From: DiMaggio, Janet H - DNR
To: Carolyn Edwards; Dan Dunn
Subject: GM Remaining Actions Needed Email, BRRTS 02-54-560205
Date: Thursday, March 10, 2022 2:59:00 PM
Attachments: GM - Additional information needed.msg
image001.png
image002.png
image003.png
image004.png
image007.png

Hi Carolyn and Dan,

We have completed the QA/QC review of the closure request. I am also attaching an earlier request for additional information and your responses. Once all of the items below are addressed including the items in the above attachment, all revisions should be included in a revised closure request. This revised submittal should be submitted through our on-line portal. We will not require a paper copy.

The following points, in addition to those enumerated in the attachment, need to be addressed.

- On page 15 of attachment A, “through” is misspelled in subheading. Please correct this.

- On the table of contents for attachments B, B.4.b, B.4.c, and B.5: they should all be labeled not applicable.
    - They have explanations for why they aren't attached on individual pages, but the table of contents should acknowledge that there's nothing for these maps.

- We are requesting that you follow our established naming convention when creating multiple maps throughout each Attachment in the closure request. For example, B.1.b.1 for the very first map, then B.1.b.2, B.1.b.3, etc.

- Map B.1.b.(2) needs to include parcel ID numbers for all affected properties.
    - NOTE: B.1.b.(2) is being treated as the detailed site map and the other ones as extra maps to aid in site understanding.

- Please include soil contamination maps of individual constituents currently included in the B.2.a. and B.2.b. series in Attachment B.4.C. “Other” and adjust the labels of the maps.
    - In Attachment B.2.a include the grouping of similar families of contaminants on the same map. Maps may be included as follows or suggest an appropriate grouping:
        - B.2.b.1. Residual Soil Contamination exceeding RCLs for PCBs should remain in this section.
        - A map showing total metals

        - A map of showing combined PAH constituent exceedances
        - A map of all VOCs or, alternatively a CVOC map and a separate PVOC map which combines all constituents in these categories
    - In Attachment B.2.b., do a similar set of maps.

- B.3.a(1) needs a north arrow and scale.

- On B.3.a.(1), The symbols indicating the starting end endpoints of cross-section A to A' references figure2 and B to B' references figure 3. This should be revised to reference figures B.3.a.(3), B.3.a.(4), B.3.a.(5), and B.3.a.(6). This explanation can be placed on the line or in the legend on B.3.a.(1).

- On B.3.a.(1), it is difficult to see the lines showing the path of cross sections A-A' and B-B'. Please make these line more obvious. Additionally, a line for cross-section C-C' should be included on the same map and not on a separate map as you currently have it (you have it on B.3.a.2. This second map can then be deleted).

- Please revise as follow for maps in attachment B.3.b:
    - Combine all metals (B.3.b.1. through B.3.b.3) onto one map
        - Use a combination of symbols in the lines (dashes, dots, etc.) and colors to easily decipher the various metal isoconcentration lines.
        - Alternatively – use isoconcentration lines to indicate all metal PAL or ES exceedances and include the individual maps in Attachment B.4.C. "Other" and label appropriately.
    - Include the existing map B.3.b.4. map for all VOC exceedances and renumber as appropriate
    - Include the existing map B.3.b.5. for all PAH exceedances and renumber as appropriate

- On B.3.d., there are some MWs that are in green. The legend should include an explanation/definition.
  The other colors besides black are represented in the legend.
    - You should also indicate what the regular circles represent (soil borings) on the legend.
      If there's multiple symbols being used on a map, they are all generally included in the legend.

- Attachment D, Cap Maintenance Plan
    - Include language for infiltration to groundwater in cover purpose section of D.1
    - On maps D.2.(1) through D.2.(13) – include a north arrow on each map and re-labeled the maps – D.2.a through D.2.m. following our established naming convention.
    - The legal descriptions on PDF pages 47 to 74 of the Cap Maintenance Plan, Attachment D, should be removed. They should all be included as required in

Attachment F.
    - The Department does not require the engineering concrete specifications in the Cap Maintenance Plan, Attachment D, on PDF pages 75 to 120. These pages should be removed.

- Attachment E Monitoring Wells
    - A substantial amount of documentation of well abandonment, construction etc. has been included in this closure request. You should remove from the closure request the 80 wells abandoned in accordance with Wisconsin Administrative Code and submit that documentation as a separate Well Abandonment Documentation Transmittal (short cover letter with well documentation forms 3300-005). This should be sent through our electronic portal. We do not require a paper copy.
    - All the documents for the lost/missing/damaged wells should be placed with each other for readability. Example: Place forms for 29S, then all the forms for 51S, etc. Attachment E will contain the required forms (4400-122, 4400-113A, and 4400-113B) for the following 15wells:
        - MW-29S, MW-51S, MW-52S, MW-56S, MW-57S, MW-58S, MW-66S, MW-68S, MW-5, MW-5D, MW-32S, MW-48S, MW-53S, MW-67S, and MW-71S.

- Current Attachment F.3 (1) Zoning. It's difficult to tell how the site is zoned because the colors that differentiate the industrial zones are so similar. I suggest you have an arrow point to the zone name on the legend.

