

TENNESSEE VALLEY AUTHORITY  
KNOXVILLE, TENNESSEE 37902

NOV 17 1987

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

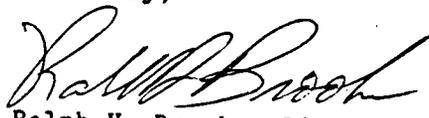
Dear Mr. Stewart:

WATTS BAR NUCLEAR PLANT (WBN) - NPDES PERMIT NO. TN0020168 -  
COMPLIANCE EVALUATION INSPECTION REPORT AND NOTICE OF VIOLATION

The information requested in your October 16 letter is enclosed. The responses to Notice of Violations 2 and 3 and Deficiency 4(b) were provided in an October 30 letter to you.

If there are any questions regarding this response, please call Madonna E. Martin of my staff at (615) 632-6695 in Knoxville.

Sincerely,

  
Ralph H. Brooks, Director  
Environmental Quality

Enclosures

cc (Enclosures):

Mr. Kenneth W. Bunting, Director  
Division of Water Pollution Control  
Tennessee Department of Health  
and Environment  
TERRA Building  
150 Ninth Avenue, North  
Nashville, Tennessee 37219-5404

Mr. Douglas K. Lankford, Chief  
South Carolina/Tennessee Unit  
Facilities Performance Branch  
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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NOV 17 1987

Mr. Philip L. Stewart

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

Mr. G. G. Zech, Assistant Director  
Regional Inspections  
Division of TVA Projects  
Office of Special Projects  
U.S. Nuclear Regulatory Commission,  
Region II  
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Atlanta, Georgia 30323

Mr. J. A. Zwolinski, Assistant Director  
for Projects  
Division of TVA Projects  
Office of Special Projects  
U.S. Nuclear Regulatory Commission  
4350 East West Highway  
EWW 322  
Bethesda, Maryland 20814

## ENCLOSURE 1

### Notice of Violation 1 and Deficiency 3 - Cooling Water Flow Diagram

The attached diagrams show the sections of the piping that are currently being replaced leading to the diffuser lines, the section of piping that is currently under study for repairs or replacement, the normal flowpaths for the cooling water system, and the temporary flowpaths currently in use for the cooling water and radwaste systems.

The decision to replace or repair the cooling tower blowdown line completely back to the cooling tower basin has not been made at this time. TVA will inform the State about any decision before the possible replacement work is done.

### Notice of Violation 1 - Chlorination

Several modifications have been made to the sodium hypochlorite injection system in an attempt to improve the system's reliability and performance. These modifications are summarized below:

1. New injection lines were installed at the intake pumping station in late 1986 because the old lines became plugged with solids. Cleaning the existing injection lines was not feasible because the piping is embedded in concrete. These new lines were used during the 1987 chlorination season without any problems.
2. The introduction of hypochlorite into the injection lines is via raw water eductors. Four such injection lines exist. After the new injection lines were installed, the driving force of the eductors became unnecessary because the head pressure from the supply tanks would deliver the hypochlorite to intake pits. Because the eductors have proved to be continuous maintenance problems, two of the eductors were replaced with tees which has increased TVA's ability to control the dosage of hypochlorite to the raw water systems.
3. The supply pipe was modified by installing a y-type strainer before any of the small orifice equipment such as needle valves, eductors, or rotameters. Provisions were included to flush debris from the strainer as needed. This change significantly reduced the downtime because of maintenance.

The above modifications have been completed using temporary changes. A design change has been requested to make the temporary installation into a permanent configuration. These studies will also determine if further improvements in the injection system are possible.

Testing of the total residual chlorine continuous analyzers will begin in the near future and should be complete by mid-April 1988. The results will be presented to the State for evaluation and approval. The analyzers will be scheduled for installation upon approval by the State.

