TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE
37401

TVA 40TH ANNIVERSARY OF PEOPLE IN PARTNERSHIP

May 23, 1974

Mr. John F. O'Leary, Director
Directorate of Licensing
Office of Regulation
U.S. Atomic Energy Commission
Washington, DC 20545

Dear Mr. O'Leary:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 1 - DOCKET NO. 50-259 - FACILITY OPERATING LICENSE DPR-33 - ABNORMAL OCCURRENCE REPORT BFEAO-7419W

The enclosed report is to provide details concerning a river temperature increase exceeding the Environmental Technical Specification. This event occurred on Browns Ferry Nuclear Plant unit 1 on April 29, 1974. This report is submitted in accordance with Appendix A to Regulatory Guide 1.16, Revision 1, October 1973.

This letter supersedes a letter dated May 9, 1974, in which the Abnormal Occurrence Report number was incorrectly given.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

E. J. Thomas

E. F. Thomas
Director of Power Production

Enclosures
CC (Enclosures):
Mr. Norman C. Moseley, Director
Region II Regulatory Operations Office, USAEC
230 Peachtree Street, NW., Suite 818
Atlanta, Georgia 30303

50-259

4772

COPY SENT REGION 2

ABNORMAL OCCURRENCE REPORT

Report No.: BFEAO-7419N
Report Date: May 9, 1974
Occurrence Date: April 29, 1974
Facility: Browns Ferry Nuclear Plant Unit 1

Identification of Occurrence

At 4 p.m. on April 29, 1974, Browns Ferry Nuclear Plant exceeded the Environmental Technical Specification limit of 5.0° F. river temperature increase.

Conditions Prior to Occurrence

The reactor load increased steadily from 487 MWe at 9 a.m. to 773 MWe at 4 p.m. Riverflow was between 30,000 and 45,000 cfs for the entire period and was about 40,000 cfs at the time of occurrence. The weather was clear and air temperatures ranged from a low of 60.9° F. at 5 a.m. to a high of 81.1° F. at 4 p.m.

Description of Occurrence

The temperature difference between the upstream control thermistor at TRM 309.7 and the downstream thermistor at TRM 292.5, as displayed in the power plant control room, reached 5.3° F. at 4 p.m. The data printout from the monitoring stations at approximately the same time showed this difference to be 5.1° F.

Designation of Apparent Cause of Occurrence

This situation was apparently caused by a natural difference in the temperature of the water between the upstream and downstream monitors at the 5-foot depth. This difference is not the result of plant operation but is apparently caused by diurnal solar heating.

Analysis of Occurrence

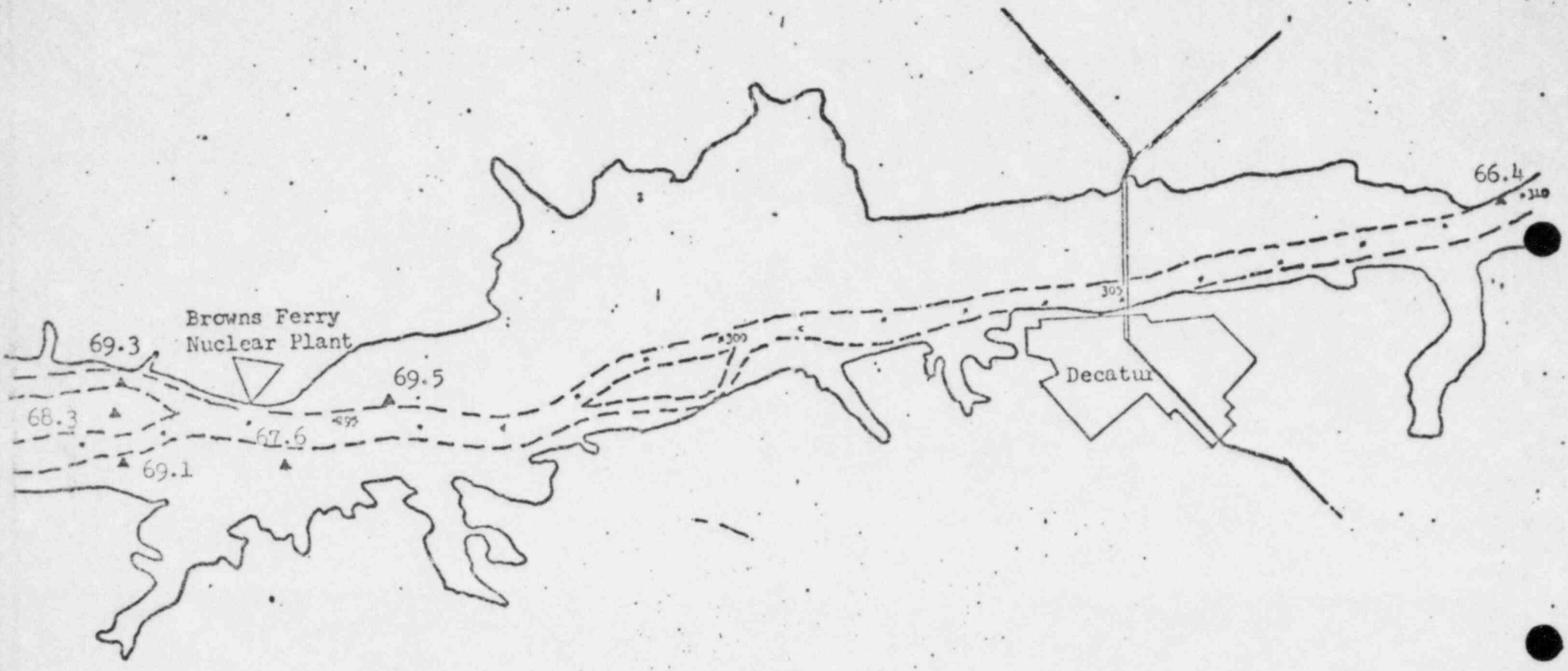
The attached sketches show the variation of temperatures at the surface and at the 5-foot depth throughout the monitored reach of the river during the abnormal occurrence period. These sketches show a higher temperature rise between the two upstream thermistors than between any of the five thermistors in the immediate upstream and downstream vicinity of the plant.

