K P R G

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

GROUNDWATER REMEDIAL ACTION OPTIONS MEMORANDUM ADDENDUM

May 6, 2021

To: Mr. Mark Drews, P.G., Wisconsin Department of Natural Resources
141 NW Barstow Street, Room 180
Waukesha, WI 53188

From: Josh Davenport, Tim Stohner, Rich Gnat, KPRG and Associates, Inc. (KPRG)

VIA E-MAIL and FEDEX KPRG Project No. 11717

Re: Technical Memorandum Addendum – Groundwater Remedial Action Options / Interim Remedial Action Plan
Former Navistar/RMG Foundry - 1401 Perkins Avenue, Waukesha, WI
BRRTS # 02-68-098404

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KPRG and Associates, Inc. (KPRG), in support of our client Navistar Inc. (Navistar), is pleased to present this Technical Memorandum Addendum to respond to the WDNR's comments on the previously submitted Remedial Action Options Technical Memorandum. The WDNR's comments were provided to KPRG and Navistar via email on April 1, 2021. The WDNR's comments are provided in **bold** followed by KPRG's responses.

1. DNR is concerned that the contaminant plume may be pushed towards wells MW-39, MW-27 or further north towards the new apartment buildings. Explain what measures should be taken to prevent further plume expansion due to the injection. Proposal states that pilot test indicated that the injection moved higher concentrations towards the northwest. A more complete evaluation of all wells in the northern area (on property and off property) should be provided to determine the full extent of plume movement. Should the injection rates be lowered in the northern portion of the site? Additional evaluation of projected movement of plume from MW-13/15 area and how that is currently being monitored - comparison of depth of wells (well screens) should be included in this evaluation.

In discussion with the injection contractor, to reduce the potential spread of any groundwater contamination, the injection will be performed starting in the northwest corner of the property and will proceed moving east towards the source area. In addition, the injection pressures and volume injected within each point along the property boundary can be reduced. Reducing the injection pressure would prevent excess pressure that could force groundwater movement. Reducing the injected volume at each point would reduce any mounding effect in the groundwater that may

occur. Reducing the mounding effect would prevent vertical pressure caused by a higher groundwater elevation and would prevent groundwater movement. If the volume were reduced at a point along the property boundary, any remaining injectate would be injected into one of the injection points that is farther within the property. The field measurements that will be occurring will help to determine if the above-mentioned contingency measures will be needed. Beginning the injection in the northwest corner will move any potential contaminated groundwater back towards the source zone/core room area as the injection progresses and minimize the potential for off property migration, but will still enable the enhanced reductive dichlorination to be effective.

Quarterly groundwater monitoring (including groundwater elevation measurement) continues to occur for the monitoring wells MW-13, MW-15, MW-39, MW-27, the other wells in the northwest corner of the property, and the off property wells. Reviewing the analytical results of these wells will determine if additional plume movement may have occurred as a result of the pilot test injection.

Within one month of completing the injection event, groundwater sampling (including groundwater elevation measurement) will be performed at wells NMW-9, MW-11, MW-13, MW-15, MW-25, MW-36, and MW-39. These wells will also be involved in the quarterly groundwater sampling that will occur post-injection. Wells NMW-9 (screen 16 to 26 feet below ground surface [bgs]), MW-11 (screen 15 to 25 feet bgs), MW-13 (16 to 26 feet bgs), MW-15 (screen 17 to 27 feet bgs), MW-25 (screen 23 to 33 feet bgs), MW-36 (screen 4 to 19 feet bgs), and MW-39 (screen 14 to 24 feet bgs) span almost the same interval and intersect the groundwater surface, which will identify any plume movement within the area. In response to item 2 below, an additional cross-section and map view presentation with the previous years' worth of quarterly analytical data will assist in tracking potential plume movement.

As discussed above, injection pressures and injection volumes may be adjusted downward as necessary. KPRG will use a specific injection sequencing to minimize the potential for further pushing of groundwater impacts off-site. In the unlikely event that ongoing monitoring during the injection suggests that there is some movement to the west-northwest, injections will be stopped and a vacuum truck will be brought on site to initiate extraction from the nearest point to the specific injection location, extracting water as the injection is resumed to provide an inward pull of fluid through the aquifer toward the east-southeast (toward the exiting source area). Any extracted fluids would be collected for subsequent proper disposal.

