

# **SADCMET WATER PT Scheme – 11<sup>th</sup> Evaluation Workshop**

## **24<sup>th</sup> Nov – 26<sup>nd</sup> November 2014, Lusaka, Zambia**

### **Report**

#### **Introduction**

The 11<sup>th</sup> Evaluation workshop within the SADCMET chemistry proficiency testing scheme for water took place in Lusaka, Zambia and included the following topics:

- Report of the PT provider
- Evaluation and assessment of the PT system
- Training on Basic statistics
- Training on Method validation
- Training on Measurement uncertainty

This short report summarises the outcome of the above-mentioned workshop for the chemical part. Although there was a proposal to hold the chemistry workshop every two years as from 2013, the SADCMET secretariat decided to continue with the workshop due to the high number of interested laboratories.

The report will be provided to all participants of the PT round to facilitate corrective actions and improvement in their respective laboratories.

#### **Report of the local coordinators**

The local coordinators (LC) for each country have to be updated and updated and confirmed. There was a need expressed that there should be an alternate person appointed as well. The functions of the local coordinators are to assist with the arrangements of the PT scheme and also to market the PT scheme in their respective countries. The list will be confirmed and updated and the information will be available is available from [www.sadcmnet.org](http://www.sadcmnet.org).

During the workshop the local coordinators were requested to give a short report on their quality management activities in their appropriate countries. The PT leaflet for the chemistry was revised and it is currently at the printers in order to be used by the local coordinators for future promotion. It was further suggested that the local coordinators should try and market the different PT's through their appropriate National Accreditation focal point in their respective countries.

Customs problems were again encountered in Kenya and Tanzania this year and it caused serious delays on the scheduled activities of the PT round. Customs remains a problem and customs issues continue to be unpredictable. Mr Donald Masuku reported that this s was taken up and addressed on a SADC level and he informed the participants that a special form is currently under development. This form will be printed and made available by March 2015 for use with the distribution of PT samples to try and solve all the customs issues.

A special form for the reporting on a quarterly basis was compiled by Mr David Koech and approved by the meeting for use by the local coordinators in 2015.

The local coordinators can report on any quality activities in their respective countries in the approved format. The form will be distributed to all the local coordinators. Feedback

by the local coordinators are expected in March, June, September and November to the SADMET Secretariat. Mr Donald Masuku highlighted the fact the newsletter depends on the information from the local coordinators and if he does not receive news from the local coordinators, then the newsletter cannot be submitted.

### **Working groups of SADCWaterLab:**

#### **Working group : Methods**

Although there were nothing to report from the working group for methods, it was decided the group will still remain active and will be available whenever any technical issues arise from any of the PT rounds.

#### **Working group: Trainer of the trainers**

The continued sponsorship from PTB for ToT workshops is over now and it is too late for the countries that did not make use of this opportunity.

### **Report of the PT provider**

The PT round was provided by NamWater in the same way as in the years before, The PTB financially assisted the distribution of the samples again. The chemistry PT scheme was up and running for the past eleven years. Dr Michael Koch indicated during the workshop in 2013 that he was the facilitator for the past ten years and that he intended to scale down his involvement in the PT scheme. It was the first evaluation workshop for the chemistry to take place without the presence of Dr Michael Koch. Mr David Koech was identified as the new facilitator for the chemistry part. The total number of laboratories that participated in the chemistry in 2014 was the highest number of participant ever with seventy two laboratories (excluding the three expert laboratories.)

### **Samples**

Sample were prepared gravimetrically based on pure water by spiking with pure chemicals. Reference values with small uncertainties could be calculated from the formulation process. Samples were distributed using DHL as courier. Many problems were experience during the transportation with DHL.

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:

- Again late registrations
- Registration forms causing a lack of laboratory information
- Registration forms are often not clear
- Kenya: delay of 30 days with customs;
- Problems with files > 5MB was solved by the creation of a gmail address
- Shortage of staff and scheduling of a PT round between normal laboratories activities was again a challenge but it should improve in 2015.

- The return date for the results was extended from the 22<sup>th</sup> August 2014 to the 22<sup>nd</sup> September and then again to the end of September
- Further delays were caused by the Eurachem workshop from the 6-9 October 2014, Berlin Germany which the PT provider attended.

## **Results of the evaluation and assessment**

Meryllinda Conradie from NamWater explained the details of the evaluation and assessment. The most important facts are summarized in this report.

