



Division of Mines — Report 1993/01

Sand resources in the Hobart area (Revision 1)

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INTRODUCTION

This report has been prepared in order to analyse available production figures and predict future requirements for sand for the construction industry in the Hobart area.

SAND SOURCES

There are three main sources of sand in the Hobart area. These sources have been summarised from the Geological Survey Explanatory Report for the Hobart geological map by Leaman (1976).

Triassic sandstone decomposes on weathering to a profile which has clean surface sand grading down to fat sand and eventually into unaltered sandstone. The grading of this material is poor because of its derivation from well sorted sandstone. The material is not used for the manufacture of concrete. An example of these deposits occurs at Boronia Hill, Kingston.

Tertiary-Quaternary sand deposits generally overlie Tertiary clay in the area around Seven Mile Beach, Roches Beach and the Sandford and South Arm Peninsulas. Maximum measured thicknesses of 13 m occur in the Calverts Lagoon area. Estimated total reserves are 410×10^6 cubic metres (Threader, 1974) although most of this is unavailable due to the zoning of land for other purposes. These deposits provide the bulk of sand requirements for the Hobart area.

Only a small area of coarse sand at the eastern end of Hope Beach is suitable for concrete production without the addition of coarser material. This material is one of the few deposits that conform to AS 2758-1985.

Dune sand reserves in the Sandford-South Arm area have been estimated by Threader (1974) to contain 49×10^6 cubic metres of sand of which only 6×10^6 cubic metres may be available because of land zoning.

Silica sand is now only mined on Lazenby's lease (fig. 1). The fine white Tertiary-Quaternary sand is used exclusively in the glass making industry. Estimated available reserves of about 100×10^6 cubic metres are considered adequate for future years.

The grain size distribution of most of the sand deposits does not conform to Australian Standard 2758-1985 and is therefore not suitable for use in the manufacture of concrete without blending it with coarser material. The coarser material used is crusher fines.

There has been no offshore exploration of sand resources and therefore the quality and quantity of sand in such areas as Ralphs Bay, D'Entrecasteaux Channel, Storm Bay and Frederick Henry Bay is unknown.

SAND RESERVES

Total sand reserves in the Hobart area are difficult to assess. Threader (1974) suggests that available dune sand reserves are of the order of 1.3 million cubic metres, and Tertiary sand reserves on the Sandford Peninsula are about 34 million cubic metres. Threader suggests that the estimates are based on insufficient data to be very reliable.

Accurate figures for the resource remaining on existing leases do not exist. No resource evaluation has been conducted in order to determine this important figure. There is a need to conduct investigations to determine accurate figures in order to plan for further resource requirements. Future potential sources can then be investigated.

Reserves of offshore sand in areas such as Ralphs Bay, D'Entrecasteaux Channel, Storm Bay and Frederick Henry Bay are unknown.

Seven Mile Beach is the largest body of sand close to Hobart which has not been exploited. Large reserves of sand suitable for dry-pit mining are present in this area.

SAND PRODUCTION

The production figures for the State and for the Hobart area are given below. Actual production is probably higher than the recorded figures.

There are fifteen current mining leases for sand in the Hobart area (fig. 1). These are listed below.

