15 August 2022

To: Laboratories participating in Proftest SYKE proficiency tests

Proficiency test MET 12/2022 – Metals in wastewater and fly ash

Proftest SYKE will organize a proficiency test for the analysis of metals and mercury in wastewaters and in fly ash. The measurands for the synthetic sample, municipal wastewater and industrial wastewater are: Al, As, B, Ba, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, S, Sb, Se, Sr, Ti, U, V and Zn. Acid soluble measurands for the fly ash sample are: As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Se, V ja Zn.

The purpose of this proficiency test is to ensure the comparability and accuracy of the results of the participants. Depending on the measurement, about 10 – 20 laboratories are expected to participate in this proficiency test.

The organizing of this proficiency test is included in the accreditation scope (www.finas.fi/sites/en) with the exception of fly ash analysis.

Sample matrices

Synthetic sample, municipal and industrial wastewater and fly ash.

Timetable

Registration	**15 August – 16 September 2022**	
Sample dispatch date (national participants)	11 October 2022 (see Chapter 4 *Sample delivery*)	
Analysis of the samples	Mercury samples	**28 October 2022**
	Other samples	at the latest on **4 November 2022**
Reporting of the results	**12 October – 9 November 2022**	

Participation fee

The participation fee is **1015 €** (+ VAT) including all measurements and samples.
See detailed information in Chapter 9 *Participation fee.*

Mirja Leivuori,
Head of Unit, coordinator

Päivi Grönroos,
substitute for coordinator

Proftest SYKE is proficiency testing provider PT01 (EN ISO/IEC 17043:2010) accredited by FINAS (Finnish Accreditation Service, www.finas.fi/sites/en).

Organizing the proficiency test

1 Organizer

Proftest SYKE, Finnish Environment Institute SYKE, Laboratory Centre
Address: Mustialankatu 3, FI-00790 Helsinki, FINLAND
Email: *proftest@syke.fi*

Contact

Coordinator: Mirja Leivuori, tel. +358 295 251 366

Substitute for coordinator: Päivi Grönroos, tel. +358 295 252 174

Email: *firstname.lastname@syke.fi*

Co-operation partner

The Water Protection Association of the River Kokemäenjoki
(KVVY Tutkimus Oy, T064, www.finas.fi/sites/en)

Analytical experts

Metals, ID-MS-ICP	Timo Sara-Aho (SYKE), tel. +358 295 251 618
Hg, ID-MS-ICP	Teemu Näykki (SYKE), tel. +358 295 251 471
Email:	*firstname.lastname@syke.fi*
Fly ash sample	Suvi Pöyhönen (KVVY Tutkimus Oy)
Email:	*firstname.lastname@kvvy.fi*

Expert laboratory

SYKE, Helsinki (T003, K054, www.finas.fi/sites/en)

Subcontracting

KVVY Tutkimus Oy: Fly ash sample analyses

2 Samples and measurands

The sample matrices in this proficiency test are: synthetic sample, municipal wastewater and industrial wastewater as well as fly ash sample. Samples, measurands, concentration ranges and sample preservations are presented in Appendix 1.

Note! Check the samples volumes and, in case needed, order additional samples.

3 Registration

The registration for this proficiency test is open until 16 September 2022.

Registration is done via the electronic client interface, ProftestWEB: https://wwwp5.ymparisto.fi/Labtest/en. If there are problems when using ProftestWEB or you need username and password, please contact *proftest@syke.fi*.

4 Sample delivery

The sample dispatch day for national participants is 11 October 2022. To ensure timely arrival, the samples are dispatched earlier for participants abroad.

If the sample package does not arrive **at the latest on 12 October 2022**, or there are missing and/or broken sample containers, please contact the provider immediately *proftest@syke.fi*. More contact details in Chapter *1 Organizer*.

5 Sample storage and analysis

All water samples should be kept in dark and cool (4 °C) until analysis. Fly ash sample F2M should be kept at room temperature. Samples are analysed within the laboratory where they are delivered to, and analyses are conducted according to the participant's normal procedures.

The results for fly ash sample F2M should be reported on the dry weight basis.

Timetable for sample analysis is on the first page of this letter.

6 Reporting the results

The participant results are reported to Proftest SYKE at the latest on **9 November 2022**.

