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June 20, 2018

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

Subject: Sampling and Analysis Plan/Proposal for the an Emerging Contaminant Assessment of Groundwater at the Former Town of Newton Gravel Pit (BRRTS No. 02-36-000268) and former Mirro Plant (BRRTS No. 02-36-545108) Sites in Manitowoc, Wisconsin

Dear Mr. Beggs:

AECOM Technical Services, Inc. (AECOM) is pleased to provide this Sampling and Analysis Plan/Proposal to conduct groundwater sampling for emerging contaminants (per- and polyfluoroalkyl substances [PFAS]). The groundwater sampling is proposed to be conducted at two sites; the former Town of Newton Gravel Pit, 3130 Hecker Road and the former Mirro Plant, 1512 Washington Street in Manitowoc, Wisconsin. The following paragraphs provide a brief project background, scope of services – including field procedures, proposed schedule, and our cost proposal to complete the described services.

Site Locations and Background

The former Newton Gravel Pit is located at 3130 Hecker Road in Manitowoc County. As part of the continuing assessment of the groundwater impacts associated with the former gravel pit, a potential for the presence of per- and polyfluoroalkyl substances (PFAS), has been identified.

The former Mirro plant at 1512 Washington Street in Manitowoc, Wisconsin may have manufactured Teflon-coated consumer products. The process for Teflon-coating is known to have incorporated the use of PFAS substances.

Scope of Work

The scope of work for the former Newton Gravel Pit includes:

- Sample five existing monitoring wells (WT-31, PZ-31, WP-06R, WT-26 and PZ-26A) for PFAS compounds.
- Install one water table monitoring well in the north source area. The monitoring well will be installed, developed and after equilibration, sampled for PFAS compounds.
- Evaluate the data and prepare a technical memorandum describing the site activities and presenting the results of the groundwater sample analysis.

The scope of work for the former Mirro Plant includes:

- Installing two new water table monitoring wells. One on the northeast corner of the plant in the sidewalk right-of-way and one within the building footprint.
- Sample three existing monitoring wells (MW-14, MW-16, and MW-16PZ) and the two newly installed monitoring wells for PFAS compounds.
- Evaluate the data and prepare a technical memorandum describing the site activities and presenting the results of the groundwater sample analysis.

These work items will be completed as described under the field procedures below.

Field Procedures

Utility Clearance

AECOM will contact Digger's Hotline for the location of public utilities in the area of the investigation prior to commencing work. AECOM will also subcontract a private utility locator to mark potential private buried utilities at each planned location.

Monitoring Well Installation and Development

NR 141 groundwater monitoring wells will be installed by advancing a boring drilled with a roto-sonic rig. The roto-sonic rig advances a 4-inch "sampler bit" casing to collect subsurface samples. The sampler is advanced in 10-ft intervals, and once the 10-ft run is complete, an 8" ID casing is advanced to the same depth so the core barrel can be withdrawn. After the "sampler bit" is tripped out of the hole, a monitoring well is installed within the casing. The casing is removed as the well filter pack and sealant is installed.

The wells will be screened to intercept the soil-groundwater interface. In areas where subsurface utilities may exist, prior to advancing the boreholes, the locations will be evaluated for the presence of subsurface utilities by hand digging or vacuum clearing the first five feet of the boring.

The groundwater monitoring wells will be constructed in general conformance with NR 141. The wells will be completed with 2-inch ID, polyvinyl chloride (PVC) completed with a 10-foot long section of 10-slot (0.010-inch) PVC screen, flush-threaded to a similar PVC riser. The annulus will be filled with clean, appropriately-graded sand pack to approximately two-feet above the screen. A two-foot fine sand seal will be installed above the filter pack. Chipped or granular bentonite will be used on top of the filter pack seal to fill the annulus space. Wells will be completed an above grade or flush-mounted well protector outer casing cemented into an approximate 2-foot square concrete pad.

The newly installed monitoring wells will be developed in general conformance with NR 141.21. The wells will be allowed to equilibrate, prior to collecting depth to groundwater measurements and groundwater samples.

