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APR 25 1980

MEMORANDUM FOR: J. T. Collins, Deputy Program Manager, TMI Program Office

FROM: George Kalman, TMI Program Office

SUBJECT: GROUND WATER MONITORING PROGRAM STATUS

Well Status

Monitoring Wells: All eight ground monitoring wells are functional. Samples were taken from these wells daily from April 11 to April 18, 1980. Composite, split samples were sent to four laboratories for analysis. The tritium analysis from the participating laboratories is included in enclosure (1). No other radioactive isotopes were identified in the samples. Based on the consistency of the daily sample results, sampling frequency will be reduced to once per week.

Based on sample trends to date, and the relatively low tritium content in the well water, it was agreed that well water would be pumped directly to the storm drains if sample results were available from water pumped during the previous week.

The source of the brown color in wells two, three, and eight has not been identified. Test results to date have not identified anything in the water which would prohibit discharge to the river. The NRC has requested a copy of all brown water test results. The test results will be forwarded to the state (Carlile Westlund) to determine whether the water meets state criteria for discharge to the river.

Observation Wells: Seven observation wells are being drilled in the locations shown by enclosure (2). It is hoped that the observation wells will help identify the source of the higher tritium levels in wells two, three, and eight.

Observation well drilling commenced on April 22, 1980. Barring weather problems and equipment failure, one observation well should be completed each day. Five observation wells will be drilled to bedrock. The two observation wells west of the reactor building will be drilled 15 feet into the bedrock to detect any potential water migration through the bedrock.

OFFICE ►						
SURNAME ►						
DATE ►						

General

1. Bill Riethle, GPU (944-1768), is the primary contact for the licensee ground water monitoring program.

2. The licensee considers that background tritium activity in the river surrounding TMI is 200 - 500 picocuries per liter. EPA records examined by the NRC indicate that background tritium in the general area is 200 picocuries per liter.

3. The next ground water monitoring meeting is scheduled for 10:00 a.m. on Thursday, May 1, 1980.

George Kalman
TMI Program Office

Enclosures: (1) Agenda, April 23, 1980, Ground Water Monitoring Meeting
(2) Map of Well Locations

cc: W. Bivins
T. Johnson
M. Shanbaky
B. Snyder
M. Greenberg

OFFICE ►	TMI	TMI				
SURNAME ►	GKalmna/ws DK	MGreenberg				
DATE ►	4/25/80	4/ /80				

AGENDA

LOCATION: Three Mile Island

TIME: 3:00 pm

DATE: April 23, 1980

ATTENDEES: GPU, NRC, Bechtel, Ground/Water Technology, Inc., DER

SUBJECT: Groundwater Monitoring

I. Report of Results
   A. Groundwater - GPU
   B. Soil - GPU

II. Observation Well Program
   A. Location of wells - Bechtel
   B. Development of wells - Bechtel
   C. Procedures for drilling - Bechtel
   D. Procedures for sampling - GPU, Ground/Water Technology, Inc.
   E. Sample handling and analysis - GPU, Ground/Water Technology, Inc.
   F. Discussion

III. Schedule - GPU, Bechtel

ENCLOSURE 1

EFFICIENCY, LINE NO. 6636

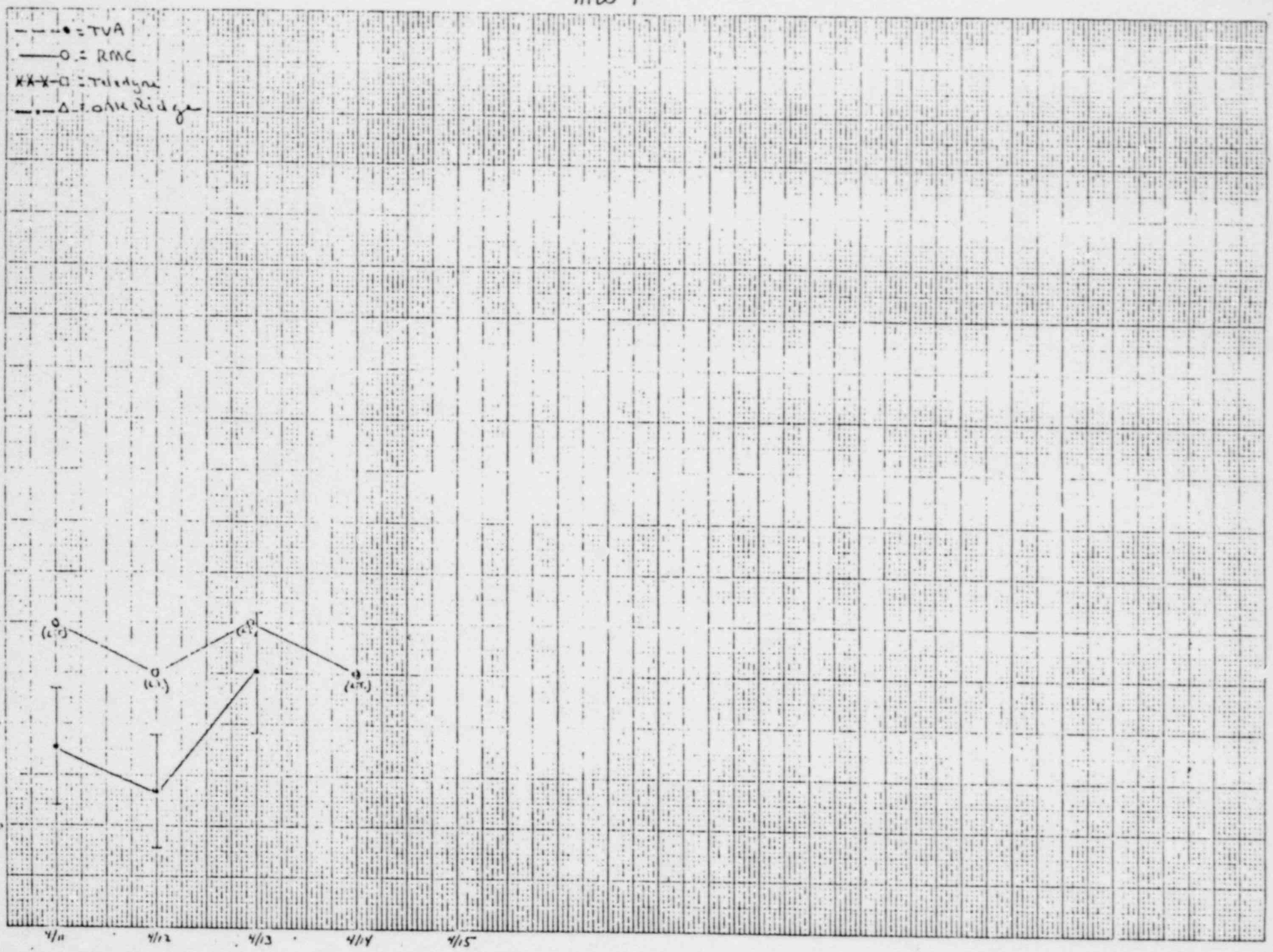
T = Teledyne
RMC = RMC
OR = Oak Ridge
TVA = TVA

