

SADCMET WATER PT Scheme – 7th Evaluation Workshop 2nd Nov – 4th Nov 2010, Windhoek, Namibia

Short report

Introduction

This short report summarizes the outcome of the above mentioned evaluation workshop for the 7th PT round on Chemical Analyses.

It will be provided to all participants of the PT round to facilitate corrective actions and improvement in the laboratories. A detailed report will be published on <http://www.sadmet.org>.

Report of the local coordinators

To facilitate the organisation of the PT rounds and to reduce shipment costs local coordinators (LC) for each country have been installed. The list of local coordinators is available from www.sadcmnet.org. During the workshop the local coordinators were requested to give a short report on their activities. The local coordinators reported on their activities to promote the PT scheme on a national level using national meetings and contacts via phone, fax, e-mail, letters and direct communication. The PT leaflet was widely used. It was reported that in many cases there was interest among the laboratory people, but nevertheless this was not followed by participation due to lack of awareness of the importance of PT among the decision makers. For this purpose following the last workshop in 2009 a leaflet was published by SADCWaterLab with the title "How to ensure high quality analytical results", especially targeted to decision makers. This leaflet is available from www.sadcmnet.org.

No customs problems were encountered this year.

Report of the PT provider

The PT round was provided by NamWater in the same way as in the years before, financially assisted by PTB Germany and directed by SADCWaterLab Association.

The 59 participating labs came from most of the SADC and EAC countries, participants from Burundi and DRC were present for the first time. Samples were prepared gravimetrically based on pure water by spiking with pure chemicals. So reference values with uncertainties could be calculated from the formulation process. Samples were distributed using DHL as courier.

For the evaluation and assessment the reference value was used as assigned value. To calculate z-scores (the difference between the lab results and the assigned value divided by a standard deviation for proficiency assessment) the standard deviation of the data set (calculated with Algorithm A described in ISO 13528) was used whenever it was smaller than a limit agreed between the participants in the previous evaluation workshops. This limit can be regarded as a fitness-for-purpose criterion.

The PT provider faced the following problems:

- Late confirmations from participants
- Registration forms were not sent to the provider – this caused communication problems
- Receipt of results by fax unclear
- Results faxed without lab name
- Different names used for E-mails or faxes than on registration forms

- Delayed reporting of results
- Only 4 out of 11 laboratories from DRC reported results

Results of the evaluation and assessment

Dr. Michael Koch, the consultant from Germany, explained the details of the evaluation and assessment. The most important facts are summarized here, for more detailed description please see the full report.

Sulphate

- Quite good agreement between means and ref.-values
- Standard deviations are still too high
- Too many labs with unsatisfactory results, but some are quite good
- High portion of outliers for the turbidimetric and the gravimetric method – mistakes in executing the methods

Chloride

- Means are a bit too high compared to reference value
- Standard deviations are too high – no improvement
- More unsatisfactory results than ever before
- Only 2/3 of the labs have good results
- Problems with the endpoint detection in argentometric determination
- Obviously some problems with the spectrometric method

Fluoride

- Standard deviations are still very high, but not as extreme as in the last rounds
- About 45% of the values are not satisfactory
- Colorimetric values are not reliable (as in the last years!)
- Obviously some problems with ion selective electrode

Nitrate

- Some values obviously again were reported in wrong units (most probably 6 labs, at least 1 of them identical with 2009 and 2008)
- High number of outliers
- Standard deviations are still too high
- Harmonization of methods is urgently needed!!

Phosphate

- Some values were reported in wrong units, otherwise results would be quite good
- Standard deviation slightly improving

Calcium

- Mean values are close to reference values
- Standard deviations are still too high
- Still > 30% non-satisfactory results
- Mistakes in the application of analytical methods

Magnesium

- Mean values are around reference values
- Standard deviations are slightly better than last years, but still too high
- Almost 40% of the values are not satisfactory
- Titrimetric values are not reliable

Sodium

- Consensus means close to ref.values
- Slight improvement in the number of satisfactory results

Potassium

- Mean values are close to reference values
- Standard deviations are better again
- 1/3 of the results are non-satisfactory
- Problems with AAS

Iron

- Means are close to reference values
- Standard deviations are much lower
- Good improvement

Manganese

- Mean values are close to reference values
- Standard deviation are much better than last year
- More satisfactory values

Aluminium

- Small number of values
- Mean values are close to reference values
- Standard deviations are comparable to last year, but not really good

Lead

- Mean values are around reference values
- Standard deviations are similar to last year – too high
- Problems with AAS?

Copper

- Mean values are in quite good agreement with reference values
- Standard deviations are better than in previous year
- Percentage of non-satisfactory results is steadily going down

Zinc

- Perfect agreement between mean values and reference values
- Standard deviations are better again
- 20 % non-satisfactory results

Chromium

- Mean values are exactly as reference values
- Standard deviations are again below limit
- Percentage of non-satisfactory results went down again

Nickel

- Mean values are in good agreement with reference values
- Standard deviations are lower again

Arsenic

- Low number of values
- Good agreement between reference values and means
- Standard deviation like the years before

Cadmium

- Mean values are slightly lower than reference values
- Standard deviations are better again, but the percentage of non-satisfactory results is increasing

Cobalt

- Means are close to reference values
- Best standard deviation

All in all the results of the participating labs are better than last year.

A closer examination of the development in the individual laboratories showed that some laboratories are continuously performing well, some are improving, but others constantly deliver bad quality without any change.

In total it can be stated that:

- Again the PT Provider did a very good job
- The evaluation and assessment procedure is fit for the purpose
- The SADC MET Water PT is a good possibility for the participants to compare with peers and with stated fitness-for-purpose criteria
- Overall the results of this PT round show an improvement for many labs, but the results of some laboratories continuously are not satisfactory or getting worse
- More emphasis should be put on corrective actions after unsatisfactory participation
- Some participating labs seem to be resistant against advice; in an accreditation procedure they will wake up
- There should be a discussion
 - How to proceed with recommendation of suitable methods?
 - How to help laboratories to properly apply these methods?
 - How to convince the “resistant” labs that participating in PTs without corrective actions is a waste of money and resources
- The gaps that prevent labs from proper application of the methods should be identified

Discussion about parameters, concentrations, standard deviation limits and missing networking within SADCWaterLab

Regarding the parameters it was decided that no other parameters are to be added. The PT provider was asked to check whether the anion sample is suitable to be used also for measuring of total dissolved solids (TDS).

There were lots of discussions for the change of concentration levels. Up to now the concentration for some parameters are much higher than the WHO limits for drinking water. Finally it was decided that at least for one sample the concentrations should be lowered to match the WHO limits since these values are used for assessing suitability of drinking water.

The standard deviation limits for some parameters up to now are very high. It was discussed whether these limits are really fit for the purpose for the judgement of drinking water. After some discussions it was decided to use in future:

- in principle 10% for all parameters
- but 20% for the more challenging heavy metal samples (lowest concentration)
- 25% for Aluminium

It was also discussed why the networking did not really work within SADCWaterLab. No satisfying answer could be found since the website and contact addresses are available. It was proposed to also put the ranges of tests for each lab on the website.

Working groups of SADCWaterLab:

Both working groups, established in 2009, had a meeting. The results of this meetings will be reported separately in the SADCWaterLab newsletter.

Report prepared by Dr. Michael Koch