MEMORANDUM

DATE:	6 April 2021
TO:	Chris Prucha, Bill McDonough and Jim Forney, Waste Management (WM)
FROM:	François Richard and Madeleine Corriveau (BluMetric)
PROJECT NO:	210166-05
SUBJECT:	Supplementary Groundwater PFAS Sampling at M217 and M218, Waste Management Richmond Landfill, Town of Greater Napanee

BACKGROUND AND OBJECTIVE

The Ministry of the Environment, Conservation and Parks (MECP) requested supplementary sampling for per- and polyfluoroalkyl substances (PFAS) of two shallow groundwater monitoring wells. The two groundwater monitoring wells, M217 and M218, are installed in the shallow flow zone and located immediately downgradient of the North Lagoon.

The supplementary sampling event at these two monitoring wells summarized in this document was requested by MECP to confirm results, using low level reportable detection limit (RDL) of 2 ng/L, from a similar sampling event conducted on January 11, 2021, where the results at these two locations were below the RDL of 20 ng/L. Results from the latter sampling event were reported in a memorandum dated February 1, 2021.

SAMPLING

Samples were collected on March 19, 2021 and were submitted to Bureau Veritas Laboratories for analysis of the PFAS parameters listed in Table 1.

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Table 1: PFAS Parameters Analyzed

Parameter	Acronym	Parameter	Acronym
Perfluorobutanoic acid	PFBA	Perfluoroundecanoic acid	PFUnA
Perfluoropentanoic acid	PFPeA	Perfluorodecanesulfonic acid	PFDS
Perfluorohexanoic acid	PFHxA	Perfluorododecanoic acid	PFDoA
Perfluoroheptanoic acid	PFHpA	Perfluorobutanesulfonic acid	PFBS
Perfluorooctanoic acid	PFOA	Perfluorohexanesulfonic acid	PFHxS
Perfluorononanoic acid	PFNA	Perfluorooctanesulfonic acid	PFOS
Perfluorodecanoic acid	PFDA	Perfluorooctane sulfonamide	PFOSA

One field blank sample, using PFAS-free de-ionised (DI) water supplied by the laboratory, was also submitted for analysis.

Due to the very low analytical method detection limits and the numerous potential sources of trace PFAS concentrations that can lead to false positive results, PFAS sampling programs require additional precautions to reduce the potential for cross-contamination. Sample collection from the groundwater monitoring wells followed current industry standard guidance for aqueous sampling for PFAS, in particular:

- New ¼" High Density Polyethylene (HDPE) tubing was installed;
- New silicone pump head tubing was used at each location; and,
- Purging and sampling was conducted with a peristaltic pump at low flow to achieve parameter stabilization in flow through cell (temperature, pH and conductivity, dissolved oxygen and Eh).

All purge water was collected and disposed of in the North Chamber leachate collection station.

RESULTS AND DISCUSSION

A summary of results from the January 11 and March 19, 2021 sampling events is presented in Table 2. Total PFAS concentrations were calculated for each sample by adding individual constituent concentrations (non-detects were treated as zero).

The sample collected from the North Lagoon on January 11, 2021 had several PFAS compounds detected (PFBS, PFBA, PFHpA, PFHxS, PFHxA, PFOS, PFOA and PFPeA) with concentrations ranging from 20 to 250 ng/L, and a total PFAS concentration of 912 ng/L. PFAS compounds detected in the North Lagoon are consistent with those previously detected in leachate[1].

Results from groundwater monitoring locations M217 and M218 were below detection during both sampling events for all PFAS compounds, as were the results from the field blank samples.

Table 2: Per- and Polyfluoroalkyl Substances (PFAS) Sampling Results

			North Lagoon	M217		M218	
Reading Name		Units	11-Jan-2021	11-Jan-2021	19-Mar-2021	11-Jan-2021	19-Mar-2021
Total PFAS	-	*ng/L*	*912*	*0*	*0*	*0*	*0*
Perfluorobutanesulfonic acid	PFBS	ng/L	27	<20	< 2	<20	< 2
Perfluorobutanoic acid	PFBA	ng/L	120	<20	< 2	<20	< 2
Perfluorodecanesulfonic acid	PFDS	ng/L	<20	<20	< 2	<20	< 2
Perfluorodecanoic Acid	PFDA	ng/L	<20	<20	< 2	<20	< 2
Perfluorododecanoic Acid	PFDoA	ng/L	<20	<20	< 2	<20	< 2
Perfluoroheptanoic Acid	PFHpA	ng/L	79	<20	< 2	<20	< 2
Perfluorohexanesulfonic acid	PFHxS	ng/L	36	<20	< 2	<20	< 2
Perfluorohexanoic Acid	PFHxA	ng/L	250	<20	< 2	<20	< 2
Perfluorononanoic Acid	PFNA	ng/L	<20	<20	< 2	<20	< 2
Perfluorooctane Sulfonamide	PFOSA	ng/L	<20	<20	< 4	<20	< 4
Perfluorooctanesulfonic acid	PFOS	ng/L	20	<20	< 2	<20	< 2
Perfluorooctanoic Acid	PFOA	ng/L	170	<20	< 2	<20	< 2
Perfluoropentanoic Acid	PFPeA	ng/L	210	<20	< 2	<20	< 2
Perfluoroundecanoic Acid	PFUnA	ng/L	<20	<20	< 2	<20	< 2

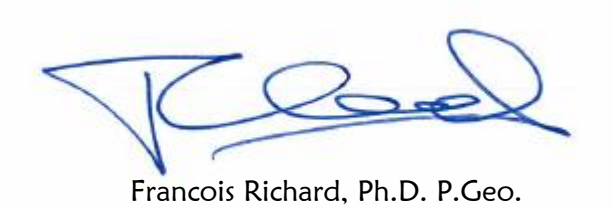
SUMMARY AND CONCLUSION

The results indicate that PFAS compounds are present in the North Lagoon, while shallow groundwater monitoring locations immediately downgradient from the North Lagoon did not have detections of PFAS compounds.

[1] *PFAS Sampling Summary, Waste Management Richmond Landfill, Town of Greater Napanee*, prepared by BluMetric Environmental Inc., 5 February 2019

We trust the above is satisfactory. If you have any questions or need further information please do not hesitate to contact the undersigned.

Respectfully submitted,
BluMetric Environmental Inc.



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