

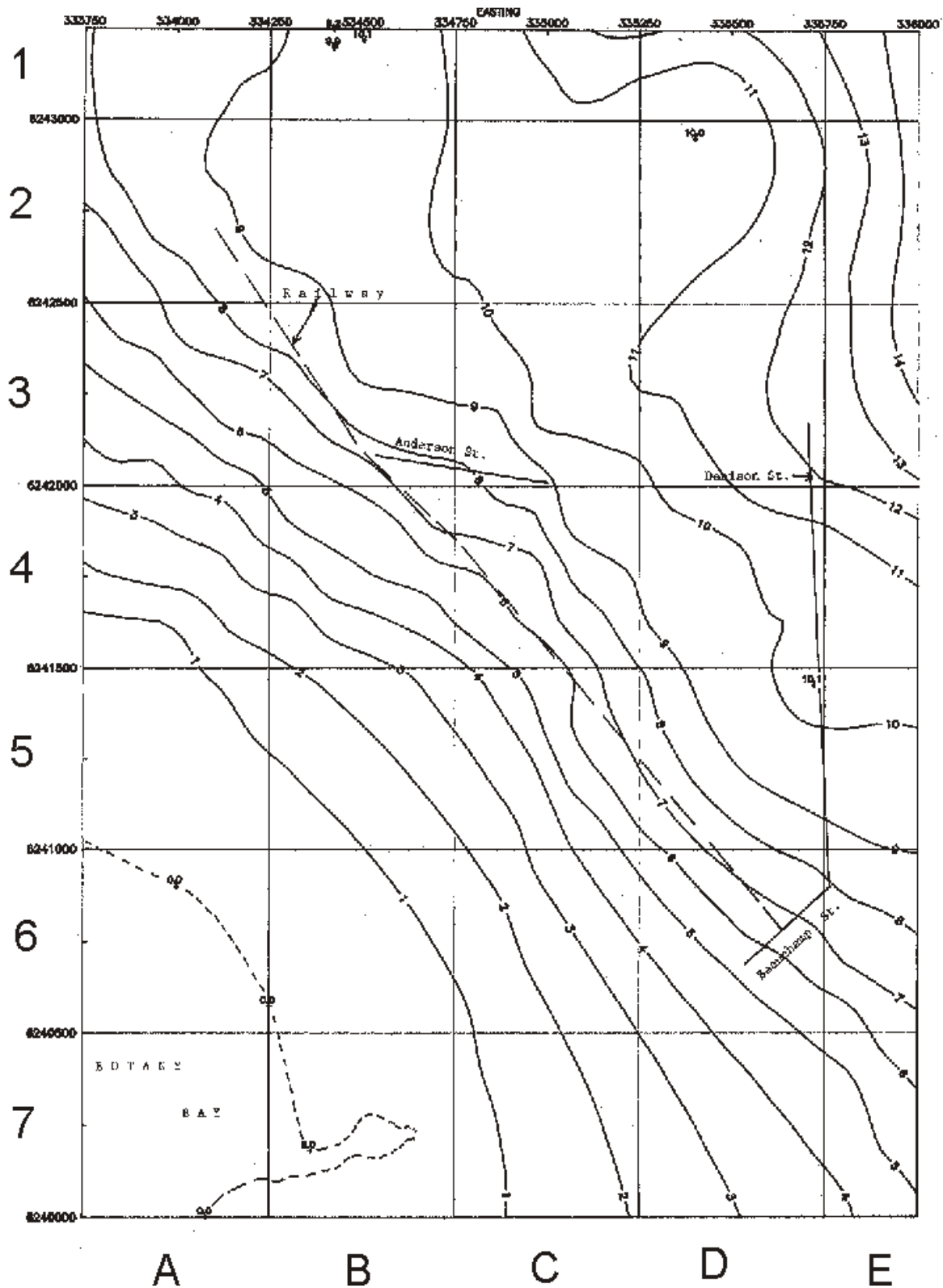
## **Independent Monitoring Committee – Community Liaison Committee Tasks for Prof Ian Acworth**

