

Notice: Use this form to request a **written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

Definitions

"Property" refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

"Liability Clarification" refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

"Technical Assistance" refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

"Post-closure modification" refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

Select the Correct Form

This form should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do **not** use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: dnr.wi.gov/topic/Brownfields/Pubs.html.

Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located.

See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

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Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name Wahl	First Scott	MI	Organization/ Business Name Tyco Fire Products LP
Mailing Address 2700 Industrial Parkway South		City Marinette	State WI
		ZIP Code 54143	
Phone # (include area code)	Fax # (include area code)	Email	

The requester listed above: (select all that apply)

- Is currently the owner
 Is considering selling the Property
 Is renting or leasing the Property
 Is considering acquiring the Property
 Is a lender with a mortgagee interest in the Property
 Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

Select if same as requester

Contact Last Name Verburg	First Ben	MI	Organization/ Business Name Arcadis
Mailing Address 126 N Jefferson Street, Suite 400		City Milwaukee	State WI
		ZIP Code 53202	
Phone # (include area code) (414) 276-7742	Fax # (include area code)	Email ben.verburg@arcadis.com	

Environmental Consultant (if applicable)

Contact Last Name Verburg	First Ben	MI	Organization/ Business Name Arcadis
Mailing Address 126 N Jefferson Street, Suite 400		City Milwaukee	State WI
		ZIP Code 53202	
Phone # (include area code) (414) 276-7742	Fax # (include area code)	Email ben.verburg@arcadis.com	

Section 2. Property Information

Property Name Tyco Fire Technology Center - PFCs	FID No. (if known) 438005590
BRRTS No. (if known) 0238580694	Parcel Identification Number
Street Address 2700 Industrial Parkway South	City Marinette
	State WI
	ZIP Code 54143
County Marinette	Municipality where the Property is located <input checked="" type="radio"/> City <input type="radio"/> Town <input type="radio"/> Village of Marinette
Property is composed of: <input type="radio"/> Single tax parcel <input checked="" type="radio"/> Multiple tax parcels	Property Size Acres 380

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1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

No Yes

Date requested by: _____

Reason: _____

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

No. **Include the fee that is required for your request in Section 3, 4 or 5.**

Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:

Section 3. Technical Assistance or Post-Closure Modifications;

Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [Numbers in brackets are for WI DNR Use]

- No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of \$350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.
- Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of \$700.**
- Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of \$1050.**
- Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of \$1050.**
- Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of \$1050.**
- Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of \$1050.**
- Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of \$350**
- Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of \$425.**
- Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of \$425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

- Schedule a Technical Assistance Meeting - **Include a fee of \$700.**
- Hazardous Waste Determination - **Include a fee of \$700.**
- Other Technical Assistance - **Include a fee of \$700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

- Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of \$1050, and:**
 - Include a fee of \$300 for sites with residual soil contamination; and
 - Include a fee of \$350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this form Section 6. Other Information Submitted

Identify all materials that are included with this request.

Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

Phase I Environmental Site Assessment Report - Date: _____

Phase II Environmental Site Assessment Report - Date: _____

Technical Assistance, Environmental Liability
Clarification or Post-Closure Modification Request

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- Legal Description of Property (required for all liability requests and specialized agreements)
- Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

- Groundwater
- Soil
- Sediment
- Other medium - Describe: _____

Date of Collection: _____

- A copy of the closure letter and submittal materials
- Draft tax cancellation agreement
- Draft agreement for assignment of tax foreclosure judgment
- Other report(s) or information - Describe: Fish Tissue and Surface Water Sampling Work Plan

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

- Yes - Date (if known): _____
- No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at:
dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf.

Section 7. Certification by the Person who completed this form

- I am the person submitting this request (requester)
- I prepared this request for: Scott Wahl
Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

Joseph R. Rutkowski
Signature

11/5/2020
Date Signed

Project Environmental Specialist
Title

(414) 277-6233
Telephone Number (include area code)

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

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Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a [DNR regional brownfields specialist](#) with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>.

DNR NORTHERN REGION

Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

DNR NORTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2984 Shawano Avenue
Green Bay WI 54313