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**APERTURE CARD/HARD COPY AVAILABLE FROM RECORD SERVICES BRANCH, TIDC  
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## ENCLOSURE 2

### Notice of Violation 4 - In-field versus Laboratory pH Measurements

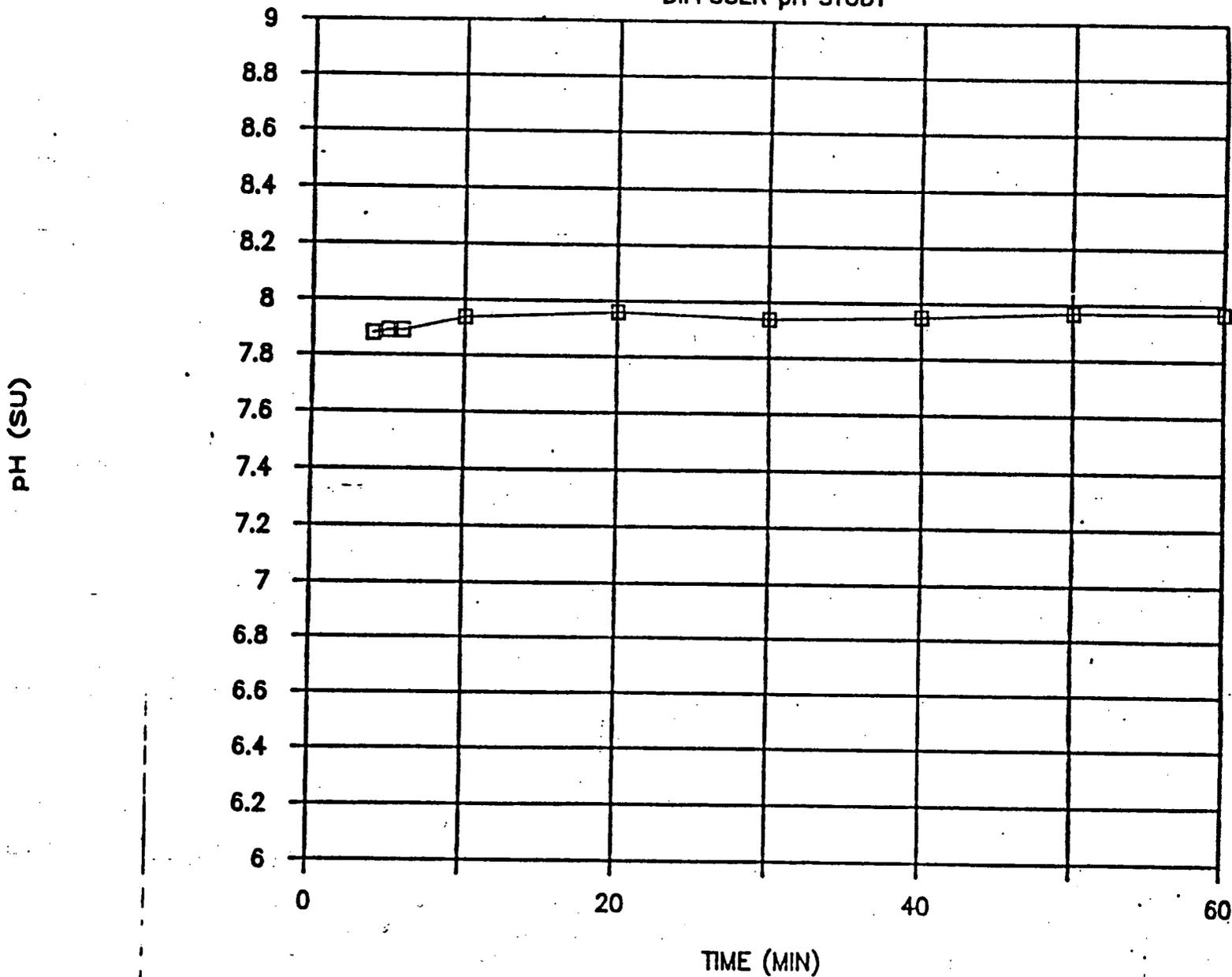
WBN plans to pursue the use of laboratory pH measurements. The chemistry staff conducted studies to determine the effect of temperature and time on pH measurements. The results of these studies are attached in graphical form. For the time studies, a pH meter was installed in the portable building near the ponds. The time for analyses are indicated on the graphs. Samples were taken in polyethylene bottles and sealed until pH measurements were performed. The temperature studies were made in the laboratory using a water bath with the samples in sealed polyethylene bottles. Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985, Method 423, pH values, states that  $\pm 0.1$  pH units represents the required limit of accuracy, and values should be reported within  $\pm 0.1$  pH units. The studies conducted show that the pH values did not vary more than  $\pm 0.1$  pH units over the range of temperatures and times used in the studies. The samples are routinely sealed in one-liter poly bottles until pH measurements are performed. Based upon your review of this information, please advise TVA if a formal variance is required.

