Appendix A: Data Sources, Analysis and Manipulation

Appendix A-1: Sources Consulted for the Study Area

1) Historical Records

Historical records were initially consulted to establish a chronological history of the areas to be investigated. Given the time constraints of this project, regional heritage syntheses and broad thematic histories were consulted to obtain both potted and specific histories of the regional localities to be investigated. Several detailed histories of some of the various maritime thematic industries and services were already available for this area:

- **Customs Service:** Day 1992
- **Pilots:** Noble 1979; "Mark Three" 1884a, 1884b;
- **Lifeboats** - Schutt 1986; Loney 1989a; Boyd 1996; Noble 1979; Syme 2001;
- **Defence** – Noble 1979; Tate 1982; Jones 1986; Kitson 1987, 2001; Nicholls 1988; O'Neill 1988;
- **Tourism** – Wells 1982; Inglis 1999; QHM 2003; Baker and Lawson 2004; Brown 2004

Some abbreviated chronicles were also found for some other maritime sectors:
Navigation – Raison 1997;
Fishing – Kerr 1985; Raison 1987, 2002

Shipwrecks in this area have already been exhaustively documented (e.g. Williams and Searle 1963, 1964; Loney n.d. a, n.d. b, 1971, 1981; Foster 1987, 1988, 1989, 1990; Anderson 1997a; Anderson and Cahir 2003; Heritage Victoria (state government) Shipwreck Database - *Shiplist*; **Wrecking** – Loney 1989). These collections are derived from a number of different sources including historical, archaeological and ethnographic sources, including state libraries and archives, government departments (e.g. HV; DOT; Crown Land Management), local historical societies, museums and oral histories. Therefore further research to identify wreck sites was not required. However, no attempts have been made to comprehensively document stranding sites, although partial attempts have been undertaken (Williams and Searle 1963, 1964; Love n.d: In Prep.) so their general location and circumstances were recorded wherever they were identified.

A) Government Records

I) Official Correspondence: Colonial Secretary's Office

Government functions for the state were centralised in Victoria under the Colonial Secretary's Office until secession from NSW in 1851. Early official correspondence pertaining to the installation of lighthouses, navigational and defence facilities and the pilots service included a series of letters between the Victorian Governor (LaTrobe) and various civil servants engaged in the Harbour Masters Office, The Colonial Architects Office, The Lighthouse Board, Colonial Storekeepers Office and Water Police Office. Correspondence between these boards and offices was sent either from Queenscliff, Geelong, Williamstown or Melbourne, and has been preserved in a number of collections, including that of the QHM.

II) Victorian Parliamentary Papers/Summary Contracts Books

Many of the issues regarding the implementation and maintenance of maritime infrastructure were discussed before the Legislative Assembly of the Victorian Parliament. Reports of Select Committees, Royal Commissions and other submissions and despatches that were tabled for discussion were often included in the *Victorian Parliamentary Papers*, which proved to be a valuable data resource for proposed and passed government bills, acts and expenditure. These addendums to parliamentary discussion often outlined defence strategies and networks, along with proposed installation and/or expenditure on navigational services, pilotage systems, health,

customs, mail, communications, and transport systems. These papers were widely available on microfiche from a number of institutions.

A second body of official reports was the Summary Contracts Books, which outlined government expenditure by the Public Works Department thematically for projects dating from 1858 to 1935. These provide summarised details of expenditure, along with a brief description of the project, which were used to establish the chronology of site evolution for various industries and services including defence, navigational, health, lifesaving and harbour facilities.

III) Sailing Directions

Sailing directions were used in conjunction with hydrographic charts, and provided more detailed information for mariners such indications of important landscape routes, hazards, and other maritime infrastructure. Details of navigational facilities were gleaned from the official sailing instructions issued either by the Admiralty Hydrographic Office, (the Australia Directory: 1830- 1919. [See HOA 1830, 1913, 1918; Burdwood 1855, Yule 1868, 1876, 1884, 1897) or later the Australian Hydrographic Office (Australia Pilot 1920- present) and Ports and Harbours Branch (1959). Local sailing directions were also issued by the local Harbour Master (Ferguson 1854, 1861). These resources detailed not only the location, availability and directions for navigational facilities in Port Phillip, but also outlined harbour services including pilots, health, customs, and mail services and other harbour facilities. These official directions were supplemented with occasional and sporadic official notices which were published in the *Victorian Government Gazette* and *Notices to Mariners*, and included details of restrictions to waterways caused by navigational hazards (e.g. wrecks and live fire exercises) and other official notices regarding quarantine, customs, mail, defence and pilotage regulations for Port Phillip.

