

1.0.6 DATA PROCESSING AND VALIDATION
Sections 1.0.6.1 through 1.0.6.3 apply to Criteria Pollutants

1.0.6.1 DATA PROCESSING - The ARB's air monitoring program collects real-time pollutant values and samples of ambient air throughout California. The program also is designed to ensure the quality of the data collected and disseminated by the ARB and California's air quality districts. The data generated are used to determine which areas of California are in attainment, or non-attainment, and the severity of pollution in California. The data are also used in air models and emission inventory.

The Air Quality Data Acquisition System Version II (AQDASII) is used to collect, process, and report air quality data for the Air Resources Board's Statewide air monitoring network. Dataloggers located in the monitoring stations convert the analog output of the various analyzers (ozone analyzers, carbon monoxide analyzers, etc.) into digital minute and hour averages. These averages are polled over telephone lines via an AQDASII Communication Server and stored in a SQL database on an AQDASII file server. The data is then accessed and edited by workstations on the Local Area Network (LAN). The LAN, database, workstations, and servers comprise the AQDASII.

Within the ARB, the staff of the Monitoring and Laboratory Divisions, Air Quality Surveillance Branch (AQSB) performs three levels data review of the ambient data. The first level review is done by the station operator who verifies the data and evaluates the accuracy of the data through evaluation of the daily calibration checks. The second level review consists of spot checks of the ambient data and a review of the required equipment maintenance. The third level review consists of reconciliation of data from hard copy to electronic copy, confirming second level edits exported correctly within the electronic version; scan reports and historical highs and lows are verified, and spikes and anomalies are verified.

Under agreements with data suppliers, some monitoring agencies will submit air quality data directly to the U.S. EPA's Aerometric information Retrieval System (AIRS) database via modem and telephone link. These monitoring agencies will process their data submittals through computers routines on AIRS that provide an electric review of the data. AQDR section will then transfer a copy of the data to the ARB data management system, ADAM.

Other monitoring agencies will continue to submit air quality data directly to AQDR section. The AQDR section will log the data and check for gross errors within the screening files to be processed using data review routines.

Site reports are generated or amended for State and local air monitoring stations, national air monitoring stations, and special purpose monitoring stations by the field technicians. A copy of the report stays with the agency that operates the station, and a copy is sent to the AQS Branch of the Monitoring and Laboratory Division (MLD). A complete site report must be on file in MLD's Air Quality Monitoring - North section. A site number is assigned by the reporting agency prior to reporting data for record to ARB and/or U.S. EPA. Site numbers are assigned when a complete site report is received. The MLD keeps the original site report on file.

1.0.6.2 DATA VALIDATION - After the monthly submittals of criteria pollutant ambient air quality data have been checked for gross errors by levels one, two and/or three of the reporting agency, the electronic data are stored in the database. The edits are also screened for a minimum and maximum level for each pollutant. These edits are intended to catch obvious errors and outliers in the data. Errors identified by the editor are questioned and resolved. Once the data are in the database, printouts of the data are run by the AQDR Section and reviewed for questionable or missing data. The AQDR Section confers with the responsible data supplier regarding suspected errors. If errors are found, questionable or missing data questions are forwarded to the proper reporting agency. That agency would then validate the data and return comments to the AQDR Section. The AQDR Section runs several reports, which determine the completeness and representativeness of the data.

1.0.6.3 AIR QUALITY DATA ACTION - An Air Quality Data Action (AQDA) is a request for an investigation of the validity of ambient air quality data for a certain period of time. Figure 1.0.6.3 depicts an AQDA request form. AQDA requests can be initiated by any person suspecting erroneous data and serves as a means for withholding questionable air quality data pending further investigation.

AQDAs are generally issued by the QA Section staff based upon review of field calibrations or audit results which show an analyzer/sampler operating outside ARB's control limits of ± 15 percent (± 10 percent for (PM₁₀) or for siting or temperature conditions within the station not meeting specifications. The original AQDA is sent to the person responsible for submitting the respective data to the appropriate Air

Monitoring (AM) Section or Air Pollution Control District (APCD). A copy of the AQDA is sent to the AQDR Section, which withholds the air quality data from processing and publication until the data are determined to be within limits.

After receiving the AQDA request, the appropriate air monitoring staff, within 30 days, investigates the questionable data and generally responds to QA with a recommended data action and its justification, which QA staff then reviews. If QA is in agreement with the response, the AQDA is completed, signed, dated, and forwarded to the AQDR Section for appropriate action, i.e., data correction, acceptance, or deletion for the affected time period.