**Task 7** – Review the effects of groundwater abstraction in the Botany Aquifer.

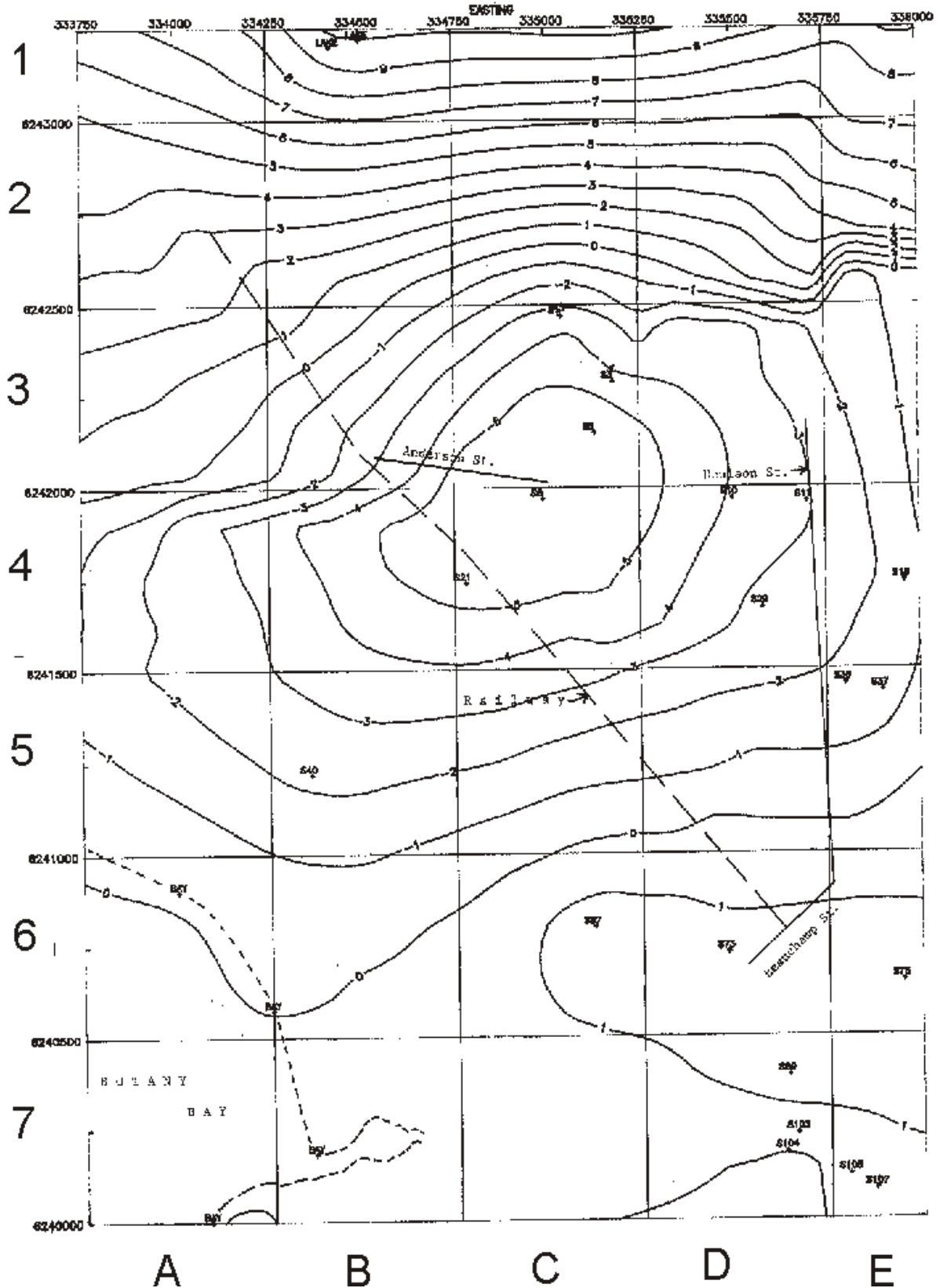
This task was initially described as a review of the impact of abstraction over the last 50 years or so. The only work carried out in this area, to my knowledge, was that presented by Dr William Milne-Home and Noel Merrick in a UNSW UNISEARCH report in 1989 (Hydrogeology and Groundwater Quality of the Botany Aquifer ICI Site Region, Botany for A.G. Environmental Engineers, November 1989. UNISEARCH REPORT R5453). Mr Merrick obtained a number of groundwater level data sets from the Department of Water Resources, supplemented this data with other available information and produced contour maps of the southern part of the aquifer for several time slices (1942, 1969, 1979, 1980, 1093, 1986 and 1988). These have been scanned and are reproduced as an Appendix to this report. The separate maps have been further reduced in size and fit to a single page to facilitate comparison. Interpretative comments are included in the Appendix.

