

# Fossil Beach Cement Works Heritage Study

April 2011



*'A view of Fossil Beach in 1872', oil painting by R Scott, in the collection of the Mornington Peninsula Regional Gallery.*

# Fossil Beach Cement Works Heritage Study

April 2011

Gary Vines & Geoff Yugovic

**Report for  
Mornington Peninsula Shire**

**Ballarat:**

449 Doveton Street North Ballarat 3350  
Ph: (03) 5331 7000 Fax: (03) 5331 7033  
email: [ballarat@biosisresearch.com.au](mailto:ballarat@biosisresearch.com.au)

**Melbourne:**

38 Bertie Street Port Melbourne 3207  
Ph: (03) 9646 9499 Fax: (03) 9646 9242  
email: [melbourne@biosisresearch.com.au](mailto:melbourne@biosisresearch.com.au)

**Canberra:**

Unit 16/2 Yallourn Street Fyshwick 2609  
Ph: (02) 6228 1599 Fax: (02) 6280 8752  
email: [canberra@biosisresearch.com.au](mailto:canberra@biosisresearch.com.au)

**Sydney:**

18-20 Mandible Street Alexandria 2015  
Ph: (02) 9690 2777 Fax: (02) 9690 2577  
email: [sydney@biosisresearch.com.au](mailto:sydney@biosisresearch.com.au)

**Wangaratta:**

PO Box 943 Wangaratta 3676  
Ph: (03) 5721 9453 Fax: (03) 5721 9454  
email: [wangaratta@biosisresearch.com.au](mailto:wangaratta@biosisresearch.com.au)

**Wollongong:**

8 Tate Street Wollongong 2500  
Ph: (02) 4229 5222 Fax: (02) 4229 55  
email: [wollongong@biosisresearch.com.au](mailto:wollongong@biosisresearch.com.au)

**Biosis Research Project – 11255  
Date of Completion – 12/05/2011  
ISBN 978-1-921405-10-5**

### Acknowledgments

Biosis Research acknowledges the contribution of the following people and organisations in preparing this report:

- Jo-Anne E. Tetteroo, Simon Lloyd, Simon Thorning (Shire of Mornington)
- Peter Greer, (National Trust of Australia (Vic) Mornington Peninsula Branch)
- Derek Smith (Mornington & District Historical Society)
- Gill Gordon, (Mount Martha Foreshore Advisory Group)
- Lorraine Huddle (Heritage Advisor)
- Paul Young and Carmel Prestinenzi (Biosis Research Pty. Ltd.)

Cover illustration 'A view of Fossil Beach in 1872', oil painting by R Scott, in the collection of the Mornington Peninsula Regional Gallery.

### Abbreviations

AHC	Australian Heritage Commission
AMG	Australian Map Grid
DSE	Department of Sustainability and Environment (formerly DNRE)
DOI	Department of Infrastructure
DPCD	Department for Planning and Community Development
HO	Heritage Overlay
HV	Heritage Victoria (DSE)
ICOMOS	International Council on Monuments and Sites
LCC	Land Conservation Council
MPS	Mornington Peninsula Shire
RNE	Register of the National Estate

## Contents

<b>SUMMARY .....</b>	<b>7</b>
<b>1.0 INTRODUCTION .....</b>	<b>9</b>
1.1 Project background .....	9
1.2 Aims .....	9
1.3 Consultation .....	9
Consultation with Heritage Victoria .....	9
1.4 Location and description of the study area .....	10
1.5 Authorship .....	10
<b>2.0 BACKGROUND INFORMATION .....</b>	<b>13</b>
2.1 Planning status, heritage listings and controls .....	13
2.2 Terminology .....	14
2.3 Environmental background .....	15
2.4 Flora .....	16
<b>3.0 HISTORICAL BACKGROUND .....</b>	<b>18</b>
3.1 Aboriginal occupation .....	18
3.2 European exploration .....	23
3.3 Settlement .....	23
3.4 Cement manufacture technology .....	26
3.5 Development of Melbourne's lime and cement industry .....	28
3.6 Establishment of the Patent Septaria Cement Co. ....	29
3.7 Later history .....	40
3.8 Culican's Excavation .....	48
3.9 Later Management .....	49
<b>4.0 DESCRIPTION .....</b>	<b>50</b>
4.1 Background and main layout .....	50
4.2 Entrance Track .....	52
4.3 Sea Wall .....	53
4.4 Washmill and settling tanks (Culican & Taylor Area B & C) .....	54
4.5 Large Kiln (Culican & Taylor Area G) .....	57
4.6 Retaining walls (Culican & Taylor Area I) .....	58
4.7 Small Kiln (Culican & Taylor Area H) .....	59
4.8 Tanks/well (Culican & Taylor Area D & E) .....	61
4.9 Other historic Features (Culican & Taylor Areas A, F & J) .....	63
4.10 Aboriginal sites .....	64
4.11 Fossil Beds .....	64
4.12 Vegetation .....	66
<b>5.0 COMPARATIVE ANALYSIS .....</b>	<b>67</b>
5.1 Cement works .....	67
5.2 Fossil site .....	68
5.3 Recreation reserve .....	68

5.4	Natural values .....	69
5.5	Aboriginal sites .....	69
6.0	CULTURAL HERITAGE SIGNIFICANCE .....	70
6.1	Statement of significance .....	70
7.0	MANAGEMENT RECOMMENDATIONS .....	74
<b>Appendix 1. Statutory Regulations .....</b>		<b>80</b>
	Victorian cultural heritage legislation .....	80
<b>Appendix 2. Heritage Listings .....</b>		<b>83</b>
	Mornington Peninsula Planning Scheme Heritage Overlay.....	83
	Mornington Heritage Study .....	84
	Shire of Mornington Heritage Study.....	90
	Register of the National Estate Citation .....	94
	National Trust of Australia (Victoria) Citation.....	96
	Victorian Heritage Register Citation.....	98
	Sites of Geological and Geomorphological Significance CITATION .....	100
	Mornington Peninsula Planning Shceme, Schedule 25 to the Environmental Significance Overlay .....	103
	Biosphere Reserve Information .....	105
<b>Bibliography .....</b>		<b>108</b>

## Maps

Map 1: Location of the study area. ....	11
Map 2: General Plan of Fossil Beach Management Area.....	12
Map 3: Location of Aboriginal Archaeological Sites (VAHR) and areas of Aboriginal archaeological potential, also including plan of geological features and fossil beds.....	22
Map 4: General plan of archaeological features. ....	51
Map 5: Management Actions Site Plan: showing proposed boundaries for statutory protection and designation of the Fossil Beach Cement Works Historic Area. ....	79

## Figures

### Cover illustration

'A view of Fossil Beach in 1872', oil painting by R Scott, in the collection of the Mornington Peninsula Regional Gallery.

Figure 1: Part of Smythe's 1841 <i>Map of the coast of Port Phillip</i> .....	24
Figure 2: Gazette entry for reservation of Mornington foreshore reserve, 1882.....	25
Figure 3: Advertisement for Robertson's patent <i>The Age</i> - 5 March 1862 p.2 .....	31
Figure 4: Survey Map of 1862, Lands Department Melbourne, Sheet X No 22 surveyed by Commander Henry L Cox RN. Track and buildings highlighted in red.....	34
Figure 5: Left -Great Britain. Hydrographic Dept. Port Phillip 1865 - 1873. MAP RM 1696. right - Great Britain. Admiralty. Australia south coast. Port Phillip 1932. MAP RM 1763. ....	35
Figure 6: Advertisement for the initial auction of the cement works.....	36
Figure 7: Subsequent sale advertisement for the works .....	37
Figure 8: Watercolour of Fossil Beach held by a Mrs Gleadell (from Culican & Taylor) dated c1879. ....	41

Figure 9: The old cement works, Schnapper Point, Victoria, c1880 Part of Views of Victoria, South Australia, New South Wales and Tasmania National Library nla.pic-an10608594-54	41
Figure 10: Looking towards small and large kilns. Photo taken 'early this century' by Mr. C Allchin of Mornington – reproduced in Culican & Taylor.	42
Figure 11: 1902 View towards small kiln, with large kiln on extreme left - from Mornington Progress Society (Latrobe Library Victorian Historical Pamphlets VII) reproduced from Culican & Taylor.	42
Figure 12: Old Cement Works near Mornington, post card c 1909.	43
Figure 13: Girl Guide Camp at Fossil Beach, <i>The Age</i> - 15 Jan 1936.	44
Figure 14: Moorooduc Parish Plan, Imperial measure M3175-2 Sheet 2 M161 showing alignment of sewer.	47
Figure 15: View looking south from access track, note large Banksia on right growing from small kiln, and possible track or bench on hill side – reproduced from Culican & Taylor.	52
Figure 16: Similar viewpoint to above – note regrowth and dead trunk from Banksia.	52
Figure 17: Looking south along sea wall.	53
Figure 18: Sea wall looking south, note revegetation area on left and mix of Baxter sandstone and limestone on the rocky shore.	54
Figure 19: Looking towards modern toilet and site of settling tanks. Washmill located on the rise behind and right of toilet.	55
Figure 20: Washmill after partial clearing of vegetation, central drum takes up right hand half of photo, dark area is circular ditch.	55
Figure 21: Washmill during excavation - Culican and Taylor Plate VIII a & b p.40.	56
Figure 22: Plan of excavated Washmill - Culican and Taylor Plate VII p.39.	56
Figure 23: Outer surface of southern wall of large kiln, showing line of surviving stone on Culican's c1970 photograph.	57
Figure 24: Plan of excavated Larger Kiln - Culican and Taylor Plate XVII p.49	57
Figure 25: Retaining wall south of large kiln.	58
Figure 26: Two of the east-west walls running off the retaining wall south of the Large Kiln	59
Figure 27: Plan of excavated Lesser Kiln - Culican and Taylor Plate XIII p.45	60
Figure 28: Eroded bank west of Small Kiln	60
Figure 29: Excavation of the small kiln looking south, Culican & Taylor Plate XIIb p.44.	61
Figure 30: Well from Culican & Taylor Plate Xb p.42.	62
Figure 31: Large rectangular cistern looking north west, Culican & Taylor Plate XVb p.47.	62
Figure 32: Internal stonework of rectangular tank.	62
Figure 33: Area F, possible boiler/machinery setting remains Culican & Taylor Plate XXV a & b p.57.	63
Figure 34: Balcombe Clay Cliffs and inter-tidal fossil bearing zone at base. Note deflated Baxter Sandstone blocks that have come from the top of the cliff.	64
Figure 35: Nodule of <i>Septaria</i> Limestone (about 50cm wide) embedded in grey Balcombe clay at base of cliffs.	65
Figure 36: Rocky beach immediately north of the end of the sea wall showing mix of natural stone and introduced basalt, granite and concrete.	65

## SUMMARY

Fossil Beach is a small cove on Port Phillip Bay, south of Mornington with a rich natural and cultural history including geological sites, Aboriginal archaeological remains, industrial and social history.

The site has geological strata and fossil beds and stratigraphic exposures from the Tertiary period which were important in establishing Victorian geological sequences. Aboriginal shell middens are found on the headlands and remnant coastal shrubland vegetation. Weed invasion has occurred on the site, particularly over the ruins. The footings and ruins of several industrial structures related to lime and cement processing, including two kilns a puddling machine and various stone-lined tanks, demonstrate the technology and brief history of the Patent Septaria Cement Company. In the 20th century the site was briefly important for recreational and social activities, being used for scout and guide camps and natural heritage education, but has otherwise fallen into obscurity. In 1968-70 William Culican of Melbourne University carried out Australia's first historical, archaeological excavation on the site.

The Mornington Peninsula Shire wishes to improve the conservation values and amenity of the site and properly manage its natural, cultural, aesthetic and social values, and so has commissioned this heritage assessment as part of this process.

The site inspection has identified a range of features relating to the cement works use, and has relocating and mapped the features that were excavated by Culican and Taylor in the late 1960s. It would appear that little has been done with the site since the 1970s, apart from construction of a toilet block and track maintenance. Growth of both native and exotic vegetation has obscured the ruins and presented challenges for conservation and interpretation. A balance is therefore needed between clearing the ruins for public viewing and ensuring their protection, while avoiding loss of native vegetation.

The following recommendations have been proposed for managing the various elements of the site's significance.

### **Recommendations**

Detailed recommendations are provided in Section 6.

In summary, it is recommended that a staged approach be undertaken in order to conserve, manage and interpret the natural and cultural values of the Fossil Beach historic area. These include:

- Redefining the extent of the "Fossil Beach Historic Area" and updating heritage protection and planning maps accordingly.
- Selective clearing of woody weeds from the large and small kiln and wash mill, and other weed removal and maintenance.
- Conservation works on exposed ruins to limit weathering and deterioration.
- Fencing of some areas to control public access.

- Revegetation of indigenous plants including the climber Bower Spinach, to provide a protective covering to areas around the ruins liable to erosion.
- Obtaining appropriate heritage approvals as necessary and undertaking archaeological monitoring, supervision and management.
- Management of impacts to Aboriginal sites, native vegetation, archaeological remains and fossil and geological zones from public access and visitation, site maintenance and future infrastructure works.
- Future stages of conservation, interpretation and archaeological investigation to enhance the value of the site for visitors.



## 1.0 INTRODUCTION

Cultural heritage legislation protecting historical heritage places applies in Victoria under the *Heritage Act 1995* and *Planning and Environment Act 1987*. These places are a vital part of our heritage as they can provide us with important information about past lifestyles and cultural change. Preserving and enhancing these important and non-renewable resources is encouraged under various government legislation and policies.

It is an offence under sections of *Heritage Act* to damage or destroy heritage sites without a permit or consent from the appropriate body, while a planning permit is required for works on places included in the Mornington Peninsula Planning Scheme Heritage Overlay or from Heritage Victoria if the area is included on the Victorian Heritage Overlay (see Appendix 2 for a complete discussion of relevant heritage legislation and constraints).

### 1.1 Project background

Biosis Research Pty. Ltd. was commissioned by the Mornington Peninsula Shire to undertake a cultural heritage assessment which identifies the conservation values and amenity of the site, and provides recommendations for the proper management of the site's natural, cultural, aesthetic and social values.

### 1.2 Aims

The aim of this assessment is to establish the cultural heritage values of the structures, landscape and other features, to undertake research and field surveys documenting the site to determine the nature and extent of surviving historical fabric, to prepare a statement of cultural significance for the place, and to make recommendations for its management.

The specific objectives of the project are to:

- Confirm the location and condition of historic material.
- Assess historic, natural, geological, indigenous and scientific values.
- Develop policies and strategies for management.
- Provide guidelines for management activities to conserve the site's heritage values.

### 1.3 Consultation

#### CONSULTATION WITH HERITAGE VICTORIA

Before undertaking surveys for historical heritage places there is a statutory requirement to notify Heritage Victoria – the state government agency responsible for historical cultural heritage places. In the present study, the site inspection was intended to help identify standing structures and engineering works, and so was not considered archaeological in nature.

A notice of intent to undertake an archaeological survey was submitted to Heritage Victoria on 9/06/2010.

Mornington Peninsula Shire has included a number of people on a steering committee to manage the project including Gill Gordon of the Mount Martha Foreshore Advisory Group, Derek Smith of the Mornington and District Historical Society, heritage consultant Lorraine Huddle, Peter Greer, of the Mornington Peninsula Branch of the National Trust and council staff.

Discussions were held on site at the commencement of the study to consider potential issues relating to the community access, conservation and management of the site.

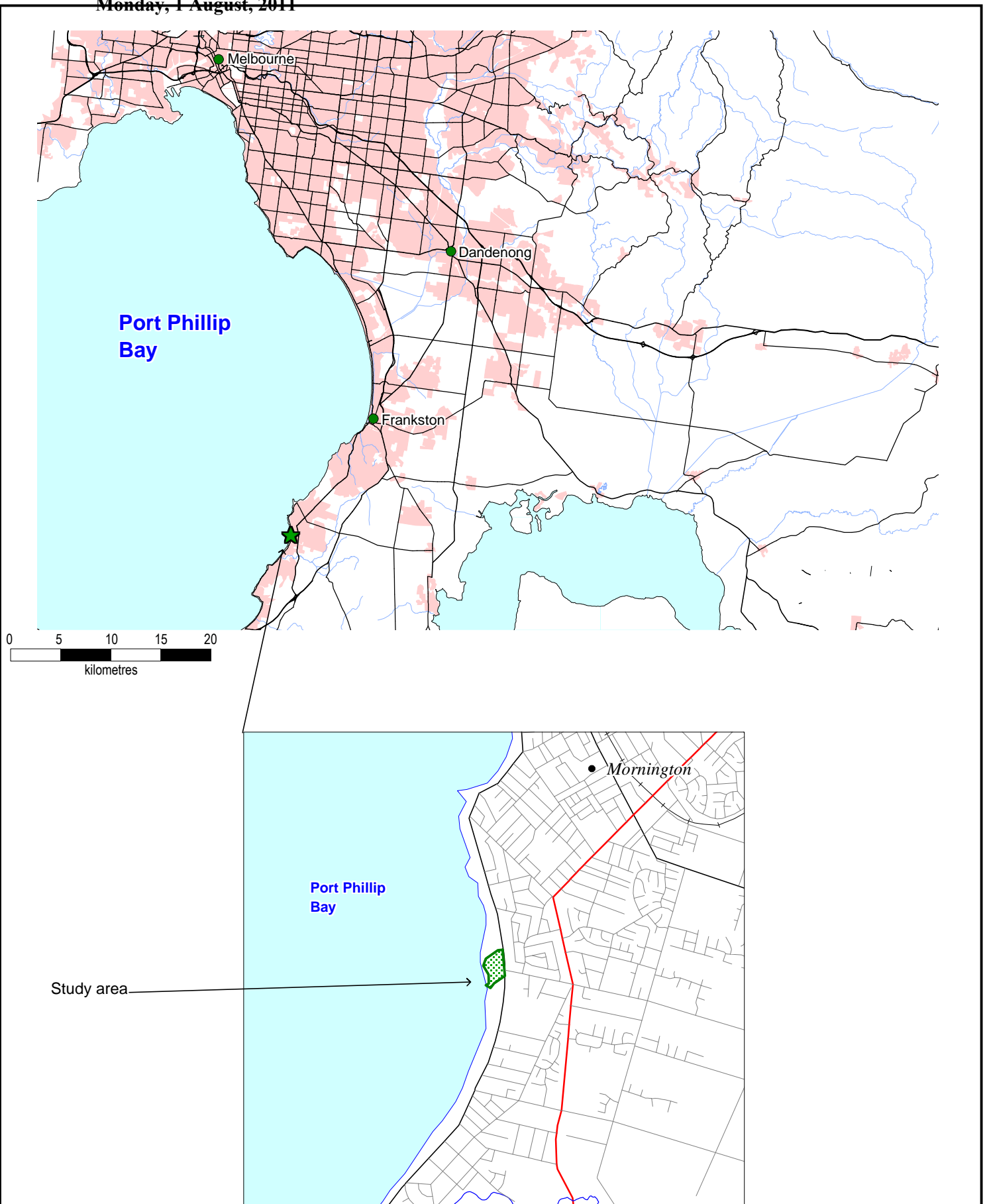
#### **1.4 Location and description of the study area**

Fossil Beach is located about 3.5km south of Mornington off the Esplanade. Access is from a track running off the Esplanade north of Bentons Road. The land is part of Crown Allotment 2022, Parish of Moorooduc Parcel P382323. PP3175

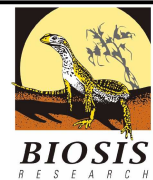
The location of the Study Area is shown in Map 1.

#### **1.5 Authorship**

Gary Vines managed the project, carried out the field survey and wrote the report. Jeff Yugovic undertook the flora assessment and provided plant lists and vegetation management recommendations. Paul Young compiled all the figures.



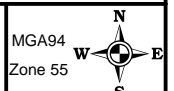
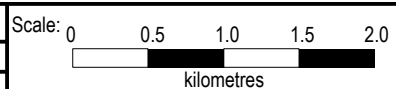
Acknowledgement: VicRoads



Biosis Research Pty. Ltd.  
38 Bertie Street  
(PO Box 489)  
Port Melbourne  
VICTORIA 3207  
Offices also in Sydney, Ballarat,  
Wollongong, Canberra & Wangaratta

Map 1: Location of the study area





DATE: 2010  
Checked by: ABC Drawn by: ABC File number: 1234  
Location: ..\0000\Mapping\0000 Fig 1.wor







**Key**

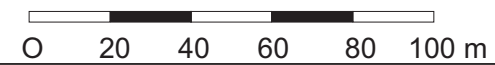
-  Walking Track
-  Vehicle Track
-  Contour
-  High Water Mark




Biosis Research Pty. Ltd.  
38 Bertie Street  
(PO Box 489)  
Port Melbourne  
VICTORIA 3207

**Map 2: General Plan of Fossil Beach Management Area**

Date 30 August 2010



GDA94  
Zone 55





## 2.0 BACKGROUND INFORMATION

### 2.1 Planning status, heritage listings and controls

Fossil Beach is in a reserve of land zoned Public Conservation and Resource. This area is Coastal Crown Land Reserve managed by MPS as the Committee of Management (CoM) on behalf of the Crown and the wider community.

There is a Heritage Overlay (HO83) and Environmental Significance Overlay (ESO25 Port Phillip Coastal Area) in the Mornington Peninsula Shire Planning Scheme. The present Heritage Overlay covers a rough semicircular area of land adjacent to the sea wall, but does not entirely include the archaeological remains. The Environmental Significance Overlay covers “The Port Phillip coastal area and adjoining offshore areas”, which appears to be generally mapped as the area from the high water mark to 600m off the coast. According to Shire maps it comes inshore around the location of the toilet block and appears also to cover the fossil beds to the north, it then comes in further south possibly to cover fossil beds there. The description suggests that it is intended to cover all “the natural features, vegetation, ecological diversity, landscape quality, heritage values and recreation opportunities of the Port Phillip Bay coastal area and associated intertidal and marine habitats” and therefore may be intended to cover at least part of the landward area as well.

The site is listed on the Victorian Heritage Register (VHR Number H1929 – listed in 2001), Heritage Inventory (H7921-0021) and is classified on the National Trust Register both for the industrial archaeological site (B3420) and for the greater landscape of the Mount Martha - Mornington Foreshore (L10064). The VHR designation covers the same area as the Heritage Overlay.

The cement works was also included as an indicative place on the former *Register of the National Estate* (Place ID: 100470). There are no statutory requirements as a consequence of this listing.

The Shire of Mornington Heritage Study identifies the Patent Septaria Cement Company, both in the Thematic History<sup>1</sup> and the Significant Sites and Areas volumes.<sup>2</sup>

There are three sites included on the Victorian Aboriginal Heritage Register within or adjacent to the Fossil Beach historic area, while the entire *foreshore reserve is an “area of cultural heritage sensitivity” under the Aboriginal Heritage Act 2006*, by way of it being located within 200m of the high water mark of the coastal waters of Victoria (Aboriginal Heritage Regulation 28) or within Coastal Crown Land (Regulation 27).

The Mornington Peninsula and Western Port Biosphere Reserve – (Stage 1) nomination form has identified the “Fossil Beach Geological Reserve”, based it would seem on the Rosengren report and which was also picked up in the Land Conservation Council and the Metropolitan

---

<sup>1</sup> Graeme Butler & Associates, Mornington Peninsula Shire Environmental History: draft, 2008: 85 .

<sup>2</sup> Graeme Butler & Associates, Shire of Mornington Heritage Study Part 2.

Strategy Project Team report.<sup>3</sup> However, there does not appear to be any statutory frameworks for such a geological reserve.

Citations from the various lists and studies are included in the Appendices to this report.

## 2.2 Terminology

The conservation terminology used in this report is of a specific nature, defined in the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (the Burra Charter) as endorsed by the Australian Heritage Commission. The terms most frequently referred to are: place, cultural significance, fabric, conservation, preservation, restoration, reconstruction and adaptation. These terms are defined in the charter as follows:

*Place* means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

*Cultural significance* means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the *place* itself, its *fabric*, *setting*, *use*, *associations*, *meanings*, records, *related places* and *related objects*.

*Fabric* means all the physical material of the *place* including components, fixtures, contents and objects.

*Conservation* means all the processes of looking after a *place* so as to retain its *cultural significance*.

*Maintenance* means the continuous protective care of the *fabric* and *setting* of a *place*, and is to be distinguished from repair. Repair involves *restoration* or *reconstruction*.

*Preservation* means maintaining the *fabric* of a *place* in its existing state by removing accretions or by reassembling existing components without the introduction of new material.

*Restoration* means returning the existing *fabric* a *place* to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric.

*Reconstruction* means returning a *place* to a known earlier state and is distinguished from *restoration* by the introduction of new material into the *fabric*.

*Adaptation* means modifying a *place* to suit the existing use or a proposed use.

*Use* means the functions of a *place*, as well as the activities and practices that may occur at the *place*.

*Compatible use* means a *use* which respects the *cultural significance* of a *place*. Such a use involves no, or minimal, impact on cultural significance.

*Setting* means the area around a *place*, which may include the visual catchment.

*Related place* means a *place* that contributes to the *cultural significance* of another *place*.

*Related object* means an object that contributes to the *cultural significance* of a *place* but is not at the *place*.

*Associations* mean the special connections that exist between people and a *place*.

*Meanings* denote what a *place* signifies, indicates, evokes or expresses.

*Interpretation* means all the ways of presenting the *cultural significance* of a *place*.

---

<sup>3</sup> Metropolitan Strategy Project Team Technical Report 1 "Environmental Issues and their Impact on Metropolitan Strategy" Department of Infrastructure, 200; Neville Rosengren Sites of Geological and Geomorphological Significance on the Coast of Port Phillip Bay 1988; Land Conservation Council Melbourne District 1 Review, July 1994.

## 2.3 Environmental background

Fossil Beach is located on a prominent escarpment around the eastern shore of Port Phillip Bay. The cliffs are a result of erosion of raised hills at the edge of the Port Phillip Sunkland which was formed by the uplift of the Selwyn Fault on the west side of the Mornington Peninsula.<sup>4</sup> An earthquake measuring 4.5 on the Richter scale struck Mornington on 2 September 1932 associated with the nearby Selwyn fault. No injuries or major damage was reported.<sup>5</sup>

### Geology

Fossil Beach along with the adjoining Fosters land slip to the north is an important geological site in the study of stratigraphy, palaeontology, mineralogy and weathering. Several units of the Tertiary marine transgressive-regressive geological sequence can be seen here. The site includes all the units from the Older Volcanic basalt to the Baxter Sandstones and displays the complete sequence beginning with volcanics and non-marine sediments, passing to marine and then returning to non-marine conditions. The area is extensively affected by land slipping with unstable cliffs partly protected by masonry and boulder walls.<sup>6</sup> Sections of harder stone outcrops have resulted in a series of small headlands and indented bays between. In some cases, such as the southern end of Fossil Beach and the adjoining Dava Beach to the south, the Fossil Beach Fault exposes the Mt Martha Sand Beds and the Harmon Rocks Sand Bed. The Balcombe Clay is exposed in the low cliffs north of the sea wall and on the inter-tidal platform at Fossil Beach. This is a complex geological formation with two units, (calcareous and non-calcareous), the former being a richly fossiliferous clayey silt with bands of hard carbonate concretions of uncertain origin. These concretions are lenticular in form and vary from a few centimetres to almost a metre in length. They contain about 80% carbonate and are the "Septaria" nodules that gave rise to the cement works. There are now few accessible concretion layers in the cliffs but they occur in the intertidal area.

The calcareous Balcombe Clay beds have an abundant fossil fauna, the richest layer containing the most robust shells being a seven centimetre thick bed exposed only at low tide, although fossils also occur above and below this layer. In the cliffs, the fossils are scarcer and are more fragile.

The fauna represented in the fossil beds is dominated by mollusc (bivalves and gastropods), foraminifera and other microfossils, but includes sponge spicules, corals, echinoids and the 'ear bones' (otoliths) of fish. The latter are of particular importance in the systematic study and taxonomy of fossil fish.

Historical fossil records identified at Fossil Beach include the following:

F6 *Lilax conohelix* (1877) Fossil Beach, Mornington, Vic

F11 *Niso psila* (1879b) Fossil Beach, Mornington, Vic

F24 *Austrolithes tateana* (1877) Fossil Beach, Mornington, Vic

F27 *Cancellaria varicifera* (1879a) Fossil Beach, Mornington, Vic

---

<sup>4</sup> Keeble Geological Survey of Victoria. 17, 1-84. Spencer-Jones et al. Proceedings of the Royal Society of Victoria 87, 43-67.

<sup>5</sup> Birch, W. D. (ed), 2003. "Geology of Victoria". *Geological Society of Australia Special Publication 23. Geological Society of Australia (Victorian Division)*.

<sup>6</sup> Rosengren 1998.

F28 *Micantapex rhomboidalis* (1879a) Fossil Beach, Mornington, Vic<sup>7</sup>

## 2.4 Flora

Historically, the coastal vegetation around Mornington would have comprised coastal scrub grasslands and woodlands. This is still evident in the less disturbed parts of the foreshore, with some high quality vegetation areas just north of Fossil Beach.

The coastal vegetation generally along the Fossil Beach to Fosters Beach section of coastline has been described by Jo-Anne Thyer as Coastal Headland Scrub Ecological Vegetation Class (EVC) with variable quality vegetation, with some large areas of good quality vegetation present.

