TENNESSEE VALLEY AUTHORITY
KNOXVILLE, TENNESSEE 37902

OCT 28 1988

Mr. Philip L. Stewart, Manager
Chattanooga Field Office
Division of Water Pollution Control
2501 Milne Avenue
Chattanooga, Tennessee 37406-3399

Dear Mr. Stewart:

WATTS BAR NUCLEAR PLANT - NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NUMBER TN0021068 - RESULTS OF TESTING OF CONTINUOUS CHLORINE ANALYZER (CCA)

As committed in my April letter to you, enclosed are the report and figures on the testing of an Orion Model 1770 CCA. In summary, this instrument which is reputed to be the best on the market is not consistently accurate, but rather is subject to fairly regular spikes which are greatly different from the results of conventional grab sample analysis. Based on the results of this test combined with the testing conducted on the Xertex CCA last spring, we plan to request in our NPDES permit renewal application that the CCA requirements to be removed from our new permit since we have not been able to acquire an accurate CCA. In the interim, we will, of course, continue to use multiple grab samples to demonstrate compliance with the permit.

If you have any questions concerning the enclosed report or would like to discuss this matter further, please contact Abraham H. Loudermilk, Jr., of my staff, at (615) 632-6656 in Knoxville.

Sincerely,

M. Paul Schmierbach, Manager
Environmental Quality

CEM:MFB
Enclosures
cc (Enclosures):
Mr. Bruce R. Barrett, Director
Water Management Division
U.S. Environmental Protection Agency,
Region IV
345 Courtland Street, NE.
Atlanta, Georgia 30365

Continued on page 2

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Mr. Philip L. Stewart

OCT 28 1988

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Division of Water Pollution Control
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Nashville, Tennessee 37219-5404

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

CONTINUOUS CHLORINE ANALYZER (CCA) TEST RESULTS

Testing was recently conducted at Watts Bar Nuclear Plant (WBN) to determine the adequacy of the Orion Model 1770 CCA for environmental monitoring of total residual chlorine (TRC). The test began August 1 and concluded on September 3. Testing was interrupted for eight days to allow performance of system maintenance.

Testing consisted of temporarily installing the CCA in the plant to continuously monitor the TRC concentration in the raw service water system. Grab samples, collected periodically from the analyzer discharge piping, were compared to the results provided by the CCA. The grab samples were analyzed for TRC by N,N-diethyl-p-phenylenediamine (DPD) Titration, an analytical method which has been approved for use by the Environmental Protection Agency. A chart recorder was used to trend the results from the CCA.

Upon completion of testing, the data was studied to determine how the CCA output compared to "actual" values as determined by DPD titration. Only 34 percent of the CCA data points exhibited an error which was less than or equal to 10 percent. Figures 1 and 2 represent the percent error which was calculated from differences between the CCA and corresponding grab samples. If the difference between a grab sample and the CCA reading exceeded 50 parts per billion, another sample was collected and analyzed to determine if analytical error was the reason for the discrepancy.

The most significant problem encountered while testing the Orion CCA was an unexplainable spike which occurred at a somewhat rhythmic frequency throughout the test. Figure 3 depicts a portion of the chart paper from the test which demonstrates how an unrepresentative spike can cause a false noncompliance condition. The Orion representative was contacted about the spikes in the data, but was unable to correct the problem. Figure 4 is a plot which was generated from grab samples and corresponding CCA data purposes, but the results are unsatisfactory for compliance monitoring. For these reasons we believe that the Orion Model 1770 CCA is not reliable enough to effectively monitor plant discharge for the TRC limits specified in the National Pollutant Discharge Elimination System (NPDES) permit.

In the next NPDES permit application for WBN, we plan to request that the requirement for installation of a CCA be removed. We feel that sufficient data now exists to justify this request. We will continue to comply with our NPDES permit by collecting multiple grab samples according to the requirements specified therein which ultimately serve to better protect the environment by producing more reliable results.

