

## STANDARD OPERATING PROCEDURE (SOP) – Water Quality Planning Division

### **Title: QUALITY ASSURANCE OF EXTERNAL PARTY CONTINUOUS WATER QUALITY DATA VALIDATION**

Team Leader: \_\_\_\_\_ Date: \_\_\_\_\_

Quality Control Review: \_\_\_\_\_ Date: \_\_\_\_\_

Section Manager: \_\_\_\_\_ Date: \_\_\_\_\_

Effective Date: 12/22/09

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1.0	PURPOSE	

This SOP describes the procedures followed by Texas Commission on Environmental Quality (TCEQ) Water Data Management and Analysis (WDM&A) workgroup staff for verifying the quality of Continuous Water Quality Monitoring (CWQM) data that is validated by a party external to the TCEQ.

#### 2.0 SCOPE AND APPLICABILITY

CWQM data can be used to establish baseline environmental conditions, identify trends and variations over time, and characterize pollution events. Water quality parameters for validation may include, but are not limited to, the following: temperature, specific conductivity, pH, dissolved oxygen, turbidity, nitrate, ammonia, and total reactive phosphorus. Some automated validation procedures are performed by the Leading Environmental Analysis and Display System (LEADS) data processing software. TCEQ water data validators, external cooperators, or external contractors may perform manual validation procedures. This SOP outlines quality assurance (QA) procedures to be followed by TCEQ water data validators and applied to any continuous water quality data validated by cooperators or contractors external to the TCEQ.

### 3.0 METHOD SUMMARY

The TCEQ operates, either in-house or via cooperators or contractors, CWQM stations throughout the State. When either a contractor or cooperative partner performs the data validation, there is the potential for variations in process and procedure to occur, even though a universal data validation SOP is adopted. To ensure data quality and comparability, WDM&A workgroup staff will conduct periodic data quality assurance checks. The process for these checks is covered in this SOP.

QA checks for cooperators and contractors will be done on the following schedule:

Once per month for the first three months

Once every two months for months 3 - 6

Quarterly thereafter

If for any reason WDM&A workgroup staff believes there is a deficiency in the data validation or data record of any site, QA checks will return to a monthly schedule until such time that WDM&A is confident no deficiencies remain. The previous schedule will then resume. Data will be checked at the rate of 10% of the possible data record.

WDM&A staff will also check site operation once per week to ensure the validator is not overlooking a site in either validation or maintenance. WDM&A will report any missing data or operators logs or any other site discrepancy to the appropriate validator and the TCEQ Project Lead.

### 4.0 LIMITATIONS

- 4.1 Data validation is dependent upon the quality of field observations and the reporting of equipment calibration and post-calibration information in operator logs.
- 4.2 Some CWQM equipment components are susceptible to fouling when sediment, nutrient, or algae levels are high in ambient surface waters. Data invalidation may occur as a result of this fouling.
- 4.3 Unforeseen events such as equipment malfunctions, floods, or vandalism could result in lost data or data in need of invalidation.
- 4.4 If data are reloaded or reprocessed in LEADS after validation, previously flagged and/or invalidated data will default to their original status. Data must be validated again by referring to the validator's notes and operator logs.
- 4.5 LEADS is a developing system, and the software tools used to validate data could contain defects that may or may not have been identified.

### 5.0 SAFETY

Usual office and computer safety practices apply. For additional information about the TCEQ Safety Program, see:

<http://home.tceq.state.tx.us/internal/admin/support/riskmgmt/healthsafety/>

### 6.0 EQUIPMENT

Computer Hardware:

- 486 PC, 8 MB RAM, 80 MB hard drive or 68040 Macintosh, 8MB RAM, 80 MB hard drive
- Data logger and data communication hardware

Computer Software:

- HP UNIX
- HP Common Desktop Environment
- Exceed for PC
- LEADS user interface
- Manual Validation data retrieval and validation software

## 7.0 PROCEDURES

### 7.1 Weekly

7.1.2 Check to make sure the site is up and running properly and that all appropriate documentation is in place. See the most recent version of *Standard Operating Procedure for Validation of Continuous Water Quality Monitoring Data Collected by Multiparameter Sonde, 2006* for exact details on how to accomplish this task.