## APPENDIX - Botany Aquifer Levels

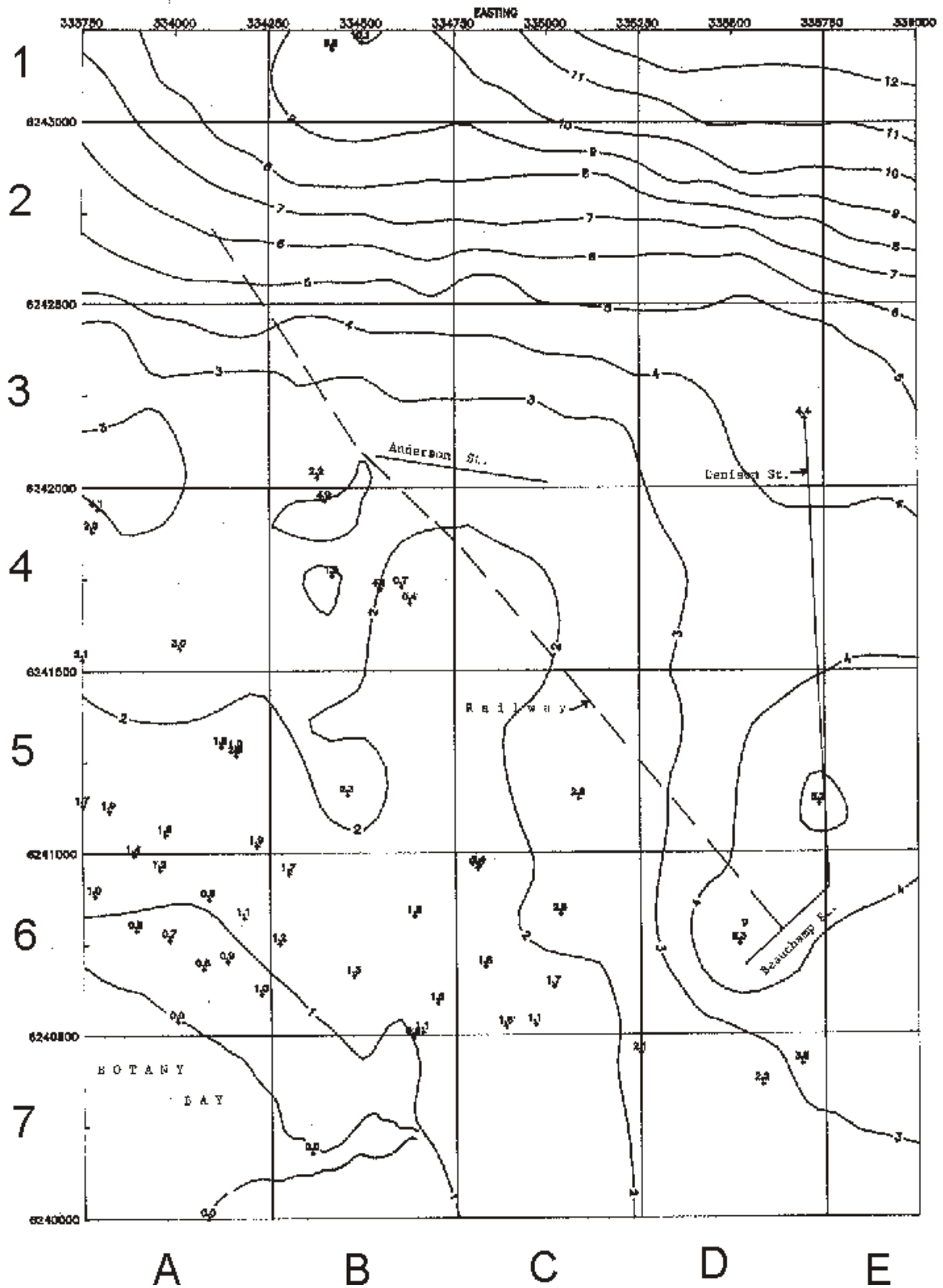
1942 Data were derived from the reports by Shiel (1942) and Mulholland (1942). The shore line shown is as it was in 1942 with Lachlan Lakes water levels in 1986 used to constrain the contouring. The groundwater levels at this time show regular flow through the aquifer to Botany Bay. The cone of depression at C-D6 shows significant abstraction.



