AECOM
1555 N. RiverCenter Drive, Suite 214
Milwaukee, WI 53212

414.944.6080 tel
414.944.6081 fax

Letter of Transmittal

Attention:	Mr. Tauren Beggs Hydrogeologist, WDNR 2984 Shawano Ave Green Bay, WI 54313	Date:	10/27/21
Project reference:	Former Newton Pit BRRTS No. 02-36-000268	Project number:	60135471

We are sending you the following:

Number of originals:	Number of copies:	Description:
One	Zero	Emerging Contaminant Work Plan Update #4 – 2021 Groundwater and Surface Water Sampling

Mr. Beggs,

Attached is the Emerging Contaminant Work Plan Update #4 – 2021 Groundwater and Surface Water Sampling for the Former Town of Newton Gravel Pit, Manitowoc Wisconsin.

Please let me know if you have any questions.

Thank you.

D. S. Henderson

David Henderson, P.E.
Senior Project Manager
D 414.944.6190 C 414.429.8304
dave.henderson@aecom.com

Cc: Kathleen M. McDaniel, City Attorney, City of Manitowoc
Dan Koski, Director of Public Infrastructure, City of Manitowoc

AECOM
1555 N. RiverCenter Drive
Suite 214
Milwaukee, WI 53212

T: +1-414-944-6080
aecom.com

October 27, 2021

AECOM Project No.
60135471(52518)

BRRTS No.
02-3-000268

Mr. Tauren Beggs
Hydrogeologist
Wisconsin Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54313-6727

Emerging Contaminant Work Plan Update #4 - 2021 Groundwater and Surface Water Sampling
Former Town of Newton Gravel Pit

Dear Mr. Beggs,

AECOM Technical Services, Inc. (AECOM), on the behalf of the City of Manitowoc (City), is pleased to submit this emerging contaminant work plan update for 2021 per- and polyfluoroalkyl substances (PFAS) groundwater and surface water sampling at the Former Town of Newton Gravel Pit site, 3130 Hecker Road, Manitowoc Wisconsin.

Presented below is a project update along with the proposed scope of work for continued groundwater (monitoring wells) and surface water monitoring.

Emerging Contaminant Project Update

The Former Newton Gravel Pit property is owned by the City of Manitowoc, is approximately 58 acres in size, and is located at 3130 Hecker Road in the Town of Newton, Manitowoc County Wisconsin. The property is situated in the southeast quarter of the northwest quarter of Section 02, Township 18N, Range 23E. A property location map is included as Figure 1.

The land use near the property is rural. Bordering the property to the west is an active gravel pit, to the north is farmland and forest, to the east is farmland and rural residences, and to the south is farmland and an active gravel pit. A small creek, Silver Creek, flows through the property from the north/northwest to the south/southeast. Site features are shown on Figure 2.

During the 1960's and early 1970's liquid industrial waste was disposed of within two source areas. The Western Source Area is located on an elevated area of the property along the western property line. The Northern Source Area is located on the north central portion of the property. In addition, historical aerial photos indicate former drying ponds were present in the northwest corner of the property.

In July 2018, at the request of the Wisconsin Department of Natural Resources (WDNR), AECOM conducted a limited groundwater assessment for PFAS[1] . The limited investigation focused on the property boundaries, the Western Source Area, the Northern Source Area, and based on anecdotal information along with historic aerial photography, an area in the northwestern portion of the property that historically contained former drying ponds. The limited investigation sampled groundwater from seven monitoring wells. Groundwater samples were analyzed for PFAS compounds using the Modified EPA Method 537, isotope dilution method, for the Michigan 24 compound list. Laboratory analytical results indicated that PFAS are present in the groundwater beneath the site and that concentrations of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) compounds exceed the EPA advisory level lifetime HAL at one location (WT-01).

On September 24, 2018, AECOM notified[2] the WDNR that emerging contaminants (i.e. PFAS) were present in the groundwater at the Former Newton Pit site. In response to the notification, the WDNR issued an updated responsible

[1] *Limited Groundwater Assessment for Emerging Contaminants*, Former Town of Newton Gravel Pit, 3130 Hecker Road, Manitowoc, Wisconsin, BRRTS no. 02-3-000268, AECOM Project No. 60581251, October 22, 2018
[2] Notification for Hazardous Substance Discharge, WDNR Form 4400-225, submitted to WDNR on September 24, 2018

party (RP) letter[3] to the City informing them of their legal responsibilities and the next steps to be taken associated with the PFAS release.