*The widest area of vegetation located just north of Fossil Beach fire access track is characterised by a Coast Tea-tree Leptospermum laevigatum overstorey with emergent Drooping Sheoak Allocasuarina verticillata, scattered Coast Banksia Banksia integrifolia and other shrubs including Sea Box Alyxia buxifolia, Coast Beard-heath Leucopogon parviflorus and Golden Wattle Acacia pycnantha. The area closest to the track, where previous weed control works have been carried out, is relatively free of mature woody weeds. However, many seedlings (particularly of Myrtle-leaf Milkwort \*Polygala myrtifolia) are still present. In other areas dense patches of Myrtle-leaf Milkwort \*Polygala myrtifolia and mature Sweet Pittosporums dominate. Throughout the main gully large, dead Sweet Pittosporums \*Pittosporum undulatum are being replaced by a dense layer of Myrtle-leaf Milkwort \*Polygala myrtifolia. The vegetation at the top of the cliff thins northward, with steep cliffs dropping down to the beach along the remainder of this zone. Vegetation is absent from some sections of the cliff face and where present is characterised by salt pruned Coast Teatree Leptospermum laevigatum, Myrtle-leaf Milkwort \*Polygala myrtifolia and scattered Boneseed \*Chrysanthemoides monilifera subsp. monilifera. A thin strip of Coast Saltbush Atriplex cinerea is present at the cliff base in some sections. Along the cliff top Coast Tea-tree Leptospermum laevigatum again dominates the overstorey along with several large Sweet Bursarias Bursaria spinosa var. spinosa, Golden Wattle Acacia pycnantha, and Scurfy Pomaderris Pomaderris paniculosa. Myrtle-leaf Milkwort \*Polygala myrtifolia is present in dense patches. There is also one large Monterey Cypress \*Cupressus macrocarpa and a Flax-leaf Broom \*Genista linifolia infestation.*<sup>8</sup>

The understorey comprises:

*Seaberry Saltbush Rhagodia candolleana subsp. candolleana, Bower Spinach Tetragonia implexicoma and Small-flowered Flax-lily Dianella brevicaulis are common elements under the Coast Tea-tree Leptospermum laevigatum in the southern half Vegetation Assessment and Management of Mt Martha Foreshore Naturelinks Landscape Management Pty Ltd 5 Layer of this zone. In higher quality areas (particularly in directly north of the Fossil Beach fire access track) there is a good cover of indigenous sedges, grasses, herbs and several species of orchids. Panic Veldgrass \*Ehrharta erecta is a prominent understorey weed in these areas. Further north there is a south-facing gully with where there is a distinctive patch of Austral Bracken Pteridium esculentum. Some indigenous understorey vegetation is present along the Cliff top, however the area is dominated by introduced species particularly only track edges. These include Freesias \*Sparaxis spp., Capeweed \*Arctotheca*

---

<sup>7</sup> Geological time scale: the Goudey collection fossils, Mary Mackillop Penola Centre, Goudey, *Fossils in The Goudey Collection*, 2006; SA Department of Mines and Energy, *Geology of the South East*, 1988

<sup>8</sup> Thyer, Jo-Anne (Tettaroo), 2007, *Vegetation Assessment and Management of Mt Martha Foreshore*



*calendula*, Bridal Creeper \**Asparagus asparagoides*, Panic Veldgrass \**Ehrharta erecta*, Annual Veldgrass \**Ehrharta longifolia*, *Oxalis* spp. and a patch of Climbing Groundsel \**Senecio angulatus*. The landslip in the middle of the site is devoid of overstorey vegetation and is dominated by introduced species such as Kikuyu \**Pennisetum clandestinum* and Angled Onion \**Allium triquetrum*. Behind the seawall and along some sections of cliff face are distinct bands of coastal tussock grassland, dominated by Prickly Spear-grass *Austrostipa stipoides* with Beaded Samphire *Sarcocornia quinqueflora* ssp. *tasmanica*, Rounded Noon-flower *Disphyma crassifolium*, Common *Eutaxia* *Eutaxia microphylla* var. *microphylla* and Coast Bonefruit *Threlkeldia diffusa*. Indigenous

Species of Note include:

- Dwarf Greenhood *Pterostylis nana* – regionally significant (Yugovic 1995). Not sited this study.
- Coast Bonefruit *Threlkeldia diffusa* - regionally significant (Yugovic 1995).
- Scurfy Pomaderris *Pomaderris paniculosa* – regionally significant (Yugovic 1995).
- Common *Eutaxia* *Eutaxia microphylla* var. *microphylla* – regionally significant (Yugovic 1995).
- Beaded Samphire *Sarcocornia quinqueflora* ssp. *tasmanica* – state significance (Yugovic 1995).

Weed Species of Note

- Bridal Creeper \**Asparagus asparagoides* – small infestation along track edge.
- Climbing Groundsel \**Senecio angulatus* – a small patch is present just north of the Fossil Beach car park.

## 3.0 HISTORICAL BACKGROUND

### 3.1 Aboriginal occupation

Prior to European settlement, the Mornington Peninsula was part of the territory occupied by the *Bunurong* people (also spelled as *Boon wurrung*, *Bunwurrung*, *Bun wurrung*, and many other variants), whose land stretched along the coast from roughly the Werribee River to Andersons Inlet, and up to the Dandenong Ranges.<sup>9</sup> Ethnographers refer to language groups as the defining characteristic of Aboriginal groups, as the concept of “tribe” sometimes conveys a level of political organisation that was not necessarily characteristic of Australian Aboriginal society. The *Bunurong* language group has been identified as sharing a cultural and linguistic affinity with the neighbouring *Woi Wurrung*, *Ngurai-illam wurrung*, *Djadja wurrung*, *Wada wurrung*, and *Daung wurrung* groups. Howitt described this cultural block as the Kulin Nation.<sup>10</sup>

Smyth claimed that the *Bunurong* language was virtually identical to that of their northern neighbours, the *Woi wurrung*.<sup>11</sup> Linguistic analysis of the languages also indicates a high degree of similarity, with Blake noting a shared vocabulary of more than 90%.<sup>12</sup> Barwick has suggested that the *Bunurong* speech name was applied to those with ownership and authority over coastal lands, where mythical figures such as Bunjil and Lohan had travelled or rested.<sup>13</sup>

In reality, the most important bonds between the so-called Kulin groups was patrilineal moiety affiliations; the Kulin social world was divided into two named moieties – *waa* (crow) and *bunjil* (eaglehawk). Each localised group was identified with one of these moieties and these could influence alliance patterns. Marriages were carried out across moiety lines, with members of *bunjil* groups having to find *waa* partners, preferably from a distant group.<sup>14</sup> Participation in religious rituals and allegiances in the settlement of disputes or expiation ceremonies was also often shaped by moiety affiliations, and membership in a moiety could transcend allegiances to the broader language group.<sup>15</sup> William Thomas, the Assistant Protector of the Aborigines in the Melbourne region, wrote that the main interactions between Kulin clans were at large gatherings in the Melbourne area.

Language groups were not political or social units. Instead, land custodianship and ownership centred on a number of smaller groups that comprised the broader language grouping. These groups are often called “clans” or “local descent groups”, however as Wesson points out, they are better described as “named groups”, as the membership structure of these groups could vary, as could the degree of division from other groups.<sup>16</sup> Named-group members could be united by descent, dialect, history, and shared mythological ancestry; primary allegiance was owed to this named group, although this could vary according to context and location. Influential senior men, skilled in the use of weapons, magic and with considerable ritual

---

<sup>9</sup> Clark 1990:367

<sup>10</sup> Howitt 1904

<sup>11</sup> Smyth 1878:13-14

<sup>12</sup> Blake 1991:50

<sup>13</sup> Barwick 1984:115

<sup>14</sup> Barwick 1984:104-105

<sup>15</sup> Howitt 1904:336-338, Barwick 1984:105)

<sup>16</sup> Wesson 2000:8

knowledge, acted as leaders of most named groups. The *Bunurong* groups called such men *Arweet*.<sup>17</sup>

For daily activities and the exploitation of local estates, people did not usually live together permanently in their named groups, but aggregated and dispersed over the course of a year, often travelling in smaller residential units or extended family groups.<sup>18</sup> People would often travel or reside in the territory of another named-group so that they could fulfil religious or family obligations or exercise the privilege, granted to them by family or moiety associations, of exploiting the resources of another estate. Although a person usually inherited rights to land through their patriline, they may also have had access rights to the land of both their spouse and mother. Hence most Kulin people could speak a number of different dialects and when living in the territory of another named-group, would use the speech of its owners.<sup>19</sup> Journeys were also made to neighbouring tribal areas for ritual gatherings and marital arrangements.

Day-to-day social organisation was within the family group and clan (sometimes referred to as bands or in the past “mobs”). The *Bunurong* clan which occupied the Mornington Peninsula area was the *Bun wurrung balug*, who reportedly held the lands around Point Nepean and Cape Schanck, and called the area between Mount Martha and Mount Eliza *Barren neun*. One of the last known *Bun wurrung balug Arweet*, or clan head, was Bobbinary (circa 1799 - 1849) who was “a famed healer and sorcerer reputed to be able to ‘charm away rain’” his moiety affiliation of the *Bun wurrung balug* is uncertain, although Howitt identified them as *Bunjil*, Barwick later classified them as *Waa*.<sup>20</sup>

Although somewhat limited by language difficulties, and misunderstandings of indigenous concepts of ownership, the Assistant Aboriginal Protector for the Melbourne District, William Thomas, provided some of the most detailed ethnographic information regarding *Bunurong* people. Thomas’ early observations of *Bunurong* movements indicate that foraging groups of 20-30 people ranged an average of 10 kilometres a day, but that larger base camps of 100 residences were also established.<sup>21</sup> Thomas observed that movement around the Peninsula was mainly via the coasts, with evidence that there was also of exploitation of hinterland resources, particularly close to fresh water sources.<sup>22</sup>

Much of the information on the *Bunurong* also came from members of neighbouring groups – such as William Barak of the *Wurundjeri balluk* – rather than *Bunurong* people themselves. Hence, such information cannot be uncritically regarded as an accurate account of the *Bunurong* lifestyle. Early ethnographic accounts of the *Bunurong* were also describing people whose lifestyle was suffering under white invasion and settlement. More than many groups, the *Bunurong* suffered a great decline in population following contact with Europeans, with Assistant Protector Thomas recording a steep decline in numbers from the 1830’s to the 1840’s. Altercations possibly began when the *Bunurong* were visited by early sealers, whalers and explorers from the late-18<sup>th</sup> century onwards.<sup>23</sup> A sealing industry was

---

<sup>17</sup> Barwick 1984:107

<sup>18</sup> Barwick 1984:106

<sup>19</sup> Tindale 1974:131-132

<sup>20</sup> Barwick (1984:117; Clark 1990: 366

<sup>21</sup> Sullivan 1981:33

<sup>22</sup> Sullivan 1981:36

<sup>23</sup> Sullivan 1981:13

established in Bass Strait from 1798 and numerous accounts exist of Aboriginal people, including at least one *Bunurong* man, being taken by force to live with the sealers.<sup>24</sup>

Thomas established his first protectorate station for Western Port at Tuerong on the Mornington Peninsula. In February 1840 he noted that there were 101 Aborigines camped here,<sup>25</sup> but he saw further reduction of *Bunurong* numbers during the 1840s, caused by disease spread by contact with whites, murder, executions, shooting by authorities and others, inter-tribal warfare, death in gaol and intemperance. Thomas reported that nine out of ten of the *Bunurong* were suffering from venereal disease and many also suffered from dysentery. In addition he thought that as their lands were invaded and food became scarce, the *Bunurong* deliberately controlled their own population growth, telling him "No country, no good piccaninny".<sup>26</sup>

While the preference for inland camps was noted, much of the archaeological evidence of Aboriginal presence comes from coastal shell middens. These are perhaps the more visible form of archaeological remains, compared with the mostly obscured creek and swamp sites <sup>27</sup>

Examples of such middens are located on the headlands, to the north and south of Fossil Beach. Three sites listed on the Victorian Aboriginal Heritage Register (VAHR) are within or near the historic area (VAHR7921-0082 Fossil Beach 1, VAHR7921-0083 Fossil Beach 2, and VAHR7921-0084 Dava Beach 1).

The site register has the following co-ordinates for these sites:

AAV site number	Site Name	Easting	Northing
VAHR7921-0082	Fossil Beach 1	327376	2764959
VAHR7921-0083	Fossil Beach 2	327388	5765056
VAHR7921-0084	Dava Beach 1	327282	5765209

Table 1: Aboriginal sites located near Fossil Beach

However, these are only approximate locations. The locations based on sketch maps on the VAHR site cards have been examined and interpreted on current topographic mapping shown in Map 3. The locations of the sites were re-examined during field inspection but evidence of midden material could not be seen. It is likely that exposed areas have further eroded since the sites were recorded in 1984, and other areas have been overgrown with vegetation.

These sites are shallow lenses of shell material exposed in eroding faces of dune sand near the top of the coastal cliffs. Shellfish, mostly comprising mussel (*mytilus*), but with some turbo (*subnivalis*), limpet (*celana*), whelk (*dicathais*), or abalone (*haliotis*), are found in the middens, but rarely any other cultural materials such as flaked stone, bone or charcoal from fires.<sup>28</sup> The middens are considered the remains of specific meals, rather than long term camp sites, as the coastal locations rarely had fresh water available, and so could only have been occupied for very short terms.

<sup>24</sup> Gaughwin 1981:46, Sullivan 1981:14

<sup>25</sup> Cole, Valda, Western Port Chronology, p.95

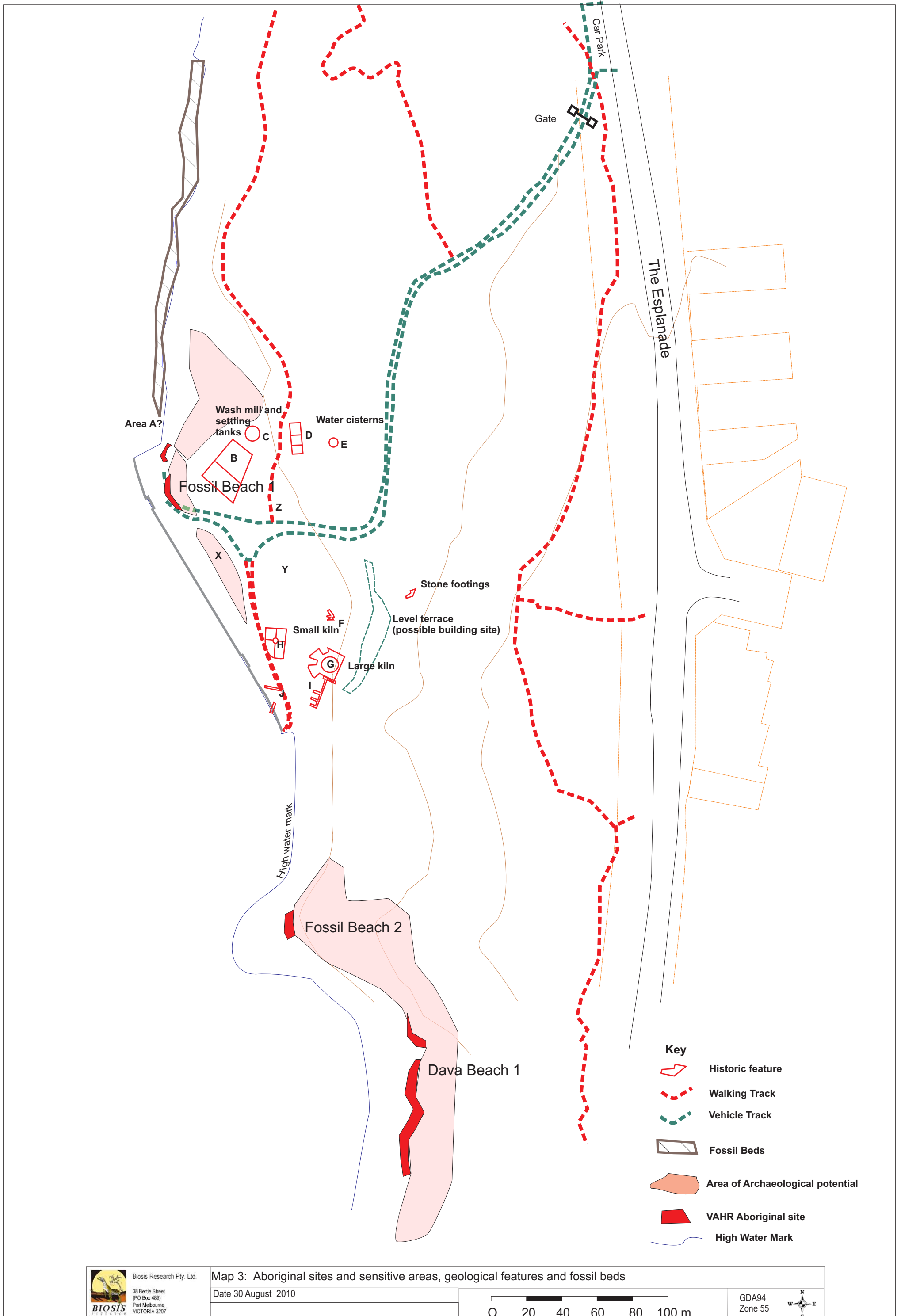
<sup>26</sup> quoted in Derek Fowell, 'The Aborigines of the Mornington Peninsula', *Newsletter of the Victorian Archaeological Survey*, n.d. *Historical Records of Victoria* vol. 2B. 'Extracts from Journal of W. Thomas', p.625/

<sup>27</sup> Hillary Sullivan, *An Archaeological Survey of the Mornington Peninsula*, 1981, pp 15, 16, 31, 33

<sup>28</sup> Victorian Aboriginal Heritage Register site cards.

Aboriginal tracks and pathways, which were noted by early settlers, tended to run inland with spur routes to the beaches and cliffs where specific resources were sought. Such a route may have followed the valley that is now the route of the Nepean Highway, with the beach route following Balcombe Creek to the south.

Shell middens tend to be located (or are more likely to survive) on headlands and in the secondary dunes behind the beach. An elevated site with some protection from the wind, was probably chosen for opening and cooking the fish. As well as the small headland at the north end of the sea wall, and the more prominent point to the south, there are other sheltered elevated locations along the coastal margin. These are also shown in Map 3, as an indication of areas where Aboriginal archaeological material is more likely to occur.



### 3.2 European exploration

Lieutenant Grant sailed the *Lady Nelson*, a new 60 ton vessel, from London to Port Jackson in March 1800 with instructions to survey then unknown parts of New Holland and along the way received he dispatches to sail through the then newly discovered strait between NSW and Van Diemen's Land, i.e. Bass Strait. He arrived at Port Jackson in December 1800 and then undertook a survey of the south coast in March 1801, reaching as far as Western Port. Lt. John Murray returned some months later to complete the task and on 14 February 1802 entered Port Phillip Bay. Matthew Flinders also landed in *HMS Investigator*, at Bird Rock, near Mornington on 28 April 1802 and walked around to Schnapper Point to make his first survey of Port Phillip Bay, but mistook Port Phillip Bay for Western Port and only discovered his mistake after climbing Arthurs Seat. On the basis of the reports of these voyages, a settlement was established at Sorrento by the British in 1803, in part to thwart attempts by the French to claim any part of the continent though it was abandoned the following year. European settlement of the Peninsula did not resume until the 1830s after the establishment of Melbourne.<sup>29</sup>

The initial surveys of land along the Peninsula were undertaken in the 1840s, following squatters' occupation. Township sites were set aside at Schnapper Point and Osborne, while some of the larger grazing holdings were held under pre-emptive rights or special surveys.

### 3.3 Settlement

From the 1840s, most of the more open areas on the Mornington Peninsula had been taken up by squatters and their sheep, George Smythe's map of 1841 shows a number of the first pastoral runs around Mornington – Straton's Gorm Griza on Beleura Hill, just north of the Tanti Creek and his former "Tontine Old Sheep Station" located near the site of the Tanti Hotel. Further east was Mr Gorrings's Sheep Station near the site of the Mornington Racecourse, Captain Reid's Checkingkurk (later The Briars) at Mt Martha, Assistant Aboriginal Protector William Thomas's Towerong (Tuerong) and Jamieson's Special Survey of 5,000 acres (2025 hectares).<sup>30</sup>

---

<sup>29</sup> Keith Bowden, *The Westernport Settlement and its Leading Personalities*, 1970, p25; 'Western Port 1827'; Smythe, Coastal Survey from West side of Port Phillip to Western Port, CS17, 1841; Commander Henry Cox, *Port Western*, surveyed 1865, CS 67,

<sup>30</sup> George D. Smythe, "Survey of the Coast of Port Phillip from the Mouth of the Tangenong Creek to Arthur's Seat", Coastal Survey 81 A, 1841, Ref. no. 5 Sheet no. 1

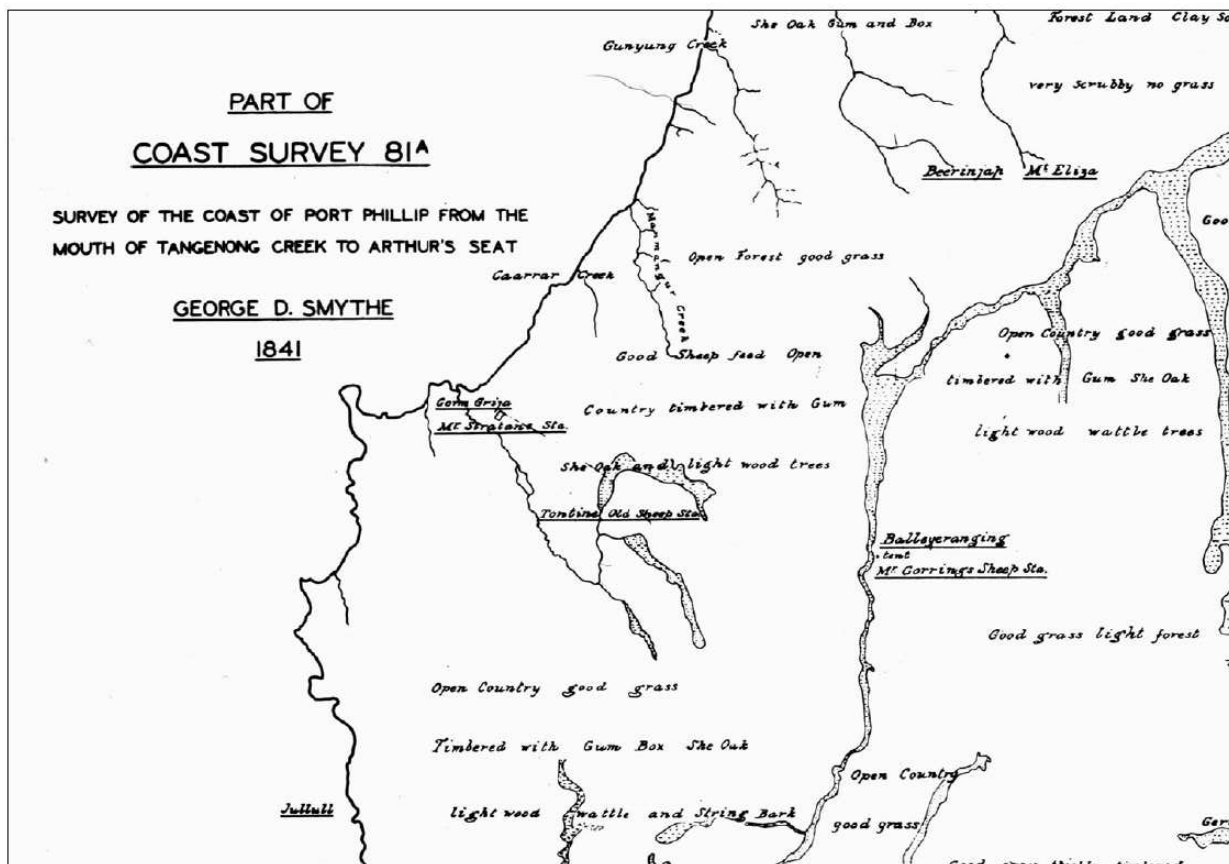


Figure 1: Part of Smythe's 1841 Map of the coast of Port Phillip

Schnapper Point township was surveyed in 1854 in preparation for land sales by Government Surveyor Permein. A store had been established in 1852, and a hotel was built and post office opened in c1856 while the building of the pier in 1857 cemented the location as an important excursion destination and service town.<sup>31</sup> Rennison's Hotel of 1862, the 1858 Mornington Hotel and the Schnapper Point Hotel provided further opportunities for family accommodation in 1860.<sup>32</sup>

Osborne township to the south was the nearest visible human habitation to the cement works although the site was not settled for many years after being laid out.<sup>33</sup> Access to the southern part of the peninsula was been improved by a new bridge erected over Balcombe's Creek in 1859.<sup>34</sup>

While Osborne may originally have been intended as the local town, the concentration of facilities at Mornington was well under way in 1858 when the jetty at Schnapper Point was

<sup>31</sup> The full extent of the jetty was not completed until 1869, A.B. Balcombe, letter requesting completion of the work, Secretary General's correspondence C.10492. Leslie N. Moorhead's, Mornington in the Wake of Flinders, 1971, pp. 67-75. .

<sup>32</sup> The Argus, Dec. 16, 1859, p.3, The Argus, Jan. 3, p.3

<sup>33</sup> Mornington Heritage Study (Thematic History) Osborne

<sup>34</sup> Tender called by A.B. Balcombe and the Central Roads Board, The Australian Builder and Practical Mechanic, Oct. 2, 1856.



constructed "...for the unloading of duty free goods and supplies."<sup>35</sup> It was described thus: "Schnapper Point has advanced considerably within the last twelve months, some of our leading merchants having purchased large estates and built fine marine residences."<sup>36</sup>

A regular steamer run operated in 1862 and besides passengers, took cargo from a depot established (along with the Queenscliffe steamer) at Cole's Wharf.<sup>37</sup> The Esplanade was first projected in August 1862, with a road one chain wide from Schnapper Point to Osborne.<sup>38</sup>

In the early 1860s the police station, courthouse and post office followed. The town was renamed Mornington in 1864 (in honour of the Earl of Mornington). The Shire of Mornington was proclaimed and Mornington became the economic, legal and social centre of the Mornington Peninsula. From the 1860s to the 1880s, Mornington became a tourist destination for Melbourne's elite while the opening of the railway in 1889 increased business for a time, but the depression, the rise of Sorrento as an alternative holiday spot and the introduction of steamers, saw Mornington return to a day excursion destination from the early 1900s.

The coastal land tended to be utilised for firewood collection, but was purposely reserved from sale, possibly in recognition of the unstable nature of the cliffs and dunes in the initial surveys and land sales. This was formerly sanctioned as a public recreation reserve in 1882 when the land between Schnapper Point and Balcombe Creek was gazetted.<sup>39</sup>

*The following Notice was gazetted 1<sup>st</sup> on 21 July, pursuant to Order of 17 July 1882.*

**MOOROODUC AND OSBORNE.**—Site for Public Recreation about to be permanently reserved, being the land permanently reserved for Public purposes by Order of 31<sup>st</sup> May 1875.—Ninety acres, more or less, county of Mornington, parish of Moorooduc, and town of Osborne: Commencing at a point on the right bank of Balcombe's Creek where the north-western side of the Esplanade, town of Osborne, abuts thereon; bounded thence by the Esplanade and the road forming the western boundary of the sold land in the parish of Moorooduc bearing northerly to the south boundary of Snapper Point Park; thence by that park bearing west to Port Phillip Bay; thence by the shore of that bay southerly to Balcombe's Creek aforesaid; and thence by that creek upwards to the point of commencement.—(M.161<sup>(2)</sup>) (81.M.32689). "

**WALTER MADDEN,**  
Commissioner of Crown Lands and Survey.  
Lands and Survey Office,  
Melbourne.

Figure 2: Gazette entry for reservation of Mornington foreshore reserve, 1882.

<sup>35</sup> Handbook to Australasia, 1856, p.11, Osborne was surveyed and laid out for a township by 1856. On the survey map of 1848 it already appears as reserved; The full extent of the jetty was not completed until 1869, A.B. Balcombe's letter requesting the completion of the work is preserved in the Secretary General's correspondence C.10492. See Leslie N. Moorhead's, Mornington in the Wake of Flinders, 1971, pp. 67-75 for the development of Schnapper Point in the 'Golden Fifties'.

<sup>36</sup> The Illustrated Melbourne Post, May 24, 1862, p.37

<sup>37</sup> The Argus, July 23, 1862.

<sup>38</sup> Culican & Taylor

<sup>39</sup> Victorian Government Gazette 85, Date: Friday, August 18th 1882 page 2020; VGG 75, Date: Friday, July 21st 1882 page 1787

### 3.4 Cement manufacture technology

In 1858, 3,400 bushels of hydraulic lime were imported from England at 5s.0d. per bushel, whilst 12,000 bushels of common lime were exported at a cost of 1s.10d. per bushel. Imported hydraulic lime (which would set under water, and was not prone to dissolving when rained on or from damp), cost an estimate of three times the current price in England.