H_3 Analysis
pCi/liter

Date/lab	1 MW1	2 MW2	3 MW3	4 MW4	5 MW5	6 MW6	7 MW7	8 MW8	9 Pond	10	11	12	13
4/11 T[1]	-	1010±110	700± 80	-	-	-	-	1060±100	190±70				
RMC[2]	<300.0	770±200	560±190	<300.0	<300.0	<300.0	<300.0	690±200	<250				
OR[3]	-	-	-	-	-	-	-	-	-				
TVA[4]	178±57	921± 79	266± 58	252± 59	160±57	301± 60	436± 60	885± 74	172±55				
5													
4/12 T[6]	-	920± 80	720±100	-	-	-	-	1020±100	<100				
RMC[7]	<250	810±180	600±170	<250	<250	<250	300±160	710±200	<300				
OR[8]	-	-	-	-	-	-	-	-	-				
TVA[9]	135±56	774± 74	358± 60	301± 60	-	356± 61	393± 63	793± 75	123±54				
10													
4/13 T[11]	-	980±110	690± 90	-	-	-	-	790±100	100±80				
RMC[12]	<300	580±200	440±190	<300	<250	290±160	330±160	810±170	<250				
OR[13]	-	-	-	-	-	-	-	-	-				
TVA[14]	252±59	860± 77	449± 63	264± 59		333± 60		665± 67	100±50				
15													
4/14 T[16]	-	1010±100	590± 70	-	-	-	-	860±100	90±80				
RMC[17]	<250	840±170	640±160	<250	<250	<250	250±160	620±160	-				
OR[18]	-	-	-	-	-	-	-	-	-				
TVA[19]	-	1056± 81	470± 65	293± 58	235±57	411± 60	-	617± 65	-				
20													
4/15 T[21]	-	610± 80	1040±100	-	-	-	-	570± 90	110±80				
RMC[22]	-	-	-	-	-	-	-	-	-				
OR[23]	-	-	-	-	-	-	-	-	-				
TVA[24]	-	-	-	-	-	-	-	-	-				
25													
26	- RESULTS NOT RECEIVED												
27													
28													
29													
30													
31													

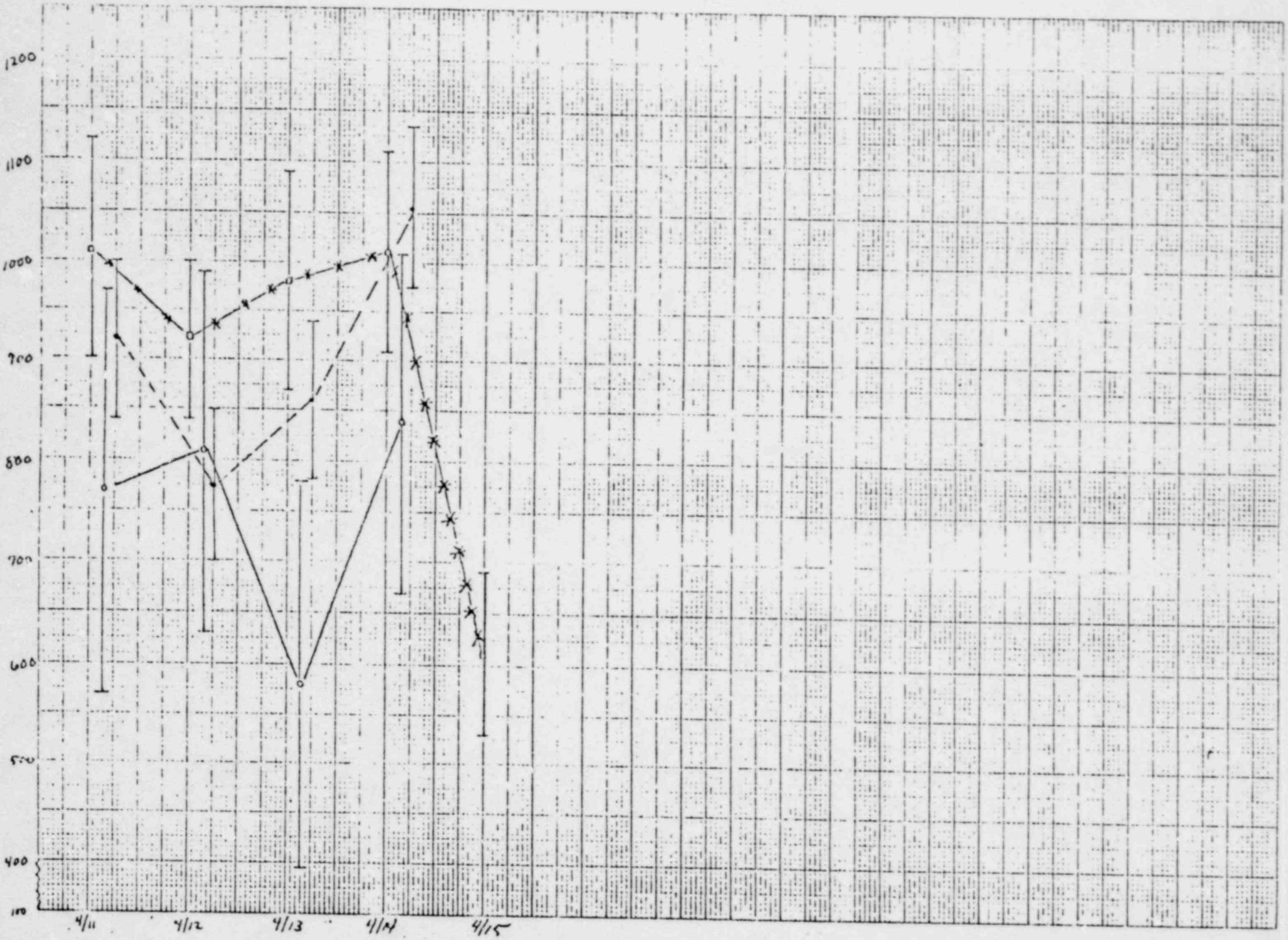
NH_3 Conc.