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FIGURE 1

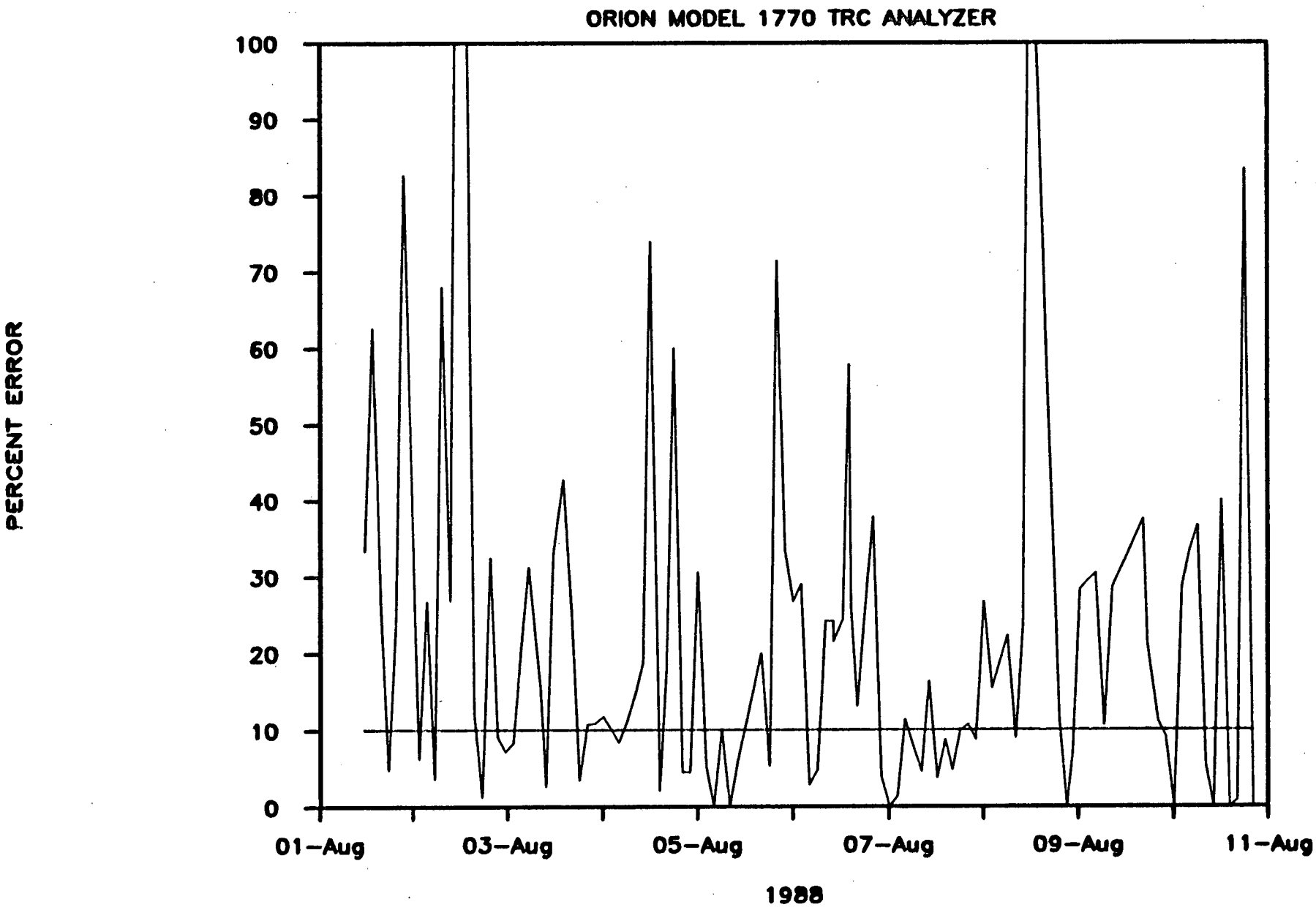

ORION MODEL 1770 TRC ANALYZER
PERCENT ERROR
100
90
80
70
60
50
40
30
20
10
0
01-Aug
03-Aug
05-Aug
07-Aug
09-Aug
11-Aug
1988