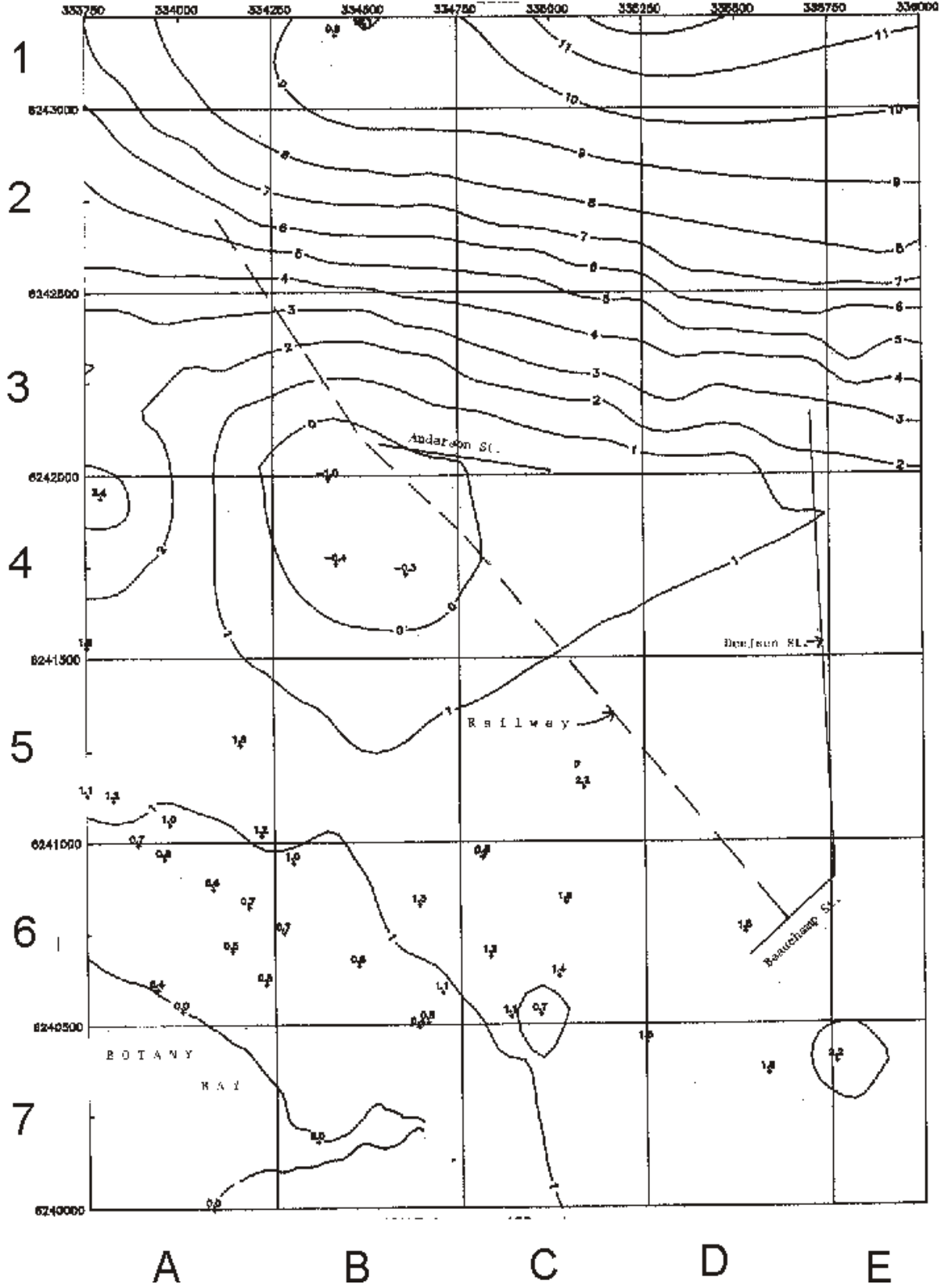
The **1969 Data** shows the development of a major cone of depression centered on C3-4. This data has been taken from a map by Smart (1974). There is the probability of saline intrusion from the coast at this time. Major abstraction at CDE6 is also indicated. It was at this time that the contamination from the ICI plant is believed to have been moved to the north west.