MW 1


---•: TVA
——○: RMC
XX-X-□: Teledyne
—·—Δ—: Oak Ridge
pCi/liter
1
100
4/11
4/12
4/13
4/14
4/15
DATE

—□ = RMC
- - - ◇ = TVA
++□ = Talladega
Δ = Oak Ridge

M.W. #2
H_3 Conc.



—— O = RMC

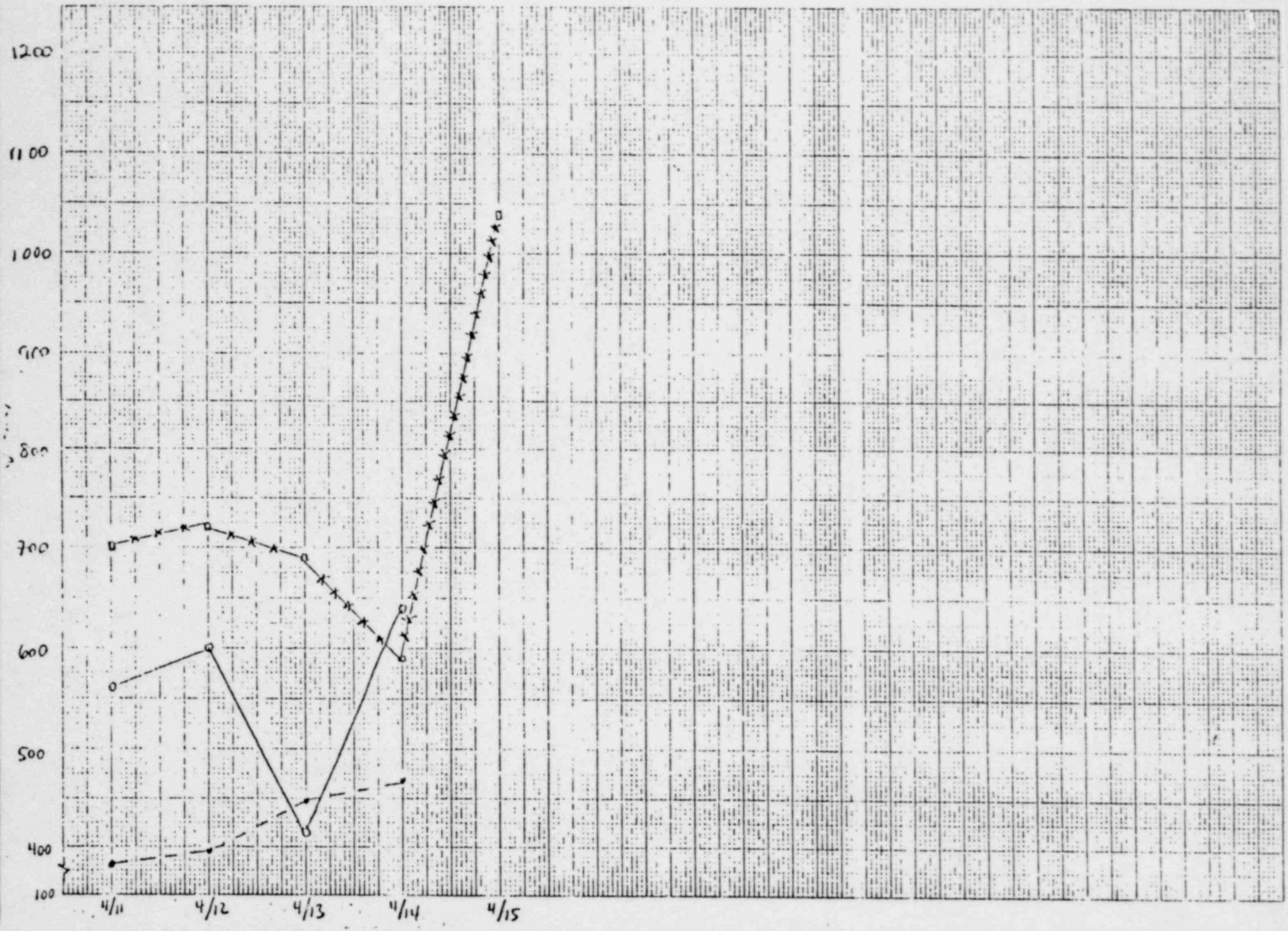
