SADCMET WATER PT Scheme – 9th Evaluation Workshop 19th Nov – 22nd Nov 2012, Addis Ababa, Ethiopia

Short report

Introduction

This short report summarizes the outcome of the above mentioned evaluation workshop for the 9th 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 urgently needs to be revised and published on the SADCMET webpage in order to be used for promotion in future. 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 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.
Customs problems were encountered in Kenya this year. For an additional sample package sent a little later no problems occurred. So customs issues continue to be unpredictable.
The follow-up from the training of trainers on quality assurance in analytical chemistry was widely discussed. Some countries already organized one or even more trainings in their countries, but others are still on the way to arrange the first one.

Report from the SADCWaterLab Training Working Group

The objectives of the ToT programme were explained. Trained persons were obliged to perform training activities in their countries. A trainers database was compiled.
The following challenges were identified:

- Not all workshops were done a promised
- For workshops being done not in all cases this was reported to the secretariat
- Staff turnover leads to unavailability of trainers

There is continued sponsorship from PTB for such workshops. This opportunity was not used in many countries.
There was an intense discussion on the future of the ToT programme and how to ensure that training activities are done in all countries.

Report from the SADCWaterLab Methods Working Group

Methods for analysing anions were collected and sent back to all participants. Only comments from Shabbir (Mauritius) and Vivian (Seychelles) were received. The chair of the working group changed from Merylinda Conradie to Vivian Radegonde.

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 57 participating labs came from most of the SADC and EAC countries. 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:

- Angola: paid but did not submit results
- Kenya: delay with customs; one lab requested 2 parcels and an additional parcel was sent without any delays.
- Files > 5MB are blocked by NamWater internet security and cannot be received
- Shortage of staff and scheduling of a PT round between normal laboratory activities is a challenge
- Registration forms not received in time or some not at all
- Laboratory information and contacts are not available
- Registration forms often not clear
- Return date for the results : 10th of August 2012; but last results were received in October only. This caused a delay with evaluation report

Results of the evaluation and assessment

Merylinda Conradie from Namwater 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

- Average recovery (93,4%) was lower than in the last rounds
- STD are still quite high, especially for low conc.
- Still many data outside the limits, especially for the low level
- Gravimetric methods often delivers too low values
- Not a big change compared to 2011

Chloride

- STD not much different from last rounds, maybe a bit better
- 24% of the data outside – no change
- Argentometric titration has many high values (exactly as in last rounds!)– incorrect recognition of endpoint?
- As in 2011 problems with spectrometric method

Fluoride

- STD not much different from last rounds, maybe a bit better
- 24% of the data outside – no change
- Argentometric titration has many high values (exactly as in last rounds!)– incorrect recognition of endpoint?

- As in 2011 problems with spectrometric method

Nitrate

- More labs reporting in wrong units
- Labs either do not read / do not understand / are not able to calculate or convert to the correct unit
- STDs very high – mostly because of wrong units
- percentage of non-satisfactory results again very high (units!) – 48%
- what means colorimetric? Many different methods behind that!

Phosphate

- Again some labs reported in wrong units
- Therefore average recovery low
- STD a bit better 17 -30%
- percentage of non-satisfactory results slightly better (31%)

Total dissolved solids

- Although is was clearly specified that a gravimetric determination is required – method information was not reported - “other”
- Methods was reported as “an electrode method”? These are obviously different measurands!!
- Average recovery of 95% is not too bad
- STD better than last year, but still too high
- percentage of non-satisfactory results slightly better (30%), but it was made clear now, that the determination should be gravimetric

Electrical Conductivity

- Obviously serious problems with units
- STD of the values with correct units are not bad
- percentage of non-satisfactory results is very high (50%)

Calcium

- Perfect average recovery
- STD – no change compared to 2011
- percentage of non-satisfactory results 31% - no improvement
- method specific evaluation very similar to 2011

Magnesium

- More titrimetric results than in 2011 - with the problems of a high portion of too results for this method
- STD higher than last year
- Results worse than last year