In compliance with the updated RP letter, an *Emerging Contaminant Monitoring Work Plan*[4] was developed and submitted to the WDNR for initiating an emerging contaminant site investigation. The work plan included both potable well and groundwater monitoring well sampling activities. The emerging contaminant potable well sampling was conducted during the October 2018 event and the results have been reported under a separate cover[5].

The emerging contaminant groundwater investigation was conducted in association with the fall 2018 on-site groundwater sampling event[6] . In total, between the two 2018 PFAS sampling events, 16 on-site wells and the groundwater treatment pond were sampled and analyzed using EPA Method 537 modified, isotope dilution, for the State of Michigan list of 24 PFAS. Analytical results indicated that PFAS were present in the on-site groundwater and in the waters of the treatment pond. At the time, no source area was defined for the PFAS.

In March of 2020 the City provided a *Revised Emerging Contaminant Work Plan Update #1*[7] to the WDNR for continued groundwater, potable well, and surface water sampling. The workplan was approved by the WDNR, with additions to the potable well and surface water monitoring scope of work.

The Work Plan Update #1 groundwater monitoring[8] was conducted in June of 2020 and it included PFAS sampling for the remaining 38 monitoring wells associated with the site. Groundwater samples were analyzed using EPA Method 537 modified, isotope dilution, for the Wisconsin list of 36 PFAS. Analytical results indicated that PFAS were present in the wells sampled.

The Work Plan Update #1 potable well sampling[9] was conducted in conjunction with the June 2020 groundwater event. In total, 15 addresses were scheduled for sampling and 15 addresses were sampled. Water samples were analyzed using EPA Method 537 modified, isotope dilution, for the Wisconsin list of 36 PFAS. The laboratory analytical data indicated that PFAS are present in the potable wells sampled.

The Work Plan Update #1 - Silver Creek surface water sampling[10] was conducted during August and November 2020. Samples were obtained both upstream and downstream of the gravel pit site. Water samples were analyzed using EPA Method 537 modified, isotope dilution, for the Wisconsin list of 36 PFAS. In total, 15 surface water samples were obtained from 11 locations during the two events. Analytical results indicate that PFAS were present in the surface water at all sample locations.

On November 6, 2020, the Wisconsin Department of Health Services reported-out the *11th Cycle of Groundwater Standards Proposals*. The recommendation included individual standards for 12 PFAS and combined standards for 6 PFAS.

Effective March 1, 2021 the WDNR modified the Wisconsin 36 PFAS laboratory analytical list. Three PFAS were removed from the original list, making the updated Wisconsin PFAS laboratory analytical list of 33 compounds.

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[3] Roxanne N. Chronert, WDNR, to City of Manitowoc, September 24, 2018. Reported Contamination at Manitowoc City/Former Newton Tn Gravel Pit, 3130 Hecker Road, Manitowoc.
[4] Emerging Contaminant Monitoring Work Plan and Project Status Update, Former Town of Newton Gravel Pit, BRRTS no. 02-3-000268, AECOM Project No. 60135471(82518), October 24, 2018
[5] October 2018 VOC Semi-Annual Potable Well Monitoring Letter Report and Initiation of Per- and Polyfluoroalkyl Substances (PFAS) Monitoring, Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), February 18, 2019
[6] Northern Source Area Sampling, 2018 VOC Annual Groundwater Monitoring, and Initial Emerging Contaminant Groundwater Investigation Report, Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268, WDNR FID No. 436104020, AECOM Project No: 60135471(82518), June 5, 2019
[7] Revised Emerging Contaminant Work Plan Update #1, Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), March 18, 2020
[8] Emerging Contaminant Groundwater Investigation Update Report, June 2020, Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268, WDNR FID No. 436104020, AECOM Project No: 60135471(82518), February 26, 2021
[9] June 2020 VOC Semi-Annual and PFAS Potable Well Monitoring Letter Report, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), December 30, 2020
[10] 2020 Silver Creek Emerging Contaminants Sampling Letter Report, Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), March 15, 2021

On April 19, 2021 the City provided an *Emerging Contaminant Work Plan Update #2*[11] *– Continued On-Site Investigation* to the WDNR for work focused on the former drying ponds present in the northwest corner of the property. The investigation was also designed to aid in the hydrological understanding of the northwest corner of the property, especially how groundwater flow relates to the surface water of Silver Creek.