Groundwater Monitoring Well Sampling

Groundwater samples will be collected using low-flow sampling. 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, during the sampling event. Groundwater samples will be placed in appropriate pre-cleaned, laboratory-supplied sample jars. Sample labels will be adhered to each sample jar and will contain the sample identification number (project and facility), date and time of collection, analysis to be conducted, preservative, and the sampler's initials. A chain-of-custody (COC)

form will be completed after sample collection and the samples will be placed in a cooler and shipped under standard COC procedures to the analytical laboratory.

PFAS Sampling Considerations

PFASs are present in hundreds of commercial items (e.g. waterproof clothing). With analytical reporting limits for PFASs being in the parts per trillion range, care must be taken to assure non-site related PFAS compounds are introduced into the samples.

All AECOM samplers will be trained in PFAS sampling procedures. 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 hard cover notebooks
- Post-it Notes®
- Food packaging material
- Markers

Sample pumps must be checked for Teflon® (fluoropolymer materials) including check valves, O-rings, and bladders. These must not be used or replaced with PFAS-free parts (HPDE and silicon tubing are acceptable).

Surveying

The location and elevations of each sampling point will be surveyed relative to State Plane Coordinates and mean sea level using global positioning system and/or standard surveying techniques, as appropriate based on location and physical access/configuration on the site. Elevations of the ground surface, top of PVC and top of protector pipe will be surveyed for each of the new (and in for the former Mirro site existing) groundwater monitoring wells. Groundwater elevations will be calculated based on the top of PVC elevation measurements.

Laboratory Analytical Methods

Groundwater samples will be analyzed by Vista Analytical, a specialty lab for PFAS compounds using method 537.1.1M with a 24 compound list. Level IV quality control reporting will be provided by the lab. Quality control will include one matrix spike and matrix spike duplicate sample collected from one well at each location. Additionally, a different well at each location will be sampled in duplicate.

Quality Assurance Project Plan

Sampling and analytical testing will be conducted in accordance with this plan as well as the Quality Assurance Project Plan developed for the WDNR WAM projects.

Investigative Waste Management

Soil generated during the installation of the monitoring wells will be placed into 55-gallon drums that will be temporarily staged at each site until the analytical results from testing are available and the proper disposal methods are determined. Likewise, water generated from purging the NR 141 monitoring wells will also be placed in a 55-gallon drum until proper disposal methods are determined. Based on the scope of the proposed assessment, we anticipate that approximately six drums of soil and four drums of water will be generated during the assessment. AECOM will coordinate proper disposal of the investigative wastes provided the City of Manitowoc signs the appropriate waste profile and manifest forms prior to completion of the final report for this project. The cost for coordination and off-site disposal of the investigative waste is included in this proposal for solid waste disposal. If results indicate any of the waste requires classification as hazardous, additional costs will be incurred.

Reporting

A technical memo will be prepared for each site to describe the installation of the monitoring wells and relay the results of the groundwater analysis. A draft memo in electronic format will be submitted to the WDNR project manager and the property owner (i.e. the City of Manitowoc) for their review and comment prior to submitting a final report.

Schedule

The five existing groundwater monitoring wells at the Newton Pit will be sampled either the last week of June or the first week of July, 2018.

The well installations at the former Newton Pit and Mirro plant will be conducted in a single mobilization later in July based on driller available. The monitoring wells will be developed after installation and groundwater sampling will occur one to two weeks after the wells are developed.

Laboratory turnaround time is approximately 15 working days. AECOM will provide a draft technical memoranda approximately four to six weeks after receipt of the laboratory analytical results from the groundwater sampling.

Health and Safety Plan

A site specific Health and Safety Plan has previously been prepared. 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 prior to beginning the fieldwork.

Cost Proposal

AECOM proposes to complete this project in accordance with the labor and unit rates included in the AECOM Fee Schedule for WAM Projects, effective October 1, 2016. AECOM estimates the breakdown of labor and material costs to complete the requested services, as shown on the attached Cost Proposal to be:

Newton Pit Site	\$19,262.25
Mirro Plant Site	<u>\$18,313.00</u>
Total Project estimate	\$37,575.25

The Cost Proposal indicates the unit prices for the various elements of service that we expect will be used to provide the services outlined in this proposal and is separated by each site. A back-up labor estimate is also provided, as you requested, to provide a breakdown of the labor effort by task. Invoice amounts will be based on actual units utilized at the agreed upon rates and will include travel costs and other expenses incurred by AECOM in rendering the proposed services. AECOM understands that the WDNR will incorporate this proposal into a contract including terms provided in the WDNR's Request for Statements of Qualification dated June 30, 2016.

