

Wisconsin DNR – NR 700 Process

Remediation and Redevelopment Program

April 2019

Purpose

This guidance is offered as an optional tool to help develop and review site investigation work plans for compliance with Wis. Admin. Code ch. NR 716 Site Investigation requirements. Consultants may choose to use this checklist as an outline for preparation of the site investigation work plan. Use of this checklist is not required. Rule citations are added for clarity. The checklist is meant for use with Wis. Admin. Code § NR 716.09 and other site investigation related guidance. For more comprehensive site investigation related information, visit our web page at dnr.wi.gov and search: "site investigation."

Receipt of Site Investigation Work Plan NR 716.09 (1)		Comments
<input type="checkbox"/> NR 716.09 (1)	Within 60 days of receipt of RP letter, or other notification that a site investigation is required	Due August 25, 2020
<input type="checkbox"/> NR 716.09 (1), NR 700.11 (3g)	One paper copy	
<input type="checkbox"/> NR 716.09 (1), NR 700.11 (3g)	One electronic copy	
<input type="checkbox"/> NR 749	Review fee, if review by DNR is requested	Will be submitted separately.
Purpose NR 716.01		Comments
<input checked="" type="checkbox"/> NR 716.01	Proposed investigation will define the nature, degree and extent of contamination	
<input checked="" type="checkbox"/> NR 716.01	Proposed investigation will define the source or sources of contamination	
<input checked="" type="checkbox"/> NR 716.01	Proposed investigation will determine the need for an interim and/or remedial action	
<input checked="" type="checkbox"/> NR 716.01	Proposed investigation will provide information needed to select an interim and/or remedial action	
Contents NR 716.09 (2)		Comments
<input checked="" type="checkbox"/> NR 716.09 (2) (a)	Site name and address	Introduction
<input checked="" type="checkbox"/> NR 716.09 (2) (a)	Site location – ¼ ¼ section, Township, Range, County	Section 3
<input checked="" type="checkbox"/> NR 716.09 (2) (a)	WTM coordinates	Section 3
<input checked="" type="checkbox"/> NR 716.09 (2) (b)	RP's name and address (May be more than one RP – current property owner, lessee, operator, other RP.)	Section 2
<input checked="" type="checkbox"/> NR 716.09 (2) (b)	Consultant or contractor's name and address	Section 2
<input checked="" type="checkbox"/> NR 716.09 (2) (c)	Site location on a USGS topo map	Figure 1
<input checked="" type="checkbox"/> NR 716.09 (2) (c)	Site layout map(s) with: buildings, roads, discharge location & other relevant site features	Figure 2 and Figure 3
<input type="checkbox"/> NR 716.09 (2) (d)	Scoping of the Investigation:	Section 1
<input checked="" type="checkbox"/> NR 716.07 (1)	<ul style="list-style-type: none"> History of the site or facility, including land uses that may have one or more associated hazardous substance discharges or environmental pollution, including emerging contaminants such as PFAS 	Section 4
<input checked="" type="checkbox"/> NR 716.07 (2)	<ul style="list-style-type: none"> Type and amount of contamination, if known 	Section 4

Site Investigation Work Plan Preparation Checklist Wis. Admin. Code § NR 716.07

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Contents (continue) NR 716.09 (2)		Comments
<input checked="" type="checkbox"/> NR 716.07 (3)	<ul style="list-style-type: none"> History of previous hazardous substance discharges or environmental pollution 	Section 4
<input checked="" type="checkbox"/> NR 716.07 (4)	<ul style="list-style-type: none"> Environmental media affected or potentially affected by contamination 	Section 4, Table 1 and Table 2
<input checked="" type="checkbox"/> NR 716.07 (5)	<ul style="list-style-type: none"> Location of the site or facility and its proximity to other sources of contamination 	Section 5
<input checked="" type="checkbox"/> NR 716.07 (6)	<ul style="list-style-type: none"> Need for permission from property owners to allow access to the site or facility and to adjacent or nearby properties 	Access agreements in place.
<input checked="" type="checkbox"/> NR 716.07 (7)	<ul style="list-style-type: none"> Potential or known impacts to receptors, including buildings, utilities or other subsurface improvements, and water supply wells within 1,200 feet of outermost edge of contamination 	Section 4, Table 1 and Table 2
<input type="checkbox"/> NR 716.07 (8) (a), (b), (c), (d)	<ul style="list-style-type: none"> Potential for impacts to sensitive species, habitats or ecosystems, wetlands, resource waters, sites of historical/archaeological significance 	NA
<input type="checkbox"/> NR 716.07 (9)	<ul style="list-style-type: none"> Potential interim and remedial actions applicable to the contamination 	NA
<input checked="" type="checkbox"/> NR 716.07 (10)	<ul style="list-style-type: none"> Immediate or interim actions taken or in progress, including any evaluations made of whether an interim action is necessary 	Section 4
<input type="checkbox"/> NR 716.07 (11)	<ul style="list-style-type: none"> Any other items, including climatological conditions and background water or soil quality info that may affect the scope or conduct of the investigation 	NA
<input type="checkbox"/> NR 716.07 (12)	<ul style="list-style-type: none"> Need to gather data to determine the hydraulic conductivity of materials where contaminated groundwater is found 	NA
<input type="checkbox"/> NR 716.09 (2) (e)	Physiographical and geological setting of the site necessary to choose sampling methods and locations, including:	
<input checked="" type="checkbox"/> NR 716.09 (2) (e) 1.	<ul style="list-style-type: none"> Existing topography, including prominent topographic features 	Figure 1
<input checked="" type="checkbox"/> NR 716.09 (2) (e) 2.	<ul style="list-style-type: none"> Surface water drainage patterns and significant hydrologic features, such as surface waters, springs, drainage basins, divides, wetlands, floodplain or floodway 	Figure 1
<input checked="" type="checkbox"/> NR 716.09 (2) (e) 3.	<ul style="list-style-type: none"> Texture and classification of surficial soils 	Section 6
<input checked="" type="checkbox"/> NR 716.09 (2) (e) 4.	<ul style="list-style-type: none"> Nature and distribution of geologic materials, including the thickness and type of unconsolidated materials and type and nature of bedrock 	Section 6
<input checked="" type="checkbox"/> NR 716.09 (2) (e) 5.	<ul style="list-style-type: none"> General hydrogeologic information 	Section 6
<input type="checkbox"/> NR 716.09 (2) (e) 6.	<ul style="list-style-type: none"> Potential hazardous substance migration pathways 	
<input type="checkbox"/> NR 716.09 (2) (f)	Sampling and analysis strategy to be used during the field investigation, including:	Section 7
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 1.	<ul style="list-style-type: none"> Description of the investigative techniques to be used to characterize the site or facility 	Section 7
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 2.	<ul style="list-style-type: none"> Site layout map(s), in planimetric and vertical views, with locations from which samples of environmental media will be obtained or a description of the strategy to be used for determining sample locations 	Figure 2 and Figure 3