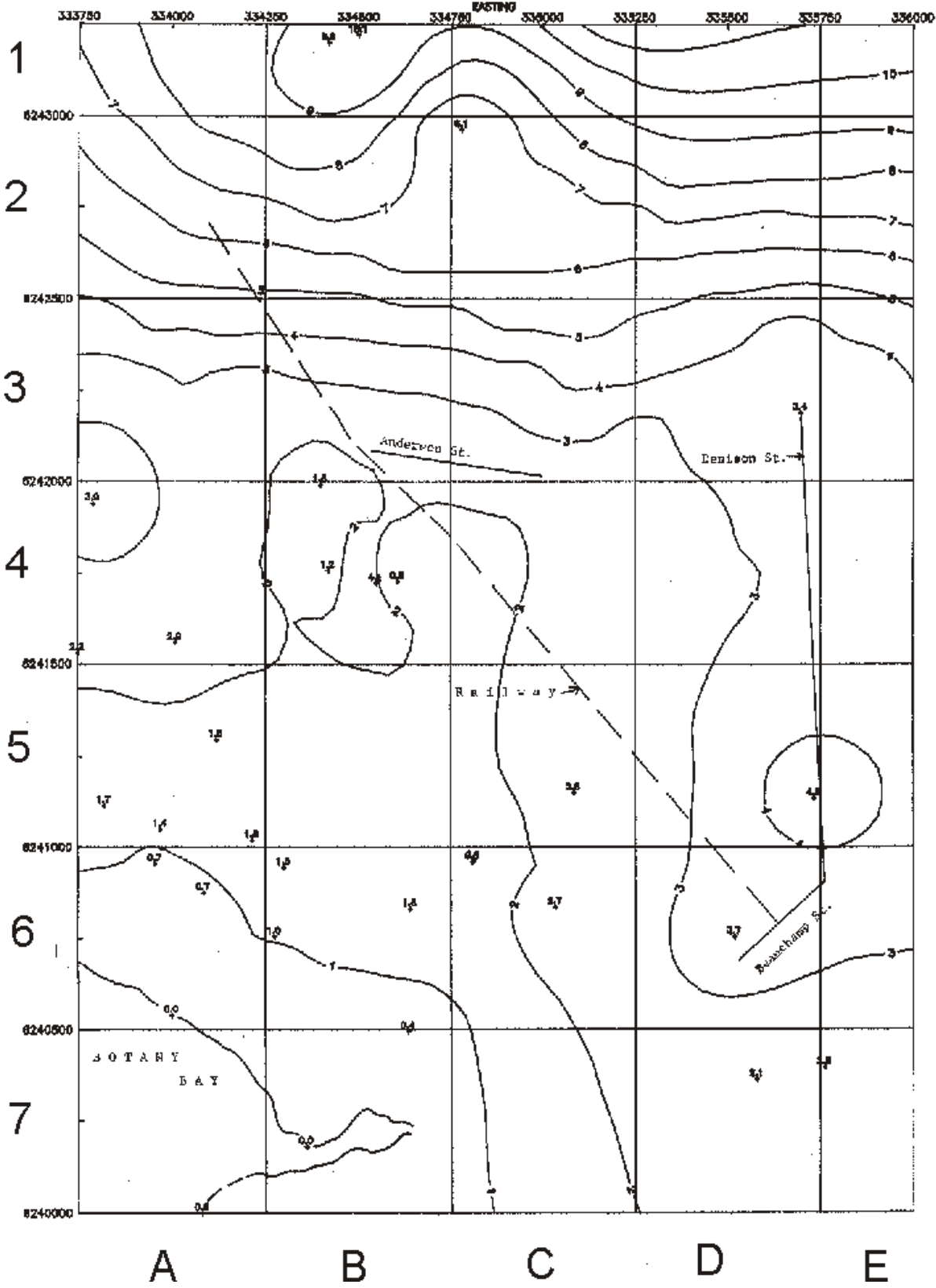
The **1979 Data** indicates the impact of cessation of pumping at C3-4 with somewhat indeterminate flow in the southern part of the aquifer..