- - - ● = TVA

✱✱✱ = TELEDYNE

Δ = OAK RIDGE

M.W. H3

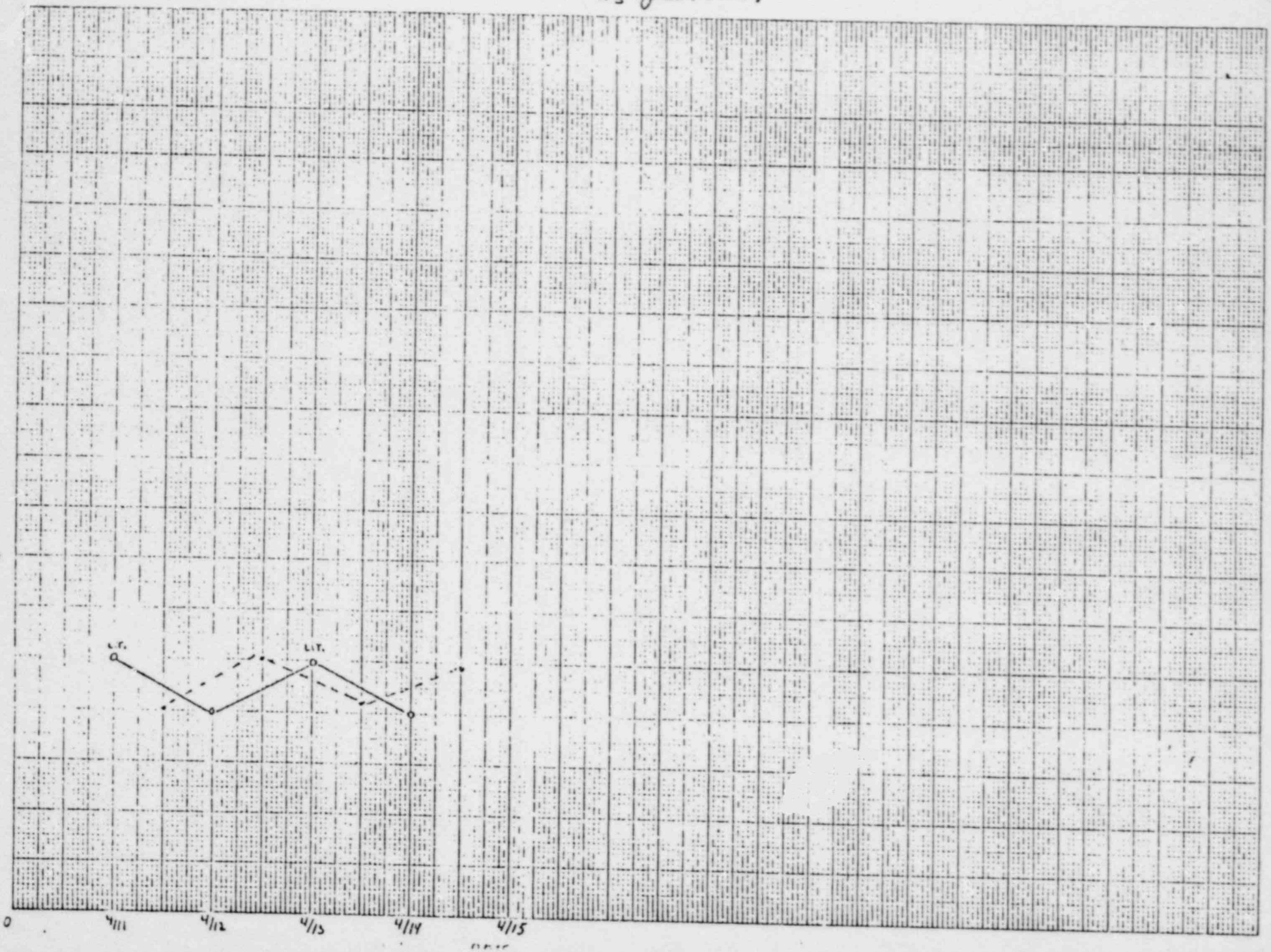
H_3 (pCi/LITER)



- • - TVA
-▪▪- = TELEDYNE
Δ = OAK RIDGE
L.T. = LESS THAN

M.W. # 4

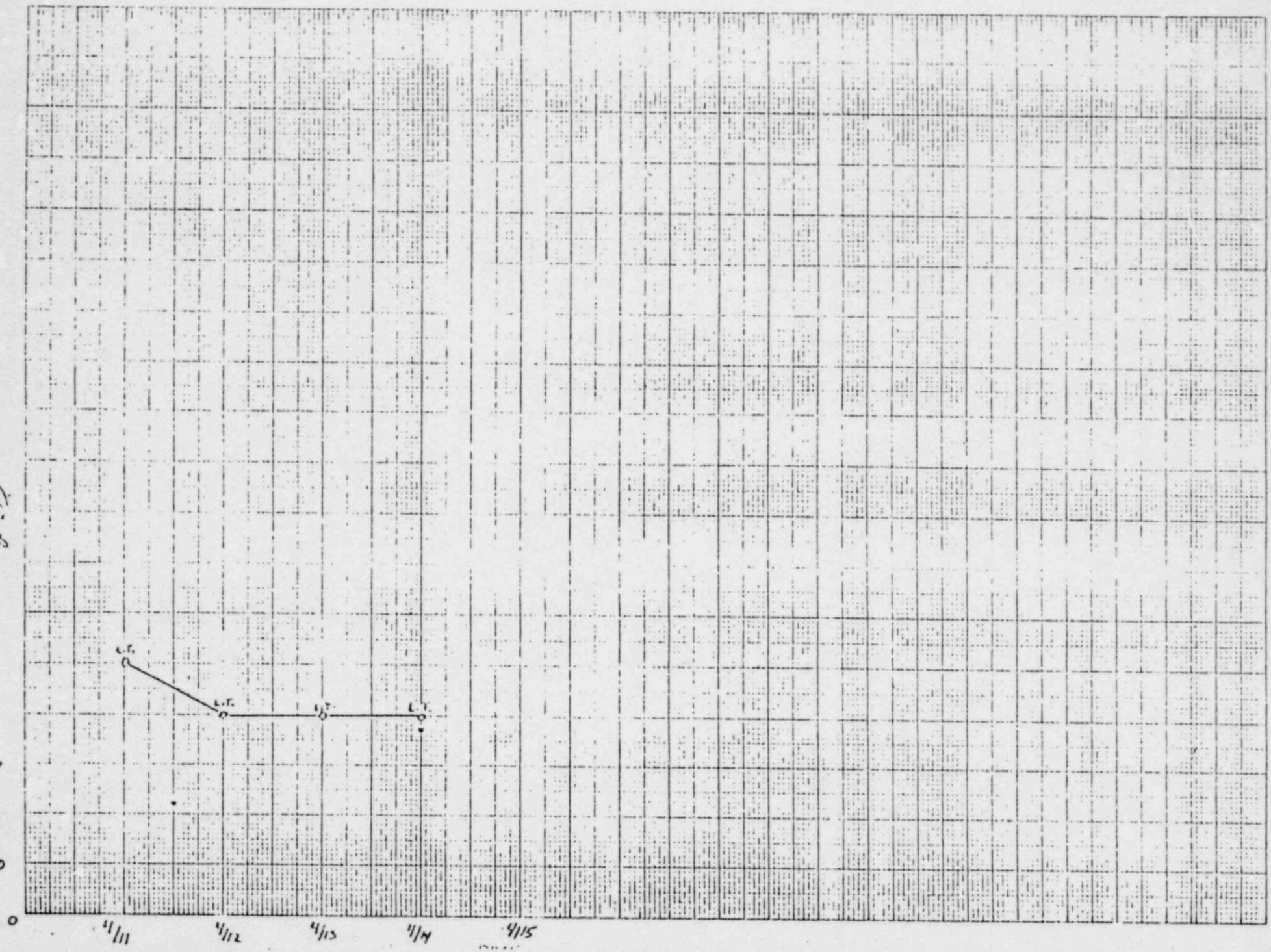
H_3 (pCi/liter)