DNR SOUTH CENTRAL REGION

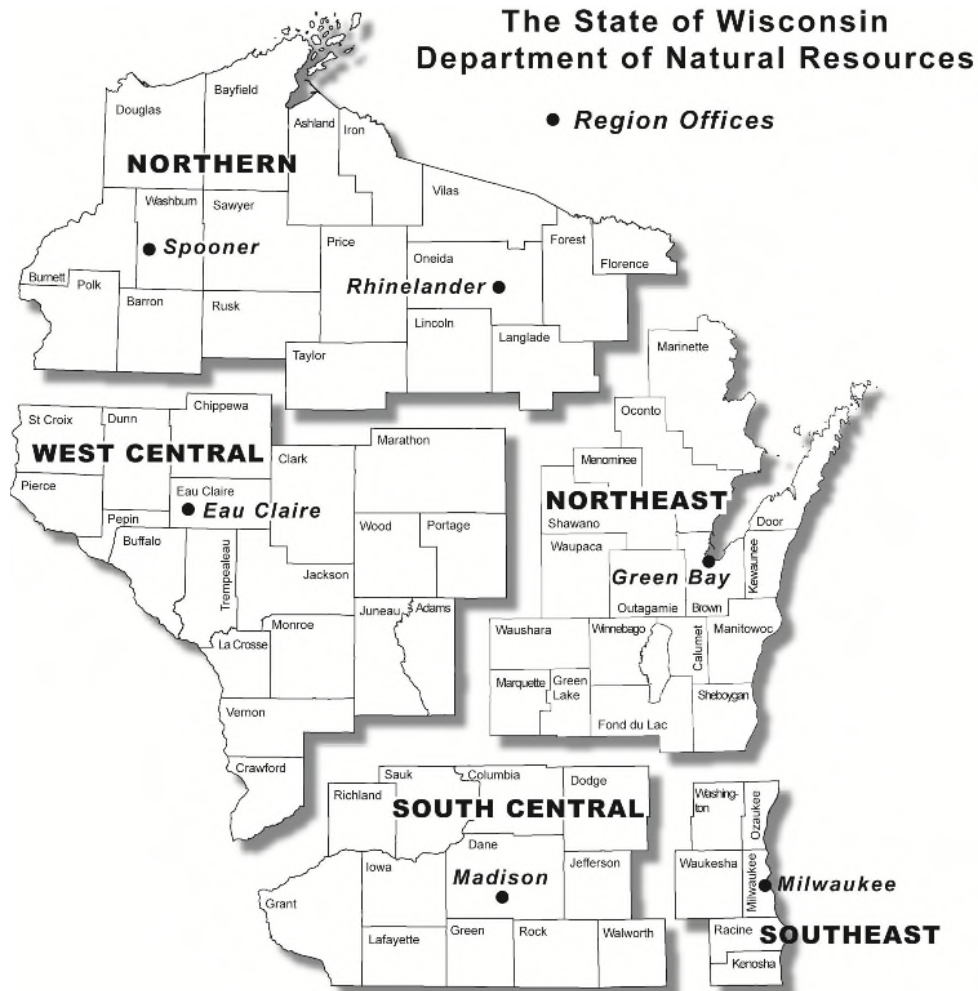
Attn: RR Program Assistant
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

DNR SOUTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee WI 53212

DNR WEST CENTRAL REGION

Attn: RR Program Assistant
Department of Natural Resources
1300 Clairemont Ave.
Eau Claire WI 54702



Note: These are the Remediation and Redevelopment Program's designated regions. Other DNR program regional boundaries may be different.

DNR Use Only			
Date Received	Date Assigned	BRRTS Activity Code	BRRTS No. (if used)
DNR Reviewer		Comments	
Fee Enclosed? <input type="radio"/> Yes <input type="radio"/> No	Fee Amount \$	Date Additional Information Requested	Date Requested for DNR Response Letter
Date Approved	Final Determination		

Tyco Fire Products LP

FISH TISSUE AND SURFACE WATER SAMPLING WORK PLAN

Tyco Fire Technology Center
Marinette, Wisconsin

BRRTS No. 02-38-580694

November 2020



FISH TISSUE AND SURFACE WATER SAMPLING WORK PLAN

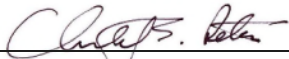


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Project Engineer

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Scott Potter
Project Lead/National Expert

Our Ref.:

WI001605

Date:

November 5, 2020

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FIGURES

Figure 1 Site Location

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ACRONYMS AND ABBREVIATIONS

AFFF	aqueous film-forming foams
Arcadis	Arcadis U.S., Inc.
BRRTS	Bureau of Remediation Redevelopment Tracking System
COC	chain-of-custody
GIS	geographic information system
MDEQ	Michigan Department of Environmental Quality
OTA	Outdoor Testing/Training Area
PFAS	per- and poly-fluorinated alkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
R&D	Research and Development
SCP	scientific collectors permit
Site	Ansul Fire Technology Center
Tyco	Tyco Fire Products LP
USEPA	United States Environmental Protection Agency
WDNR	Wisconsin Department of Natural Resources

1 INTRODUCTION

On behalf of Tyco Fire Products LP (Tyco), Arcadis U.S., Inc. (Arcadis) has prepared this *Fish Tissue and Surface Water Sampling Work Plan* (work plan) to continue investigation into the nature and extent of per- and poly-fluoroalkyl substances (PFAS) related to the Ansul Fire Technology Center (the Site), located at 2700 Industrial Parkway South, Marinette, Wisconsin (**Figure 1**). The investigation work proposed herein is in response to the Wisconsin Department of Natural Resources (WDNR) December 7, 2018 letter stating that additional investigation of PFAS, including fish tissue sampling, must be completed in the area of the Site and WDNR verbal request on October 13, 2020 for additional fish tissue sampling.

Investigation activities described in this work plan will consist of surface water and fish tissue sampling in privately owned ponds and Ditch B near the Site. Objectives of this investigation are to:

- Evaluate whether PFAS is present in surface water in ponds
- Evaluate whether PFAS are present in tissue of edible-size fish
- Assess the nature and extent of PFAS in surface water and fish tissue
- Evaluate the potential transport of PFAS into fish tissue.

Assuming that data gaps remain based on the newly sampled pond surface water data proposed in this work plan, potentially fish tissue data collected by WDNR, and the correlation between concentrations of perfluorooctanesulfonic acid (PFOS) in surface water and fish tissue is evaluated, fish tissue sampling will be proposed.