FIGURE 2

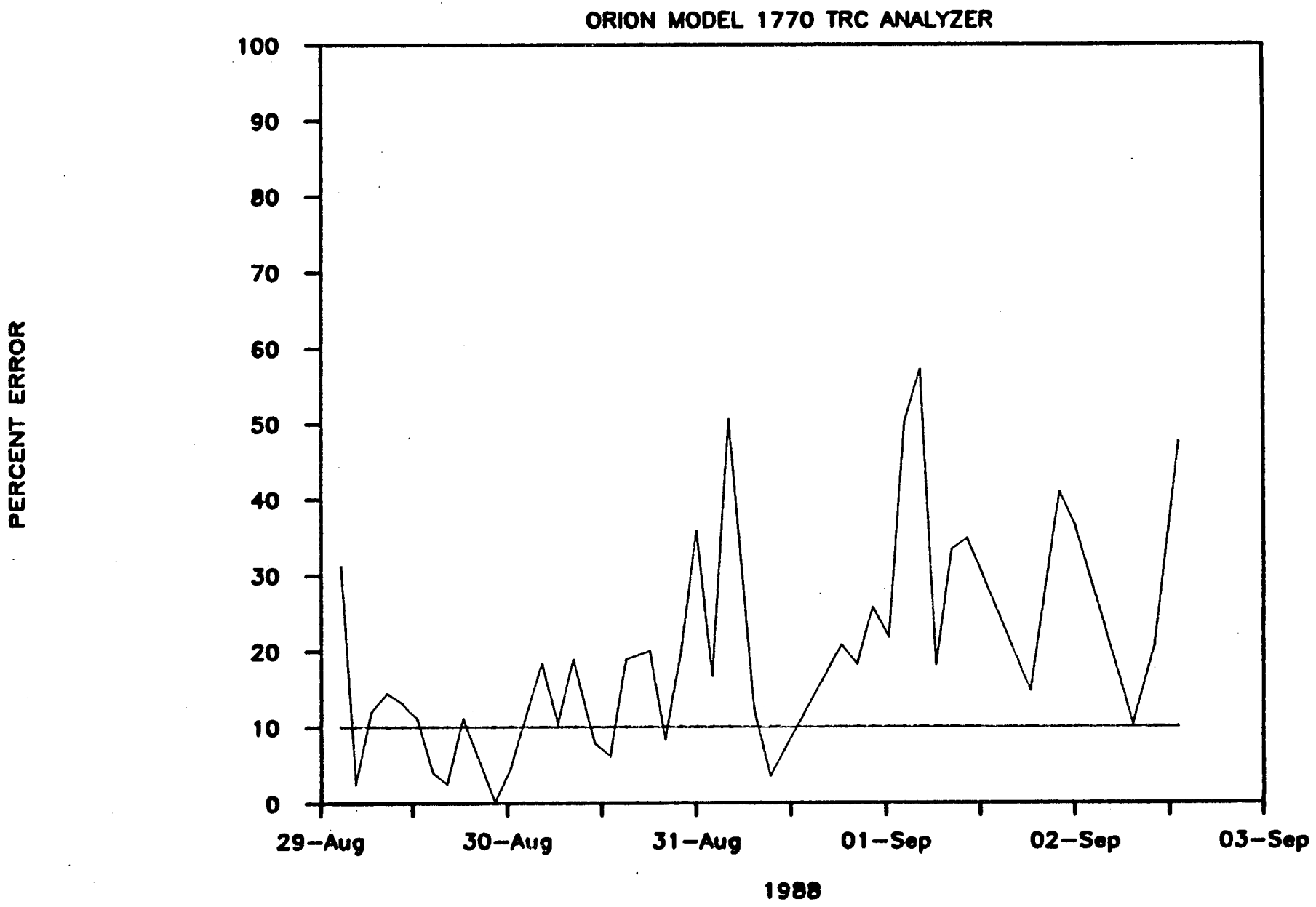