NOTE: pH was buffered @ 25° and samples were adjusted to the same temperature when analyzed,  
pH instrumentation accuracy  $\pm 0.1\text{pH(SU)}$

June 1, 1987

# WATTS BAR NUCLEAR PLANT

## DIFFUSER pH STUDY



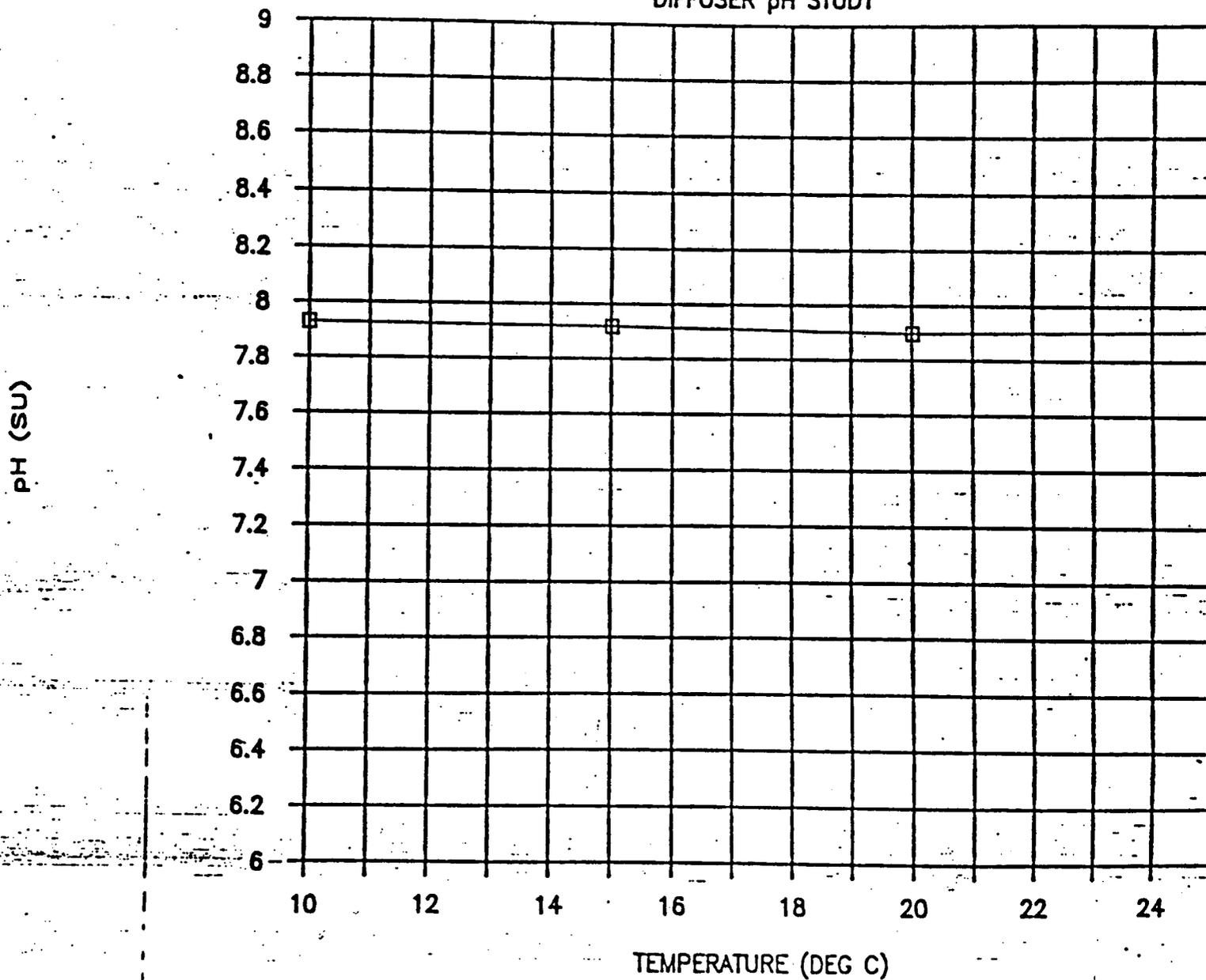
NOTE: Samples at 10°, 15° and 20° were analyzed 3 hours after sample collection,  
Sample at 25° was analyzed immediately after sample collection.

Range of test temperatures includes typical range of river water temperatures.