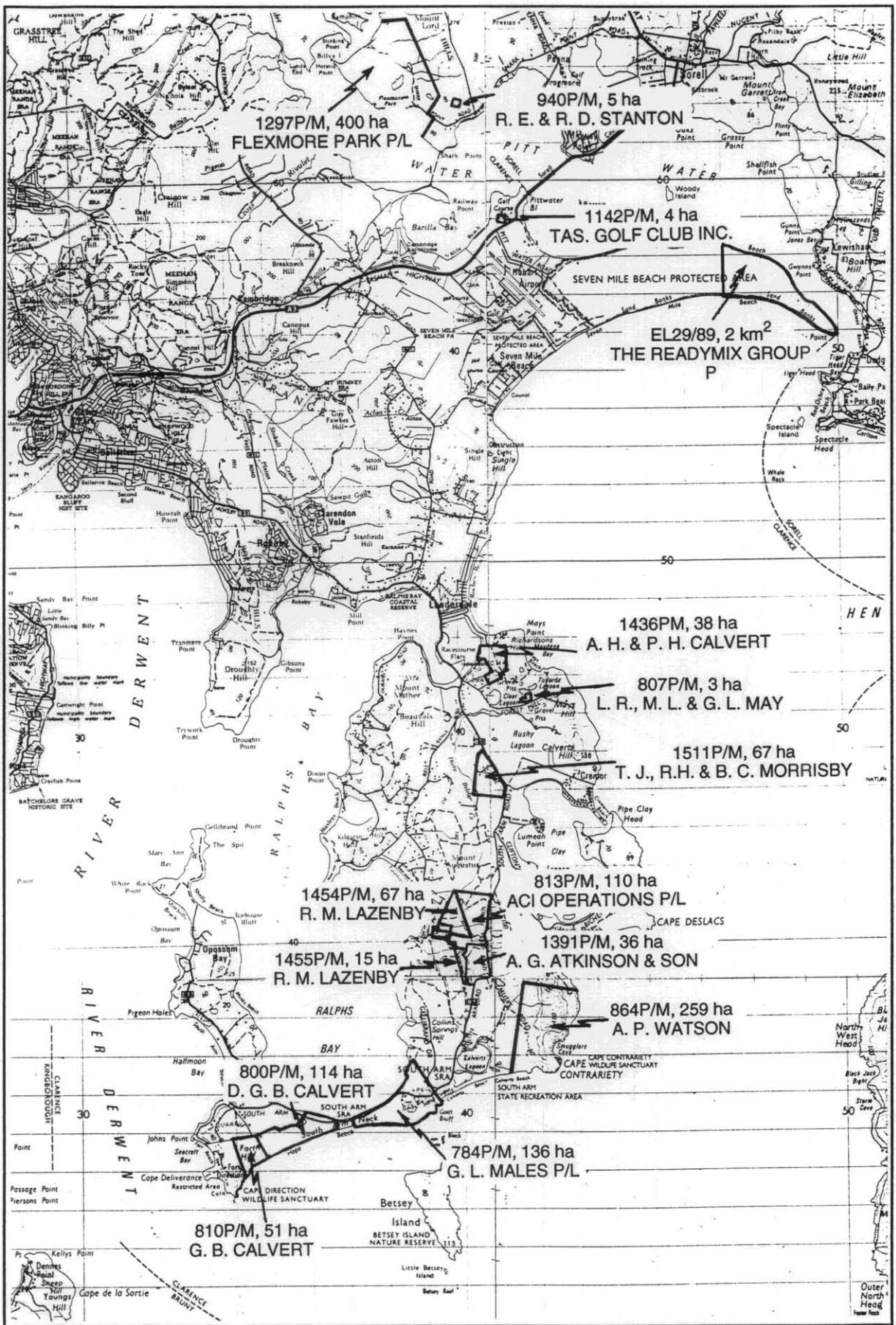
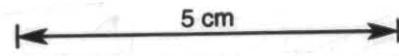


Figure 1. Location of sand mining leases in the Hobart area.



| YEAR | STATE TOTAL (m ³) | SOUTH TOTAL (m ³) |
|------|----------------------------------|----------------------------------|
| 1960 | | |
| 1961 | | |
| 1962 | | |
| 1963 | 80 725 | 44 230 |
| 1964 | 86 640 | 46 819 |
| 1965 | 112 434 | 36 967 |
| 1966 | 174 847 | 58 820 |
| 1967 | 144 990 | 51 824 |
| 1968 | 162 118 | 63 191 |
| 1969 | 181 922 | 51 318 |
| 1970 | 179 364 | 69 410 |
| 1971 | 111 244 | 69 377 |
| 1972 | 124 855 | 54 816 |
| 1973 | 105 350 | 70 287 |
| 1974 | 128 214 | 53 320 |
| 1975 | 108 675 | 21 762 |
| 1976 | 292 409 | 115 355 |
| 1977 | 262 867 | 128 404 |
| 1978 | 204 347 | 80 065 |
| 1979 | 269 244 | 114 837 |
| 1980 | 212 170 | 73 805 |
| 1981 | 210 844 | 84 456 |
| 1982 | 166 954 | 87 716 |
| 1983 | 229 566 | 93 056 |
| 1984 | 203 311 | 80 718 |
| 1985 | 218 771 | 115 335 |
| 1986 | 415 148 | 162 793 |
| 1987 | 240 529 | 81 462 |
| 1988 | 289 251 | 103 263 |
| 1989 | 323 813 | 149 513 |
| 1990 | 311 399 | 131 428 |
| 1991 | 267 274 | 104 481 |
| 1992 | 280 091 | 109 642 |