2. The proposal and evaluation of data should be supported by figures and cross sections. Cross sections should identify unconsolidated material, bedrock (and competency observations if available), water table depth, well screen depths, recent groundwater concentrations, and ground surface. Figures should identify monitoring wells to be used in the injection monitoring. Provide at least one figure with groundwater data for all these wells over the last year, to support evaluation of pilot test impacts.

New cross sections have been created to provide the above listed information. The existing site cross sections already show the stratigraphy of the site, water table depth, well screen depths, and the ground surface. The cross sections A-A' and B-B' provided in Attachment A include the groundwater concentrations for TCE from March/April 2020 through December 2020. A figure is

also provided in Attachment A that shows the groundwater monitoring TCE data from March/April 2020 through December 2020 as isoconcentration contours for that data. Post-injection groundwater monitoring will occur at the site using all of the existing monitoring wells that are part of the current groundwater monitoring events.

3. Provide a detailed description of injection plan, including timing and progression plan for injections and how this will be monitored to ensure plume expansion is not being caused. Identify potential receptors in the path of possible plume expansion and any potential impacts to be monitored.

There will be thirty-five (35) points of injection total. Twenty-nine (29) injection points will be installed as 3"-4" diameter open boreholes with a target injection range of 20 ft to 40 ft bgs. Six (6) injection points will be installed as 6" diameter open boreholes with a target injection range of 20 ft to 60 ft bgs. Figure 4 that was previously provided in the GW RAOR was updated to include the proposed numbered order in which the injections will be performed. It may be necessary to alter this order based on field conditions that may arise. This revised Figure 4 is provided in Attachment B.

The injection will begin with the 60 feet deep injection points along the northwest property line. A packer system will be used in the 60 feet deep injection points to inject the injectate at 5-feet intervals to allow for the targeting of the lower end of the treatment range specifically. At this time, the packer system will be used throughout the entire injection point to be able to target the lower and upper portions of the treatment interval separately. After these points are completed, the 40 feet deep injection points along the property line will be completed in the general order listed on the revised Figure 4 mentioned in the previous paragraph. The injection of the 40 feet deep injection points will be performed from the bottom of the injection point moving up towards the top of the treatment interval.

The proposed progression for the injection points will be discussed with the injection contractor. In addition, KPRG will have staff onsite to document the injection, including the order in which the injection points are completed. After the injection is completed, quarterly groundwater monitoring will be performed to document the groundwater conditions post-injection. Additional plume expansion monitoring is discussed in response to a comment below.

The following in italics was the proposed injection method provided in the GW RAOR previously provided.

> *The injection will be executed over thirty-five (35) injection points spaced approximately 55 feet apart. The injection points will consist of twenty-nine (29) 3"-4" diameter points and six (6) 6" diameter points.*
>
> *The 3"-4" diameter injection points will be executed using the following sequence:*
> 1. *Each injection point boring will be drilled to the top of bedrock and a 6" diameter temporary sonic casing will be seated on top of the bedrock;*
> 2. *A 3-4" diameter open rock socket will be drilled to 40 feet bgs;*

3. *Once the total depth is reached, a 4" diameter PVC casing will be dropped inside the 6" diameter sonic casing and left as a temporary casing through the overburden;*
4. *The injectate will be pumped into each injection point starting from the bottom of the borehole and working towards the surface in approximate 5-foot intervals.*

The 6" diameter injection points will be executed using the following sequence:

1. *Each injection point boring will be drilled to the top of bedrock and an 8-9" diameter temporary sonic casing will be seated on top of the bedrock;*
2. *A 6" diameter open rock socket will be drilled to 60 feet bgs;*
3. *Once the total depth is reached, a 6" diameter PVC casing will be dropped inside the 8-9" diameter sonic casing and left as a temporary casing through the overburden.*
4. *The injectate will be pumped into each injection point starting from the bottom of the borehole and working towards the surface in approximate 5-foot intervals.*

The waste material generated as part of installing the injection points will be drummed, sampled, and disposed of accordingly.