Site Investigation Work Plan Preparation Checklist Wis. Admin. Code § NR 716.07

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Contents (continue) NR 716.09 (2)	Comments	
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 3.	<ul style="list-style-type: none"> Description of sampling methods to be used, including methods for collecting, preserving, and delivering samples and leak detection methods (for vapor sampling) 	Section 7
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 4.	<ul style="list-style-type: none"> List of the parameters for which samples will be analyzed, analytical methods to be used including method detection limits 	Section 7
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 5.	<ul style="list-style-type: none"> Description of quality control and quality assurance procedures to be used per sampling method, including the items listed in NR 716.13 	Section 8
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 6.	<ul style="list-style-type: none"> Description of procedures to prevent cross-contamination between samples 	Section 7
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 7.	<ul style="list-style-type: none"> Description of the type of investigative wastes that will be generated during the site investigation and how they will be collected, stored, transported, treated or disposed 	Section 7
<input checked="" type="checkbox"/> NR 716.09 (2) (f) 8.	<ul style="list-style-type: none"> Discussion of how the sampling and analysis results will be related to previous investigations at the site or facility and how the results will be used to determine the degree and extent of contamination and the selection of a remedial action, including natural attenuation, where appropriate 	Section 9
<input type="checkbox"/> NR 716.09 (2) (g)	Description of other procedures to be used for site management, including erosion control and repair of structural, soil or ground disturbance	NA
<input checked="" type="checkbox"/> NR 716.09 (2) (h)	Schedule for conducting the field investigation and reporting the results to the DNR	Section 10
<input checked="" type="checkbox"/> NR 712	Certification of professional(s) that will conduct or supervise the work necessary to obtain data, develop conclusions and recommendations, and prepare the site investigation submittal, per Wis. Admin. Code NR 712	Yes, Wisconsin PG

This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

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August 25, 2020

AECOM Project No.
60639735

WDNR BRRTs No.
02-08-585623

Mr. Kevin McKnight
Wisconsin Department of Natural Resources
Green Bay Service Center
2984 Shawno Avenue
Green Bay, WI 54313-6727

Work Plan for Site Investigation for Per- and Polyfluoroalkyl Substances (PFAS) at former Tecumseh Products Co. Plant, 1604 Michigan Avenue, New Holstein, Wisconsin

Dear Mr. McKnight:

On behalf of Tecumseh Products Co, LLC (TPC), AECOM Technical Services, Inc. (AECOM) is providing the Wisconsin Department of Natural Resources (WDNR) this Per- and Polyfluoroalkyl Substances (PFAS) Site Investigation Work Plan (Work Plan) for the former TPC manufacturing plant located at 1604 Michigan Avenue, New Holstein, WI (Site). The work plan is designed to evaluate potential PFAS impacts at the Site.

1. Purpose and Scope

This work plan is provided in response to the WDNR's "Responsible Party" letter dated April 29, 2020, and in general accordance with Wisconsin Administrative Code (WAC) Chapter NR 716.09 *Site Investigation Work Plan* requirements.

This work plan is designed to provide an evaluation of potential receptors, based on a review of historical site documents that will show where and when PFAS chemicals may have been used and stored at the Site. Following this, groundwater quality will be evaluated, using the extensive monitoring well network at the Site, to evaluate the extent of potential PFAS impacts at the Site.

2. Involved Parties Information

Responsible Party

Tecumseh Products Co, LLC
Mr. Jason Smith – Corporate Director of Environmental Control / Legal Support
Tecumseh Products Company LLC
2700 West Wood Street
Paris, TN 38242

Consultant

AECOM Technical Services, Inc.
James A. Buss, Project Manager
1350 Deming Way, Suite 100
Middleton, WI 53562
(608) 630-7681

Laboratory

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, California 95605
(916) 373-5600

3. Site Description

Figure 1 depicts the Site location and surrounding area. The Site is located in the NE 1/4 of the SE 1/4 of Section 10 in Township 17 North, Range 20 East, within the municipal limits of the City of New Holstein, Wisconsin. The Wisconsin Transverse Mercator coordinates for the Site are Northing 388691 and Easting 673571. The Site encompasses approximately 38.7 acres and is owned by the City of New Holstein. Eight separate parcels make up the Site and the tax ID numbers for these parcels are #18450, #18464, #18465, #18568, #18569, #18919, #18920, and #18921.

The City of New Holstein zoning maps shows the Site is zoned for Heavy Industrial use. Adjacent parcels are zoned for Light Industrial, General Business/Commercial, and Multi-Family Residential use. The property includes an approximate 410,000 square foot building that is currently vacant.

4. Site History/Background

Historical research for the Site indicates that development began in the 1880s as a machine/repair shop (Robert E. Lee, 2015). By 1915 manufacturing focused on the production of gasoline powered engines. Engine manufacturing continued through the 1930s and moved to small gasoline engines in early 1940. TPC acquired the property in 1956 and made a series of expansions. TPC discontinued active operations at the Site in 2006. Heus Acquisitions, LLC (Heus) acquired the Site in 2007 and operated a contract machining facility at the property for a brief period of time. Heus went into bankruptcy in 2009 and discontinued operations at the Site. The Site has remained unoccupied since that time.

The only known manufacturing process conducted at the Site with potential for PFAS impacts is chrome plating. **Figure 2** depicts the location of the two chrome plating lines, referred to as the “Former Plating Line” and the “Former Northern Plating Line”. The 2015 Phase I Site Assessment for the Site reported, “*The earliest chrome plating operation began by 1970 and was replaced with a new line in 1978*” (Robert E. Lee, 2015). The Assessment goes on to state that “*the newer plating line was located north of the original plating line and was installed in a concrete pit in the floor.*” This would make the southern (Former Plating Line) the older of the two lines and the northern (Former Northern Plating Line) the younger of the two lines. The assessment does not indicate when plating operations were terminated at the Site. However, a second Phase I Environmental Site Assessment (LT Environmental, 2009) states, “*hard chrome electroplating of pistons ceased at the site in 2005*”. Overall manufacturing operations at the Site were discontinued in 2007.

In a July 11, 2019 letter, the Wisconsin Department of Natural Resources (WDNR) requested TPC prepare a Site Investigation Work Plan for PFAS sampling (WDNR, 2019). In response, TRC Environmental Corporation (TRC), on behalf of TPC, submitted a Site Investigation Work Plan on September 30, 2019 (TRC, 2019).