Please contact us if you have any questions or comments regarding the scope of services or procedures presented in this plan.

Sincerely yours,

AECOM Technical Services, Inc.



Lanette L. Altenbach, P.G., C.P.G.
Senior Hydrogeologist
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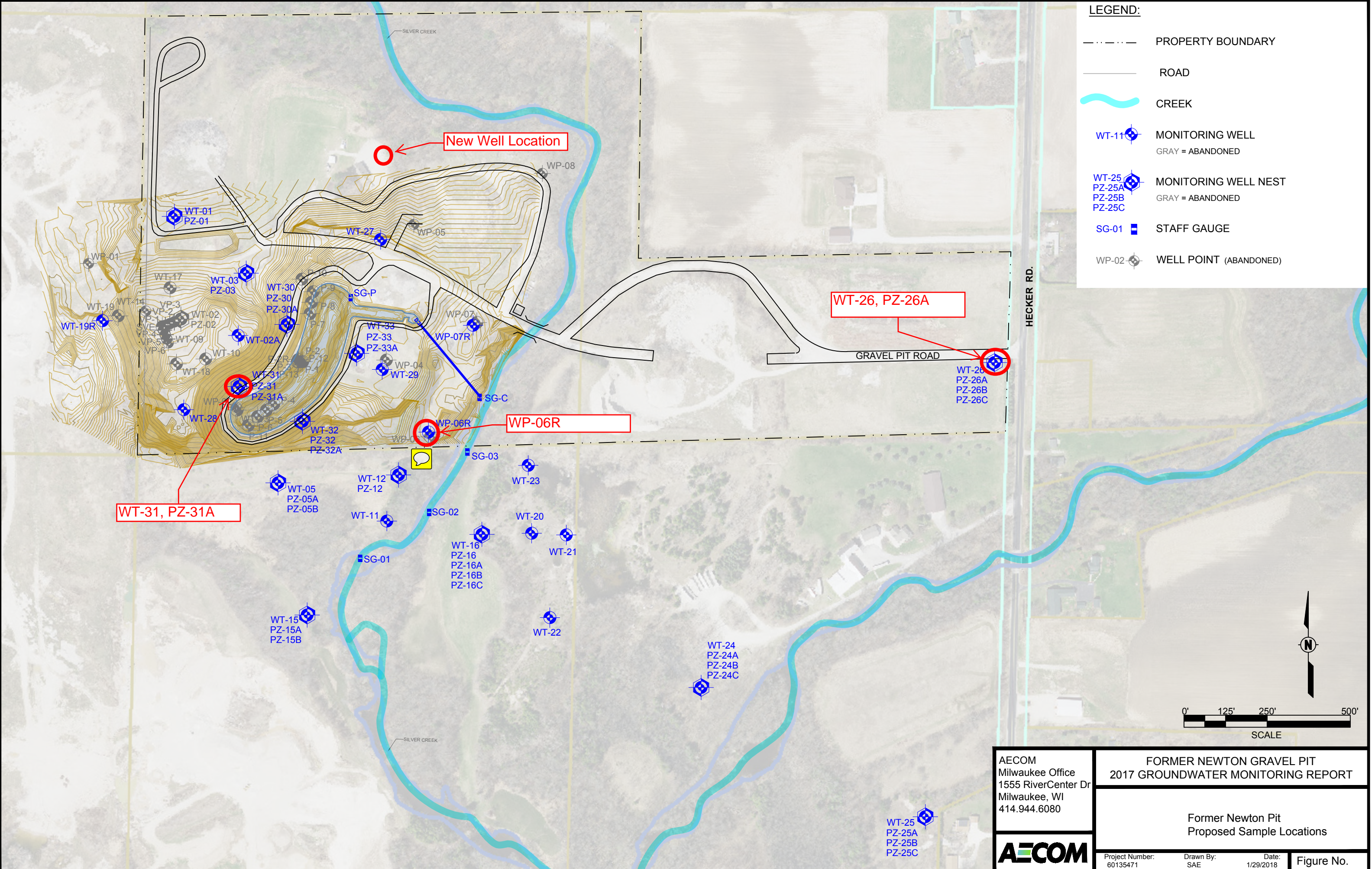


