SADCMET WATER PT Scheme – 8th Evaluation Workshop 14th Nov – 17th Nov 2011, Port Louis, Mauritius

Short report

Introduction

This short report summarizes the outcome of the above mentioned evaluation workshop for the 8th 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.sadcmet.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.sadcmet.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 56 participating labs came from most of the SADC and EAC countries, after a long time again a laboratory from Ethiopia was participating, for the first time a laboratory from a Ghana took part. Samples were prepared gravimetrically based on pure water by spiking with pure chemicals. So reference values with small 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. A plausibility check was made using results from the National Metrology Institute of South Africa and two German expert laboratories. 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 workshop. This limit can be regarded as a fitness-for-purpose criterion.
The PT provider faced the following problems:

- Providing a PT between normal activities in the laboratory and obligations is a presistent challenge
- Some participants did not submit results
- One parcel was delivered to the wrong laboratory

- Files over 5 MB are blocked by Namwater's e-mail system
- Late confirmations from participants is always a unnecessary burden
- Still some registration forms were not sent to the provider – this caused communication problems
- Sometime the written registration forms are not all clear
- Delayed reporting of results caused a delay in the evaluation

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 deviation still too high
- Too many labs with unsatisfactory results, but some are quite good
- High portion of outliers for the turbidimetric and the gravimetrical method – mistakes in executing the methods
- exactly as in 2010

Chloride

- Average standard deviation – no real improvement
- Many labs have good results, but some are continuously deviating
- Problems with the endpoint detection in argentometric determination
- Obviously some problems with the spectrometric method

Fluoride

- Standard deviations still very high
- Again about 45% of the values are not satisfactory
- Colorimetric values not reliable (as in the last years!)
- Obviously some problems with IC

Nitrate

- Some values obviously again reported in wrong units (most probably 6 labs, at least 1 of them identical with 2010, 2009 and 2008)
- High number of outliers, almost half of the values are wrong
- Standard deviation still too high
- Harmonization of methods needed!!

Phosphate

- Results from 2 labs in wrong units and some very high results
- Average standard deviation
- 44 % of the values are outside the limits

Total dissolved solids

- Standard deviations are quite high
- number of out-of-range values quite high
- Is TDS from conductivity really comparable with gravimetric TDS??

Calcium

- Standard deviations still too high
- 2/3 of the labs are ok, 1/3 consistently out-of-range

Magnesium

- Average standard deviations, no significant improvement
- 1/3 of the results out-of-range
- Titrimetric values still not really reliable

Sodium

- Average standard deviation – still too high
- Still 30% of the results ot-of-range

Potassium

- Standard deviations as last year
- 1/3 of non-satisfactory results
- Problems with AAS

Iron

- Standard deviations higher again
- Problems especially with low concentrations
- Problems with colorimetric method

Manganese

- Standard deviation much worse
- Serious problems with low concentrations
- At low concentrations many values much too high – why? – contamination?

Aluminium

- Low concentrations only
- Lowered standard deviation for proficiency assessment
- Therefore increased number of values out-of-range
- Problems with AAS

Lead

- Lowered standard deviation for proficiency assessment
- Experimental standard deviation still too high
- Especially at low concentrations many too high values

Copper

- Good standard deviation
- Percentage of non-satisfactory results at a constant low stage

Zinc

- Standard deviations ok
- Percentage of outliers ok
- Only a few bad performing labs

Chromium

- Low concentrations
- Standard deviation limit lowered
- Experimental standard deviations are still quite high

Nickel

- Despite of the low concentrations and the lowered standard deviation limit an improvement could be seen

Arsenic

- Low number of values
- High standard deviation estimate
- 30% of the values out-of-range

Cadmium

- Low concentrations
- Average standard deviation
- More or less constant performance

Cobalt

- Standard deviation high
- But most labs are consistently well performing

All in all the average quality of the participating labs is similar to 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 SADCMET 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 a good performance 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 proper apply these methods?
    - How to convince the “resistant” labs that participating in PTs without corrective actions is waste of money and resources
- The gaps that prevent labs from proper application of the methods should be identified

Group discussions and their results

The participants divided into 4 groups to discuss issues around the PT round and the way to proceed. Several questions were given as a basis for discussion.

Are the concentration levels and standard deviation limits ok?

- There was a general agreement between all groups that both should stay as they are

Should we change the parameters?

- One group mentioned pesticides. But it is not possible to add those to the same PT round. Another PT round would have to be provided for that. The current PT provider does not have the capacities to do that. In addition another PT scheme (for fish) is in preparation
- There was some discussion about adding As, Sb or Hg and to take out some other parameters. Hg would be difficult since the samples would need a special conservation. No consensus could be reached, so nothing will be changed with regard to that
- It was decided to add the parameter electrical conductivity to the anion samples and to clearly state that total dissolved solids requires a gravimetric determination

Anything else to be changed?

- It was suggested to have 2 rounds per year. The decision on that will depend on the cost analysis to be done by the PT provider
- There was some discussion about issuing certificates. At the end it was decided in future to issue certificates with all parameters and its assessment

How can well performing labs help the others?

- Well performing labs should be ready and willing to help when contacted by other labs or the PT provider
- Sharing experiences on mistakes that have previously been made and resolved would be helpful
- It was suggested to establish a group e-mail to discuss various topics (maybe facebook could be used); a discussion forum on the website (troubleshooting page) was suggested
- Finally it was decided to encourage participants to report about successful corrective actions and publish them on a troubleshooting web page. There wil be further discussions in SADCWaterLab working group 1 on this topic.

How can bad performing labs seek for assistance?

- They should be encouraged to contact the PT provider to get into contact with good labs, but first(!) a root cause analysis should be done
- There was decision to refer those labs also to the troubleshooting webpage

How to improve advertisement for the PT scheme, to attract more participants?

- It was decided to translate the brochures into French and Portuguese
- Local coordinators should to be more “aggressive” and use national meetings and national lab associations, use institutions websites and organize seminars
- Local coordinators that are too busy with other obligations should be substituted
- A cooperation between regional organisations (e.g. SADCAS) could be helpful
- Local coordinators should to raise the awareness: “PT is the way forward to accreditation”

What costs can be covered by the participants?

- There was an agreement that participants should be able to pay for the transport (air ticket) to the workshop, if a convenient venue is selected
- One group also stated that participants also could pay for the sample transport

Is the fee adequate?

- The majority of the group said that the fee is too low.
- The new fee should be dependent on the cost analysis of the PT provider
- It was decided to recommend to the General Assembly to increase the fee for the 2012 round to 200 US-$

Is it absolutely necessary to have an evaluation workshop after each PT round?

- No agreement could be reached in this regard
- It was decided to postpone this question to the 2012 workshop

Other ideas to ensure the sustainability of the scheme?

- Seek for support from the CEOs of the laboratory institutions
- More training in the workshops, advertised at the beginning could attract more participants
- Find another sponsor
- Review participation fee continuously
- Encourage labs to include the scheme and its fees in their budget
- Lobbying within SADC
- SADC/PTB to approach CEOs
- Create awareness among clients

Working groups of SADCWaterLab:

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

Report prepared by Dr. Michael Koch

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