Common lime is produced by the calcination of lime carbonate (chalk), limestone or the freestone and marble which are the forms of lime more economically used for building purposes (and in some cases shell deposits). Lime made from these materials usually retains a very high percentage of its soluble lime carbonate and, thus, mortars and plasters made from them quickly deteriorate if exposed to rain.

Hydraulic lime is slaked or mixed with water and used to make lime mortar. Hydraulicity is the ability of lime to set under water and hydraulic lime is produced by heating calcining limestone that contains clay and other impurities. Calcium reacts in the kiln with the clay minerals to produce silicates that enable the lime to set without exposure to air. Hydraulic lime is used for providing a faster initial set than ordinary lime in more extreme conditions (including under water).

Cement has been made in a number of forms since Roman times. "Roman cement", however, is a specific variety originally developed by James Parker in the 1780s, and finally patented in 1796. It was not, in fact, the material used by the Romans, but was a natural cement made by burning septaria nodules that are found in certain clay deposits and contain both clay minerals and calcium carbonate. The burnt nodules were ground to a fine powder and this product was made into a mortar with sand, which would set in 5–15 minutes. The success of "Roman Cement" led other manufacturers to develop rival products by burning artificial mixtures of clay and chalk.

The most successful of these was Portland Cement, initially patented in 1824 by Joseph Aspdin, a British stone mason. It is made by heating limestone (calcium carbonate), with small quantities of other materials (such as clay) to 1450°C in a kiln, in a process known as calcination, whereby a molecule of carbon dioxide is liberated from the calcium carbonate to form calcium oxide, or quicklime, which is then blended with the other materials that have been included in the mix. The resulting hard substance, called "clinker", is then ground with a small amount of gypsum into a powder to make 'Ordinary Portland Cement', the most commonly used type of cement.<sup>40</sup>

Both hydraulic lime and some Roman and/or Portland cement were imported into the Port Philip district in the mid 19<sup>th</sup> century.<sup>41</sup> However, the cost of bringing in this weighty and bulky material convinced many to investigate the possibility of local manufacture.

Common lime burning used large rectangular kilns, known as "D-kilns" in New South Wales. Later kilns at David Mitchell's Cave Hill Lime-Works at Lilydale, near Melbourne, were of a different form, ovoid at the base but with perpendicular sides. The limestone was stacked in

---

<sup>40</sup> Miles Lewis, *Australian Building: A Cultural Investigation*, <http://mileslewis.net/australian-building/> viewed 19/8/2010.

<sup>41</sup> *Melbourne Prices Current and Shipping List*, 14 April 1857, quoted Dodd, 'Lime and Victorian Buildings', p 37.

alternate layers with fuel, and the burnt lime was drawn out at the base in a standard way. In the 1880s there were five such kilns, and three hundred tonnes of lime were produced per week. Flare kilns, in which the fuel and the limestone are kept separate, give a less adulterated product but tend to be less efficient, producing a high proportion of underburnt and overburnt material. According to Harrington the only Victorian examples were Dibley's at Coimadai, as first operated, and the Fossil Beach Cement Works.<sup>42</sup>

Portland Cement was eventually made in Victoria, but only after a number of aborted attempts. Limestone from Waurm Ponds, Moorabool was ground with basalt in a ratio between 2:1 and 4:1, mixed with water, formed into bricks, calcined, and ground again into powder. This led to the more or less enduring enterprises of the Australian Portland Cement Co. and the Victorian Cement Works and several other companies being established elsewhere in Australia which adopted the limestone calcination method on increasingly large scales, adopting rotary kilns and continuous operations adjacent to deep limestone quarries, such as at Fyansford near Geelong.

---

<sup>42</sup> Michael Pearson, 'Archaeological Interpretation and Ethnographic Analogy'. Michael Pearson, 'The Lime Industry in Australia - an Overview', *Australian Journal of Historical Archaeology*, VIII (1990), pp 28-35; Harrington, *Limeburning in Victoria*, p 9.

### 3.5 Development of Melbourne's lime and cement industry

The early Port Phillip settlers managed to construct buildings using whatever materials could be obtained, often employing local timber, stone, wattle and daub, pug and sod, and a variety of vernacular materials and construction styles.<sup>43</sup> By the late 1830's lime was being produced on the Mornington Peninsula and other parts of Victoria, both from shell deposits (including Aboriginal shell middens) and limestone. However, it remained an expensive commodity, and good quality lime was not available in sufficient quantity to supply the demand.<sup>44</sup>

The Geelong burners had already established an export industry as early as 1841 using limestone deposits near Limeburner's Point, when the *Dusty Miller* and other schooners took cargoes of lime to the Launceston market. By 1848 the partnership of Taylor and Boucher was operating the kilns in Corio Bay.<sup>45</sup>

Lime was manufactured in the Mornington Peninsula by small enterprises operating simple kilns in the Portsea-Sorrento area using the dune limestone which, except for a small area behind Rosebud, is limited to the Nepean Peninsula to the west of Selwyn's fault. Other freshwater lime works were at Limeburners Bay at Corio (now Limeburners Point in Corio Bay) known as the "Heads Lime" but this was found to be unsatisfactory.<sup>46</sup>

These small private lime burning industries had already reached their peak in the early 1850's.<sup>47</sup> The burning of lime for commercial purposes began in 1839. This can be shown from the Fawkner papers. An account by 'Resident' in *Glimpses of Life in Victoria*, tells of entering Port Phillip Bay in winter 1839 when passengers observed lime burners, 'probably Tasmanian convicts', who built fires along the beach and treated the crew to kangaroo meat and damper.<sup>48</sup>

The coastal survey of 1841 by George D. Smythe, shows the positions of ten kilns, including a concentration of six at Tootgarook. In the Blue Book for 1858, forty-seven lime kilns are listed as operating in Victoria, twenty-eight of which were situated in Mornington county, including the Heads, Western Port and the southeast coast of Hobson's Bay.<sup>49</sup> A special port, known as the Lime Wharf, was opened on the Yarra in 1849, to unload the twenty-five small lime boats operating in the bay.<sup>50</sup>

The lime burners are credited with destroying the she-oak woodlands which were characteristic of the Peninsula. The 1841 survey map of the Nepean Peninsula also notes she-oak, box and wattle trees, with tea-tree limited to the swampy areas immediately to the south

---

<sup>43</sup> Lewis *Australian Building: A Cultural Investigation*

<sup>44</sup> The Australian Builder, Aug. 6, 1859, notes with enthusiasm the discovery of good lime in the Beechworth district.

<sup>45</sup> W. Randolph Brownhill, *The History of Geelong and Corio Bay*, 1955, pp.402-403

<sup>46</sup> For a discussion of Lime manufacture in Victoria see Harrington *An archaeological and historical overview of limeburning in Victoria*, Heritage Council, 2000. note 'Lime Kiln Point' in the Geelong area cf. P. L. Brown (ed.) *The Narrative of George Russell*, (1841) p.17.

<sup>47</sup> C. N. Hollinshed's article 'The Nepean Peninsula in the Nineteenth Century. *Victorian Historical Magazine*, 28, 1958

<sup>48</sup> *Glimpses of Life in Victoria*, Edinburgh 1872, p.5 Attributed in Ferguson to J.H. Kerr.

<sup>49</sup> Seventeen kilns were burning lime at the Heads in 1845. There are two kilns extant between Point King and Point Arthur.

<sup>50</sup> The Argus, 16 Feb.

of Arthurs Seat. The 1855 map however, has “Little timber remains, having been used for lime burning purposes”. There were also kilns at Cameron's Bight, Sorrento and at White Cliffs. While George C. McCrae recalled that the bulk of the lime in the 1840s was shipped from White Cliffs. Lime-burning may have developed more rapidly at Portsea probably because of the better loading facilities.<sup>51</sup>

While the lime industry experienced an extended boom and made a considerable contribution to building in Melbourne in the mid-nineteenth century, according to Miles Lewis, the only significant local manufacturer of Roman cement was the Patent Septaria Cement Company at Mornington, Victoria. It was to be more than twenty years before local makers were able to produce Portland cement successfully, with the Australian Portland Cement Co. established in 1889 and the Victorian Cement Works in 1890 in Victoria, and several other companies being established elsewhere in Australia in the same period.<sup>52</sup>

James M Robertson was not only important in the development of the Fossil Beach Cement Works, but also had a hand in a second attempt to manufacture cement locally when he called for tenders for the erection of kilns and other works for the Australian Hydraulic Cement Company in 1873.<sup>53</sup>

### 3.6 Establishment of the Patent Septaria Cement Co.

Government geologist A R C Selwyn undertook a survey of the Mornington Peninsula in 1854, as one of the first tasks of the Geological Survey.<sup>54</sup> He noted that the limestone nodules found on Fossil Beach 'might be found highly valuable for making hydraulic cement'. This is likely to be the source that encouraged local architect James Robertson to establish the Patent Septaria Cement Company in 1861 at Fossil Beach. Selwyn gave the earliest geological description of the coast between Tangenong and Chechingurk Creeks north of Mount Martha and next to Balcombe's Station.

Shortly after, Mr. W. Blandowski, Curator of the Museum of Natural History, printed the first description of the immediate area of Fossil Beach in Transactions of the Philosophical Institute of Victoria. He describes the rock stratification 'strikingly exhibited' between Schnapper Point and Balcombe's Creek and notes: 'A few chains to the southwest from this point lie two small islands or reefs a short distance from the shore. At low tide they are about one foot above the sea and are the resort of hundreds of white-bellied shags (*phalacrocorax leucogaster*) and Bass Straits tern (*Thalasseus pollicercus*).' He noted also that the settlers had noticed the 'curious rounded blocks of limestone' which occurred in the area and had compared them to dampers, 'by which name they are generally known'.<sup>55</sup> The name 'Shag Rock', located just off the coast a little south of Fossil Beach, was established on the map of 1862.<sup>56</sup>

---

<sup>51</sup> Hollinshed p.163

<sup>52</sup> Lewis *Australian Building: A Cultural Investigation*

<sup>53</sup> *The Argus* Thursday 10 April 1873 Page 3.

<sup>54</sup> recently formed in 1852, the Geological Survey of Victoria under Alfred Selwyn, conducted more than 60 major surveys between 1852-1868. TA Darragh, *Historical Records of Australian Science* 7(1) 1 - 25

<sup>55</sup> *Transactions of the Philosophical Institute of Victoria* 1855, p.28f.

<sup>56</sup> Survey Map of 1862, Lands Department Melbourne, Sheet X No 22 surveyed by Commander Henry L Cox RN.

Selwyn's Plan is inscribed:

*'Beds of blue stiff Clay with calcareous bands and concretions full of Fossils and crystallized Sulphates of Lime Fossil Wood in ferruginous Sandstone and conglomerate at sea level hard fine grained Basalt the sandstone resting upon and apparently upheaved by it.'*<sup>57</sup>

James Robertson made public his intention to make cement in a notice of January 1862 under the name of Patent Septaria Cement Company by claiming the mineral resource for his sole use, warning:

*THE Patent Septaria Cement Company hereof do give notice, that PARTIES REMOVING SEPTARIA from the coast at Mornington, or South of Geelong, unless authorized, will be PROCEEDED AGAINST.  
By order.  
JAMES ROBERTSON, Manager.*<sup>58</sup>

Shortly after, under the name of the Patent Septaria Cement Company, he invited three separate tenders: one for:

*MACHINERY, &c. :- An engine from 10 to 12 horse power, for cash ; also, tenders for the erection of the same at Mornington, near Schnapper Point, Two pair of edgestones and gear, complete, for cash ; also, tenders (or erecting the same).*

Another advertisement for the main works "(labour only) for the erection of kiln and tanks etc." and a third for: "...erection (labour only) of a jetty, sheds and other works near Schnapper Point".<sup>59</sup>

Tenders were to be delivered to the Company's office at 56 Flinders Lane East, where plans and specifications could be seen. Tenders closed on 17 April and on 26 April 1862, Robertson also invited tenders for "500 tons of firewood delivered to the Company's ground at Schnapper Point".<sup>60</sup>

Robertson attempted to patent the process for making cement using the septaria nodules, taking out an advertisement to notify others of his claim.

The Patent (No. 498) was listed in the Government Gazette, for:

*Improvements in the manufacture of hydraulic and other cements from certain indurated marls called "septaria," indigenous to the colony of Victoria, and deposited his specifications at the Chief Secretary's Office on 1 October 1861.*<sup>61</sup>

The gazetted notice indicates that this was done on 1 October 1861, and that notice was given for any objection to be heard on 29 March 1862 at the Attorney General's office (R.D. Ireland).<sup>62</sup>

---

<sup>57</sup> Selwyn, Alfred R. C., 1824-1902. Geological map of area around Westernport and Port Phillip Bay, Victoria 1856. National Library MAP RM 2426.

<sup>58</sup> The Argus Thursday 9 January 1862, page 3.

<sup>59</sup> The Argus Friday 11 April 1862, page 3. Wednesday 16 April 1862

<sup>60</sup> The Argus. April 26, 28 and 29. April 14, p.3; April 15, p.3; April 17 p.2,

<sup>61</sup> Victorian Government Gazette 155, Date: Friday, October 18th 1861 p.1996

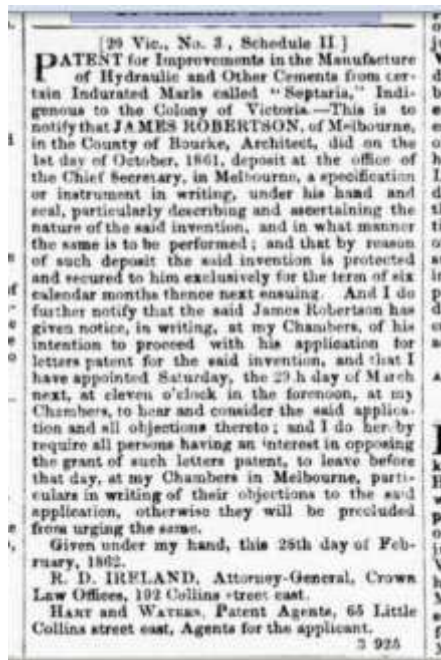


Figure 3: Advertisement for Robertson's patent *The Age* - 5 March 1862 p.2

Local residents, headed by A W Balcombe, publicly supported the new industry possibly with some encouragement from Robertson, and they placed a notice to this effect.

*To Mr. J. M. Robertson, Esq., Kew, near Melbourne. We, the undersigned, inhabitants and landowners of the county of Mornington, noticing with pleasure the (pr)ogress of your Cement works in this neighbourhood and feeling assured of the great benefit the whole of the community must derive from it (independent of the desirability to develop our natural resources) trust that every possible facility will be given you by the Government to assist your undertaking; and we hereby wish to assure you that no opposition will be raised on our part to any grant of land, or other aid the Government may think proper to give you....<sup>63</sup>*

The company issued shares and began constructing what was described as 'wells, water vats, grinding mills, furnaces, a jetty' and 'some stone huts built for habitation... with beautiful masonry throughout'. The newly formed Mount Eliza Roads Board offered to clear the road near the cemetery (Craigie Road) for timber to aid the project. The cement works, which were hailed as a 'new enterprise'<sup>64</sup> and the products would appear to have been initially successful. The first shipment of lime from Fossil Beach was sent to Melbourne by boat in October 1862 from an anchorage north of the site. In November 1862 *The Age* newspaper claimed that the cement had 'proved itself to be of excellent quality [and was] now being used in the erection of the Bank of Victoria, Collins Street.'<sup>65</sup>

*A comprehensive description of the undertaking was recorded in The Argus and Sydney Morning Herald in September 1862, suggesting the works were both up and running, and that the enterprise was of considerable interest to city merchants, builders and general public.*

---

<sup>62</sup> *Victorian Government Gazette* 29, Date: Friday, March 7th 1862 p.444; *The Age* - 5 March 1862 p.2

<sup>63</sup> *The Argus* May 16, 1862, p.8.

<sup>64</sup> *The Argus* August 25 1862

<sup>65</sup> Winty Calder, 2002: 54 cites Davies, *Vict. Nat.* 77:14-18.

VICTORIAN CEMENT.

(From the Argus Summary, September 25.)

A NEW branch of industry has recently been commenced in Victoria, which cannot fail to develop itself into a very important trade, as well as to turn to practical utility another of the many natural sources of wealth with which the colony abounds. We allude to the manufacture of cement, in which a party of energetic gentlemen have embarked, with every prospect of success crowning their undertaking. The existence in this colony of "septaria," the name given by mineralogists to the particular description of marl from which the best cements are prepared in England and elsewhere, was made known by the Government geological department more than two years ago, but it is only within the last six or eight months that steps have been taken to turn the discovery to useful account. One of the first to direct attention to the commercial value of the mineral was Mr. Robertson, who also took an active part in the establishment of the Kaolin Works, at Bulla Bulla. The result has been the formation of a company called the Septaria Cement Company, who have erected works for manufacturing cement, and have obtained a patent for that purpose. The septaria is found near Schnapper Point, which is the name of a small settlement on the shores of Hobson's Bay, about twenty five miles to the south of Melbourne. A deposit of the marl runs along the beach for nearly two miles ; there are also seams of it in the cliffs above the beach ; and another deposit of it appears on the opposite shore of the bay, at a place called Spring Creek, south of Geelong. The bed in the neighbourhood of Schnapper Point, where the company have established their works, is a very extensive one, its depth having been ascertained to be at least thirty-two feet. The quality of the marl has been tested by several analytical chemists and it is very excellent, the quantity of silica-one of the chief agents in cement-making-which it contains being as great, or even greater, than that in any similar deposit which has been found in any part of the world. The company's patent gives them the exclusive right to use this septaria during the next fourteen years, and they have leased about two acres of land, some two miles beyond Schnapper Point, where their manufactory will be carried on. The site is adjoining the beach, and is overhung by some lofty cliffs, which completely enshroud it from the observation of all travellers upon the land Bide until they come close upon it. Indeed, , it .would seem impossible to devote this strip of land, situated as it is between the cliffs and the bay, to any other useful purpose ; but for this it is admirably adapted, and the raw material is close at hand. The principal feature of the works is a gigantic kiln, which just rears its head above the top of the cliffs, and suggests rather the idea of a massive stone castle or fortification upon the coast than of a structure built for peaceful manufacturing purposes. This kiln is about thirty feet high, and is larger, we understand, with one or two exceptions, than any of the kind erected in England. It is a conical kiln, constructed upon what is known as the "perpetual" principle, and is capable of holding nearly forty tons of material. The burning is a process which is accomplished by gradations, and about one-third of this quantity of material will be passed through the kiln in the course of a day. The rest of the works consist of tanks, in which to mix the moil, when dug from the bed, with lime, and "agitators" to make the mass of the same consistency; a machine for making the marl into hollow bricks for the kiln ; drying sheds for drying the bricks previous to their being placed in the kiln ; a powerful Chilian mill for crushing the bricks into powder after they are .taken out of the kiln ; an engine of twenty-horse power to work this mill ; a dressing-machine to make the powdered cement as fine as flour; and sheds in which to stoic the cement after it has been packed in bags or barrels. The enumeration of this machinery will serve to indicate the various processes necessary for making cement, the manufacture of which, though new in the Southern Hemisphere, is no novelty in England. The great art required in making it is to generate a sufficiently high temperature in the kiln to drive off the carbonic acid in combination with the lime, which requires to be mixed with the septaria; and the samples of the cement which have already been produced are sufficient to show that the manager of the company thoroughly understands his business. "While mentioning this, we ought to state that, though the septarian



*deposit is chiefly found in a soft state, and therefore requires to have a certain proportion of lime mixed with it, it is interspersed with layers of indurated marl, which requires no lime mixed with it. The Septaria Cement Company have not yet commenced to supply the public with cement, but they will very shortly be in a position to do so. In the meantime, they have a staff of about thirty workmen busily engaged in completing all the preliminary arrangements, and in laying down tramways from the public road to the works; and from the works to that section of the septaria which is now being excavated, as well as to a jetty which is in course of formation. This jetty will extend about 120 feet into the bay, and will afford ample accommodation for the moorage of all lighters and other Vessels which may have occasion to visit the cement depot. An expense of nearly £10,000 has been incurred in establishing the works, but the proprietors have every reason to anticipate a handsome return for their capital and enterprise. There can be no doubt that from the silicious deposit which they have at their disposal, a cement can be manufactured possessing properties equal to those of the best Portland, or any other description of hydraulic cement. Cement is used for a large variety of purposes, including the "facing" of public buildings and private residences, and also in the erection of bridges, breakwaters, lighthouses, and other hydraulic works. It consequently forms a large item in the imports of the colony. It is stated that upwards of 2000 barrels of Portland cement sometimes arrive at the port of Melbourne in the course of a month, and we are informed that the price paid for this cement by the contractors for the Victorian Railways was 22s, per barrel. We believe that the price is now somewhat reduced but the Septaria Cement Company, with an unlimited supply of the raw material at their very doors, and with great facilities for manufacturing the cement, will be in a position to supply it at a considerably lower rate than that imported from England can possibly be sold. The cost of freight alone must deprive the Portland cement hitherto imported from the old country of a market in this colony, as soon as the company to which we have alluded have fairly commenced operations. In the course of two or three weeks they will be in a position to supply about 300 barrels per week. We believe that the price, as at present contemplated, will not exceed 15s. per barrel. It is their intention, in a short time, to apply for a lease of more land, in order that they may erect additional kilns, and be able to supply all the demands for cement made upon them. A good deal of the cement imported from England is more or less damaged by long exposure to the sea air ; and this circumstance, as well as the high price, has hitherto prevented its being so extensively used as we may now fairly expect to see it. In addition to the ordinary purposes for which it is used in connexion with buildings, and other large undertaking», it can also be employed for making garden vases, fountains, and other ornamental articles, in which it forms a cheap and effective substitute for stone. With a considerable reduction of price, therefore, the consumption of cement will, in all probability, greatly increase in Victoria, and the new company hope to find an emporium for their manufacture in each of the neighbouring colonies, as theirs are the only cement works in the whole of Australia. We trust that their undertaking will meet with the success which it seems to be in a fair position to demand, and that it will contribute to expand the commercial importance and wealth of this great colony.<sup>66</sup>*

The news of the works spread at least as far as Brisbane (again possibly as a result of Robertson's self promotion) with the local paper recording the new supply of cement:

*PATENT CEMENT.-The patent Septaria Cement works at Schnapper Point, recently noticed in the Argus, are now in full work, and supplies of the cement have this week been placed on the market. Four hundred barrels can be supplied weekly, and if the builders and contractors are satisfied with the cement, the imported article will speedily disappear as an item in the*

---

<sup>66</sup> *The Sydney Morning Herald...* Tuesday 30 September 1862, page 8; *The Argus* Thursday 25 September 1862, page 5.

*manifests of ships arriving from England. Encouragement at the hands of the public is all that is necessary to foster this deserving enterprise.*<sup>67</sup>

No plan of the works has survived but Admiralty charts picked up some of the features probably due to their visibility along the shoreline and therefore value as markers for shipping across the bay. Henry Cox prepared a series of plans in 1862-4, with the works labelled and in the more detailed versions a group of six or more buildings laid out below the escarpment along a curved track

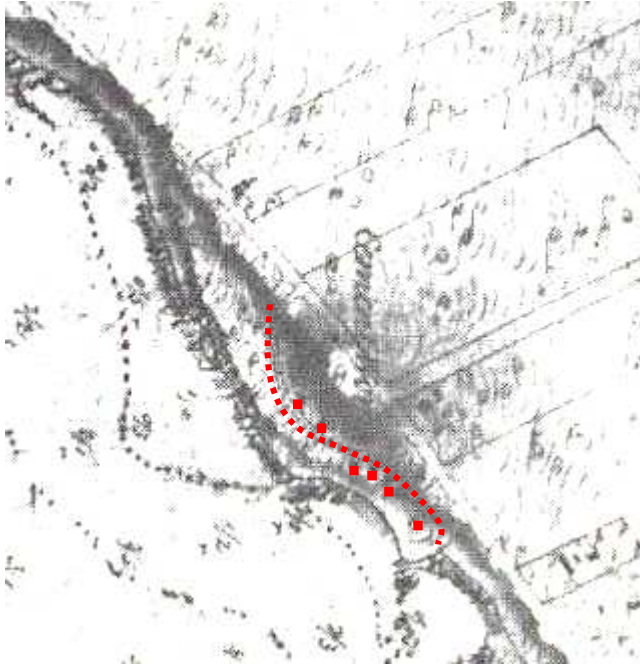


Figure 4: Survey Map of 1862, Lands Department Melbourne, Sheet X No 22 surveyed by Commander Henry L Cox RN. Track and buildings highlighted in red.

The works continued to be shown on Admiralty charts long after it would have ceased to be visible from the passing ships. This is perhaps an indication of the production of these maps in Britain as much as the utility of the plans. The buildings tend to become less defined with later additions as shown in Figure 4.

---

<sup>67</sup> The Courier (Brisbane) Monday 10 November 1862, page 3.



Figure 5: Left -Great Britain. Hydrographic Dept. Port Phillip 1865 - 1873. MAP RM 1696. right - Great Britain. Admiralty. Australia south coast. Port Phillip 1932. MAP RM 1763.

The company seems to have not prospered at all. As the invested capital was quickly used up and sales were needed, the share price, after a brief rise from the listed £5 to £7, in November, dropped to £4, then 5s0d.<sup>68</sup> The decline can be traced in the stock market figures for trade on the company's shares. The Hare sales at the Melbourne Stock Exchange recorded "Septaria Cement, they offer at £6; we are sellers at £4 10s."<sup>69</sup> By October 1863, the Patent Septaria Cement Co had failed and was listed for the last time in the stock market columns. According to the Geological Survey of Victoria 1864, Robertson had failed to investigate the exact properties of the septaria before embarking on his venture. The septaria at Fossil Beach apparently contained too little soluble silica to make it commercially acceptable.<sup>70</sup>

The following June, a shareholders' meeting was perhaps a portent of the impending demise of the company:

*A MEETING of SHAREHOLDERS in the PATENT SEPTARIA CEMENT COMPANY will be hold at the Duke of Rothsey, In Elizabeth-street, at 2 o'clock on Thursday next.*<sup>71</sup>

No record of this meeting has been found, but it is very likely that it determined to wind up the company and to try to cut its losses by selling the works as a going concern. The first of several sale notices appears just a couple of weeks after the shareholders' meeting:

*Sales by Auction.  
PRELIMINARY NOTICE.  
Important Sale of the  
SEPTARIA CEMENT WORKS, Schnapper Point*

<sup>68</sup> Culican & Taylor p.18.

<sup>69</sup> *The Argus* Tuesday 18 November 1862, page 4.

<sup>70</sup> Victoria. *Geological Survey: report of the Director of the Geological Survey of Victoria for the period from June 1863 to September 1864, with appendices*; Melbourne: John Ferres, Government Printer, 1864-5

<sup>71</sup> *The Argus* Thursday 4 June 1863, page 8

*To Capitalists, Speculators, and Others.*

*Mr. ROBERT BYRNE is favoured with Instructions to SELL by AUCTION, at the rooms, 88 and 40 Collins-street east, on an early day, due notice of which will be given, the whole of the machinery, plant, and effects lately belonging to the Septaria Cement Company, together with the special licence granted by the Government for the use and occupation of the land.*

*For further particulars apply to the auctioneer, or -to Mesrs. Vaughan, Moule, and Seddon, solicitors, Chancery-lane, Melbourne.*

*Terms, Liberal, Declared at Sale.* <sup>72</sup>

## **Septaria Cement Works.**

**To Capitalists, Speculators, and others.**

**SEPTARIA CEMENT WORKS,**

**Snapper Point.**

The whole of the machinery, plant, and effects lately belonging to the Septaria Cement Company, together with the special license granted by the Government for the use and occupation of the land. The machinery and works are in perfect working order, and the manufacture of cement can be commenced immediately. The septaria has been pronounced by the Government geologist to be the real cement clay, and the present price of the imported article offers an inducement to men of enterprise to commence the manufacture of the native produce, which can be placed in the market at a price which will defy competition by the importer. The price placed upon the property now offered for sale is so low as to bring it within the reach of men of moderate capital. Further particulars and samples of the clay can be had on application to Mr. BYRNE.

Page 176.

Figure 6: Advertisement for the initial auction of the cement works<sup>73</sup>

A more detailed advertisement of the works, which emphasised that the works were “in perfect working order” and seems to promise a profitable outcome for a new operator, appeared several months later:

*TUESDAY, NOVEMBER 17.*

*At Twelve o'clock noon.*

*To Capitalists, Speculators, and Others.*

*Important Sale of The SEPTARIA CEMENT WORKS, Schnapper Point.*

---

<sup>72</sup> The Argus Saturday 20 June 1863, page 2 and subsequent weeks up to November.

<sup>73</sup> The Argus Saturday 20 June 1863, page 2 and subsequent weeks up to November.

*Mr. ROBERT BYRNE has been instructed to SELL by AUCTION, at the rooms 88 Collins street east (adjoining the new Bank of Victoria Tuesday, the 17th November, at twelve o'clock.*

*The whole of the machinery, plant, and 1 ins» 1 lately belonging to the Septaria Cement Company, together with the special licence granted by the Government for the use and occupation of the land.*

*The machinery and works are in perfect working order, and the manufacture of cement can be commenced immediately.*

*The Septaria has been pronounced by the government geologist to be the real cement clay, and the present price of the imported cement offers an inducement to men of enterprise to commence the manufacture of the native produce, which can be placed in the market at a price which will defy competition by the importers.*

*- For further particulars apply to the Messrs Vaughan, Moule, and Seddon, solicitors, Chancery-lane.*

*Terms, Liberal, at sale<sup>74</sup>*

The sale however either fell through due to lack of interest, or was delayed, perhaps to test the market. When it reappears several more month later, the intention of the shareholders would appear to have been changed from selling it as a going concern to making a quick sale of the plant and machinery, and whatever could be liquidated from the works.