Sodium

- Problems with high results for lowest level – high blank?
- No improvement in the STDs
- percentage of non-satisfactory results higher (41%) mainly due to problems with lowest level

Potassium

- Average recovery is ok
- STDs higher than in previous rounds
- percentage of non-satisfactory results with 34% a bit worse than in 2011

Iron

- Problems with the lowest level – high blank?, high STD (68%!)
- Same picture as in 2011

Manganese

- STDs much better than last year, comparable to previous rounds
- Improved percentage of non-satisfactory results (17%)

Aluminium

- Higher concentrations than last year
- STDs similar to previous rounds
- Problems with the low level (52% of the results outside the limits)
- Problems with the colorimetric method

Lead

- Obviously problems with the lowest level – high blank?, high STD (83%!)
- STDs for the other levels is fine
- Similar picture for the methods

Copper

- Similar performance to last year
- Good standard deviations - around 10 %

Zinc

- Similar to last year
- But the STD for lowest level is significantly higher, maybe due to a lower conc.
- For the two higher levels everything is fine

Chromium

- Blank problems with the lowest level?
- The mean of the labs is quite low in comparison with ISWA and IWW as well
- The calculation of the reference values were checked for transcription errors and confirmed to be correct
- The colorimetric methods again has a high number of too low values – is that a method to determine Cr(VI)?

Nickel

- High STD for the lowest level just as in the previous rounds

Arsenic

- Low number of values
- STDs higher
- Obviously problems with AAS

Cadmium

- STDs better than last year, but in the same range as in the previous rounds

Cobalt

- Slight improvement in the STDs

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:

- No real improvement – still high standard deviations
- The same mistakes are being done - Reporting of results in wrong units (N and not NO_3 and as P and not PO_4;Use of non-standard methods
- The ranges do not help to improve the results
- Corrective actions are still not implemented - Investigate problems / determine the root cause
- Recommended methods must be finalised and implemented

Challenges for the 2013 are:

- Use old PT samples to implement corrective action immediately
- Use the ranges to avoid complete outliers
- Application of internal quality control
- Equipment, method comparison, assistance and continuous education amongst the SADCMET lab association important and a good platform for networking

Group discussions

The participants divided into 3 groups to discuss issues around the PT round and the way to proceed. Several questions were given as a basis for discussion.

Is the selection of parameters still fit for purpose?

- It was agreed that the PT provider should check to include pH into the anion sample without adding a special substance.

Are the concentrations ok?

- Generally yes, but the PT provider should check again the WHO guidelines

Are the standard deviation limits still ok?

- PT provider (together with consultant) to decide whether to increase limits for low concentrations

What could the PT provider do to resolve the problem with wrong units?

- PT provider could include a leaflet especially dealing with the unit problem

How can bad performing labs be convinced to do corrective actions?

- No action required, it is the labs responsibility

Any suggestions for changing reporting of results in the workshop and in the written report?

- PT provider and consultant to decide how to shorten the report at the workshop

How to achieve sustainability?

- Cost analysis by the PT provider to get an idea what is needed
- LC to market the scheme to potential participants
- Awareness creation on the benefits of the PT, target decision makers and lab community through different forums at national level (lab association)
- Labs should include PT participation in their budget
- Consider increasing fee from 200 $ to 250 $ (transportation costs around 250$ per parcel)
- Membership fees for lab association
- Encourage organisations to support their labs and the PT scheme
- Workshop to be reduced; training on national level
- Training with fees (partly supporting the PT scheme)
- Future hosts consider to use their own facilities to reduce costs
- More discussions needed

What participation fee would be adequate and affordable?

- To be decided after discussion of cost analysis

Do we need a workshop every year?

- Workshop could be reduced to 2 days (one for evaluation, one for SADCWaterLab issues), use e.g. hosts‘ facilities, enable accomodation in cheaper hotels, on the longer term maybe workshop every two years

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

Stuttgart, 28.12.2012