

**European Union / United Nations Economic Commission for Europe  
International Co-operative Programme on Assessment and Monitoring of Air Pollution  
Effects on Forests**

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**Meeting of the Working Group QA/QC (Subgroup of the Deposition Expert Panel)  
together with experts in chemical analysis from other Expert Panels**

**26-27 February 2007, DG Environment, Brussels, Belgium**

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**Conclusions of the meeting:**

- 1. Quality assurance and quality control programs for chemical analyses in forest research, projects in the forestry part of the Life+ program and the forest monitoring programs are extremely important to ensure good quality and usability of analytical data and full comparability between the individual countries.**
- 2. Ringtests are the most important part of a QA/QC program for laboratories. Only with ringtests carried out each year (every 2 years for soil) can we ensure that all analytical data in these programs are intercomparable and of good quality.**
- 3. Therefore the working group proposes that ringtests be carried out regularly for water and plant samples each year, and for soil samples every 2 years.**
- 4. ICP forests could apply for annual funds from the Life+ program in order to be able to carry out these ringtests or, alternatively, the costs could be applied for within the Life+ program as an integral part of the program.**
- 5. Evaluation of the ringtests should, in the future, be carried out by the FFCC, FSCC or by appointed work groups who receive payment for this task.**
- 6. The QA/QC working group will evaluate the costs of ringtests for the different types of sample, and prepare a cost plan for the years 2008 to 2013.**
- 7. In order to ensure the quality of the analytical data in forestry programs, it is extremely important to have a QA/QC program in each laboratory that checks the data before it is sent to the data bases.**
- 8. In order to achieve this, the working group will prepare a critical review of the current status and importance of QA/QC in the laboratories and present it at the next Task Force Meeting (May 2007) in order to bring this problem to the attention of all the NFC`s.**
- 9. The working group will also prepare a paper containing a list of all the suitable quality checks, including control charts and plausible ranges for soil and plant analyses, and send this list to all the laboratories and NFC`s.**
- 10. Regular meetings of the heads of the laboratories are needed in order to ensure that QA/QC programs and quality checks are adopted in all the laboratories and to discuss analytical problems identified on the basis of the results of the ringtests.**
- 11. In order to fulfil this task, the working group will organize such meetings regularly.**
- 12. The working group will organize a meeting with the JRC to discuss the importance of QA/QC for the quality of the data bases and the possibility of introducing different types of quality check.**
- 13. The composition of the working group should be changed such that representatives of all the expert panels associated with chemical analyses**

(Deposition, Soil, Soil solution, Foliar and litterfall, Air quality etc.) should be members of the group in the future.

14. The working group should be set tasks associated with QA/QC analytical problems by the above Expert Panels and harmonize the QA/QC work among these Expert Panels.
15. Consultancy and assistance programs for laboratories with analytical problems should be organized by the group.
16. One of the main tasks of the group is to organize regular meetings of the heads of the laboratories. At these meetings the results of the ringtests, analytical and methodical problems and analytical questions related to the individual manuals should be discussed with the aim of presenting proposals to the Expert Panels. Visits to laboratories should be included in the meetings.
17. The next ICP Task Force Meeting should give a mandate to the group concerning this new structure and working proposals.

#### Minutes:

##### a. Short reports on the QA/QC work and previous ring tests carried out by the different expert panels:

Rosario Mosello, Bruno de Vos and Alfred Fürst gave very interesting reports on the previous QA/QC work of the Expert Panels for Deposition, Soil Solution, Soil and Foliar. (The power point presentations will be available on the website of the WG on QA/QC.)

##### b. Organisation and evaluation of future ring tests for the different types of sample (plant, water, soil):

Rosario Mosello, Nathalie Cools and Alfred Fürst gave reports on the different techniques used in evaluating the previous ringtests. (The power point presentations will be available on the website of the WG on QA/QC.) The different evaluation methods, their organisation, costs and the importance of ringtests were discussed.

It was the overall opinion that ringtests are the most important part of a QA/QC program for laboratories. Only by carrying out ringtests every year (every 2 years for soil) is it possible to ensure that all the analytical data generated by these monitoring activities are comparable between the countries and of high quality. As a result, the working group proposed to implement regular ringtests for water and plant samples each year, and for soil samples every 2 years. ICP forests could apply for annual funds from the Life+ program in order to be able to carry out these ringtests or, alternatively, the costs could be applied for within the Life+ program as an integral part of the program. Evaluation of the ringtests should continue to be carried out by the FFCC, FSFC or by appointed working groups who receive payment for this task. The working group will evaluate the costs of ringtests for the different types of sample, and prepare a cost plan for the years 2008 to 2013. Alfred Fürst, Rosario Mosello and Bruno de Vos will send detailed information about the costs to Nils König.

Kirsti Derome will compare the lists of participants in the different ringtests, and prepare a list of those labs participating in all the ringtests.

##### c. Method code: harmonisation of the method coding across the different Expert Panels on the basis of the code for plant analyses (FFCC):

Nathalie Cools gave a short report about the possibilities and problems involved in integrating the method code for soil analyses into the existing code for foliar analyses.

(The power point presentations will be available on the website of the WG on QA/QC.)  
It was decided to retain the existing codes for water, soil and foliar analyses and not to integrate the different codes.