*... ABSTRACT OF SALES BY AUCTION THIS DAY. Mr. BOBERT BYRNE.—At twelve o'clock, at the rooms, Collins street—The Septaria Cement Works, Schnapper Point<sup>75</sup>*

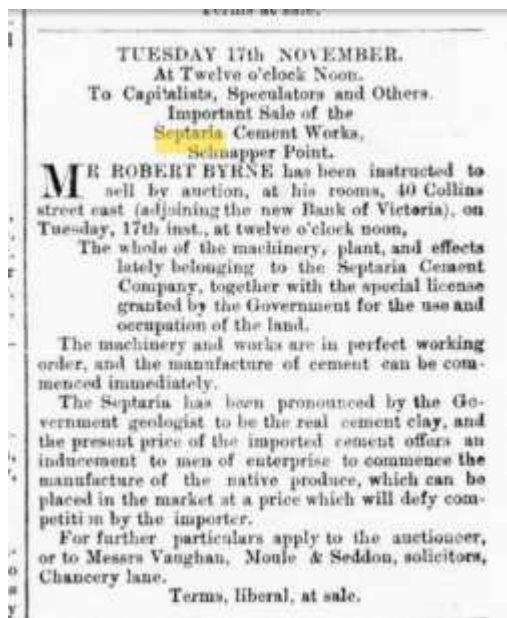


Figure 7: Subsequent sale advertisement for the works <sup>76</sup>

<sup>74</sup> The Argus Saturday 17 October 1863, page 2

<sup>75</sup> The Argus Tuesday 17 November 1863, page 2.; The Age - 9 Nov 1863 p.2; Tuesday 8 March 1864, page 3. "this day at 12 o'clock noon..."

The new sale notices provide a useful inventory of the equipment in use at the works:

*SATURDAY, MARCH 10.*  
*On the Ground. At Two o'clock.*  
*To Contractors, Mining Companies, Speculators,*  
*General Dealers, and Others.*  
*Positive and Unreserved Sale,*  
*By Order of the Mortgagee,*  
*Of the*  
*Septaria Cement Company's Works,*  
*Plant, Machinery, and Sundries,*  
*In Lots to Suit Purchasers,*  
*On the Ground, at Schnapper Point.*  
*MR. ROBERT BYRNE is favoured with instructions from the*  
*mortgagee to SELL by PUBLIC AUCTION, on the ground, at*  
*Schnapper Point, on Saturday. March 19, at two o'clock p.m.*  
*precisely.*  
*The whole of the machinery, plant, tools, and sundry*  
*materials, lately belonging to the Septaria Cement Company,*  
*comprising*  
*first class high-pressure steam-engine, with steam boiler*  
*18ft. x 6aft., of 16-horse power (can be worked up*  
*to 20), built by Messrs. Robert Douglass and Co.,*  
*Dumferrin Foundry, Kirkall; together with hot-*  
*water apparatus attached, and funnel 30ft. x 2ft.;*  
*all in splendid order.*  
*Chilian mill*  
*Dressing machine and elevators*  
*Buildings materials of office, enginehouse, mill shed, five-*  
*story dryinghouse, with steam hoist and large kiln*  
*Office, containing desk and other fittings*  
*Waitingroom*  
*Store*  
*Firewood depot, containing about 200 tons, besides a large*  
*quantity of building materials of various*  
*descriptions*  
*Tramway from depot to shoot and rear of kiln, 600ft. long*  
*Do. for conveying firewood from shoot to kiln furnaces,*  
*212ft. long , Dressing machine and elevators.*  
*Tank Shed.*  
*Agitator*  
*Four tanks, 4ft. deep, 18ft. wide. Drying shod, 27R. x 10ft.*  
*Wash mill*  
*Three large evaporating tanks*  
*Limehouse, 30ft. x 10ft.*

---

<sup>76</sup> The Age - 4 Mar 1864 p.2 – identical except for auction date = 18 March 64

*Tramway from wash-mill to brick-machine, about, 480ft.  
long  
Do, from marl pits to wash-mill, about 200ft. long  
1 patent brick-machine, with two roller tables and seven dry  
plates  
1 kiln, 82ft. high, with cast-iron cover and funnel 30ft. long  
1 pier, 160ft. long, not quite completed  
Cement store, fronting pier, containing about 800 bags  
cement Smiths' shop  
Carpenters' shop  
Stables  
Engineer's cottage  
A large quantity of machinery, consisting of pulleys, shafts,  
bolting, shell bearings, &c.*

*Also,  
A large quantity of engineers' and other tools 4 tramway  
trucks  
Draught horse and harness  
Tramway to quarry, about 400ft. long  
1 scow, with crab winch Longboat and gear  
Quantity of mining tools  
Quantity of wheelbarrows  
Quantity of handbarrows, &c  
In lots to suit purchasers,  
And the special licence granted by the Government for the  
use and occupation of the land.  
The machinery and works are in perfect order.  
Terms-Cash on the fall of the hammer for each lot as sold.  
After the sale of the above,  
Several allotments of land at and near Schnapper Point, of  
various sizes, and in fine situations.  
Title perfect.  
Terms easy, viz.-one-third cash ; residue by bills at six and  
12 months', bearing bank interest.<sup>77</sup>*

Thus the Patent Septaria Company was clearly a failure despite it having been well-equipped and at least initially capitalised. The fault appears to have been in an overly-optimistic appraisal of the availability and suitability of the raw materials. According to the Geological Survey of Victoria Report for 1863-1864, Robertson had failed to investigate the exact properties of the septaria before embarking on his venture. The septaria at Fossil Beach apparently contained too little soluble silica or sulphates to make it commercially acceptable. The initial abundance of nodules along the coast seems not to have been available once mining and production commenced. Today, while fragments of the limestone litter the beach, very little is visible in the adjacent cliffs and exposures, so it is likely that the workers had to move large quantities of useless clay to get at the limestone.

---

<sup>77</sup> The Argus Thursday 17 March 1864, page 2 The Age - 19 Mar 1864 p.2

The Patent Septaria works were an early attempt to exploit the natural resources of Mornington for commercial purposes. Had the venture succeeded, it would not only have been a boon to the local community, but also to the colony, which otherwise had to continue to import large quantities of cement at some expense in the 1860s.

### 3.7 Later history

The site of the cement works at Fossil Beach soon faded, but not entirely into oblivion. As noted above, the works continued to be shown on maps, and local knowledge about the venture was preserved, although confused in some accounts.

A painting by R Scott titled 'A view of Fossil Beach in 1872' (see cover illustration) shows the site with the distinct drums of the large kiln and arched opening clearly represented. Partly collapsed walls are shown either side of the arch, and extending on the downslope sides, where other obscured structural features are also suggested. On the upslope side a cleared terraced area and possible embankment are also depicted. A track runs down to the beach north of the kiln, with another apparently heading towards the arch opening.

A watercolour owned by a Mrs L Gleadell dated 1879,<sup>78</sup> shows a similar view of the works from the north, with the large kiln mostly intact and what is probably the base of the small kiln in the middle distance. The large kiln stands proud of the hillside behind for some of its height, but is clearly built into the cliff. Other remnants of walls can be seen around it. The stone from this structure must have been carted away, as no evidence of the collapsed material was recorded by Culican's excavation.

The smaller kiln is also seen in middle distance and appears to have the stone walls cemented over as in later photos dated to 1902 and 1909. A photograph of 1880 shows the larger kiln still standing and the smaller kiln near the shore, so it is likely that the larger kiln substantially collapsed or had stone removed between 1880 and about 1900.

The site was occasionally photographed for post cards, although in competition with Schnapper Point and the far more popular Mornington beaches, it seems to have not been a common subject. It was also the subject of at least two paintings, the picturesque nature of the ruined works no doubt attracting those of romantic artistic temperaments.

---

<sup>78</sup> Illustrated in Culican and Taylor p34 Plate IIa





Figure 8: Watercolour of Fossil Beach held by a Mrs Gleadell (from Culican & Taylor) dated c1879.

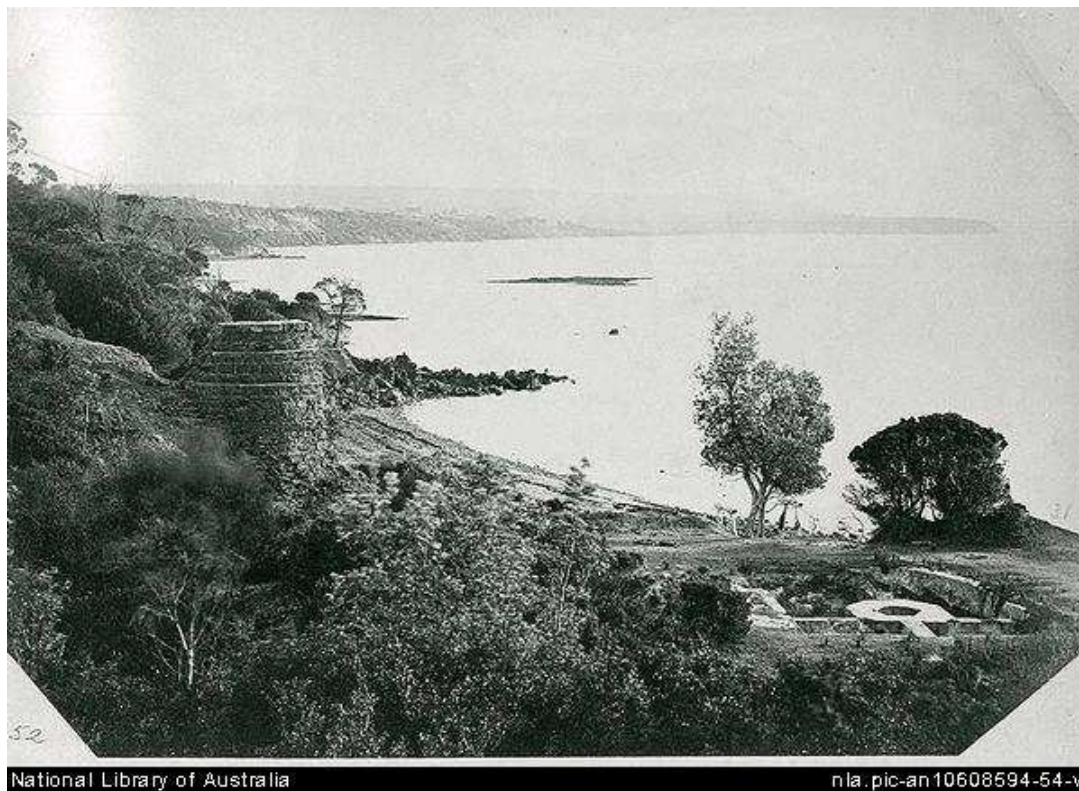


Figure 9: The old cement works, Schnapper Point, Victoria, c1880 Part of Views of Victoria, South Australia, New South Wales and Tasmania National Library nla.pic-an10608594-54



Figure 10: Looking towards small and large kilns. Photo taken 'early this century' by Mr. C Allchin of Mornington – reproduced in Culican & Taylor.



Figure 11: 1902 View towards small kiln, with large kiln on extreme left - from Mornington Progress Society (Latrobe Library Victorian Historical Pamphlets VII) reproduced from Culican & Taylor.





Figure 12: Old Cement Works near Mornington, post card c 1909

The location was apparently a local tourist venue going back to at least 1919, when a small advertisement for a lost ... "...Gold Brooch at Fossil Beach, near Mornington". was placed in *The Argus*.<sup>79</sup> A similar advertisement in 1925, for a lost suitcase with thermos, etc from a traveller from North Fitzroy, suggests the site continued to be a picnic spot for day visitors.<sup>80</sup> The access to the beach at this point, which was originally created by the cement works, was probably the main attraction, as it would have allowed horse and cart, and later motor vehicles to get down to one of the few readily accessible parts of the shoreline.

Also in 1925, the Broadcasting Co of Australia Pty Ltd noted that on 3L0 (broadcasting at 371 Metres) on the Night at 7 30- Mr. Frederick Chapman would be presenting a program entitled "Mornington Fossil Beach".<sup>81</sup> It would be interesting to know what this talk was about, whether it dealt with the industrial history of the site, or more likely something to do with the natural history – fossils, wildlife, or even tourism.

In the 1930s Fossil Beach appears to have been a regular camp site of Scouts and Guides. *The Argus* reported that the "...Fitzroy, Collingwood, Canterbury and Surrey Hills Rangers have just completed their camps at Fossil Beach Mornington, with Miss Broadhurst as commandant. They will be succeeded by Fitzroy and Collingwood Guides with Miss Dunn as commandant..."<sup>82</sup> and again in 1933.<sup>83</sup> Guide camps continued throughout the 1930s, for example when it was reported that "... an informal visit to the two Girl Guide camps at Fossil Beach, Mornington was paid yesterday by Lady Huntingfield, as State president, and the State commissioner, Lady Chauvel. At one camp are patrol leaders from many Victorian country centres ..."<sup>84</sup>

---

<sup>79</sup> *The Argus* Saturday 12 April 1919, page 13.

<sup>80</sup> *The Argus* Monday 1 September 1924, page 1

<sup>81</sup> *The Argus* Friday 28 August 1925, page 20

<sup>82</sup> *The Argus* Wednesday 6 January 1932, page 14

<sup>83</sup> *The Argus* Tuesday 5 December 1933, page 10

<sup>84</sup> *The Argus* Saturday 18 January 1936, page 19. "A Happy Holiday: Girl Guides in Camp at Fossil Beach" *The Age* - 5 Jan 1934, p.18



Figure 13: Girl Guide Camp at Fossil Beach, *The Age* - 15 Jan 1936

The unique natural heritage of the site was well known in the early twentieth century. The local naturalist Reverend Cox, was among those who regularly studied its flora and fauna.

#### *MORNINGTON'S FOSSIL BEACH.*

#### *WONDERS OF MARINE LIFE.*

*A Visitor to Mornington in the summer holiday period, weary of carnival and bathing beach, may turn with advantage to the studs of Nature. He will find much to interest him along Fossil Beach a mile or so south of the town. Thrown up there against the cliff formation and extending along the strand, lie relics of marine animal life of remote periods. At high points on the cliffs are the sites of Aboriginal camping grounds and cave shelters known as kitchen middens. Among the ashes upon the floor of the caves are to be found the remains of edible shellfish. Those of the periwinkle variety have had their sides chipped away with a stone revealing the method employed by the blacks to extract the delicacy. In his study in a quiet villa beyond the town a local naturalist the Rev. George Cox spends his leisure hours generously in disclosing to visitors some of the marvels of Fossil Beach. His cabinets contain specimens from various parts of the State. Settling in Mornington in 1910 after his retirement from active service in the Church of England, Mr Cox found opportunity to pursue nature study.*

*He interested in his hobby, members of church organisations of juniors and founded in 1924 a nature study club which has gained members throughout and even beyond the State, and now has correspondents as far away as Egypt. The members of the club number among their activities rambles under Mr Cox's leadership along the beaches about Mornington.*

*A curious shell in Mr Cox's collection is a cowrie picked up on Fossil Beach. It was inhabited during life by an animal which covered the exterior with a filament.<sup>85</sup>*

The local naturalists made numerous excursions and occasionally found some new natural wonder to report to the Melbourne readers, even if it was only on the habits of robins when hand fed:

#### *ROBIN AND THE CRUMBS*

*It is cheery to hear from the Rev. George Cox, that enthusiastic naturalist of Mornington, who has a comment on the note of a week or two ago about the yellow robin eating crumbs.*

*"On our numerous excursions to Fossil Beach, Mornington," he says, "It was quite the usual thing for us to be visited at lunch time by several yellow robins, which were so tame that they would al- most feed from our hands. They did not discriminate between sandwiches, cake, or fruit-all alike appeared good eating to them. "To this might be added a suggestion that if Mr.*

<sup>85</sup> The Argus Saturday 30 April 1932, page 12

*Cox tries them next time with crumbs of cheese in his palm, he may not need to use that word "almost" In his next note. Cheese has a tang about it that seems to appeal irresistibly to insect-eating birds.<sup>86</sup>*

Foreshore erosion has clearly been an issue at Fossil Beach. Culican suggests that the curved north-west corner of the small kiln may have been to allow sufficient space for a track between it and the beach, therefore indicating the narrowness of the shore platform on which the works were built. This area today does not appear to offer sufficient room for much of a track, despite the sea wall and fill to the west.

Erosion along the eastern foreshore of Port Phillip Bay has been recorded as far back as 1865 along the Lower Esplanade, St Kilda when a basalt rubble retaining wall is thought to have been erected to contain the foreshore. From 1904, larger sums were spent on sea walls, groynes, fill and repairs of the coastline. Foreshore management committees came into being.

The Foreshore Erosion Board report of 1936 catalogued the dire situation along the west side of the Mornington Peninsula noting that "...clearing coastal vegetation for the motor car, carving of new tracks down cliffs to the water, and drain construction:" were all issues. Limits were called for on all of these activities. Construction of new stone and concrete sea walls had also been carried out since the interwar Depression era using sustenance labour and after WW2 as a general program to halt erosion of the foreshore. An official inspection of the Fossil Beach area in 1935 noted that the high cliffs in the area had been eroded to within a few feet of the roadway. This had occurred at the rate of 20 feet in two years. Plans were considered to acquire land next to the cliff top and move the road. At the time a stone wall was to be erected at Tanti Creek to the north of Mornington township, costing 10/8d to one pound per foot. Sand removal from Mt Martha Beach was also still a problem, as it was allowed by the Crown Land Bailiff but discouraged by the Shire.<sup>87</sup>

The Mornington Foreshore Reserves Committee, which in the 1930s controlled the whole of the Mornington foreshore, endeavoured to obtain a £5,000 grant from the State Government for foreshore improvements including the construction of several sections of sea wall to control erosion. But it would appear that they were not successful.<sup>88</sup>

In the lead up to the Second World War, military manoeuvres were undertaken in the area. This included training camps and simulated gas attacks. The description of manoeuvres suggests they were also doing a fair bit of digging along the beach for defensive earthworks, sand bagging and trenches. While there is no specific mention of the Cement Works ruins, this activity is likely to have caused disturbance to surviving features.

#### *WAR TRAINING*

#### *REALISTIC*

*In a realistic atmosphere of sandbags, trenches, and gas clouds, the 3rd Divisional Commander (Brigadier-General E. A. Drake-Brockman) inspected the 4th Field Company Royal Australian Engineers in their camp near Dava Lodge, between Mornington and Mt. Martha, yesterday.*

---

<sup>86</sup> *The Argus* Saturday 23 October 1937 Supplement: The Argus Week-end Magazine, page 21. News Illustrated

<sup>87</sup> *The Argus* August 1935, Graeme Butler & Associates, *Bathing boxes and boat sheds, Mornington Peninsula Shire beach reserves*, 2004

<sup>88</sup> *The Argus* Wednesday 15 June 1938 Page 12

*For nearly a week the engineers have been digging a model trench system in the hard ground near the camp. The trenches represent the defensive position of a company with all the details of fire steps, duck boards, revetting, and sandbags.*

*Brigadier-General Drake-Brockman saw the men working under service conditions. Gas sentries were posted well out in front of the trenches. Every man had his respirator slung from his neck. At a warning from the sentry and the cry of "Gas!" from the officer, the men dropped their tools for a moment while they fixed on their gas masks. Then, while the gas cloud drifted over them, they continued their work.*

*On Fossil Beach, which is near the camp, Brigadier-General Drake-Brockman saw a gas-resisting dug-out entrance which had been constructed from sand-bags, timber, and two blankets.*

*The work of the engineers, who are commanded by Captain R. N. Field, with Captain H. G. Shannon as adjutant, was a fine example of militia enthusiasm and efficiency, ' and earned the praise of Brigadier-General Drake-Brockman.<sup>89</sup>*

The cement works was occasionally the subject of historical interest although some accounts of its history had become obscured or muddled by time. Culican records the local view that the works never operated, although the excavation results prove that it did. Other less informed reports were discussed in the early 1940s.

#### *BYGONE DAYS*

*By A. AV. GREIG*

#### *Ruins at Fossil Beach*

*At Fossil Beach, a couple of miles beyond Mornington, are the remains of several buildings said to have belonged to cement works established there many years ago. One tradition dates them back to 1843, but the more probable date of 1873 has also been suggested. Is any reader in possession of the facts concerning these relics?*

*As this was about 70 years after the works operated, the responses had a much closer connection with the time than we do.<sup>90</sup>*

Oral history associated with the site gives some hints about other buildings for habitation by the workmen that were on the site as well as the timber jetty, of which no trace is presently evident.

#### *BYGONE DAYS*

*By A. W. GREIG*

*I have received several letters concerning the remains of the cement works at Fossil Beach, in which my correspondents agree in assigning to them a date earlier than 1873. Mr. G. H. Roche (Ashburton) says that he knew the place well in that year, and that the buildings were then in ruins. H.M.S. (Morning- ton) writes:- "As one of a family living within a stone's-throw of these ruins as far back as before 1870, I can state with some assurance that in those days there were only a chimney and kiln and the mixing tanks of what our parents told us represented the remains of an attempt to establish a cement works. In addition, I recollect portions of an old timber jetty, and, I think, a concrete landing stage. Near the works were*

---

<sup>89</sup> The Argus Saturday 12 February 1938, page 7.

<sup>90</sup> The Argus Saturday 27 January 1940, page 6.

*some remnants of habitations, evidently used by the work- men. When I first knew the chimney it was probably almost 30ft. high. Fossil Bench in those days and until recently was called 'Cement Beach,' "*

*Mr. A. McRae (Caulfield) has known the ruins for over 60 years, and thinks that the works probably date from about the middle 'sixties; but another correspondent, who wishes to remain anonymous, cites definite evidence which seems to place them at least a decade earlier. "In the possession of members of our family," she writes, "is a water-colour of the ruins, painted by my mother some time in the 'sixties. It shows the remains of the jetty and the ruins of the tower (?chimney) and other portions of the works. Neither my mother nor my father had any remembrance of work being done there, but they always alluded to them as the Old Cement Works. It was in 1858 that my mother's father built a house, still standing, though with an altered front, on the Esplanade, and he took his family to live there."<sup>91</sup>*

In the 1940s, the naturalists and guides having forsaken the location for a time, and it becoming a popular site for summer tourists, a move was made to do something about the ruins. A proposal was put by the Mornington Foreshore Committee to “perpetuate the cement walls and kilns at Fossil Beach.” It was reported that “Despite their age, the wells and kilns are still in good condition although none of the old identities can remember when they were working.”<sup>92</sup>

Another decade passed, and further proposals for cleaning up and marking with a plaque were proposed by the Mornington Foreshore Committee. Committee member Cr. E. G. Bradford recalled that: “his late father, Cr Samuel Bradford worked in the kilns in 1860”. For a second time the committee invited residents to provide information about them.<sup>93</sup>



Figure 14: Moorooduc Parish Plan, Imperial measure M3175-2 Sheet 2 M161 showing alignment of sewer

<sup>91</sup> The Argus 10 February 1940, page 9

<sup>92</sup> The Age 26 Aug 1949 page 7

<sup>93</sup> The Age - 24 Oct 1949 page 2

The problems of continuing erosion seem to have been the trigger for finally undertaking some works in the area.

*EROSION of a cliff at Fossil Beach, in Mornington area, has caused damage to 100 feet of the face, and Mr. E. C. Madsen, Mornington Shire engineer, believes that only erection of a 400ft. sea-wall will halt damage. He has recommended to Mornington Foreshore Trust that application be made to the Public Works Department for a grant.<sup>94</sup>*

The Mornington Shire Council probably undertook works in the 1950s and 60s, including fencing off some of the more dangerous pits and cementing over the smaller kiln, as part of preparation of a picnic area and constructing a toilet block near where the washmill and settling pans once stood. A toilet or other structure from prior to the present toilet block was in place here, as evidenced by modern brickwork still visible in the ground surface just behind the present toilet.

A sewer was constructed from the Esplanade down to the site of the toilet block in the 1960s (see parish plan), possibly in conjunction with the construction of the seawall, and improvements to and possibly realignment of the access road. A water pipe was laid to the toilet and picnic area, probably also at this time (see Figure 14). Winty Calder observed that when a seawall was built at Fossil Beach between December 1963 and October 1964, it was positioned so the fossil plain would remain exposed.<sup>95</sup>

### 3.8 Culican's Excavation

William Culican was professor in the Classics Department at Melbourne University in the 1960s and 70s. The 1960s saw the development of an awareness of historical archaeology as a discipline through the extension of existing Aboriginal archaeological research, and the development of amateur groups such as the Archaeological Society of Victoria. The Australian Society for Historical Archaeology was formed in 1970 with an aim of encouraging public interest in the subject, and it remains a non-professional society which is open to any devotee. Culican led volunteers from the Archaeological Society in excavating the Fossil Beach Cement Works, partly to foster interest in the discipline, and also to provide practical training to his archaeology students, who otherwise depended on overseas digs for their hands-on training. The excavation was undertaken on most Sundays over two years and was written up in the first monograph on historical archaeological excavation in Australia, about the same time as Jim Allen's work in Arnhem Land.<sup>96</sup>

Culican and his crew excavated the Larger Kiln and Lesser Kiln, The washmill and settling ponds, various drains and channels, stone lined tanks and wells, and cleared vegetation from sections of standing walls. The interpretation of these features was tied into the history of the site's development and the technological processes for manufacturing cement. The report "Fossil Beach Cement Works: An Essay in Industrial Archaeology" has often been cited both

---

<sup>94</sup> The Argus Friday 28 September 1951, page 13.

<sup>95</sup> Calder, 2002: 54 cites Davies, Victorian. Naturalist. 77:14-18.

<sup>96</sup> Ireland, Tracy, Giving value to the Australian historic past: Historical archaeology, heritage and nationalism *Australasian Historical Archaeology*, 20,2002, Culican & Taylor 1972



for its primacy in the field, and as an example of best practice in archaeological excavation, analysis and publication.<sup>97</sup>

### 3.9 Later Management

In 1981 The Mornington Council prepared, on behalf of the Mornington Foreshore Reserve Committee, plans for a stone historical marker to be located near the small kiln. It is not clear if this was erected, but is no longer evident.

It is understood that a video tape and survey titled "Pathways of Fossil Beach" was made sometime in the early 1990s about the area by Ted and Cath Davis and a copy was given to the Shire at the time.<sup>98</sup> A copy is believed to be held by Mornington Library (Cat No 75/3583). During the 1990s and early 2000's it appears the Council was actively seeking heritage grants for conservation of the Cement Works, partly as a result of increased public concern over the state of the site. In 1998, Monash University Science Centre put a proposal to the Shire to prepare an information/excursion package for Fossil Beach and produced a draft 'Excursion Guide' (mainly focussed on the Fossil Beds).<sup>99</sup>

A new toilet block was erected in 2005. At the time Heritage Victoria were consulted and gave permission on the basis they did not think the area (where it was to be sited) was likely to contain any significant material.

---

<sup>97</sup> See for example Jack, Ian 2006 "Historical Archaeology, Heritage and the University of Sydney", *Australasian Historical Archaeology* 24:19-24, and Tracy Ireland, 2002. "Giving value to the Australian historic past: Historical archaeology, heritage and nationalism", *Australasian Historical Archaeology*, 20:17-25.

<sup>98</sup> This information came via Cynthia Rigg, a relative of the Davis's, pers com. Derek Smith & Simon Lloyd

<sup>99</sup> Pers. com. Simon Lloyd Shire of Mornington Peninsula Thursday, 24 February 2011.