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Janet DiMaggio, P.G.
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Foellmi, Thomas J - DNR

From: DiMaggio, Janet H - DNR
Sent: Tuesday, January 25, 2022 9:23 AM
To: Dan Dunn; Carolyn Edwards
Subject: GM - Additional information needed

Good Morning Carolyn and Dan,

The South Central Region's closure committee looked at the former GM site located in Janesville for closure on January 20, 2022.
There are some additional items we need. We discussed this on January 24, 2022.

- A waiver, comments, or 30 days to pass from the time you notified the former WWTP parcel, which has been sold, of the closure request. We also need your documentation of proof of sending and receipt of said notification.
- The caps for the GM site need to be geolocated so that future MMPs can be developed with the residual soil and covers taken into consideration. I believe Attachment D in the closure request which includes the cap information may have already done this. Please verify.
- The department needs some sort of visual which shows the location of the caps and that they are consistent with residual contamination.
- Include narrative and data tables from the April 2021 SI/RAOR in regards to PFAS into the closure request.
- The Department needs information on the former fire training activities, identified on a map as source #63, source areas unknown. Was AFFF used? You should talk with former GM personnel who may have information.
- The Department needs a scoping statement or lab data if you sampled for 1,4-Dioxane. This is an emerging contaminant.
    - 1,4-Dioxane is rarely listed on ingredient labels, but can be found in the following products: Cleaning products: paints, dyes, fragrances, pesticides, antifreeze.
    - 1,4-Dioxane is used as **a stabilizer for chlorinated solvents such as trichloroethane and trichloroethylene**.

There may be some additional administrative items we will need. Our QAQC closure specialist is reviewing the submitted documentation.

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January 31, 2022

Janet DiMaggio
Wisconsin Department of Natural Resources
Remediation and Redevelopment Division
3911 Fish Hatchery Road
Fitchburg, WI 53711
Via: email

Subject: **Case Closure Request – Supplemental Information**
Former General Motor (GM) Property
1000 General Motors Drive, Janesville, WI 53546
BRRTS 02-54-560205

Dear Ms. DiMaggio

This letter has been prepared for the former General Motor (GM) property by EnviroAnalytics Group, LLC (EAG) on behalf of Jaines, LLC to provide supplemental information regarding the Case Closure request submitted in October 2021. The WDNR requested additional information in their email dated January 25, 2022. EAG offers the following comments:

A waiver, comments, or 30 days to pass from the time you notified the former WWTP parcel, which has been sold, of the closure request. We also need your documentation of proof of sending and receipt of said notification.
Form 4400-286, *Notification of Continuing Obligations and Residual Contamination*, was sent by certified mail to the owner of the former Waste Water Treatment Plant, Center Construction LLC, on January 28, 2022. The notification included a waiver of the 30-day comment period. To date, EAG has not received the return receipt.

The caps for the GM site need to be geolocated so that future MMPs can be developed with the residual soil and covers taken into consideration. I believe Attachment D in the closure request which includes the cap information may have already done this. Please verify.
Attachment D of the Closure Request included a table of GPS locations (latitude/longitude) for the extent of each of the cap maintenance areas. The 13 areas of the cap are shown on the attached map, including GPS coordinates.

The department needs some sort of visual which shows the location of the caps and that they are consistent with residual contamination.
EAG has created a map that includes the extent of residual soil contamination in relation to the areas of the cap. The extent of the soil contamination at 8 of the 13 areas were defined during site investigation activities using step-out borings. Step-out borings were not drilled adjacent to SB-98-16 (3 mg/kg), SB-173-16 (2.2 mg/kg), SB-183-16 (2.6 mg/kg), SB-212-16 (2.8 mg/kg) and

MW-73S (2.8 mg/kg). The site investigation included only areas with concentrations of PAHs in excess of 2x the Industrial Direct Contact RCLs (4.2 mg/kg). EAG concludes that, if the areas with elevated concentrations (>4 mg/kg) of benzo(a)pyrene were defined within 20 feet in each compass direction, then areas where the benzo(a)pyrene (<4 mg/kg) is less elevated is also defined within 20 feet. The extent of the soil cap for these locations is based on the extent of the soil contamination identified at the eight areas defined by step-out borings.

Include narrative and data tables from the April 2021 SI/RAOR in regards to PFAS into the closure request.

The narrative regarding PFAS was added Sections 3.A.i and 3.C.i, a map of the location of monitoring wells and PFAS sampling results was added as Figure B.3.b (6) and a table of PFAS sampling results was added to Table A.1. of the Case Closure. Additional information regarding PFAS is attached.

The Department needs information on the former fire training activities, identified on a map as source #63, source areas unknown. Was AFFF used? You should talk with former GM personnel who may have information.

EAG contacted GM personnel on January 28, 2022. GM personnel with extensive knowledge of the site stated that they have no knowledge of any fire training exercises or the use of AFFF. This is consistent with the statement provided in the Phase I EAS (GHD, 2016) that “Site personnel had no knowledge of historical fire training practices”. Additional information regarding AFFF and PFAS is attached.

The Department needs a scoping statement or lab data if you sampled for 1,4-Dioxane. This is an emerging contaminant.

Information regarding 1,4-dioxane was added to Section 3.C.i of the Case Closure. An evaluation of the potential for the presence of 1,4-dioxane was completed by EAG and is attached.

Thank you for your feedback regarding the Case Closure. Please let me know if you have any questions or need additional information.

