

National Metrology Institute of South Africa
Private Bag X34
Lynnwood Ridge
0040
South Africa

Tel: +27 12 947 2780
Laura Quinn

pt@nmisa.org
www.nmisa.org

NMISA-PT-120

Trial Proficiency Testing Scheme

Contaminants in Drinking Water

Proficiency Testing Scheme Description

1 FOREWORD

This is the call for participation in, and description of the NMISA proficiency testing (PT) schemes for the determination of contaminants in drinking water. Participants will be required to report on the contaminants which form part of their routine laboratory services. A confidential report will be issued to all participants after completion of the PT. Information on the proficiency test including, dates for distribution and reporting are listed in **Table 1**.

This trial PT will be conducted in accordance with ISO 17043. Please consult our website www.nmisa.org for information on PT schemes on offer. NMISA can also assist with the preparation of traceable gravimetrically prepared spike solutions for benchmarking *ad-hoc* analyses for which commercial PT schemes are not available.

2 SCHEME AIMS

NMISA-PT-120 is provided as a trial proficiency testing scheme for the determination of a wide range of contaminants in water looking at various National and International Drinking water guidelines. Contaminant classes to be assessed during this PT round include elements (macro and micro parameters); industrial; agricultural; and pharmaceutical chemicals. As this is a trial PT there are certain aspects of the scheme for which preliminary participant data is needed to best define quality parameters. These included the following: the best sample format and the associated implications on performance and stability; transportation; storage and fit-for-purpose PTS reference value and standard deviation.

As such, the cost of the scheme was reduced to encourage maximum participation from laboratories. Conclusions reached from the trial round will assist laboratories that routinely analyse drinking water for contaminants both organic and elemental, to monitor their laboratory performance. The PT scheme allows laboratories to evaluate their accuracy and comparability of measurement results produced; the continued competency of analytical staff; and the maintenance and effectiveness of the current quality assurance systems within the laboratory. In addition, this information may also be used to provide accreditation bodies or clients with objective evidence of laboratory performance.

3 PARTICIPATION FEES AND ADDITIONAL CHARGES

The cost of participation in each PT is captured in **Table 1**. These rates exclude costs associated with delivery (0% VAT, please note that we are not a VAT registered company). This fee includes the material and a confidential report upon completion. Upon registration for participation, an official quotation will be provided. Participation is confirmed following receipt of a purchase order and/ or proof of payment.

Since many of the South African participants are located within proximity to NMISA, the option of collecting the PT scheme samples from NMISA premises is permitted.

Please note: *International laboratories will have test samples sent by courier and appropriately packaged to maintain sample integrity. International participants must provide NMISA with any import or quarantine permits that might be required to complete sample delivery well in advance of the shipment date and are liable for any customs or import duties charged. Please note that it remains the participants responsibility to ensure custom documents and requests are seen to expediently to ensure the sample is not held in customs.*

4 PT SCHEME DESCRIPTION

The timeline for the PTs is presented in **Table 1**. Laboratories are requested to report results for as many of the parameters specified as possible, to allow for maximum benefit from the participation. This study is designed to support laboratories routinely performing drinking water analysis. The levels of the analytes should be easily achievable using analytical methods typically applied, however care should be taken to ensure the sample size used in the analysis is sufficient, and to maximise recovery and monitor potential matrix effects. Instructions for proper handling and storage of the samples prior to sample preparation will accompany the PT scheme samples. Participants should adhere to these instructions to ensure sample integrity and comparability of the results.

Table 1: PT details for the Contaminants in Drinking Water Proficiency Testing Schemes to be conducted in 2024-25. Please note that the full list of organic compounds may not be present in the sample, as part of the competency being assessed, is accurate identification.

Drinking Water PT schemes			Sample format*	Distribution	Result reporting	Cost ZAR
Elements		Zinc; Arsenic; Boron; Cadmium; Chromium; Copper; Iron; Lead; Manganese; Nickel and Selenium	500 mL in a plastic bottle using acid (pH < 2) as a preservative/ stabiliser	Jan 2025	Feb 2025	R 5 000
Organic compounds	Agricultural and pharmaceutical chemicals	Aldrin; Alpha-HCH; Beta-HCH; Delta-HCH; Gamma-HCH; Atrazine; Cis-chlordane; Trans-chlordane; Dieldrin; Endrin; Endosulfan I; Endosulfan II; Endosulfan sulfate; Heptachlor; Heptachlor epoxide; Simazine; <i>p,p'</i> -DDT; <i>p,p'</i> -DDE; <i>p,p'</i> -DDD; <i>o,p'</i> -DDT; <i>o,p'</i> -DDE; <i>o,p'</i> -DDD; Prometon; Prometryn; Sulfamethoxazole; Fenoprop	2 x 500 mL water a plastic bottle (no preservative added), 2 x glass ampoules			
	Industrial chemicals	2,4,6-Trichlorophenol; Acenaphthene; Acenaphthylene; Anthracene; Benz[a]anthracene; Benzene; Benzo[a]pyrene; Benzo[b]fluoranthene; Benzo[g,h,i]perylene; Benzo[k]fluoranthene; Chrysene; Dibenz[a,h]anthracene; Fluoranthene; Fluorene; Indeno[1,2,3-c,d]pyrene; Naphthalene; Phenanthrene; Phenol; Pyrene				
Result Reporting		Participants will be required to perform the analysis using their normal laboratory procedures and are required to report <u>two results for each parameter measured in the sample(s) provided. Two result reporting forms will be distributed. One for elements and one for organic compounds. Please ensure you submit using the correct units as requested (please do not use non-SI units such as ppm).</u> If your institution has submitted multiple registrations, please submit a separate result form for each registration. <u>Please note: no additional submissions will be accepted, and no combined workbooks will be accepted.</u> Participants are encouraged to include an uncertainty estimate for each result obtained. The result reporting form will be distributed to participants and will request additional information on the measurement technique and parameters, any recovery correction application, calibration standards used etc.				
PT conduct		The scheme is fully confidential. Each participant will be issued with a unique identification number. For multiple participants within the same laboratory, the participating laboratory is required to identify its analysts by a code known only to the laboratory. 1. Test sample 1.1. Elements (mg/L): The test sample will consist of homogenised drinking water that has been enriched with a known concentration of selected elements. One sample will be distributed, for the determination of elements and can be analysed as received. Please note that this sample will have a pH of approximately 2, as it has been acidified to ensure the stability of the sample. 1.2. Organic compounds (µg/L): The test sample will consist of spring water and a glass ampoule containing a mixture of organic compounds. The glass ampoule (approximately 1.5 mL of methanol) must be broken, and the full volume inserted into the spring water bottle shipped, mixed thoroughly and analysed as soon as combined. Two sets will be provided. More details on sample handling will be provided in the PT instruction, that will accompany the sample. 2. Assigned value The PT value will be determined using the gravimetric enrichment values confirmed by analysis or the participant consensus value depending on the number of participant results received. Please note that outsourcing of PT activities is limited to couriers 3. Laboratory performance Laboratory performance will be evaluated using the z-score. 4. Standard deviation of proficiency assessment The modified Horwitz model will be used to estimate a standard deviation of proficiency assessment. The standard deviation of participant results will also be included in the final PT report for reference and comparison to the Horwitz prediction. 5. PT report The PTS report will be distributed within 2 weeks following the result submission deadline. Reports will be provided in electronic format only (Adobe Acrobat- pdf) files.				