## 4.0 DESCRIPTION

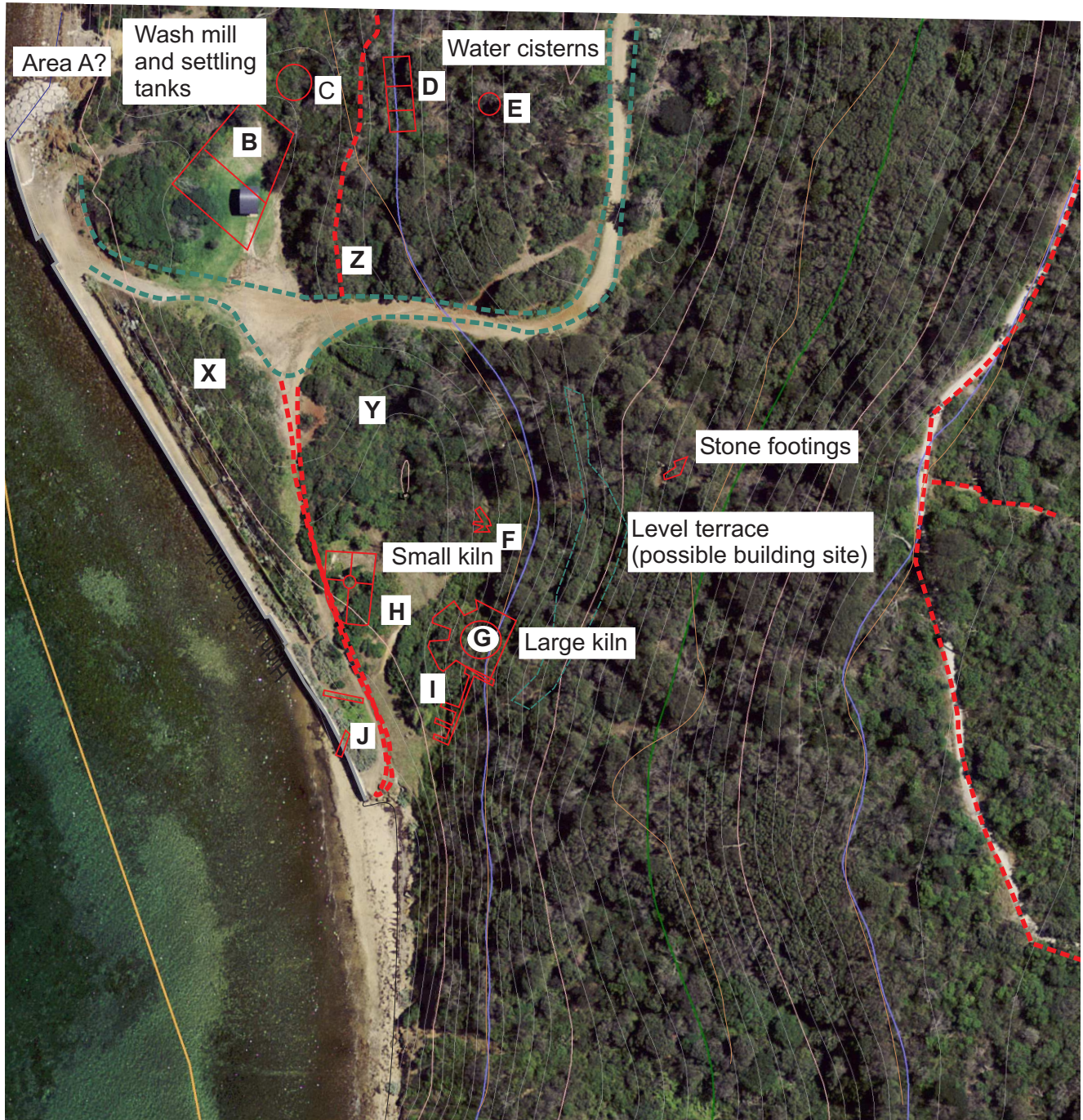
### 4.1 Background and main layout

Fossil Beach today is difficult to interpret from visible clues as moving sand, modern earth works and regrowth of vegetation, have obscured both the natural topography (where it exists) and the evidence of historic land uses, construction and demolition. However, the main features of the cement works and the excavations by Culican could be discerned with a bit of bush bashing, exploring and selective vegetation clearance.

Two site inspections were undertaken for recording existing conditions. An initial inspection to meet the council staff and stakeholders in the site was held on 20 May 2010. The second inspection which included assistance from Mornington Peninsula Shire Parks Staff to remove vegetation from parts of the archaeological sites and ruins was carried out on 18 June 2010. Jeff Yugovic also attended on this day to undertake a flora survey and prepare a plant list for the site.

Measurements were made of visible features using tape, and differential GPS (with accuracy of +/-1m) was used to obtain positions for each feature.

As it stands today, the prominent features of the Fossil Beach site are shown in Map 4 and described in the following section. Culican and Taylors designations of the various archaeological features and excavations (Areas A, B, C, etc.) are also shown in this figure.



**Key**

 Historic feature

 Walking Track

 Vehicle Track

A-J X, Y - Cullican 1972 areas.

 High Water Mark



Biosis Research Pty. Ltd.  
38 Berlie Street  
(PO Box 489)  
Port Melbourne  
VICTORIA 3207

Map 4: General plan of archaeological features

Date 30 August 2010



GDA94  
Zone 55





## 4.2 Entrance Track

This is a formed and benched gravel track which runs off the Esplanade near Bentons Road, from a car park. The track initially heads south along a ridge, then swings west down a steep slope to a level area behind the sea wall. There is some evidence of grading or levelling in this area, with various crushed stone or gravel used to provide hardstand. A view over the beach and works area is obtained from the bend in the track, looking south. An interesting feature of this point is that some of the larger trees are recognisable from both the Culican report photos and earlier post card images.



Figure 15: View looking south from access track, note large Banksia on right growing from small kiln, and possible track or bench on hill side – reproduced from Culican & Taylor.



Dead  
Banksia  
trunk

Figure 16: Similar viewpoint to above – note regrowth and dead trunk from Banksia.

### 4.3 Sea Wall

The sea wall, constructed in the 1960s, is a rock-faced bluestone structure on concrete foundations, with a concrete wave deflection lip near the top and concrete coping stones. Both of these are made from cast concrete blocks and the structure is similar to many other sections of seawall along the coast, suggesting a fairly standard design had been developed. The wall is about three metres high at its greatest and extends for about 120 metres. There are two staircases set into the wall, one about 50 metres from the south end and the other about 20 metres from the north end.

Apart from near the north end, where the cliff face rises close behind the wall, it is likely that the wall was constructed in front of an existing eroded cliff face, and the area behind it subsequently back filled. Exposed rubble and rocks at the south end, where the wall stops abruptly confirms this.

At the north end of the sea wall, large blocks of granite have been placed at the base of the eroding cliff. Smaller blocks of granite, basalt and brick can be found among the natural Baxter sandstone and Septaria limestone nodules on the shore platform. Granite and bluestone are not naturally occurring in this area, and so the broken stone creates a geological confusion as it is intermingled with the natural stone.



Figure 17: Looking south along sea wall



Figure 18: Sea wall looking south, note revegetation area on left and mix of Baxter sandstone and limestone on the rocky shore

#### **4.4 Washmill and settling tanks (Culican & Taylor Area B & C)**

This structure could not initially be identified as the area was entirely overgrown with *Polygala* and other weeds. A depression under the vegetation was noted to the west of the level area on which the toilet block stands, and to the north of this a steep rise was explored. A roughly triangular area of vegetation between the clearing, the sea wall and the hill to the north marks the settling ponds site, but no section of the wall or floor can be seen as this is buried under soil and vegetation.

A retaining wall at the base of the hill north of the toilet is visible just under the vegetation and gave a clue to the position of the wash mill, which was found about 3 metres further north and elevated about 1.5 metres. The 1 metres wide circular ditch and central raised drum with the partly excavated central post hole were all discernable, although heavily over grown.





Figure 19: Looking towards modern toilet and site of settling tanks. Washmill located on the rise behind and right of toilet.

It would appear from an overlay of Culican & Taylor's site plan<sup>100</sup> that much of the settling pond area is now under the site of the toilet and level area around it. If this is the case, then at least some of the structure may have been damaged by this works, or the earlier construction of the sewer and previous facilities. A timber post and remnants of barbed wire to the west of the washmill indicate the excavation site had been fenced off, probably soon after completion of the 'dig'.



Edge of  
washmill  
trench

Figure 20: Washmill after partial clearing of vegetation, central drum takes up right hand half of photo, dark area is circular ditch.

---

<sup>100</sup> Culican & Taylor Plate VI page 38



Figure 21: Washmill during excavation - Culican and Taylor Plate VIII a & b p.40

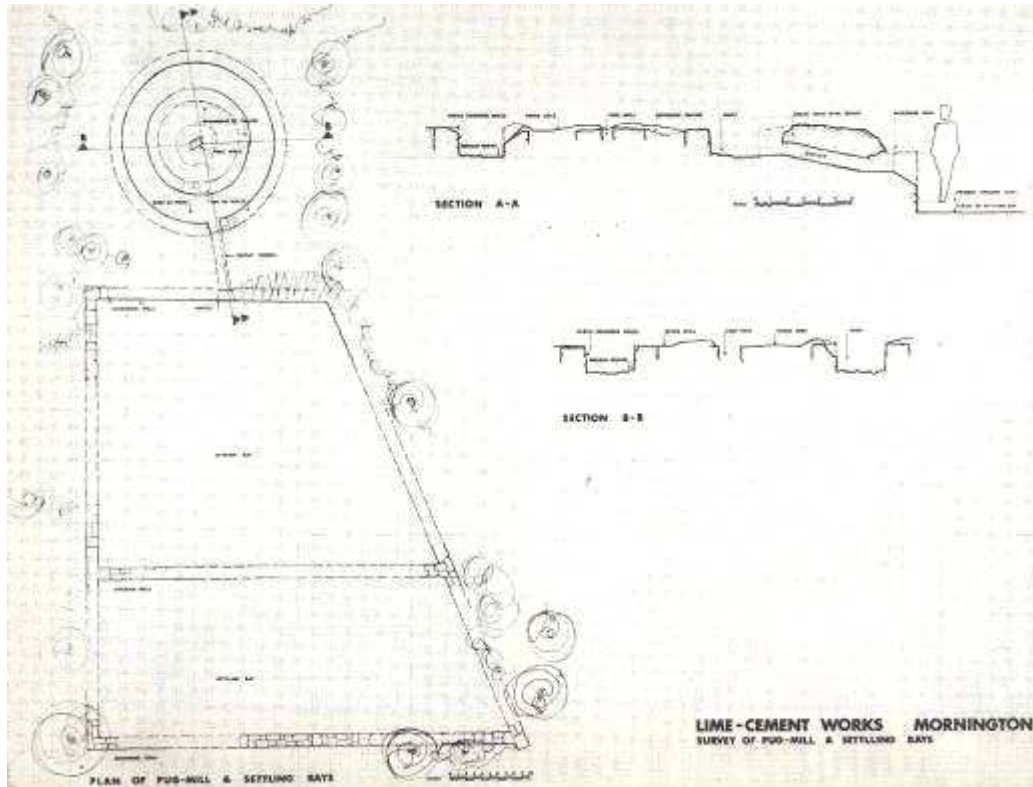


Figure 22: Plan of excavated Washmill - Culican and Taylor Plate VII p.39



#### 4.5 Large Kiln (Culican & Taylor Area G)

Evidence of the large kiln was particularly difficult to see from the foot tracks at the base of the hillside. However, scrambling over what was expected to be the site, revealed substantial stone structure still in place, set into the face of the hillside. The rubbly northern side of the kiln is at the same line of the hill slope, but the southern wall still stands proud of the surrounding land. This forms an intact section about 3 metres high and about 1 metre wide, although comparison with photographs from the 1970s and recent conditions show that about 0.5 metre of the stonework has fallen away in the last 40 years. This stone is most likely lying on the hill-slope a little further down. Some blocks were noted under the vegetation.



Figure 23: Outer surface of southern wall of large kiln, showing line of surviving stone on Culican's c1970 photograph.

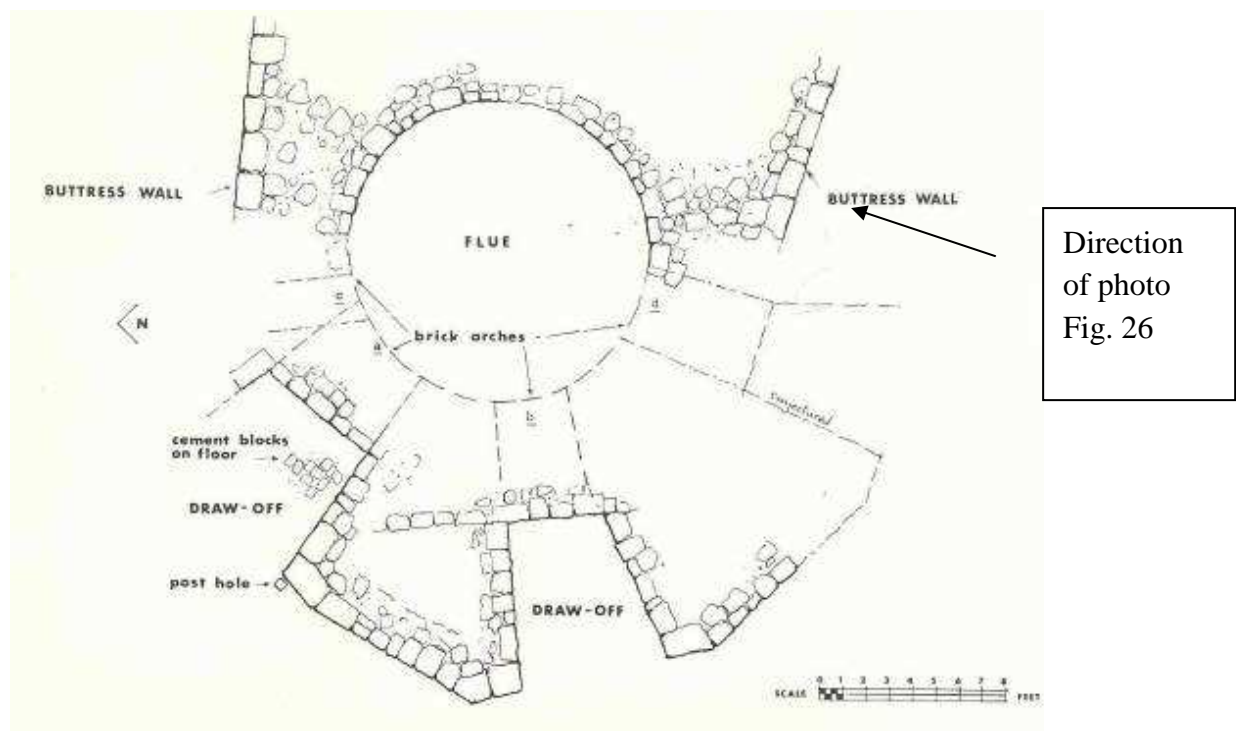


Figure 24: Plan of excavated Larger Kiln - Culican and Taylor Plate XVII p.49

#### 4.6 Retaining walls (Culican & Taylor Area I)

Further south of the large kiln, and evidently attached to that structure, are a series of Baxter sandstone walls, which in part form a retaining wall against the hillside and at least three walls running off to the west. These were interpreted by Culican & Taylor as part of a processing building. About 1.5 m of the retaining wall is standing and comparison with photos from Culican and Taylor (Plate XXIV a & b p56) suggests that a proportion of these walls has either fallen away or become buried by soil slippage.



Figure 25: Retaining wall south of large kiln.



Figure 26: Two of the east-west walls running off the retaining wall south of the Large Kiln

#### 4.7 Small Kiln (Culican & Taylor Area H)

Evidence of the small kiln was more easily recognised. A rectangular depression with walking tracks leading around and into it is located just inland from near the southern stair in the seawall. This depression corresponds with the draw off chamber (the eastern half), and Chamber No 2 (the western Half). The dividing wall appears to be mostly lost, and the northern part of the flue base has also been further eroded. However, at least a third of the diameter of the flue is recognisable as a curved rendered wall. The western part of the outer wall of the structure is also readily discernible and stands about a metre high. Erosion of the fill to the west shows the extent of coastal change, with only about 2 metres of fill between the stonework and the much lower area on the inside of the sea wall where a walking track runs.

A dead Banksia trunk stands in the middle of the ruins, with other weeds and regrowth native vegetation. The Banksia is evidently the same tree shown in Culican's photo of the excavation, and several early views (see Figure 10, Figure 11, Figure 12, & Figure 15).



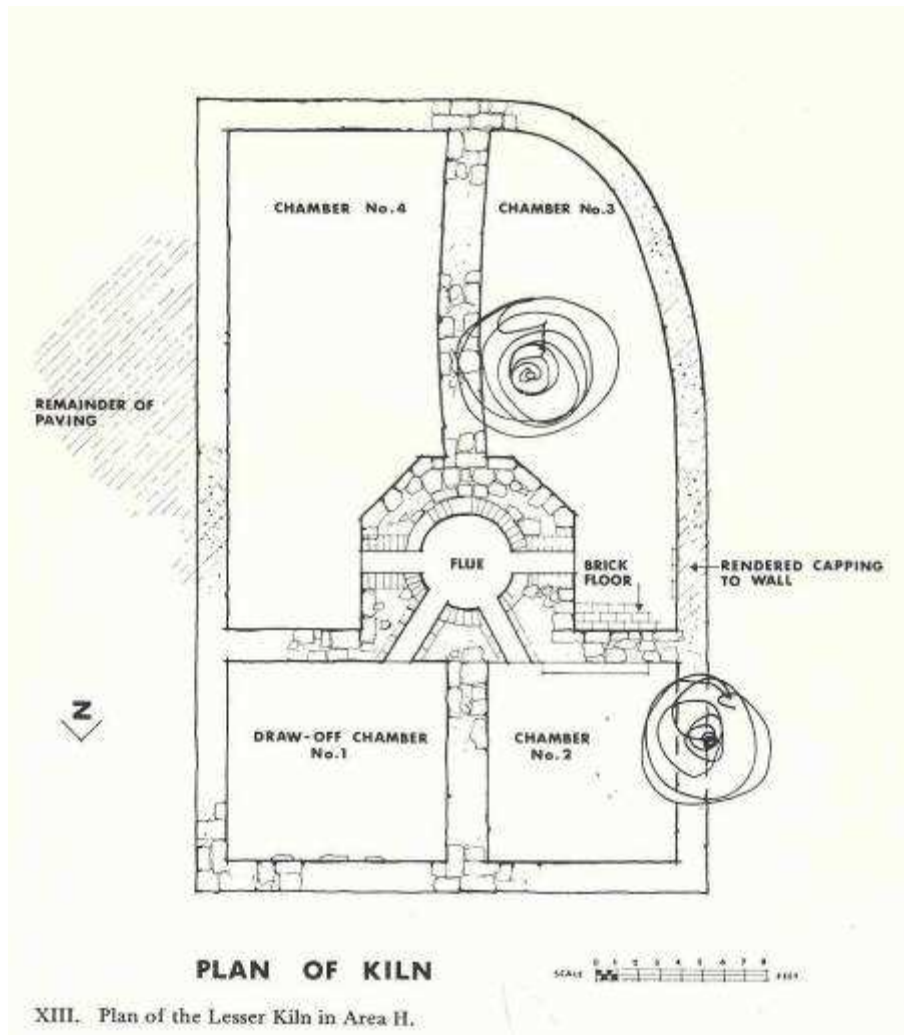


Figure 27: Plan of excavated Lesser Kiln - Culican and Taylor Plate Xiii p.45



Figure 28: Eroded bank west of Small Kiln



Figure 29: Excavation of the small kiln looking south, Culican & Taylor Plate XIIb p.44.

#### **4.8 Tanks/well (Culican & Taylor Area D & E)**

This area is located east of the washmill on high ground north of the access track. A deeply dissected landscape of ridges and gullies is found in the area, with the rectangular stone-lined tank in the first gully to the east, and the circular stone lined well in the second gully, with a ridge about 4 metres high between them.

A ridge separating the tanks from the washmill appears to be part of a gently sloping but narrow incline running north from the cleared area of the Fossil Beach cement works site, this follows the top of the cliff and may be an earlier access track to the site.

While both the tanks and well are extensively overgrown, they appear to have changed little structurally from when Culican cleared and recorded them. Several sections of fencing with sawn timber posts and barbed wire were noted around the site of the deep tanks, indicating that they had been fenced off for safety at some time. This was probably when the area was more accessible, and it can be assumed this was after the 1968-9 excavation. The style of fence post and wire suggests a 1970s date.





Figure 30: Well from Culican & Taylor Plate Xb p.42.



Figure 31: Large rectangular cistern looking north west, Culican & Taylor Plate XVb p47.



Figure 32: Internal stonework of rectangular tank

#### 4.9 Other historic Features (Culican & Taylor Areas A, F & J)

A number of features described by Culican and Taylor are now difficult to discern. His Area A, an eroded area on the cliffs north of the sea wall was noted at the time as having stonework evident in 1967, but subsequently eroding into the sea. This was believed to have been associated with excavation for the Septaria nodules, or loading.

Near Culican's Area F, north of the large kiln, some stonework is visible, but the excavated area shown in Plate XXV a & b, would appear to have collapsed and been reburied by soil coming down the slope and by regrowth. This area was not fully explained but was believed to relate to the provision of engines and/or boilers for the site. A small section of stonework is visible where a foot track goes up the hill from the clearing at the base of the large kiln.

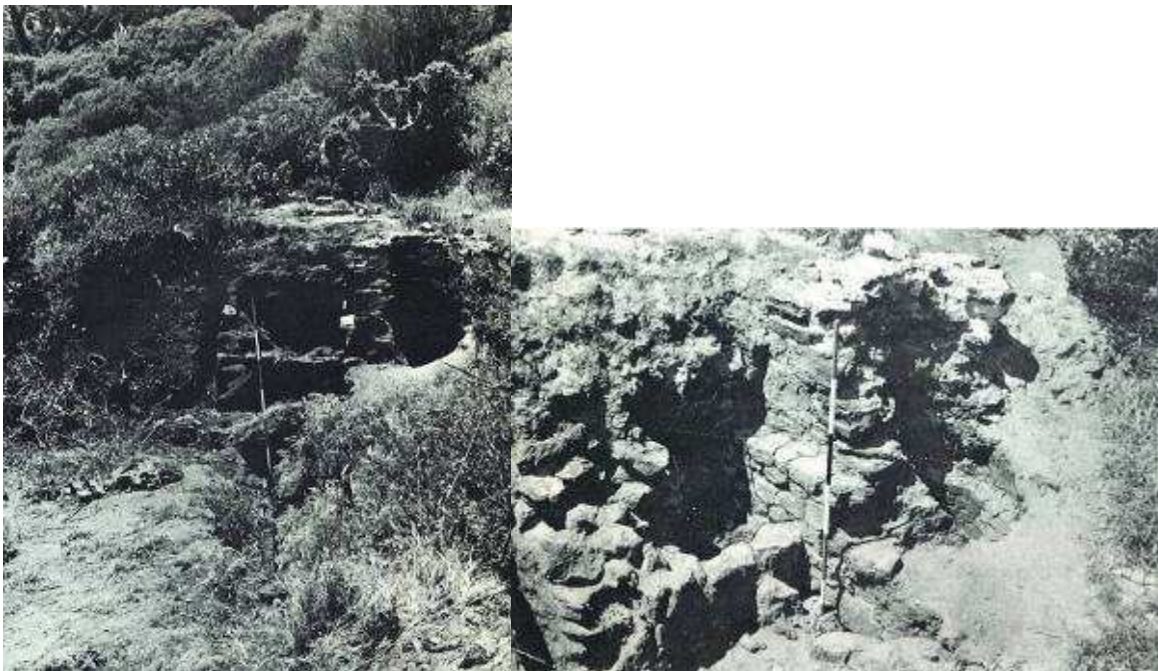


Figure 33: Area F, possible boiler/machinery setting remains Culican & Taylor Plate XXV a & b p.57.

No features were discernible at Area J, where Culican recorded an 'offset wall' and 'superimposed curb'. It is likely that foundations and other archaeological features survive at this site but have been reburied by windblown sand and possible introduced fill.

Other evidence of the past use of the area was observed during the site inspection. A broad terrace area above the kiln was noted, which is believed to be the loading platform and access track to the large kiln. Glimpses of stonework and bricks in this area suggest it may also have contained other buildings or structures. While dense vegetation prevented the terrace being fully traced, it appeared to extend to the north to meet up with the access track.

A second possible access track was noted to the north of the wash mill where a gently sloping level area runs between the Washmill and the deep tanks. There is extensive evidence of alterations to the natural ground levels in this area, including excavations into the sandstone terrain. This is probably not part of the excavations for Septaria, but may have been for



extracting building stone and gravel for track-making. The early Admiralty plans show a track closer to the shore which curves around the cliff-top to join the Esplanade some distance to the north.

#### 4.10 Aboriginal sites

No visible evidence of the Aboriginal shell middens could be identified in the study area. The Fossil Beach 1 site is evidently located on the rise to the immediate north west of the carpark and toilet. However, it is difficult to discern from the VAHR site record cards precisely what extent was recorded. An inspection of the area suggested there had been extensive disturbance to this area from track construction. However, areas of intact midden may still be present either on the elevated ground at the top of the eroded cliff, or buried under later fill to the south of the access track to the beach.

The Fossil Beach 2 and Dava Beach 1 sites are to the south of the main cement works area, on elevated ground at the top of the shore line cliffs and again are heavily vegetated, so that little exposure is evident. The recorded Aboriginal sites and areas of further archaeological potential in the immediate vicinity of Fossil Beach are shown in Map 3.

#### 4.11 Fossil Beds

While Winty Calder remarks that the sea wall was constructed so as to avoid the fossil beds, it appears that at least some of this work has covered the shore-line exposure of fossil-bearing layers of the Balcombe Clay. The main area available for finding fossils today is the inter-tidal zone at the base of the cliffs immediately north of the sea wall extending for a distance of about 200 metres to the north. Fossils are generally visible in the tidal zone, although past collection and slumping of the cliffs has depleted the exposure. Fossils are found above and below, but would appear to be susceptible to oxidation on exposure.



Figure 34: Balcombe Clay Cliffs and inter-tidal fossil bearing zone at base. Note deflated Baxter Sandstone blocks that have come from the top of the cliff.

This cliff face is actively eroding and the upper strata form scree over the Balcombe Clay, which is eventually washed away by wave action. As a result the beach is scattered with the more resistant rocks, including nodules of septaria limestone, and the Baxter Sandstone blocks from the top of the cliff.

Mixed in with the natural stone are the remains of various phases of dumping, land filling, sea wall construction and reclamation, including bluestone (basalt) granite, concrete and various forms of road metal. This material has both been dumped here, and is the result of use of the stone or concrete for various works, which has been allowed to remain. Where the material is obviously discarded waste – such as the random broken concrete, it creates the impression of a dump site, but even where the stone is rounded and weathered by wave action, it confuses the visitor by ‘contaminating’ the natural geology with types of stone that are not found in this location.



Figure 35: Nodule of Septaria Limestone (about 50cm wide) embedded in grey Balcombe clay at base of cliffs.



Figure 36: Rocky beach immediately north of the end of the sea wall showing mix of natural stone and introduced basalt, granite and concrete.

## 4.12 Vegetation

Botanist Jeff Yugovic has undertaken a brief assessment of vegetation in the area immediately around the cement works remains and identified a predominantly introduced vegetation with some surviving or recolonising native species.

Yugovic's assessment is as follows:

The vegetation growing on the ruins is predominantly introduced vegetation, with the majority of cover provided by Myrtle-leaf Milkwort *Polygala myrtifolia*. A large individual of African Box-thorn *Lycium ferocissimum* occurs on the kiln site.

Bower Spinach *Tetragonia implexicoma* is the most common indigenous plant.

Plant species noted are as follows:

Species	Common name
Indigenous:	
<i>Austroanthonia setacea</i>	Bristly Wallaby-grass
<i>Clematis microphylla</i>	Small-leaved Clematis
<i>Dianella brevicaulis</i>	Small-flower Flax-lily
<i>Disphyma crassifolium</i>	Rounded Noon-flower
<i>Lepidosperma laterale</i>	Variable Sword-sedge
<i>Leptospermum laevigatum</i>	Coast Tea-tree
<i>Leucopogon parviflorus</i>	Coast Beard-heath
<i>Myoporum insulare</i>	Common Boobiella
<i>Poa labillardierei</i>	Common Tussock-grass
<i>Rhagodia candolleana</i>	Seaberry Saltbush
<i>Tetragonia implexicoma</i>	Bower Spinach
Introduced:	
<i>Anagallis arvensis</i>	Pimpernel
<i>Chrysanthemoides monilifera</i>	African Boneseed
<i>Ehrharta erecta</i>	Panic Veldt-grass
<i>Galium murale</i>	Small Goosegrass
<i>Lycium ferocissimum</i>	African Box-thorn
<i>Olea europaea</i>	Olive
<i>Pennisetum clandestinum</i>	Kikuyu
<i>Pittosporum undulatum</i>	Sweet Pittosporum
<i>Polygala myrtifolia</i>	Myrtle-leaf Milkwort

## 5.0 COMPARATIVE ANALYSIS

### 5.1 Cement works

There are a number of similar kiln sites in Victoria, most of which were devoted to the lime industry, and which had varying levels of success. Jane Harrington has undertaken a review of lime burning which established a typology of sites and listed about 39 sites of lime burning with 34 extant kilns recorded in the state, of which nine were considered worthy of inclusion on the Victorian Heritage Register as being of state significance.

Harrington's typology included: heap & pit kilns; flare kilns, intermittent and mixed feed (running) kilns, inverted bell kilns, short cylindrical shaft kilns, vertical (deep) shaft or bottle kilns, and hillside kilns. The commencement dates for the various sites are predominantly in the period 1880-1920, all but 12 being from this period. Four are dated to the 1840s and 50s, (Lake Merrimu, Sullivan's, Duffy's, Shelly Beach and Quarantine Station).

These were not mutually exclusive categories, and most kilns were identified as hillside kilns with a range of shaft and shape forms. Harrington did not distinguish between lime and cement manufacture and did not include assessment of the later and more complex cement works such as Geelong Cement Co at Fyansford or Blue Circle at Waurin Ponds. While there are a number of surviving lime kilns, only the Fossil Beach works is specifically credited with cement manufacture.