With riverflow between 30,000 and 45,000 cfs during the entire period, there is no doubt that positive flow was maintained past the plant at all times. This, together with the rapid air warming from 60.9° F. to 81.1° F. and the large river surface area downstream from Decatur, indicates that most of the temperature rise was caused by natural conditions rather than the plant discharge.

An analysis of the plant heat load and streamflow will also show that the plant discharge could not have been responsible for the entire temperature rise. The rise in temperature of the condenser circulating water ranged from 15° F. at 2 p.m. to 17.1° F. at 4 p.m. The circulating water flow rate was between 1,400 and 1,425 cfs for this period. The plant effluent diffuser is designed to immediately mix this with at least 22 percent of the riverflow or 8,800 cfs. This immediate dilution is about 6 to 1 and therefore the maximum temperature rise caused by the plant effluent would have been 2.9° F. Preliminary results of a field investigation made on May 4, 1974, indicate that the diffuser is operating as designed and is holding the temperature rise to 2 or 3° F.

Corrective Action

An immediate solution to this problem is not available. We are analyzing the results of the field investigation and are developing a technique to interpret the data from the monitoring system to account for the effects of solar heating and lateral wind-induced currents. This should provide a river temperature rise attributable only to the plant discharge.

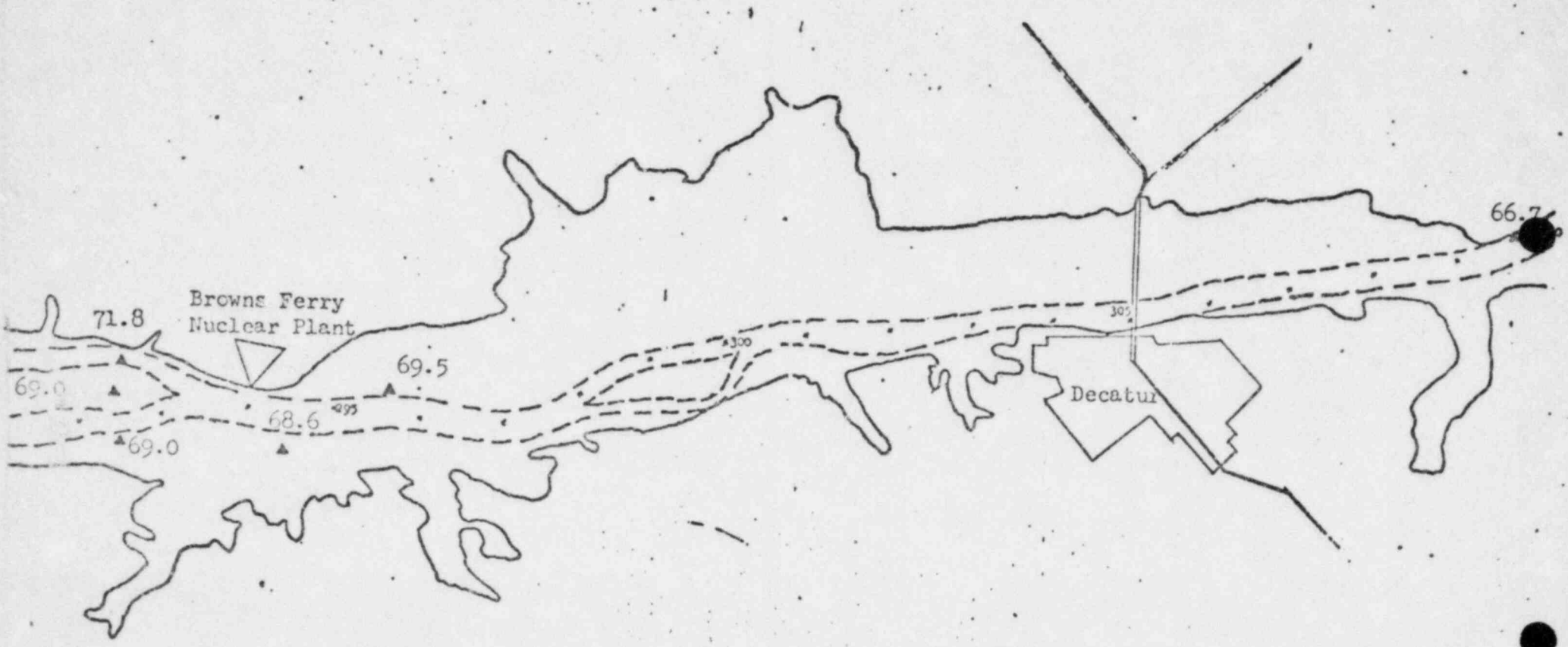


Wheeler Reservoir

Date: April 29, 1974
Time: 1400
Depth: 5-foot

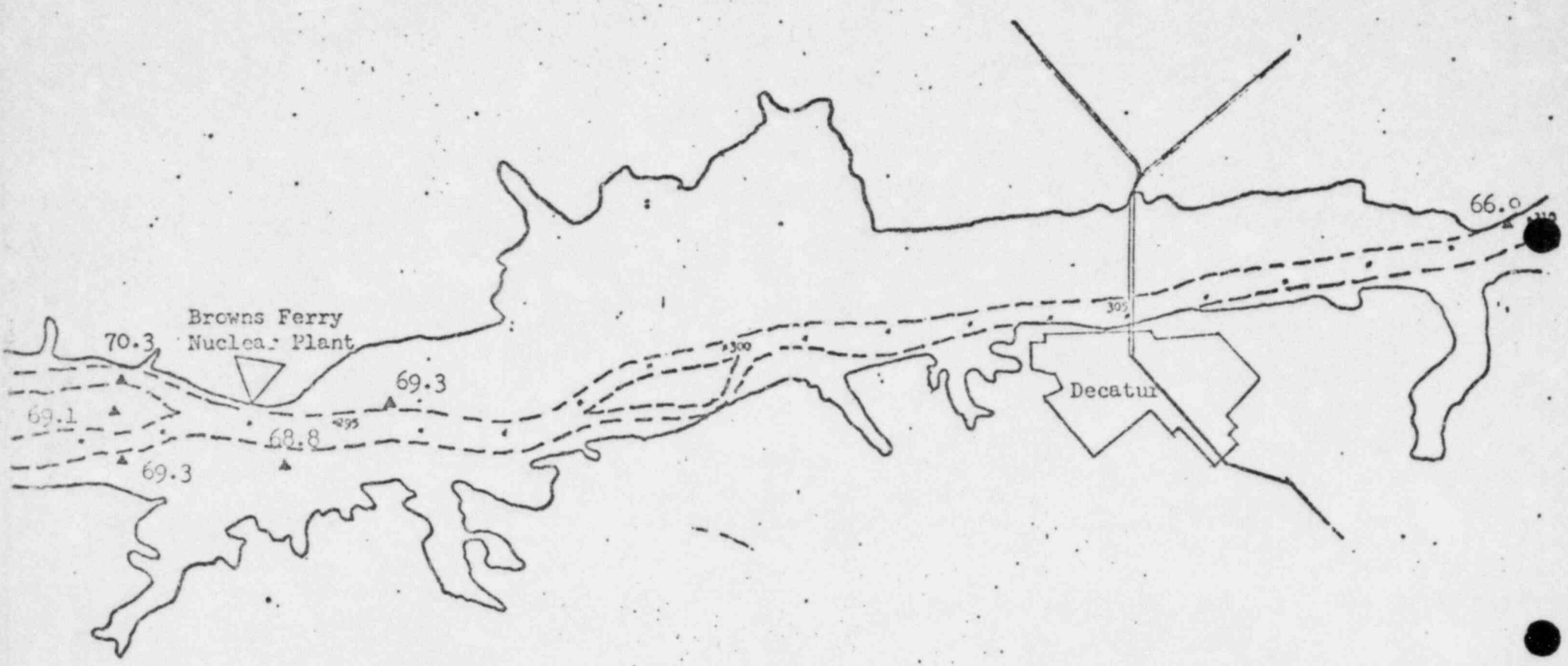
Wheeler Reservoir

Date: April 29, 1974
Time: 1500
Depth: 5-foot



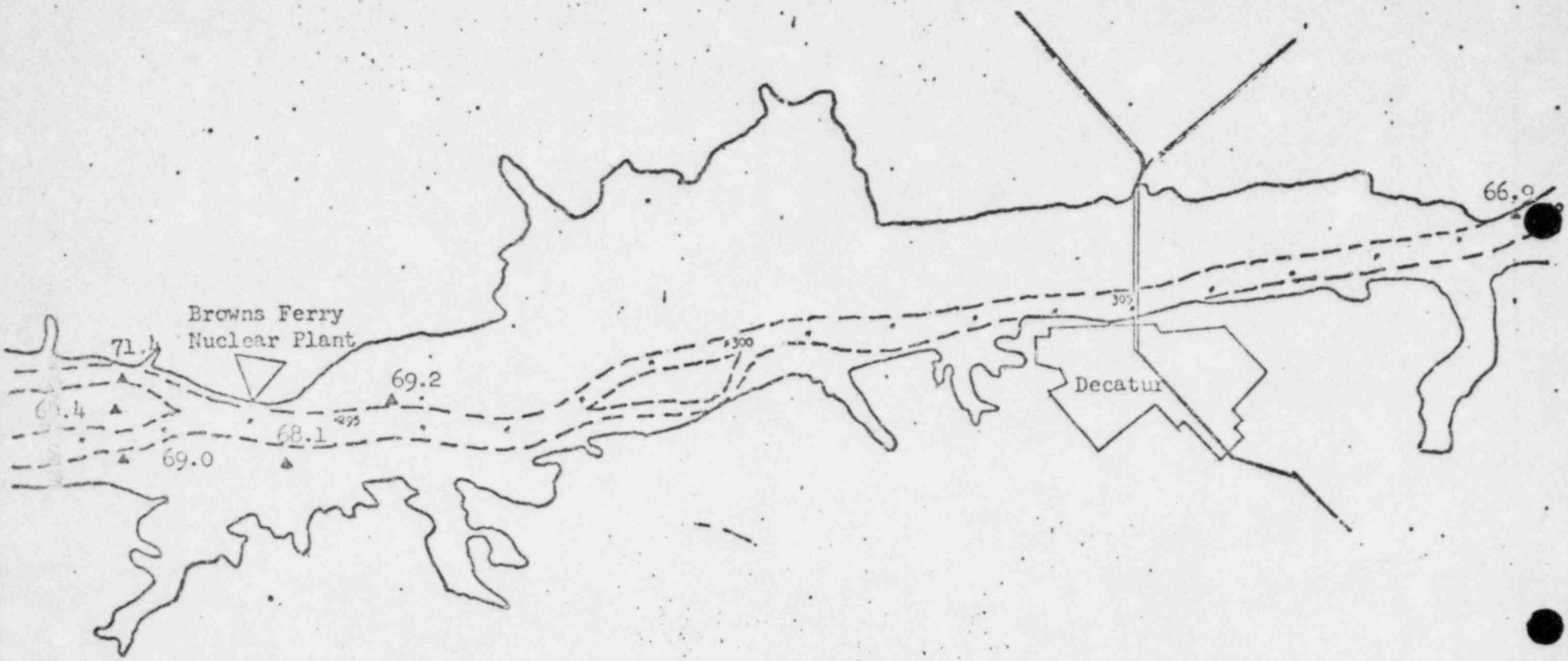
Wheeler Reservoir

