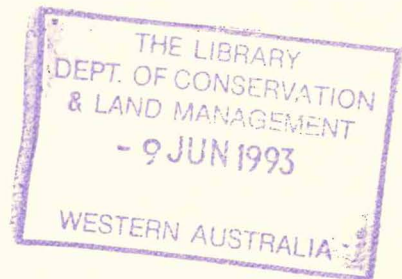


218.

Burswood Island Resort Groundwater Investigations

Burswood Management Limited

Report and Recommendations
of the
Environmental Protection Authority



Department of Conservation and Environment
Perth, Western Australia

Bulletin No. 248 January 1986

BURSWOOD ISLAND RESORT
GROUNDWATER INVESTIGATIONS
BURSWOOD MANAGEMENT LIMITED

REPORT AND RECOMMENDATIONS
OF THE
ENVIRONMENTAL PROTECTION AUTHORITY

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CONTENTS

	Page
INTRODUCTION	1
DESCRIPTION OF PROPOSAL	1
PUBLIC SUBMISSIONS RECEIVED	1
IMPACT OF CONSTRUCTION ACTIVITIES ON GROUNDWATER AND THE SWAN RIVER	2
CONCLUSION	3
RECOMMENDATION	4
REFERENCE	5

INTRODUCTION

Burswood Island has a history of change, largely as a result of dredging and filling activities. Most change has been on the southern portion of the Island where the Burswood Island Resort is being constructed.

Much of the Resort area was part of the shallows of the Swan River until the 1950s, but was subsequently filled by dredge spoil and by industrial, construction and domestic refuse. It was the potential for pollution of the river from this refuse which the Authority required to be investigated as a component of the Burswood Island Resort development.

When the Government approved the development in February 1985, the Authority sought the preparation of a Public Environmental Report (PER) by the proponent, Burswood Management Limited. The Authority's principal objective was to ensure that there would be no adverse environmental impact on the Swan River from construction and to ensure that appropriate commitments were given to monitor for and to manage environmental impacts.

A Public Environmental Report was released to the public for a period of eight weeks, closing on 13 December 1985.

DESCRIPTION OF PROPOSAL

The Burswood Island Resort is being constructed within a 12 hectare area of alienated Crown land (Figure 1). Included within the development will be:

- . a 400 room hotel,
- . a casino,
- . a convention centre, and
- . sporting complexes

The poor foundation characteristics of the site dictate that most structures within the freehold development site be constructed on a system of piled foundations. The piles were driven through the landfill and soft clay into layers of stiff clay and dense sand. Piles have been driven to depths of up to 36 metres. Details of pile layout and design are provided in Section 7 of the PER.

PUBLIC SUBMISSIONS RECEIVED

Five submissions were received on the Public Environmental Report: four from government agencies and one from an individual. They were:

- . Geological Survey of Western Australia
- . Western Australian Museum

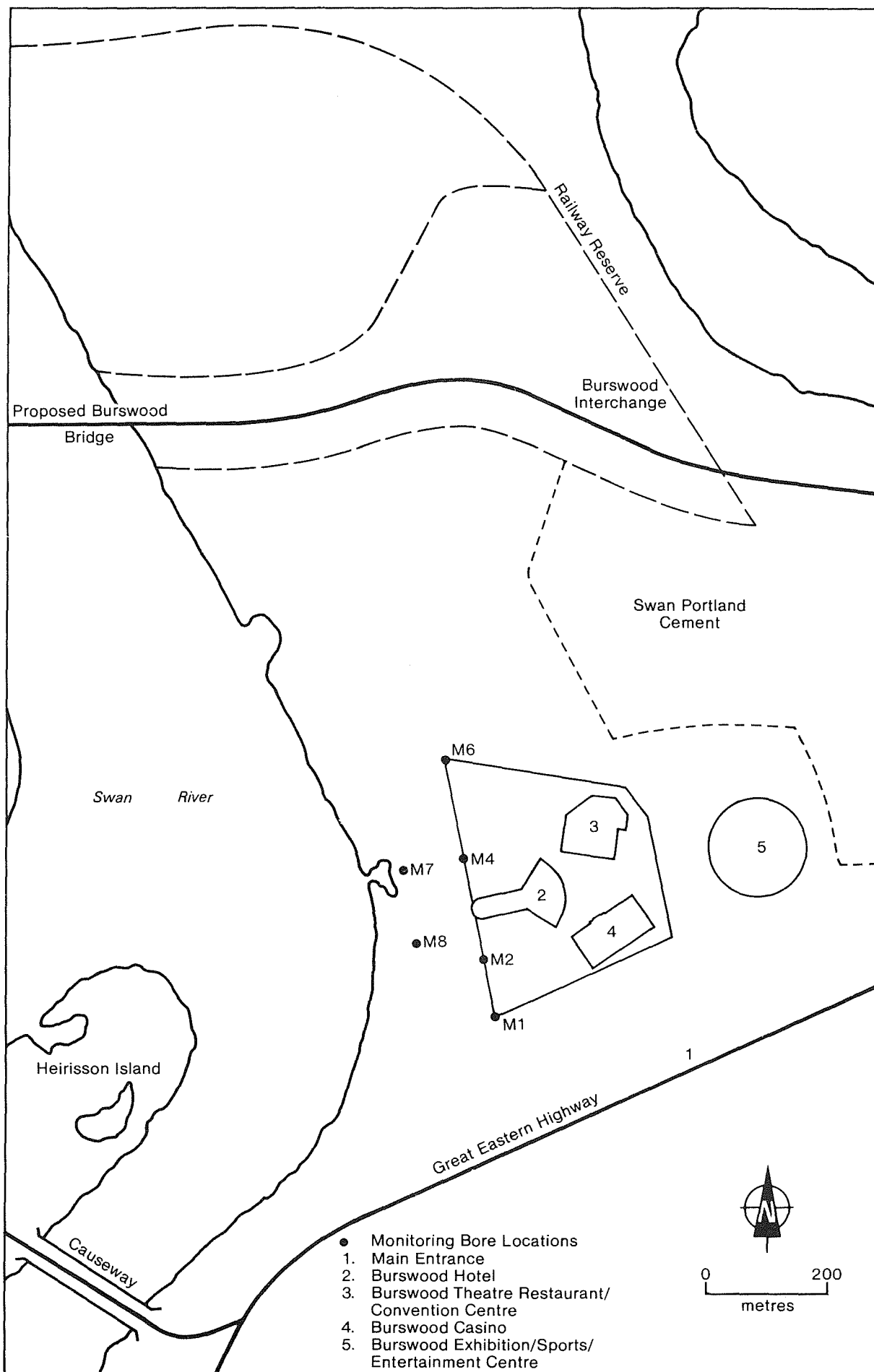


Figure 1 Burswood Island resort complex and monitoring locations.

- . Dr C Barber
- . Swan River Management Authority
- . Water Authority of Western Australia

IMPACT OF CONSTRUCTION ACTIVITIES ON GROUNDWATER AND THE SWAN RIVER

The principal concern of the Authority was that construction activities, especially pile-driving, might cause putrescent and chemically contaminated groundwater to be mobilised and enter the Swan River. Further, commitments were sought to monitor for, and to manage any, contaminated groundwater.

The Public Environmental Report outlined in considerable detail the method by which monitoring was undertaken and the results of that programme.

Monitoring on the site commenced in March 1985 and continued through to August 1985. Twenty bores were established, to monitor:

- . water level
- . groundwater quality and contaminants
- . suspended sediment

There was also some limited sampling of the Swan River.

The monitoring programme showed high levels of suspended particulates in several of the bores, suggesting that construction activities might have cause localised and short term peaks in suspended solids in the groundwater.

There is some contamination of the groundwater, consistent with the history of the site. Water which seeps through the old landfill sites on Burswood Island is taking some pollutants into the shallow groundwater. It is likely that this process has been occurring since disposal commenced and long before the present construction began. The levels of contaminants in the groundwater are affected by seasonal factors, such as rainfall and the movement of the saline groundwater wedge outward from the Swan River.

The watertable level on the site indicates that there is a slow flow of groundwater towards the Swan River. There is some minor contamination of the Swan River, possibly from domestic and/or industrial waste. It is likely that the source of this contamination is from previous disposal activities on Burswood Island and also from other locations upstream.

Following an assessment of monitoring results, the Public Environmental Report concludes that:

"The results of this investigation indicated that construction activities have not caused any increase in the quantity or decrease in quality of the leachate nor are they likely to in the future. Consequently, there can be no worsening of the quality of the leachate entering the Swan River" (Riggert Consulting Ecologists, p 47-8).

This conclusion is generally supported in the public submissions. Some additional comment was however, made about the level of sampling undertaken in the Swan River and also the short duration of the monitoring programme, upon which the conclusion was based.

Burswood Management Limited has undertaken to continue the monitoring programme till the end of 1986, at a reduced frequency and at fewer sampling sites. Further, the PER contains the following commitment:

"If any lessening of groundwater quality is observed during the monitoring period, which is attributable to construction activities within the Freehold, then Burswood Management Limited will undertake any containment or remedial measures necessary to ensure that contamination of the Swan River does not occur. Any measures required will be designed at the time to suit the particular problem that arises but will be performed to the satisfaction of the Government of the State of Western Australia. "(Riggert Consulting Ecologists, p 48).

This commitment is noted by the Authority.

CONCLUSION

The Authority concludes, on the basis of the information available to it, that construction activity within the freehold area of the Burswood Island Resort has not caused degradation in the quality of groundwater flowing into the Swan River.

In view of the limited duration of the monitoring and possibly seasonal effects, the Authority recommends that monitoring continue.

RECOMMENDATION

The EPA recommends that monitoring of groundwater at sites M1, M2, M4, M6, M7 and M8 should continue until 1990, but at a reducing frequency. Parameters to be measured should include:

- . water level
- . pH
- . conductivity
- . total dissolved solids
- . chemical oxygen demand
- . total nitrogen
- . coliforms and E. coli
- . phenols

The EPA suggests the following frequency of monitoring:

- . 1986 - every two months
- . 1987 - every three months
- . 1988 & 89 - every six months

Monitoring results and an interpretation of these results should be provided to the EPA on an annual basis. The frequency of sampling will be reviewed by the EPA during its assessment of this information.

Should a significant adverse change be detected, the EPA should be advised immediately.

Monitoring at a location in the Swan River should be continued, in accordance with this recommendation. The location should be determined in consultation with the Swan River Management Authority.

REFERENCE

Riggert Consulting Ecologists Pty Ltd (1985), Burswood
Island Resort - Public Environmental Report.