□ = YELLOWPINE
△ = OAK RIDGE

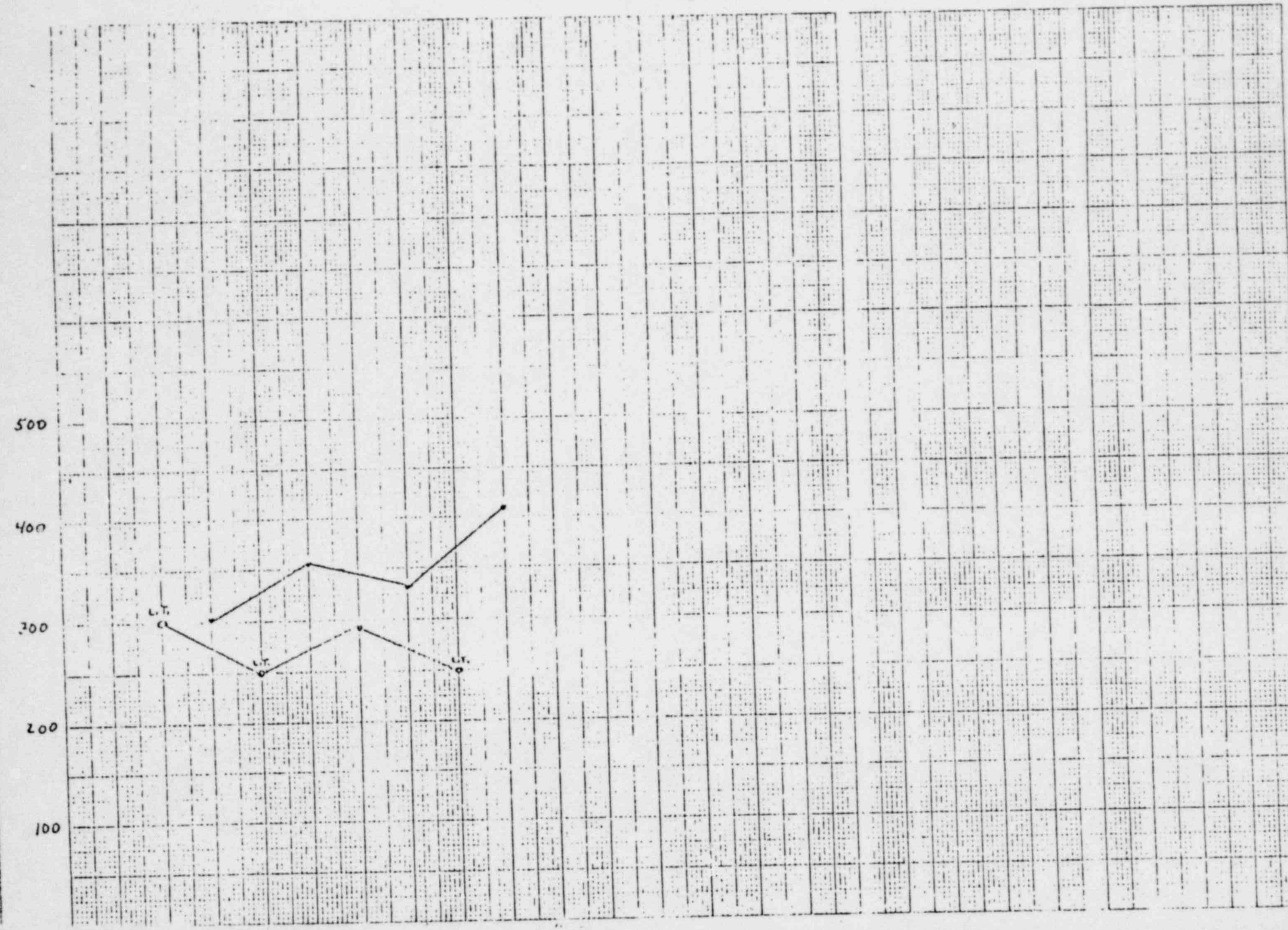
MW-5
H_3 RESULTS (pCi/l)