On February 19, 2020, TRC sampled five monitoring wells at the site (TRC, 2020a). **Figure 3** shows that two of the wells (NW-26 and TEC-4) are located adjacent to the Former Northern Plating Line and the Former Plating Line, respectively. Two additional downgradient wells NH-7 (downgradient from NH-26) and MW-E (downgradient from TEC-4) were also sampled. The fifth well (MW-D) is located upgradient of both plating lines. The samples were submitted for the 36 PFAS compounds included in the Wisconsin Laboratory Certification Program. **Table 1** presents a tabulated summary of the results and shows that a number of PFAS compounds were detected, including Perfluorooctanesulfonic acid (PFOS), which exceeded the proposed NR 140 Groundwater Enforcement Standard (ES) for PFOS of 20 nanograms per liter (ng/L). While the concentrations of PFOS were higher than the proposed standard, the sampling results

also showed a marked decrease in PFOS concentration with distance downgradient from the former chromium plating lines.

In response to this, the WDNR, on April 29, 2020, issued a Responsible Party letter to TPC requesting initiation of work plan preparation to evaluate the nature and extent of PFAS impacts at the Site (WDNR, 2020).

TPC responded by collecting groundwater samples from two of the City of New Holstein municipal wells (TRC, 2020b). As shown in **Figure 4**, The two wells are located approximately 800 feet west-southwest (City Well #1 [RG69]) and 900 feet east (City Well #2 [BF260]) of the former plating lines. The City of New Holstein also sampled a third well located approximately 7,100 feet west-northwest of the former plating lines (City Well #3 [BF269]). Given that regional groundwater flow is toward the north and northeast, these wells are generally located upgradient (City Well #1 and City Well #3) and cross gradient (City Well #2) from the plating lines.

Table 2 presents a tabulated summary of the municipal well results. All PFAS results were below the proposed NR 140 Groundwater Enforcement Standard (ES) for PFOS and PFOA and were all below the laboratory reporting limits. The only exception to this was perfluorooctane sulfonamide (FOSA), which was detected at 6.0 ng/L in City Well #1 (RG659). We believe the FOSA detection is not likely related to the former TPC Site for several reasons:

- City well #1 is situated upgradient of the Site and the plating lines.
- The detected FOSA concentration in City Well #1 was more than 10 times greater than the other PFAS compounds in the sample. In the monitoring well samples, PFOS and other PFAS compounds were 10 to more than 1,000 times greater than the FOSA result. If the FOSA detection were related to the Site, one would expect a similar compound ratio in the City Well #1 sample.
- FOSA is a relatively large compound with lower mobility than most PFAS compounds. As a result, it is most commonly associated with near-source conditions in the soil, and is not known to migrate extensively in groundwater.

5. Surrounding Properties

North of the Site, beyond Taft Street, are predominately agricultural parcels. South of the Site is the Canadian National Railway and a mix of commercial and business properties. East of the Site are mostly residential properties. West of the Site is the Canadian National Railway and a series of business and commercial properties.

6. Environmental Setting

6.1 Topography

According to the United States Geological Survey (USGS) topographic map, and a review of the Google Earth application, the elevation of the Site is approximately 930 feet above mean sea level. Based on a review of these technical resources, the Site appears to be generally flat with a slight downward slope toward the west.

6.2 Soil / Geology

Based on past environmental investigations conducted at the site, the soil profile below the site consists of granular fill material that is 5 to 10 feet thick. This is underlain by silty sand with some clay that is approximately 30 to 40 feet thick. The Quaternary Geology of Calumet and Manitowoc Counties, Wisconsin (Mickelson, 2017) maps this as part of the Holy Hill Formation, which is a crudely stratified glacial till that is typically classified as silty sand (SM) using the unified soil classification system.

At depths of approximately 45 to 50 feet below ground surface (bgs), the till deposits are underlain by undifferentiated Silurian aged dolomite bedrock.

6.3 Groundwater / Hydrology

Sitewide and regional maps show the horizontal groundwater flow direction is towards the northeast (WDNR, 2017 and Gotkowitz, 2006). However, in the vicinity of the Former Plating Line and the Former Northern Plating Line, localized groundwater flow patterns are more complex, likely owing to the position of the water table near the contact of the fill soil and underlying silty sand. As a result, near the former plating lines, groundwater flow is locally to the southwest (at the Former Plating Line) and locally to the northwest (at the Former Northern Plating Line).

7. Field Investigation and Sampling Plan

7.1 Historical PFAS Use and Storage

Initially, AECOM will conduct a desktop study of information provided by TPC which may include, but not be limited to:

- site plans,
- figures,
- reports,
- safety data sheets (SDSs),
- laboratory analytical reports,
- monitoring well and water supply well boring logs and construction reports,
- documentation of PFAS historic use, storage, and disposal as a fume/mist suppressant or as fire suppression foam or other materials and products that may potentially contained PFAS and were used at the Site.

AECOM will also conduct a preliminary review of historic reports about potential off-site properties within the area that might have been in the past, or are currently, using materials and products that contained PFAS and could have impacted groundwater.

From this information, AECOM will identify the location(s) within the site where PFAS was used or stored in the past. Following the review of this information, AECOM will use the extensive existing monitoring well network to identify monitoring wells adjacent to and downgradient from the areas where PFAS was potentially used and stored to evaluate any potential impacts.

7.2 Health and Safety Plan

A site-specific Health and Safety Plan has previously been prepared and will be updated for this proposed work. The Health and Safety Plan contains a summary of known site contaminants and other site hazards, emergency resources available, personnel protection, decontamination procedures, and emergency procedures recommended for this project. Project field personnel will read and be familiar with the Plan before beginning the fieldwork.

7.3 Field Sampling Plan

AECOM will use the results of Site data review to identify up to 10 monitoring wells that are located adjacent to or downgradient from areas where PFAS have been used and stored in the past. Groundwater samples will be collected from each of the wells using PFAS free protocols as outlined below:

- The wells will be sampled using PFAS free protocols.
- Each well will be purged for three well volumes and sampled via a peristaltic pump with non-Teflon lined HDPE tubing using low-flow sampling techniques. Field parameters of temperature,

pH, specific conductance, oxidation-reduction potential, dissolved oxygen, and turbidity will be measured and recorded during purging.

- Groundwater samples will be collected from each well in laboratory-supplied 250mL HDPE plastic sample bottles for the PFAS Wisconsin 36-compound list.

PFAS are present in hundreds of commercial items (e.g., waterproof clothing). With analytical reporting limits for PFASs being in the parts per trillion range, reasonable care must be taken to minimize the potential for non-site related PFAS compounds being introduced into the samples. AECOM has collected over 50,000 PFAS samples and developed sampling protocols that are adequate to prevent cross-contamination. Sampling will be conducted by AECOM-certified PFAS sampling teams. AECOM certification requires attending an AECOM internal PFAS sampling training course and reviewing the AECOM's PFAS Sampling Guidance document designed to make AECOM samplers aware of the products that are known to have tested positive for PFAS compounds, as well as identifying products that are appropriate to use in the sampling environment.