If QA is not in agreement with the response, follow-up recommendations and their justifications are exchanged with the appropriate staff to work towards a satisfactory resolution. QA then informs the AQDR Section regarding final data action and disposition of the AQDA. The AQDR Section then completes the recommended data action.

The QA Section may request that the AQDR Section delete the questionable data in the absence of response from AM/APCD within 30 days or if the data are greater than ± 25 percent from true levels, as determined by zero, span, and precision checks. QA may recommend data be invalidated or corrected back to the initial occurrence of the malfunction. If the malfunction date cannot be verified, the data can be invalidated or corrected back to the last successful calibration or audit.

1.0.6.4 CHANGES TO PROCESSING AND VALIDATION PROCEDURES

Figure 1.0.6.2 depicts the general process a district or the ARB will use to process data into the AIRS and ARB databases. The handling of site reports by the ARB may also change, although new procedures have not yet been determined.

Questions regarding the above procedures can be addressed to the AQDR Section (916-324-7672) or the QA Section (916-324-6191) of the ARB in Sacramento.

1.0.6.5 AMBIENT TOXICS DATA REVIEW

The ARB Monitoring and Laboratory Division's (MLD) Northern Laboratory Branch submits ambient toxics data to the Planning and Technical Support Division (PTSD) for verification and storage. MLD provides six toxics submittal formats to PTSD for each calendar month. The six submittals group the toxics species as follows:

- | | |
|-----------------|--|
| 1. Gases | Unxygenated volatile organic compounds |
| 2. Aldehydes | Oxygenated volatile organic compounds |
| 3. PAHs | Polycyclic aromatic hydrocarbons |
| 4. LoVol Metals | Metals collected with a low-volume sampler |
| 5. Cr+6 | Hexavalent Chromium |

Distinct sampling methods define the groupings. For example, gas samples are collected in stainless steel canisters, whereas aldehyde samples are collected with adsorbent tubes, PAHs with SSI equipped HiVol samplers, etc.

MLD screens these submittals electronically for proper coding, expected sites, expected compounds, data representativeness, and data completeness. In addition, PTSD compares each individual measurement statistically to a data record that is specific to each compound and site. Measurements that deviate significantly from the expected (usually with less than a one percent likelihood of occurrence) are flagged for further evaluation.

PTSD refers flagged measurements, possible data errors, and other questionable matters to MLD in an informal Data Inquiry. MLD investigates the questions raised and recommends appropriate action in its response to the Data Inquiry. When the questions have been resolved to PTSD's and MLD's mutual satisfaction, the data are read into a ADAM database where the data are available for general use.

The Northern Laboratory Branch (NLB) of the ARB performs quality control reviews of ambient toxic data. Periodic checks of charts for monthly averages and trends are done. Normal QC procedures include checking duplicates, QC charts, blanks, spikes, standards, and review of chromatographs. The lab checks in-depth on all unusual events. They scan the data reports to look for results that appear unusually high or low.

1.0.6.6 TEOM AND BAM DATA REVIEW

Quality Assurance audit procedures for these samplers are contained in the QA Manual, Volume V, Appendix V. AQSBS is submitting data to AIRS and is currently performing quality control flow checks and comparisons of the data against SSI/dichots for outliers.

1.0.6.7 NON-METHANE HYDROCARBONS IN AMBIENT AIR DATA REVIEW

The data validation guidance for non-methane hydrocarbons in ambient air encompasses mainly routine checks, tests for internal consistency, and historical data comparisons. Additional checks for parallel consistency, which incorporate statistical evaluations, may be considered for data validation. A flow chart of data validation activities is shown in Figure 1.0.6.4.

1.0.6.8 NON-METHANE HYDROCARBONS IN MOTOR VEHICLE EXHAUST DATA REVIEW

The data validation guidance for non-methane hydrocarbons in motor vehicle exhaust encompasses mainly routine checks, tests for internal consistency, and historical data comparisons. Additional checks for parallel consistency, which incorporate statistical evaluations, may be considered for data validation. A flow chart of data validation activities is shown in Figure 1.0.6.4.

