

## **6. CONCLUSIONS**

### **6.1 Specific Conclusions relating to Heron Island Spoil Dump**

Overall in the 42 months following the enlargement of the boat harbour the frequency and extent of silt plumes has reduced significantly, although recently there has been an increase in plume frequency following an erosion event exposing a fresh silt scarp in early January 1991. Silt plumes are unlikely to occur unless the wind speed exceeds 15kn and the tide level exceeds 2.5m. During this period much of the fine material released has been transported off the reef top.

Approximately 10% of the material in the spoil dump is silt and by June 1991 about 12% of the total volume of material has been removed from the spoil dump. The seaward face of the spoil dump has been reshaped and realigned with the "normal" wave action from both the northern and southern sides of the reef. Erosion at the jetty is being resisted by rubble which has been transferred by mechanical means from the beach face on other parts of the spoil dump.

The large amount of coarse material present in the spoil dump makes its beach unpleasant to walk on, not visually attractive and obstructs turtle nesting. The advantages are that the shoreline is likely to remain fairly stable except during extreme events, e.g., cyclones. The spoil dump is thus effectively a reclamation which increases the area of the island and gives space for storage of construction materials, boats, etc., without requiring destruction of vegetation and bird nesting habitats elsewhere on the island. However, this use compounds the visual unattractiveness of the area. It will remain unattractive unless such activities are restricted so that vegetation can develop and be maintained.

Significant erosion and change of the spoil dump shoreline in the short term are only likely with large waves at higher high tides. Such conditions are most likely to occur during cyclones or strong sustained southeasterly winds or heavy swells. While increased amounts of silt will be released from the spoil dump under such conditions, they are also expected to create conditions favourable for the removal of fine sediments from the reef flat.

Continued routine monitoring is required so that conditions causing change are recorded, the effectiveness of management actions can be assessed, and baseline observations are available for future maintenance dredging or new capital works associated with the boat harbour or other facilities in its vicinity.

### **6.2 Some General Observations concerning Environmental Monitoring**

During the period of observation conditions were mainly relatively calm. Hence environmental managers and others can be lulled into a false sense of security. Climatic variations from year to year mean that few years (periods) are "average" or "typical" ones. Erroneous conclusions with regard to environmental conditions thus can be made easily since most periods of observation are too short. This applies to both preproject baseline studies and postproject monitoring programmes.

Environmental impact assessments are of limited use unless the public authorities responsible for protecting the general public interest ensure that the project has been constructed in accordance with the approved plans and that its environmental performance, as well as other aspects of public concern, e.g. safety, meet the specified standards appropriate for that project. In this case the postproject implementation of the monitoring programme was inhibited by the absence of any survey of the spoil dump and adjoining shoreline immediately following project completion. The only work-as-executed plan available was a postdredging survey of the boat

harbour showing the jetty but not the spoil dump. Furthermore, in this case, much valuable information was not obtained because the monitoring programme was not commenced until more than twelve months after the completion of the project.

Individual perceptions of events vary greatly. Emotive reporting of an event without an adequate sense of its scale within the overall system or an understanding of the processes involved may be misleading. For example, reported "severe" erosion at the jetty might actually be relatively small in comparison with the whole spoil dump; observed "massive" resurfacing of the spoil dump by earthmoving machinery might result only in a small change in surface levels even though it appears to the observer that a considerable amount of rubble has been redistributed; "vast" silt plumes actually might be only quite localised with respect to the whole reef and may dissipate quite quickly without significant adverse effects. Nevertheless such reports may also highlight significant factors overlooked by project planners and environmental managers. This may be so, particularly when decision makers are located away from the site, do not have reliable on site knowledge, or lack a sufficiently wide knowledge of either the natural phenomena involved or the particular engineering activities. On site assessments by persons with experience in coral reef environments and properly qualified to give reliable objective advice are essential.