Sincerely,

Carolyn Edwards
Senior Project Engineers
EnvrioAnalytics Group LLC

Enclosures: Supplemental Information – Emerging Contaminants

Cc: Michael J. Roberts, Jaines LLC
Dan Dunn, EAG

Introduction

Site investigations should include an evaluation of all potential contaminants associated with hazardous substance discharge and/or environmental pollution, including emerging contaminants, in accordance with Wis. Admin. Code NR 716.07. A Phase I Environmental Site Assessment conducted by GHD in 2016 identified "fire training activities" as a recognized environmental condition (REC); however, GHD also states that "Site personnel had no knowledge of historical fire training practices" and that "no information was found to assess potential impact to the underlying soil and groundwater". EAG further investigated the REC and provides lines of evidence that the residual PFAS in the groundwater is not related to a release aqueous film forming foam (AFFF).

GHD also identified several areas with historical operations involving the use of chlorinated solvents in the Phase I Environmental Site Assessment. At the request of the WDNR, an evaluation of the presence of 1,4-dioxane was conducted. 1,4-dioxane was mainly used as a stabilizer in chlorinated solvents. Multiple studies suggest that when investigating for the presence of 1,4-dioxane that an evaluation of the concentrations of 1,1,1-tricholoethane (1,1,1-TCA), trichloroethene (TCE), and their daughter products should be performed. Multiple groundwater sampling events have been conducted but 1,4-dioxane was not historically analyzed because it has only recently been identified as an emerging contaminant by the WDNR. The purpose of this letter to provide lines of evidence as to why an additional investigation of 1,4-dioxane is unnecessary.

Receptors

As presented in the Case Closure Report, the WDNR states that "PAL groundwater quality standards are used as design standards for facilities, practices and activities regulated by the state that can affect groundwater. They are also the level at which a regulatory agency may investigate the source of a substance in groundwater and require response actions to minimize the substance concentration and prevent exceedance of an ES." (https://dnr.wisconsin.gov/topic/Groundwater/GWLaw.html).

The site and surrounding off-site properties are provided with municipal water by the City of Janesville. No potable groundwater wells are present on-site or immediately downgradient of the Site. The City of Janesville does not have a specific ordinance prohibiting the use of groundwater as a potable water supply; however, Ch. 40, Sec. 40-37 of the Code of Ordinances states that any property served by public water must abandon any private wells. The site and surrounding properties are prohibited from installing potable water wells in the future. There are no on-site or off-site groundwater receptors and residual groundwater contamination is minimal; therefore, the PALs are not site-specific remedial drivers and are not appropriate for this site.

PFAS

Type and Amount of PFAS

Groundwater samples were collected on September 4, 2019 from select monitoring wells and submitted to the laboratory for analysis of PFAS including PFOA and PFOS. Groundwater samples were collected from MW-7S, MW-40S, MW-41S, MW-55S, MW-61S and MW-62S as shown on the attached map. Several PFAS compounds were detected at each well location but only PFOA and PFOS have Groundwater Standard Recommendations (Cycle 10)(June 2019). The results are as follows:

- MW-7S – The concentration of PFOA (4.5 ng/l) slightly exceeded the PAL (2 ng/l) but is below the ES (20 ng/l).
- MW-40S – The concentration of PFOS (6.6 ng/l) slightly exceeded the PAL (2 ng/l) but is below the ES (20 ng/l).
- MW-41S – The concentration of PFOA (<1.9 ng/l) and PFOS (<1.4 mg/l) do not exceed the PAL (2 ng/l).
- MW-55S – The concentrations of PFOA (2.8 ng/l) slightly exceeded the PAL (2 ng/l) but is below the ES (20 ng/l).
- MW-61S – The concentration of PFOA (<1.9 ng/l) and PFOS (<1.4 mg/l) do not exceed the PAL (2 ng/l).
- MW-62S – The concentration of PFOA (6.3 ng/l) slightly exceeded the PAL (2 ng/l) but is below the ES (20 ng/l).

Groundwater analytical results are summarized in the attached Table A.1. and on the attached Figure B.3.b(6).

Lines of Evidence

The low concentrations of PFAS in the groundwater does not appear to be associated with fire training exercises using AFFF. Interstate Technology Regulatory Council (ITRC) presented USEPA findings as part of a study to characterize the range of PFAS associated with AFFF release sites, industrial facilities and landfills. The results of the study are as follows:

- Background concentrations of PFOA ranged from <1 ng/l to <100 ng/l and PFOS ranged from <1 ng/l to <1,000 ng/l
- AFFF site concentrations of PFOA ranged from <1,000 ng/l to <1,000,000 ng/l and PFOS ranged from <10,000 ng/l to <10,000,000 ng/l.
- Industrial site concentrations of PFOA ranged from <10,000 ng/l to <1,000,000 ng/l and PFOS ranged from <100 ng/l to <100,000 ng/l.

PFOA and PFOS are consistent with industrial background levels as presented by ITRC and are not consistent with groundwater concentrations observed at AFFF sites.

ITRC also indicates, in the same study, that petroleum constituents are generally present in conjunction with PFAS at fire-training AFFF sites. Concentrations of BTEX, MTBE and PAHs are not present in any of the wells that were sampled for PFAS in excess of the ES during any of the sampling events in 2016, 2019 and 2020. The lack of petroleum constituents in conjunction with the low levels of PFAS indicate that PFAS is not likely the result of a release of AFFF.