The injection sequencing will start from the farthest down gradient perimeter of the injectate grid (Fig. 4), with subsequent injections gradually moving towards the east end of the injection area. By ordering the injections from the outer perimeter of the treatment area and then inwards, the potential for mobilizing contaminant offsite is minimized. The location of the injection points in the northwest will also address any contaminant that may have been pushed as part of the pilot test, which was discussed in Section 2.2.2. In addition, locating the injection points on the edge of the 300 µg/L contour and in some cases beyond will also address some of the contaminants within the 200 µg/L contour because the pressure of the injection will move the injectate into this area and any groundwater flow will carry the injectate.

KPRG will contract ORIN Technologies, LLC to conduct the injection. The remedial injection treatment chemistry will be prepared using ORIN's specialized injection equipment. The treatment chemistry will be mixed and temporarily staged prior to injection in 200-gallon tanks located inside ORIN's enclosed injection trailer. The tank will first be filled with the proper amount of water sourced from on-site taps to achieve the appropriate treatment chemistry solution concentration. Multiple tanks will be mixed and used during the injection, which enables work to proceed steadily and efficiently. The treatment chemistry will be pumped into the formation using ORIN's air-driven, chemically resistant pumps. The rate, pressure, and volume will be monitored using a chemically resistant inline electronic flow meter. Shut-off valves are present at numerous locations throughout the delivery system for health and safety purposes. To mitigate accidental spills and/or leaks, ORIN uses a variety of spill containment basins and sorbent pads/socks.

Once the injections are complete, the injection points will be capped to prevent infiltration until it is determined if a second round of injection is necessary. Once all the necessary injections are complete, the injection points will be properly abandoned in accordance with NR 141.

As previously noted above in this response, the referenced Figure 4 in the italics text provided from the original submittal has been revised to include an injection point sequencing numbering. That revised Figure 4 is provided in Attachment B.

If necessary, to reduce the potential spread of any groundwater contamination the injection pressures and volume injected within each point along the property boundary can be reduced. Reducing the injection pressure would prevent excess pressure that could force groundwater movement. Reducing the injected volume at each point would reduce any mounding effect in the groundwater that may occur. Reducing the mounding effect would prevent vertical pressure caused by a higher groundwater elevation and would prevent groundwater movement. If the volume were reduced at a point along the property boundary, any remaining injectate would be injected into one of the injection points that is farther within the property. The field measurements that will be occurring will help to determine if the above-mentioned contingency measures will be needed.

The properties around the former Navistar property are serviced by the City of Waukesha's public water utility and therefore, they are not at risk of ingesting impacted groundwater. In addition, the groundwater flow for the area is east towards the Fox River and no receptors are present between the site and the river. Hobo Springs is present in Frame Park and discharges at the surface level; however, signs are present instructing users of the park that the water is not safe to drink.

4. What other piezometers/monitoring wells exist at the MW-9D depth to monitor whether plume expansion is being caused at this depth?

The other wells that are screened at the same depth as MW-9D are MW-29D, which is located south of MW-9D, and MW-24D, which is located east of MW-9D. Monitoring well MW-9D2 (screen 90 to 100 feet bgs) was installed and sampling began in July 2019. The three most recent rounds of groundwater sampling at this deeper well were below the enforcement standard (ES), indicating that the vertical extent of the TCE impacts have been defined at the location of MW-9D.

5. Evaluate other indirect field measurements that can be used to more quickly determine whether injections are causing plume movement. Propose to use these measurements during and immediately following the injection to provide indication of plume movement. Provide a schedule and identify the wells to be monitored. Show on a figure the monitoring wells to be used to monitor the injection.

During the injection events, down well monitoring will be performed for dissolved oxygen (DO), oxidation-reduction potential (ORP), and pH at monitoring wells NMW-8R, MW-9D, MW-25, MW-26, MW-29, MW-36, MW-37, MW-38, and MW-39. Readings will occur until they are stable and each well will be monitored once at the beginning of the injection event and once every 2-business days thereafter until the injection event ends. In addition, a field kit will be used to test for persulfate at the beginning of a weekly injection event and at the end of a weekly injection event. A weekly injection event is five (5) business days of injections occurring.