These data sets also provided insights into the areas used by mariners, but also those to be avoided. The former enabled prediction of potential archaeological sites and their possible signatures through descriptions of the types of infrastructure and associated behaviour, but the latter could also be used to indicate and explain empty spaces in the landscape. These documentary records were extensively used in conjunction with cartographic sources to better understand mariners' use of the maritime environment.

IV) Cartographic Sources

A plethora of chart, maps and plans were available for the study area, and a summary are outlined in Table A-3.1. Over 100 charts, plans and maps were examined to identify past features, maritime infrastructure and coastal environmental changes. These varied from charts produced by the earliest explorers (e.g. Flinders 1814; Grimes 1803; Tuckey 1804) to specialised thematic plans commissioned by local service providers (e.g. Defence; Queenscliff Sewerage Board; Victorian Railways; Roads Board; Tourism operators). Many sources of varying scales and projections were used during the survey, which although problematic due to differences in generalisation of features and topography/bathymetry, still proved effective for the identification of the general locality and existence of archaeological sites. The problems of scale differentiation were recognised when used for identifying potential field search and survey area, and the size of the search area was adjusted accordingly. Furthermore, many of the cartographic sources (especially the specialist military, tourist and local plans) provided indications of thematic cultural landscapes, in addition to local toponymic variations to official place names.

CHARTS	Producer	Information	Problems
Hydrographic	British and Australian Hydrographic Offices	Bathymetry, maritime infrastructure, shipwrecks, coastline changes	Small scale - generalised data, official data only - local features often omitted, accuracy varies in early charts - improves over time, Over-printing of info onto old maps - remnant obsolete data still on maps, Validity of data needs verification
Coastal Survey Series (CSS)	Local harbour masters and early surveyors - templates for later charts	Large scale detail of primary marine surveys of bathymetry/ maritime infrastructure from original surveys, local toponymy, very accurate in authors experience	None experienced
Harbour Facility Construction Plans	Dept of Public Works/ Ports and Harbours/ Marine and Harbours	Large scale plans of maritime infrastructure and bathymetry	Non-maritime features often omitted or generalised
Large Scale Marine Charts	Used by Marine Science Centre	Fine large scale detail (1:5000) of bathymetry and environmental detail	Too large for practical use during interviews
Local Sailing Directory Charts	Private Producers (e.g. Hawkins 1996)	Used by small boat operators - large scale detail of local maritime infrastructure, local variations of toponymy	Generalised detail of marine bathymetry, intended as guides only to be used in conjunction with official charts
MAPS			
Topological Surveys	Australia Section Imperial General Staff,	General topographic info - roads, rivers, prominent landmarks, official names	Small scale - data often generalised or omitted, official data only - local features often omitted
Survey General Parish Plans/ Dept Lands and Survey		Locally specific information	Over-printing of info onto old maps - remnant obsolete data still on maps, Validity of data needs verification
Special Purpose Plans - Military, Geological, Tourist Maps	Victorian Geological Survey, Various defence departments/ tourism operators/ Council Amenity & Services (e.g. Sewerage Plans)/ Victorian Railways/	Detection of coastline change, specific military feature/ reserve locations, tourism attractions and routes, indicators cultural landscape, railway and tramway locations, sewerage and coastline positions	Omitted data - biased towards specific purpose of creator
PLANS			
Construction Plans	Dept of Public Works/ Council Amenity & Services (e.g. Sewerage Plans)/ Victorian Railways/	Detailed construction info of maritime and other infrastructure - used to interpret archaeological sites	Proposal plans - some work was not instituted

Table A-3.1: Summary of cadastral sources and associated information and problems.