| NAME | LEASE NO. | LOCATION |
|-------------------------------|-----------|------------------|
| G. L. Males P/L | 784 P/M | South Arm |
| G. B. Calvert | 810 P/M | South Arm |
| D. G. B. Calvert | 800 P/M | South Arm Neck |
| P. H. & A. H. Calvert | 1436 P/M | Lauderdale |
| T. J., B. C. & R. H. Morrisby | 809 P/M | Sandford |
| Tasmania Golf Club | 1142 P/M | Barilla Bay |
| Flexmore Park P/L | 1297 P/M | Penna |
| R. E. Stanton | 940 P/M | Penna |
| A. P. Watson | 864 P/M | Cape Contrariety |
| L. B., M. L. & G. L. May | 807 P/M | Sandford |
| A.C.I. Operations P/L | 813 P/M | Sandford |
| R. M. Lazenby | 1454 P/M | Sandford |
| R. M. Lazenby | 1455 P/M | Sandford |
| T. J., B. C. & R. H. Morrisby | 1511 P/M | Sandford |
| A. G. Atkinson & Sons P/L | 1391 P/M | South Arm |

The first four producers, located in the Sandford-South Arm area, produce approximately 80% of the total production for the Hobart area. The Readymix EL 29/89 is pending.

Lazenby and A.C.I. Operations produce silica sand for the glass making industry exclusively. A.C.I. Operations did not produce sand for the past three financial years.

PRODUCTION ANALYSIS

The production returns for sand have been analysed for the period 1963 to 1992 (fig. 2). Some of the figures have been revised from Threader's analysis of production trends (*in* Leaman, 1976). The producers from the Hobart area have been separated and the production figures are shown. Prior to and including 1980, the figures are on calendar year periods. From 1981 onwards the figures are for the financial year period and have been plotted for the year ending the financial period; e.g. 1981 figures are for the 1980-1981 financial year.

The abnormally low production figure for the Hobart area in 1975 is attributed to the collapse of the Tasman Bridge. A boom in production for the 1976 to 1979 period is related to a large increase in the value of construction work during this period. A peak in 1986 corresponds to a record high value of construction activity.

The production figures have not been statistically analysed in detail. The figures have been plotted as a line graph and the growth trends have been analysed by regression analysis. The regression line shown on the graphs (fig. 2 and 3) appears to be a reasonable fit and indicates that production figures are possibly not related to a growth curve.

Threader's 1974 analysis (*in* Leaman, 1976) indicated that the average annual growth in production was 5% and therefore a 5% growth curve has been plotted (fig. 4). This curve is clearly not a good fit. If the figures are related to a growth curve then a curve of best fit probably corresponds to an average annual growth of less than 3%. The growth curve is therefore very shallow, approaching the straight regression line. The regression line is therefore considered a reasonable interpretation of the production figures.

From the regression analysis it can be deduced that production is increasing by a constant average annual amount of about 7,600 cubic metres for the State and about 3,200 cubic metres for the Hobart area.

Assuming a constant average annual increase in production, the figures for the Hobart area for the year 2000 will be about 159,000 cubic metres and about 191,000 cubic metres for the year 2010. Total required production for the Hobart area from 1990 to 2000 will be about 1.5 million cubic metres, and 3.2 million cubic metres by the year 2010.

