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Independent Monitoring Committee – Community Liaison Committee

Task 12 - Provide comment on the progress of the Botany Groundwater Cleanup Project to date

The Quarterly Groundwater and Surface Water Monitoring Report (December 2006) presents the most recent groundwater monitoring data available to IMC members. Comments below relate directly to that report. The report does not provide details on progress to clean up the source zone contamination. Reference is made to other reports in Section 3.3 but these have not been released to the IMC (as yet). As cleanup can only be achieved by removal of the source zones, it is not possible to comment completely on Task 12 as requested.

Hydraulic control of the existing plumes is demonstrated by the available monitoring report. It seems clear that the equipment and processes are sufficiently installed and operational that the hydraulic control within the existing boundaries can be carried out successfully. There will continue to be equipment failures, borehole clogging and pump failures. None of this is exceptional. The capability to monitor water levels, detect equipment failure and then act accordingly is well demonstrated. To a large extent, conditions within the contaminated area occurring on ORICA land will be sorted out by ORICA and the public need not be overly concerned. However, the impact of work (pumping) carried out by ORICA on conditions at or beyond the boundary is of public concern.

I remain concerned that conditions around the boundaries are only poorly understood. I have previously drawn attention to the boundary along Foreshore Road and the boundary in the vicinity of Lachlan Ponds. These were the subject of reports submitted as Tasks 4 and 5 and contained specific recommendations that have yet to be acted upon by the various groups involved.

The Foreshore Road Boundary has been investigated to some extent by the sampling in Penrhyn Estuary. Appendix D of the latest monitoring report contains the results of geophysical monitoring at MWF15 that demonstrate the great value of this form of work. Unfortunately, the equipment used could not be adequately calibrated and therefore the salinity of the water represented by the upper plume (between 5 and 7 mBGL) could not be determined. The gamma ray log shows that the bottom piezometer at MWF15 has been inadvertently completed in clay and this explains the abnormal response of this piezometer shown in Figure A.10 noted by URS in the report. It should be clear from this work that further use of this equipment in other piezometers will dramatically improve the monitoring of saline water movement along this boundary. Repeated electromagnetic surveying represents a cheap and efficient tool to monitor the saline boundary in this area.

Figures 6.11 to 6.15 present the results of groundwater quality monitoring in the Penrhyn Estuary. The contours that are drawn on these figures give rise to the comment in Section 7 (Conclusions and Recommendations) that “Volatile CHCs generally decrease in a seaward and upward direction within the intertidal discharge zone”. Inspection of the data shows that these contours have been drawn based more on the assumed conceptual model that all contaminated discharge is occurring at the assumed position of the saline front, rather than on the data! To illustrate this point, consider Figure 6.14 that purports to show the concentration of EDC beneath Penrhyn Estuary. The data collected at high tide shows a value of 6.810 in the deepest port of BP44 and a value of 6.86 at -9.0 m in BP01 (with deeper ports of BP01 not sampled!), yet the contour is drawn to curve back strongly. Based on the data presented, a more realistic position would be to project that contour from BP44 at -2.5m to the sea bed beyond the low tide mark. Similar comments could be made concerning the other plots.

It seems entirely possible that higher zones of contamination discharge further from the beach at or below the low tide mark. This data again demonstrates a lack of understanding of this important boundary in a zone that will be significantly altered by the proposed port development. I strongly recommend that this work be repeated with all available ports sampled and careful consideration be given to the manner in which these contours are drawn and the conclusions that are then made based upon these contours. It is worth noting that these are the only available data along this important boundary.

It is interesting to note that the significant rainfall events in December (20 and 21), when approximately 35mm of rain was recorded, did not produce a significant response at any piezometer. Tidal impacts and the impact of pumping are clearly seen. When the groundwater model is rerun to calibrate against all the new data, the lack of response to rainfall recharge on practically all piezometers needs to be investigated.

There is a general lack of data and monitoring on the northern side of the ORICA area of the aquifer. The water-level monitoring needs to be extended to include all monitoring points included in the calibration of the groundwater model.

The CLC have requested comment on the progress of the Botany Groundwater Cleanup to date.

In summary:

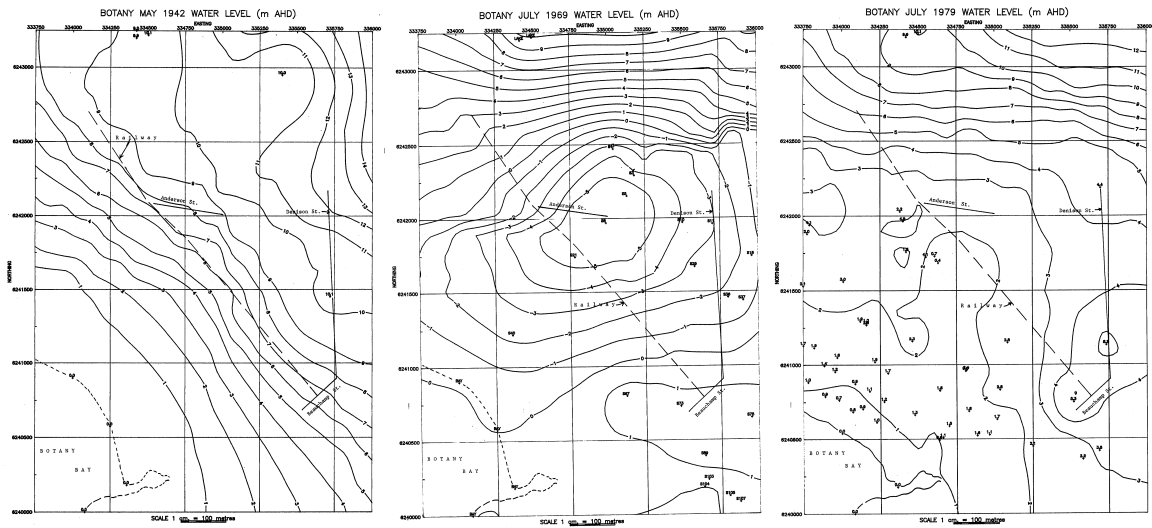
- No information on source zone removal is presented
- Information on actions within the GTP area of activity is well documented and demonstrates an ability to control local movement of polluted groundwater
- Information on the northern boundary conditions is scant or does not exist
- Information on the Botany Bay Boundary is insufficient

Task 13 – Advise on specific questions that IMC members think the CLC should be asking about the project

The GTP project is expected to have a significant impact on groundwater flows in the lower part of the Botany Sands Aquifer. The heads in the upper part of the aquifer could also be impacted by the long term abstraction that is now underway. The CLC should be requesting detailed information as to how the aquifer as a whole will be impacted.

The water abstracted from the aquifer represents a considerable resource. What will happen to this water?

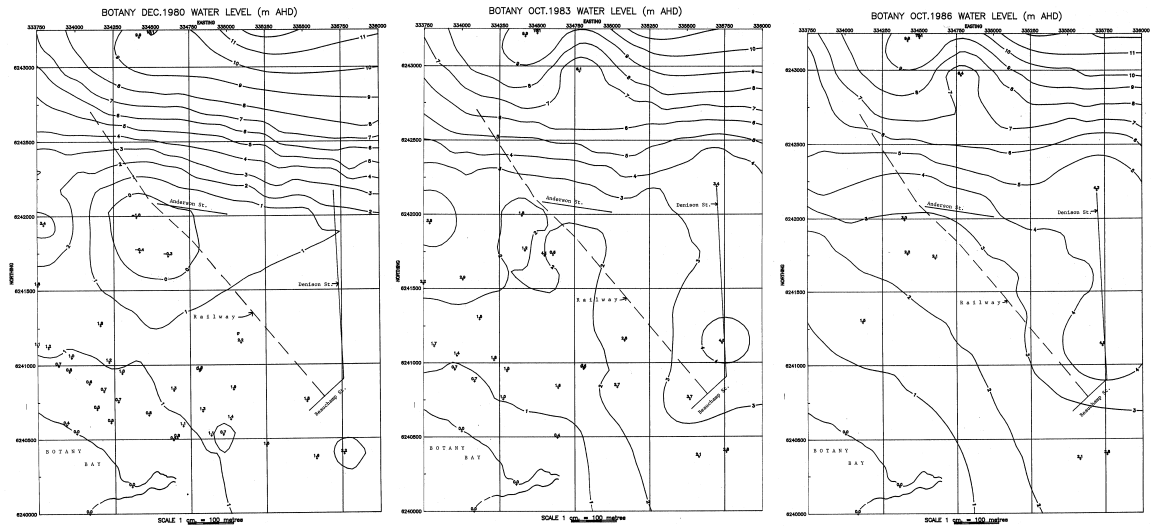
Task 5 - Botany Aquifer Levels – showing the development of a cone of depression due to over pumping and the recovery that occurred when pumping was stopped.



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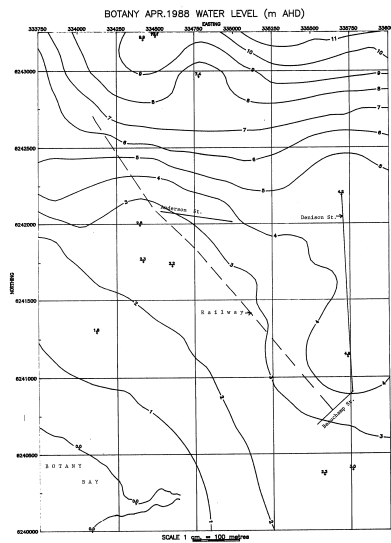
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1980

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