2 SITE BACKGROUND

2.1 Site Description and History

The Site is a fire suppressant training, testing, research, and development facility built in the early 1960s. The Site occupies approximately 380 acres with approximately 9 acres used as the Outdoor Testing/Training Area (OTA). The OTA includes the Firefighting School area (where firefighting scenarios are simulated) and the Research and Development (R&D) area (where product testing occurs). The remaining area of the Site is used for manufacturing, warehousing, office, classroom, parking, or is undeveloped.

The Site is bordered by industrial and commercial properties to the west and industrial, commercial, and Marinette School District property to the north. Agricultural land, a cemetery, a community center, private owners, including residential property, and undeveloped land owned by the University of Wisconsin Board of Regents border the Site to the east and south.

Aqueous film-forming foams (AFFF) historically have been used at the OTA as part of R&D, quality testing, and firefighting training activities. While the presence of multiple PFAS compounds has been included in historical and recent investigation analyses, the primary focus of the recent site investigation has been on perfluorooctanoic acid (PFOA) and/or PFOS, which have been present in various formulations of these foams. AFFF has not been sprayed outdoors at the OTA since November 2017.

2.2 Recent Investigation Work

The results of recent PFAS investigations have been provided previously in the following documents:

- *2016 Site Investigation Report* (Bureau of Remediation Redevelopment Tracking System [BRRTS] No. 03-38-001345; Arcadis 2016)
- *2018 Site Investigation Report* (BRRTS No. 02-38-580694; Arcadis 2018)
- *2019 Data Summary Report*, March (BRRTS No. 02-38-580694; Arcadis 2019a)
- *2019 Data Summary Report – Supplemental Site Investigation*, December (BRRTS No. 02-38-580694; Arcadis 2019b)
- *2020 Data Summary Report – Health Lane Area Investigation* (BRRTS No. 02-38-580694; Arcadis 2020a)
- *2020 Southern Area Groundwater Evaluation Report* (BRRTS No. 02-38-580694; Arcadis 2020b)
- *2020 Interim Site Investigation Report* (BRRTS No. 02-38-580694; Arcadis 2020d)
- *2020 Conceptual Site Model – Fire Technology Center* (BRRTS No. 02-38-580694; Arcadis 2020e)
- *2020 Aerial Deposition Evaluation Report* (BRRTS No. 02-38-580694; Arcadis 2020f).

3 GENERAL FIELD ACTIVITIES

The following general field activities apply to the access, permitting, surveying and waste disposal efforts associated with the investigation events described in this work plan.

3.1 Access and Permits

Investigation locations are planned on private property. Per Wisconsin state legislature 29.219(1)(d) and 29.228(1)(d), “no fishing license is required for a resident or non-resident to fish in a pond that is a self-contained body of water and that is located entirely on private property owned by a person who gives permission to the resident to fish in the pond.” As such, a fishing license is not required for this investigation. Agreements for access to investigation locations and fish collection will be obtained from property owners prior to mobilization. The proposed monitoring in this work plan may be modified or reduced based on the ability to receive access to properties.

In addition to obtaining access, a state of WDNR scientific collectors permit (SCP) will be obtained prior to mobilization and sampling activities. An SCP will authorize fishery collection techniques not generally made available to the public through traditional resident and/or non-resident fishing licenses (e.g. electrofishing, seining, gillnetting, trap netting [fyke/hoop nets], trot lining, etc.). A SCP will also identify any special conditions and/or limitations of the permit as defined by the department.

3.2 Surveying

The pond locations currently reside in the project geographic information system (GIS) from Digital Globe Vivid-USA aerial imagery, accessed April 27, 2016 and United States Geological Survey National Hydrography Dataset, accessed fall 2017. Therefore, surveying of the ponds is not needed and will not be performed as part of sampling. The pond coordinates in the GIS are referenced to the Wisconsin State Plane North American Datum 1983 – Wisconsin Central 4802 Zone system.

3.3 Investigation Derived Waste

Decontamination water, disposable equipment, personal protection equipment, and waste generated during investigation activities will be containerized (e.g., 55-gallon steel drums) and staged in a centralized and secured location on Tyco property, pending characterization. Waste disposal options will be assessed following waste characterization.

4 POND SURFACE WATER SAMPLING

Surface water grab samples will be collected from six privately-owned ponds within the investigation area to evaluate the concentrations of PFAS present in surface water. The purpose of the surface water sampling is to aid in determination of which ponds require fish tissue collection and analysis. The locations of the proposed private ponds are shown on **Figure 2**. There are 13 ponds identified within the investigation area. Five of the 13 ponds have previously been sampled for surface water. Four of the 13 ponds are stormwater detention ponds and are believed to be lined ponds. As groundwater is not discharging to lined stormwater ponds, these ponds are not proposed for surface water sampling. Of the remaining four ponds, three of these ponds are proposed for sampling. The fourth pond is not proposed for sampling as the property owner has been unresponsive to requests for drinking water sampling; therefore, it is assumed the property owner would also be unresponsive for pond sampling.