Specific items that must not be brought on-site include:

- Field sampling items or equipment that contain Teflon® and that will be in direct contact with the sampling media,
- Gore-Tex® treated fabrics or clothing
- Any item in the ingredient list that includes the term “fluoro.”
- Aluminum foil
- Teflon-bearing plumber's tape
- Blue (or chemical) ice
- Clothing or boots described as waterproof, water-resistant, or stain-treated
- Tyvek® or coated Tyvek
- Clothing that has been washed with fabric softener as fabric softeners may contain PFAS
- Waterproof field books (e.g., Rite in the Rain®)
- Plastic clipboards, binders, or spiral hardcover notebooks
- Post-it Notes®
- Food packaging material
- Markers
- Sample pumps will be checked for Teflon® (fluoropolymer materials), including check valves, O-rings, and bladders. Teflon® (fluoropolymer materials) must not be used and, if present, will be replaced with PFAS-free parts (HPDE and silicon tubing are acceptable).

7.4 Investigative Derived Waste

Purge and decontamination water will be placed in a 55-gallon drum(s). The drum(s) will be stored on-site until a disposal pick-up is scheduled. A sample of the wastewater will be characterized for waste disposal. Following characterization and waste acceptance, the wastewater will be appropriately disposed.

8. Laboratory Analytical Methods and Quality Assurance

Samples collected into pre-labeled containers provided by the laboratory placed on ice and transported under a standard chain-of-custody practices to Eurofins TestAmerica Analytical Laboratory (Sacramento, CA), a specialty lab for PFAS compounds. Samples will be analyzed for PFAS by EPA Method 537 Modified - Isotope Dilution – State of Wisconsin 36 Compound List. The samples will be analyzed on a

standard (21 days) turn-around-time. A reporting limit of 2 ng/L will be achieved for the majority of the PFAS compounds, including PFOA and PFOS. In accordance with WDNR Method Guidance EA-19-0001, qualified results that are detected below the reporting limit but above the method detection limit will be reported with appropriate qualifiers.

Standard sampling protocols for PFAS compounds include the use of field and equipment blanks due to the possible ubiquitous nature of these compounds, including the potential presence of these compounds in sampling equipment and supplies, and to assess the possibility of cross-contamination during sampling, transport, and storage of samples. To evaluate the sampling technique, a field blank sample is prepared by pouring laboratory-certified PFAS-free water into a laboratory-provided sampling container in the field and shipping the sample to the laboratory with the field samples. Field blanks will be collected at a rate of 10% of the field samples collected for the overall sampling event.

Equipment blanks will also be collected to evaluate the sampling equipment by using laboratory-certified PFAS-free water, or process water, and passing the water over and through disposable or decontaminated field sampling equipment to assess the adequacy of the decontamination process and/or to evaluate potential contamination from the equipment used during sampling. The equipment blanks will be shipped to the laboratory with the field samples. Equipment blanks will be collected at a rate of 10% of the field samples collected for the overall sampling event.

A matrix spike/matrix spike duplicate sample is not required due to the isotope method used for determining PFAS concentrations. The lab will provide level IV quality control reporting.

Following receipt of sample results, AECOM will perform a QA/QC review of the laboratory data report. If quality issues are observed that could result in the rejection of the data, a Stage IIB validation will be conducted.

9. Sample Notification and Site Investigation (SI) Report

AECOM will notify the WDNR and the City of New Holstein within ten business days after receiving and performing a QA/QC review of the laboratory data report via the WDNR Form 4400-249. The SI report will generally follow WAC NR 716.15 requirements, which includes site general and background information, investigation methods, sampling and analysis requirements, field and analysis results, and conclusion and recommendations. Tables summarizing laboratory results, and figures that include well locations, groundwater flow, the extent of contamination will be included. A Remedial Action Options Report (RAOR) is not proposed at this time.

10. Project Schedule

Field tasks are anticipated to commence within 45 days of the WDNR review of this Work Plan. A Site Investigation report in general conformance to NR 716 will be submitted to the WDNR within approximately 60 days of receipt and QA/QC review of the analytical data.

11. Conclusion

TPC understands PFAS contamination is an emerging issue and has moved forward expeditiously to conduct initial sampling at the Site as well as at nearby municipal wells. The results of this show little if any risk to receptors. To better understand the extent of impacts at the Site, TPC proposes to conduct the PFAS storage and use assessment and groundwater sampling outlined in this work plan. The \$700 fee associated with a technical review of this Work Plan is enclosed.

We look forward to working with you on this project. If you have any questions regarding the information contained in this work plan, please contact us at your convenience.

Yours sincerely,



James Buss
Project Manager
AECOM
T: 608-828-8210
M: 608-630-7681
E: james.buss@aecom.com



John Cuthbertson
Associate Vice President
AECOM
T: 616-574-8480
M: 616-481-4009
E: John.Cuthbertson@aecom.com

enclosures: Figure 1 – Site Location Map
Figure 2 – Site Detail Map
Figure 3 – Initial PFAS Sampling Locations
Figure 4 – Municipal Water Supply Well Locations
Table 1 – Per- and Polyfluoroalkyl Substances (PFAS) Analytical Summary – Monitoring Wells
Table 2 – Per- and Polyfluoroalkyl Substances (PFAS) Analytical Summary – Municipal Wells

cc: Jason Smith – Tecumseh Products Company

Hydrogeologist Certification

I, James A. Buss, 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 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.

A handwritten signature in blue ink that reads "James A. Buss". The signature is written in a cursive style with a large initial 'J'.