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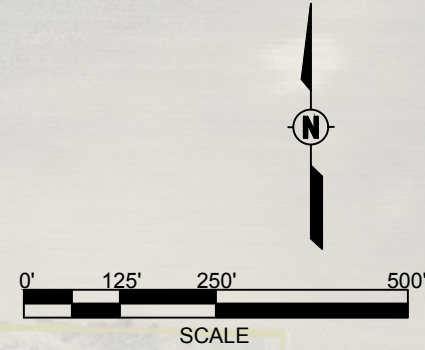
Attachments:

- Figure 1 – Former Newton Pit Proposed Sample Locations
- Figure 2 – Former Mirro Site Proposed Sample Locations
- Cost Proposal

File: \\USM\MK\F5001\proj\03\Data\Library\work\82519\Cad\2018\2018 - Newton Gravel Pit Remediation.dwg; USER: ENGELHARDT, SARAH; PLOTTED: January 29, 2018 - 4:14 PM



- LEGEND:**
- PROPERTY BOUNDARY
 - ROAD
 - ~ CREEK
 - WT-11 MONITORING WELL
GRAY = ABANDONED
 - WT-25, PZ-25A, PZ-25B, PZ-25C MONITORING WELL NEST
GRAY = ABANDONED
 - SG-01 STAFF GAUGE
 - WP-02 WELL POINT (ABANDONED)



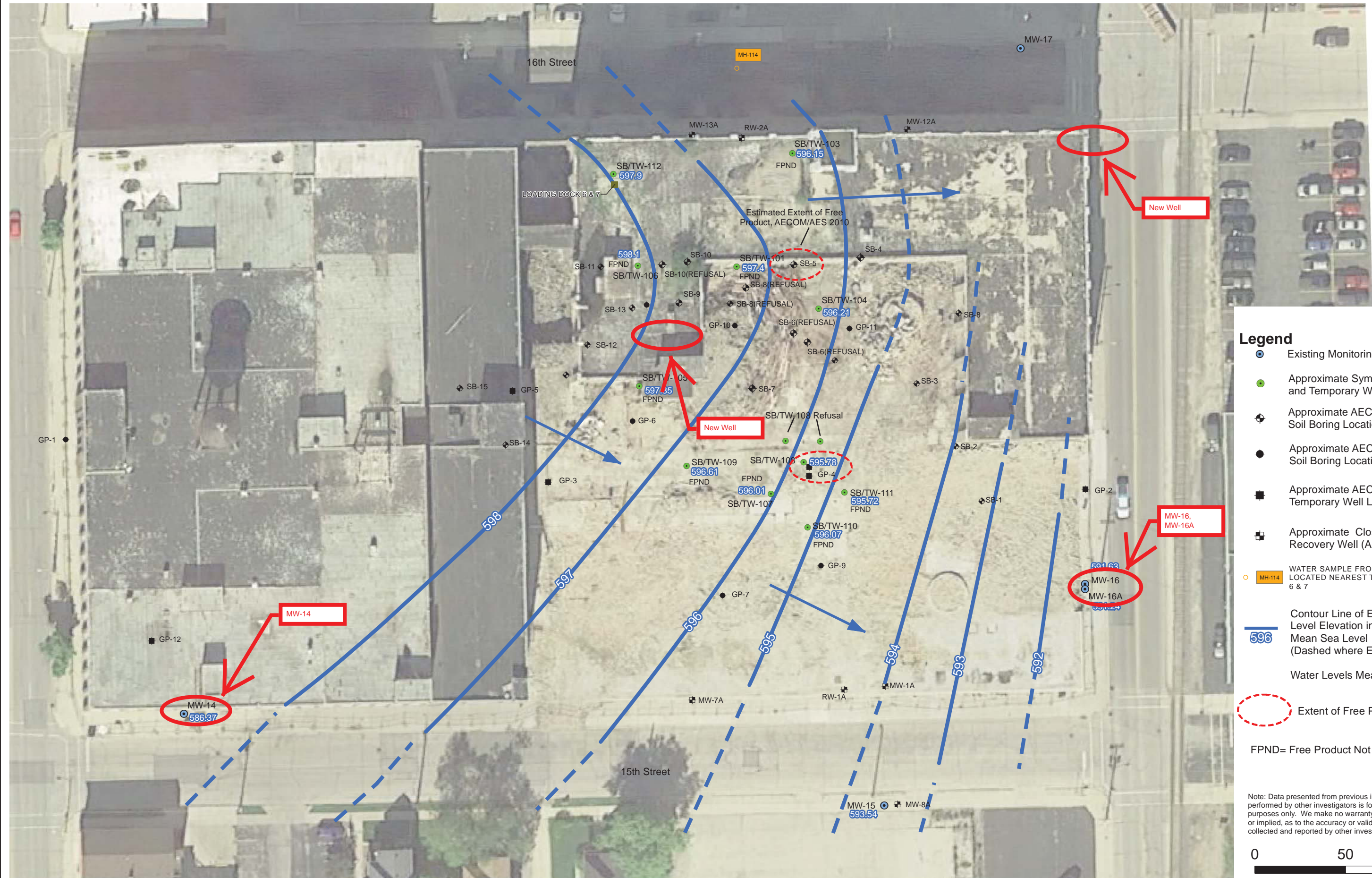
AECOM
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**FORMER NEWTON GRAVEL PIT
2017 GROUNDWATER MONITORING REPORT**

