of site delineation, the interim remedial actions will be reviewed to determine if they can be classified as remedial actions or if additional remedial actions are needed.

If you have any questions regarding the framework, please let me know.

Sincerely,

Arcadis U.S., Inc.

Michael Bedard
Associate Vice President

Copies:

Roxanne Chronert - WDNR
Jeffrey Danko – Johnson Controls

**Attachments**

1 Engineering Review and Feasibility Analysis Framework of Remedial Alternatives for Soil and Groundwater

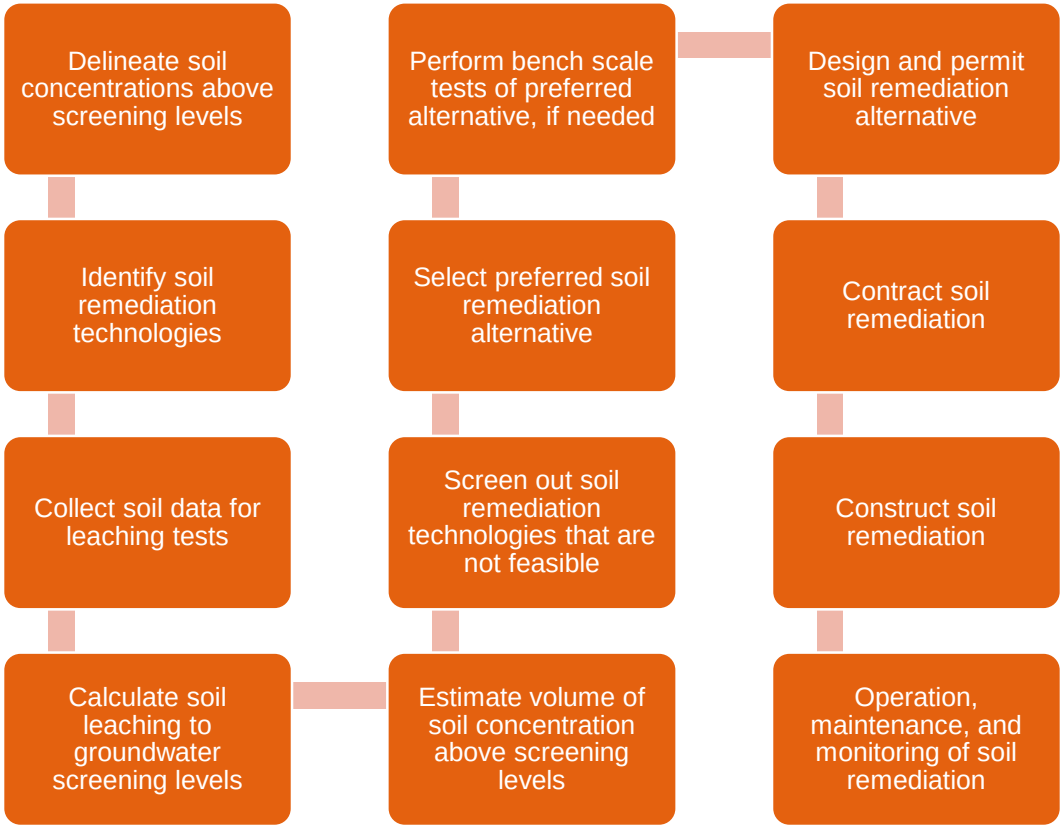
ARCADIS Design & Consultancy for natural and built assets

# ENGINEERING REVIEW AND FEASIBILITY ANALYSIS FRAMEWORK OF REMEDIAL ALTERNATIVES FOR SOIL AND GROUNDWATER

Tyco Fire Technology Center, Marinette, Wisconsin

July 8, 2019

# Soil Remediation Framework




The framework will be termed interim remedial actions until site delineation is completed.