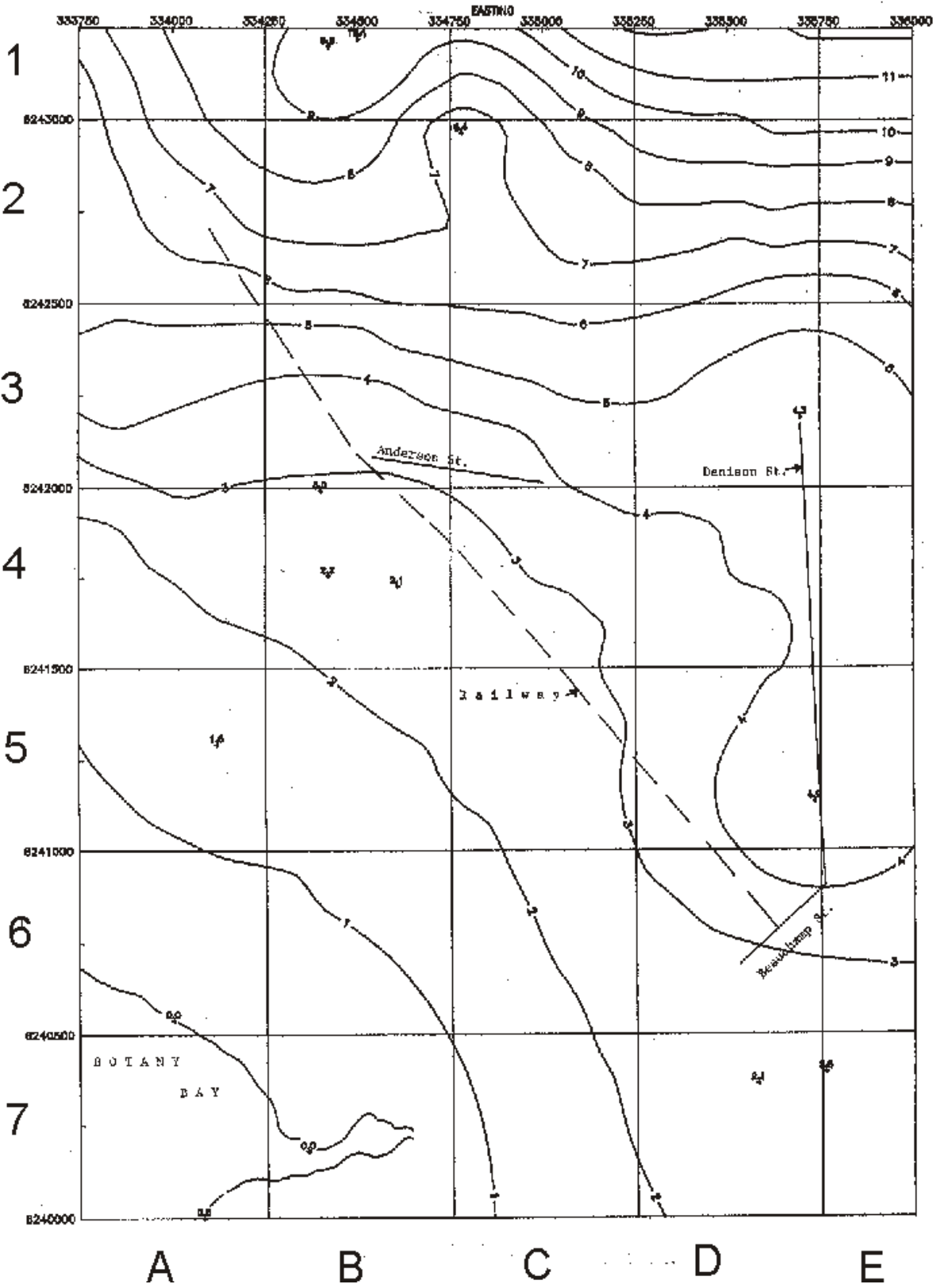
The **1980 Data** also indicates major abstraction at B4. No saline intrusion is indicated at this time as there is a groundwater ridge maintained between the abstraction and the coast.