The work included soil and groundwater sampling for six water table or piezometer wells installed at three locations during August 2021. Samples were analyzed using the Modified EPA Method 537, isotope dilution method, State of Wisconsin list of 33 PFAS. The results of the former drying ponds investigation have not been published yet.

On April 20, 2021 the City provided an *Emerging Contaminant Work Plan Update #3 – Area Wide Potable Well Investigation*[12] to the WDNR for a May/June 2021 potable well sampling event. A total of 96 potable wells were scheduled for sampling. Sampling was proposed along Hecker Road, Viebahn Street, CTH CR, Thunder Ridge Road, Blackhawk Court, Silver Creek Road, South 26th Street, Elm Road, Orchard Lane, South 19th Street, and South 15th Street. The work was scheduled to be conducted in conjunction with the *Area Wide VOC Five Year Potable Well Monitoring Work Plan*[13]. The results of the May/June 2021 potable well sampling event have not been published yet.

Future potable well sampling will be addressed in the Emerging Contaminant Work Plan Update #5 – Up-gradient Potable Well Investigation, to be submitted under a separate cover.

Emerging Contaminant Work Plan Update #4

This work plan update is provided in general accordance with the requirements of the Wisconsin Administrative Code Chapter NR 700 rule series with the understanding that multiple work plans for the project are currently in place and approved by the WDNR. Therefore, this work plan update is intended to be reviewed in conjunction with the existing plans.

Groundwater Monitoring Well Sampling

The proposed monitoring well sampling locations, schedule, and sampling methods are presented as follows. This is a one-time only work plan. Future sampling will be based on the results and WDNR discussions.

Locations and Schedule

The proposed monitoring well PFAS groundwater sampling includes all existing on-site and off-site monitoring wells. This includes a total of 60 wells (see Figure 2) to be sampled during the November 2021 sampling event, as listed below:

On-site monitoring wells:

- WT-01
- PZ-01
- WT-02A
- WT-03
- PZ-03
- WP-06R
- WP-07R
- WT-19R
- WT-26
- PZ-26A
- PZ-26B
- PZ-26C
- WT-27
- WT-28
- WT-29
- WT-30
- PZ-30
- PZ-30A
- WT-31
- PZ-31
- PZ-31A
- WT-32
- PZ-32
- PZ-32A
- WT-33
- PZ-33
- PZ-33A
- WT-34
- WT-35
- WT-36
- WT-37
- PZ-37A
- PZ-37B
- PZ-37C

[11] Emerging Contaminant Work Plan Update #2 – Continued On-Site Investigation, Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), April 19, 2021
[12] Emerging Contaminant Work Plan Update #3 – Area Wide Potable Well Investigation, Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), April 20, 2021
[13] Area Wide VOC Five Year Potable Well Sampling Work Plan, Former Town of Newton Gravel Pit, 3130 Hecker Road, Manitowoc, Wisconsin, BRRTS No. 02-36-000268, AECOM Project No: 60135471(82518), April 16, 2021

Off-site monitoring wells:

- WT-05
- PZ-05A
- PZ-05B
- WT-11
- WT-12
- PZ-12
- WT-15
- PZ-15A
- PZ-15B
- WT-16
- PZ-16
- PZ-16A
- PZ-16B
- PZ-16C
- WT-20
- WT-21
- WT-22
- WT-23
- WT-24
- PZ-24A
- PZ-24B
- PZ-24C
- WT-25
- PZ-25A
- PZ-25B
- PZ-2

Methods

There are potential cross contamination issues associated with PFAS sampling due to the presence of these compounds in many commercial products. Therefore, AECOM PFAS-certified sampling teams will conduct the PFAS sampling events. AECOM certification requires attending an internal PFAS sampling training course and reviewing the AECOM PFAS Sampling Guidance document designed to make AECOM samplers aware of the products known to have tested positive for PFAS compounds, as well as identifying PFAS-free products that are appropriate to use in the sampling environment.

Groundwater sampling for PFAS will include the following protocols:

- *Testing Laboratory:* WDNR PFAS certified laboratory, or a laboratory that has applied for Wisconsin certification, for analyses.
- *Laboratory Analysis:* Modified EPA Method 537 (isotope dilution method), State of Wisconsin list of 33 analytes.
- *Sampling:* Groundwater samples will be obtained using PFAS free equipment and low-flow sampling procedures. To determine stabilized readings during well purging AECOM will measure field parameters, such as oxygen reduction potential (ORP), dissolved oxygen (DO), conductivity, temperature, and pH.