June 1, 1987

## WATTS BAR NUCLEAR PLANT

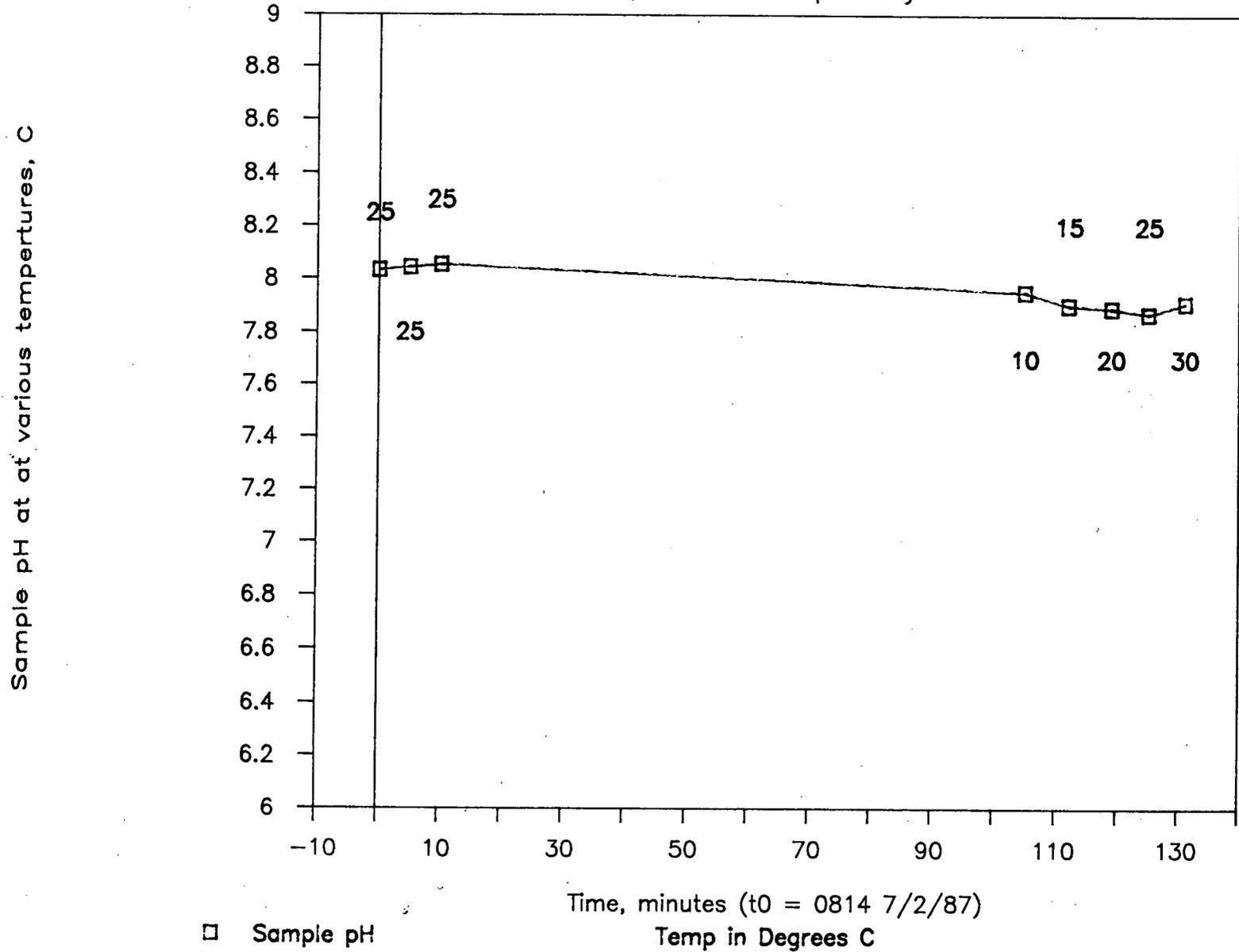
### DIFFUSER pH STUDY



Note: Sample collected at 0724 and temperature variation began at 0824 until 1035 7/2/87.

