ENVIRONMENTAL SAMPLING CORPORATION

Dedicated to Environmental Monitoring, Science & Technology

June 23, 2021

Mr. Mark Slocomb, Chairman
Emerald Park Landfill Standing Committee
W182 S8200 Racine Avenue
Muskego, WI 53150

Subject: 2020 Private Well Water Testing Program Results – Muskego, WI

Dear Mr. Slocomb:

Due to the COVID-19 pandemic declared by the World Health Organization, the December 2020 private well monitoring event was postponed until February 2021. The postponement was approved by you in order to limit potential exposure to both the homeowners and Environmental Sampling Corporation personnel during the sampling event.

Samples were collected from 35 wells on February 22-25, 2021. A list of the private wells included in the monitoring event is provided as **Table 1**. Each well was purged for a minimum of 15 minutes, samples were collected, and the tap was sterilized prior to collecting the total coliform bacteria samples. An additional sample for lead analysis was collected at the kitchen sink. Samples were placed on ice, Chain-Of-Custody (COC) was established, and samples were shipped overnight to Pace Analytical Services, Inc. and TG Analytical Laboratories for analysis. Due to an instrument calibration issue at Pace Analytical laboratory, 16 of the 35 VOC samples collected during the original sampling event on February 24-25, 2021 were not analyzed within the required sample hold time. ESC personnel provided notification on March 15, 2021 to the 16 homeowners and an additional sampling event was scheduled. Fifteen of the sixteen samples for VOC analysis were collected between March 15- 22, 2021. The sixteenth sample was collected on April 14, 2021 due to homeowner availability. The samples were sent from Pace Analytical to Northern Lake Service, Inc. to perform the second VOC analysis.

In a letter dated July 29, 1999, WDNR states that Emerald Park Landfill is located over about 140 feet of clayey saturated soils, underlain successively by sand and gravel and by dolomite of the Niagara Formation. The sand and gravel aquifer, and the dolomite aquifer serve as the water supply for most private wells in the area. Deeper groundwater flows to the east/ northeast while shallow groundwater flows to the southwest.

Drinking water samples were analyzed for total coliform bacteria, boron, chloride, lead, manganese, sulfate, total suspended solids (TSS), iron, selenium, nitrate+nitrite nitrogen, alkalinity, total kjeldahl nitrogen (TKN), chemical oxygen demand (COD), Volatile Organic Compounds (VOCs), and field parameters (i.e. pH, conductivity, temperature, color, odor and appearance). Analytical results indicate that there were no exceedances of the Public Health Groundwater Quality Standards (Primary).

There was one exceedance of the EPA Maximum Contaminant Level (MCL), Wisconsin Department of Natural Resources (WDNR) MCL, and WDNR Enforcement Standard (ES) for the VOC tetrachloroethene. Additional information on the exceedance is provided later in this letter. There are no exceedances of the Primary Drinking Water Standards for the remaining parameters analyzed.

Concentrations of iron and sulfate exceeded the Public Welfare Groundwater Quality Standards (Secondary) in the samples collected from a number of private wells. The elevated concentrations of iron and sulfate are typical of groundwater quality of Southeast Wisconsin. Based upon a thorough review of the test results and the direction of groundwater flow, there is no apparent evidence of adverse impacts from the operations of Emerald Park Landfill.

Iron was reported above the Public Welfare Groundwater Quality Standard in the samples collected from 28 wells. Iron is a Secondary Standard that affects the appearance or taste of the water but does not

pose a human health risk. The iron concentration in these samples is likely a result of high iron concentration levels that are naturally found in the native soils of Southeast Wisconsin.

Sulfate was reported above the Public Welfare Groundwater Quality Standard in the samples collected from three wells. Sulfate is a Secondary Standard that affects the appearance or taste of the water but does not pose a human health risk. The sulfate that was measured in the well water samples is likely a result of high sulfate concentration levels that are naturally found in the native soils of Southeast Wisconsin.

There were no additional exceedances of the Secondary Drinking Water Standards for chloride, iron, manganese or sulfate.