  The water samples will be collected in laboratory-supplied 250ml HDPE bottles without preservative. The sample bottles, once filled, will be stored on ice in insulated coolers. The coolers will be shipped via FEDEX to the analytical laboratory for chemical analysis within the holding times specified by the analytical method (14 days). The samples will be transferred to the laboratory under standard chain of custody control.
- *Field Duplicate:* Duplicate Sample: One field dup will be obtained for every 10 samples.
- *Field Blanks:* The Method 537 sampling protocol, which require field blanks at each sampling location, will be modified as follows:

  A single field blank will be collected adjacent to a current sampling location during the sampling event. Field blanks will be collected by pouring laboratory-certified PFAS-free water into a laboratory-provided sampling container and shipping the sample to the laboratory with the field samples.
- *Equipment Blanks:* One equipment blank representative of the sampling procedures and equipment will be collected for every 10 samples.
- *Laboratory Quality Control:* The test lab will provide a Level 4 data package. Due to the use of the isotope dilution method, Matrix Spike/Spike Duplication (MS/MSD) analysis will not be requested.
- *Data Validation:* AECOM will provide a data validation review using procedures described in the National Functional Guidelines for High Resolution Superfund Method Data Review (EPA, April 2016), as appropriate.
- *Reporting:* AECOM will present the PFAS sampling results in a dedicated groundwater and surface water monitoring letter report. The report will also include historical PFAS groundwater sampling results. Groundwater results will be compared to the Wisconsin Department of Health Services (WDHS) Cycle 11 proposed PFAS ES and PAL limits. The need for additional monitoring will be evaluated pending the results from the sampling and future discussions with the WDNR.

Response Actions

There are no groundwater response actions proposed at this time.

Surface Water Sampling

The proposed surface water sampling locations, schedule, and sampling methods are presented as follows.

Locations and Schedule

The preferred surface water sampling schedule is during a low flow period, when stream flows are clear and stream base-flow includes groundwater discharge. These conditions may occur during summer dry periods and into the fall season. Therefore, surface water sampling of Silver Creek is proposed to occur during the first reasonable low flow/dry period during 2021.

The proposed PFAS surface water sampling in Silver Creek will be conducted upstream, within the boundaries of the site property, and downstream from the property. This includes a total of five sample locations along with obtaining a sample from the on-site groundwater treatment pond as shown on Figure 3 and listed below:

- SW-AA, northwest of the gravel pit, upstream of the Highway 42 right-of-way (ROW).
- SW-A, north of the western gravel pit property line.
- SW-E, Hecker Road upstream of the ROW bridge.
- SW-G, CTH CR upstream of the ROW bridge.
- SW-I/SG-2, south of the southern gravel pit property line, adjacent to VOC sampling staff gage SG-2.
- Treatment Pond at Staff Gauge SG-P location.

Methods

There are potential cross contamination issues associated with PFAS sampling due to the presence of these compounds in many commercial products. Therefore, AECOM PFAS-certified sampling teams will conduct the PFAS sampling events. AECOM certification requires attending an internal PFAS sampling training course and reviewing the AECOM PFAS Sampling Guidance document designed to make AECOM samplers aware of the products known to have tested positive for PFAS compounds, as well as identifying PFAS-free products that are appropriate to use in the sampling environment.

Surface water sampling for PFAS will include the following protocols:

- *Testing Laboratory:* WDNR PFAS certified laboratory, or a laboratory that has applied for Wisconsin certification, for analyses.
- *Laboratory Analysis:* Modified EPA Method 537 (isotope dilution method), State of Wisconsin list of 33 analytes.
- *Sampling:* Sampling will be initiated at the furthermost down-stream location and progress up-stream. At each location, samples will be obtained from an undisturbed mid-stream flowing channel of water. Due to the reported properties of PFAS compounds, that indicate they like to exist at the air/water interface, grab samples will include the air/water interface.

  The grab samples will be obtained using laboratory-supplied 250ml HDPE bottles without preservative. The sample bottles, once filled, will be stored on ice in insulated coolers. The coolers will be shipped via FEDEX to the analytical laboratory for chemical analysis within the holding times specified by the analytical method (14 days). The samples will be transferred to the laboratory under standard chain of custody control.