V) GIS Cartographic Data Sources

Several modern cartographic plans were available in GIS format, and were used in the geo-referencing process outlined below. These included coverages of cadastral land parcel boundaries (DNRE), Australian Hydrographic Charts (AHO) and Geo-referenced aerial imagery (PMS). The latter was used to identify potential archaeological features to be investigated, and several visible features (both under and above water) from this coverage proved upon inspection

to be archaeological sites. It also enabled geo-referenced historic maps and charts to be overlaid over the aerial imagery, allowing better interpretation of relocated ground features. Although some GIS coverages were only available in different projections, extracted data was converted to a common co-ordinate system (AMG, AGD 1966) to allow the results of all data extracted to be viewed concurrently.

B) Private Records

I) Pilots log books

The Port Philip Sea Pilots were a private commercial organisation that has been responsible for pilotage in Port Phillip since 1841. A Port Phillip Sea Pilots log book (Emerson et al. 1897-9) and a sailing directions manual were consulted (Anon. n.d.) to investigate the daily activities on board pilotage vessels, along with other significant features and components of the pilots' landscape.

II) Mercantile Directories

Mercantile directories provide annual detailed catalogues of merchant traders operating in Victoria, and some were thinly disguised as historical encyclopaedias (e.g. Sutherland 1888a, 1888b). Several of these trade directories and trade sponsored histories (e.g. Jarrat 1865, Sutherland, 1888a; Sands and McDougal 1889-1894; Wise and Co. 1891) were consulted for a period of three decades to further investigate individual extractive industries identified through newspaper accounts. However, it became apparent that many of the extractive industries being researched either never became commercially viable industries, or were of local importance only and were hence not listed in the commercial directories.

III) Memoirs

Several historical memoirs were available for the study area, and many were published by lifelong residents who could recount their personal recollections dating back in some cases to the establishment of the town (e.g. Fanning 1892a, 1892b, 1892c; Draper 1900; Cuzens 1912; Dod 1931; Thompson n.d.; Ferrier 1991) or to ancestral familial memories (Dunn 1949, 1963). Some historical memoir accounts were rewritten verbatim by later authors as their own accounts (e.g. McGrath n.d. borrowed from Fanning 1892a, 1892b, 1892c – see Kruithof 2003). Although it is recognised that these resources introduce the personal bias of the narrator, they also provided primary baseline observations of local activities and cognitive landscapes, and further assisted in the geographical placement of sites identified through oral histories.

IV)Images

Images of the area were available through extensive archival collections located at the State Library of Victoria, The Queenscliff Historical Museum and the Queenscliff Maritime Museum. In particular, many photographs display iconic portraits of local shipwrecks, and demonstrate community attitudes to the popularity of local shipwrecks as a tourist attraction. These images also provided insights into the everyday lives of many of the town's residents, and were of particular use for the fishing industry where official records were lacking. Furthermore, many images were used to aid geographical relocation and identification of possible archaeological features, and demonstrate details not described elsewhere.

V) Private Databases

Several individuals were known to possess extensive local knowledge founded on years of personal research and were approached to assist with the background information prior to the field inspections. Some informants, in particular Don Love, Peter Ferrier and Terry Arnott had

undertaken documentary research that provided extensive primary data for sites not included in previous heritage studies, particularly for the southern Port Phillip region.

This study drew heavily on the collections of the Queenscliff Historical Museum, Maritime Museum and Fort Museum, which contained a diverse range of historical data and informants that formed the backbone of the historical research undertaken for this project. Their collections included assortments of primary, secondary, tertiary historical and recorded oral history data, in addition to cartographic sources which were often not replicated elsewhere.