### **Sulphate**

- Average recovery (98.6) 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
- 20% of the data is outliers (34% in 2013)
- Big variety of methods indicated as “other”
- Gravimetric methods often delivers too low values
- Not a big change compared to 2013

### **Chloride**

- STD very similar than in 2013
- 34.7% of the data outside – no change
- Argentometric titration has many high values
- Too low value with the Mercuric nitrate method

### **Fluoride**

- Many results too high results for lowest level mainly for the colorimetric results
- STD very similar to last year (very high, > 180%, for the low level)
- Decrease in the percentage of non-satisfactory results – still high 49% to 59% in 2014
- Many results are too high for the Hach method 8029 – correct results are possible
- The same problems as in 2013

### **Nitrate**

- Still problems with reporting of NO<sub>3</sub> in the 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%

### **Phosphate**

- Laboratories reported in the Wrong units again
- Standard deviations bit
- Percentage of non-satisfactory results increased from 35-42 %

### **Total dissolved solids**

- Although it was clearly specified that a gravimetric determination is required – method information was reported as “other”
- Methods was reported as “an electrode method”? These are obviously different measurands!!

- Average recovery was good
- STD's still too high
- Percentage of non-satisfactory results improved a bit from 39-34%

### **Electrical Conductivity**

- Still serious problems with units
- STD of the values with correct units were below 8%
- Percentage of non-satisfactory results is very high (40%)

### **Calcium**

- Good average recovery
- STD improved from 2013 to 2014
- Percentage of non-satisfactory results 31% method specific evaluation very similar to 2013

### **Magnesium**

- High number of "other" methods
- STD higher too high
- Slight improvement in comparison with last year

### **Sodium**

- Again problems with high results for lowest level – high blank?
- Slight improvement in the STDs
- Percentage of non-satisfactory results improved from 37% to 28%

### **Potassium**

- Average recovery is ok
- STDs still outside the limits
- Percentage of non-satisfactory results still 30%

### **Iron**

- Significant improvement for the lowest – from 68% to 28%
- Number of outliers increased a bit

### **Manganese**

- STDs much better than last year, comparable to previous rounds
- Very high percentage of non-satisfactory results (49%)

### **Aluminium**

- Improved from last year
- STDs similar 30%
- Percentage outliers reduced from 34% to 27 %
- Problems with the AAS method

### **Lead**

- Obviously problems with the lowest level – high blank?, high STD (104.30% !)
- STDs for the other levels are also > 20 %
- Variety of all the other methods causes a problem.

### **Copper**

- Outliers increased from 11% to 28%
- Standard deviations for lower value is 68.61%

### **Zinc**

- Similar to last year
- STD varies between 12.8 and 23.2%
- The higher SD for the lowest level maybe due to a lower conc.
- For the two higher levels everything is fine

### **Chromium**

- Blank problems with the lowest level?
- The colorimetric methods again has a high number of too low values – is that a method to determine Cr(VI)?
- Problems with the graphite furnace method
- Percentage non-satisfactory results slightly improved

### **Nickel**

- High STD for the lowest level - 56%
- The other two were both below 20%
- Percentage non-satisfactory results reduced from 44% to 25%

### **Arsenic**

- Low number of values
- Percentage outliers decreased
- Problems with ICP and colorimetric method

### **Cadmium**

- STDs varies between 13.5 %and 26.7 %
- Percentage non-satisfactory results similiar than in 2013
- No serious problems

### **Cobalt**

- Slight improvement in the STDs
- Atomic absorption problems

All in all the average quality of the participating labs is similar to last year. With little improvement.

- The standard deviations are still high.
- The same mistakes are being done where laboratories report in the wrong units
- Many laboratories are still using non-standard methods.
- The ranges did not improved the results
- Laboratories did not do corrective actions.
- The root cause of the mistakes were not determined.

### **Challenges for the 2015 are:**

- Web portal

- Use the ranges to avoid complete outliers
- Application of internal quality control
- Use old PT samples to implement corrective action immediately
- Assistance and continuous education amongst the SADC MET lab association remains and important requirement

### **Announcement of the PT in 2015**

It was announced that the 12<sup>th</sup> PT round will take place in 2015. THE notification will be sent out by the end of February 2015.

### **Proposed work programme for 2015**

The new work programme will be distributed to all the PMS member in order to implement it.

### **Date and venue of the next meeting**

It was proposed that the next workshop will be in format of evaluation and training and it will be in Botswana during the second week of November. It was decided that training will be part of the workshop in future. Botswana needs to confirm about hosting the event and the exact dates will be communicated. All the participants that participated in a PT round will be welcome at these workshops.

The SADC MET will investigate the possibility to advertise during these workshop. There were also interest of many suppliers to advertise during the workshop. This can be used as a funding and support opportunity for the SADC Water lab association. Donald Masuku will consult and give feedback about this issue.

Report prepared by Merylinda Conradie  
Windhoek, 01-12-2014