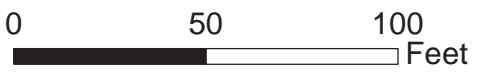
Former Newton Pit
Proposed Sample Locations

Project Number: 60135471	Drawn By: SAE	Date: 1/29/2018	Figure No.
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- Legend**
- Existing Monitoring Well (AECOM/AES 2010)
 - Approximate Symbiont Soil Boring and Temporary Well Location (2015)
 - Approximate AECOM/AES Soil Boring Location (2010)
 - Approximate AECOM Soil Boring Location (2009)
 - Approximate AECOM Temporary Well Location (2009)
 - Approximate Closed LUST Site Recovery Well (Abandoned)
 - WATER SAMPLE FROM MANHOLE LOCATED NEAREST TO LOADING DOCK 6 & 7
 - Contour Line of Equal Water Level Elevation in Feet Above Mean Sea Level (Dashed where Estimated)
 - Extent of Free Product
- Water Levels Measured 10/06/2015
- FPND= Free Product Not Detected

Note: Data presented from previous investigations performed by other investigators is for illustrative purposes only. We make no warranty, expressed or implied, as to the accuracy or validity of data collected and reported by other investigators.



Path: G:\Projects\City of Manitowoc\Site\1100\12016\Report\Mirro9_GF_Elevations.mxd

6737 West Washington Street
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West Allis, Wisconsin 53214
414.291.8840
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- WASTEWATER TREATMENT/CONVEYANCE
- FACILITIES ENGINEERING
- ENVIRONMENTAL MANAGEMENT
- AIR QUALITY
- DESIGN/BUILD CONSTRUCTION MANAGEMENT
- INVESTIGATION, REMEDIATION, AND SITE CLOSURE
- HEALTH CARE FACILITIES DESIGN
- WATER SUPPLY AND DISTRIBUTION
- SOLID AND HAZARDOUS WASTE MANAGEMENT
- PROCESS ENGINEERING
- WATER RESOURCES PLANNING/DESIGN
- STORM WATER MANAGEMENT
- GIS SERVICES
- BROWNFIELDS

DSGN: KE	CHK: TAR
DR: KE	APVD: TAR

MIRRO PLANT #9
1512 WASHINGTON STREET
MANITOWOC, WI

Proposed Sample Locations
Former Mirro Plant

SCALE	1 in = 25 ft
FIGURE	2
DATE	APRIL 2016
PROJ NO.	W140408

AECOM

COST PROPOSAL - (Manitowoc PFAS Evaluation)