Date: April 29, 1974
Time: 1600
Depth: 5-foot



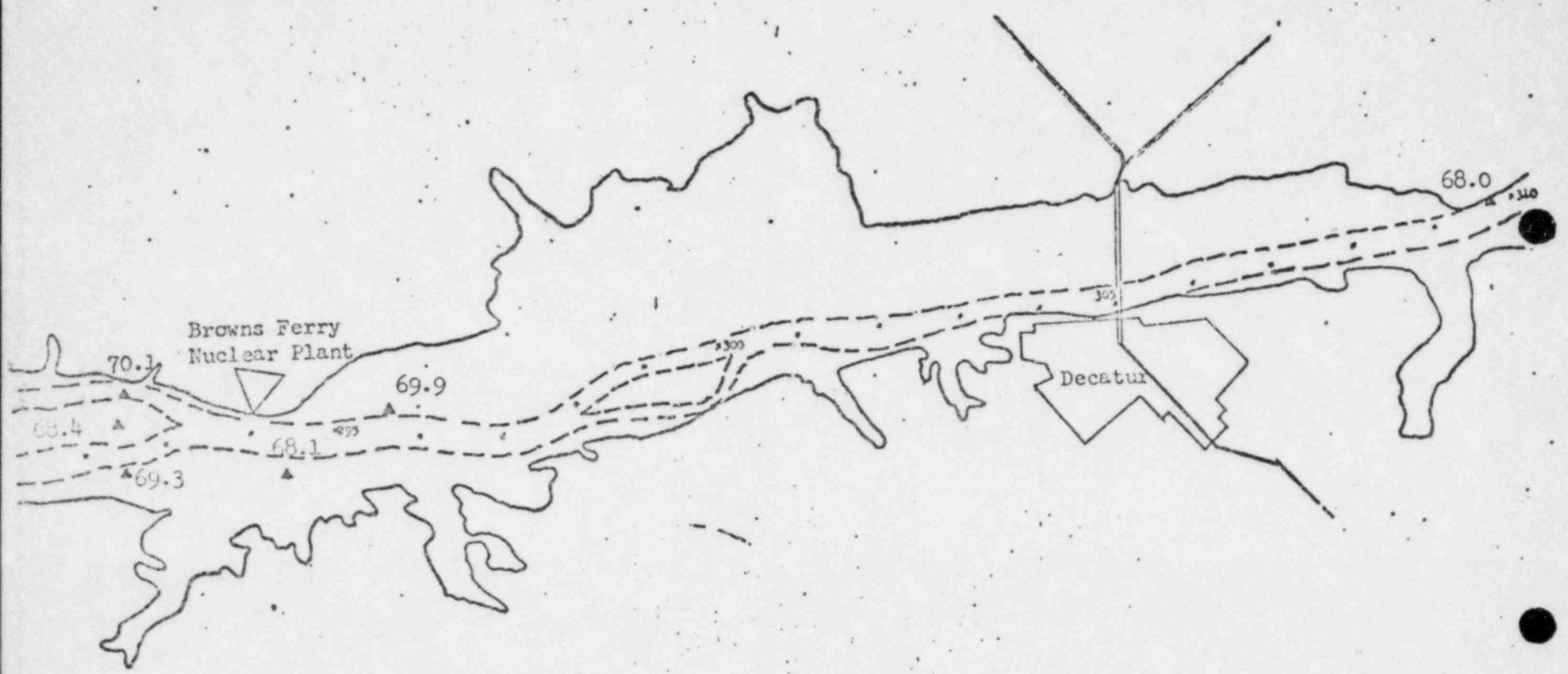
Wheeler Reservoir

Date: April 29, 1974
Time: 1700
Depth: 5-foot



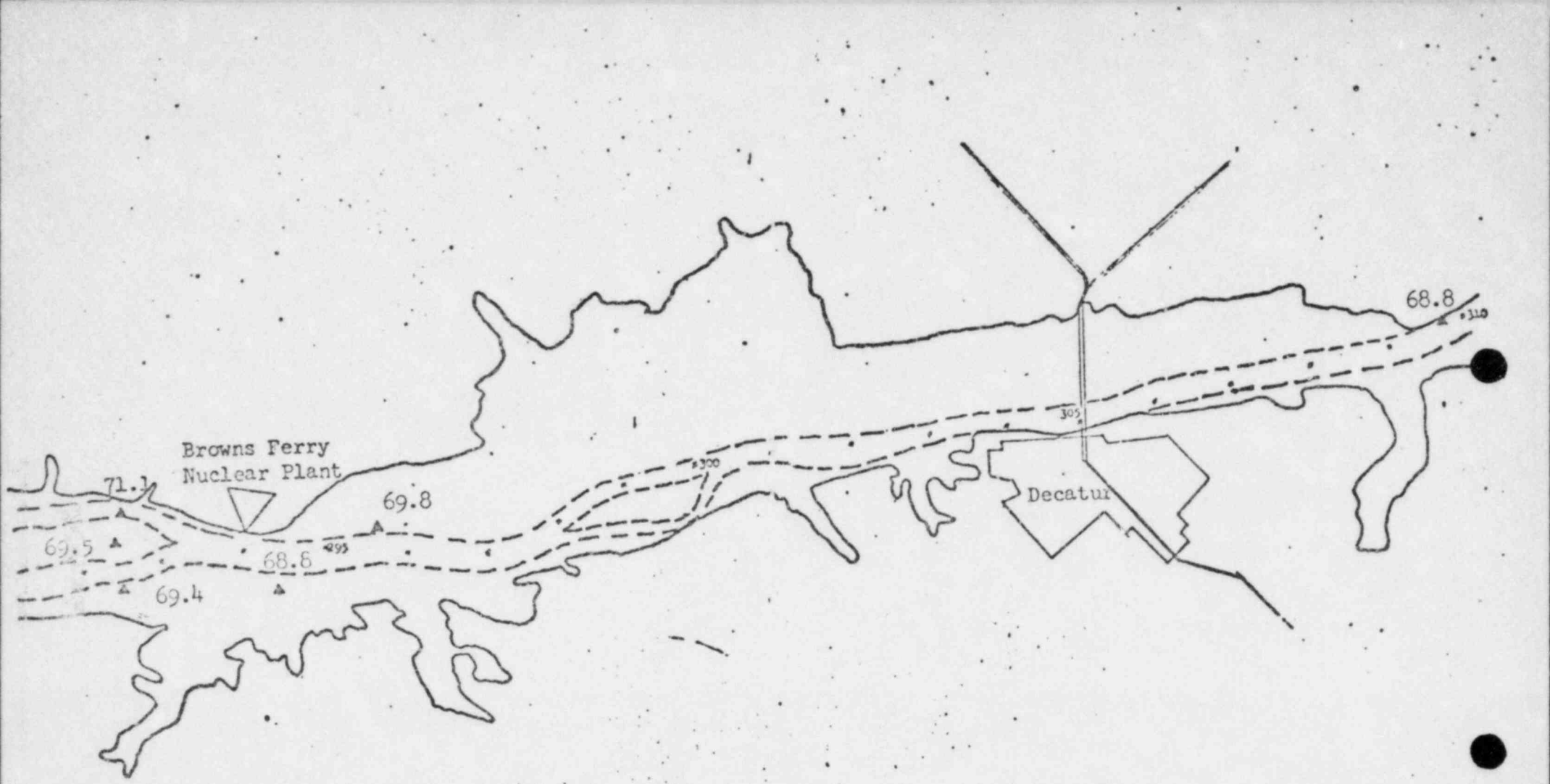
Wheeler Reservoir

Date: April 29, 1974
Time: 1800
Depth: 5-foot



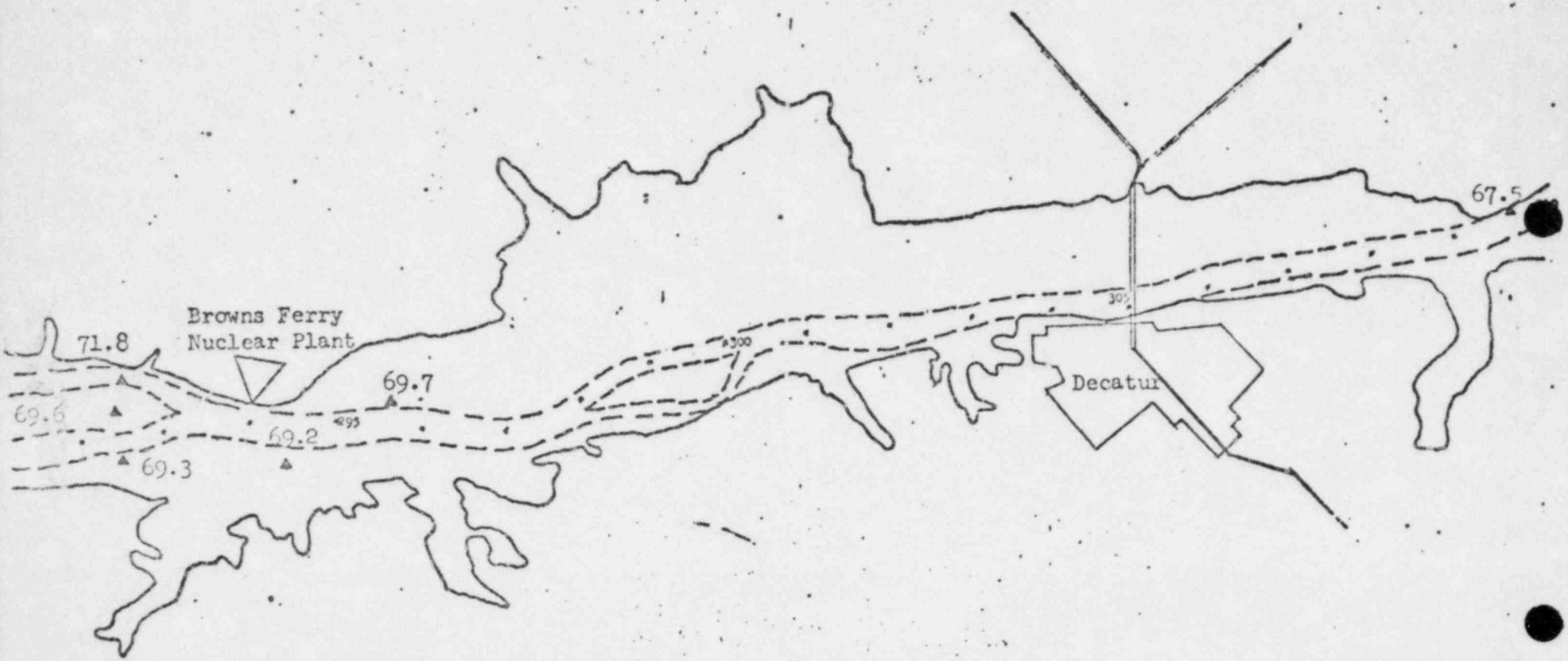
Wheeler Reservoir

Date: April 29, 1974
Time: 1400