L.T. = LESS THAN



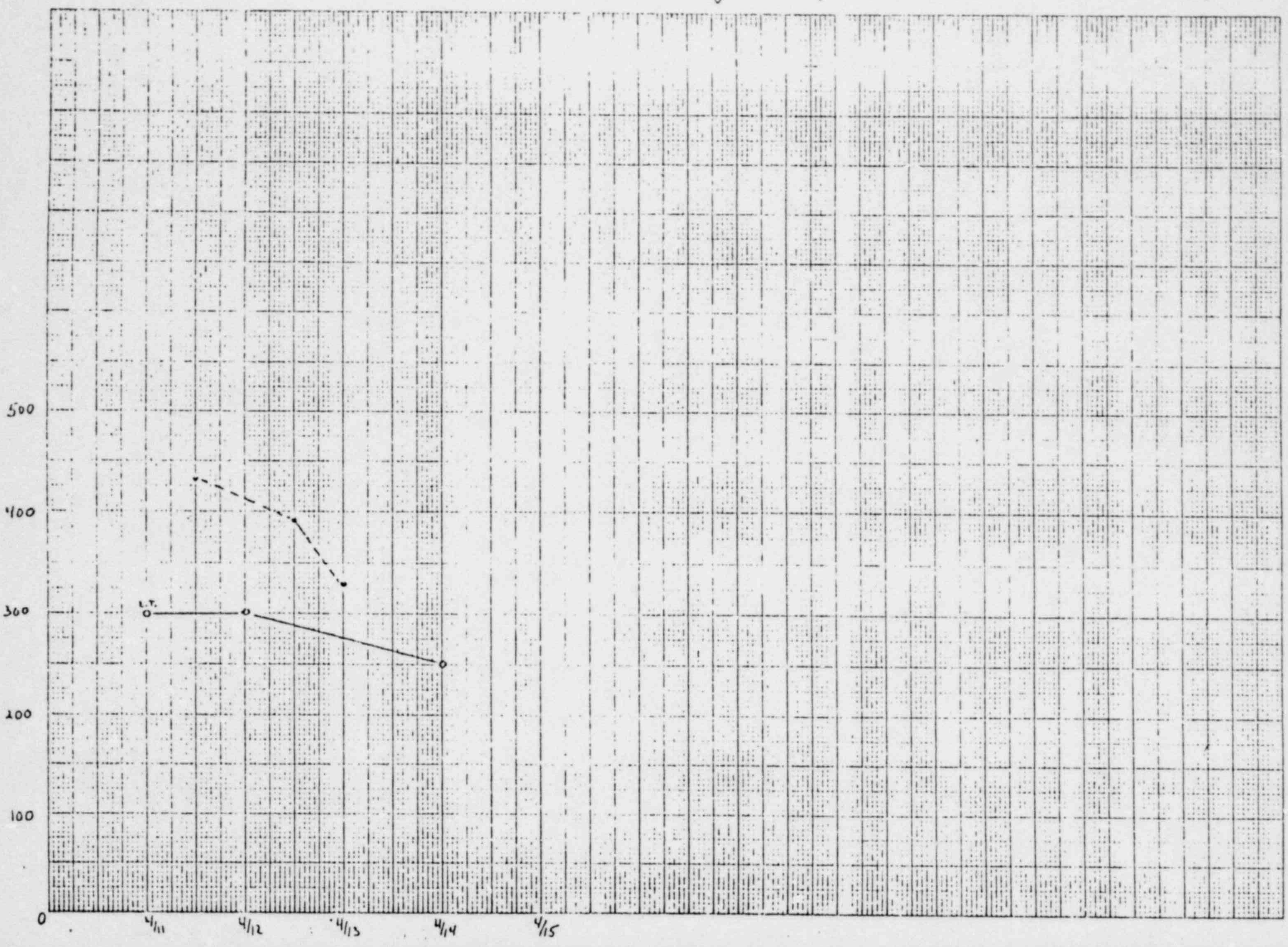
L.T. = LESS THAN

MW-6
H_3 RESULTS (pCi/l)