**d. Future work on QC/QA in laboratories:**

All participants at the meeting agreed that it is extremely important, in order to ensure high quality of the analytical data in the forest monitoring programs, to have a QA/QC program in each laboratory and that the data should be checked and verified before being sent to the data bases. The working group will prepare a critical review of the current status and importance of QA/QC in the laboratories, and present this at the next Task Force Meeting in order to bring this problem to the attention of all the NFC`s. A list of all possible quality checks for water, soil and plant analyses (ion balance, conductivity check etc. for water, plausible range checks for plant and soil etc.) was discussed and completed.

The proposed and currently used quality checks are:

**A. Water analyses:**

1. Completeness of the list of analyses
2. Ion balance without DOC (for bulk/wet only, open field deposition)
3. Ion balance with DOC for throughfall, stemflow (and soil solution)
4. Conductivity check
5. Na/Cl ratio check (not for soil solution)
6. N balance

**B. Soil analyses:**

1. pH check
2. Carbon balance
3. Plausible range checks

**C. Plant analyses:**

1. Plausible range checks

**D. All samples:**

1. Control charts
2. Use of reference material

Bruno de Vos will prepare a list of plausible ranges for soil analyses, and Alfred Fürst for plant analyses. The importance of using control charts and reference standards in the laboratories was emphasized. The working group will also prepare a paper with a list of all useable quality checks (including control charts) for the laboratories, and send this list to all the laboratories and NFC`s.

Problems with the comparability of chemical analytical methods, including digestion and extraction methods, should be discussed at meetings with the heads of the laboratories. Methods that are unsuitable can only be found through evaluation of the results of the ringtests. These methods have to be rejected from the lists of permitted methods in the individual manuals.

Rosario Mosello gave an overview of the evaluation of data from the deposition and soil solution monitoring programs based on QA/QC checks (ion balances with and without DOC). This work should be continued especially for soil solutions (as cooperation between Rosario Mosello and Nils König). (The power point presentations will be available on the website of the WG on QA/QC.)

**e. Organisation of assistance programs for laboratories with methodical problems:**

Rosario Mosello and Alfred Fürst gave short reports on the assistance work that has been carried out under the Deposition and Foliar expert panels. The possibilities of developing the assistance program were discussed.

Suitable measures are:

1. visit to the laboratories with methodical problems by experts
2. invitation to technicians from the laboratories with methodical problems
3. exchange of samples for co-analysis
4. training courses

**f. Role of ICP-Forests and the EC-JRC in QA/QC matters:**

The role of ICP-Forests (and the Expert Panels) and the EC-JRC in QA/QC matters in the monitoring programs and the BioSoil Project were discussed. However, there were still some open questions.

**a. BioSoil Project:**

FSCC is organizing a soil ringtest, and has provided a soil standard that should be analysed a regular time intervals and reported 4 times a year during the BioSoil Project. However, the question arose whether this program is mandatory or optional, and who will pay for it.

**b. Monitoring activities:**

In order to ensure the quality of the analytical data in the forest monitoring programs, it is extremely important to have a QA/QC program in each laboratory that checks the data before it is sent to the data bases.

The open questions are:

- Who will develop a quality check program for analytical data?
- Should participation in the ringtests be mandatory, and who will pay for them?

In order to address these questions the working group will organize a meeting with the JRC to discuss about the importance of QA/QC for the quality of the data bases, and the possibilities of carrying out different quality checks.

**g. Organisation of the work of the QA/QC group and organisation of meetings for the heads of the laboratories to discuss ring test results, quality checks in the labs, methodical problems and to organize assistance programs:**

A new structure and working proposals for the QA/QC group were discussed.

**1. Organisation of the group:**

The composition of the working group should be changed such that representatives of all the expert panels associated with chemical analyses (Deposition, Soil, Soil solution, Foliar and litterfall, Air quality etc.) should be members of the group in the future.

The working group should be set tasks associated with QA/QC analytical problems by the above Expert Panels, and harmonize the QA/QC work among these Expert Panels.

The results of the ringtests should be evaluations in order to identify unsuitable methods and methods associated with problems.

Individual assistance programs for laboratories with analytical problems have to be organized by the group.

The group should meet regularly “back-to-back” with one of the expert panel meetings (Deposition, Soil, Foliar) in rotation.

**2. Meetings of the heads of the laboratories:**

In order to ensure that QA/QC programs and quality checks are adopted in the laboratories, and that analytical problems identified on the basis of the ringtest results are discussed, regular meetings of the heads of the laboratories are needed.

The working group will organize such meetings regularly as one of the main tasks of the work of the group.

**At these meetings the results of the ringtests, analytical and methodical problems and analytical questions in the different manuals, have to be discussed in order to formulate proposals to the Expert Panels. Visits to laboratories should be included in the meetings.**

**The next ICP Task Force Meeting should give a mandate to the group concerning this new structure and working proposals.**

**h. Preparation of the meeting of the overall QA/QC working group under Marco Ferretti in Hamburg (end of March 2007):**

**Nils König will prepare a Power Point presentation with the results of this meeting.**

**i. Miscellaneous:**

**The next meeting of the group will take place “back-to-back” with the EPD meeting in Hungary (10.-15. September)**