There are at least 12 lime kiln sites on the Mornington Peninsula. These vary in form and state of preservation. Some, such as Sullivan's in Browns road, retain much of their structure, including almost the entire kiln shaft itself. Others such as the Iluka bathing boxes, and Duffy's kiln at Portsea, have been extensively modified and converted into other structures. There are also several which are comparable archaeological sites, with only foundations or ruinous structures surviving. Examples of these include St Andrews Beach kiln (Heritage Inventory site H7821-0013), Devine Bros at Rye (HI site H7821-0017) which is an entire reconstruction, possibly on the site of an original kiln and Cains lime kiln in Rye.

Most lime kilns were operated as single stand alone structures, with only a bagging shed attached or standing separate. The more complex grinding, sedimentation and kiln drying processes that distinguish the cement works, were rarely employed at the lime works.

Known lime kiln sites in the Shire of Mornington include the following:

Name	Address	Heritage Inventory	VHR
Bakers Lime Kiln	9-15 Hotham Road Sorrento	H7821-0029	H2068
Browns Road Lime Kiln	459-461 Browns Road Rye	H7821-0016	
Cain's Lime Kiln	8 Byron Street Rye	H7821-0014	
Canterbury Jetty Road Lime Kiln	Cape Schanck Coastal Park and Ocean Beach Road Rye	H7821-0020	
Devine Bros Lime Kiln	Foreshore Reserve And Point Nepean Road Rye	H7821-0017	

Name	Address	Heritage Inventory	VHR
Duffy's Lime Kiln	7 Merrylands Avenue Portsea	H7821-0018	H1288
Ilyuka Lime Kiln & Bathing Box	2 & 16 Point King Road Portsea	H7821-0012	H1191
Skelton's (Shelly Beach) Lime Kiln & Stonehenge	4 McColls Way Portsea	H7821-0019	H1288
Quarantine Station Lime Kiln 1	Point Nepean	H7821-0052	
Quarantine Station/ Lime Kiln 2	Point Nepean	H7821-0053	
St Andrews Lime Kiln	99 Bass Meadows Boulevard St Andrews Beach	H7821-0013	H1959
Sullivan's Lime Kiln	335 Browns Road Rye		H1930

In terms of specific cement works, Fossil Beach is unique in Victoria. No other structures or sites relating to cement manufacture (as opposed to lime) are known to survive from prior to the twentieth century. While the Australian Portland Cement Company commenced production at Fyansford near Geelong in 1889, their manufacturing site was progressively replaced with ever larger and more complex machinery and buildings, evidently eliminating any of the 19<sup>th</sup> century works (James & chanson 2000). David Mitchell's Cave Hill works in Lilydale commenced as a lime manufacturer, but also produced cement possibly by the 1890s. However, this was manufactured in a works in Burnley of which nothing remains. While the Lilydale works continues to operate, it is a modern facility with no evidence of 19<sup>th</sup> century fabric (Campbell 1974).

Fossil Beach Cement works is therefore unique in Victoria (and probably Australia) as evidence of the first stage in local cement manufacture in the nineteenth century.

## 5.2 Fossil site

Well exposed fossil sites are rare in the Melbourne Metropolitan area. The Beaumaris Cliffs fossil site is known as one of the best and most diverse fossil locality in the Melbourne area (Rosengren 1988). Other more famous sites such as Flat Rocks near Inverloch, and Dinosaur cove in the Otways, have come to fore because of recent, well publicised excavations, and research into ancient fauna of Victoria (Vickers-Rich & Rich 2000). Many sites in the metropolitan area, are however, difficult to access or obscured by development, vegetation growth or landscaping. Fossil Beach is therefore quite rare.

## 5.3 Recreation reserve

The recreational use of the Fossil Beach Site is a common pattern for beachside and foreshore reserves around Port Phillip Bay. Practically all accessible foreshore areas have variously been used for picnicking, swimming, camping and other recreational uses. Fossil Beach would appear to have been a more heavily used picnic and camping spot in the past, but because it was not formally developed like several other larger reserves, and subsequently was closed to vehicles, it is now confined to individual walking visits. As a result the larger part of the former clearing has become overgrown with both native and weed species, creating a somewhat different character to either the highly developed and landscaped reserves such as Snapper Point, or the rugged and more 'natural' areas like Balcombe Point. The increasing

regulation of foreshore activities has had a similar effect on public access to many similar areas, so Fossil Beach can be considered typical of the historical changes to bayside land uses.

#### **5.4 Natural values**

While Fossil Beach is an attractive location with remnant vegetation as a backdrop, the site is not of special botanical or zoological significance. Vegetation communities and species represented in the foreshore reserve at this location are typical of the coastal area along the eastern shore of Port Phillip Bay. The 19<sup>th</sup> century clearance and subsequent weed infestations means it is probably only a fair example of the vegetation classes.

#### **5.5 Aboriginal sites**

The Aboriginal sites are typical of many found along the Port Phillip Bay coastline, comprising remnants of shellfish and small numbers of flaked stone tools. There are about 80 Aboriginal sites recorded along the coast between Frankston and Point Nepean, most of which are shell middens, with about a third also having flaked stone material.

Victorian Aboriginal Heritage Register records do not indicate potential intact or stratified archaeological deposits, so the sites are unlikely to have value for detailed archaeological research. They do however have cultural significance for the descendants of Woiwurrung and Bunurong Aboriginal people who inhabited the area prior to European settlement.



## 6.0 CULTURAL HERITAGE SIGNIFICANCE

### 6.1 Statement of significance

Several Statements of Significance have already been prepared for Fossil Beach – see Appendix 2. The following has been updated and edited from a combination of these.

#### What is significant?

Fossil Beach Historic Area is an area of coastal reserve on Port Phillip Bay, south of Mornington on the Esplanade, in the Mornington Peninsula Shire. While not precisely defined, it comprises approximately 15 hectares of undulating heavily vegetated ground. A number of walking tracks traverse it and a vehicle track gives access to a picnic area.

The site retains evidence of Aboriginal use of the coast in the form of shell middens. There are ruins of the 1861-64 Patent Septaria Cement Company works built by Melbourne Architect James M Robertson, which includes two kilns, wash mill and settling tanks, stone lined well and storage tanks, and evidence of other stone buildings and structures. There is also modern infrastructure including a bluestone sea wall and toilet block. The site retains remnant native vegetation of the Coastal Headland Scrub EVC.

The cliffs to the north and south of the beach expose geological sequences including fossil beds of Tertiary Age, and all the units from the Older Volcanic basalt to the Baxter Sandstones including the Balcombe Clay, and displays the complete sequence beginning with volcanics and non marine sediments, passing to marine and then returning to non-marine conditions.

Fossil Beach was a destination for excursions by naturalists, geologists and holiday makers, spurred by valuable fossil deposits in the area. Some attempts were made in the late nineteenth century to preserve the cement works ruins, and develop the area for picnicking and recreation

The Fossil Beach Cement Works were subject to thorough archaeological excavation during the late 1960s by William Culican and John Taylor. The results of that excavation, together with a comprehensive history of the site, were published in 1972.

Significant elements within the reserve include the following

- Stone ruins of cement works – these extend over an area of about 4000 square metres either side of the access track and running from near the shoreline to 200m back into the cliffs (archaeological features shown in Map 4).
- Identified and potential archaeological deposits – associated with the recorded ruins with potential for other buried structural remains, refuse deposits and occupation debris within and around the ruins (an area of historical archaeological potential is defined in Map 4 and Map 5).
- Landscape of early terraces, quarried areas and access tracks – these are difficult to define due to heavy vegetation cover and later land modification, such as the modern vehicle track, however, it is likely that the deep ravines between the access track and the Esplanade and hollows north of the kilns, behind the wash mill near the base of the cliffs south of the kilns reflect the efforts to extract septaria and marl. Level areas from potential building sites and access tracks can be discerned in the surrounding landscape, and contribute to understanding the site.



- Aboriginal sites – two sites adjacent to the historic area have been identified, located on the high ground above the points north and south of the sea wall. These are shown in Map 4.
- Sea wall – while a relatively modern component, this feature is now an integral part of the reserve and provides erosion protection
- Fossil beds and geological formation – the prominent exposures of fossils are on the shore platform at the base of the cliffs, commencing about 50m north of the sea wall. Other exposures of the Balcombe Clays and Baxter Sandstones are evident in the cliffs to the north and south of the sea wall. These are shown in Map 4 and Map 5.
- Remnant Vegetation – covering most of the reserve but of varying quality.

### How is it significant?

The Fossil Beach Historic Area is of historical, scientific, aesthetic and social significance to the State of Victoria.

Individual elements of the site are significant at the following levels.

<b>Site/feature</b>	<b>Level of significance</b>
Stone ruins, archaeological remains and landscape	State
Sea Wall	Local
Fossil Beds	State
Aboriginal sites	Local
Remnant vegetation and other natural values	Local
Toilet Block	None
Modern track	None

### Why is it significant?

Criterion A Importance to the course, or pattern, of Victoria's cultural history

This site of the Fossil Beach Cement works is of historical significance at the state level as the earliest surviving cement manufacturing complex in Victoria and shows a pioneering spirit given the extent of the undertaking, its isolation and distance from markets.

The extant ruins reflect the nature and scale of early industrial enterprise in the often remote locations, and the development of local manufacture in response to the growing colonial economy and demands of the building industry.

As an 'import replacement' industry, the site demonstrates the sometimes difficult process by which Victoria changed from a colonial culture and economy dependent on supplies from either the older colonies or Britain, to a self-sufficient economy with its own financial and production capabilities.

The exposed and concealed fossil deposits along the sea cliffs and foreshore are of historical significance at the state level as a focus for geological investigations and excursions over a long period to examine its valuable fossil deposits and its use as a picnic area at least since the 1870s.

This surrounding landscape of native and exotic plants is also of historical significance at the local level as an example of evidence of the process of denudation of the Peninsula landscape in the nineteenth century when the she-oak and Banksia dominated woodland was converted to the tea tree scrub characteristic of the Peninsula today, as larger trees were cut down to supply fuel for lime burning and other uses.

Remains of Aboriginal middens are locally significant as part of the Aboriginal history of Victoria in demonstrating their resource exploitation strategies and patterns of occupation.

Criterion B Possession of uncommon, rare or endangered aspects of Victoria's cultural history.

The site of the Fossil Beach Cement Works is rare at the state level as the only surviving evidence of attempts to manufacture cement in the nineteenth century in Victoria and the only known example of surviving fabric from cement kilns dating prior to the mid twentieth century.

Criterion C Potential to yield information that will contribute to an understanding of Victoria's cultural history.

The geological structures and formations and fossil deposits, as exposed in the Fossil Beach cliffs, are of historical significance at the state level as an important site for demonstrating a variety of geological processes.

This site of the Fossil Beach Cement Works has industrial archaeological significance at the state level for its potential to yield artefacts and evidence relating to the production of Roman cement. Further archaeological deposits may be extant which can provide additional information regarding both the manufacturing process and of the people who worked there. The coastal headlands have potential for further Aboriginal archaeological deposits that may add to our knowledge of Aboriginal history and culture.

Criterion D Importance in demonstrating the principal characteristics of a class of cultural places or objects.

The complex combination of natural and cultural heritage values at Fossil Beach is of local significance demonstrates the important interplay between geological, landscape, biological, scientific and historical processes which characterise the early development of settlement and industry in Victoria, and therefore can be seen as a 'type site' for the introduction of new industry and economic activity in the 'virgin' landscape of colonial Victoria.

Criterion E Importance in exhibiting particular aesthetic characteristics.

The area is of aesthetic significance at the local level for its high scenic value, having significant natural vegetation together with high visual quality associated with diversity of landform. Picturesque views to the headlands and bay from the cliff tops, paths and the track descending the cliff provide varied aesthetic experiences, while the archaeological ruins (although obscured by vegetation regrowth in more recent decades) contribute a rustic and romantic feel to the locality, which has been interpreted and presented in a variety of paintings and photographs.

Criterion F Importance in demonstrating a high degree of creative or technical achievement at a particular period.

The site is of technical significance at the state level for the way that the archaeological remains of the cement manufacturing process demonstrate technical innovation of early experiments in Roman cement production in Victoria, and while ultimately unsuccessful, it predates and predicts the establishment of more successful Portland Cement manufacturing in Victoria by nearly thirty years.

- Criterion G Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. This includes the significance of a place to Indigenous peoples as part of their continuing and developing cultural traditions.

The area is of social significance at the local level for its importance as a well known recreational location near Melbourne which is heavily used in summer for beach related activities. The Mornington coast is also the focus of much private boating activity, and there is some commercial tourist and fishers' use of the area. Local residents and others associated with the site, maintain a knowledge of the history of the cement works, despite its operation being well beyond living memory.

- Criterion H Special association with the life or works of a person, or group of persons, of importance in Victoria's history.

The site is also of historical significance at the state level for its association with Melbourne architect and entrepreneur James M Robertson, who had a major role in the development of the local cement industry both at Fossil Beach and with the later Australian Hydraulic Cement Company.

The site is also of local significance for the association with Melbourne University lecturer William (Bill) Culican, who was renowned for his scholarship and eccentricity. His contribution to archaeology both through his university lecturing and private interests including the establishment of the Archaeological Society of Victoria, and the instigation of historical archaeology as demonstrated in the Fossil Beach dig, was significant to the development of the discipline in Australia.

## 7.0 MANAGEMENT RECOMMENDATIONS

The following Management Actions have been prepared on the basis that the purpose of management of the Fossil Beach area is primarily to protect the natural and cultural values of the site's geological formations, native vegetation and wildlife habitat, Aboriginal cultural heritage, historical features, industrial archaeological remains and cultural landscapes.

These values are protected for the benefit of residents of the Mornington Peninsula Shire and Victoria, for all visitors to the site as well as for the importance of Aboriginal cultural places to the Bunurong and Wurundjeri people. They are also protected for the importance of the geological, palaeontological and archaeological remains for scientific study and education.

A staged approach has been taken to determining management of the site, which recognises the interrelationship between managing vegetation, conserving the archaeological ruins and providing assess and site interpretation to the public. The first priority works should be to carefully remove woody plants which risk damage to historic structures through root penetration and provide protective fencing to prevent public climbing over the ruins or accidental falls. Second priority works involving exposure and conservation of structures can be undertaken as council resources permit, along with appropriate interpretation.

Progressive or staged removal of exotic weeds over the whole of the historic area can be undertaken and council resources allow. While the Culican excavations provide a good understanding of the site, there is potential for further archaeological evidence, therefore long term recommendations are made of future research, excavation and site development.

General recommendations below are followed by a proposed table of staged options.

### Planning

- Appropriate designation of the site should be provided through an accepted locality name such as "Fossil Beach Historic Area".
- The appropriate boundary for the historic area should be determined and designated in management documents. This would ideally coincide with a revised area to be included in the Mornington Peninsula Shire Planning Scheme Heritage Overlay and is suggested that it extend from the Esplanade to the Coast, and from the entrance track and north end of the fossil beds to Dava Beach. Separate boundaries are also proposed for Victorian Heritage Register and Heritage Inventory designation. This area of state significance should encompass the main archaeological features and an appropriate buffer, as well as the fossil beds. The suggested boundaries are included in Map 5.
- The Environmentally Significant Overlay should be amended to more clearly include the natural and historic features of the Fossil Beach Historic Area. This might be achieved by additional wording to be incorporated into the Schedule of the ESO, along the lines of: "for example, the fossil beds, and geological strata exposed at Fossil Beach, and the archaeological remains of the former Fossil Beach Cement Works Mornington"

## Vegetation Management

- Vegetations management should aim to reduce weed infestation, improve the quality of native vegetation and minimise harm to historical remains.

### Stage 1 – urgent vegetation removal for protecting ruins

- In order to protect the ruins it is recommended that all large shrubs growing within and immediately adjacent to the ruins be controlled using the cut and paint method. The cut branches should be removed and disposed of properly. This will leave the root systems dead in situ so the structures will not be damaged. Small shrubs can be manually removed without damage to the structures. This approach may involve a few indigenous shrubs such as Common Boobialla *Myoporum insulare* and Coast Tea-tree *Leptospermum laevigatum*. Removal of these species may require a planning permit.
- It is recommended that as a first stage to conserving the ruins, the woody vegetation from the large and small kiln and wash mill should be removed by the cut and paint method described above. In the case of the large kiln, this should include removal of the large box-thorn. Weed removal should be followed by selective and periodic weed spraying to maintain some of the site visibility.
- It is recommended that the climber Bower Spinach *Tetragonia implexicoma* be allowed to expand over the ruins in order to protect them from further damage from people and from the weather. However, the spinach should be monitored in order to not allow it to set roots into the structures, and where necessary it should be removed. Bower Spinach draped over the ruins has an enhancing ornamental effect.

### Stage 2 – further weed removal

- It is recommended that on-going management of vegetation for the historic area should involve removal of all weeds and replacement with indigenous vegetation over time.
- There may be an erosion issue with complete removal of Myrtle-leaf Milkwort *Polygala myrtifolia* from the steep slope immediately above the kiln site. This should be done in stages and in necessary jute mesh should be applied to prevent erosion.
- The orchid colonies present in this zone may require specific management actions; such prescriptions have been outlined by Yugovic (1995) and should be taken into consideration when formulating work plans for this zone.

The Mt Martha Foreshore Vegetation Assessment and Management Plan also proposes the following:

- *The more intact areas to the north of the fire access track at Fossil Beach have been the focus of various weed control works for a number of years. For the past 3 years, regeneration works in 1 ha of this area have formed part of the ongoing works for the Shire's Retention, Restoration and Rehabilitation (RRR) contract.*
- *Regeneration works within this zone should continue to focus on these higher quality areas, expanding as budget constraints allow. A section of the site adjacent to a high*

*quality area is currently being used as a bike jumps circuit and, as a result, is highly disturbed. Bike activity and jump construction should be monitored in this area to ensure that it remains confined to its present size, and does not spread into neighbouring high quality areas.<sup>101</sup>*

- If vegetation removal has the potential to harm the archaeological site, a Consent to Disturb and/or Permit may be required from Heritage Victoria. Such clearing works should be monitored by a suitably qualified historical archaeologist to ensure that further damage to the archaeological remains is not caused, and to record any features exposed during the process.
- If the vegetation clearing is likely to be undertaken on the sites of recorded Aboriginal cultural heritage, or if it is likely that unrecorded cultural heritage may be present elsewhere, and the works will potentially cause harm, then a Cultural Heritage Management Plan, or Cultural Heritage Permit may be required before the works can commence.

### **Stage 3 – conservation of ruins**

- Given the high significance of the remains of the Fossil Beach Cement Works, it is recommended that the main archaeological features should be progressively cleared of vegetation, conserved to prevent further deterioration, and interpreted to the public.
- Monitoring of any vegetation clearance works by an archaeologist is recommended, along with further recording of features that may be uncovered.
- Selective repointing and cementing of the stonework on the small kiln and wash mill and the retaining wall south of the large kiln, should be carried out to ensure loose stones are not dislodged. Accumulated rubbish and soil should be removed from around the small kiln and wash mill. An historical archaeologist should monitor or supervise this work.
- Fencing should be installed around the bottom of the large kiln, the small kiln and the wash mill to prevent access.
- The area around the deep tanks presents a safety risk from falling, and so should be protected either by maintaining dense native vegetation, including infill planting, to discourage access, or by reinstating fencing, should access increase.
- Future stages of conservation and interpretation could consider the following options – roughly in order of preference and time:
  1. Removals of soil cover on the larger kiln.
  2. Repointing of stone works and possibly reinstatement of stones on the southern wing wall, if these can be accurately determined from the Culican excavation drawings and photographs.

---

<sup>101</sup> Jo-Anne Thyer, Vegetation Assessment and Management of Mt Martha Foreshore Prepared for the Mornington Peninsula Shire Council by Naturelinks Landscape Management Pty Ltd, October 2007



3. Removal of vegetation and soil over the settling tanks, and the stone remains in Culican's area F, where the boiler setting is believed to have been located, N.B. this work would need to be carried out with the appropriate permit and/or consent from Heritage Victoria, and should take the form of a properly controlled and recorded archaeological excavation.
4. Clearance of vegetation, fencing, conservation and interpretation of the deep tanks could be considered at a later stage.
5. Exploratory excavations in the areas of other potential archaeological remains including Culican's Area K and I, the car park between the small kiln and settling tanks, and the terraced areas above the large kiln.

### **Conservation of fossil zone**

- Because it obscures the natural exposures and interpretation of the geology, it is recommended that any loose 'exotic' stone be removed from the shore platform at the base of the Balcombe Clay cliffs (i.e. fossil bearing shore platform), in order to prevent contamination of natural geological formations and that future coastal works are sympathetic in use of materials to the local geology.

### **Aboriginal archaeological considerations**

- Areas of recorded Aboriginal sites and areas of archaeological potential could be identified in management documents and plans to ensure these are not disturbed in future works. Hand planting of native species, hydro seeding with native grasses, or covering with mulch or thatch are preferred measures for protecting these areas. If any works which may cause harm to the Aboriginal sites is proposed then a Cultural Heritage Management Plan may need to be prepared and approved prior to undertaking the works.

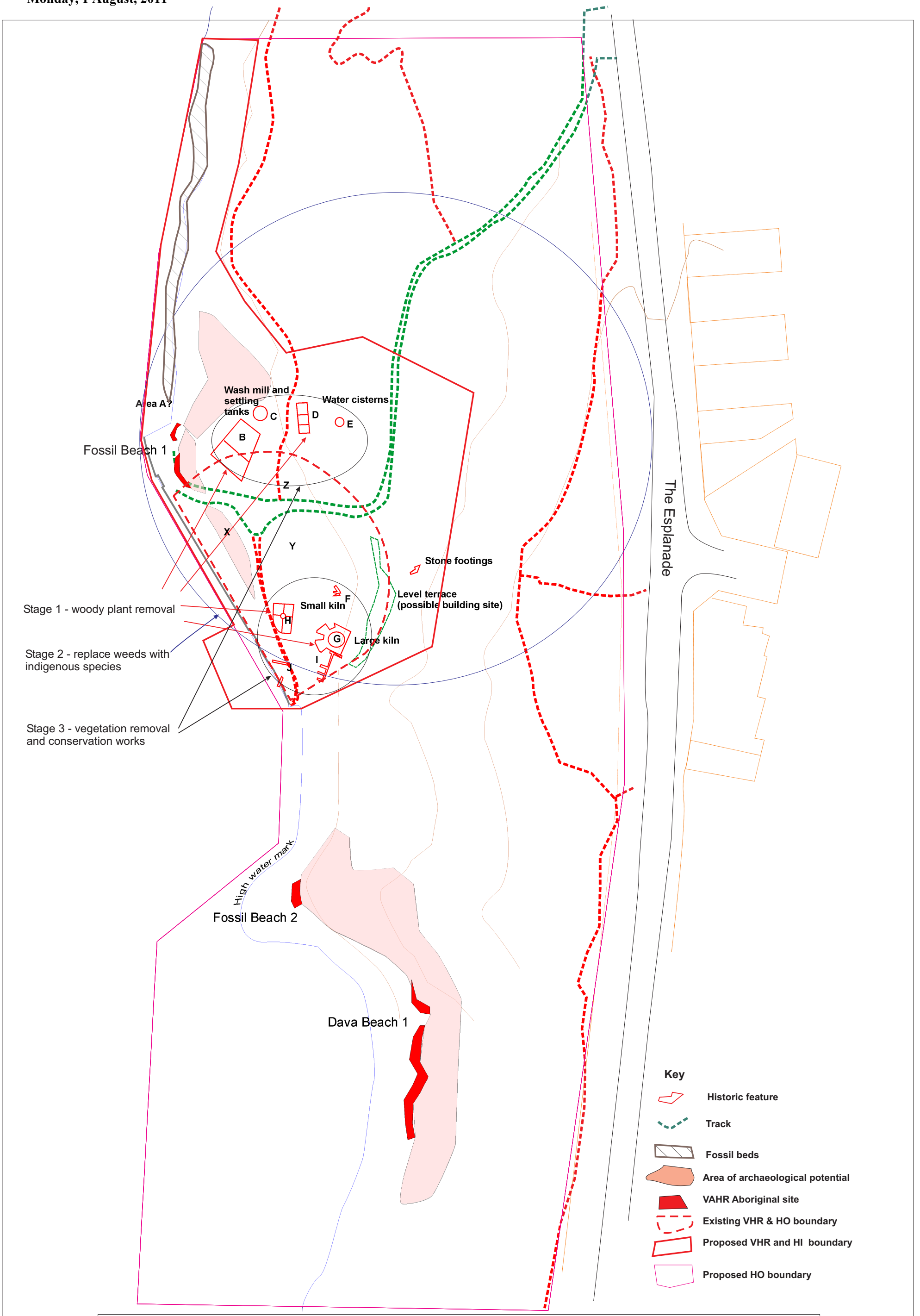
### **Future Infrastructure and interpretation.**

- A basic interpretation program is recommended involving the initial clearance of woody vegetation from the archaeological remains and installation of an interpretive sign at the top of the access track in the Esplanade car park. This should summarise the natural and cultural values of the site and direct visitors to carefully explore the evidence for themselves.
- The existing vehicle track is adequate for access to the site, but improvements can be made to the walking tracks by better defining them through regular mowing or surfacing with fine gravel, and possibly creating a loop which goes past the base of the large kiln, the small kiln and the wash mill.
- A future stage of interpretation could involve producing a printed guide (leaflet, brochure or booklet), to the site and installing numbered posts at the major features which are explained in the guide. Key points for interpretation would be the major parts of the cement works, the fossil and geological zone on the cliffs, a general location discussing Aboriginal occupation (but not specifically directing people to any visible midden remains) and characteristic elements of the indigenous vegetation.

- Any future infrastructure including construction or replacement of toilets, benches and tables, water and sewage supplies, underground services, etc. may require the preparation of Aboriginal Cultural Heritage Management Plan and/or obtaining appropriate permits/consents. It is recommended however, that new infrastructure be kept to a minimum on the site.

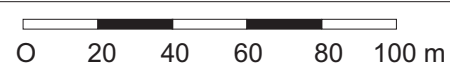
Stage	Action	Timing
1	Remove woody plants from large kiln, small kiln and wash mill	As soon as possible
2	Weed removal across site	On-going
2	Replanting native vegetation	On-going
3	Fence off base of large kiln, around small kiln and wash mill	When '1' is complete
3	Fence around deep tanks	If
3.1	Removal of soil cover on the larger kiln.	When resources are available
3.2	Repointing of stone works, reinstatement of stones	When resources are available or if damage becomes evident
3.3	Removal of vegetation and soil over the settling tanks, and the stone remains in Culican's area F	When resources are available
3.4	Clearance of vegetation, fencing, conservation and interpretation of the deep tanks	If resources available
3.5	Exploratory excavations Culican's Area K and I	If resources available

Table 2: Summary and timing of recommended actions.



Map 5: Management Actions Site Plan: showing proposed boundaries for statutory protection and designation of the Fossil Beach Cement Works Historic Area

Date 30 August 2010



GDA94 Zone 55



## APPENDIX 1. STATUTORY REGULATIONS

### VICTORIAN CULTURAL HERITAGE LEGISLATION

The *Heritage Act 1995* details statutory responsibilities for historic buildings and gardens, historic places and objects, historical archaeological sites, and historic shipwrecks. These responsibilities are set out in Part 1 of the Act, which states that one of the main purposes of the Act is to: 'provide for the protection and conservation of places and objects of cultural heritage significance and the registration of such places and objects'. The Act is administered by Heritage Victoria, part of the Department of Sustainability and Environment. The Act establishes the Heritage Council, a ten-member, independent statutory authority. The Heritage Council determines which heritage places are included on the Victorian Heritage Register and acts as an appeal body.

- The Victorian Heritage Register

The Victorian Heritage Register was established pursuant to Section 18 of the *Heritage Act 1995*. Heritage places included on the Heritage Register are places assessed as having cultural heritage significance at a State level. For a place to be added to the Victorian Heritage Register a nomination must be made to the Executive Director. The Executive Director will review nominations and make recommendations to the Heritage Council for inclusion on the Victorian Heritage Register. All recommendations are advertised in a relevant newspaper and the owners or any party with a substantial interest in the heritage place or object can make a submission to the Heritage Council.

A permit may be required for particular works or activities in relation to a registered place or object. Permit applications must be submitted to the Executive Director who will consider the application and determine the matter. Should the applicant or owner object to the decision of the Executive Director, an appeal can be made to the Heritage Council.

- The Heritage Inventory

The Heritage Inventory was established pursuant to Section 120 of the *Heritage Act 1995*. The Heritage Inventory includes historical archaeological sites, places and relics in Victoria, providing they are older than 50 years, and regardless of their level of cultural heritage significance.

A Consent will be required for particular works or activities, including excavation, in relation to an archaeological site. Under the *Heritage Act* it is an offence to damage or disturb relics and archaeological sites, whether or not they have been included on the Heritage Inventory, without obtaining the appropriate permission from the Executive Director.

### Consents and Permits

Depending on whether a place/site is listed on the Heritage Register or the Heritage Inventory, any proposed works will require the submission of an application for either a *Permit* (Heritage Register) or a *Consent* (Heritage Inventory). If an archaeological site has been added to the Heritage Register, this will take precedence: a Permit will be required, but not a Consent. In summary:

- A Permit is required if the site is on the Heritage Register. The assessment of the Permit application will be guided by its heritage status as a site of State significance.
- A Consent is required if the site is on the Heritage Inventory (and not on the Heritage Register). The assessment of the Consent application will be guided by the significance and integrity of the site.