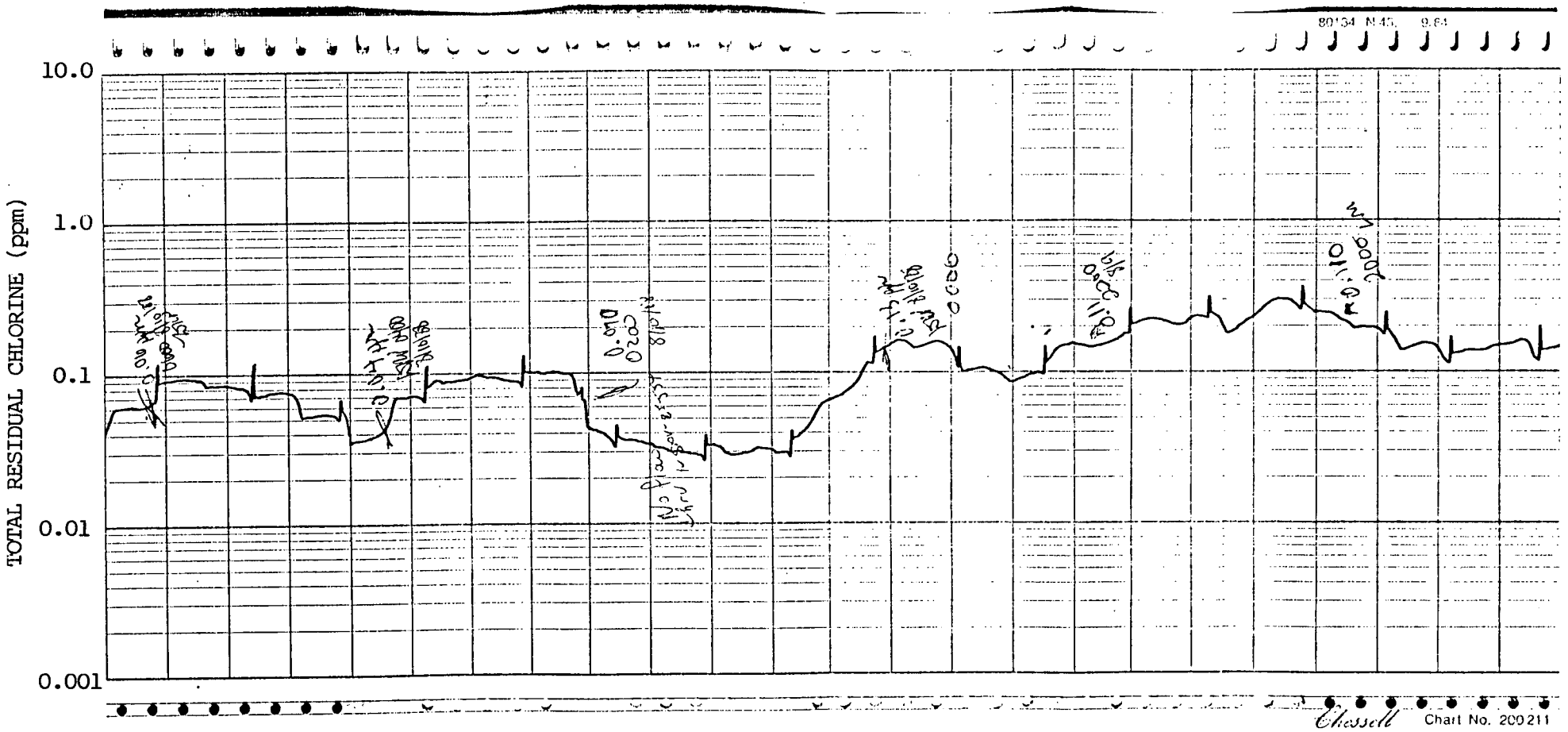