  Additional field data, specific to the Newton Pit site, will be collected to understand the local interaction between Silver Creek and groundwater as part of the local flow system. At the time of surface water sampling, a round of groundwater elevation readings will be obtained from the monitoring well network associated with the Newton

Pit. Along with the groundwater elevation readings, surface water elevation readings will be collected from the Silver Creek and treatment pond staff gauges, SG-C and SG-P respectively. Mapping of the groundwater and surface water elevations will provide an interpretation of groundwater flow and whether Silver Creek is a losing or a gaining stream at the time of sampling.

- *Duplicate Sample:* One field dup will be obtained for every 10 samples.
- *Field Blanks:* A single field blank will be collected adjacent to a current sampling location, during the sampling event. Field blanks will be collected by pouring laboratory-certified PFAS-free water into a laboratory-provided sampling container and shipping the sample to the laboratory with the field samples.
- *Equipment Blanks:* No sampling equipment, other than laboratory provided bottles, is anticipated to be used during the surface water sampling. Therefore, no equipment blanks will be obtained.
- *Laboratory Quality Control:* The test lab will provide a Level 4 data package. Due to the use of the isotope dilution method, Matrix Spike/Spike Duplication (MS/MSD) analysis will not be requested.
- *Data Validation:* AECOM will provide a data validation review using procedures described in the National Functional Guidelines for High Resolution Superfund Method Data Review (EPA, April 2016), as appropriate.
- *Reporting:* AECOM will present the PFAS sampling results in a dedicated groundwater and surface water monitoring letter report. The report will also include historical PFAS surface water sampling results. Surface water results will be compared to proposed Surface Water Quality (SWQ) standards for PFAS. The need for additional monitoring will be evaluated pending the results from the sampling and future discussions with the WDNR.

Response Actions

There are no surface water response actions proposed at this time.

Closing

The potential need for additional PFAS sampling of groundwater or surface waters, beyond what is proposed in this work plan, will be evaluated pending the results from the proposed sampling and future discussions with the WDNR.

Unless otherwise notified by the WDNR, the City intends to proceed with the activities proposed in this Work Plan Update. If you have any questions, please contact Dave Henderson at 414.944.6190 or dave.henderson@aecom.com.

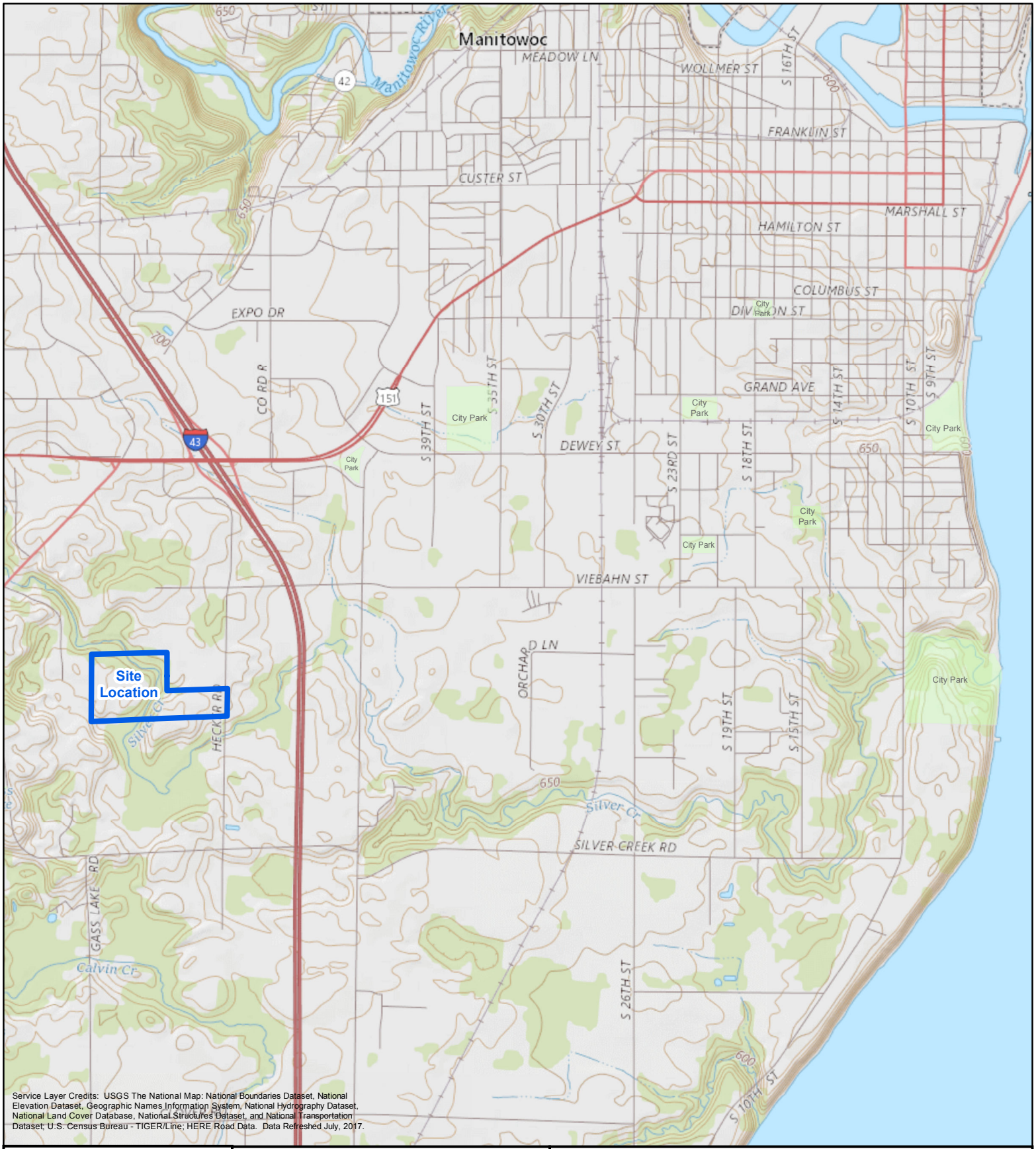
Yours sincerely,
AECOM Technical Services Inc.