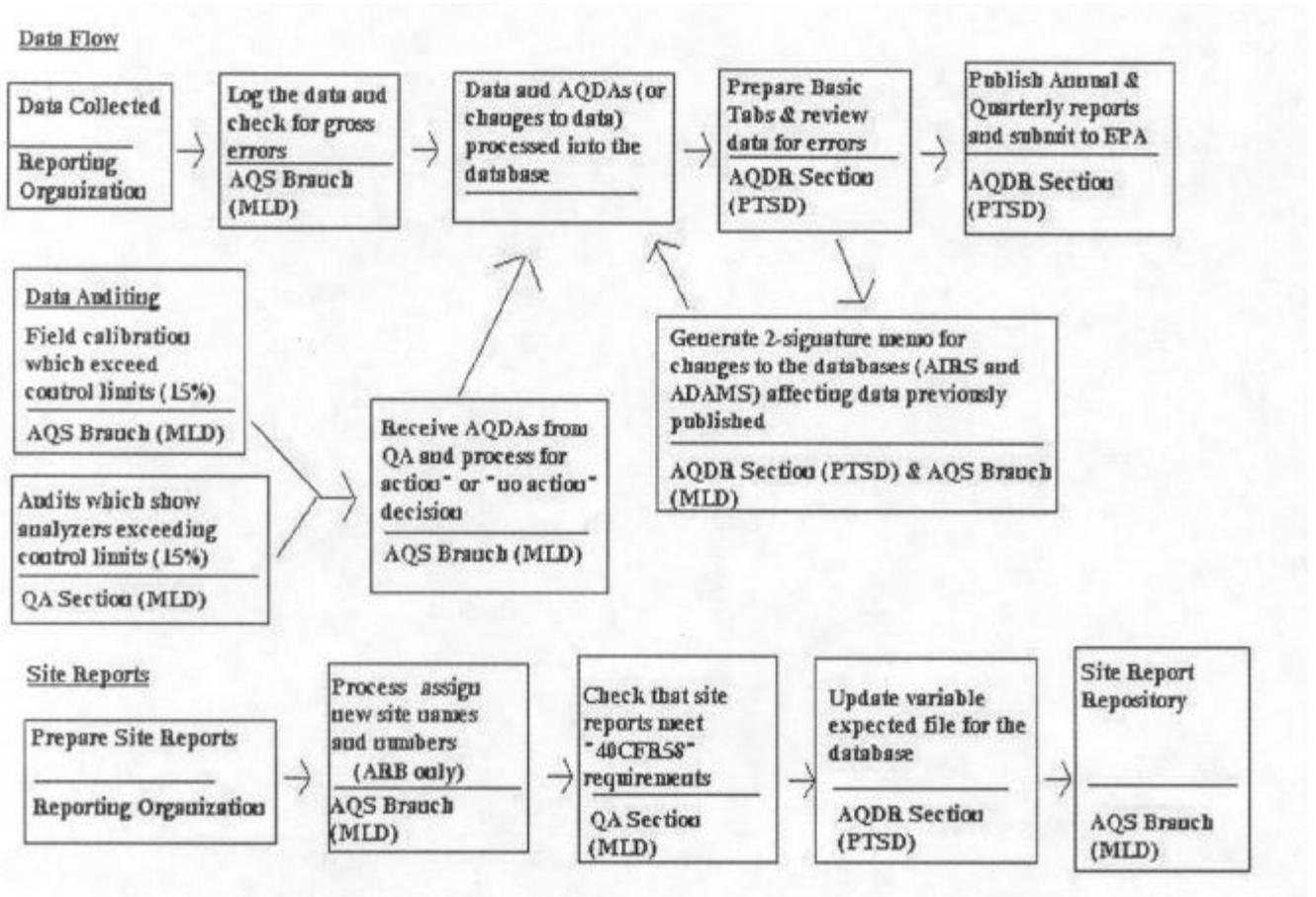


Figure 1.0.6.1
 Data Processing and Validation-Criteria Pollutants

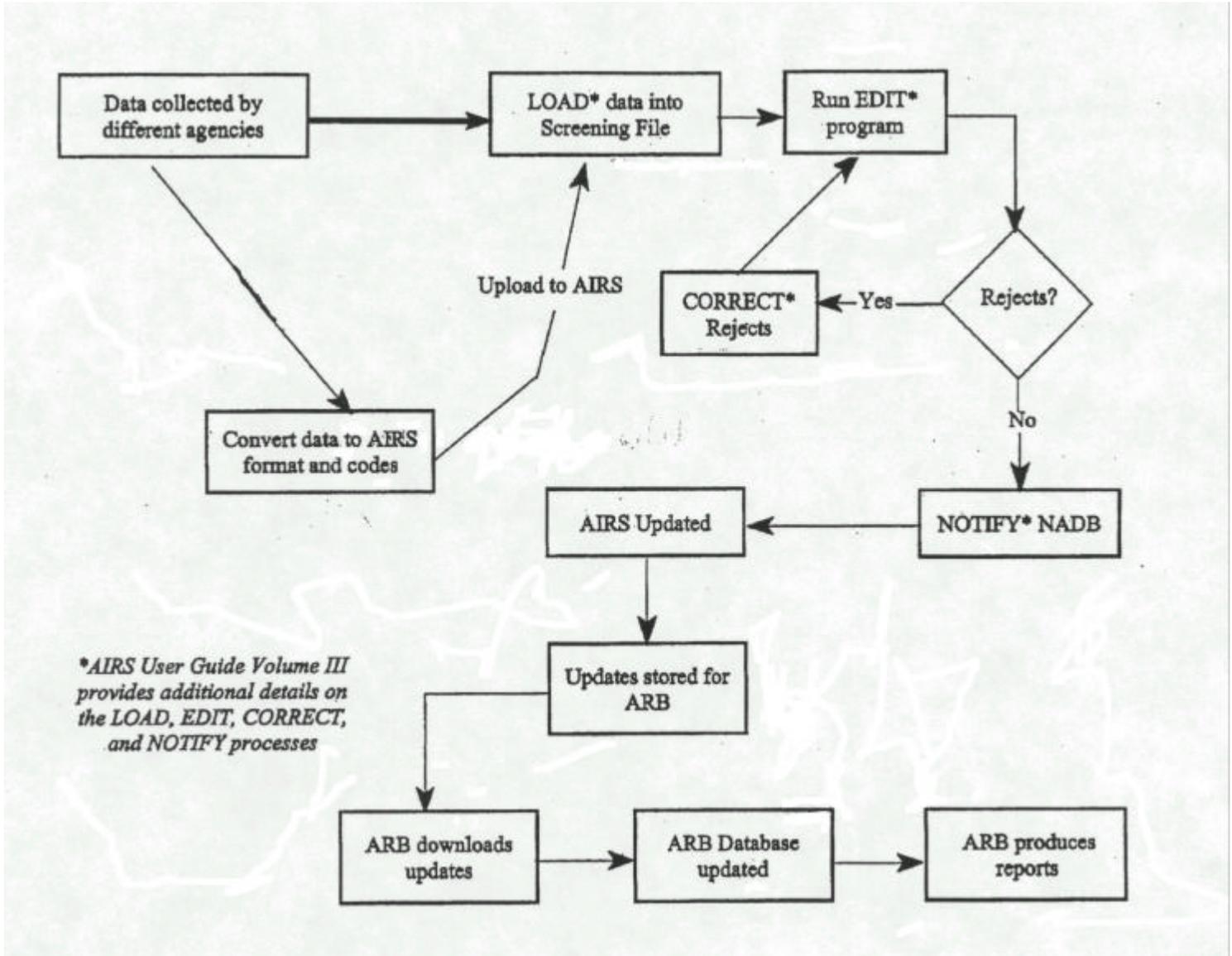


Figure 1.0.6.2
General Process to Load Data into AIRS/ARB Database

AIR QUALITY DATA ACTION REQUEST
 (For ARB Use Only)

SITE NAME:	Clovis – North Villa	REQUEST LOG #:	844
SITE NUMBER:	10248	AIRS#:	060195001
		REQUEST DATE:	August 3, 1998
TO:	George Jung, Air Monitoring/APCD. Please investigate the potential inaccuracies listed below * and recommend appropriate action/s. If no response to this action is received by <u>September 3, 1998</u> , QA staff shall review and recommend appropriate action/s.		
TO:	Norma Montez, Air Quality Data Review. Please withhold the following air quality data from processing until potential data inaccuracies are resolved.		
FROM:	John Kato, Quality Assurance Section.		
* Potential Data Inaccuracies			

POLLUTANT	EST. TIME PERIOD *			REASON FOR ACTION
NMHC	FROM:			Audit conducted on July 30, 1998, found the analyzer to be an average of 19.2% from true.
	12	16	96	
CODE	Month	Day	Year	
	TO:			
	9	30	98	
	Month	Day	Year	

Air Monitoring/APCD to complete the following block from their quality control records, sign, and return to Quality Assurance Section. * Exact interval to be determined by district.