Depth: Surface



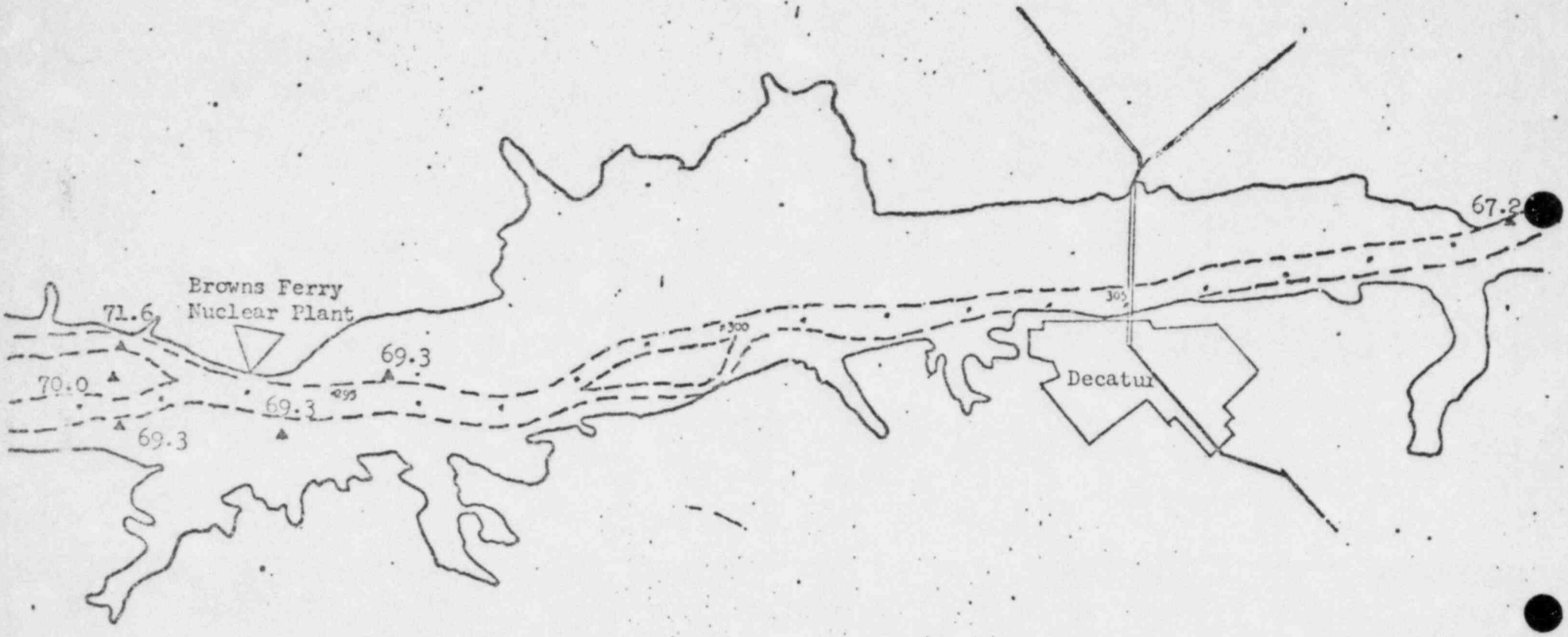
Wheeler Reservoir

Date: April 29, 1974
Time: 1500
Depth: Surface



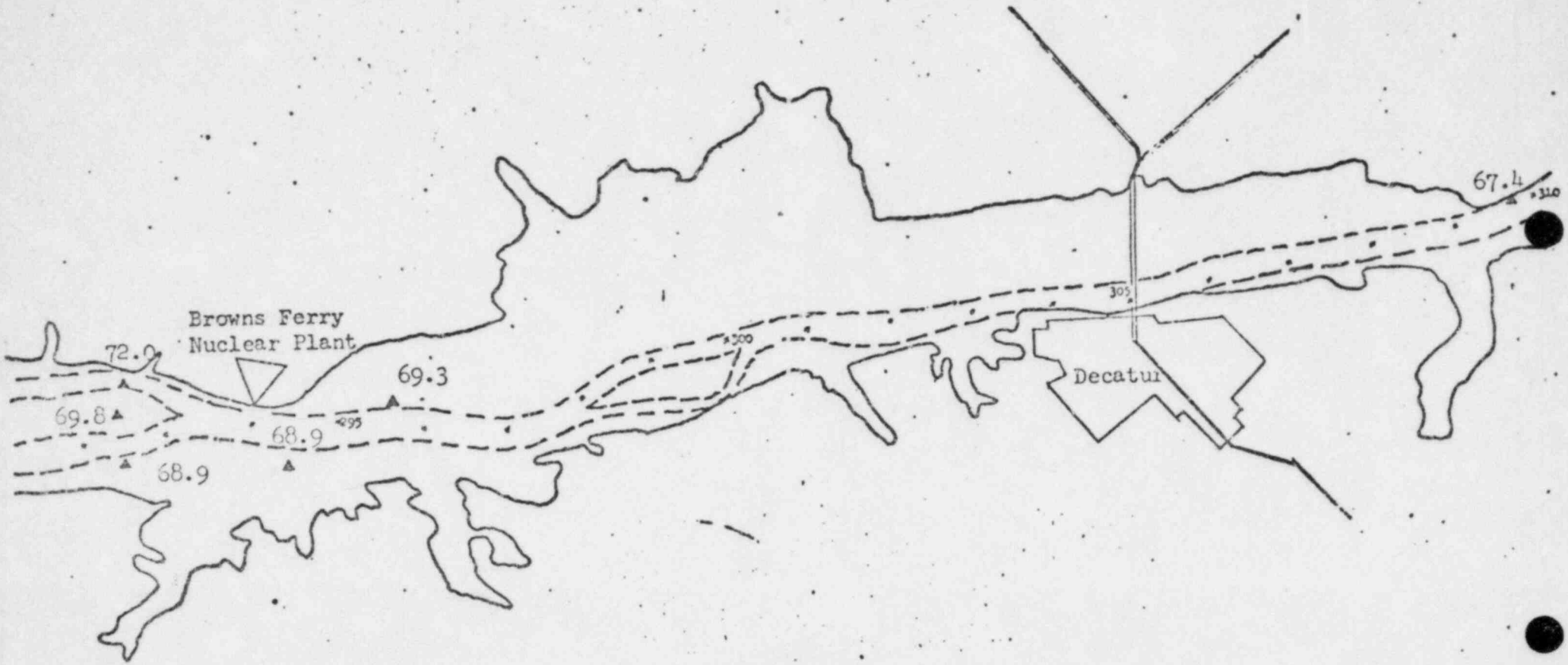
Wheeler Reservoir

Date: April 29, 1974
Time: 1600
Depth: Surface



Wheeler Reservoir

Date: April 29, 1974
Time: 1700
Depth: Surface



Wheeler Reservoir

Date: April 29, 1974
Time: 1800
Depth: Surface