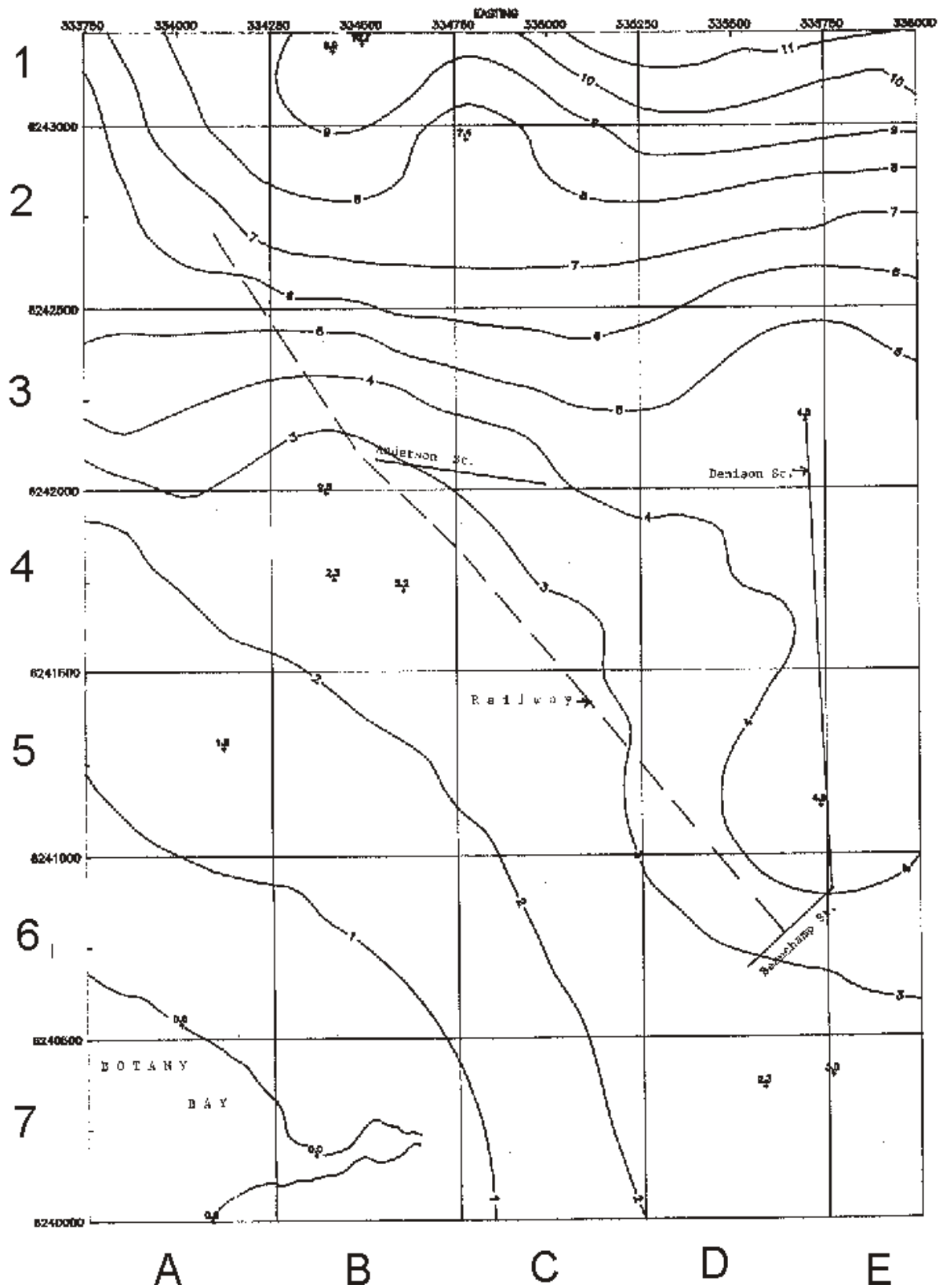
The 1983 Data shows considerable variation with the occurrence of more smaller zones of abstraction at D3, A4, C6 while the cone of depression that was at B4 has disappeared.



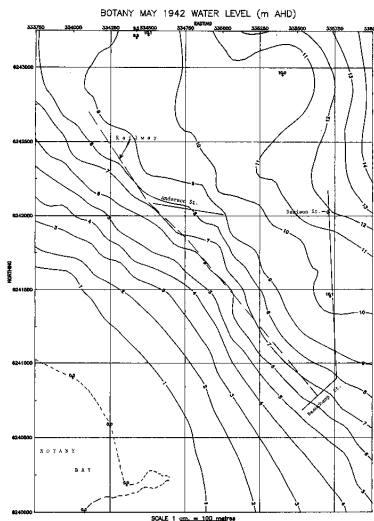
The 1986 Data shows only the abstraction at C6 with a general recovery of water flow though the remainder of the aquifer to the south west.