The proposed private ponds were selected based on previous surface water concentrations observed in 2018 and 2019 and groundwater data. Three of the private ponds, SW-14, SW-37, and SW-38, were sampled for fish tissue in August 2020; final data on the fish tissue analysis is pending. These three ponds will be re-sampled to evaluate variability and confirm surface water concentrations relative to concentrations observed during previous sampling events. Three additional ponds (SW-41, SW-42, and SW-43) will be sampled for surface water for the first time. Based on the relationship between pond surface water concentrations and nearby groundwater concentrations, these three ponds are expected to have surface water concentrations between the range of surface water concentrations in Ponds SW-14, SW-37, and SW-38. Surface water sampling of Ponds SW-41, SW-42, and SW-43 will be performed to confirm this expectation. The results of the surface water sampling and the need for fish tissue sampling will be discussed with WDNR.

There are already sufficient data on PFAS surface water concentrations in Ditch B. Note that Ditch B is undergoing extensive investigation activities at this time as part of the data collection efforts for extraction and treatment system design, which includes collection of surface water samples. No additional surface water sampling in Ditch B is proposed for the fish tissue sampling.

In addition to surface water concentrations, field reconnaissance will evaluate the approximate pond size and determine the potential for frequent fishing. If the property owner is available, they will be interviewed regarding use of the pond for fishing. Data collected during the surface water sampling event will be used to evaluate the fish tissue sampling locations described in Section 5.

Samples will be collected by hand using a clean beaker attached to a pole, then pouring the sample into appropriate lab-supplied containers. Sample locations will be accessed from the edge of water, by foot, with permission from property owners. All surface water samples will be analyzed for PFAS and Total Suspended Solids, following the quality assurance/quality control (QA/QC) and sampling handling procedures described in Section 6.

5 FISH TISSUE COLLECTION

The fish tissue sampling approach is based on WDNR (2013), Great Lakes Sport Fish Advisory Task Force (1993), Michigan Department of Environmental Quality (MDEQ 2019), and United States Environmental Protection Agency (USEPA 2000).

5.1 Sample Location

Fish tissue sampling is proposed for ponds and Ditch B, as discussed below. USEPA collected fish tissue samples in 2008 and 2009 from the Menominee River and in 2010 from Green Bay as part of a national evaluation of PFAS in fresh-water fish tissue (Williams and Schrank 2016). WDNR collected fish tissue samples in 2012 as part of regular population assessments and fishery surveys at the mouth of the Menominee River (Stahl et al. 2014). WDNR conducted additional fish tissue sampling in the Menominee River in 2019. The data have not been published at the time of this document preparation and will be evaluated as they become available. As WDNR and USEPA have already collected fish tissue samples from the Menominee River and Green Bay, these water bodies will not be sampled for fish tissue as part of this work plan.

5.1.1 Ponds

The approach for the fish tissue sampling will be based on the surface water data from the sampling event described in Section 4 and the results of the fish tissue sampling conducted in August 2020. The fish tissue data from August 2020 sampling indicate a relationship between pond surface water PFOS concentrations and fish tissue PFOS concentrations. Pond SW-14 had the highest surface water PFOS concentrations and the highest fish tissue PFOS concentrations. Pond SW-38 had the lowest surface water PFOS concentrations and the lower fish tissue PFOS concentrations.

The intent of the pond selection for fish tissue sampling is to have each pond represent a different surface water concentration. This will provide fish tissue data on a total of five ponds (including results from the August 2020 fish tissue sampling and fish tissue analysis proposed in this work plan) with a range of PFOS concentrations and is intended to yield sufficient data to further develop a correlation between pond surface water concentrations and fish tissue concentrations. Surface water sample PFOS concentrations from SW-41, SW-42, and SW-43 will be compared to average surface water PFOS concentrations from ponds SW-14, SW-37, and SW-38. Two of the three ponds from SW-41, SW-42, and SW-43 will be selected for fish tissue sampling. The two ponds that best provide a range of surface water concentrations, when evaluated with the surface water data from Ponds SW-14, SW-37, and SW-38 will be selected. Therefore, fish tissue data will be available on a total of five ponds within the study area; theoretically with a range of PFAS concentrations in the fish tissue and should yield sufficient data to further develop a correlation between pond surface water concentrations and fish tissue concentrations. If the surface water sample PFOS concentrations from SW-41, SW-42, and SW-43 are not within the range of the average surface water PFOS concentrations from ponds SW-14, SW-37, and SW-38, a discussion will be had with WDNR on the need for fish tissue sampling. Assuming that data gaps remain based on the newly sampled pond surface water data, potentially fish tissue data collected by WDNR, and the correlation between concentrations of PFOS in surface water and fish tissue is evaluated, fish tissue sampling will be proposed for two of the ponds.

FISH TISSUE AND SURFACE WATER SAMPLING WORK PLAN

A second round of surface water sampling will be performed on the day of fish tissue sampling, if such additional tissue sampling should be needed. Surface water samples will be collected from the ponds selected for fish tissue sampling.

5.1.2 Ditch B

Fish tissue sampling will be conducted from Ditch B. Although fishing for human consumption within Ditch B is unknown, the ditch has been identified as a northern pike spawning waterbody by WDNR. Sampling will be performed at one location, east of where Ditch B crosses Pierce Avenue to evaluate if edible fish are present within the ditch.