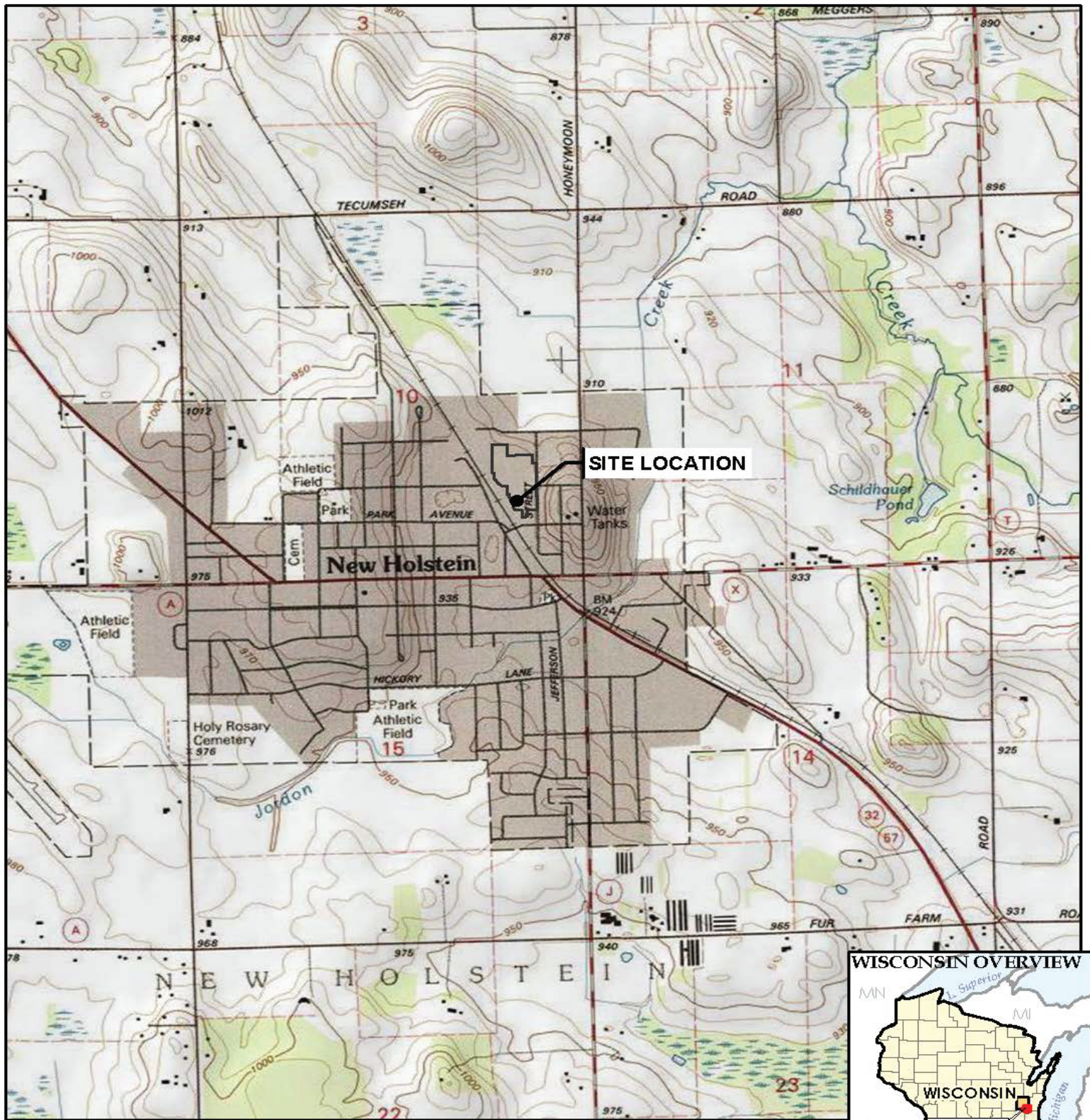
James A. Buss; Senior Hydrogeologist, P.G. 467

Date August 25, 2020

References

- LT Environmental, 2009. Phase I Environmental Site Assessment, Heus Manufacturing LLC, 1604 Michigan Avenue, City of New Holstein, Calumet County, Wisconsin 53061. Dated April, 2009.
- Gotkowitz, 2006. Water-Table and Aquifer-Susceptibility Map of Calumet County, Wisconsin. Wisconsin Geological and Natural History Survey Miscellaneous Map 56. Dated 2006.
- Mickleson, 1977. Quaternary Geology of Calumet and Manitowoc Counties, Wisconsin. Wisconsin Geological and Natural History Survey Bulletin 108, 60p., 2pls. UW Extension Bulletin 108-2017. Dated 2017.
- Robert E. Lee, 2015. Phase I Environmental Site Assessment, 1604 Michigan Avenue – Former Tecumseh Property, City of New Holstein, Calumet County, Wisconsin. Dated December 16, 2015
- TRC, 2019. Per- and Polyfluoroalkyl Substances (PFAS) Groundwater Sampling Plan, Former Tecumseh Facility, New Holstein, Wisconsin, BRRTS #02-08-363333. Dated September 30, 2019.
- TRC, 2020a. Per- and Polyfluoroalkyl Substances (PFAS) Groundwater Sampling Results, Former Tecumseh Facility, 1604 Michigan Avenue, New Holstein, Wisconsin, BRRTS #02-08-363333. Dated March 30, 2020.
- TRC, 2020b. Per- and Polyfluoroalkyl Substances (PFAS) Groundwater Sampling Results, Former Tecumseh Facility – 1604 Michigan Avenue, New Holstein, Wisconsin, BRRTS #02-08-585623, Dated May 21, 2020.
- WDNR, 2017. Final Case Closure with Continuing Obligations – Updated. Tecumseh Products Co Inc – West, 1604 Michigan Avenue, New Holstein, Wisconsin, BRRTS #02-08-100332. Dated March 27, 2017.
- WDNR, 2019. Per- and Polyfluoroalkyl Substances (PFAS) Groundwater Sampling Requirements, Former Tecumseh Products, Former Plating Line Area, New Holstein, Wisconsin, BRRTS #02-08-363333. Dated July 11, 2019.
- WDNR, 2020. Reported Contamination at Tecumseh Products Co LLC (former) – PFAS, 1604 Michigan Ave., New Holstein WI, DNR BRRTS Activity #02-08-585623. Dated April 29, 2020.

Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.



AECOM Imagine it.
Delivered.