CONCLUSIONS

Reliable quarterly returns are required from producers to ensure accurate analysis of commodity requirements.

An analysis of sand production figures from 1963 to 1992 indicates that there appears to be a steady average annual production increase of 7,600 cubic metres for the State and 3,200 cubic metres for the Hobart area. It is estimated that the required total production for the Hobart area from 1992 to 2000 will be approximately 1.5 million cubic metres and 3.2 million cubic metres by the year 2010.

There are fifteen current mining leases for sand in the Hobart area. Four of these supply 80% of the areas

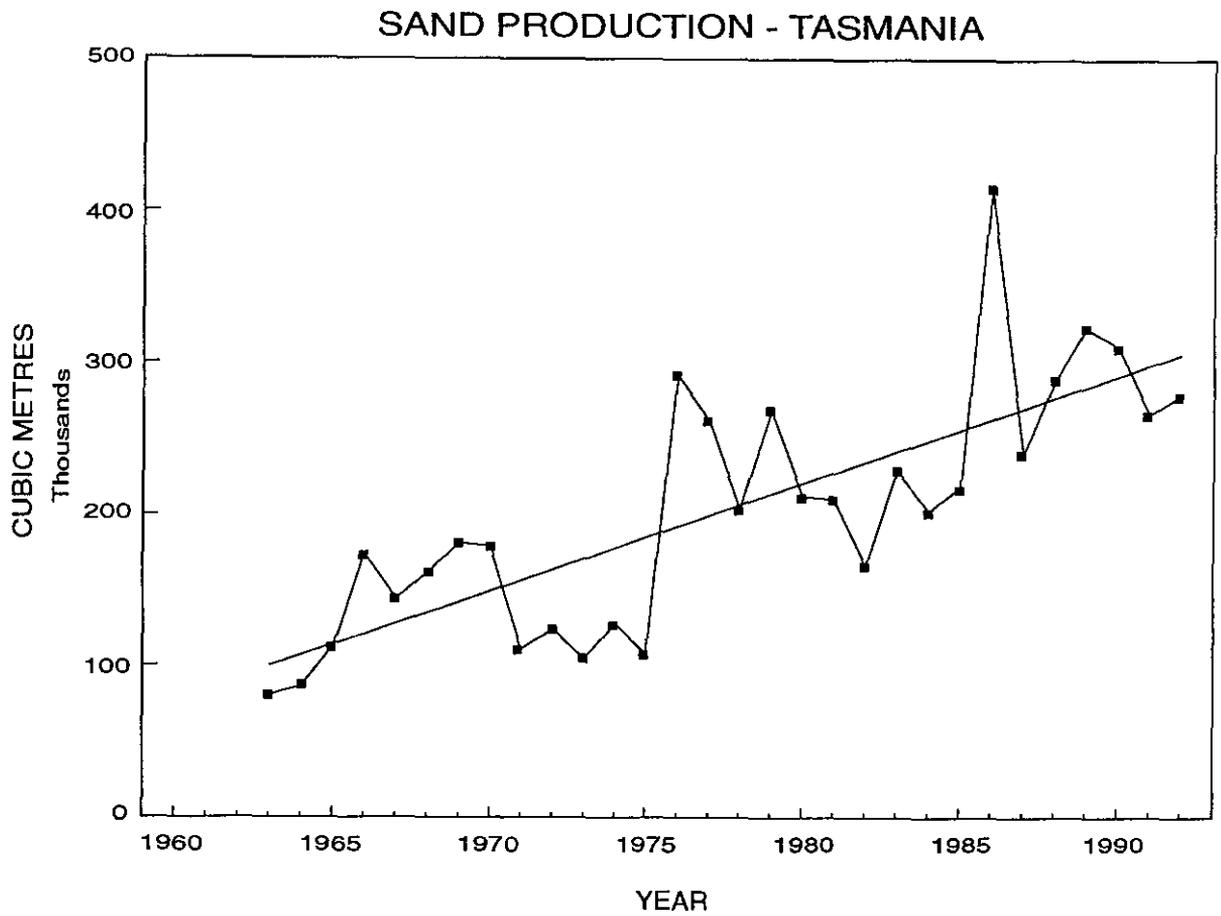


Figure 2.