PFAS, including PFOA and PFOS, are stable and persistent in the environment because of their strong Carbon-Fluorene bond and are difficult to degrade under normal conditions, although they can undergo physiochemical changes and breakdown into smaller alkyl chains (Teaf, et al. 2019). No in-situ remedial activities have been performed at this site; therefore, the low concentrations of PFAS observed in the wells are not related to a degradation of the higher concentrations that would present at AFFF sites and are more consistent with industrial background levels.

The EPA health advisor level is for PFOA and PFOA is 70 ng/l. Concentrations of PFOA and PFOS are well below the national recommendations.

PFAS Conclusion

Concentrations of PFAS in the groundwater do not exceed the WDNR NR 140 ES at any of the monitoring well locations that were sampled. Personnel at GM confirmed that they have no knowledge of any fire training exercises at the site. The multiple lines of evidence in conjunction with the lack of exceedance of the ES indicates that PFAS is not a contaminant of concern and is consistent with industrial background levels. The investigation that was conducted satisfies the requirements of NR 716. No further investigation of evaluation of PFAS is necessary.

1,4-Dioxane

Prior to the 1980's 1,4-dixoane was used to stabilized TCE and in the 1980's, 90% of the production of 1,4-dioxane was used as stabilizer for 1,1,1-TCA as TCE was being phased out as the main chemical in chlorinated solvents. 1,4-dioxane can also be found in the raw materials used in the production of many consumer products including: detergents, shampoos and cosmetics. 1,4-dioxane is a by-product of ethoxylated surfactants, particularly products containing propylene glycol. It can also be found in paints, coating, brake fluid and automotive trim adhesive.

Fate and Transport of 1,4-Dioxane

1,4-Dioxane is completely miscible in water and infiltrates into the subsurface water bearing zone with minimal retardation because of its low potential for absorption. The characteristics of 1,4-dioxane suggest that it has greater mobility than chlorinated solvent co-contaminants; however, 1,4-dioxane is generally co-located with 1,1,1-TCA, TCE and/or the daughter products of 1,1,1-TCA (1,1-DCA and 1,1-DCE) and TCE (cis-,1,2-DCE, trans-1,2-DCE, vinyl chloride). Because 1,4-dioxane migrates rapidly in soil, the focus of this evaluation will be on the occurrence of co-contaminants in the groundwater only.

Groundwater Investigation Results and Potential Source Areas

Ninety-five monitoring wells have been installed throughout the entire site (six parcels). Groundwater sampling results from 2014 through 2020 were evaluated at each potential source area as identified by GHD in the Phase I Environmental Site Assessment (2016). Contaminants in the groundwater during the 2019 sampling event reported several COPC concentrations that significantly deviated from the 2016 sampling event. The higher concentrations of inorganic constituents were apparently the result of field sampling methods affecting turbidity of the groundwater. 12 of the 42 monitoring wells were not sampled using low flow methods during the 2019 sampling. 11 of the monitoring wells were sampled for PFAS using a stainless-steel bailer and one well was sampled with a disposable bailer because of a malfunction with the bladder pump. The slow groundwater recharge also contributed to increased turbidity in groundwater samples collected with the bladder pump. EAG concluded that the groundwater data generated during the 2019 sampling event may not be representative of the true groundwater quality and results are biased- high due to suspended solids in the samples. Groundwater results from the 2019 sampling event were not used in this evaluation.

The following locations were identified to be potential sources of chlorinated solvent releases:

- Former Kolene Building/Lye Tank Buildings – The buildings were previously located on the northern portion of the plant building adjacent to the power house and were used for paint stripping operations. The Kolene building was removed in 1987 and residual liquids were discovered in the USTs and ASTs. Approximately 100 cubic yards of impacted soil was removed from area of the former Kolene building

and disposed of off-site. Groundwater samples were collected from two of the closest down-gradient monitoring wells, MW-49S and MW-50S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit (<1 µg/l) at MW-49 or MW-50 during any of the groundwater sampling events.

- Oil/Duco Thinner AST, 5,000-Gallon Primer UST, 5,000-Gallon Primer UST and 12,000-gallon chassis black paint AST - The Oil/Duco Thinner AST was located north of the main plant building to the east of the power house. The 1960 Factory Insurance Map shows an earthen berm around the 11,000-gallon Oil/Duco Thinner AST. The 5,000-Gallon Primer UST was previously located north of the main plant building adjacent to the power house. Based on a 1960 Factory Insurance Map, three USTs were shown in this area within a paint mix room. According to the 1960 Factory Insurance Map, the 12,000-gallon chassis black paint AST was also located in the former paint mix room. Groundwater samples were collected from the two nearest wells, MW-51 and MW-52. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

- 12,000-gal Oleum & thinner ASTs – Based on the 1960 Factory Insurance Map, the ASTs were located to the west of the former paint mix room and were surrounding by a 5-foot concrete dike. Groundwater samples were collected from the nearest downgradient wells at MW-80S, MW-81S and MW-84S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