# Soil Data Needs

- Data will be collected for soil leaching tests as described in Supplemental Site Investigation Work Plan dated February 2019; results are expected in August 2019
- Data collection may be proposed for bench scale tests of the preferred remedial alternative. If bench scale tests are recommended, will work on the plan for data collection and bench testing with WDNR

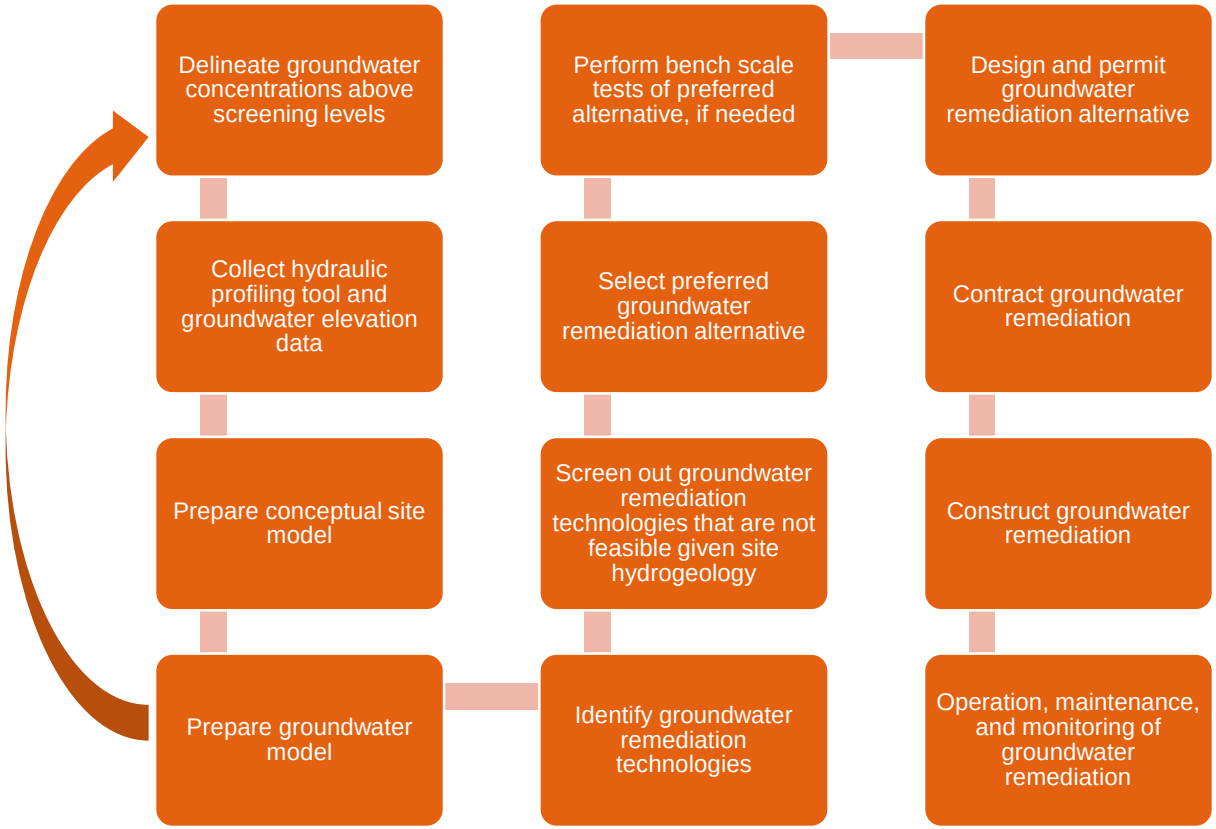
# Soil Remediation 2019-2021 Schedule

- Delineate soil concentrations above screening levels
- Identify soil remediation technologies
- Collect soil data for leaching tests
- Calculate soil leaching to groundwater screening levels
- Estimate volume of soil concentration above screening levels
- Screen out soil remediation technologies that are not feasible
- Select preferred soil remediation alternative
- Perform bench scale tests of preferred alternative, if needed

The schedule may change based on field conditions, investigation results that indicate further investigation is needed, and/or discussions with WDNR.

# Groundwater Remediation Framework

Possible feedback loop based on model results




The framework will be termed interim remedial actions until site delineation is completed

# Groundwater Data Needs

- Data will be collected for hydraulic profiling and groundwater elevation as described in Supplemental Site Investigation Work Plan dated February 2019; results expected in August 2019
- Additional investigations may be warranted based on results
- Data collection may be proposed for bench scale tests of the preferred remedial alternative. If bench scale tests are recommended, will work on the plan for data collection and bench testing with WDNR

# Groundwater Remediation 2019-2021 Schedule

- Delineate groundwater concentrations above screening levels
- Collect hydraulic profiling tool and groundwater elevation data
- Prepare conceptual site model
- Prepare groundwater model
- Identify groundwater remediation technologies

The schedule may change based on field conditions, investigation results that indicate further investigation is needed, and/or discussions with WDNR.