Researcher	Area of Expertise
Bob Leak	Maritime Infrastructure Hobsons Bay
Bob Marmion, FQM	Defence History
David Green	Pt Lonsdale Defence History
Don Love, MAAV	Shipwrecks and Strandings
Francis O'Neill, Heritage Victoria	Pt Nepean Defences
Henry Hudson, QMM	Local Queenscliff History
Ivar Nelson, DSE	Chinamans Hat
Jill Barnard, Living Histories	Maritime Infrastructure History
Jim Anderson, MAAV	Archaeological sites
Jocelyn Grant, QHM	Local Queenscliff History
John Patrick	Crows Nest Fort
Lauchlan Jackson, HV	Mud Islands and Archaeological Sites
Leonie Foster, HSAC	Shipwrecks and Strandings
Les Irving Dusting, QMM	Local Queenscliff History
Malcolm Venturoni, MAAV	Archaeological sites
Martin Zweep, HV	Fort Franklin
Mike Nash, THO	General Bass Strait History, Shipwrecks
Lyall Mills, MAAV	Archaeological sites
Parks Victoria, Queenscliff	Archaeological sites
Patrick Miller, HV	General Defence History
Peter Ferrier, QMM	Shipwrecks and Strandings, Local Queenscliff History
Peter Lovell, Lovell Chen and Associates	Queenscliff High Lighthouse
Peter Somerville	Maritime Infrastructure Melbourne
Peter Taylor, MAAV	Shipwrecks, Hulks, Sailing Direction
Queenscliff Historical Museum	Local Queenscliff History
Queenscliff Maritime Museum	Local Queenscliff History
Ralph McDonell, MMA	Defence History
Ross Anderson, HV	Shipwrecks
Steve Smithyman, SBICMC	Swan Bay History and Archaeological Sites
Terry Arnott, SAHB	Archaeological Sites

Table A-3.3: Private research collections accessed.

VI)Newspaper Reports: Ethno-historical Accounts

Newspapers have been widely exploited by maritime archaeologists to identify the locations of shipwrecks and the circumstances that contributed to them. Although these sources have traditionally been regarded with skepticism (especially editorials and second hand accounts) due to their biased documentation and personal views, they offer a potentially rich insight into the psyche of local community attitudes that may not be accessible in official historical records. Queenscliff's local newspapers proved a particularly fertile ground of opinionated rhetoric. Aside from explicit details of various activities (including accounts of social events, tourist attractions and infrastructure construction) undertaken in the area, the locally published *Queenscliff Sentinel* often contained explicit accounts of important local issues, memoirs and reminiscences, folklore and other scandals, which often presented a startling contrast to mainstream documentary accounts. The proceedings of many council meetings and other government inspections often detailed progress reports and installation of many maritime infrastructure projects in greater detail than was available in other historical sources. Although the objectivity of the newspaper was often questionable, with a bias against the Melbourne dominated State government (which was often criticised for lack of action pertaining to many local infrastructure projects), it provided valuable insights into the psyche and rationale of many community residents that was not available elsewhere. These views were contained in the local editorials and personal community contributions, which proved valuable for later analysis of local community structures and hierarchy.

This newspaper often included many individual memoirs of several maritime services and/or industries written by local identities (often under pseudonyms – "Bluelight" (1911, 1912); the first White Boy/ Oldest Native (Dod 1917); "The Native" (1887, 1894, 1910); "Old Salt" (1890); "Old Times Rocks" 1907; "Queenscliff Boy" (1910), many of whom were original residents of the Borough in the 1850s which contained personal minutiae not evident elsewhere (e.g. Fanning 1892 a, 1892b). Other early accounts were written by tourists (e.g. "Pro Bono Publico" 1884; "Rolling Stone" 1894; "Rambler" 1908), although the authenticity of some of these accounts were suspect, as they may have been written as promotional material by local businessmen. These recollections provided insights into many maritime services, along with personal minutiae not contained elsewhere. These anecdotal accounts represent the first written oral history accounts of the township, and extended the range of the oral history interview records (undertaken by the author and the Queenscliff Historical Museum) for the area back some 150 years. Personal history accounts and memoirs of community members and local industries were also published in the modern *Queenscliff Herald* and *Rip View* newspapers. Other newspapers outside the region (including the *Geelong Advertiser* and Melbourne-based *Argus)* provided balancing insights into general state events and wider community sentiments, in addition to the only coverage of news before the establishment of the local borough newspaper in 1879. Many of these sources were held at the Queenscliff Historical Museum (QHM), Queenscliff Maritime Museum (QMM), and Geelong Heritage Centre (GHC). In particular, the Baillieu Collection (an index summary of local and regional historical events held by the QHM) was extensively consulted as a directory source for locating relevant newspaper information.