LABOR				FIELD INSTRUMENTS/EQUIPMENT*					ANALYTICAL LABORATORY TESTING			
PERSONNEL BILLING TITLE	TOTAL HOURS	HOURLY RATE	TOTAL COST	DESCRIPTION	QTY USED	# OF DAYS	UNIT COST*	TOTAL COST	Analyte	QTY USED	UNIT COST	TOTAL COST
PROJECT DIRECTOR II/III / ENGINEER V	42	\$150	\$6,300	Newton Pit					Newton Pit			
PROJECT MANAGER II / PROJECT DIRECTOR I	8	\$135	\$1,080	55-GALLON STEEL DRUM	4	1	\$55.00	\$220.00	PFAS 537.1.1 Modified - 24 Compounds	9	\$350	\$3,150
ENGINEER IV/ SCIENTIST V	22	\$120	\$2,640	PHOTO IONIZATION DETECTOR	1	1	\$75.00	\$75.00	ultra pure water per liter	2	\$30	\$60
PROJECT MANAGER I/ENGINEER III/ SCIENTIST IV	40	\$105	\$4,200	GPS EQUIPMENT	1	0.5	\$200.00	\$100.00	<i>Newton Pit Lab Subtotal</i>			<i>\$3,210</i>
ENGINEER II /SCIENTIST III	16	\$95	\$1,520	YSI or Insitu- GW field parameters w/flo-thru cell	1	1	\$75.00	\$75.00				
ENGINEER I /SCIENTIST II	0	\$85	\$0	PERISTALTIC PUMP	1	1	\$25.00	\$25.00	Mirro Plant			
SCIENTIST I	24	\$70	\$1,680	POLYETHYLENE TUBING (per ft.)	150	1	\$0.50	\$75.00	PFAS 537.1.1 Modified - 24 Compounds	7	\$350	\$2,450
TECHNICIAN II	0	\$60	\$0	SILICONE TUBING (per ft.)	6	1	\$4.50	\$27.00	ultra pure water per liter	2	\$30	\$60
TECHNICIAN I	0	\$50	\$0	GLOVES	1	3	\$20.00	\$60.00	<i>Mirro Plant Lab Subtotal</i>			<i>\$2,510</i>
PROJECT ADMINISTRATOR	26	\$50	\$1,300	WELL LOCKS	1	1	\$15.00	\$15.00				
Newton Pit Labor Subtotal			\$10,220	WATER LEVEL METER	1	1	\$10.00	\$10.00				
Mirro Plant Labor Subtotal			\$8,500	MILEAGE (FEDERAL RATE)	150	2	\$0.54	\$160.50				
TOTAL LABOR COST			\$18,720	PER DIEM	1	2	\$140.00	\$280.00				
				<i>Subtotal Newton Pit Equipment/supplies</i>				<i>\$902.50</i>				
				Mirro Plant								
SUBCONTRACTORS												
Newton Pit Subcontractors				55-GALLON STEEL DRUM	4	1	\$55.00	\$220.00				
Cascade Drilling	\$3,885.00	1.00	\$3,885.00	PHOTO IONIZATION DETECTOR	1	1	\$75.00	\$75.00				
Private Utility Locator	\$500.00	1.00	\$500.00	GPS EQUIPMENT	1	0.5	\$200.00	\$100.00				
Soil and Water Disposal	\$750.00	1.00	\$750.00	YSI or Insitu- GW field parameters w/flo-thru cell	1	1	\$75.00	\$75.00				
		1.00	\$0.00	PERISTALTIC PUMP	1	1	\$25.00	\$25.00				
		1.00	\$0.00	POLYETHYLENE TUBING (per ft.)	80	1	\$0.50	\$40.00				
<i>Subtotal for Newton Pit Subs</i>			\$5,135.00	SILICONE TUBING (per ft.)	4	1	\$4.50	\$18.00				
Mirro Plant Subcontractors				GLOVES	1	2	\$20.00	\$40.00				
Cascade Drilling	\$4,830.00	1.00	\$4,830.00	WELL LOCKS	2	1	\$15.00	\$30.00				
Private Utility Locator	\$500.00	1.00	\$500.00	WATER LEVEL METER	1	1	\$10.00	\$10.00				
Soil and Water Disposal	\$750.00	1.00	\$750.00	MILEAGE (FEDERAL RATE)	150	2	\$0.54	\$160.50				
		1.00	\$0.00	<i>Subtotal Mirro Plant Equipment/Supplies</i>				<i>\$793.50</i>				
<i>Subtotal for Mirro Plant Subs</i>			\$6,080.00									
			Subcontractors Subtotal \$11,215.00						(other parameters by site-specific quote)			
TOTAL SUBCONTRACTORS (w/5% markup)			\$11,775.75					TOTAL EQUIPMENT & OTHER DIRECT COSTS \$1,073.50				TOTAL LABORATORY COSTS \$5,720.00
												TOTAL LABORATORY COSTS (w/ 5% markup) \$6,006.00