Proftest SYKE delivers the preliminary results report to the participants at the latest in the week 47 (21 – 25 November 2022). The final report will be published at the latest in April 2023 and it is then available via ProftestWEB and via Proftest SYKE website (*www.syke.fi/proftest/en*). The availability of the report will be informed to the participants.

7 Assigned values and evaluation of the results

Either the calculated concentration (synthetic samples) or the robust mean, the median, or the mean of the results reported by the participants will be used as the assigned value for the measurand. The calculation of the assigned value is based on the results reported according to the given guidelines. Also, when needed, the result of the expert laboratory can be used as the assigned value. The evaluation of the results will be based on z scores. The preliminary standard deviation for proficiency assessment will be given in the cover letter of the samples. In special cases also E_n or D% scores can be used for the performance evaluation.

8 Confidentiality

The results of participants are treated anonymously.

9 Participation fee

The participation fee is **1015 €** (+ VAT) including all measurements and samples. The basic fee is **480 €** (+ VAT) and the fees for each sample and measurand are as follows:

Sample	Fee / sample (+ VAT. 24 %)
Metals in water samples (3 samples)	100 €
Hg in water samples (3 samples)	50 €
Metals and Hg in fly ash (1 sample)	85 €

The invoice will be sent after the delivery of the preliminary result report. If the participant orders additional samples, they are charged according to the prices listed above.

Note! In Finland VAT is 24 %. Further, if the invoicing address or any other additional information has to be corrected after the invoicing, the extra handling cost will be charged. The participant is also responsible for possible custom clearance or customs fee is the samples.

10 Appendices

Appendix 1 Samples, measurands, concentration ranges and preservations

Appendix 1 Samples, measurands, concentration ranges and preservations

Measurands	Sample type (sample volume [1]) and *preservation*	Sample code [2]	Concentration range
Metals in synthetic sample Al, As, B, Ba, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, S, Sb, Se, Sr, Ti, U, V, Zn (21 measurands)	Synthetic water sample (60 ml plastic bottle) *0.3 ml conc. HNO_3/60 ml*	**A1M**	Cd, Co, Ni, Pb, Se, U: 1 – 10 µg/l As, Ba, Cr, Cu, Mn, Mo, Sb, Sr, Ti, V, Zn: 10 – 100 µg/l Al, B: > 100 µg/l Fe: > 1000 µg/l S: >10 mg/l
Metals in fly ash (acid soluble) As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Se, V, Zn (12 measurands)	Fly ash (ca. 20 g/125 ml plastic bottle)	**F2M**	As, Cd, Mo, Pb, Se: 1 - 50 mg/kg Cr, Cu, Ni, V: 10 - 150 mg/kg Ba, Zn: > 1000 mg/kg Hg: > 0.05 mg/kg
Metals in wastewaters Al, As, B, Ba, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, S, Sb, Se, Sr, Ti, U, V, Zn (21 measurands)	Industrial wastewater (125 ml plastic bottle) *0.6 ml conc. HNO_3/125 ml*	**T3M**	As, Cd, Co, Pb, Sb, Se: 1 – 10 µg/l Cr, Cu, Ni, Ti, V, U, Zn: 10 – 100 µg/l Al, B, Ba, Fe, Mn, Mo, Sr: > 100 µg/l S: >20 mg/l
	Municipal wastewater (125 ml plastic bottle) *0.6 ml conc. HNO_3/125 ml*	**V4M**	As, Cd, Co, Cr, Cu, Mo, Ni, Pb, Sb, Se, U: 1 – 10 µg/l Al, Ba, Fe, Mn, Sr, Ti, V, Zn: 10 – 100 B: > 100 µg/l S: > 10 mg/l
Hg in synthetic and wastewater samples	Synthetic water sample (250 ml glass bottle) *12.5 ml conc. HCl/250 ml*	**A1Hg**	0.1 – 1 µg/l
	Industrial wastewater (250 ml glass bottle) *12.5 ml conc. HCl/250 ml*	**T3Hg**	> 1 µg/l
	Municipal wastewater (250 ml glass bottle) *12.5 ml conc. HCl/250 ml*	**V4Hg**	0.1 – 1 µg/l

[1] Note! Check the samples volumes and, in case needed, order additional samples.

[2] Sample codes / matrices are:

A = Synthetic Sample
F = Fly ash
T = Industrial wastewater
V = Municipal wastewater