- Fluid Fill Area – The fluid fill area is located within the main plant building in the area labeled “chassis”. Vehicles were filled with automatic transmission fluid, brake fluid, gasoline, antifreeze and windshield wiper fluid along the final assembly line. Groundwater samples were collected from the nearest downgradient well, MW-72S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

- Trim – The trim area is located within the main plant building adjacent to of the general assembly area. Once the vehicles were painted, the vehicle body and chassis were assembled and moved the trim area where windshields, wiring systems, instrument panels, side molding and other trim components were installed. Groundwater samples were collected from the nearest downgradient wells, MW-72S and MW-73S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

- Hazardous Materials Building – The building is located on the south side of the main plant building. This building was used for less than 90 days in accordance with RCRA and for PCB waste in accordance with TSCA. The building housed approximately 800 drums of various hazardous waste including kolene sludge, kolene baghouse ash, waste adhesives and sealers, solvent, paint thinner and scrap paint. Groundwater samples were collected from the nearest downgradient wells, MW-60S and MW-61S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

- Former Painting Operations – Three separate painting operations areas were identified in the Phase I Environmental Risk Assessment. A painting area was located east of the former power house (north paint room), in the southern portion of the main plant building adjacent to the body shop (body shop paint room) and in a separate building south of the main plant building (south paint mix room). Historic

painting operations included a 10-stage zinc phosphate coating system, single stage ELPO (primer) and painting applications.

Groundwater samples were collected from the north paint room from MW-65S, MW-66S and MW-67S. Analytical results confirmed that chlorinated VOCs (TCE) were present at MW-66S during the April 2016 (33 µg/l) sampling event and the July 2016 (35 µg/l) sampling event. Low levels of TCE was also present at MW-65S (0.34 µg/l). Chlorinated VOCs were not present at MW-67S in excess of the laboratory reporting limit during any of the groundwater sampling events.

Groundwater samples were collected from body shop paint room from the nearest downgradient wells at MW-80S, MW-81S and MW-84S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

Groundwater samples were collected from south mix paint room from the well located within the former paint room, MW-56S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

- Wastewater Treatment Plant – Groundwater samples were collected from all of the wells located throughout the WWTP, MW-1S/1D, MW-5S/5D, MW-8S, MW-16S, MW-19D, MW-28S through MW-30S. Analytical results confirmed that chlorinated VOCs were not present in excess of the laboratory reporting limit during any of the groundwater sampling events.

Concentrations of chlorinated VOCs were present at one potential source areas: Former Painting Operations (north paint room). The concentration of TCE in the groundwater adjacent to MW-66S indicates a release of chlorinated solvents in the area of the former painting operations. Step-out soil borings confirmed that the contamination is limited to the areas directly adjacent to MW-66S. A 40'x40'x4' area around MW-66S was excavated and disposed of off-site during remedial activities in 2021.

<u>Other Potential Source Areas</u>

Chlorinated VOCs were present in other areas of the site that were not previously identified as potential source areas in the Phase I ESA at very low concentrations:

- TCE at MW-65S = 0.34 µg/l (2/15/16) and <1 µg/l (7/12/16)
- TCE at MW-70S = <1 µg/l (4/28/16), <1 µg/l (7/13/16) and 0.915 µg/l (10/2/20)
- TCE at MW-24S = 2 µg/l (6/4/14), 1.5 µg/l (8/27/15), 2.7 µg/l (7/20/16)

These low-level concentrations in groundwater are well below applicable standards and do not indicate a major release of chlorinated solvents in any of these areas.

<u>Line of Evidence</u>

1,1,1-TCA was not present in any of the groundwater samples during any sampling event (2014-2020) at any monitoring well location. 1,1,1-TCA daughter products, 1,1-DCA and 1,1-DCE were not present at any well location from 2014 to 2020 indicating that 1,1,1-TCA has not been present at any of the monitoring well locations. In conclusion, if 1,4-dioxane is present in the groundwater, it is not associated with 1,1,1-TCA.

The addition of 1,4-dioxane to chlorinated solvents increases the solubility of TCE and decreases sorption. The decrease in sorption of the TCE increases the potential for TCE to migrate with groundwater similar to the migration characteristics of 1,4-dioxane; therefore, 1,4-dioxane is expected to be co-located with TCE. It is expected that concentrations of 1,4-dioxane would be a fraction of the concentration of TCE within the chlorinated solvent mixture. It is unknown what fraction of 1,4-dioxane was used to stabilize TCE, however, it is known that 1,1,1-TCA is an order of magnitude more reactive with specific metals than TCE and a greater amount of 1,4-dioxane would have been needed to stabilize 1,1,1-TCA. A white paper published by the Santa Clara Valley Water District in 2001, indicated that 1,4-dioxane was added to 1,1,1-TCA in a mixture of 2-8% by volume. For the purpose of this evaluation, EAG assumes that 1,4-dioxane was added to TCE in a mixture of 5% by volume. A study conducted in California and published in the article "Evidence of 1,4-dioxane attenuation at groundwater sites contaminated with chlorinated solvents and 1,4-dioxane" (2015), indicates that dioxane attenuation rates were positively correlated with the rates of 1,1-DCE and TCE but not TCA. As TCE degrades, so does 1,4-dioxane at similar rates, so assumptions can be made regarding the amount of 1,4-dioxane that is potentially present at MW-24S, MW-65S, MW-66S and MW-70S:

- MW-24S – The concentrations of TCE was reported to be 2.7 µg/l. Assuming similar degradation rates for 1,4-dioxane and TCE, concentrations of 1,4-dioxane could potentially be 0.14 µg/l, which is below the WDNR Groundwater Standard Recommendations (Cycle 10) Enforcement Standard of 0.35 µg/l.