5.2 Species Selection

Sampling will target three to five edible size fish per species for three individual species, resulting in a total of 9 to 15 fish tissue samples collected per pond. The proposed target species will be collected based on fish availability, abundance, and potential for human consumption (i.e., large enough to produce an edible-size fillet). One species will be targeted from each of the following trophic levels, if available, in each pond:

- Benthic bottom feeder (e.g., brown bullhead catfish [*Ameiurus nebulosus*], channel catfish [*Ictalurus punctatus*])
- Benthopelagic panfish (e.g. yellow perch [*Perca flavescens*], bluegill sunfish [*Lepomis macrochirus*], black crappie [*Pomoxis nigromaculatus*])
- Carnivorous predator (e.g. largemouth bass [*Micropterus salmoides*], smallmouth bass [*Micropterus dolomieu*]). For Ditch B, northern pike (*Esox lucius*) will also be targeted.

The species listed above are those commonly found in freshwater ponds in northern latitudes, although others may be present (Schrouder et al. 2002). Two species from the same trophic level may be sampled if all three trophic levels of fish are not well represented for collection (i.e., one benthic bottom feeder and two benthopelagic panfish may be sampled from one pond if that pond does not contain sufficient carnivorous predator fish for sampling). However, similar species of similar size should be collected from each of the three ponds, if available, for data comparison purposes (i.e., if bluegill sunfish is collected as the representative benthopelagic panfish, bluegill sunfish should be collected at each pond, if available). Fish of edible size will still be collected from each pond to fill sample size even if the same species are not present in each pond.

Fish sample size for consumption will target regional Wisconsin catch limits (WDNR 2019), as practical. Edible size fish will be defined by the following Wisconsin catch limits for different species as well as the suggested target minimum size for sample collection:

- Catfish – no size limit defined; target minimum of 8 inches in length for bullhead and 12 inches in length for channel catfish
- Panfish – no size limit defined; target minimum of 5 inches in length for sunfish/crappie and 8 inches in length for perch
- Bass – minimum 14 inches; target minimum of 12 inches in length

FISH TISSUE AND SURFACE WATER SAMPLING WORK PLAN

- Northern pike – no size limit defined.

Fish samples will target the edible sizes as described above but smaller-sized fish (i.e. under-sized fish that are edible, within reason, will be collected versus not collecting fish at all) may be collected based on fish abundance and availability.

5.3 Sampling Schedule

USEPA recommends collecting fresh-water fish tissue from late summer to early fall (August to October) because the lipid content of most species is highest during this time (USEPA 2000). Lipophilic chemicals often concentrate in the lipids of fish (USEPA 2000, Great Lakes Fish Advisory Task Force 1993). While PFOS is distributed differently in fish tissue compared to other lipophilic compounds, PFOS is found in muscle and skin (Great Lakes Consortium 2019). Thus, using the same sampling schedule as fish tissue sampling for lipophilic organic compounds is appropriate. The Wisconsin fishing season for 2021 to 2022 has not been issued yet. The Wisconsin fishing season for 2020 to 2021 is as follows:

- Brown bullhead catfish, channel catfish, and panfish fishing season is all year (WDNR 2019)
- Largemouth bass and northern pike fishing season is May 2, 2020 to March 7, 2021 (WDNR 2019)
- Smallmouth bass fishing season is June 15, 2020 to March 1, 2021 (WDNR 2019).

It is assumed the 2021 to 2022 fishing season will be similar to the 2020 to 2021 fishing season. Fish tissue sampling will be performed in approximately late August 2021.

5.4 Fish Collection

Edible-size fish will be collected. Fish will be collected using the electrofishing sampling method, as authorized by a WDNR-issued SCP. State personnel (typically a conservation officer) will be notified of the sampling prior to going into the field as required by the SCP.

During fish collection the target species will be retained in a live-well or clean cooler with fresh site water until sampling is complete. Species to be retained for sample analysis will be based on overall availability, abundance, and potential for human consumption, and the largest sized fish of the 3 most abundant and/or appropriate species will be retained for sampling.

Upon completion of the collection activities, selected fish will be retained, measured, and counted to confirm the proper size/number were taken and processed (described in Section 5.5). The remaining fish will be released live back into the pond or Ditch B. Notes will be taken on the total number of fish species observed during the sampling and their relative abundance.

5.5 Fish Processing

Fish will be processed in the field in preparation for shipment to the analytical laboratory for PFAS analysis in edible fillets. All samples will be given a unique sample identification number that will be recorded in the field notebook, and that corresponds to the fish species, sampling date, and collection location. Chain-of-custody (COC) forms, custody seals, address labels, and air-bill forms will be initiated. COC forms will identify the tissue sample preparation procedure and chemical analysis. A copy of the completed COC form and air-bill form will be retained by the sampler.

FISH TISSUE AND SURFACE WATER SAMPLING WORK PLAN

To begin field processing, sediments, soil, and other debris will be removed from the fish, as needed, by hand-picking or by rinsing with site water, PFAS-free deionized water, or potable water. Fish will be measured (total length), weighed (with an electronic balance), a photograph will be taken, and any minor morphological external abnormalities will be noted, (e.g., blackspot, hook scar, split fins, discolored or blind eye, parasites, etc.). Since fish should represent those likely to be eaten by anglers, those with abnormal deformities, gross external lesions, or other obvious health issues may not be sampled (MDEQ 2019). If these are the only fish present, they will still be sampled, since the objective is to characterize PFAS tissue concentrations in edible-size fillets.