6. Provide emerging contaminants\PFAS scoping statement, which must be reviewed before the injection approval can be provided.

As stated above, the WDNR review e-mail requested that a polyfluoroalkyl substances (PFAS) scoping statement be provided in order to obtain approval of the proposed groundwater injection interim remedial measure. There is substantial documentation that the subject site has been operating as a foundry since prior to at least 1941 (oldest aerial photograph available which showed that foundry operations were already occurring on the eastern portion of the property) through 2020 at which time foundry operations were permanently ceased. Considering this well documented historical site use, KPRG reviewed the WDNR Site Investigation Scoping: Identifying Contaminants of Concern Guidance (RR-101E) which includes a table that lists potential contaminants of concern for various site uses. This table includes the group of PFAS compounds. A review of that table indicates that foundry operations may have the potential for PFAS impacts. A common major use of PFAS compounds is within firefighting foam. There is no documented use of firefighting foam at this facility either in response to a fire or as part of training operations. Another major industrial source of PFAS is electroplating. There is no documented history of electroplating to have occurred at this site. A review of potential PFAS concerns for foundries in general has limited information available at this time. Outside standard general industry uses of potential PFAS containing cleaning agents for metal surfaces, it is believed that PFAS compounds may be associated as additives with the use of core oils (Association of State Drinking Water Administrators, Mapping Guide for Per- and Polyfluoroalkyl Substances (PFAS) Source Water Assessments, Page 20. Undated) within the casting process, which would generally occur within the core room areas. Based on this screening, Navistar/KPRG will prepare a PFAS Groundwater Sampling Work Plan for WDNR review and approval. At this time, an initial screening sampling is proposed which would include the following monitoring wells and rationale:

Well No.	Location	Rationale
MW-34	East Property Boundary	Upgradient location
MW-30	Source Area	Core room well

The upgradient well location is intended to provide a screening of potential PFAS groundwater impacts entering the property from upgradient. The well within the core room area (MW-30) is proposed to screen for potential presence of elevated PFAS within the area, which would most likely be a source with the use of core oils. Based on the results of the sampling, either no further definition will be proposed or expanded sampling may need to be considered.

7. Submit an injection approval request and WPDES permit application.

As noted in the text of the initial submittal on page 18, an injection approval request and WPDES permit application will be submitted once the injection methodology provided in the GW RAOR and the responses to DNR's comments is approved by DNR. It is KPRG's understanding from completion of previous groundwater injection remediations that these permit applications are to be submitted after initial injection plan approval.

8. Monitor the Hobo Spring during the injection event and in subsequent groundwater monitoring events to determine whether there are any impacts. Provide a contingency plan for the spring if impacts occur.

Hobo Spring will be monitored for the same parameters as the monitoring wells discussed previously. During the injection events, Hobo Spring will be monitored for dissolved oxygen (DO), oxidation-reduction potential (ORP), and pH. Readings will occur until they are stable and each well will be monitored once at the beginning of the injection event and once every 2-business days thereafter until the injection event ends. In addition, a field kit will be used to test for persulfate at the beginning of a weekly injection event and at the end of a weekly injection event. A weekly injection event is five (5) business days of injections occurring.