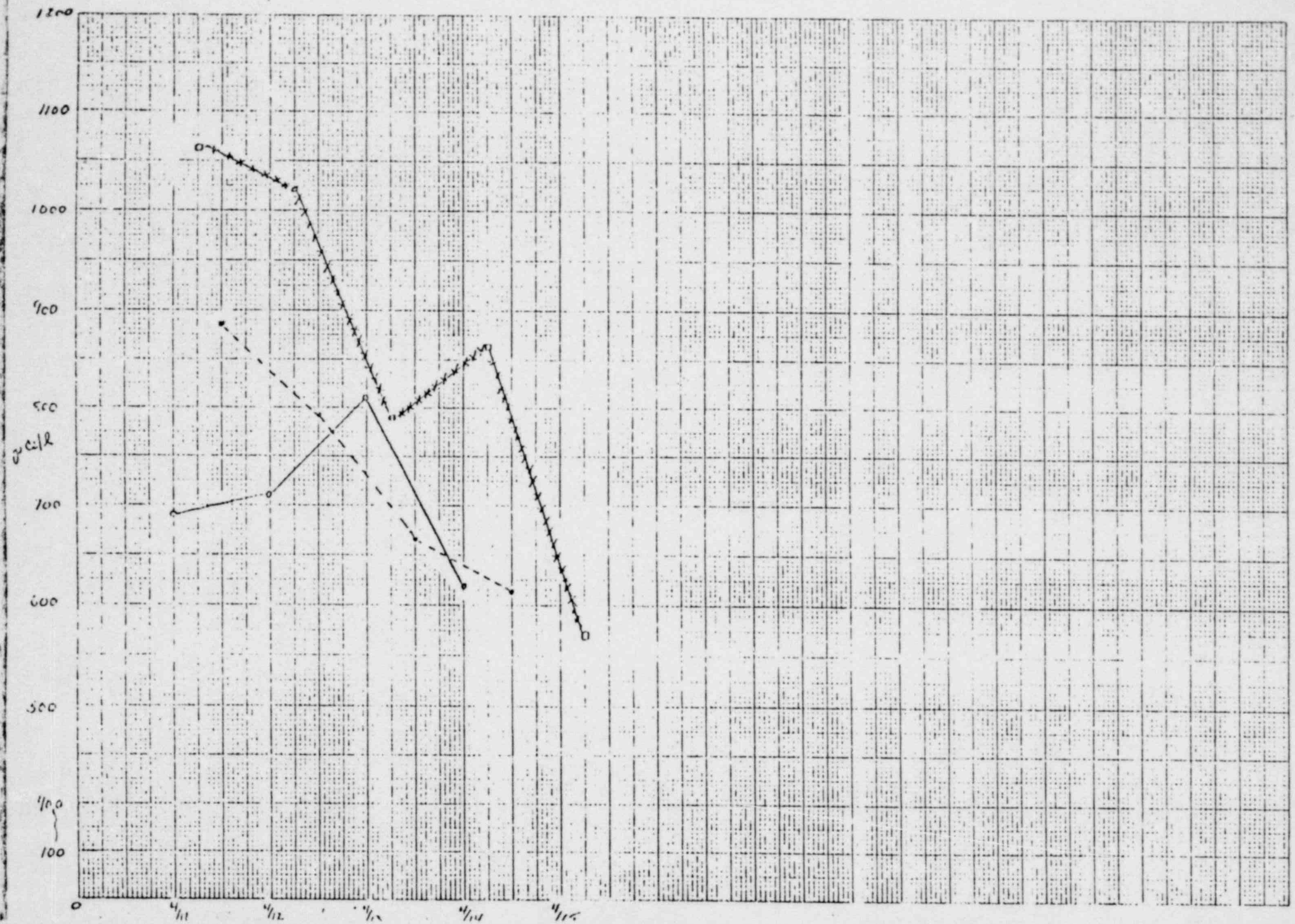
MW-7

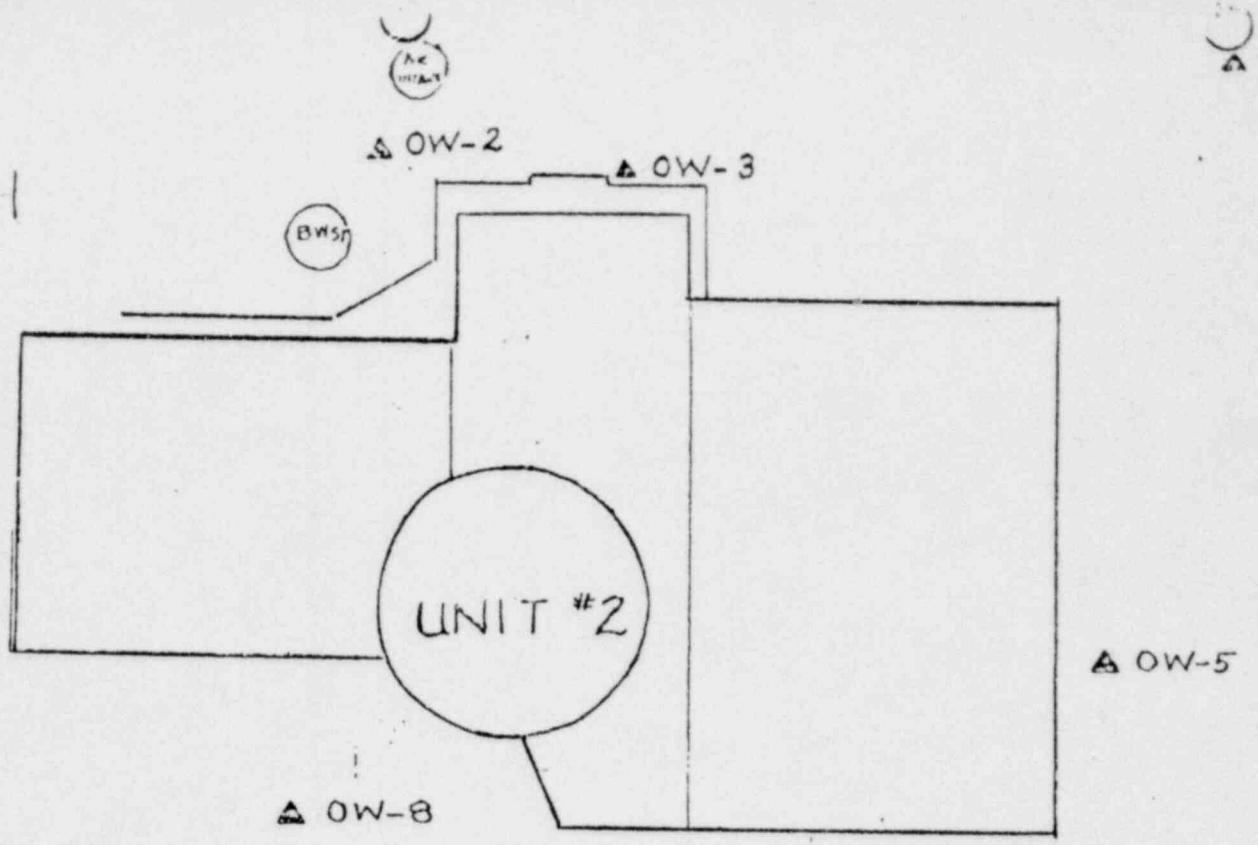
H3 RESULTS (pCi/liter)



• • TVA - - -
□ • TECUMSEH ---
△ • OAK RIDGE - - -

MW-E
H_3 RESULTS (pCi/liter)





O. W. #	W. L. Elev.	Ave. H^3
1		
2		
3		
4		
5		
6		
7		
8		

GROUNDWATER OBSERVATION WELLS
THREE MILE ISLAND UNIT 2

100 ft.

I. SOIL

A. Materials

1. Heavy plastic bags (large and small)
2. Cutting board
3. Plastic knives
4. Ruler
5. Log book
6. Disposable gloves
7. Storage drums
8. Bottled water
9. Sample jars

B. Sampling

1. Soil samples will be taken in two foot sections down to bedrock with a two inch split spoon sampling device.
2. Upon completion of each section, the sampling spoon will be brought to the surface and placed on a heavy plastic sheet covering the cutting board. To prevent confusion, the top of the spoon will consistently be placed at a given end of the cutting board.
3. The spoon's contents will be examined to identify changes in soil consistency. Zones thus identified will be described, measured, and recorded (log book).
4. When necessary, the top few inches of the sample will be removed and discarded. This will remove material dislodged and deposited on the inside top of the spoon during travel of the sampling device in and out of the well.
5. To the extent possible, one sample per horizon will be obtained for particle-size analysis. This sample will be placed in small sample jars provided by the contractor.
6. To the extent possible, as dictated by soil horizons, the top five feet of each observation well will be sampled in one foot increments. Samples of homogeneous physical consistency will be divided in half and each half thoroughly mixed in plastic bags. Two, 1½ pound aliquots (minimum weight) will be removed for analysis of radioactivity. Each of these samples will be double bagged and marked with the following information.

TMI-2/Soil
Well #
Core #
Horizon
Date

7. For spoon samples of more than one horizon, samples (as described above) will be obtained for each horizon.

8. Following the sampling of the first five feet of materials, subsequent samples will be two foot increments unless divided by horizons.
9. The spoon will be cleaned between samples by rinsing with bottled water. The waste water will be placed in a storage drum located near the observation wells.
10. The sample collectors will wear disposable gloves. The gloves will be changed after each sample.

CHRONOLOGY OF GROUNDWATER SITUATION

3/28/80 - Groundwater sample taken from MW-2. Soil samples taken from area surrounding MW-2 as a result of high tritium level found in February 26, 1980 groundwater sample.

4/2/80 - Groundwater samples taken from MW-2, MW-3, MW-6, MW-8. Soil samples taken from surface area near MW-2, MW-3, MW-6.

- Samples delivered to Teledyne and RMC for analysis.

- NRC meeting concerning status of Groundwater Monitoring Program.

4/3/80 - 4/8/80 - Results from samples taken from April 2, 1980 were received from Teledyne and RMC.

- MW-2 tritium results were still above background levels.

4/9/80 - Groundwater samples from all monitoring wells taken.

- Proposal to drill five shallow holes around BWST.