RECOMMENDED DATA ACTION	TIME PERIOD (INCLUSIVE)				CORRECTION FACTOR
RELEASE:	BEGIN:				
DELETE:	END:				
CORRECT:		Hour	Month	Day	Year

JUSTIFICATION

REVIEWED BY:	1. _____	DATE:	_____
	2. _____	DATE:	_____
	3. _____	DATE:	_____
	4. _____	DATE:	_____

The recommended data actions were applied and the air quality data were updated on the AIRS/ADAM Database by _____ on _____.

MLD-40/12/92

Figure 1.0.6.3
 Air Quality Data Action Request

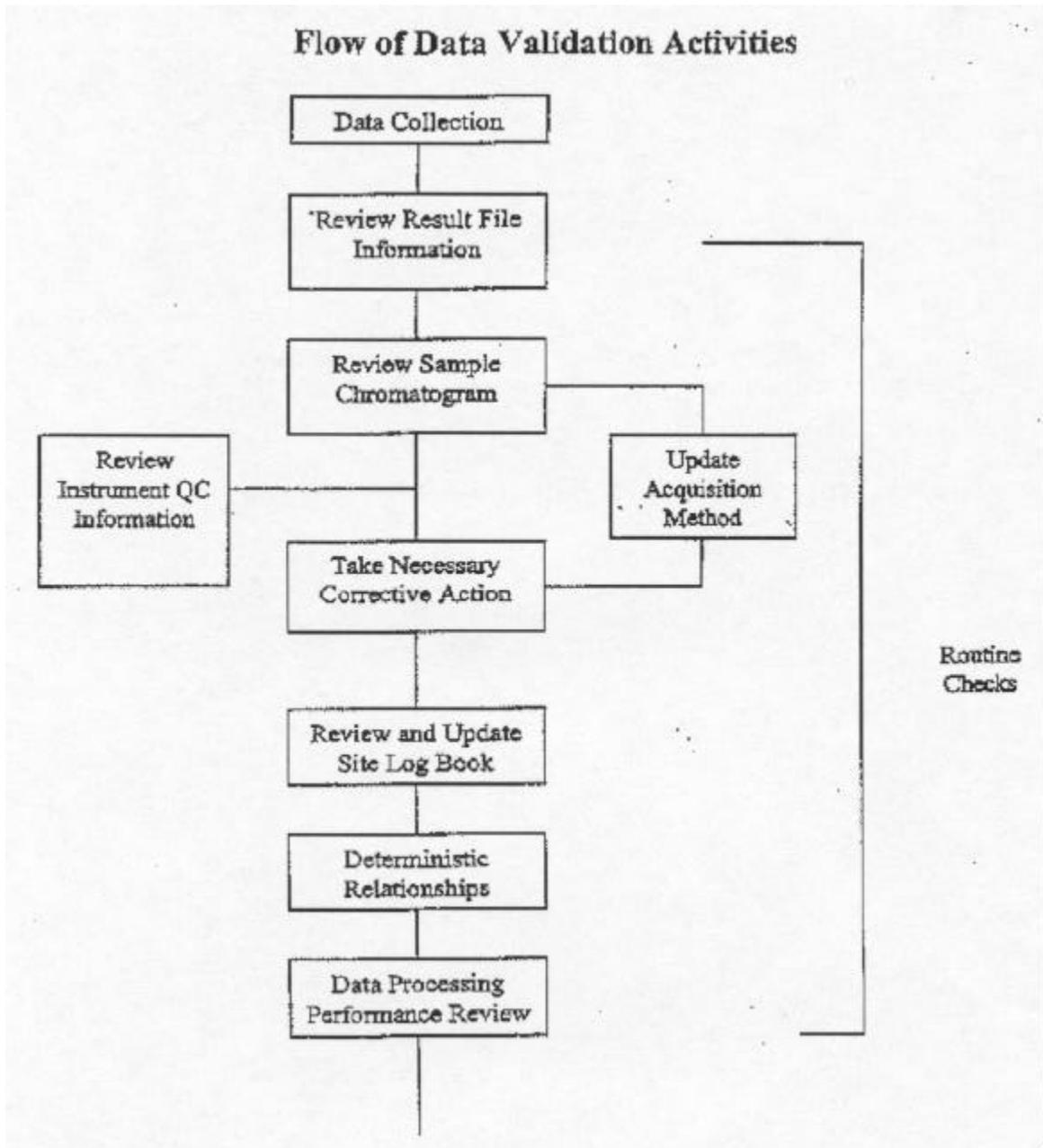


Figure 1.0.6.4
Non-Methane Hydrocarbons Data Validation Activities

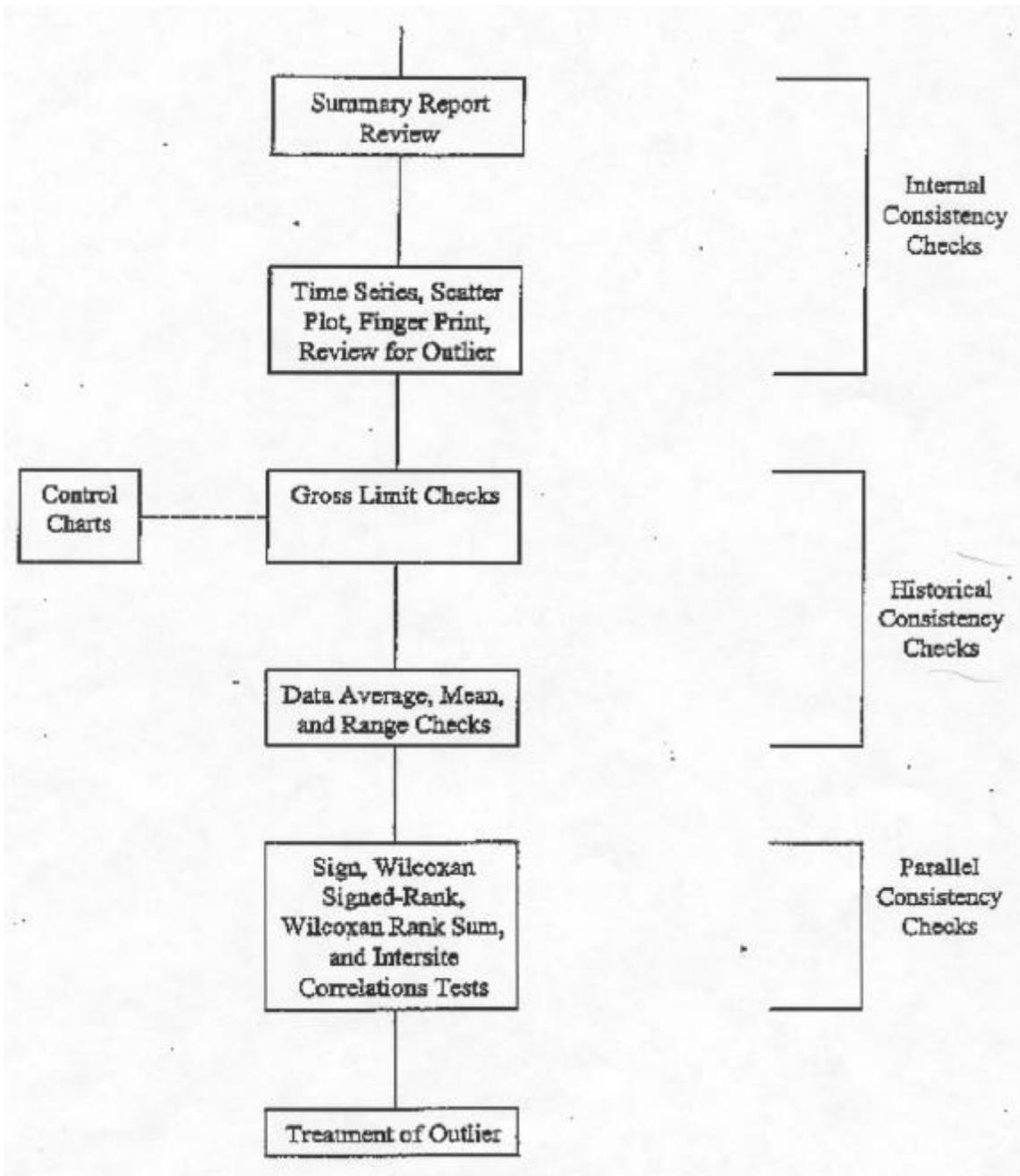


Figure 1.0.6.4 (cont.)
Non-Methane Hydrocarbons Data Validation Activities