Robert Weseljak, P.G.
AECOM
robert.weseljak@aecom.com

David Henderson, P.E.
AECOM
dave.henderson@aecom.com

enclosures: Figure 1 Site Location
Figure 2 Proposed PFAS Monitoring Well Sample Locations
Figure 3 Proposed PFAS Surface Water Sample Locations

cc: Kathleen M. McDaniel, City Attorney, City of Manitowoc
Dan Koski, Director of Public Infrastructure, City of Manitowoc



Service Layer Credits: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data. Data Refreshed July, 2017.

Map Location

0 1,250 2,500 5,000 Feet

FORMER NEWTON GRAVEL PIT

SITE LOCATION MAP

AECOM - Milwaukee Office
1555 River Center Dr
Milwaukee WI

AECOM

Project No. 60581251 | Drawn By: RW | Date: July 2018

Figure 1

Project Management Initials: BM Creator: MLB Checked: Approved: ANSI B 11" x 17"

FIGURE 2
PROPOSED PFAS MONITORING WELL LOCATIONS

Former Newton Gravel Pit
Manitowoc, Wisconsin

Legend

- Proposed PFAS Monitoring Well(s) Sampling Locations
- Gravel Pit Roads
- Approximate Pond Location
- Approximate Outfall Pipe Location
- Engineered Cap Area
- Electric Line
- Civil Divisions
- Parcels
- Streams
- Building Footprints

1 inch = 250 feet

AECOM
1555 N. RiverCenter Drive, Suite 214
Milwaukee, Wi 53212
PH: 414-944-6080
www.aecom.com

APPROVED BY: DH | DATE: 10/5/2021

Project No.: 60135471

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Project Management Initials: BM Creator: MLB Checked: Approved: ANSI B 11" x 17"

FIGURE 3
PROPOSED PFAS SURFACE WATER LOCATIONS

Former Newton Gravel Pit
Manitowoc, Wisconsin

Legend

- Proposed Staff Gauge To Be Sampled for PFAS
- Staff Gauge Not Proposed For PFAS Sampling
- Gravel Pit Roads
- Approximate Pond Location
- Approximate Outfall Pipe Location
- Engineered Cap
- Electric Line
- Civil Divisions
- Parcels
- Streams
- Building Footprints

Notes:
1. Horizontal Coordinates = NAD83 Manitowoc County Coordinates.

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Milwaukee, Wi 53212
PH: 414-944-6080
www.aecom.com

DRAWN BY: RW | DATE: 10/13/2021

Project No.: 60135471

Feet
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