Applications for Consents or Permits should be accompanied by a cheque for the prescribed fee. The cheque should be payable to the **Heritage Council**. The fees payable for particular classes of work are advised in Schedule 3 (Permits) or Schedule 5 (Consents) of *Heritage (General) Regulations 1996 (Statutory Rule No. 85/1996)*. The application should be made on the appropriate form and sent to:

Mr Ray Tonkin  
Executive Director  
Heritage Victoria

Level 7  
8 Nicholson Street  
EAST MELBOURNE VIC 3002

General queries relating to either Consent or Permit applications can be directed to:

Permits Co-ordinator  
Heritage Victoria  
Level 7  
8 Nicholson Street  
EAST MELBOURNE VIC 3002  
Ph: (03) 9637 9475  
Fax: (03) 9637 9503

Consultation relating to the Heritage Inventory and to historical archaeological sites should be conducted with Heritage Victoria archaeology officers, contact details as above.

Consultation and discussion with Heritage Victoria should be initiated well before lodging an application for a Consent or Permit to disturb or destroy a historical archaeological site.

### Significance Assessment criteria

Heritage Victoria applies the following criteria in determining the significance of a place nominated to the Victorian Heritage Register.

The criteria used in the assessment are those adopted by the Heritage Council on 7 August 2008 pursuant to Sections 8(c) and 8(2) of the Heritage Act 1995. These criteria are:

Criterion A Importance to the course, or pattern, of Victoria's cultural history

Criterion B Possession of uncommon, rare or endangered aspects of Victoria's cultural history.

Criterion C Potential to yield information that will contribute to an understanding of Victoria's cultural history.

Criterion D Importance in demonstrating the principal characteristics of a class of cultural places or objects.

Criterion E Importance in exhibiting particular aesthetic characteristics.

Criterion F Importance in demonstrating a high degree of creative or technical achievement at a particular period.

Criterion G Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. This includes the significance of a place to Indigenous peoples as part of their continuing and developing cultural traditions.

Criterion H Special association with the life or works of a person, or group of persons, of importance in Victoria's history.

- *Planning and Environment Act 1987*

The Victorian Planning and Environment Act provides local governments with the power to implement heritage controls over significant buildings or places. Heritage and conservation areas and heritage places – both Aboriginal and non-Aboriginal – can be identified and listed on a particular local planning scheme (usually through inclusion in the Heritage Overlay), and protected as places of heritage significance. A planning permit may be required from the local council if a place is subject to a heritage overlay control or is individually listed in the planning scheme. It is advisable to check with the relevant local council to determine if any additional permits are required.

- *Environment Effects Act 1978 and Amendment Act 1994*



The Victorian Environment Effects Act may have relevance with certain projects as it requires some development proposals to be assessed for their possible impact on the environment. The definition of environment includes the cultural heritage of the project area.

#### Commonwealth legislation

- *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

The Commonwealth Australian Heritage Commission Act was recently repealed and in its place amendments to the EPBC Act and the provision of an Australian Heritage Council have also been made in new legislation.

Under the EPBC Act Amendments (No 88, 2003) two mechanisms have been created for protection of heritage places of Commonwealth or National significance. Initially places in Commonwealth ownership may be placed on the Commonwealth list with similar protection measures as under the previous AHC act. In addition the National list provides protection to places of cultural significance to Australia. By law, no one can take any action that has, will have, or is likely to have, a significant impact on any places of national heritage value, without approval. Such actions must be referred to the Australian Government Minister for the Environment and Heritage.

## APPENDIX 2. HERITAGE LISTINGS

### MORNINGTON PENINSULA PLANNING SCHEME HERITAGE OVERLAY

PS Map Ref	<i>Heritage Place</i>	External Paint Controls Apply?	Internal Alteration Controls Apply?	Tree Controls Apply?	Outbuildings or fences which are not exempt under Clause 43.01-4	Included on the Victorian Heritage Register under the Heritage Act 1995?	Prohibited uses may be permitted?	Name of Incorporated Plan under Clause 43.01-2	Aboriginal heritage place?
HO83	<i>Fossil Beach Cement Works</i> Off Esplanade, Mornington	-	-	-	-	yes Ref No H1929	no	-	no

## MORNINGTON HERITAGE STUDY

Mount Martha - Mornington Foreshore

Location

MORNINGTON, Mornington Peninsula Shire

Heritage Overlay Numbers

HO228, HO55 , HO57 , HO59 , HO83

For further details, contact the local council or go to Planning Schemes Online.

Level of Significance

State

Statement of Significance

### STATEMENT OF CULTURAL HERITAGE SIGNIFICANCE:

What is significant?

There is physical evidence of Aboriginal use of the coast in the form of middens; most of these are damaged, and the people themselves were effectively wiped out following contact with the settlers of the Port Phillip area.

Early exploration of the area occurred in 1802 and 1803, but extensive European activity did not begin until the late 1830s. In those early days the locality was of importance for timber for Melbourne, fishing, and pastoral activity including cows and sheep.

The area then gradually became an important resort to which Melbourne people came for holidays and day trips, arriving first on steamboats, then the train and buses and, from the 1920s, by private car. The importance of the land abutting the coast was recognised early by the Council and Government, with the retention of reserves, prohibition of tree felling and development of public facilities on the foreshore.

Urban development of the land adjacent to the foreshore gained pace in the 1940s, bringing with it many pressures on the narrow strip of coastal land in the reserve.

How is it significant?

The Mornington Mount Martha foreshore is significant for aesthetic, historic, social and scientific reasons at the State level.

Why is it significant?

Within Port Phillip Bay the Mornington Mount Martha foreshore has a high relative visual quality and historical, geological, cultural and ecological interest.

Aesthetic Value

The area is recognised for its high scenic value, having significant natural vegetation together with high visual quality associated with diversity of landform.

#### Historical Value

The area contains several Aboriginal midden sites.

There are the remains of an early industrial activity; the lime kilns at Fossil Beach.

The pattern of development along the Bay coast reflects both the early pastoral subdivision and the subsequent provision of holiday allotments and permanent residential subdivision.

The formal park land at Schnapper Point, which overlooks Mornington Harbour, is a contrasting element which adds diversity in terms of vegetation and provides a sense of past landscape preferences. Its stone walls, often prominent behind the beach, generally add visual variety and a sense of the past to the landscape. There are two memorials to Matthew Flinders (a statue and a cairn). There is also a memorial to the 15 Mornington footballers who drowned on the return trip to Mornington after a game at Mordialloc on 21 May 1892.

#### Scientific and Educational Value

Mount Martha cliffs, Mornington to Frankston cliffs, Fossil Beach and Balcombe Bay are of geological interest, with a variety of geological structures and formations and fossil deposits.

#### Social Value

The area is renowned as a recreational location near Melbourne and is heavily used in summer for beach related activities. The Mornington - Mount Martha coast is also the focus of much private boating activity, and there is some commercial tourist and fishers' use of the area, at Mornington.

#### History

##### CONTEXTUAL HISTORY AND HISTORY OF PLACE

##### Aboriginal History

The physical evidence of Aboriginal use of the coast is in the form of middens, of which there are many remains within the classified area, both in the coastal dunes and on the cliff tops. Most have been damaged and many, particularly those on the Mount Martha cliffs, have disappeared (Vantree Pty Ltd, Frankston to Mount Martha; Coastal Processes and Strategic Plan. November 1996, Calder, W B Mount Martha: Lands and People. Jimaringle Publications 2002, p 13).

Various explorers and settlers recorded contact with the Bunurong people of the district (Calder, W B, Mount Martha: Lands and People. Jimaringle Publications 2002, pp 12-26), but little is known about their culture. As elsewhere in the nation and despite attempts by a few of the new inhabitants to improve the situation, the native population was being wiped out by competition over land, loss of traditional food sources, foreign diseases and alcohol.

##### European History

Following the earlier exploration of the Bass Strait coast and Westernport by Bass and Grant, Lieutenant Murray entered Port Phillip Bay in February 1802, sailing past Mount Martha on his way up the Bay. Matthew Flinders walked to Schnapper Point from Bird Rock and surveyed the area in April/May 1802. Charles Grimes surveyed the coast and parts of the hinterland of the Mornington Peninsula in January 1803.

There was no further recorded European activity in the area until the late 1830s, at the same time as the settlement of the northern end of Port Phillip Bay. In those early days the locality was of importance for timber for Melbourne, fishing, and pastoral activity including cows and sheep.

Pastoralists leased "runs" in the Mornington - Mount Martha area. These included:

- Tichingarook (which included the present Mornington and part of the Mount Martha coastline);
- \* Mount Martha (which included the coastline from Tichingarook south to Safety Beach);
- Jamieson's Special Survey south of Mount Martha and east of Safety Beach (1839);
- Arthurs Seat.

Timber merchants used the foreshore vegetation for sale as firewood to the Melbourne market. Some timber went to supply local lime kilns, which a cement company established at Fossil Beach (so named for the calcareous concretions which occurred in the Balcombe clay just north of Bird Rock). From the late 1850s, following the first 1854 subdivisions and land sales, the coastal strip between Mount Martha and Mornington became well known as one of Victoria's most popular holiday resorts. The Government in 1864 named "Mornington" officially and gazetted the Esplanade foreshore reserve for "promenade and recreation."

Tourism began in the 1870s with visitors coming from Melbourne by sea by excursion steamboat (including the well-known "Ozone" and "Hygeia").

In the 1860s, the Government reversed an earlier decision to use Mount Martha as a vice-regal retreat and sold much of the land to the west, north and south of the Mount. The land retained was declared a public park (Mount Martha Park). The subdivided land (which ranged in lot size from 2 to 17 acres) was sold off in the late 1860s and the 1870s.

The train service parallel to Main Street, Mornington opened in 1889. The steam train and later the motor bus allowed for a further influx of tourists.

The resort area was also notable for its yachting and its many guest houses and holiday homes.

Council decreed in 1902 that no living tree be 'touched' (felled). A Foreshore Reserves Committee convened in 1914 to combat nude bathing and vandalism. They cut tracks to the sea from various points and constructed dressing shelters, toilets and fencing.

In the 1920s the advent of motor car travel saw the beginning of "day tripping" by private transport. Although some areas had been subdivided into small lots in the 1800s (such as the township of Osborne, first laid out in the late 1850s), rapid development of urban style subdivision did not occur until the late 1940s. Gradually since then most of the land abutting the Esplanade has been turned into a residential environment tending to resemble the coastal suburbs along the eastern side of Port Phillip Bay, yet in part retaining a less developed appearance than those suburbs.

References:

-----  
Bird, E.C.F, 1993, *The Coast of Victoria: The Shaping of Scenery*, Melbourne University Press

Calder , W B, 1982, *The Changing Face of Mount Martha*, Jimaringle Publications

Calder , W B, 2002, *Mount Martha: Lands and People*, Jimaringle Publications

Culican & Taylor, 1972, *Fossil Beach Cement Works*, Mornington

Department of Sustainability and Environment, *Atlas of Victorian Wildlife*, PO Box 137, Heidelberg

Gostin, V A, 1966, *Tertiary Stratigraphy of the Mornington district*, in *Proceedings of the Royal Society of Victoria*, 79, Royal Society of Victoria, pp459-512

Gostin, V A, 1973, *Geology of the Mornington Peninsula*, in McAndrew J and Marsden, MAH (eds) "*Regional Guide to Victorian Geology*", pp 46-52

Jenkin, J J, 1988, *Mornington Peninsula* in Clark, I and Cook, B (eds), "*Victorian Geology Excursion*



Guide"

Moorhead, L, 1971, Mornington: In the Wake of Flinders, Shire of Mornington

Port Phillip Authority, 1977, Port Phillip Coastal Study

Port Phillip Authority, 1982, Coastal Vegetation of Port Phillip Bay

Rosengren, N J, 1988, J Sites of Geological and Geomorphological Significance on the coast of Port Phillip Bay. Technical Report Series, Making the Most of the Bay, Ministry for Planning and Environment, Victoria

Vantree Pty Ltd, 1996, Frankston to Mount Martha; Coastal Processes and Strategic Plan

## Description

### Geology and Geomorphology

At the northern end of the classified area, the granodiorite shore comes to an end and sandy beaches, similar to those further north at Moondah and Sunnyside, resume. They are coves separated by cliffed outcrops of Baxter Sandstone (Schnapper Point, Linley Point).

Then Baxter Sandstone forms high promontories and cliffs, with fallen sandstone hardened into ironstone. Balcombe Clay is at the base of the cliffs. Fossil Beach is named for the Miocene fossils occurring in this clay. To the south there are horizons of coarse and fine sandstone beneath the Balcombe Clay. (Gostin 1966, Jenkin 1988). At Harmon Rocks the underlying Older Volcanics again rise above sea level and form a small cliffed promontory, exposing much-weathered basalt with joints filled by ironstone carried down from the overlying Baxter Sandstone. The shore is strewn with angular blocks and rounded cobbles of basalt.

In Balcombe Bay there have been landslides where the Baxter Sandstone has subsided over slippery Balcombe Clay to form irregular tumbled coastal slopes (Gostin 1973). The sandy beach continues past the mouth of Balcombe Creek, which flows into a reedy and scrub-fringed lagoon often cut off from the sea by a wave-hilt sand barrier, and there are usually at least two nearshore sand bars, varying in position and depth with wave conditions.

The Balcombe Bay beach ends against cliffs of weathered granodiorite, which have a shore platform consisting of a wave-cut (abrasion) ramp. The upper slopes are cut in weathered granodiorite, but the cliffs have an irregular outline, with ribs and clefts dropping steeply below low tide level to a sandy sea floor close inshore. The absence of sandy beaches along the rocky Mount Martha coast may be due to the steep profile, which reflects wave action and has prevented intertidal (shore) sand accretion. The rocky coast continues past Martha Point, where the steep slopes decline to low cliffs and the bordering abrasion ramps reappear as the more weathered granodiorite zone descends again to sea level. There are pebble beaches derived from the adjacent cliffs and shore platforms where the rocks are closely jointed and weather into small angular fragments. Then there is an apron of Late Pleistocene to Holocene brown and grey gritty clays washed down the southern slopes of Mount Martha to Safety Beach.

(The above text draws on Bird, ECF, *The Coast of Victoria: The Shaping of Scenery*. Melbourne University Press, 1993, with the author's permission)

### Vegetation

(After Calder, W B *Peninsula Perspectives*. Jimaringle Publications 1986 and Vantree Pty Ltd, Frankston to Mount Martha; Coastal Processes and Strategic Plan. November 1996)

The original vegetation of this coastal strip was primarily banksia - she-oak open forest, backed by eucalyptus (principally coastal Manna Gum, *Eucalyptus viminalis* ssp *pryoriana*) woodland to open woodland (Calder, W B *Peninsula Perspectives*. Jimaringle Publications 1986). Over time, man's impact has removed much of the original she-oaks and prevented regeneration of both banksia and she-oak. They have been replaced with common tea tree (*Leptospermum laevigatum*) and introduced weeds.

The main vegetation types are now "tea tree scrub" and "banksia woodland", with a number of other communities with a more restricted distribution. These include *Stipa* grassland, *Poa* grassland,

Themeda grassland, Spinifex grassland, Saltbush shrubland, Noon-head herbland, reed grassland, sub-saline marsh and salt marsh (Vantree Pty Ltd, Frankston to Mount Martha; Coastal Processes and Strategic Plan. November 1996).

Much of the coastal vegetation is invaded by weed species, many of them garden escapes. They include boneseed (*Chrysanthemoides monilifera*), soursob (*Oxalis pes-caprae*), myrtle leaf milkwort (*Polygala myrtifolia*), box thorn (*Lycium ferocissimum*), bridal creeper or smilax (*Asparagus asparagoides*), New Zealand mirror bush (*Coprosma repens*) and radiata pine (*Pinus radiata*). There is a lack of regeneration of indigenous species together with the ageing of existing vegetation. User pressure on coastal sites, lack of natural processes such as fire, and the effects of runoff, erosion and weed invasion mean that little natural regeneration can occur.

#### Fauna

Fauna records for the coastal strip from Tassells Creek to Beleura Hill show that the principal area from which records have been obtained is the vicinity of the Balcombe Creek estuary. Mammals recorded near the estuary include: short beaked echidna (*Tachyglossus aculeatus*), agile antechinus (*Antechinus agilis*), common brushtail possum (*Trichosurus vulpecula*), common ringtail possum (*Pseudocheirus peregrinus*), sugar glider (*Petaurus breviceps*), feathertail glider (*Acrobates pygmaeus*), koala (*Phascolarctos cinereus*) and swamp rat (*Rattus lutreolus*). Mammal records for the estuary also include the introduced house mouse (*Mus musculus*), European Rabbit (*Oryctolagus cuniculus*), feral cat (*Felis catus*) and red fox (*Canis vulpes*). Marine mammals sighted in the vicinity of this coastline have included Australian fur seal (*Arctocephalus pusillus*), southern right whale (*Eubalaena australis*), killer whale (*Orcinus orca*) and common dolphin (*Delphinus delphis*). The echidna has also been recorded near Mills Beach and the white-striped freetail bat (*Tadarida australis*) near Schnapper Point.

The appendix "Fauna Species from Tassells Creek to Beleura Hill" is an extract from the Atlas of Victorian Wildlife, maintained by the Department of Sustainability and Environment. It lists the mammals, birds, reptiles, frogs and fish found in the area, together with their conservation status in Victoria.

#### Man-made elements

Structures abound on the coast.

The bay coast of the Peninsula is notable for bathing boxes, which were popular in the 19th and early 20th centuries. Most of these in the classified area are on Crown land. They were built principally at Mills and Mothers Beaches at Mornington and at the Mount Martha North beach. The Department of Sustainability and Environment and the Mornington Peninsula Shire Council offer only limited opportunities for replacement of damaged bathing boxes. A healthy real estate market for bathing boxes has formed.

There are the usual life saving club buildings, public toilets and changing rooms, public lighting and drains along the coast. In addition there are several usages not directly related to the coast, such as a bowling club and restaurants at Mornington.

Mornington Park is the principal formal park along this section of coast. Grassed, with large old cypresses and some more recent plantings of native trees, it has play areas, toilet facilities, and elderly citizens' club, car and bus parks, picnic facilities and access to the beach via asphalt paved footpaths. It also has a memorial cairn for and a statue of the navigator Matthew Flinders and a memorial to the 15 footballers who drowned during the return trip from Mordialloc on 21 May 1892.

At Fossil Beach, there are the remains of the former lime kilns (Culican & Taylor. Fossil Beach Cement Works, Mornington 1972). This plant operated between 1862 and 1864. The site is listed on the inventory of Heritage Victoria (site 7921-21) and is said to be highly significant as an early example of a Victorian coastal industrial works.

#### CONTEXT:

The area is a continuous coastal strip bounded by the sea on one side and busy road with a nearly fully

developed suburban residential environment on the landward side. There are some minor breaks in the residential pattern, particularly at the mouth of Balcombe Creek in Mount Martha (where there is a Crown reserve) and along the coast road between Tassells Creek and Martha Point, where for most of the distance the terrain is hilly and vegetation remains on the freehold land, and consequently development is more remote from the coastal reserve, or is more screened than elsewhere.

The area shares the "highest scenic value" rating with the landscape of the heads to Port Phillip Bay, (Port Phillip Authority, Port Phillip Coastal Study. 1977). The area south of Schnapper Point was designated as having "Significant Natural Vegetation", high visual quality with strongly contrasting and high relative diversity of landform. Naturalness is high and undesirable visual impacts of man made development are generally reduced by good indigenous vegetation cover. The vegetation is diverse, ranging from exposed cliffs to more sheltered cliff top and low lying associations. (Port Phillip Authority, Coastal Vegetation of Port Phillip Bay. 1982).

The Esplanade is a narrow road running along the cliff tops and the undulations and bends in the road enable fine vistas of the foreshore and Bay to be obtained. This road is an outstanding scenic road, providing one of the most attractive coastal driving experiences along Port Phillip Bay.

Little if any of the coastal reserve is "intact". The vegetation has been disturbed and exploited over the past century and a half. There are many coastal works and structures such as tracks, sea walls, bathing boxes, toilet and changing facilities, lights, clubhouses. There is significant weed invasion along all of the reserve. There is erosion and one or two unstable cliff areas.

However, there is much that has been retained and that is still relatively unspoiled. Many of the views along the coast are dramatic and little changed over time. There is still substantial indigenous vegetation and the possibility exists for it to be improved through suitable management.

SHIRE OF MORNINGTON HERITAGE STUDY

Shire of Mornington Heritage Study  
Significant Sites & Areas

---

**NAME: PATENT SEPTARIA CEMENT CO. WORKS & FOSSIL SITE  
off FOSSIL BEACH, Mornington**

---

TYPE: CEMENT WORKS, FOSSIL SITE  
MELWAY MAP REFERENCE: 145 B5  
SURVEY DATE: 1993-4

**HERITAGE RECOGNITION:**

HISTORIC BUILDINGS REGISTER (R= Registered):  
AUSTRALIAN HERITAGE COMMISSION (N= Nominated, R= Registered I= Insufficient Data to Process):  
NATIONAL TRUST OF AUSTRALIA (C= Classified, R= Recorded): C  
NTA FILE NUMBER: 3420

**CREATION DATE:**

1862c-

---



*Graeme Butler & Associates*

117

Shire of Mornington Heritage Study  
Significant Sites & Areas

**STUDY HERITAGE VALUE: S**

(Multiple elements in a site may have differing heritage values, listed in element order)  
Important to Victoria

**FIRST OR MAJOR OWNER/OCCUPIER:**

PATENT SEPTARIA CEMENT CO.

**OTHER ASSOCIATIONS: MORNINGTON SHIRE**

**DESIGNER:**

ROBERTSON, JAMES M

---

**HISTORICAL THEMES REPRESENTED: 2.4, 4.2.2**

EXTRACTIVE INDUSTRIES (Evidence of timber-getting, fishing, brick making, quarrying, mining practices)  
RESORT DEVELOPMENT (Evidence of resorts, retreats, hotels, seaside houses, beaches, seaside attractions, parks and recreation)

**CRITERIA SATISFIED BY THE SITE: 1.2, 1.3, 2.1, 3.2, 4.1**

AGE (The site is comparatively old, judged within major development eras)

INTERPRETIVE ABILITY (Physical or documentary evidence of a site allows historical interpretation)

ASSOCIATIONS (The site expresses the lives or lifestyles of typical or important people, individuals or groups, events or activities)

RARE OR UNIQUE SITES (The site may be now rare in form or function but was perhaps once more common)

---

**HISTORY:**

The need for a local cement/lime supply inspired the architect James Moller Robertson to apply for a local patent for its manufacture in October 1861. The Patent Septaria Cement Co. called tenders for supply of machinery and grinding stones, the erection of the kilns, tanks, jetty and sheds also 500 tons of firewood in 1862. This signalled the operation of their new works and the first lime shipment was sent to Melbourne in October 1862<sup>1</sup>.

The process involved crushing nodules of marble or Septaria found in local limestone and mixing it with lime and silica to produce hydraulic lime<sup>2</sup>. Production ceased in 1863 because of costly manufacturing and a dearth of local septaria. After that date it was used as a destination for excursions by naturalists and others, particularly geologists. The noted geologist, Grant, pronounced it as 'one of the best collecting grounds in Australia' in 1902<sup>3</sup>. A painting of the site from around the 1870s provides a valuable record of its form as well as an indication of its interest to tourists<sup>4</sup>.

Subsequently the Mornington Shire cemented over one of the kilns for its use as a picnic area in 1879, in 1927 built the access road and constructed a fireplace on the levelled kiln in 1941 to serve the picnic area<sup>5</sup>.

The complex consisted of two kilns, a washing table, wash mill, channels and the remains of a jetty in the early 1970s. Since a toilet block has been built by the Mornington Shire where the washing mill and settling tanks were and the kilns have been overgrown and partially dismantled.

---

**DESCRIPTION:**

The easily accessible evidence of the works appears to now consist of rubble freestone structures built into the hillside as kilns but since depleted and filled in with earth subsidence and overgrowth. A depression along the foreshore indicates an early path to the works while the relatively recent adjacent basalt sea wall is also of note (although typical along the shire's foreshore and possibly constructed over part of the works) with its cement cappings and dressed stone steps.

The works remnants consist of building bases, parts of two stone kilns (one large with Christie Wallyford Brickworks, Scotland, fire bricks; one smaller which was part dismantled and cemented over in 1879 for a picnic area and a Hoffman kiln red brick fireplace built there in 1941 by the Shire), a retaining wall working platform and cart track to top of kiln, a washing table, a 19 feet diam. wash mill with connected settling pans, deep below-ground tanks, a small well, boiler housing, numerous channels and traces of the granite base to the loading jetty<sup>6</sup>.

---

1 Moorhead p.92f  
2 see NTA file 3420  
3 'Views in and Information About Mornington.' MPHS collection  
4 Moorhead.pl.16  
5 ibid.  
6 see McMillan in NTA file 3420 1985; see also Culican & Taylor, 1972



Shire of Mornington Heritage Study  
Significant Sites & Areas

---

**CONDITION:**

A road has been built down to the site and a carpark placed on part of it, an unrelated toilet block has been built on another part of the complex c1970 and much of the rest of the site is overgrown, with the rubble stone walls eroding and reputedly suffering vandalism.

---

**SIGNIFICANCE:**

This site has State significance as the earliest surviving cement manufacturing complex in Victoria and shows a pioneering spirit given the extent of the undertaking, its isolation and distance from markets. It has also been the site of geological excursions over a long period to examine its valuable fossil deposits and used as a picnic area at least since the 1870s.

---



## REGISTER OF THE NATIONAL ESTATE CITATION

Patent Septaria Cement Works and Fossil Site Complex, Esplanade, Mount Martha, VIC, Australia

Photographs: None

List: Register of the National Estate

Class: Historic

Legal Status: Indicative Place

Place ID: 100470

Place File No: 2/18/037/0012

### Nominator's Statement of Significance:

This site has State significance as the earliest surviving cement manufacturing complex in Victoria and shows a pioneering spirit given the extent of the undertaking, its isolation and distance from markets. It has also been the site of geological excursions over a long period to examine its valuable fossil deposits and used as a picnic area at least since the 1870s.

Official Values: Not Available

### Description:

The easily accessible evidence of the works appears to now consist of rubble freestone structures built into the hillside as kilns but since depleted and filled in with earth subsidence and overgrowth. A depression along the foreshore indicates an early path to the works while the relatively recent adjacent basalt sea wall is also of note (although typical along the Shire's foreshore and possibly constructed over part of the works) with its cement cappings and dressed stone steps. The works remnants consist of building bases, parts of two stone kilns (one large with Christie Wallyford Brickworks, Scotland, fire bricks; one smaller which was part dismantled and cemented over in 1879 for a picnic area) and a Hoffman kiln red brick fireplace built there in 1941 by the Shire, a retaining wall working platform and cart track to top of kiln, a washing table, a 19ft diameter wash mill with connected settling pans, deep below ground tanks, a small well, boiler housing, numerous channels and traces of the granite base to the loading jetty.

History: Not Available

### Condition and Integrity:

A road has been built down to the site and a carpark placed on part of it, an unrelated toilet block has been built on another part of the complex c 1970 and much of the rest of the site is overgrown, with rubble stone walls eroding and reputedly suffering vandalism.

Location:

Located at Fossil Beach, Mount Martha, 2.8km south-south-west of Mornington.

Bibliography:

Cox, G. 1941. The Cement Works at Fossil Beach from articles written by Reverend George Cox, Peninsula Post.

Culican, W. and Taylor, J. 1972 Fossil Beach Cement Works Mornington Victoria. Refulgence Publishers, Deception Bay, Queensland.

Graeme Butler & Associates. Shire of Mornington Heritage Study, Recommendations and Guidelines Environmental History Significant Sites and

## NATIONAL TRUST OF AUSTRALIA (VICTORIA) CITATION

**File Number:**

L10064

**Level:**

State

**Location:**

A length of coastline within the Mornington Peninsula Shire, located about 55 to 75 km south of Melbourne by road.

**Address:**

0 VIC

**Municipality:** Mornington Peninsula Shire

**References:**

The Coast of Victoria: The Shaping of Scenery Bird, E.C.F 1993 Melbourne University Press

The Changing Face of Mount Martha Calder , W B 1982 Jimaringle Publications

Mount Martha: Lands and People Calder , W B 2002 Jimaringle Publications

Fossil Beach Cement Works Culican & Taylor 1972 Mornington

Atlas of Victorian Wildlife Department of Sustainability and Environment PO Box 137, Heidelberg

Tertiary Stratigraphy of the Mornington district, in Proceedings of the Royal Society of Victoria, 79 Gostin, V A 1966 Royal Society of Victoria pp459-512

Geology of the Mornington Peninsula, in McAndrew J and Marsden, MAH (eds) "Regional Guide to Victorian Geology" Gostin, V A 1973 pp 46-52

Mornington Peninsula in Clark, I and Cook, B (eds), "Victorian Geology Excursion Guide" Jenkin, J J 1988

Mornington: In the Wake of Flinders Moorhead, L 1971 Shire of Mornington

Port Phillip Coastal Study Port Phillip Authority 1977

Coastal Vegetation of Port Phillip Bay Port Phillip Authority 1982

J Sites of Geological and Geomorphological Significance on the coast of Port Phillip Bay. Technical Report Series, Making the Most of the Bay Rosengren, N J 1988 Ministry for Planning and Environment, Victoria

Frankston to Mount Martha; Coastal Processes and Strategic Plan Vantree Pty Ltd 1996

**Statement of Cultural Heritage Significance:**

STATEMENT OF CULTURAL HERITAGE SIGNIFICANCE:

What is significant?