Newton Pit Subtotal (Labor, Subs, Equipment & Lab) \$19,262.25

Mirro Plant Subtotal (Labor, Subs, Equipment & Lab) \$18,313.00

TOTAL ESTIMATED PROJECT COSTS \$37,575.25

The actual invoice amounts may vary due to many factors, including, but not limited to, the scope of services not yet fully developed, changes in project requirements, or alterations in the scope of services as actual site conditions are evaluated. Invoice amounts will be based on actual units utilized at the rates identified on this Cost Proposal and will also include travel costs and other expenses incurred by AECOM in rendering the services described in this proposal. AECOM will not exceed the attached cost estimate without prior approval

Proposed changes, if any, to the scope of services and estimated costs following commencement of AECOM's services will be discussed with Client and amendments made as described in the attached Terms and Conditions. For additional services rendered, if any, but not included in the scope of services described in this proposal, invoice amounts will be based on the actual units used at the rates shown, and will include travel costs, and other expenses incurred by AECOM in rendering the services. A 5% markup will be applied to other expenses and costs.

PROJECT COST ESTIMATE - LABOR
 Newton Pit - former Mirro Plant - Manitowoc PFAS Evaluation

	PERSONNEL	Project Director	Project Manager II	Eng IV/ Sci V	Project Manager I	Eng III/Sci IV	Eng II/Sci III	Eng I /Sci II	Scientist I	Technician II	Technician I	Proj Admin	TOTAL
	BY DISCIPLINE												LABOR
		\$150	\$135	\$120	\$105	\$105	\$95	\$85	\$70	\$60	\$50	\$50	REVENUE
	Newton Pit												
A.	Install MW in northern area includes soil sampling and well development	2	2	6								2	\$1,390
B.	Sample 6 wells	2				12	8		8				\$2,880
C.	Data Evaluation	6				4						6	\$1,620
D.	Technical Memo Preparation	6	2									4	\$1,370
E.	Travel costs (person from MI and mob/demob from Milwaukee)	4		4		8	8		4				\$2,960
	SUBTOTAL HOURS / UNITS	20	4	10	0	24	16	0	12	0	0	12	98
	SUBTOTAL COSTS	\$3,000	\$540	\$1,200	\$0	\$2,520	\$1,520	\$0	\$840	\$0	\$0	\$600	\$10,220
	former Mirro Plant												
A.	Prepare HASP	4	2										\$870
B.	Install 2 water table wells at Mirro plant includes ROW permit and utility coordination for O/H electric and well development	2		8								4	\$1,460
C.	Sample 4 wells					8			8				\$1,400
D.	Data Evaluation	6				4						6	\$1,620
E.	Technical Memo Preparation	6	2									4	\$1,370
F.	Travel costs (person from MI and mob/demob from Milwaukee)	4		4		4			4				\$1,780
	SUBTOTAL HOURS / UNITS	22	4	12	0	16	0	0	12	0	0	14	80
	SUBTOTAL COSTS	\$3,300	\$540	\$1,440	\$0	\$1,680	\$0	\$0	\$840	\$0	\$0	\$700	\$8,500
	TOTAL HOURS / UNITS	42	8	22	0	40	16	0	24	0	0	26	178
	TOTAL COSTS	\$6,300	\$1,080	\$2,640	\$0	\$4,200	\$1,520	\$0	\$1,680	\$0	\$0	\$1,300	\$18,720