WATER RESOURCES DIVISION MEMORANDUM NO. 82.28

Subject: WATER QUALITY--Acceptability and Use of Water-Quality Analytical Methods

This memorandum is a statement of Division policy on acceptability and use of analytical methods for determination of water-quality constituents. It supersedes Quality of Water Branch Technical Memorandum No. 79.11 (March 19, 1979) which set forth requirements for approval of such methods. This statement updates the approval requirements to reflect the responsibility of the Central Laboratories to confirm the validity of new or modified methods developed for official use in the Central Laboratories System. It also formalizes the previously unwritten policy of alternate method equivalency as applied to Central Laboratory operations.

The Water Resources Division (WRD) recognizes two types of water-quality analytical methods--Approved Methods and Special Methods. Definitions of the two types of methods and requirements for approval of analytical methods are given below.

Approved Methods

Two categories of approved analytical methods have been formally established. These are: (1) official methods, and (2) provisional methods. A description of each of these categories and requirements for their approval are given below:

Official Methods--Methods in this category are considered to be the official water-quality analytical methods of the WRD. They are or will be published in the Techniques of Water Resources Investigations (TWRI) series. Data collected by these methods may be stored in WATSTORE and published in the annual basic data reports of the WRD.

Requirements for approval are:

1. Submission of documentation of the proposed method or modification of a presently used method in TWRI format to the Chief, Quality of Water Branch.

2. Submission to and approval by the Quality of Water Branch of a method-development report giving information and supporting data on the following:

(a) applicable range, detection limit, and sensitivity of the method,

(b) known and possible interferences,
(c) precision and bias of the method; these data should as a minimum include: (1) single-laboratory and multiple-operator tests which include at least 10 replicate analyses each of pure solutions, natural water, and spiked natural waters at three concentrations covering the applicable range of the method,

(d) production rates compared to other methods, when possible.

3. Submission of statements describing hazardous chemical reactions and/or reagents that are involved in the method, sample preservation requirements, and level of skill and/or special training requirements needed by personnel using the method.

4. In addition to the above minimum requirements for approval, if it is determined that the proposed method will be used in the Central Laboratories System, the Quality of Water Branch will initiate plans to obtain technical reviews of the method documentation and method development report by at least two colleagues, one of which must be outside the author's laboratory. In addition, if the method is developed in one of the Central Laboratories, the other Central Laboratory will be expected, if they have the equipment, to confirm the precision and bias of the method and to compare results with present methodology if a method exists. These requirements must be completed within 30 days. Approval of the method will be dependent on obtaining the reviews and additional data. The Quality of Water Branch may give Provisional Approval as outlined below during the period of review.

Provisional Methods—Methods in this category are believed to produce data comparable to those obtainable from official methods but are likely to be used by WRD to such a limited extent that they have not received extensive inhouse testing by WRD personnel. Many of the methods published in such reliable compendia as Standard Methods, Environmental Protection Agency Methods for Chemical Analysis of Water and Wastes, and the American Society for Testing and Materials Book of Standards, and which are used by inhouse, cooperator, or contractor laboratories in support of WRD programs, would be accepted for approval in this category. These methods will not be published in the TWRI series. Data collected by these methods may be stored in WATSTORE if a parameter code exists, and the data may be published in the annual basic data reports.

Requirements for acceptance of methods in this category are as follows:

1. Submission of a copy of the method to the Chief, Quality of Water Branch, with an explanation of why approval of the method is desired.

2. Provision of the same type of information on precision and bias as required for Official Method approval; however, in this case, data obtained by other than WRD personnel will be acceptable for consideration.
Request for approval of water-quality analytical methods should be submitted to the Chief, Quality of Water Branch, with copies to the appropriate Regional Hydrologist. The request should be accompanied by supporting documents appropriate to the category of approval that is requested.

The Quality of Water Branch will maintain a listing of all approved methods and periodically will distribute to the field a list of all approved methods which have not been published in the TWRI series.

Special Methods

In contrast to the two categories of approved analytical methods, there are some methods that have specialized or limited application and, therefore, need not be submitted to the Chief, Quality of Water Branch, for approval. These include methods used in support of research, experimental or developmental methods used by a Central Laboratory, and screening methods used in the field or in the laboratory. Data collected by these methods are not to be stored in WATSTORE or published in the annual basic data reports. However, the data may be published in interpretive reports or project data reports, provided the method is fully described or an appropriate reference is cited to provide a basis for peer evaluation of analytical results. Defense of the validity of such a method is, therefore, the responsibility of the individual publishing the data.

Ordinarily, only approved methods will be used in the Central Laboratories unless a special method is requested and concurrence in its use is obtained from the responsible individual for Analytical Technology Transfer in the Office of the Analytical Services Coordinator (currently Marvin Fishman). Analysts will not use a modification of an approved method without satisfying all previously stated requirements for an Approved Method.

Furthermore, when a laboratory uses an alternate method to satisfy a specific analytical request because of technical or management considerations, the analytical method used must have been previously shown to have equivalent or better sensitivity, precision, and bias as compared to the method requested to the satisfaction of the individual responsible for Analytical Technology Transfer. If these conditions are not met, the requester must be notified promptly and approve the change in the method prior to analysis.

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WRD Distribution: A, B, S, FO, PO

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This memorandum supersedes Quality of Water Branch Technical Memorandum No. 79.11