There is physical evidence of Aboriginal use of the coast in the form of middens; most of these are damaged, and the people themselves were effectively wiped out following contact with the settlers of the Port Phillip area. Early exploration of the area occurred in 1802 and 1803, but extensive European activity did not begin until the late 1830s. In those early days the locality was of importance for timber for Melbourne, fishing, and pastoral activity including cows and sheep. The area then gradually became an important resort to which Melbourne people came for holidays and day trips, arriving first on steamboats, then the train and buses and, from the 1920s, by private car. The importance of the land abutting the coast was recognised early by the Council and Government, with the retention of reserves,

prohibition of tree felling and development of public facilities on the foreshore. Urban development of the land adjacent to the foreshore gained pace in the 1940s, bringing with it many pressures on the narrow strip of coastal land in the reserve. How is it significant? The Mornington Mount Martha foreshore is significant for aesthetic, historic, social and scientific reasons at the State level. Why is it significant? Within Port Phillip Bay the Mornington Mount Martha foreshore has a high relative visual quality and historical, geological, cultural and ecological interest. Aesthetic Value The area is recognised for its high scenic value, having significant natural vegetation together with high visual quality associated with diversity of landform. Historical Value The area contains several Aboriginal midden sites. There are the remains of an early industrial activity; the lime kilns at Fossil Beach. The pattern of development along the Bay coast reflects both the early pastoral subdivision and the subsequent provision of holiday allotments and permanent residential subdivision. The formal park land at Schnapper Point, which overlooks Mornington Harbour, is a contrasting element which adds diversity in terms of vegetation and provides a sense of past landscape preferences. Its stone walls, often prominent behind the beach, generally add visual variety and a sense of the past to the landscape. There are two memorials to Matthew Flinders (a statue and a cairn). There is also a memorial to the 15 Mornington footballers who drowned on the return trip to Mornington after a game at Mordialloc on 21 May 1892. Scientific and Educational Value Mount Martha cliffs, Mornington to Frankston cliffs, Fossil Beach and Balcombe Bay are of geological interest, with a variety of geological structures and formations and fossil deposits. Social Value The area is renowned as a recreational location near Melbourne and is heavily used in summer for beach related activities. The Mornington – Mount Martha coast is also the focus of much private boating activity, and there is some commercial tourist and fishers' use of the area, at Mornington.

**Level:**

State



## VICTORIAN HERITAGE REGISTER CITATION

### FOSSIL BEACH CEMENT WORKS

Location

OFF ESPLANADE MORNINGTON, MORNINGTON PENINSULA SHIRE

Heritage Inventory (HI) Number

H7921-0021

#### **Heritage Overlay Number**

HO83

Level of Significance

Heritage Inventory Site

Heritage Inventory Citation

Heritage Inventory Significance: State

#### **Statement of Significance**

##### **What is significant?**

In October 1861, an architect, James M Robertson, applied for a patent to manufacture cement from septarian nodules in Victoria. The cement works at Fossil Beach were constructed in 1862 and the company traded as the Patent Septaria Cement Co. This was the first attempt to manufacture Roman (hydraulic) cement in Victoria.

Robertson placed a public notice in the 'Argus' in January 1862, warning that action would be taken against any party removing septaria from the coast of Mornington or south of Geelong without authorisation. He signed the notice as manager of the Patent Septaria Cement Company. In April of that year he called for a series of separate tenders for various projects including machinery supply (a 10-12 horsepower steam engine) and installation, the erection of a kiln and tanks, the erection of a jetty and sheds, and supply of firewood. A loading jetty, built on granite piers, gave access to boats to transport the cement to Melbourne.

The company appears to have been operating successfully by August 1862 and by October a report appeared in the 'Argus' advising that supplies of cement had been placed on the market. Shortly after the 'Age' noted that 'The cement has proved itself of excellent quality, is now being used in the erection of the Bank of Victoria, Collins Street and it is expected to supersede importations from England. This is a satisfactory practical development of a new industry.' This, however, was proven to be misplaced optimism as within 12 months the company had failed. The supply of septaria was limited and the process, involving two kiln operations and mechanical grinding, was expensive.

From 1864 Fossil Beach was a destination for excursions by naturalists, geologists and holiday makers, spurred by valuable fossil deposits in the area. In 1879 the Mornington Shire cemented over the lesser kiln for the picnic area. An access road was established in 1927.

The Fossil Beach Cement Works were subject to thorough archaeological excavation during the late 1960s by William Culican and John Taylor. The results of that excavation, together with a comprehensive history of the site were published in 1972. They established that no industrial activity was undertaken after 1863-4, confirming that the physical remains relate to the cement works run by Robertson.

Remnants of the cement works comprise parts of two stone kilns, the larger one having fire bricks from the Christie Wallyford Brickworks, Scotland. There is also the remains of a retaining wall, a working platform and cart track to the top of the kiln, a washing table, and a 3.5m diameter wash mill

with connected settling pans. There are also remains of ground tanks, a small well, a boiler housing and numerous channels.

**How is it significant?**

The site of the Fossil Beach Cement Works is of archaeological and historical significance to the State of Victoria.

**Why is it significant?**

This site of the Fossil Beach Cement Works has historic significance as the site of the first manufacture of Roman cement in Victoria. The site demonstrates technical innovation, and predates the establishment of successful Portland Cement manufacturing in Victoria by nearly thirty years.

This site of the Fossil Beach Cement Works has archaeological significance for its potential to yield artefacts and evidence relating to the production of Roman cement. The site contains ruined remains of a rare industrial building type. Further archaeological deposits may be extant which can provide additional information regarding both the manufacturing process and of the people who worked there.

This site of the Fossil Beach Cement Works is of historical significance as evidence of the nineteenth century denudation of the Peninsula landscape. In the 1830s she-oaks and banksias dominated the landscape of this area. However these trees proved highly suitable as lime burning fuel, as she-oaks in particular were a reliable, high burning fuel. Denudation of these trees was followed by the growth of the characteristic scrubby undergrowth and tea-trees evident on the Peninsula today.

The site of the Fossil Beach Cement Works is historically significant as the site of the first historical archaeological excavation undertaken in Victoria. William Culican and John Taylor undertook archaeological investigations on this site from 1967 to 1969. Those excavations established the precise location and design of the cement works.

Architect / Designer     Robertson, James M

Heritage Act Categories     Heritage Inventory Site

Municipality     MORNINGTON PENINSULA SHIRE

**Description of Site**

Cement works excavated in early 1970s. Remains include kilns washmill, settling bays, and other features dating to the early 1860s.

Heritage Inventory Significance: State

Informants: Culican, W. & Taylor, J. "Fossil Beach Cement Works,; Mornington, Victoria: An Essay in Industrial Archaeology", Recorded by: A. Story (from report) Date Recorded: 01MAR1994

## SITES OF GEOLOGICAL AND GEOMORPHOLOGICAL SIGNIFICANCE CITATION

*Sites of Geological and Geomorphological Significance on the Coast of Port Phillip Bay (1988)* by Neville Rosengren.

PP76. Fossil Beach, Mornington Stratigraphy and Palaeontology

Location: 273652. Coastal cliffs, platforms and reefs from Marina Cove south including Fossil Beach and Dava Beach, 3 km south of Mornington.

Image: Sites of Significance Port Phillip Bay



Site 76. Marina Cove (A), Fossil Beach (B), Dava Beach (C). Arrows show important shore platform beds of Balcombe Clay.

Access:

From parking area off the Esplanade, 200 m north of Bentons Road. Walk along fire access track to picnic area.

Ownership/Managing Authority:

Crown land, Shire of Mornington.

Site Description:

The site exposes several units of the Tertiary marine transgressive-regressive sequence of the Mornington district. The area is extensively landslipped with unstable cliffs partly protected by masonry and boulder walls. The exposures available to earlier workers have been degraded in recent years due to landslips, revegetation, coastal protection works and over-zealous fossil collection by enthusiastic amateurs and excursion groups. The site includes all the units from the Older Volcanic basalt to the Baxter Sandstones and displays the complete sequence beginning with volcanics and non-marine sediments, passing to marine and then returning to non-marine conditions. At the south end of Fossil Beach (about 100 m south of the end of the sea wall), the Fossil Beach Fault exposes the Mt Martha Sand Beds and the Harmon Rocks Sand Bed which are not visible north of the fault. These are best seen in cliff sections behind and south of Dava Beach. Of particular significance is the Balcombe Clay which is exposed in the low cliffs north of the sea wall and on the intertidal platform at Fossil Beach. This is a complex geological unit and is important in the study of stratigraphy, palaeontology, mineralogy and weathering. This formation has two units, (calcareous and non-calcareous), the former being a richly fossiliferous clayey silt with bands of hard carbonate concretions of uncertain origin. These concretions are lenticular in form and vary from a few centimetres to almost a metre in length. They contain about 80% carbonate, and in the 1860's a plant was built at the site to extract and process these as a source of lime for cement making – (the beach was formerly known as Cement Beach). Remains of the kiln are visible near the picnic area (by the toilet block) at Fossil Beach. There are now few accessible concretion layers in the cliffs but they occur in the intertidal area.

The calcareous Balcombe Clay beds have an abundant fossil fauna, the richest layer containing the most robust shells being a 7 cm bed exposed only at low tide, although fossils also occur above and below this layer. In the cliffs, the fossils are scarcer and are more fragile. The fauna is dominated by mollusc (bivalves and gastropods), foraminifera and other microfossils, but includes sponge spicules, corals, echinoids and the 'ear bones' (otoliths) of fish. The latter are of particular importance in the systematic study and taxonomy of fossil fish.

Significance:

National. The site is the type locality for the Balcombian Stage, a major sub-division of the Tertiary in Australia. It was first defined here by Hall and Pritchard (1902) and subsequently re-defined by Singleton (1941) as comprising 22 m of the calcareous clays at Fossil Beach (about half this is sub-surface). It is therefore a nationally important site in Australian Tertiary stratigraphic studies. It includes the type locality of the Marina Cove Sand and the Balcombe Clay and is a major site to show changing depositional conditions. The conformable contact of the Baxter Sandstone overlying the Marina Cover Sand is best exposed here. Fossil Beach has long been recognised as a major fossil site and despite the degradation and reduction of exposures, still yields important material. The site therefore provides challenging problems in geological mapping and interpretation.

Management Considerations:

Class 1. The site should be managed as a geological reserve rather than a general public recreation area. To this end, casual use should be discouraged to avoid unnecessary degradation of outcrops by trampling or climbing, and the need to provide facilities. Coastal protection and cliff stabilization works have reduced the outcrop area available for sampling and fossil search. It is important to recognise that the most significant exposures of the Balcombe Clay occur on the shoreline and intertidal area. Further coastal protection works or other foreshore or offshore works, (including vegetation management, drainage, access) should be designed only in consultation with geological groups with specialist knowledge of the site.

References:

- Hall, T.S. & Pritchard, G. B. (1901). Some section illustrating the geological structure of the country about Mornington. Proc. R. Soc. Vict., 14, 32-54.
- Singleton, F.A. (1941). The Tertiary geology of Australia. Proc. R. Soc. Vict., 53, 1-125.
- Carter, A.N. (1959). Guide to Foraminifera of the Tertiary stages in Victoria. Min. geol. J. Vict. 6 (3), 48-54.
- Davies, E.M. (1960). Balcombe Bay a classic area for Victorian geology. Vic. Nat., 77, 14-18.
- Gostin, V.A. (1966). Tertiary stratigraphy of the Mornington district, Victoria. Proc. R. Soc. Vict., 79, 459-512.



Image: Sites of Significance Port Phillip Bay Site 76. Degraded cliffs of Balcombe Clay



Image: Sites of Significance Port Phillip Bay Site 76. Boulder wall covering shore platform outcrops, Fosters Slip north of Fossil Beach.

## MORNINGTON PENINSULA PLANNING SCHEME, SCHEDULE 25 TO THE ENVIRONMENTAL SIGNIFICANCE OVERLAY

Shown on the planning scheme map as ESO25

### PORT PHILLIP COASTAL AREA

#### **Statement of environmental significance**

The Port Phillip coastal area and adjoining offshore areas contain some of Victoria's most significant cultural and natural features, including sites of ecological, archaeological, geological, geomorphological, aesthetic and cultural heritage value.

These places are of cultural, scientific and educational value to current and future generations.

#### **Environmental objectives to be achieved**

- To protect and enhance the natural features, vegetation, ecological diversity, landscape quality, heritage values and recreation opportunities of the Port Phillip Bay coastal area and associated intertidal and marine habitats.
- To promote excellence in design of buildings, facilities and structures in the coastal area.
- To promote coordinated management of the Port Phillip coastal area.

#### **Permit requirement**

- A permit is required to construct fencing.
- A permit is not required for: The removal of vegetation in the ordinary course of the management of established parks or gardens or in the course of the repair or maintenance of any other works including fire breaks.
- Works for the establishment, maintenance, repair or removal of signs or other structures necessary for the safety or protection of the public including traffic management devices, survey marks and beacons, navigation aids, safety fences or railings.
- Any structure, works or use for which consent has been granted under the Port Phillip Coastal Planning and Management Act 1966 since 16 February 1986.
- A minor public utility installation or litter receptacles. Development carried out by or on behalf of Melbourne Parks and Waterways or Parks Victoria under the relevant provisions of the Water Industry Act 1994, the Water Act 1989, the Marine Act 1968, the Port of Melbourne Authority Act 1958, the Crown Land (Reserves) Act 1978 or the Parks Victoria Act 1998.
- Every application involving land within or abutting a Public Park and Recreation Zone or Public Conservation and Resource Zone must be referred in accordance with Section 55 of the Act to the referral authority specified in Clause 66.04 or a schedule to that clause.

#### **Decision guidelines**

- Before deciding on an application, the responsible authority must consider, as appropriate:
- The environmental objectives of this schedule.
- The existing use and development of the land.
- The degree to which the proposed development is dependent on a coastal location.
- The ability to reduce the number of buildings and other structures by combined use or reuse of existing buildings.
- The appropriateness of a condition requiring the relocation or removal of inappropriate structures as part of an application.



- Whether any proposed structure or works, including the planting or removal of vegetation, is likely to cause any deterioration of the Port Phillip Coastal Area by virtue of erosion or the deposition of sand or silt or any other reason.
- The Victorian Coastal Strategy, Siting and Design Guidelines for Structures on the Victorian Coast (May 1998) and Landscape Setting Types for the Victorian Coast (May 1998).

## BIOSPHERE RESERVE INFORMATION

<http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?code=AUL+12&mode=all>

### MORNINGTON PENINSULA AND WESTERN PORT

#### General Description

The Biosphere Reserve includes the whole of Mornington Peninsula Shire and parts of the City of Frankston, and coastal areas of the municipalities of Casey, Cardinia and Bass Coast including Phillip and French Islands. Western Port, which is also a Ramsar Site, consists of a coastal embayment incorporating vast relatively undisturbed mudflats with salt marsh vegetation. It is also considered as an internationally important feeding and roosting area for numerous species of summering waders, many of which are listed under the bilateral Migratory Birds Agreements (with Japan and China). The site periodically supports over 10,000 waders and 10,000 ducks and swans, and a rich invertebrate fauna of some 1,380 species. There is intensive use by commercial shipping in the whole Biosphere Reserve. More than 180,000 inhabitants (2002) live on a permanent basis in the biosphere reserve (270,000 seasonally). Human activities as commercial fishing, livestock raising, land clearance and its impact on water quality, and the enormous demands on the marine environment make it vital to deal with the issue of sustainable use within the region. More than 17,000 tourists (2002) visit the area annually. The biosphere reserve has Federal, State and Local Government support, taking on a holistic approach to conservation. It is complemented by Mornington Peninsula Shire's Sustainable Peninsula Initiative, which includes a variety of programmes and activities to achieve sustainable outcomes. The main goal of the Biosphere Reserve is to enable groups and individuals to achieve ecologically sustainable use and development of the region's natural and cultural resources.

Major ecosystem type                      Evergreen sclerophyllous forests, woodlands or scrub including wetlands, mangroves and marine ecosystems

Major habitats & land cover types                      Forests (cool temperate rainforest, damp forest, grassy forest, herb-rich foothill forest, riparian forest, shrubby gully forest, warm temperate rainforest, wet forest) with *Eucalyptus* sp., *Acacia* sp., *Coprosma quadrifolia* etc.; woodland/heathland (creekline herb-rich woodland, damp heathland, damp heathy woodland, damp sands herb-rich woodland, grassy woodland, gully woodland, heathy woodland, plains grassy woodland, sand heathland, sandy stream woodland, wet heathland) including *Eucalyptus* sp., *Allocasuarina littoralis*, *Banksia marginata* etc.; wetland / swamp (aquatic herbland, plains grassland, plains grassy wetland, reed swamp, riparian scrub, sedge wetland, swamp scrub, swampy riparian woodland, swampy woodland) with *Melaleuca* spp., *Eucalyptus ovata*, *Phragmites australis*, *Typha domingensis* etc.; dry coastal ecosystems (berm grassy shrubland, bird colony succulent herbland, calcareous swale grassland, coast *Banksia* woodland, coastal alkaline scrub, coastal dune grassland, coastal dune scrub, coastal headland scrub, coastal tussock grassland, spray-zone coastal shrubland) including *Atriplex cinerea*, *Banksia integrifolia*, *Leptospermum laevigatum*, *Allocasuarina verticillata* etc.; wet coastal ecosystems (brackish wetland, coastal salt marsh, estuarine flats grassland, estuarine swamp scrub, mangrove shrubland) characterized by *Avicennia marina*, *Sclerostegia arbuscula*, *Suaeda australis*, *Sarcocornia quinqueflora* etc.; marine ecosystems (intertidal rocky shores, subtidal reefs, seagrass beds, sheltered intertidal flats, mangroves, sandy beaches, subtidal soft substrates, pelagic environments) with *Zostera muelleri*, *Heterozostera tasmanica*, *Amphibolis antarctica* etc.; residential / industrial areas; agricultural areas

Location	38°20'00"S; 145°20'00"E
Area (hectares)	
Total	214,200
Core area(s)	9,300
Buffer zone(s)	63,600 (of which marine: 50,100)
Transition area(s) when given	141,300 (of which marine: 18,500)
Altitude (metres above sea level)	-20 to +898

Year designated 2002  
Administrative authorities The Mornington Peninsula and Western Port  
Biosphere Reserve Foundation

Brief description Monitoring of water quality (by Melbourne Water)  
EPA chemical turbidity and suspended solids monitoring of streams (<http://www.epa.vic.gov.au>)  
Climatic data (<http://www.bom.gov.au>)  
The Geological Survey of Victoria (NRE) program and seismic monitoring  
(<http://www.nre.vic.gov.au>)

#### Hydrology

Genetic variation in seagrasses

Impacts of biocides on the fresh and marine waters of Western Port, and surface water run-off on dairy farms

Research and monitoring on invasive plant species and invertebrate pests in relation to biological control

Research and monitoring on feral animal species

Research on fishing gear selectivity to reduce by-catch

Impacts of introduced marine invertebrates

Monitoring of seagrasses and fish stocks

Research and monitoring on Little Penguins, sea and shore birds of Western Port (since 1984) including international migratory waders

Counting of shore birds at 20 high tide roosting sites in Western Port three times a year

Permanent biodiversity monitoring plots including more than 3000 vegetation quadrats, continuous forest inventory plots, permanent water sampling plots, and monitoring plots for effectiveness of biological control

Studies of the communities of the area including demographic and economic profiles

Study into the traditional use of native plants by Aboriginal Victorians

Other socio-economic studies is being conducted by the DOI

#### Specific variables...

Abiotic n.a.

Biodiversity n.a.

Socio-economic n.a.

Integrated monitoring n.a.

Contact address Jack Krohn  
Mornington Peninsula Western Port Biosphere Reserve Foundation Ltd  
PO Box 261  
3915 Hastings, Victoria  
Australia

Telephone (61.03) 5979 2167

Fax (61.03) 5979 2167

E-mail [Jack.Krohn@dse.vic.gov.au](mailto:Jack.Krohn@dse.vic.gov.au)

Web site [www.biosphere.org.au](http://www.biosphere.org.au)



## BIBLIOGRAPHY

- Australia ICOMOS 1999. *The Illustrated Burra Charter, The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (the Burra Charter), revised edition.
- Bennett, Charles, 1926. 'Mornington' Watercolour, signed lower left and dated 1926. Inscribed on reverse, 'Bird Rock near Fossil Beach Mornington'.
- Birch, W. D. (ed), 2003. "Geology of Victoria". *Geological Society of Australia Special Publication 23. Geological Society of Australia (Victorian Division)*.
- Bird, E.C.F 1993. *The Coast of Victoria: The Shaping of Scenery* Melbourne University Press 1993.
- Bowden, Keith, 1970, *The Westernport Settlement and its Leading Personalities*.
- Briggs, Asa, *Victorian Cities*, Penguin Books, Ringwood, 1987 edition.
- Calder , W B 2002. *Mount Martha: Lands and People* Jimaringle Publications
- Calder , W B 1982. *The Changing Face of Mount Martha* Jimaringle Publications
- Calder, Winty, 1974. 'A History of the Mornington Peninsula as it Relates to Vegetation', *Victorian Historical Magazine*, Vol. 45, No.1, 1974.
- Calder, Winty, 1975. *Peninsula perspectives: vegetation on the Mornington Peninsula*, Parkville, Vic.
- Campbell, Joan, 1974, 'Mitchell, David (1829 - 1916)', *Australian Dictionary of Biography*, Volume 5, Melbourne University Press, 1974, pp 259-260.
- Cannon, Michael, 1993. *Melbourne After the Gold Rush*, Loch Haven Books, Main Ridge,
- Carter, A.N. 1959. Guide to Foraminifera of the Tertiary stages in Victoria. *Mining and Geological Journal*, Victoria. 6 (3), 48-54.
- Clark, I and Cook, B (eds), 1988. 'Mornington Peninsula' in *Victorian Geology Excursion Guide* Jenkin, J J
- Cox, George, 1941 "The Cement works at Fossil Beach", produced by Mornington Peninsula Historical Society from articles written by George Cox, Mornington Peninsula Historical Society, 1969] "From articles written by Rev. George Cox, and published in *Peninsula Post*, 23rd December, 1941."
- Crespin, Irene. *Micro-examination of samples from Mornington Fossil Beach, 400' north of small rocky point and immediately west of old lime kilns at Fossil Beach*, Canberra: Bureau of Mineral Resources, Geology and Geophysics, 1948
- Culican, William, and John Taylor, *Fossil Beach cement works, Mornington, Victoria: an essay in industrial archaeology* Deception Bay, Q. : Refulgence Publishers, 1972.
- Davies, E.M. (1960). Balcombe Bay a classic area for Victorian geology. *Victorian Naturalist*, 77, 14-18.
- Department of Sustainability and Environment, *Atlas of Victorian Wildlife*, Heidelberg
- "Fascinating Historical Facts Mornington Peninsula Fossil Beach and the Patent Septaria Cement Company Mount Martha"
- <http://www.discovermorningtonpeninsula.com.au/fascinatingfacts/fossil-beach.php> viewed 20/5/10

- Gostin, V A, 1966, Tertiary Stratigraphy of the Mornington district, in *Proceedings of the Royal Society of Victoria*, 79, Royal Society of Victoria, pp459-512
- Gostin, V A, 1973, Geology of the Mornington Peninsula, in McAndrew J and Marsden, MAH (eds) *Regional Guide to Victorian Geology*, pp 46-52
- Hall, T.S. & Pritchard, G. B. 1901. Some section illustrating the geological structure of the country about Mornington. *Proceedings of the Royal Society of Victoria*, 14, 32-54.
- Harrington, Jane, 2000. *An archaeological and historical overview of limeburning in Victoria*, Heritage Council,
- Heritage Victoria, 2008. *Guidelines for Conducting Historical Archaeological Surveys*, Department of Planning and Community Development, Melbourne
- Hollinshed C. N. 1958. 'The Nepean Peninsula in the Nineteenth Century. *Victorian Historical Magazine*, 28, 1958
- Hollinshed, C.N., Bird, E.F.C., Goss, N. 1982, *Lime Land Leisure, Peninsula history in the Shire of Flinders*, Shire of Flinders
- Ireland, Tracy, 2002 Giving value to the Australian historic past: Historical archaeology, heritage and nationalism *Australasian Historical Archaeology*, 20, 2002.
- James, D.P., and Chanson, H. 2000. "Cement by the Barrel and Cask." *Concrete in Australia*, Vol. 26, No. 3, pp. 10-13
- Jenkin, J J. 1988. "Mornington Peninsula" in Clark, I and Cook, B (eds), *Victorian Geology Excursion Guide*
- Jenkin, J.J. 1979 'The Geology of the Mornington Peninsula and Westernport' *Geological Survey Report 1974/3*. Department of Minerals and Energy.
- Keeble R. A. 1950. The Mornington Peninsula. *Memoirs of the Geological Survey of Victoria*. 17, 1-84.
- Land Conservation Council 1994. *Melbourne District 1 Review*, July 1994.
- Land Conservation Council 1973. *Report on the Melbourne Study Area*, Land Conservation Council, Melbourne.
- Lewis, Miles, *Australian Building: a cultural investigation*, 7.01 Early Lime and Cement University of Melbourne, <http://mileslewis.net/australian-building>,
- Lewis, Miles, 1994. *Melbourne: The City's History and Development*, City of Melbourne, Melbourne
- Macdonald, Fergus 2008. *Growing Up in Paradise*, a personal account of Mornington in the period 1940-1960
- Marquis-Kyle, P. and Walker, M. 1992. *The Illustrated Burra Charter: Making Good Decisions about the Care of Important Places*, Australia ICOMOS, Brisbane.
- McAndrew J and Marsden, MAH (eds), 1973. Geology of the Mornington Peninsula, in *Regional Guide to Victorian Geology* Gostin, V A 1973 pp 46-52
- McKenzie K. G. 1967 'Saipanellidae: A New Family of Podocopid Ostracoda', *Crustaceana*
- McKenzie, K. G. & Jean-Pierre, 1984. *Peypouquet Oceanic palaeoenvironment of the Miocene Fyansford Formation from Fossil Beach, near Mornington, Victoria*, interpreted on the basis of Ostracoda - -



- Metropolitan Strategy Project Team 2000. Technical Report 1 "Environmental Issues and their Impact on Metropolitan Strategy" Department of Infrastructure,
- Moorhead, L., 1971. *Mornington: In the Wake of Flinders* Shire of Mornington
- Morrison Lucy Crosbie, Victoria Black and white prints, Victorian scenery. Locations and subjects include: ...Fossil Beach; Date Range 1942 - 1953, most undated Quantity 3 cm, Inventory Identifier 5-11 Box Number 10 Series 5 Melbourne University Archive MORR00152, Photographs <http://www.austehc.unimelb.edu.au/guides/morr/MORS0005.htm>
- Pearson, M. and Sullivan, S. 1995. *Looking After Heritage Places*, Melbourne University Press.
- Port Phillip Authority, 1977, *Port Phillip Coastal Study*, Port Phillip Authority
- Port Phillip Authority, 1982, *Coastal Vegetation of Port Phillip Bay*
- Rogers, Hunter, 1960. *The Early History of the Mornington Peninsula*, Hallcraft, Melbourne,
- Rosengren, N J, 1988. *Sites of Geological and Geomorphological Significance on the coast of Port Phillip Bay*. Technical Report Series, Making the Most of the Bay Ministry for Planning and Environment, Victoria
- Singleton, F.A. 1941 The Tertiary geology of Australia. Proc. R. Soc. Vict., 53, 1941 1-125.
- Spencer-Jones D, Marsden M A H, Barton C M & Carrillo Rivera J J. 1975. Geology of the Westernport Sunkland. *Proceedings of the Royal Society of Victoria* 87, 43-67.
- Sullivan, H. 1981 *An Archaeological survey of the Mornington Peninsula, Victoria*. VAS Occasional Reports Series No. 6.
- Thyer, Jo-Anne, 2007, *Vegetation Assessment and Management of Mt Martha Foreshore* Prepared for the Mornington Peninsula Shire Council by Naturelinks Landscape Management Pty Ltd, October 2007
- Thomas, William 1840, Sketch map of the Western Port District in Coutts, P.J.F 1981 Readings in Victorian Prehistory Volume 2: The Victorian Aboriginals 1800-1860. Victoria Archaeological Survey, Ministry for Conservation.
- Vantree Pty Ltd 1996. *Frankston to Mount Martha; Coastal Processes and Strategic Plan*
- Vickers-Rich, P., and Rich, T., 2000. *Dinosaurs of Darkness*. Allen & Unwin, Crows Nest.
- Wood, Peter, *Conservation management plan: Patent Septaria Cement Works site off Fossil Beach, The Esplanade, Mornington, Victoria* [Donor L. Huddle] copy at Prahran Mechanics' Institute
- Yugovic Jeff, 1995 "Mt Eliza - Mornington - Mt Martha Foreshore, Vegetation and Management Guidelines" Biosis report.