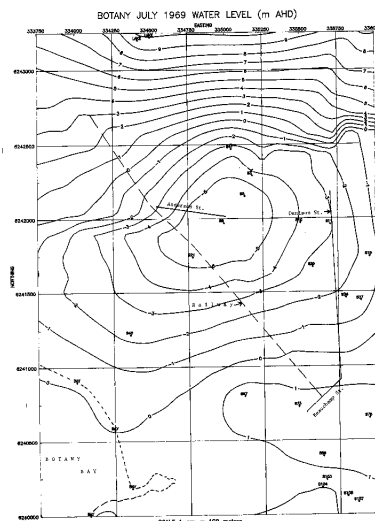
The **1988 Data** shows return of water levels in the south west to their 1942 levels while the upper part of the aquifer, particularly in the north east shows lower levels than those of 1942. This presumably reflects the northward movement of the abstraction bores.



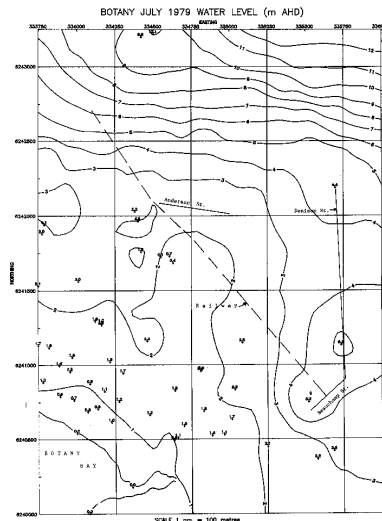
Botany Aquifer Levels – showing the development of a cone of depression due to over pumping and the recovery that occurred when pumping was stopped.



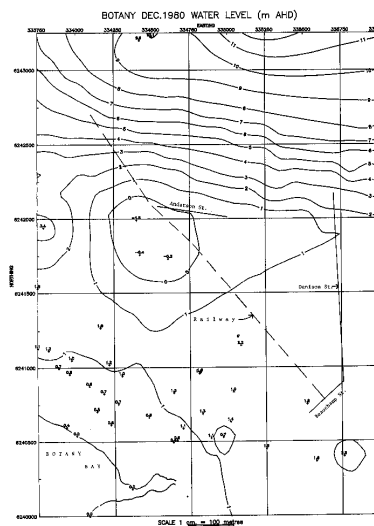
1942



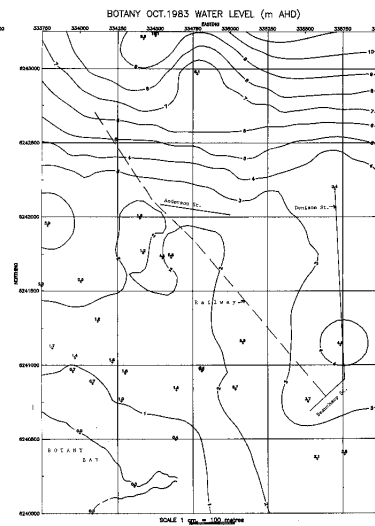
1969



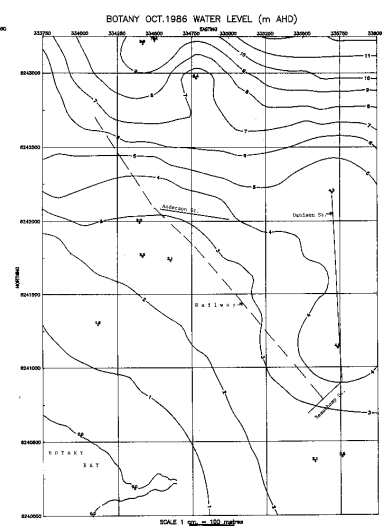
1979



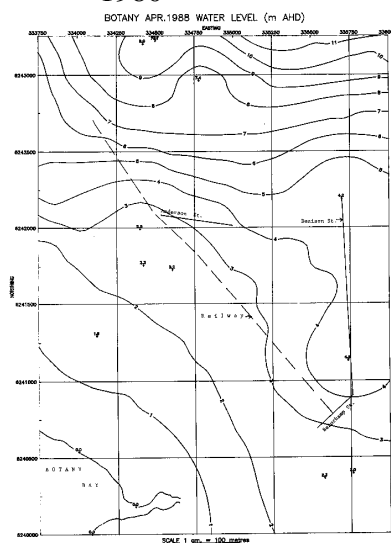
1980



1983



1986



1988