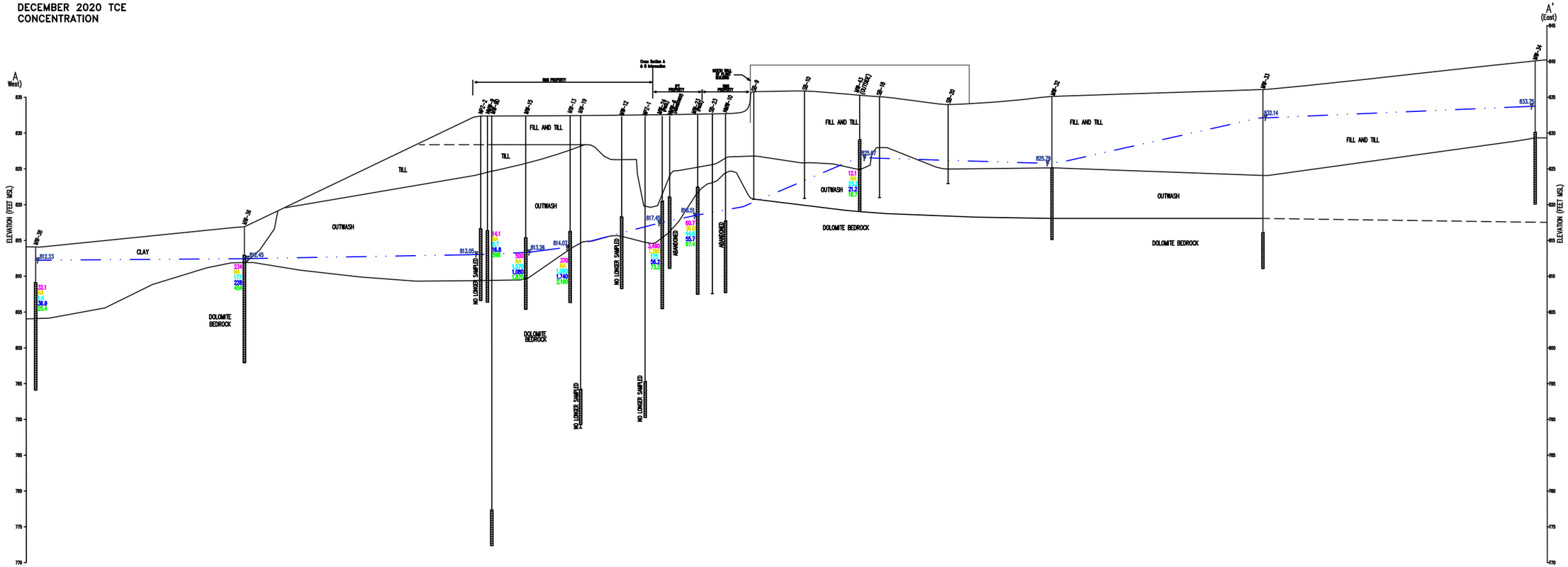
If approved by the City of Waukesha, temporary fencing will be placed around the spring during and for up to 4 weeks after the injection event to prevent access.

ATTACHMENT A
Requested Cross-Sections and Map View Showing Isoconcentrations Over Time

LEGEND

- MONITORING WELL WITH SCREEN
- 818.38 — GROUNDWATER ELEVATION (2019)
- SOIL BORING
- 100 — MARCH/APRIL 2020 TCE CONCENTRATION
- 100 — JUNE 2020 TCE CONCENTRATION
- 100 — SEPTEMBER 2020 TCE CONCENTRATION
- 100 — DECEMBER 2020 TCE CONCENTRATION

N



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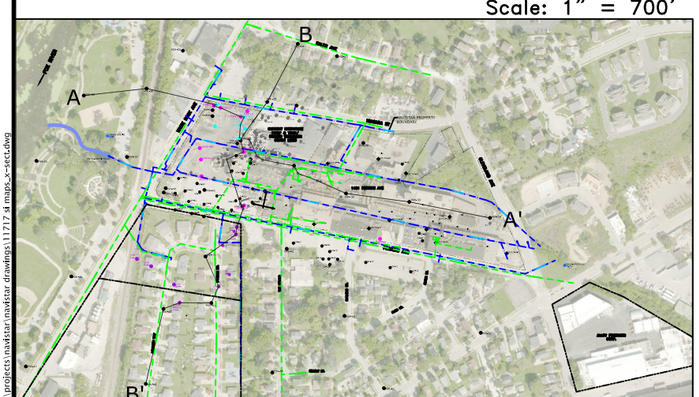