### 7.2 Monthly, Bimonthly, or Quarterly, as appropriate for validator and site

7.2.1 Determine how much time has passed since the last review was done.

7.2.2 Fill out the header portion of the checklist (Attachment A).

- Date – Date of current review.
- Validator(s) – The name of the staff that currently validate the site.
- Organization – The name of the organization with which the validator(s) is affiliated.
- Continuous Ambient Monitoring Station (CAMS) – The CAMS number and name assigned to the site
- WDM&A Staff – WDM&A staff conducting current review.
- Date of Last Review – The date the last QA check was completed.
- Date Ranges Verified – The date ranges that will be verified in the current review.

7.2.3 Calculate 10% of the data record that has yet to be reviewed.

7.2.4 Without looking at the data record, pick three time periods that equal 10% of the data record to be reviewed. One period should be at the beginning of the record, one in the middle, and one near the end.

7.2.5 Request copy of validator's notebook for periods to be audited.

7.2.6 Validate the data record using *Standard Operating Procedure for Validation of Continuous Water Quality Monitoring Data Collected by Multiparameter Sonde, 2006* or most recent version.

7.2.7 Fill out checklist as appropriate.

## 8.0 CALCULATIONS

Not applicable.

## 9.0 QUALITY CONTROL

Each data validator (TCEQ or external) is responsible for the review, verification, and validation of data from assigned ambient stations. Data outliers and unusual data will be investigated by the validator. Validators are responsible for maintaining detailed records of all validation activities and follow-up actions related to the invalidation/qualifying of ambient water quality

data. Records should be sufficient to reconstruct the data validation event at a later time if necessary.

## 10.0 DEFINITIONS

**CAMS** – Continuous Ambient Monitoring Station

**CWQM** – Continuous Water Quality Monitoring

**LEADS** – Leading Environmental Analysis and Display System

**QA** – Quality Assurance

**SOP** – Standard Operating Procedure

**TCEQ** – Texas Commission on Environmental Quality

**WDM&A** – Water Data Management and Analysis

## 11.0 REFERENCES

- LEADS Web pages. Training Material: Manual Validation
- LEADS Operator's Manual.
- *Standard Operating Procedure for Validation of Continuous Water Quality Monitoring Data Collected by Multiparameter Sonde, 2006* or most recent version.
- TCEQ Operating Policies and Procedures, Chapter 6.13
- *Monitoring Operations Hazardous Waste Disposal Plan*

## 12.0 POLLUTION PREVENTION AND WASTE MANAGEMENT

Supervisors, sampling personnel, and laboratory analysts should identify and implement innovative and cost-saving waste reduction procedures as part of the method development, and review and revision of standard operating procedures. Wastes that do result from these procedures are managed and disposed in accordance with appropriate state and federal regulations.

Refer to Chapter 6.13 of the TCEQ Operating Policies and Procedures for guidelines on general recycling, waste reduction, and water and energy conservation. Review these procedures for specific employee responsibilities and mechanisms for office related waste prevention and management. Consult the *Monitoring Operations Hazardous Waste Disposal Plan* for laboratory specific waste minimization recommendations and requirements for proper handling of hazardous waste which results from laboratory procedures.

## 13.0 SHORTHAND PROCEDURES

- Check weekly that the site is up and running and all documentation is present.
- Determine how much time has passed since the last review was done and if a review is due.
- Fill out the header portion of the checklist (Attachment A).
- Calculate 10% of the data record that has yet to be reviewed.
- Pick three time periods that equal 10% of the data record to be reviewed (one period at the beginning of the record, one in the middle of the record, and one at the end of the record to be reviewed).
- Request copy of validator's notebook for data records to be reviewed.
- Validate the data records using the appropriate SOP.
- Fill out checklist as appropriate.
- Return to data review schedule described in Section 3.0 if validation deficiencies are discovered.