The VOC analysis covers a wide range of compounds, which are generally found in household and industrial solvents, degreasers, cleaners, gases, pesticides, agricultural products, and petroleum products. Below is a summary of the VOCs detected in the samples collected during the February 2021 sampling event and associated March 2021 resample events. The laboratory's "J" qualifier is defined as a concentration between the laboratory's Limit of Detection and Limit of Quantitation which cannot be confirmed by the laboratory and should be considered an estimate:

- Low levels of acetone were detected in the samples collected from two wells, PW-AU (6.5 J ppb) and PW-EM (17.0 ppb), during the February 2021 and March 2021 sampling events, respectively, at concentrations less than the ES of 9,000 ppb established by the WDNR. Acetone is a common laboratory contaminant. The reported concentrations of acetone are likely a result of laboratory contamination and do not represent actual drinking water quality.

- Low levels of carbon disulfide were detected in the samples collected from two wells, PW-U (0.64 ppb) and PW-EJ (0.59 ppb), during the February 2021 sampling event at concentrations less than the ES of 1,000 ppb established by the WDNR. Carbon disulfide is a common laboratory contaminant. The concentrations of carbon disulfide at PW-U and PW-EJ were likely a result of laboratory contamination and do not represent the actual drinking water quality.

- Low levels of chlorobenzene were detected in the samples collected from nineteen wells during the February 2021 sampling event at concentrations that are less than the EPA MCL, WDNR MCL, and ES of 100 ppb. The concentrations of chlorobenzene were as follows: PW-E (0.14 J ppb), PW-P (0.17 J ppb), PW-AI (0.13 J ppb), PW-AM (0.17 J ppb), PW-AU (0.14 J ppb), PW-BA (0.14 J ppb), PW-BD (0.30 ppb), PW-BG (0.12 J ppb), PW-BP (0.13 J ppb), PW-BQ (0.35 J ppb), PW-CF (0.20 J ppb), PW-CO (0.15 J ppb), PW-DK (0.25 J ppb), PW-DP (0.17 J ppb), PW-EA (0.20 J ppb), PW-EL (0.14 J ppb), PW-EN (0.10 J ppb), PW-EP (0.15 J ppb), and PW-EQ (0.13 J ppb). The reported concentrations of chlorobenzene were likely the result of contaminated sample glassware and do not represent actual drinking water quality. Laboratory sample glassware is considered by EPA to be certified "contaminant-free" at 0.5 ppb of chlorobenzene. The reported concentrations of chlorobenzene in these samples were less than this concentration.

- Tetrachloroethene was detected in the sample collected from one well, PW-DP (24.9 ppb), during the February 2021 sampling event. The tetrachloroethene concentration exceeded the EPA MCL, WDNR MCL, and ES of 5 ppb. In order to provide more information regarding the February 23, 2021 VOC monitoring results, an additional sample was collected from PW-DP on March 31, 2021. There were no VOCs reported in the water sample collected from PW-DP on March 31, 2021. Therefore, the March 2021 results did not confirm the February 2021 EPA MCL, WDNR MCL, and ES exceedance for tetrachloroethene.

- Low levels of toluene were detected in the samples collected from three wells, PW-AU (0.27 ppb), PW-DP (0.081 J ppb) and PW-EN (0.39 ppb in February and 0.52 J ppb in March), at concentrations that were below the EPA MCL (1,000 ppb), the WDNR MCL (1,000 ppb) and ES (800 ppb). The toluene concentrations in the samples collected from these wells are likely related to either field or laboratory contamination and do not represent actual drinking water quality.

The VOC detections for the February and March 2021 sampling events show no apparent pattern to their distribution. The sample collection and the analytical data were also reviewed and no apparent correlations were found between the sampling dates, sampling order, or the order in which the laboratory analyzed the samples.