Horizontal Scale: 1" = 125'
Vertical Scale: 1" = 12.5'
10x Vertical Exaggeration

15' / 0 / 150'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

CROSS SECTION A–A' WITH TCE ANALYTICAL RESULTS FROM 03/04 2020 TO 12/2020

RMG WAUKESHA FOUNDRY
1401 PERKINS AVE, WAUKESHA, WI

Scale: 1" = 150' | Date: April 15, 2021

KPRG Project No. 11717 | FIGURE 1

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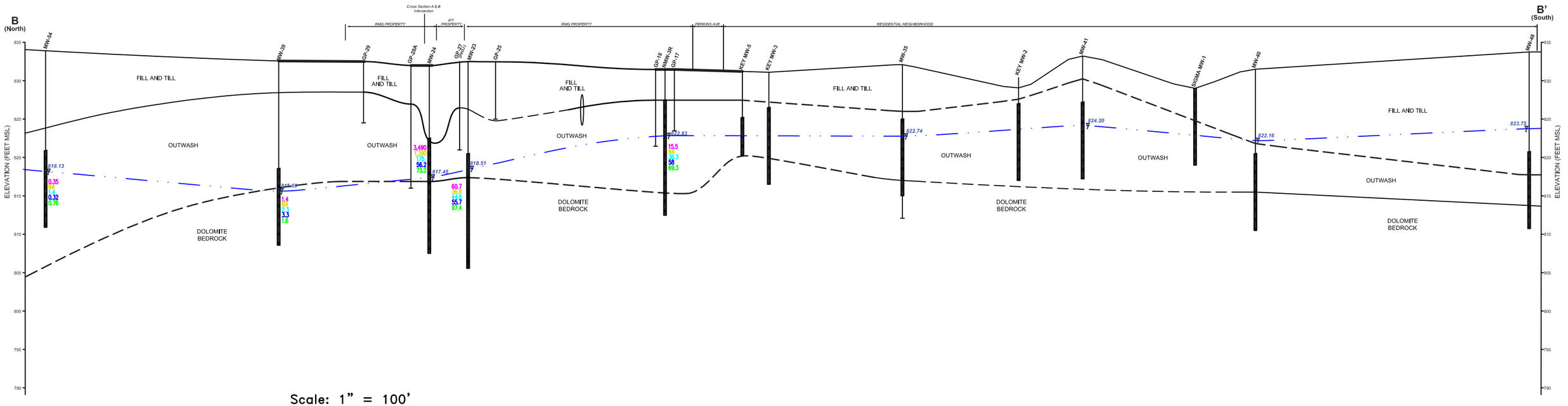
LEGEND

- MONITORING WELL WITH SCREEN
- 818.38 — GROUNDWATER ELEVATION (2019)
- SOIL BORING
- 100 — MARCH/APRIL 2020 TCE CONCENTRATION
- 100 — JUNE 2020 TCE CONCENTRATION
- 100 — SEPTEMBER 2020 TCE CONCENTRATION
- 100 — DECEMBER 2020 TCE CONCENTRATION

N



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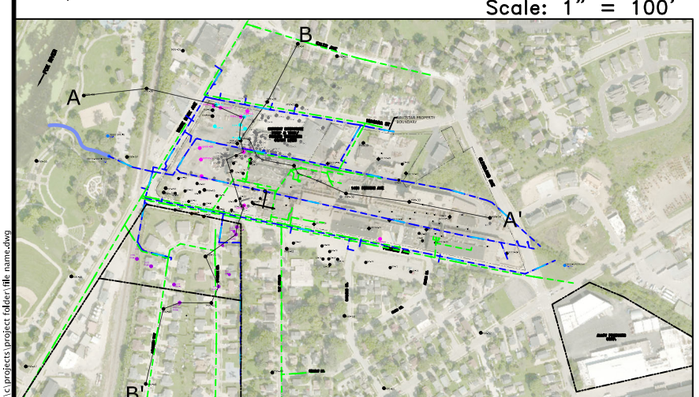

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Horizontal Scale: 1" = 125'
Vertical Scale: 1" = 12.5'
10x Vertical Exaggeration

12.5'
0
125'
APPROXIMATE SCALE

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KPRG and Associates, inc.