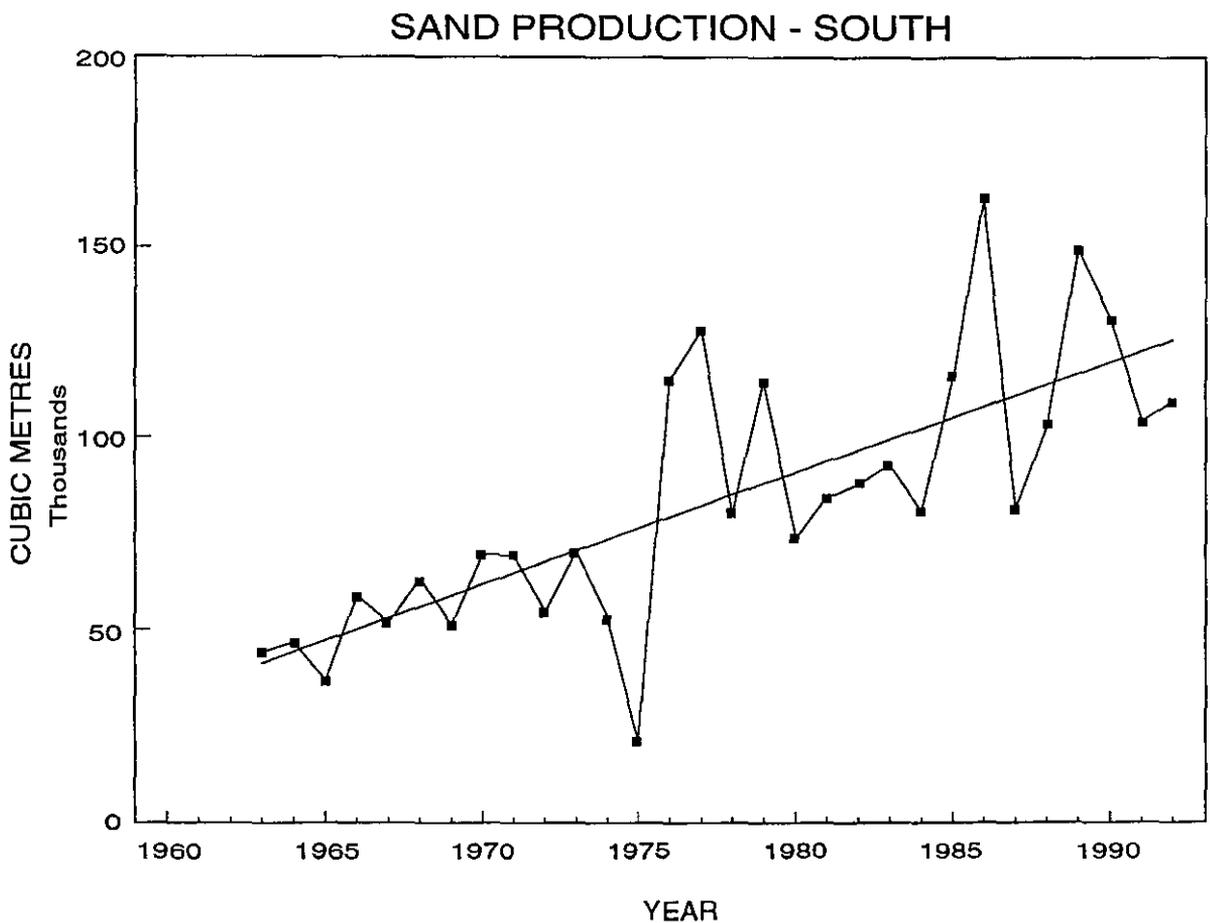


Figure 3.