# Watts Bar Nuclear Plant

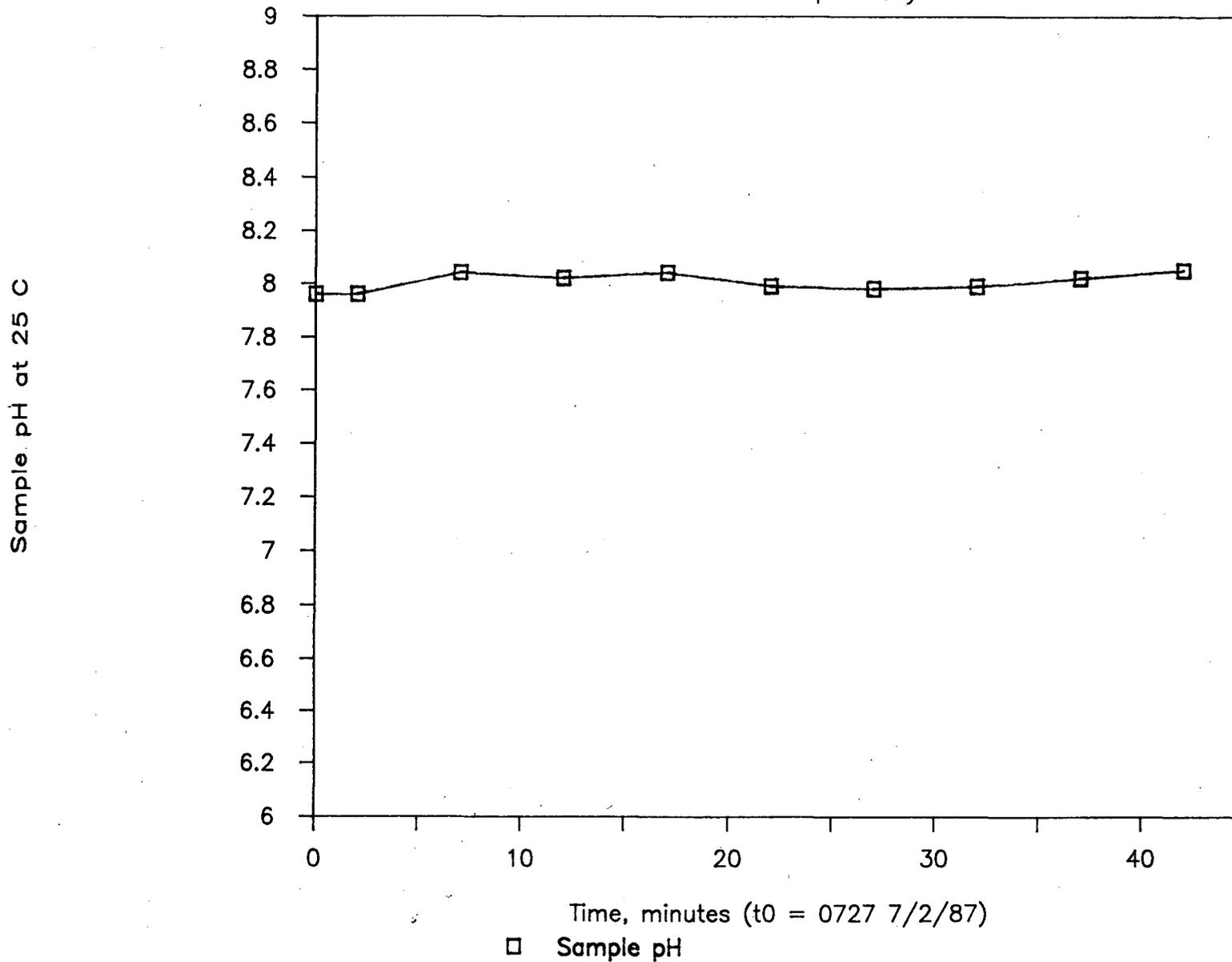
## Environmental pH Study



Note: Sample collected at 0724 7/2/87, first analyzed at 0727 and analyzed 5 minutes apart from 0724 up to 0824 7/2/87.

# Watts Bar Nuclear Plant

## Environmental pH Study



ENCLOSURE 3

Notice of Violation 5 - pH Study

Discharge serial number (DSN) 105, condenser demineralizer regeneration waste, and DSN 109, neutral waste tank, are monitored for pH before being released. This is a plant requirement in WBN Technical Instruction (TI) 16, "Plant Systems Sampling and Chemical Criteria." Tables 14.7 and 28.10 from TI-16 (attached) require that pH analyses be performed for each batch that is released and the specification for pH is 6.0-9.0 standard units. The batch is adjusted if not within the specifications. The pH specification for discharge points DSN 101, diffuser discharge, and DSN 102, yard holding point to cooling tower blowdown, is also 6.0-9.0 pH units. Therefore, TVA believes the pH study requested in your October 16 letter to be unnecessary because the tanks in question must be in limits for pH before release. We request that the State reconsider the need for the pH study.