- MW-65S - The concentrations of TCE was reported to be 0.35 µg/l. Assuming similar degradation rates for 1,4-dioxane and TCE, concentrations of 1,4-dioxane could potentially be 0.02 µg/l, which is below the WDNR Groundwater Standard Recommendations (Cycle 10) Enforcement Standard of 0.35 µg/l.

- MW-70S - The concentrations of TCE was reported to be 0.915 µg/l. Assuming similar degradation rates for 1,4-dioxane and TCE, concentrations of 1,4-dioxane could potentially be 0.05 µg/l, which is below the WDNR Groundwater Standard Recommendations (Cycle 10) Enforcement Standard of 0.35 µg/l.

- MW-66S - The concentrations of TCE was reported to be 35 µg/l in 2016. Assuming similar degradation rates for 1,4-dioxane and TCE, concentrations of 1,4-dioxane could potentially be 1.75 µg/l, which exceeds the WDNR Groundwater Standard Recommendations (Cycle 10) Enforcement Standard of 0.35 µg/l. However, it is important to note that, TCE is not present in any of the downgradient monitoring well locations. 1,4-dioxane is generally co-located with TCE; therefore, there is no evidence that 1,4-dioxane is present in any other well location and has not migrated off-site. If 1,4-dioxane is present, concentrations are limited to the area of MW-66S.

Conclusion

1,1,1-TCA and 1,1,1-TCA daughter products were not present in any of the groundwater samples during any sampling event (2014-2020) at any monitoring well location indicating that 1,1,1-TCA has not been present at any of the monitoring well locations and any presence of 1,4-dioxane would not be associated with 1,1,1-TCA.

If present, concentrations of 1,4-dioxane would make up a fraction of the concentrations of TCE. There is evidence that 1,4-dioxane and TCE degrade similarly so it can be assumed that the ratio of 1,4-dioxane to TCE remains generally unchanged over time. EAG concludes that the fraction of 1,4-dioxane that may potentially be co-located with the TCE at MW-24S, MW-65S and MW-70S does not exceed the WDNR Groundwater Standard Recommendations (Cycle 10) Enforcement Standard of 0.35 µg/l.

1,4-dioxane is potentially co-located with TCE at MW-66S in excess of the Groundwater Standard Recommendations (Cycle 10) Enforcement Standard of 0.35 µg/l; however, TCE is not present in any of the downgradient monitoring well locations. EAG concludes that, if 1,4-dioxane is present, that is limited to the areas adjacent to MW-66S only, and has not migrated to any other wells or off-site. EAG recommends that no additional groundwater investigation is necessary.

References

https://www.sciencedirect.com/science/journal/00489697

Bentuo Xu, Shuai Liu, John L. Zhou, Chunmiao Zheng, Weifeng Jin, Bei Chen, Ting Zhang, Wenhui Qiu**, PFAS and their substitutes in groundwater: Occurrence, transformation and remediation,** Journal of Hazardous Materials, Volume 412, 15 June 2021, 125159

Esmaeil Shahsavari, Duncan Rouch, Leadin S. Khudur, Duncan Thomas, Arturo Aburto-Medina and Andrew S. Ball**, Challenges and Current Status of the Biological Treatment of PFAS-Contaminated Soils,** Front. Bioeng. Biotechnol., 07 January 2021
https://doi.org/10.3389/fbioe.2020.602040

https://pfas-1.itrcweb.org/

https://www.epa.gov/sites/default/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf

https://14d-1.itrcweb.org/wp-content/uploads/2020/03/14DX-Fate-and-Transport.pdf

https://14d-1.itrcweb.org/environmental-fate-transport-and-investigative-strategies/