Newspapers were examined from 1841 to the present date, with particular regard to the period up to 1940. In order to obtain sufficient material to document the history of the area, the Baillieu collection was used as a guide for all events from 1841 to 1920, and newspapers corresponding to the times of significant events in the town's development were reviewed. Furthermore, selective examination of newspapers between those dates was undertaken to identify other data not outlined in Baillieu Collection index, particularly regarding extractive industries, and social behaviour and hierarchy.

2) Environmental data

Environmental sources accessed for this study included bathymetric and topographic plans, oceanic conditions, coastal geomorphology and prevailing weather patterns. Environmental data was also accessed through historic meteorological records (Government Astronomer, 1872-1906), and sailing directions (the Australia Directory: 1830- 1919 - See HOA, 1830; Burdwood, 1855, Yule, 1868; 1876, 1884; 1897; HOA, 1913; 1918) and Ports and Harbours Branch (1959), marine science studies (Land Conservation Council, 1993; Yugovic, 1988), environmental strategies (Fisher Stewart, 1997) and geological surveys, and oral histories.

3) Archaeological Data

A) Victorian Heritage Registers/Inventory

Sources of these registers include the Australian Heritage Register, National Trust, State Heritage agencies (e.g. Heritage Victoria Heritage Register) and local council Heritage Overlays. These types of data sets are often available in GIS formats, enabling more efficient access to the information. There are a plethora of significant Heritage Register sites located in the Queenscliff area that have been widely addressed by Allom Lovell and Bickford (1987).

Heritage Victoria supplied access to their database records of maritime infrastructure sites under their control and these aided the identification of potential areas of archaeological interest. Heritage Victoria maintains the Victorian Heritage Register (Heritage listed sites) and Heritage Inventory (archaeological sites) which were also consulted regarding existing heritage listed sites (both terrestrial sites and shipwrecks), along with their extensive collection of historical records pertaining to Victorian maritime industries.

B) Shipwreck Databases

Extensive documentation of shipwrecks had already been undertaken by both government agencies (VHR – Shiplist; Foster 1987, 1988, 1989, 1990: Anderson 1997a; Anderson and Cahir 2003) and also by several members of the public (Williams and Searle 1963, 1964; Loney n.d. a, n.d. b, 1971, 1981; Arnott n.d.; Naylor n.d.; Wealthy and Bugg 1995; Love in prep.). These collections were derived from a number of different sources including historical, archaeological and ethnographic sources, including state libraries and archives, government departments (e.g. HV, DOT, Crown Land Management etc.), local historical societies, museums and oral histories. These sites and their associated histories have been extensively documented by the Maritime Heritage Unit (HV), and a number of other local divers, and represent a very good representation of the actual archaeological resource known to exist in the bay. Hence this thesis did not reinvestigate the history and archaeological signatures of shipwrecks in this area, but did examine their effects on the community and determination of cultural landscapes.

However, as mentioned above, little or no investigation of stranding sites had been undertaken in the area, with the exception of some sites partially recorded by local divers (Love in prep.; [PF]). As large quantities of cargo were often dumped over the side when vessels stranded, they represent potential tangible archaeological sites that have thus far remained largely unexplored.

C) Maritime Infrastructure and Other Researcher Derived Archaeological Data

Although several archaeological studies (Allom Lovell and Associates 1982; Weaver 1996; Long 1996; Austral Archaeology and Coroneos 1997; Anderson and Cladow 2000; Weaver 2000; Myers 2002), and an Urban Conservation Study (Allom Lovell 1984 - which listed significant heritage sites and precincts) had been undertaken in the study area, only 11 coastal

archaeological sites (South Channel Fort and Pile Light; Fort Queenscliff; Swan Island Defence Complex; Queenscliff Dump; Popes Eye: Swan Spit Pile Light; Chinaman's Hat; McDonalds Jetty; Coles Jetty; Quarantine Ground Anchorage) and 11 registered sites were listed on the Heritage Victoria Heritage Inventory and Heritage Register, respectively. Aboriginal Affairs also listed a number of Indigenous sites in this area, but these were not examined as part of this study. Forty-six located shipwreck sites were documented by the Heritage Victoria Shipwreck Register, and 52 others were historically known to exist in the area. Many informally identified stranding sites, beacon and lightship sites, ammunition dumps and anchorages were also known for the area by local divers, but had never been formally inspected. From examination of the above sources, it was clear that further extensive archaeological documentation of the study area was required, and that some types of sites were archaeologically underrepresented by the current databases and research.