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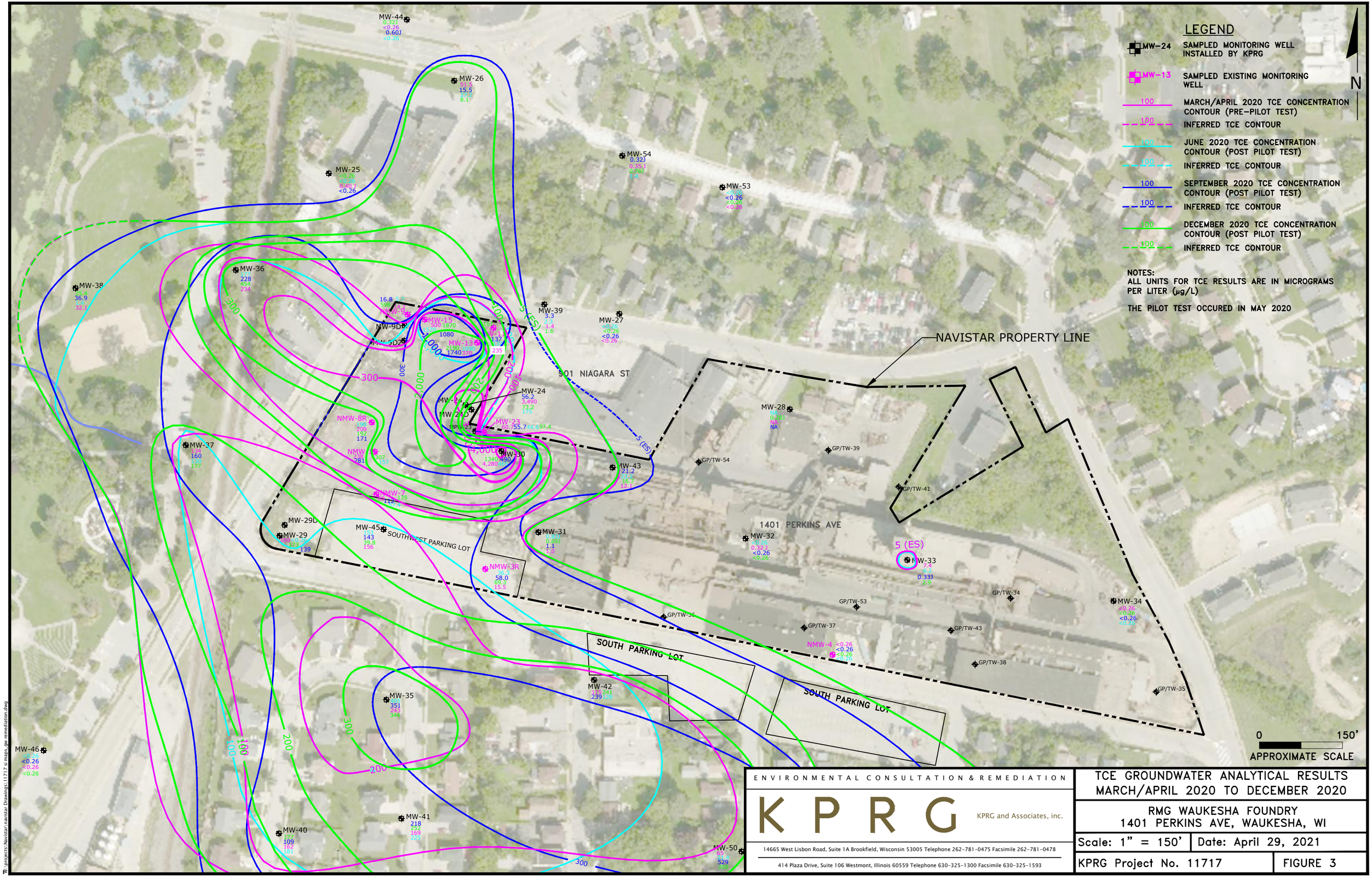
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

CROSS SECTION B–B' WITH TCE ANALYTICAL RESULTS FROM 03/04 2020 TO 12/2020

RMG WAUKESHA FOUNDRY
1401 PERKINS AVE, WAUKESHA, WI

Scale: 1" = 125' | Date: April 22, 2021

KPRG Project No. 11717 | FIGURE 2



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14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