558 North Main Street
Oshkosh, Wisconsin 54901
Phone: (920) 235-0270
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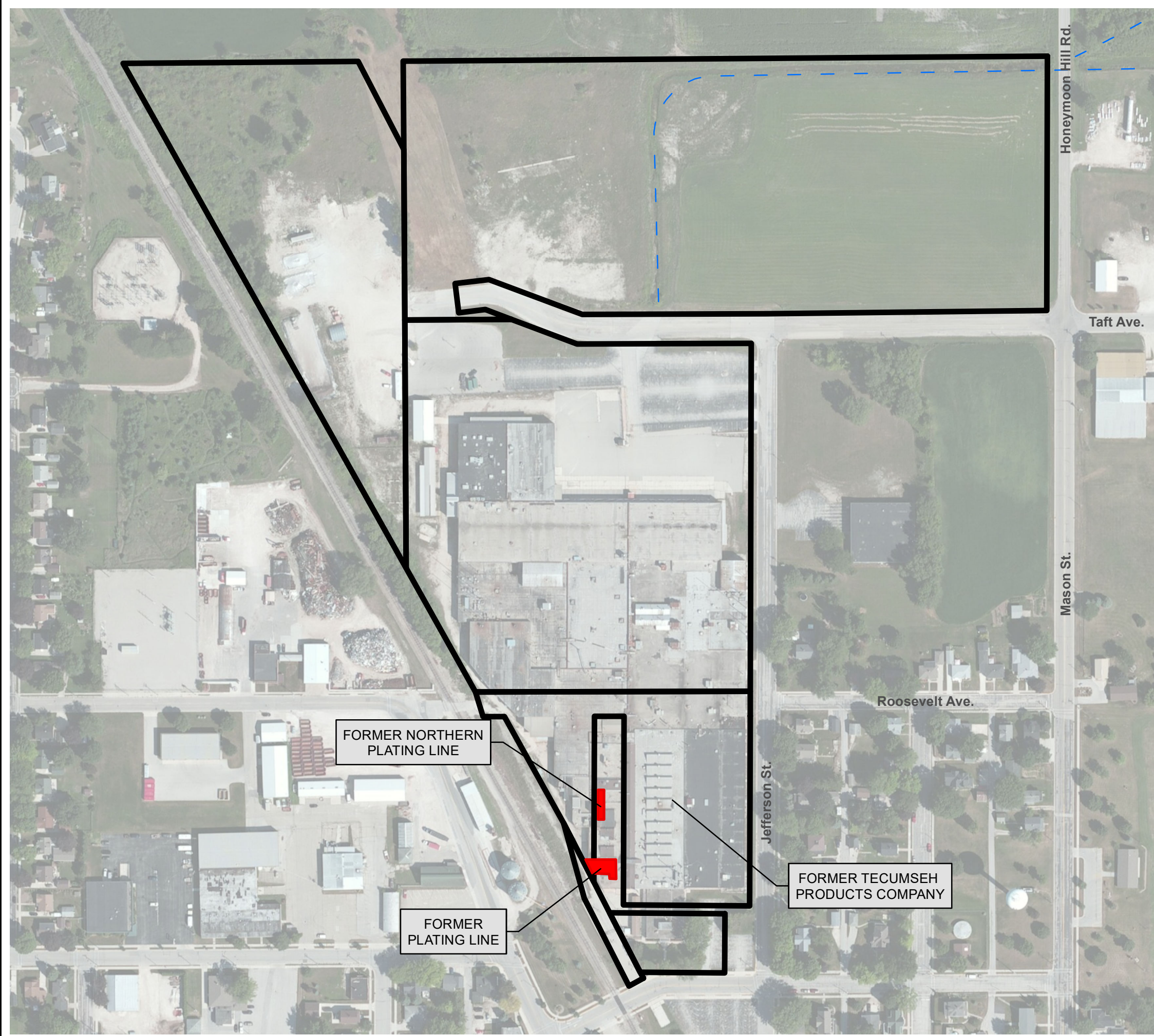
BRRTS NO.: 02-08-585623
TECUMSEH PRODUCTS CO. (FORMER)
NEW HOLSTEIN, WISCONSIN

FIGURE 1
SITE LOCATION MAP
AUGUST 2020




DRAWN BY: M. PAWLAK

APPROVED BY: J. BUSS

PROJECT NO.: 60639735

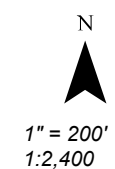
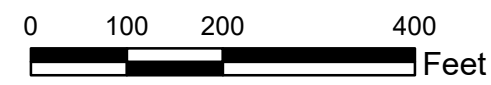


LEGEND

-  SITE PARCELS
-  STREAM
-  DITCH/CHANNEL

NOTES

1. AERIAL PHOTOGRAPHY SUPPLIED BY CALUMET COUNTY PLANNING, ZONING, AND LAND INFORMATION DEPARTMENT: PHOTOGRAPH DATE: 2014.
2. SOURCE: RMT CONSULTING, SEPTEMBER 2019

