



DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY ENVIRONMENTAL COMMAND
2455 REYNOLDS ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-7588

AMIM-AEC-M (1200C)

May 27, 2021

SUBJECT: April 2021 Monitoring and Residential Well Groundwater Data
WDNR BRRTS #02-57-001002
Badger Army Ammunition Plant

Mr. Steve Martin
Wisconsin Department of Natural Resources
GEF2 Central Office
PO Box 7921
Madison, WI 53707-7921

Dear Mr. Martin:

Enclosed is the Badger Army Ammunition Plant (BAAP) April 2021 Monitoring Well and Residential Well Groundwater Data. This was a quarterly & semi-annual sampling event. During April 2021, SpecPro Professional Services, LLC (SPS) collected groundwater samples from 115 monitoring wells associated with the Deterrent Burning Ground (DBG) Plume, Nitrocellulose Production Area (NC) Plume, and Propellant Burning Ground (PBG) Plume. On April 15 and May 5, 2021, SPS collected groundwater samples from one residential well associated with the Central Plume.

The enclosed files contain the signed Environmental Monitoring Data Certification Forms, a concentration graph, a list of wells sampled, a map showing the well locations, and residential well lab results. Also attached are data summary tables for selective wells associated with the DBG and PBG Plumes.

Deterrent Burning Ground Plume

Based on the WDNR 2014 Monitoring Well Optimization Plan email approval dated May 27, 2014 and a subsequent modification dated July 15, 2016, 45 monitoring wells associated with the DBG Plume were sampled between April 5 and 26, 2021.

The groundwater results indicate that dinitrotoluene (DNT) concentrations in the DBG Plume have continued to decrease over the past four years except in three monitoring wells, ELN-1003B, ELN-1003C, and ELN-1502A. The enclosed Table 1 compares the DNT results from ELN-1003B, ELN-1003C, and ELN-1502A from September 2016 through April 2021.

The total DNT concentration in ELN-1502A increased from 0.195 micrograms per liter ($\mu\text{g/l}$) during September 2016 to 0.801 $\mu\text{g/l}$ during September 2018 but dropped to 0.245 $\mu\text{g/l}$ during April 2021. ELN-1502A is located at the eastern plant boundary and

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0.7 miles southeast of the DBG source area. ELN-1502A will be sampled again during September 2021.

The total DNT concentration in ELN-1003B increased from <0.008 (below the detection limit) during September 2016 to 0.223 µg/l during November 2019 but dropped to 0.193 µg/l during April 2021. The total DNT concentration in ELN-1003C increased from <0.0081 during September 2016 to 0.204 µg/l during April 2021. Both ELN-1003B and ELN-1003C are located 0.5 mile southeast of ELN-1502A. Both ELN-1003B and ELN-1003C will be sampled again during September 2021.

Nitrocellulose Production Area Plume

Per the WDNR's October 3, 2014 request, we have included DNT groundwater data from four monitoring wells located near the former DNT Screen House. These monitoring wells help define the extents of DNT in the NC Plume. The groundwater results indicate that DNT concentrations in this area have remained stable. These monitoring wells associated with the NC Plume will be sampled again during September 2021.

Propellant Burning Ground Plume

Based on the WDNR Propellant Burning Ground Monitoring Requirements dated January 5, 2015, 66 monitoring wells associated with the PBG Plume were sampled between April 7 and 20, 2021.

The groundwater results indicate that volatile organic compound (VOC) concentrations in the PBG Plume were relatively unchanged since September 2017. PBN-8202C had a benzene concentration of 0.27 µg/l, which was below the Chapter NR 140 Preventive Action Limit (PAL) of 0.5 µg/l. The benzene concentrations in PBN-8202C were 37 µg/l, 41 µg/l, and 3.3 µg/l during April, June, and September 2020, respectively. Benzene is not a standard contaminant of concern in the PBG Plume. PBN-8202C is located directly downgradient of the PBG source area.