Fish body parts (scales, spines and/or otoliths) will be removed during field processing for archival and possible examination later to determine fish age. If sample integrity is compromised, the laboratory may instead be asked to remove the bony structure. Once these steps have been taken, individual fish will be placed whole and ungutted in labelled, plastic Ziploc™ bags and kept on wet ice prior to shipment to the analytical laboratory and filleting in a controlled environment. The sample label will contain the sample identification number and sample date.

6 QUALITY ASSURANCE AND QUALITY CONTROL

6.1 Special Considerations for PFAS Sampling

The detection of PFAS compounds at very low concentrations can be influenced by common PFAS-containing materials that may be present at the sampling site. Therefore, to minimize the potential for cross-contamination, special attention will be given to sampling materials, decontamination procedures, and clothing and personal care products used by sampling personnel. Detailed standard operating procedures that will be followed during investigation activities are provided in the *Draft Quality Assurance Project Plan* (QAPP) submitted to the WDNR on April 15, 2020 (Arcadis 2020c).

Quality assurance samples are specified in the Draft QAPP for each type of media to be sampled. Sampling for PFAS compounds will include the submission of one laboratory-supplied reagent field blank per day to analyze for the presence of ambient PFAS in the sampling area. PFAS-free water used for the reagent field blank sample is brought to the Site in a laboratory-supplied bottle. Field staff will transfer the laboratory-supplied PFAS-free water into an empty sample bottle. This reagent field blank will be placed in the same cooler as other samples intended for PFAS analyses.

All equipment will be decontaminated between sample locations with PFAS-free water. Only Alconox, Liquinox, or methanol can be used as decontamination materials. To assess the adequacy of the decontamination process, a rinse blank will be collected every 20 samples or per day, whichever is more frequent. To prepare a rinse blank, a sample of PFAS-free water will be poured over or through decontaminated equipment (e.g. stainless-steel tray or fillet knife) or purchased supplies (i.e. Ziploc™ bag) before use. Rinse blanks of the Ziploc™ bags will be collected every 20 samples or one per day, whichever is more frequent.

6.2 Laboratory Methods and Analysis

Details regarding the analytical methods to be used for each media are provided in the Draft QAPP. All media analyzed for PFAS will be analyzed for the 36 PFAS analytes required by WDNR per correspondence dated May 27, 2020 and listed in the Draft QAPP.

Samples will be shipped on ice and handled with chain-of-custody documentation. All samples will be sent to TestAmerica or an equivalent lab that is accredited for filleting and PFAS analysis. Fish tissue samples for scaled fish (i.e., bass, perch, sunfish, crappie) will be prepared as skin-on, scales-off fillets, and scaleless fish (i.e., bullhead, catfish) will be processed as skin-off fillets, based on the procedures in WDNR (2013) and Great Lakes Consortium. Each fillet will be taken from behind the head to the tail and from the top of the back to the belly.

Once the edible-size fillet is removed, it will be homogenized and analyzed for the 36 PFAS compounds reported using USEPA Modified Method 537 (36 compounds). As part of internal laboratory QA/QC measures, one laboratory matrix spike/matrix spike duplicate of fish homogenate will be collected for every 20 tissue samples and one field duplicate of fish homogenate will be collected for every 10 tissue samples as listed in Table 6-1.

FISH TISSUE AND SURFACE WATER SAMPLING WORK PLAN

Table 6-1. Laboratory Methods and QA/QC Frequency

Matrix	Parameter	Laboratory Method	Matrix Spike/ Matrix Spike Duplicate Frequency	Lab Duplicate Frequency
Tissue	PFAS	USEPA 537	1/20	1/10
Water	PFAS	Modified USEPA 537 (36 compounds)	1/20	1/10
Water	Total Suspended Solids	USEPA 160.2	None	1/10

Internal laboratory QA/QC should also consist of one laboratory blank and one laboratory control sample (or blank spike) per batch of samples and any additional measures as indicated by the laboratory QA/QC procedures.

7 REPORTING

Field investigation information will be communicated to WDNR through interim data summaries and in a future Site Investigation Report. Interim data summaries to the WDNR will include recommendations as to whether further characterization or monitoring work is needed. Submission of the Supplemental Site Investigation Report is not anticipated until delineation of impacts in all media of concern is sufficient to meet the requirements as detailed in Chapter NR 716 of the Wisconsin Administrative Code. Per requirements of the SCP, results are also to be reported.

8 ANTICIPATED SCHEDULE

The anticipated schedule for field investigation and reporting is as follows:

- Pond surface water sampling - approximately winter 2020.
- Fish Tissue Sampling - approximately August 2021.
- Reporting - Data summaries will be provided to WDNR after completion of significant investigation elements.

In the event the schedule is affected by weather, access, or other factors, WDNR will be provided an updated schedule for the activities.