ORION MODEL 1770 TRC ANALYZER
PERCENT ERROR
100
90
80
70
60
50
40
30
20
10
0
29-Aug
30-Aug
31-Aug
01-Sep
02-Sep
03-Sep
1988

FIGURE 3

ORION MODEL 1770 CHLORINE ANALYZER



NOTE: Chart Speed = 30 min/cm

FIGURE 4 (page 1 of 3)

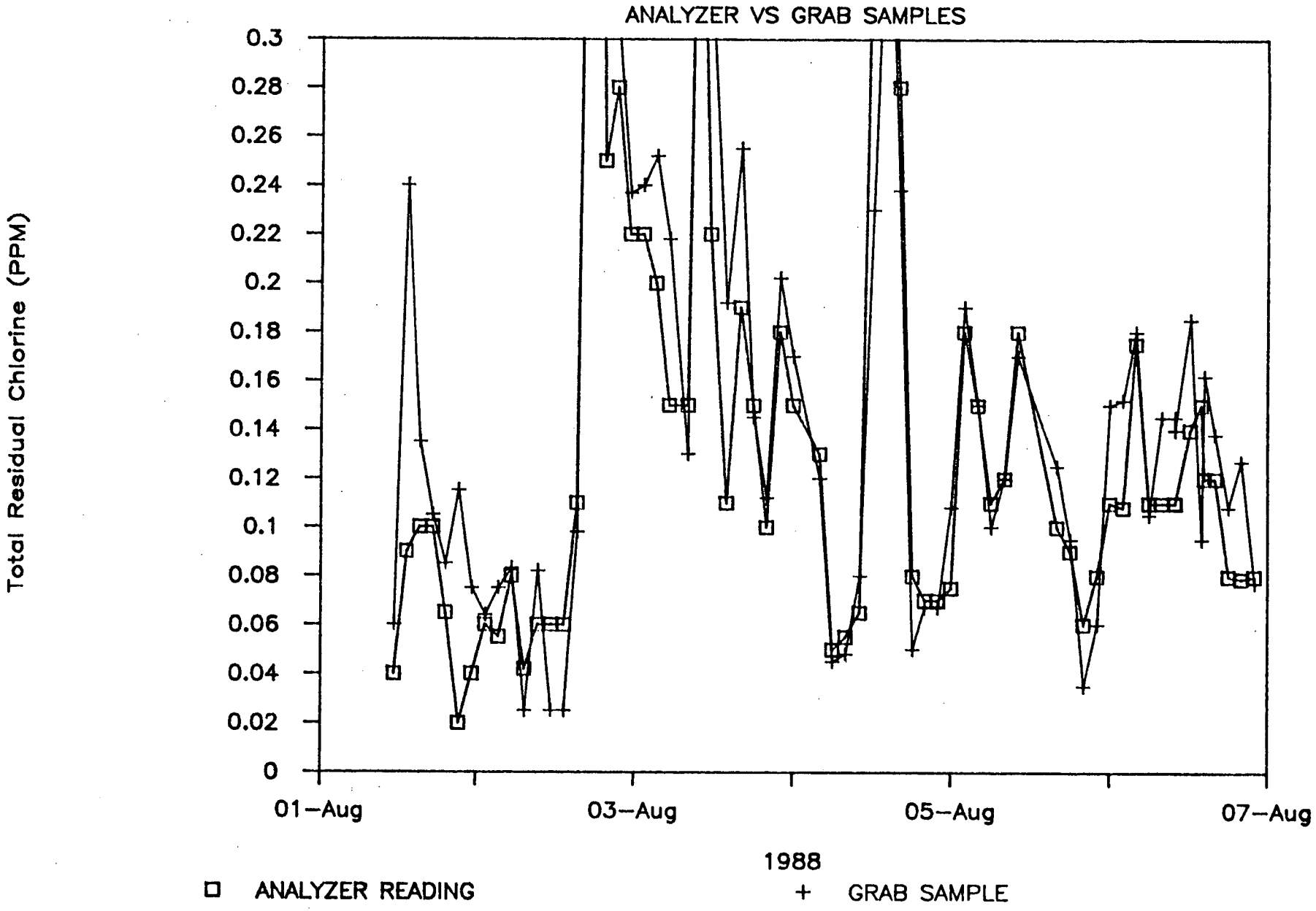


FIGURE 4 (page 2 of 3)