DNT concentrations near the PBG source area have increased since September 2017. The enclosed Table 2 compares the DNT results from PBM-9801, PBN-8202A and PBN-8202B from September 2017 through April 2021. PBM-9801 is located within the PBG source area but was not required to be sampled during April 2021. PBM-9801 will be sampled again during September 2021. PBN-8202A and PBN-8202B are located adjacent to and downgradient of the PBG source area. Both PBN-8202A and PBN-8202B will be sampled again during September 2021.

The total DNT concentration in PBN-8202A increased from 1.469 µg/l during September 2017 to 420.294 µg/l during May 2018. Since May 2018, the total DNT concentration in PBN-8202A has fluctuated. During April 2019, the total DNT

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concentration in PBN-8202A dropped to 30.49 µg/l. In April 2020, the total DNT concentration in PBN-8202A increased to 1,286.9 µg/l. During April 2021, the total DNT concentration in PBN-8202A decreased to 17.575 µg/l. The total DNT concentration in PBN-8202B increased from 0.881 µg/l during September 2017 to 85.1 µg/l during April 2019 and has decreased to 5.158 µg/l during April 2021.

Total DNT concentrations have also been increasing in one other monitoring well located beneath the capped PBG Waste Pits. The total DNT concentration in PBM-0001 increased from 0.701 µg/l (September 2017) to 9.768 µg/l (April 2021).

These are unexpected increases in DNT concentrations over recent sampling events. The recent increase in DNT concentrations near the source area may be related to the recent rise in groundwater levels. Over the past four years, the groundwater table at the PBG source area has risen eight feet and above the estimated depth of DNT contaminated soil remaining beneath the PBG cap. The enclosed graph compares the total DNT concentration in PBN-8202A versus the groundwater elevation from 2007 to 2021. The graph shows that as the groundwater elevation in PBN-8202A has dropped over the past year, the total DNT concentration has also dropped.

Residential Wells

Residential well WE-XK342, located in the Water's Edge Subdivision (Central Plume), was sampled for DNT and VOCs on April 15, 2021. A duplicate sample was also collected from WE-XK342. WE-XK342 has been quarterly sampled by the Army since August 2019. WE-XK342 is a shared well that was constructed in 2014 to a depth of 80 feet in the sand aquifer.

Total DNT was detected above the NR 140 Enforcement Standard (ES) in WE-XK342 at a concentration of 0.105 and 0.131 µg/l in the April 15, 2021 regular and duplicate samples, respectively. Both the regular and duplicate samples had detections for 2,4-DNT, 2,6-DNT, and 3,4-DNT. WE-XK342 has a history of 2,6-DNT detections above the NR 140 PAL but below the NR 140 ES. The two homeowners were offered bottled water by the Army.

On May 5, 2021, the Army collected additional groundwater samples from WE-XK342 to verify the DNT results. 2,6-DNT and total DNT were detected above the NR 140 PAL but below the NR 140 ES in WE-XK342 at a concentration of 0.027 and 0.028 µg/l in the regular and duplicate samples, respectively.

During June 2021, the Army will collect additional groundwater samples from WE-XK342 to evaluate the DNT concentrations. The Army will evaluate replacing WE-XK342 if total DNT is detected above the NR 140 ES in the additional groundwater samples.

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The Army conducts semi-annual sampling of two monitoring wells that are located approximately 150 feet east of WE-XK342. Monitoring wells SEN-0502A (33 feet deep) and SEN-0502D (187 feet deep) are screened in the sand aquifer. Both monitoring wells do not have a history of DNT detections. They were most recently sampled during November 2020 and are scheduled to be sampling during June 2021.

Quality Review

SPS conducted an internal quality control review of the groundwater data. The internal review did not find any issues with the groundwater data. All groundwater samples were analyzed by CT Laboratories, LLC (CT Lab) in Baraboo, Wisconsin. CT Lab is a WDNR Chapter NR 149 certified laboratory and accredited by the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP).

Please do not hesitate to contact me at 210-466-1351 if you have any questions.

Sincerely,



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Date: 2021.05.27 10:54:08 -05'00'

Bryan P. Lynch
Commander's Representative

Enclosures

Copy furn: Joel Janssen, SpecPro Professional Services, LLC