TCE GROUNDWATER ANALYTICAL RESULTS MARCH/APRIL 2020 TO DECEMBER 2020

RMG WAUKESHA FOUNDRY
1401 PERKINS AVE, WAUKESHA, WI

Scale: 1” = 150’ | Date: April 29, 2021

KPRG Project No. 11717 | FIGURE 3

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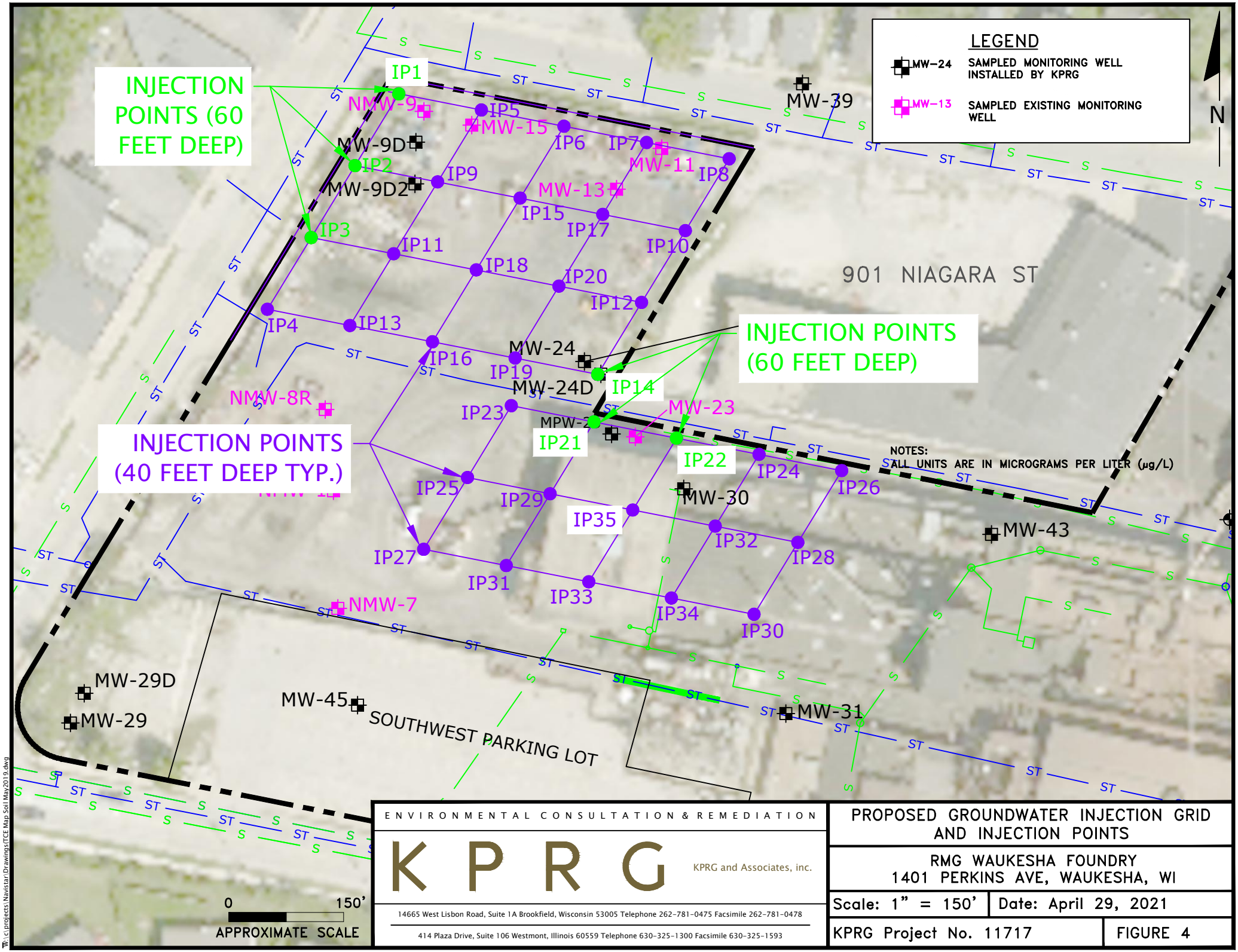
ATTACHMENT B
Revised Figure 4



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, Inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

PROPOSED GROUNDWATER INJECTION GRID AND INJECTION POINTS

RMG WAUKESHA FOUNDRY
1401 PERKINS AVE, WAUKESHA, WI

Scale: 1" = 150' | Date: April 29, 2021

KPRG Project No. 11717 | FIGURE 4

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