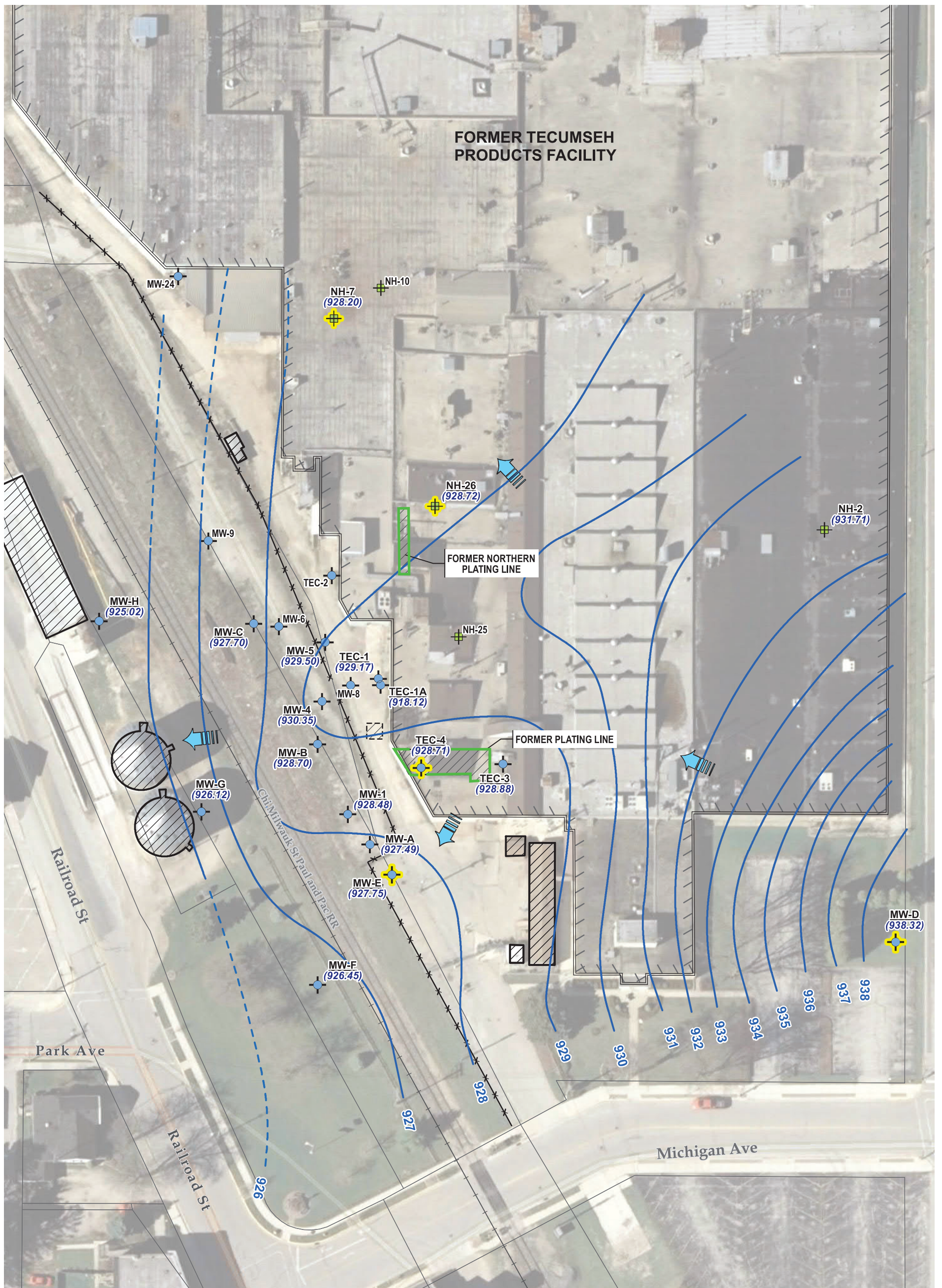


1" = 200'
1:2,400










PROJECT:		TECUMSEH PRODUCTS CO. (FORMER) NEW HOLSTEIN, WISCONSIN BRRTS NO.: 02-08-585623	
TITLE:		SITE MAP	
DRAWN BY:	M. PAWLAK	PROJ NO.:	60639735
CHECKED BY:	D. BOGDAN	FIGURE 2	
APPROVED BY:	J. BUSS		
DATE:	AUGUST 2020		



FORMER TECUMSEH PRODUCTS FACILITY

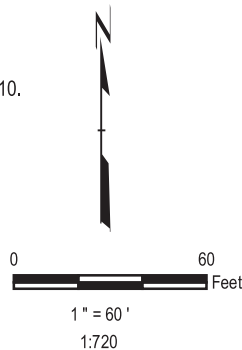



LEGEND

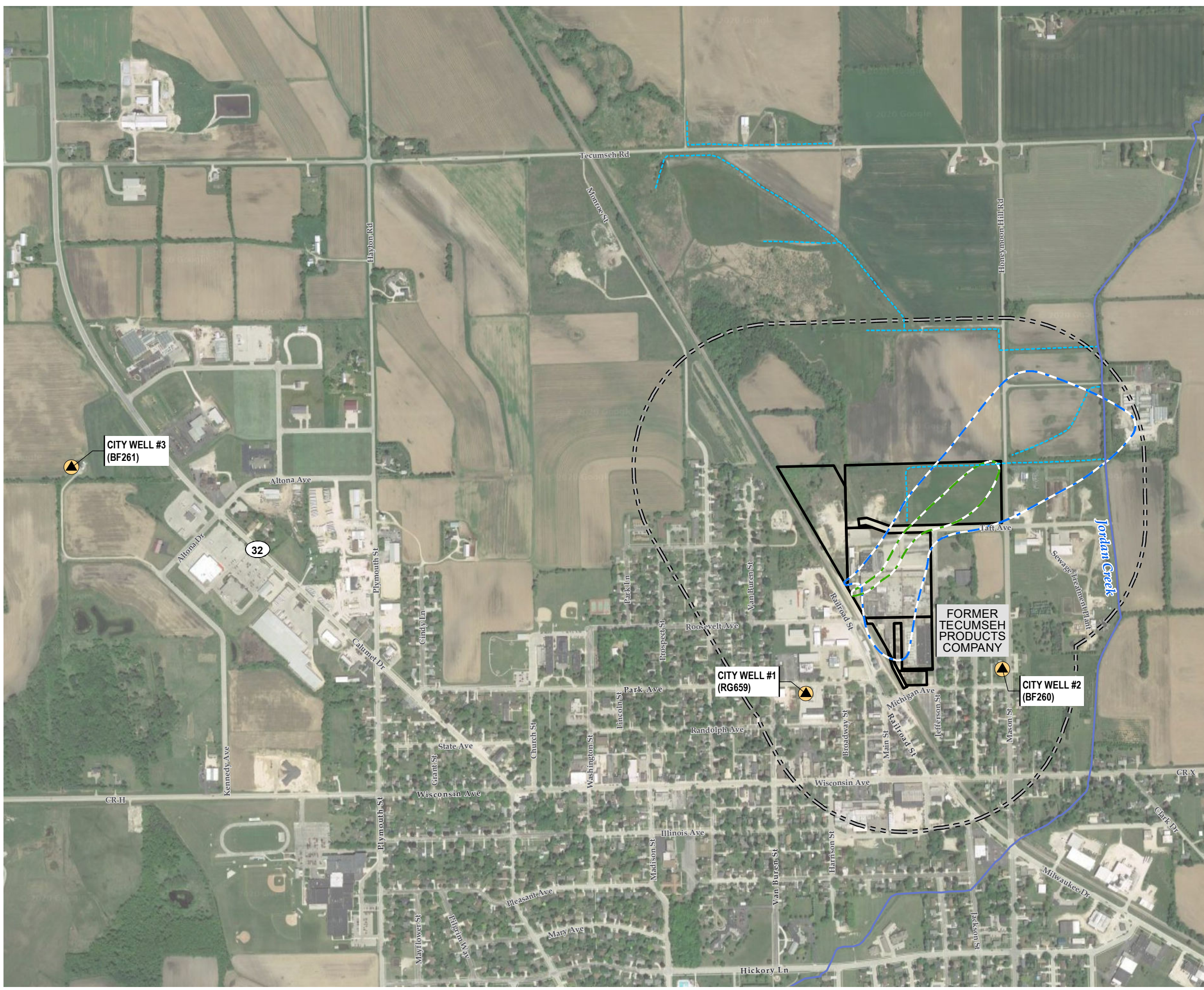
-  MONITORING WELL (TRC)
-  MONITORING WELL (R.E. LEE)
-  MONITORING WELL (TRC) USED IN INITIAL PFAS SAMPLING
-  MONITORING WELL (R.E. LEE) USED IN INITIAL PFAS SAMPLING
-  GROUNDWATER FLOW DIRECTION (INTERPRETED BASED ON MARCH 2019 DATA)
-  (925.03) GROUNDWATER ELEVATION - MARCH 2019 (FEET MSL)
-  GROUNDWATER ELEVATION CONTOUR - MARCH 2019 (DASHED WHERE INFERRED)
-  RAILROAD TRACKS
-  FENCE

NOTES








1. BASE MAP IMAGERY FROM CALUMET COUNTY, SPRING 2010.
2. SOURCE: RMT CONSULTING, SEPTEMBER 2019



PROJECT:		FORMER TECUMSEH PRODUCTS COMPANY NEW HOLSTEIN, WISCONSIN BRRTS NO.: 02-08-585623	
SHEET TITLE:		INITIAL PFAS SAMPLING LOCATIONS	
DRAWN BY:	M. PAWLAK	SCALE:	PROJ. NO. 60639735
CHECKED BY:	D. BOGDAN	1:720	FILE NO.
APPROVED BY:	J. BUSS	DATE PRINTED:	FIGURE 3
DATE:	August 2020		
		Imagine it. Delivered.	