9 REFERENCES

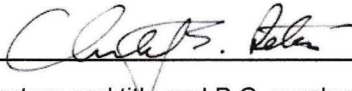
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FISH TISSUE AND SURFACE WATER SAMPLING WORK PLAN

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10 NR 712.09 CERTIFICATION

I, Christopher S. Peters, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.



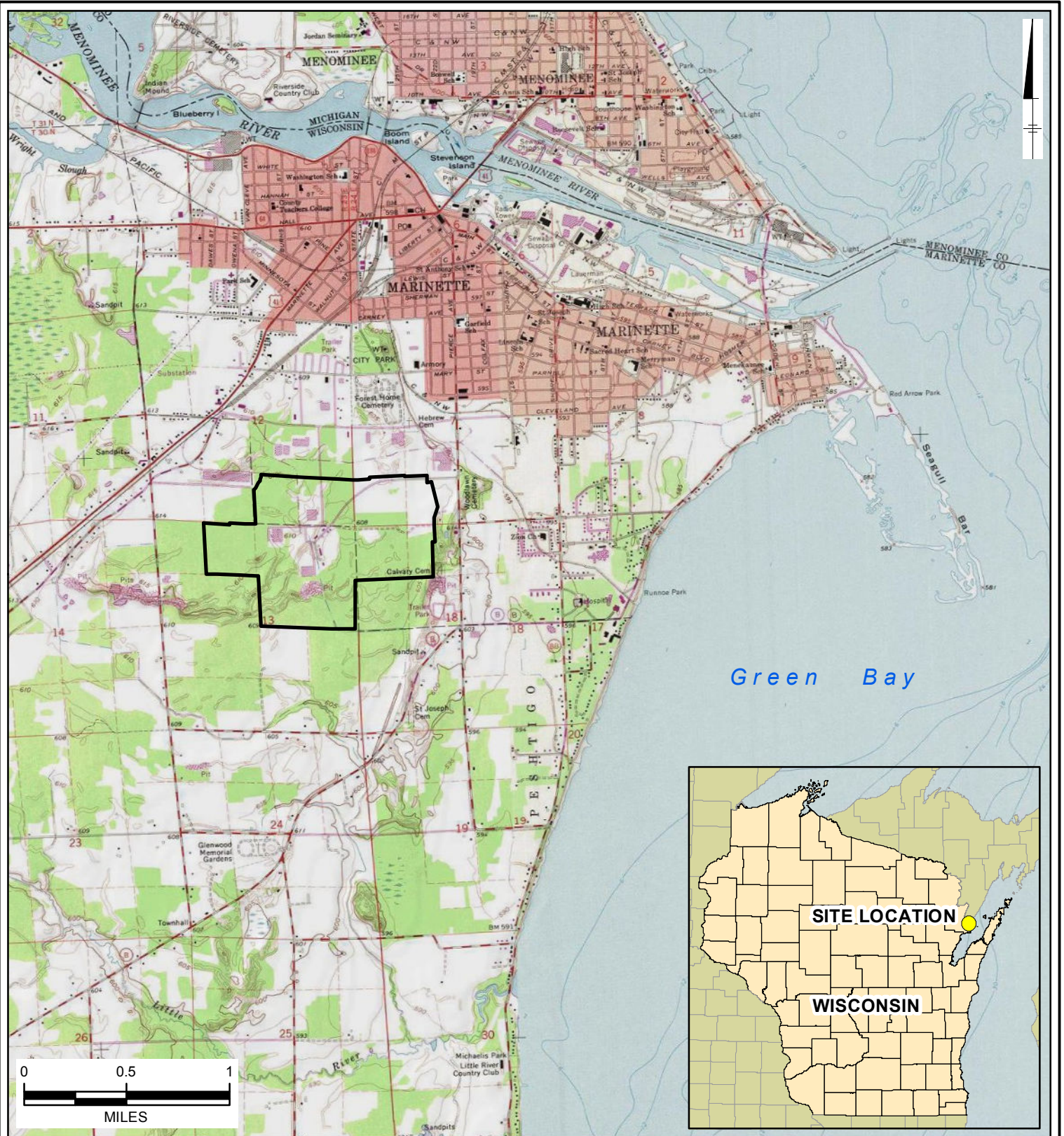
WI PG 1054-013

Signature and title and P.G. number



FIGURES





City: Minneapolis/City: Div/Group: IMDVC Created By: Last Saved By: msmiller
 TYCO Marinette WI
 ZGISProjects_ENV\TYCO_Marinette_WI\MXD\2019-09\Fig1_SiteLocation.mxd 9/26/2019 4:21:19 PM

LEGEND:

APPROXIMATE SITE PROPERTY BOUNDARY

NOTES:

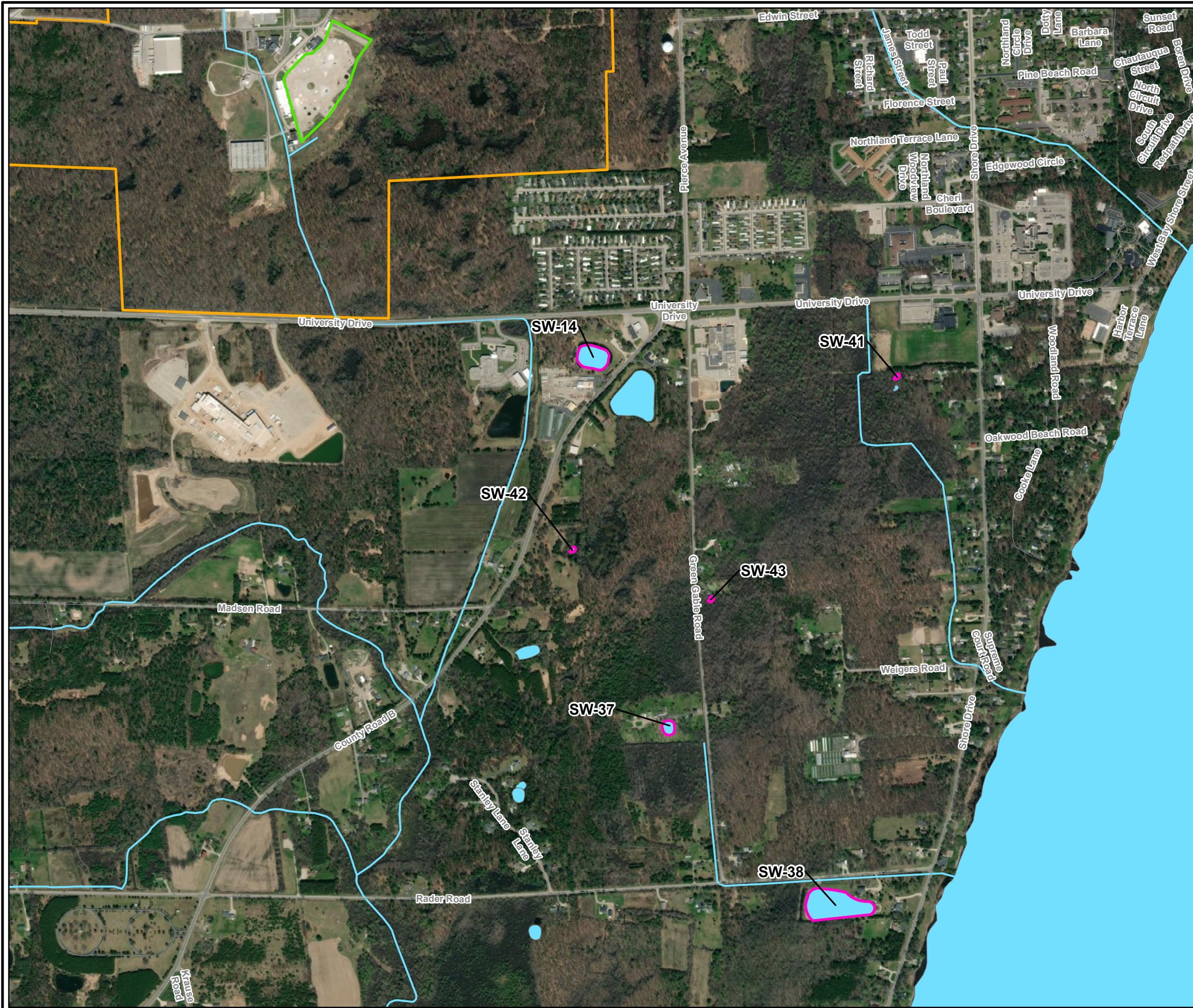
1. TOPOGRAPHIC MAP SOURCE: COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED, ACCESSED SEPTEMBER, 2019.

TYCO FIRE PRODUCTS, LP
MARINETTE, WISCONSIN
FISH TISSUE SAMPLING WORK PLAN

SITE LOCATION

FIGURE

1

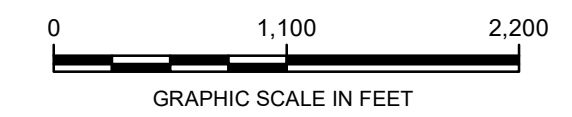


LEGEND:

- PROPOSED SAMPLE LOCATIONS
- OUTDOOR TESTING/TRAINING AREA
- APPROXIMATE SITE PROPERTY BOUNDARY
- APPROXIMATE MARINETTE CITY BOUNDARY
- ROAD
- DITCH/STREAM
- WATERBODY



- NOTES:**
1. CITY BOUNDARY DATA SOURCE: WISCONSIN LEGISLATIVE TECHNOLOGY SERVICES BUREAU, WISCONSIN COUNTY CLERKS AND LAND INFORMATION OFFICES, ACCESSED FALL 2017.
 2. DITCH/STREAM DATA SOURCE: U.S. GEOLOGICAL SURVEY NATIONAL HYDROGRAPHY DATASET, ACCESSED FALL 2017.
 3. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
 4. AERIAL IMAGERY: 4/27/2016 DIGITALGLOBE, VIVID-USA



TYCO FIRE PRODUCTS, LP
 MARINETTE, WISCONSIN
**FISH TISSUE AND SURFACE
 WATER SAMPLING WORK PLAN**

**PROPOSED POND SURFACE WATER AND
 FISH TISSUE SAMPLING LOCATIONS**

FIGURE
2

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A decorative graphic consisting of three thin orange lines. One line is horizontal, extending across the bottom of the page. Two other lines are diagonal, starting from the bottom left and extending towards the top right, crossing the horizontal line.