D) Local Knowledge of Archaeological Sites

Many Queenscliff residents knew of previously unrecorded archaeological sites in the terrestrial, littoral and underwater zones, and these were often revealed during oral history interviews. Various commercial, archaeological, scientific and avocational divers were consulted to gain some understanding of the extent of potential underwater archaeological resource of Port Phillip Bay. Most of these divers had developed a personal knowledge of The Bay's underwater archaeological sites through many years of diving experience whilst involved in archaeological, marine science or port maintenance fieldwork. The types of divers interviewed is shown in Table A3.3.

Avocational Archaeologists - MAAV	Allen, Arnott, J. Anderson, Langenburg; Love, Mills, Munro, Parkinson, Taylor, Venturoni
Scientific: Marine Science Laboratories/ Parks Victoria	Gorfine, Rodrigues, Wilson
Commercial: PMA/ Private Contractors	Rodgers, Elstone, Venturoni
Maritime Archaeologists: Heritage Victoria/ Heritage South Australia	R. Anderson, Arnott, Harvey, Hosty, Strachan, Staniforth,
Private Divers/ Bottle Collectors	Caie, P. Ferrier, Love, Paolini,

Table A3.3: Types of divers interviewed.

Many divers had for many years been or were currently involved in artefact collecting activities within The Bay, hence their detailed knowledge of the sites. In cases where interviewees were still involved in bottle and ceramic collecting, this presented an ethical dilemma for the author, as this was antithetical to the archaeological discipline. Further considerations included the non-archaeological provenance of the artefacts, sometimes inadequate documentation and/or conservation of artefacts, and legal (heritage law) implications of excavation. After much deliberation these sources/ informants were included in the study for the following reasons:

- Many informants indicated that some sites had already been lost due to over collecting, and therefore the recollections and collections of the divers represented the only surviving record of the sites
- Some divers demonstrated a detailed knowledge of the underwater environment and regional provenance of their artefact collections
- The collective experience of many of the divers consulted added up to over 300 years of exploration, which could not possibly be attempted during the time frame of this project
- The divers consulted were known to be reliable either through the authors previous experience, and/or by their association with previous scientific diving activities

Given these considerations, a number of strict guidelines were introduced to adhere to archaeological ethics. Legal advice was sought from Heritage Victoria (the State Heritage Agency) regarding the legal implications of removal of artefacts from shipwrecks or the seabed

(particularly if excavated), and the associated obligations for the author (as a researcher) and any project participants (either from interviews or fieldwork). All participants in the project were advised of these legal implications and asked to sign a memorandum of understanding prior to any participation, which included acknowledgement that no artefacts would be collected during fieldwork, and the author could be legally directed to surrender any information regarding illegal activities. The author also explained the outcomes of the project to each participant, and reiterated that this research did not actively support the practice of bottle collecting.

A number of divers were identified who demonstrated an extensive personal knowledge of sites in southern Port Phillip Bay since the inception of scuba diving into the area in the 1960s. Peter Ferrier, Don Love, and Carl Paolini all demonstrated a pervasive knowledge based on over 120 years accumulated diving experience between them during underwater bottle collecting activities. In particular, Peter Ferrier demonstrated a remarkable knowledge of the underwater landscape, and could geographically locate or identify many archaeological sites and their associated submerged topographic surrounds. On many occasion he was able to identify areas where the author had been diving simply from descriptions of underwater sand dunes, seagrass distributions or other seabed matrices, and subsequently redirect later inspections to previously unlocated sites that were being searched for based on his underwater directions. Given that this understanding was accrued through actual physical exploration (via diving) in only one generation (in P. Ferrier's case), it is also possible that Ferrier's detailed knowledge of the underwater environment also reflects the inherited ancestral knowledge accumulated by generations of family fishermen, what Parker referred to as the *underwater landscape*.