5 cm

← 5 cm →

SAND PRODUCTION - SOUTH

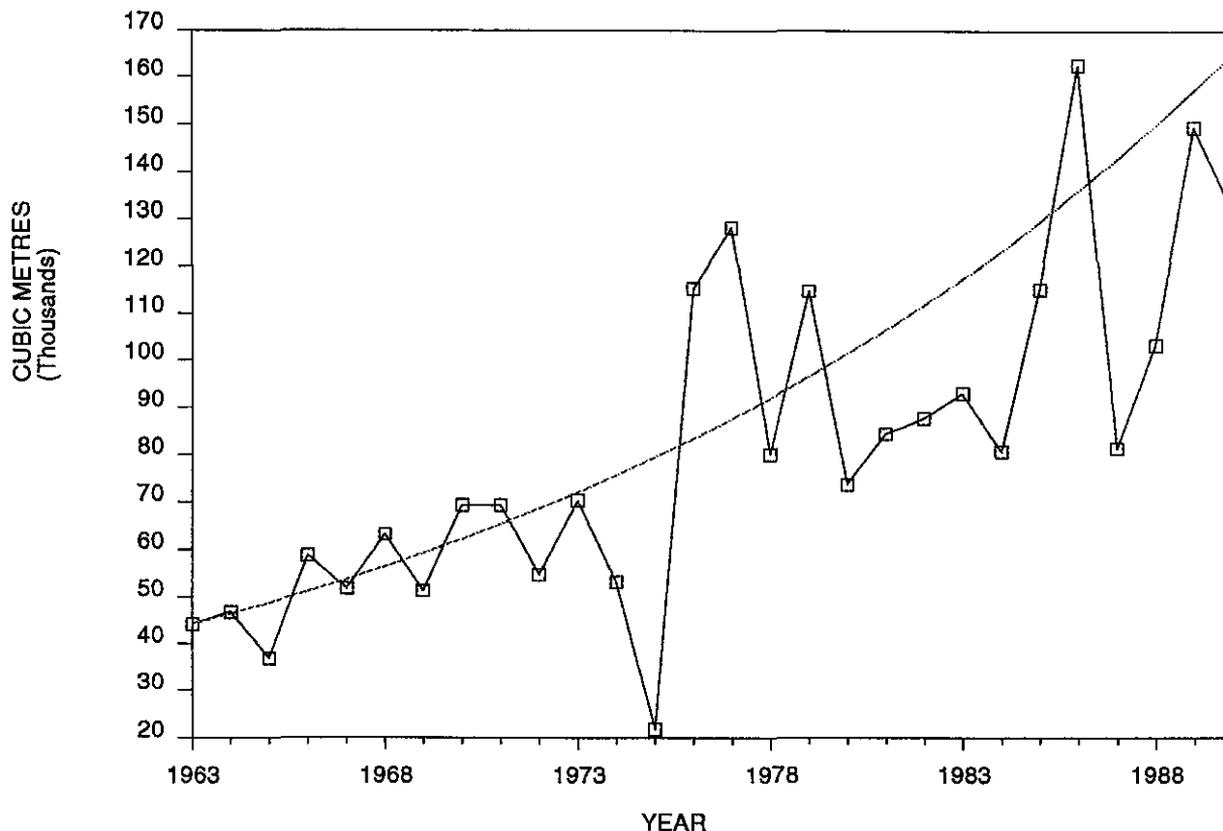


Figure 4.

requirements and one produces sand for the glass making industry only. Most of the sand is mined in the Sandford-South Arm area.

It appears essential to obtain accurate estimates of available remaining reserves of sand on existing leases in order to determine the working life of the resource. An investigation programme is required to provide these estimates.

The Seven Mile Beach area appears to be the last large sand deposit in the Hobart area with a potential for dry-pit mining. The sand would require the addition of crusher dust for concrete production. The main advantages of the deposit are that it can be easily mined, is close to Hobart, and the potential reserves are large.

Future potential sources of sand for the construction industry need to be located. Apart from the Seven Mile Beach area sand deposits are unlikely to be discovered on land in the Hobart area. Offshore exploration is required to determine the potential in areas such as Ralphs Bay, D'Entrecasteaux Channel, Storm Bay and Frederick Henry Bay.

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