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Quality Assurance and Quality Control

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Abstract

Quality control and quality assurance are important components of environmental monitoring. Quality control and quality assurance are one of the content of analysis work. It is the key technology that needs to be solved in the current environmental monitoring work and the effective method of scientific management laboratory.

Keywords

Environmental monitoring, whole procedure, actual measurement method, quality control measures.

1. Introduction

Quality control and quality assurance are one of the content of analysis work. It is the key technology that needs to be solved in the current environmental monitoring work and the effective method of scientific management laboratory. It is an extremely important link to obtain correct analysis data, in order to enable monitoring data to be able to Accurately reflect the current status of the water environment quality and prevent the development trend of pollutants; must realize the standardization of monitoring technology, modernization of equipment and equipment, network construction of sites, and systemization of data; in order to report representativeness, accuracy, precision, Comparability and completeness of monitoring data.

2. On-site sampling quality control

In order to avoid cross-contamination of sampling equipment during the sampling process, the sampling equipment should be cleaned and the sampling device should be cleaned at each sampling point of this sampling. Clean.

The on-site staff fill in the on-site observation record sheet in detail during the sampling, and record the depth of the soil layer, soil texture, color, smell, etc., in order to provide a basis for the analysis. At the same time, the site-related video records are kept, and their content, page number, and serial number are all recorded in detail for easy verification. The quality assurance measures during the sampling process also include the following aspects:

The on-site sampling personnel are all professional and technical personnel who have been trained and evaluated after being on duty, are familiar with monitoring technical specifications,

have field survey experience, and master soil sampling technical regulations to form a sampling team.

During the sampling process, the sampling personnel should not have behaviors that affect the quality of the sampling. They should not smoke during the sampling, when the sample is repacked and the site where the sample is sealed, and should not arbitrarily discard the garbage generated during the sampling process and the items that may affect the quality of the soil environment.

The collected soil is kept in its original state and will be backfilled uniformly after sampling.

After completing the collection of a sample, the sampling gloves are replaced and the sampling tools are cleaned. The gloves and masks worn by the sampling personnel are collected and processed in a centralized manner.

For the collection of volatile organic compounds samples, mixing or homogenizing the samples is prohibited.

During the sampling process, technicians use professional soil extractors to collect samples. After digging the soil to the required depth, obtain a columnar sample of a certain depth, remove the outer soil of the columnar sample with a bamboo stick, and collect soil cores as samples at different depths, while avoiding the diffusion of pollutants in the environment.

3. Quality control of sample flow

During the entire process from the completion of the sampling to the delivery of the sample to the analysis laboratory, various aspects such as sample number verification, packaging and storage, and transportation safety need to be done.

Before the sample is sealed and sent, the relevant personnel shall be designated to carry out sample verification, recording and preservation, to ensure that the sample number is correct, and the sampling amount and packaging and sealing meet the relevant requirements. Fill in the paper sample circulation form and send it to the analysis laboratory along with the sample; after the sample is delivered to the laboratory, confirm with the relevant personnel of the analysis laboratory again to ensure that the sample meets the laboratory analysis requirements.

In the process of sample circulation, all samples are sorted, sorted, and packaged after being booked, and sent to the testing laboratory within 12 hours. Corrugated cardboard is used for bottoming and spacing when the samples are transported and packed to prevent shocks. The samples are stored in an incubator at 4°C until they enter the analysis laboratory.

4. Laboratory analysis quality control

The sample laboratory analysis of this project also adopted the following quality control measures:

Sampling equipment and sampling tools must be kept clean before entering the site.

All sample analysis is carried out in strict accordance with the requirements in the relevant technical specifications. A total of 1 set of on-site parallel samples were collected this time, accounting for more than 5% of the same batch of samples.

Precision control. For each batch of samples, 5% parallel samples must be made for each item analysis. When there are less than 5 samples, no less than 1 parallel sample; the analyst will program the clear parallel sample or the quality controller will sample or experiment on-site Code parallel samples are programmed in the room; the error of the parallel double sample determination results is within the allowable range as qualified. When the qualified rate is less than 95%, in addition to re-determination of the current batch of samples, the number of samples should be increased by 10%-20%. Parallel samples until the qualification rate of parallel double samples is greater than 95%.

Accuracy control. In routine analysis, each batch must be accompanied by parallel double samples of quality control. Under the premise that the precision of the measurement is qualified, the measured value of the quality control sample must fall within the range of the guaranteed quality of the quality control sample (at the 95% confidence level). , Otherwise the results of this batch are invalid and need to be re-analyzed and determined; when the selected items do not have standard substances or quality control samples, the standard addition recovery experiment can be used to check the accuracy of the determination, and the standard recovery rate should be within the allowable range of the standard addition recovery rate. , When the standard recovery pass rate is less than 70%, the unqualified ones shall be re-measured for the recovery rate, and another 10%-20% of the sample shall be added as the standard recovery rate until the total pass rate is greater than or equal to 70%.

Dealing with interference during detection. When interference is encountered during the detection process, follow the relevant processing system. The general requirements are: water cut, power cut, gas cut, etc., when the quality of the test is affected, all samples are re-measured; when the instrument fails, the same level of standby instrument that meets the test requirements can be used to re-measure; if there is no standby instrument, the instrument Repair and retest after re-verification.

Quality control between laboratories. Participate in inter-laboratory comparisons and proficiency testing activities to ensure laboratory testing capabilities and levels, and ensure the reliability and validity of the data issued. A total of 20 samples were collected this time. The quality control of the test results is shown in Figure 6-8, and the quality control report is detailed in the appendix.

Sample validity: complete all sample analysis work within the validity period of sample preservation.

Quality control data record

In order to ensure the accuracy of the test results, according to the laboratory quality control requirements.

The reproducibility of the analysis results is evaluated by calculating the relative deviation (RD) of the parallel sample test results. The relative relative deviation (RD) is calculated by the following formula:

$$RD=(R_1-R_2)/(R_1+R_2)$$

Among them, R1 represents the result of the R sample, and R2 represents the result of the parallel sample of R.

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