The reported VOC concentrations for the February and March 2021 sampling events were randomly located within the sampling area. There was one VOC, tetrachloroethene reported in the sample collected from PW-DP, that exceeded the EPA and WDNR drinking water standards. An additional sample was collected from PW-DP on March 31, 2021 to provide more information regarding the exceedance. There were no VOCs reported in the water sample collected from PW-DP on March 31, 2021. Therefore, the March 2021 results did not confirm the February 2021 EPA MCL, WDNR MCL, and ES exceedance for tetrachloroethene. All other VOCs detected were below the EPA and WDNR drinking water standards, if applicable. As stated before, the other VOCs detected in the February and March 2021 water samples can be attributed to either laboratory contamination (including but not limited to the sampling bottles with acid used for preservation, which are only certified clean down to certain standards which may be higher than the LOD of the laboratory) or field contamination and are not related to the landfill operations.

If you have any questions or need additional information, please contact the undersigned at 414-427-5033.

Sincerely,
Environmental Sampling Corporation

Frank Perugini
Director of Operations

Attachments

cc: Dan Otzelberger, EPL General Manager (e-copy)
Kari Rabideau, GFL Environmental-Midwest Region Environ. Compliance Manager (e-copy)
Tim Curry, GFL Environmental-Midwest Region Landfill Manager (e-copy)
Mark Torresani, Tetra Tech (e-copy)
Jo Spear, JSA Environmental (e-copy)
EPL Standing Committee (e-copy)
EPL File Copy
ESC (e-copy)

TABLE 1

Emerald Park Landfill - Muskego, WI
Private Well Monitoring Program (Sample list for Feb 2021)

	Well ID	Address	City	Zip
1	PW-E	21302 7 Mile Road	Franksville	53126
2	PW-P	22207 8 Mile Road	Muskego	53150
3	PW-R	22243 8 Mile Road	Muskego	53150
4	PW-U	22505 8 Mile Road	Muskego	53150
5	PW-X	22737 8 Mile Road	Muskego	53150
6	PW-AD	S100 W13402 Loomis Drive	Muskego	53150
7	PW-AH	S100 W13547 Loomis Drive	Muskego	53150
8	PW-AI	S102 W13815 Loomis Drive	Muskego	53150
9	PW-AL	S103 W14578 Loomis Drive	Muskego	53150
10	PW-AM	S103 W14727 Loomis Drive	Muskego	53150
11	PW-AU	S99 W12707 Loomis Drive	Muskego	53150
12	PW-AY	S99 W13277 Loomis Drive	Muskego	53150
13	PW-BA	S100 W13444 Loomis Drive	Muskego	53150
14	PW-BD	S98 W12878 Loomis Drive	Muskego	53150
15	PW-BG	S103 W14305 Loomis Drive	Muskego	53150
16	PW-BP	8608 Raynor Ave.	Franksville	53126
17	PW-BQ	8702 Raynor Ave.	Franksville	53126
18	PW-BZ	21923 8 Mile Road	Muskego	53150
19	PW-CF	S98 W12772 Loomis Drive	Muskego	53150
20	PW-CO	21134 7 Mile Road	Franksville	53126
21	PW-CR	22311 8 Mile Road	Muskego	53150
22	PW-CU	S100 W13399 Loomis Drive	Muskego	53150
23	PW-DK	22529 8 Mile Road	Muskego	53150
24	PW-DP	21434 7 Mile Road	Franksville	53126
25	PW-DQ	21735 8 Mile Road	Muskego	53150
26	PW-EA	21327 8 Mile Road	Muskego	53150
27	PW-EI	22525 8 Mile Road	Muskego	53150
28	PW-EJ	S105 W15842 Loomis Drive	Muskego	53150
29	PW-EK	S101 W13814 Loomis Drive	Muskego	53150
30	PW-EL	S104 W14934 Loomis Drive	Muskego	53150
31	PW-EM	21341 8 Mile Road	Muskego	53150
32	PW-EN	21231 8 Mile Road	Muskego	53150
33	PW-EO	22018 7 Mile Road	Franksville	53126
34	PW-EP	21431 8 Mile Road	Muskego	53150
35	PW-EQ	21625 8 Mile Road	Muskego	53150