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7039255/#R2

https://pubmed.ncbi.nlm.nih.gov/25970261/

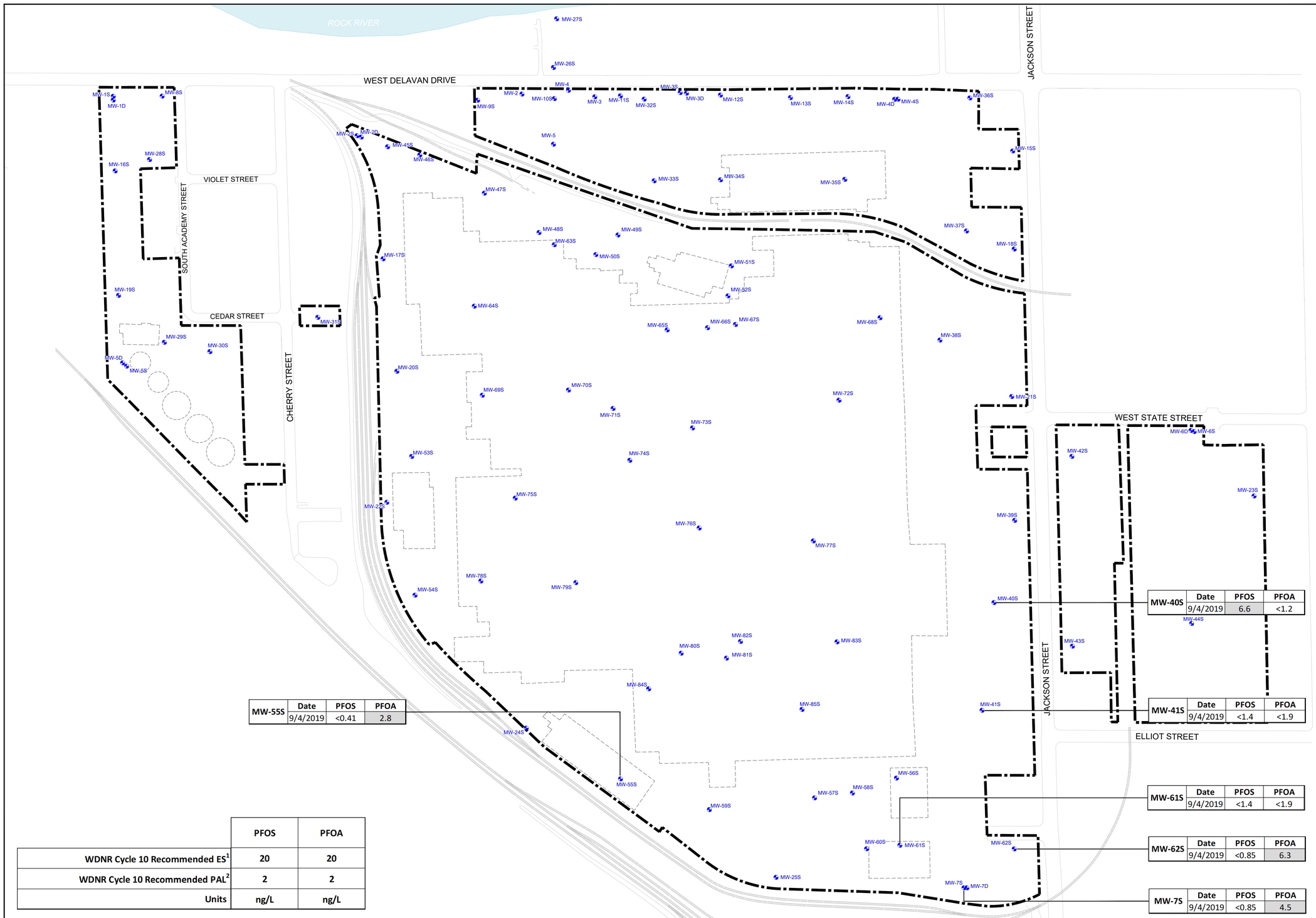
https://semspub.epa.gov/work/09/2129332.pdf

https://www.dhs.wisconsin.gov/water/gws-cycle10.htm

https://www.epa.gov/sites/default/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf

https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater/Emerging-Issues/ER-2302

https://dnr.wisconsin.gov/sites/default/files/topic/Brownfields/training/20210615_IT_1,4_Dioxane.pdf



MW-55S	Date	PFOS	PFOA
	9/4/2019	<0.41	2.8

MW-40S	Date	PFOS	PFOA
	9/4/2019	6.6	<1.2

MW-41S	Date	PFOS	PFOA
	9/4/2019	<1.4	<1.9

MW-61S	Date	PFOS	PFOA
	9/4/2019	<1.4	<1.9

MW-62S	Date	PFOS	PFOA
	9/4/2019	<0.85	6.3

MW-7S	Date	PFOS	PFOA
	9/4/2019	<0.85	4.5

	PFOS	PFOA
WDNR Cycle 10 Recommended ES[1]	20	20
WDNR Cycle 10 Recommended PAL[2]	2	2
Units	ng/L	ng/L

LEGEND

- MONITORING WELL LOCATION
- PROPERTY BOUNDARY
- FORMER BUILDING FOOTPRINT

NOTE:

1. Results in Nanograms per liter (ng/L) - parts per trillion
2. PFOA = Perfluorooctanoic Acid
3. PFOS = Perfluorooctane Sulfonate
4. ND = Not Detected in excess of laboratory reporting limits
5. [1] As contained in the Summary of Cycle 10 Recommendations, Enforcement Standards (ES), State of Wisconsin, Department of Health Memo, Jun 2019
6. [2] As contained in the Summary of Cycle 10 Recommendations, Preventive Action Limit (PAL), State of Wisconsin, Department of Health Memo, Jun 2019
7. Bolded areas indicate values in excess of laboratory reporting limits
8. Shaded areas indicate values in excess of PAL
9. Shaded and red font areas indicate values in excess of ES