4/10/80 - Groundwater samples delivered to RMC and Teledyne.

4/11/80 - Groundwater and pond water samples taken.

4/12/80 - Groundwater and pond water samples taken.

- Soil samples taken from the five and ten foot levels of the shallow holes bored at the five locations around the BWST.

4/13/ - Groundwater and pond water samples taken.

4/14/80 - Groundwater and pond water samples taken.

- Bechtel plan for drilling observation wells is proposed.

4/15/80 - Samples prepared for shipment to four labs.

4/16/80 - Samples delivered to RMC, Teledyne, and TVA.

- Groundwater and pond water samples taken.

4/17/80 - Samples delivered to Oak Ridge.

- Groundwater and pond water samples taken.

4/18/80 - Groundwater and pond water samples taken.

4/19/80 - Groundwater and pond water samples taken.

4/21-4/22/80 - Results received from samples taken 4/10 - 4/14.

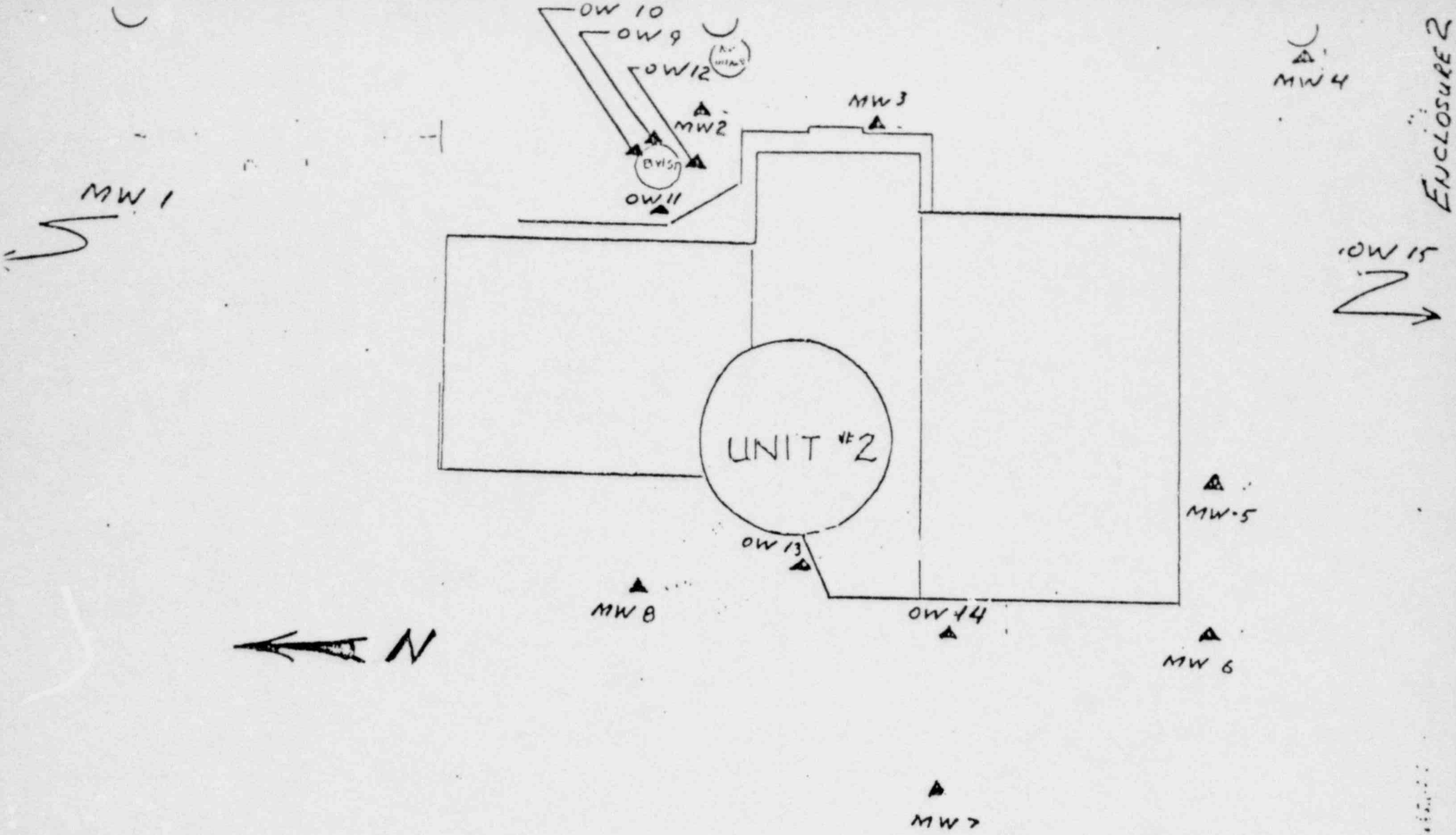
4/22/80 - Soil samples obtained from OW-9.

FLOW PATTERNS

An investigation of all the available geologic reports, subsurface data, and a supplementary geologic reconnaissance of the site confirms that two interconnected water-bearing units exist in the vicinity of Unit 2; the sand and gravel comprise one unit and underlying bedrock is the other. The soils are much more permeable than the rock. Within the rock, the thin weathered zone near the rock surface is probably more permeable than the bulk of the rock, which transmits water by flow through a system of joints and fractures.

The current water level data indicate a general groundwater flow pattern from east to west with a rather flat gradient. Water levels are believed to be the same in both the soil and rock units and east-west flow is probably occurring through the bedrock beneath the Unit 2 structures.

The groundwater flow pattern, apparent from the current data, supports the following conclusions about the Reactor Building as a hypothetical source of seepage. If fluid leaked from the Reactor Building, it would (1) flow to the natural groundwater along the seepage path of highest hydraulic gradient and (2) flow down-gradient once it had reached the body of flowing groundwater. Thus, any postulated seepage from the Reactor Building should be expected to (1) flow toward the northwestern quadrant of the Reactor Building and thence (2) flow generally westward through the rock fractures, and/or the overlying soil, toward observation wells #8 and #13. Therefore, it is not reasonable to expect that indications of Reactor Building leakage would be detected in observation well #2.



ENCLOSURE 2

GROUNDWATER OBSERVATION WELLS
THREE MILE ISLAND UNIT 2

1" = 100 ft.