WATTS BAR NUCLEAR PLANT	(WBN) SITE INSTRUCTION	(DOCUMENT NO.): <u>TI-16</u>
	TITLE: <u>PLANT SYSTEMS' SAMPLING AND CHEMICAL CRITERIA</u>	(REVISION NO.): <u>35</u>
TENNESSEE VALLEY AUTHORITY		(UNIT - IF APPLICABLE) <u>1 and 2</u>
		<input checked="" type="checkbox"/> Quality-Related <input type="checkbox"/> Non-Quality-Related
		<input checked="" type="checkbox"/> Safety-Related <input type="checkbox"/> Non-Safety-Related
		<input checked="" type="checkbox"/> PORC-Reviewed <input type="checkbox"/> Non-PORC-Reviewed

RESPONSIBLE ORGANIZATION: Chemistry Group

WRITTEN BY: D. R. Matthews  
NAME

REVISOR BY: M. King/R. Swatzell/  
S. Woods/C. L. Stewart  
NAME

SUBMITTED BY: M. E. Murray  
(SUPERVISOR) SIGNATURE

M. E. Murray  
NAME

CONCURRENCE SIGNATURE	DATE	CONCURRENCE SIGNATURE	DATE
<input checked="" type="checkbox"/> Manager, Site Quality <i>Fred Karl Teachers Jr for</i>	9-29-87	<input type="checkbox"/>	
<input type="checkbox"/> ANII/ANI		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>	
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PORC Meeting: *E. J. ...*      2344      9/30/87  
PORC Chairman      Number      Date

Approved By: *E. J. ...*      9/30/87  
Signature, Plant Manager      Date

(LAST PAGE OF THIS INSTRUCTION: 330)

**TI-16 - WATTS BAR NUCLEAR PLANT CHEMICAL CRITERIA - CDS NEUTRALIZATION TANK**

Table 14.7

Sample Location: Elevation 685 T8-d

Root Valve Location: Elevation 679, T10-d, Root Valve 14-302A

Sampling Method: 16.1.2

Flush Time: 7 Minutes

Logsheets: 37.14.5

Parameters	Specifications	Corrective Action	TI-11/12 Method	Sampling Frequency	References		Cross	Notes
					Spec.	Samp. Freq.		
pH (SU)	≥ 6.0, ≤ 9.0	26	11.44	B	2	2	10	-
Radiochemical Specifications	Note 58	Note 58	Note 58	B	3	3	-	58
Flow (mgd)	-	-	-	Cd	29	29	21	101
Oil & Grease (ppm)	≤20	14.17	11.41	Cd	29	29	21	101
Total Suspended Solids (ppm)	≤100	14.17	11.60	Cd	29	29	21	101
Floating Solids & Visible Foam	≤Trace	14.17	---	Cd	29	29	21	101

Reference Drawings: 47W838-3

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TI-16 - WATTS BAR NUCLEAR PLANT CHEMICAL CRITERIA - WTP NEUTRALIZATION TANK

Table 28.10

Sample Location: Elevation 686, T6.8-c/d

Root Valve Location: -

Sampling Method: 16.1.2

Flush Time: 5 Minute

Logsheets: 37.28.13

Parameters	Specifications	Corrective Action	TI-11/12 Method	Sampling Frequency	References			Notes
					Spec.	Samp. Freq.	Cross	
Floating Solid or Visible Foam	≤ TRACE	14,17	-	B	29	29	21	100
Oil and Grease (ppm)	≤ 20.0	14,17	11.41	B	29	29	21	100
Total Suspended Solids (ppm)	≤ 100.0	14,17	11.60	B	29	29	21	100
pH (SU)	≥ 6.0, ≤ 9.0	26	11.44	B	2	2	21	100
Flow (MGD)	-	-	-	B	29	29	21	100

Reference Drawing: 47W834-2

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ENCLOSURE 4

Deficiency 4 (a through d) - Sewage Treatment Plant

In the General Operating Instruction for the Wastewater Treatment Plant previously sent to you, items 6.2.2.1 and 6.2.4.1 state the "samples shall be collected . . . directly into sample containers . . ."

The splitter box will be modified by installing adjustable baffles. No attempts will be made to level the splitter box. The modification is scheduled for the weekend following the Thanksgiving holiday, a period when sewage inflow will be low. A brief report on the effects of modifications to the splitter box on settleable solids of the four sewage treatment units will be sent to you by February 29, 1988.