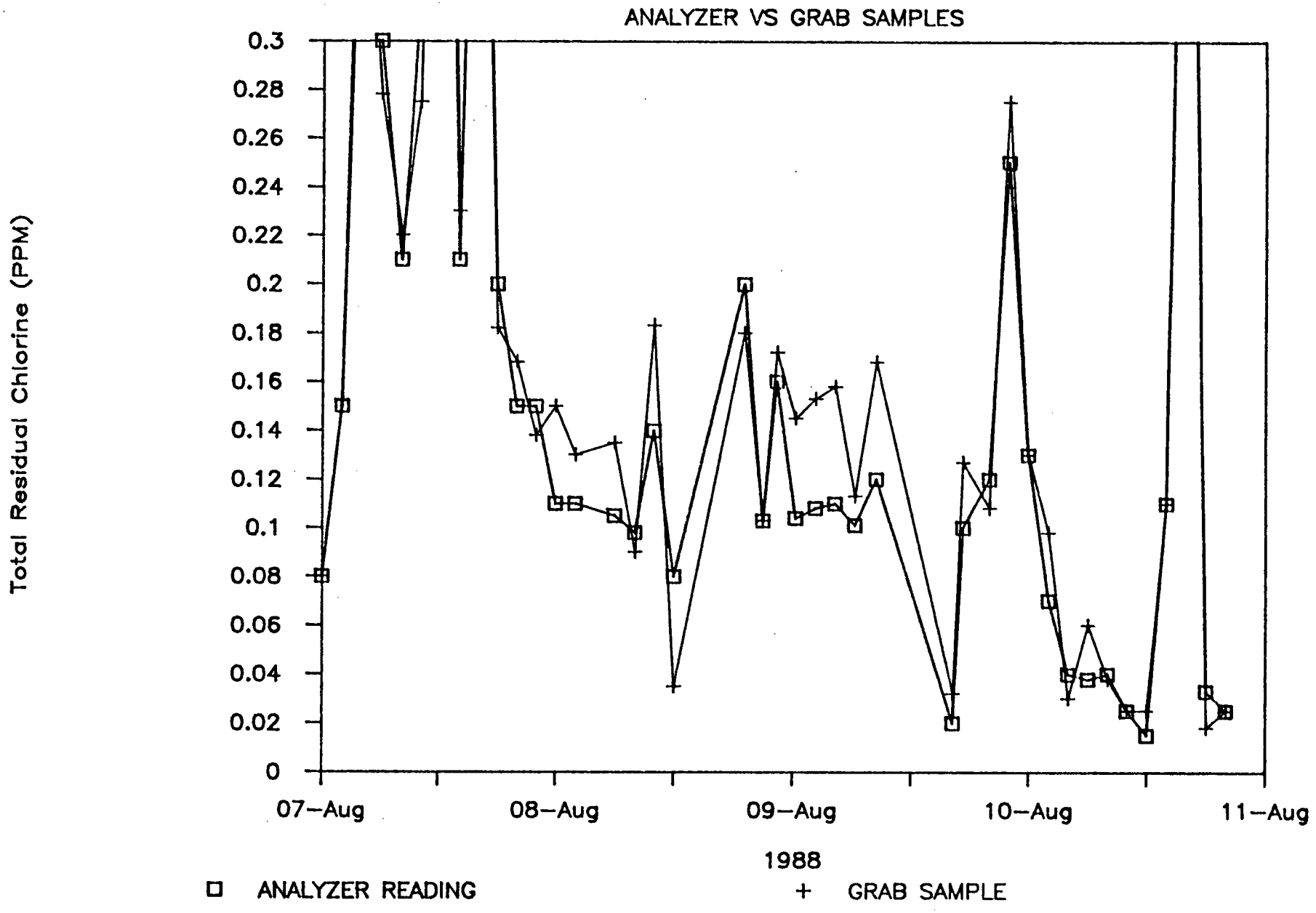


FIGURE 4 (page 3 of 3)