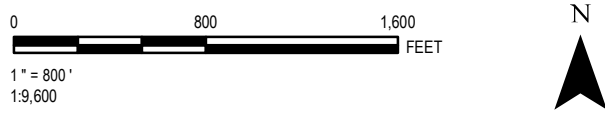


LEGEND

-  MUNICIPAL WATER SUPPLY WELL
-  SITE PARCELS
-  1,200' SETBACK FROM SITE PARCELS
-  GROUNDWATER PVOC ES EXTENT (SEE NOTE 2)
-  GROUNDWATER CVOC ES EXTENT (SEE NOTE 2)
-  STREAM
-  DITCH / CHANNEL

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, (6/1/2015).
2. THE APPROXIMATE EXTENTS OF THE CVOC AND PVOC GROUNDWATER PLUMES ARE FROM THE 2016 CLOSURE DOCUMENTS. THESE ARE INCLUDED ON THIS MAP TO SHOW THE DIRECTION OF GROUNDWATER FLOW FROM THE FORMER TECUMSEH FACILITY.
3. SOURCE: TRC COMPANIES, MAY 2020



FORMER TECUMSEH PRODUCTS COMPANY NEW HOLSTEIN, WISCONSIN BRRTS NO.: 02-08-585623	
MUNICIPAL WATER SUPPLY WELL LOCATIONS	
DRAWN BY:	M. PAWLAK
CHECKED BY:	D. BOGDAN
APPROVED BY:	J. BUSS
DATE:	AUGUST 2020
PROJECT:	60639735
FIGURE 4	
AECOM Imagine it. Delivered.	
FILE NO.:	353537_001.mxd

Tables

Table 1
Per- and Polyfluoroalkyl Substances (PFAS) Analytical Summary - Monitoring Wells
Former Tecumseh Products Co. - New Holstein, Wisconsin

Parameter	Well Designation and Sample Result (ng/L)							WI Proposed Standard (ng/L)
	TEC-4	NH-26	NH-7	MW-E	MW-D	RB-01	FB-1	
	2/19/2020	2/19/2020	2/19/2020	2/19/2020	2/19/2020	2/19/2020	2/19/2020	
6:2 Fluorotelomer sulfonate (6:2 FTS)	<17	1.7 J	<1.6	<1.7	<1.6	<1.6	<1.7	-
Perfluorobutanesulfonic acid (PFBS)	10 J	52	14	1.7	0.50 J	<0.16	<0.17	-
Perfluorobutanoic acid (PFBA)	<2.9	10 B	4.5 B	10 B	0.45 J B	0.30 J B	0.60 J B	-
Perfluorodecanoic acid (PFDA)	<2.6	<0.25	<0.25	2.1	<0.26	<0.25	<0.26	-
Perfluoroheptanesulfonic Acid (PFHpS)	<1.6	3.4	<0.15	0.31 J	<0.16	<0.16	<0.16	-
Perfluoroheptanoic acid (PFHpA)	6.7 J	1.7	0.50 J	4.0	<0.21	<0.20	<0.21	-
Perfluorohexanesulfonic acid (PFHxS)	2.1 J B C	1.7 B	0.86 J B	2.9 B	0.24 J B	0.26 J B	0.22 J B	-
Perfluorohexanoic acid (PFHxA)	7.7 J	2.1	0.73 J	4.3	<0.48	<0.47	<0.48	-
Perfluorononanoic acid (PFNA)	<2.2	1.0 J	0.22 J	22	<0.22	<0.22	<0.22	-
Perfluorooctanesulfonamide (FOSA)	<2.9	<0.28	0.30 J	0.52 J	0.40 J	0.34 J	0.30 J	-
Perfluorooctanesulfonic acid (PFOS)	300	940	22 C	44	<0.44	<0.44	<0.45	20
Perfluorooctanoic acid (PFOA)	11 J	4.9	1.1 J	14	<0.70	<0.70	<0.71	20
Perfluoropentanesulfonic acid (PFPeS)	<2.5	<0.24	<0.24	0.52 J	<0.25	<0.25	<0.25	-
Perfluoropentanoic acid (PFPeA)	<4.1	2.6	0.78 J	4.4	<0.40	<0.40	<0.41	-

Notes:

1. ng/L indicates nanograms per liter
2. RB-01 indicates Rinse Blank
3. FB-1 indicates Field Blank (quality control)
4. Samples analyzed by Eurofins TestAmerica - Sacramento for PFAS in Wisconsin 36 list. Only parameters that were detected in at least one sample are included in the table.
5. J indicates reported value was between the limit of detection and the limit of quantitation. B = Compound was found in the blank and sample.
6. C indicates transition mass ratio was outside of the established limits. Analyst judgement was used to positively identify the analyte, but there is some uncertainty in the results.
7. - indicates no standard proposed to date
8. **BOLD** = Greater than the limit of detection.

Table 2
Per- and Polyfluoroalkyl Substances (PFAS) Analytical Summary - Municipal Wells
Former Tecumseh Products Co. - New Holstein, Wisconsin

Parameter	Well Designation and Sample Result (ng/L)				WI Proposed Standard (ng/L)
	City Well #1 (RG659)	City Well #2 (BF260)	City Well #3 (BF261)	FB-1	
	5/11/2020	5/11/2020	5/11/2020	5/11/2020	
Perfluorobutanesulfonic acid (PFBS)	0.36 J	0.37 J	0.22 J	<0.19	-
Perfluorobutanoic acid (PFBA)	0.41 J	0.48 J	<0.33	<0.33	-
Perfluorohexanesulfonic acid (PFHxS)	0.42 J, B	0.49 J,B	0.39 J,B	0.24 J,B	-
Perfluorooctanesulfonamide (FOSA)	6.0	0.89 J	0.94 J	0.48 J	-
Perfluorooctanesulfonic acid (PFOS)	1.4 J	<0.51	<0.51	<0.51	20

Notes:

1. ng/L indicates nanograms per liter
2. RB-01 indicates Rinse Blank
3. FB-1 indicates Field Blank (quality control)
4. Samples analyzed by Eurofins TestAmerica - Sacramento for PFAS in Wisconsin 36 list. Only parameters that were detected in at least one sample are included in the table.
5. J indicates reported value was between the limit of detection and the limit of quantitation. B = Compound was found in the blank and sample.
6. C indicates transition mass ratio was outside of the established limits. Analyst judgement was used to positively identify the analyte, but there is some uncertainty in the results.
7. - indicates no standard proposed to date
8. **BOLD** = Greater than the limit of detection.