N

0 150 300 600

FEET

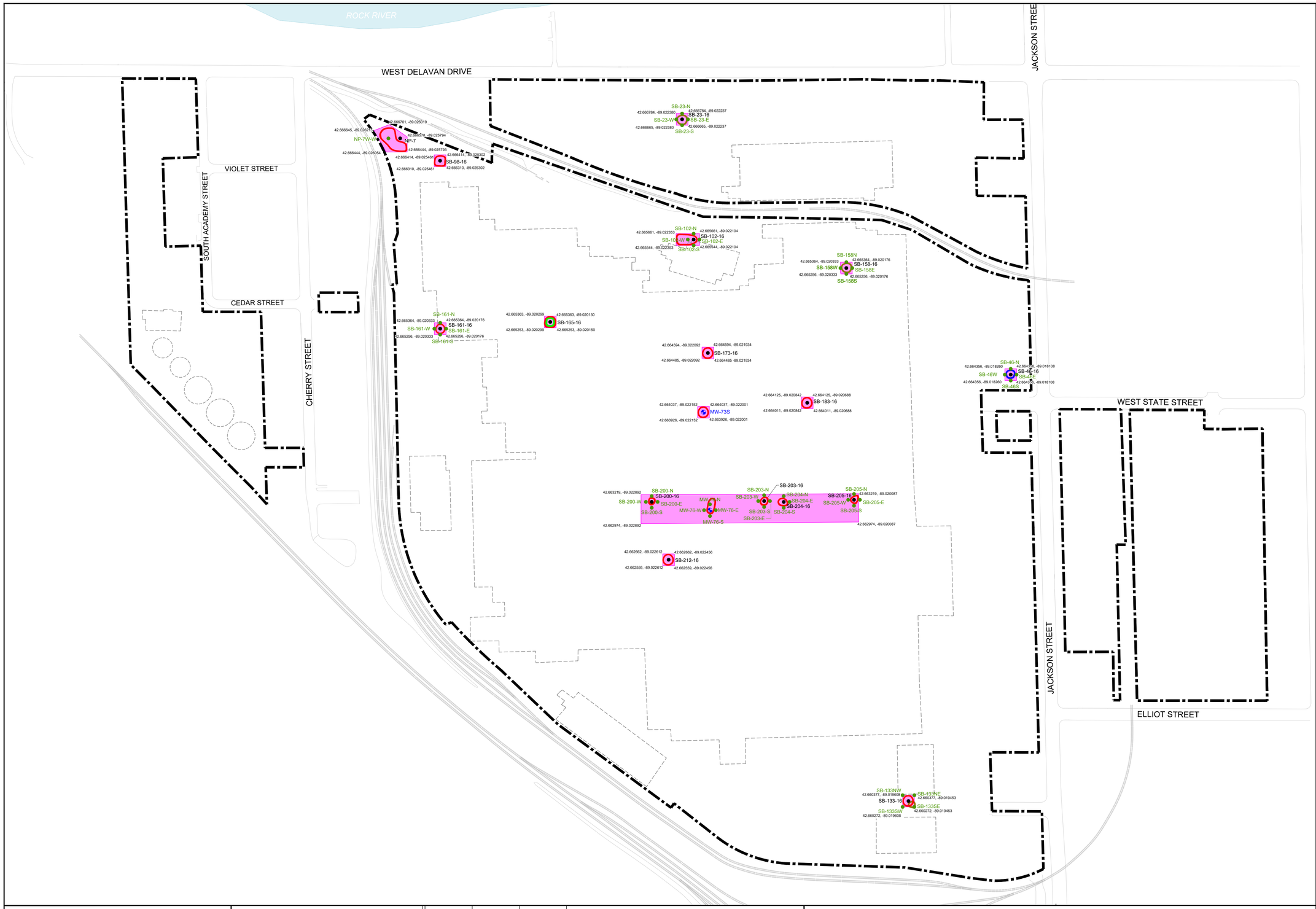
EnviroAnalytics Group

DRAWN BY: MN	REVISION NUMBER:	DATE OF REVISION:	BY:	DESCRIPTION:
APPROVED BY: CAE	#1	NA	KA	NA
DATE: 1/26/2022	#2	NA	NA	NA
SCALE: 1"=150'	#3	NA	NA	NA

GROUNDWATER PFAS ANALYTICAL RESULTS

JAINES LLC
JANESVILLE, WISCONSIN

PROJECT NUMBER:	SHEET NUMBER:
NA	1 OF 1
DRAWING DATE: 01-26-2022	FIGURE NUMBER: B.3.b (6)



LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION
- STEP-OUT SOIL BORING LOCATION
- ARSENIC ISOCONTOUR < 4 FT (BGS) (BACKGROUND THRESHOLD)
- B(a)P ISOCONTOUR > 4 FT (BGS) (INDUSTRIAL DIRECT CONTACT)
- B(a)P ISOCONTOUR < 4 FT (BGS) (INDUSTRIAL DIRECT CONTACT)
- LEAD ISOCONTOUR < 4 FT (BGS) (INDUSTRIAL DIRECT CONTACT)
- PROPERTY BOUNDARY
- FORMER BUILDING FOOTPRINT
- AREA OF CAP INSPECTION & MAINTENANE
- 42.664356, -89.018108 LATTITUDE, LONGITUDE

EnviroAnalytics Group

DRAWN BY: MN	REVISION NUMBER:	DATE OF REVISION:	BY:	DESCRIPTION:
APPROVED BY: CAE	#1	NA	NA	NA
DATE: 1/26/2022	#2	NA	NA	NA
SCALE: 1"=150'	#3	NA	NA	NA

AREAS OF CAP INSPECTION AND MAINTENANCE

JAINES LLC
JANESVILLE, WISCONSIN

PROJECT NUMBER:	SHEET NUMBER:
NA	1 OF 1
DRAWING DATE:	FIGURE NUMBER:
01-26-2022	**D.2 (14)**