Appendix A- 2: Sample of General Questions for Informants

1. Name/ Address/ Contact Details.

2. How long have you/your family lived in Queenscliff? Probe further.

3. What was your profession/ family's profession?

    a. Tell me more about that.
    b. Details how/ where/ why/ what equipment used.
    c. Details social organisation.
    d. Details locality/ time it undertaken.

4. Tell me about the history of the township?
    a. Significant places/ events.
    b. Where/ why important/ when.

5. Do you know of any archaeological sites in the area?
    a. Where/ dating to/ source of information
    b. How do you know about them?
    c. Link to family connections?

6. What areas are did you use/ are important to you in the region?
    a. Where/ why/ what.

7. What effect did (event/place/social group) have on the local community?

8. How did people respond to shipwrecks (in relation to rescue, salvage and subsequent perceptive use of those areas)?

9. How did people get on it the township?
    a. Community relationships/ social structuring
    b. Good/bad relationships and why?

10. Are there any other significant things you would like to tell me about the area?

Note:

- Probe further on all questions.
- Recheck responses during interview and at a later stage.
- After above questions are asked, raise information from other informants to check veracity of information.

Appendix A-3: Informant's Background

Informants Back Grounds																						
Name	**Pers comms pref**	**Agriculture**	**Cartage/ Transport**	**Customs**	**Defence**	**Extractive Industries**	**Fishing**	**Lifeboat**	**Local governement**	**Navigation**	**Pilots**	**Religion**	**Recreational Maritime**	**Tourism/ Merchant**	**Wrecking/ beachcombing**	**Farming**	**Knowledge of local Arch sites**	**Diving - U/w Arch sites**	**Notes**	**Born**	**Age at Interview**	**Personal/Family History Begins in Area**
Adams, John	**JnA**													f, P					Father owned Esplanade Hotel in 1960s			
Allen, Scott	**SA**																P	P	MAAV Diver			
Anderson, Cecil	**CA**					a							a, P	a, P			P		Family history in Grocery/ Guesthouse business. Former Real Estate Agent and Guesthouse/ tourism operator. Lifetime member and Green Keeper Swan Island Golf Club. Grandfather operated lime kiln Pt Lonsdale 1850s. Member Swan Bay Yacht Club since 1926.	1914	89	1853
Anderson, Jim	**JA**												a, P				P	P	Geelong resident, family holidays spent at Queenscliff and Bellarine Peninsula, Diver MAAV of over 40 years experience diving in The Bay.			
Anderson, Marjorie	**MA**																P		Family history in Grocery/ Guesthouse business. Former Guesthouse/ tourism operator. Lifetime member and Green Keeper wife on Swan Island Golf Club.	1913	90	
Anderson, Ross	**RA**																P	P	Maritime Archaeologist, Heritage Victoria			
Arnott, Terry	**TA**													a, P			P	P	Former resident Ocean Grove, Diver MAAV of over 40 years experience diving in Bay, Former Historic Shipwrecks Advisory Committee Member			
Barras, Lawrence	**LB**				P														Ex soldier, Crows Nest Fort WWII	1916	90	1940s
Beames, Dawn	**DB**	a, P											P	P			P		Great grandfather was first Scottish farmer (McDonald) in Swan Bay area. Ran local Swan Bay Store and boat hire business for 40 years.Extensive local recreational fishing experience	1928	76	1853
Beames, Robert	**RB**	a, P											P	m, f ,P			P		Parents (Dawn) ran local Swan Bay Store and boat hire business for 40 years. Extensive local recreational fishing experience	1964	39	1853
Beazley, John	**JB**				f		a	a			P						P		Shipwright/ boatwright for 50 years with Pilots Service. Three generations have lived in Queenscliff - Grandfather (Todd Walter) was a fisherman/lifeboat - Father (Reg Beazley?) was in the permanent	1929	73	1860s
Caie, Alex	**AC**																P	P	Diver in this area for at least 15 years			pre 1990
Ferrier, Geoff	**GF**						a	a		a, P							P		Lighthouse Keeper in 1950s. Father former South Channel Pile Light keeper. Ancestral fishing family background.	1926	75	1860s
Ferrier, Peter	**PF**				a,f		a	a,P		a	a				a		P	P	fishing family, ancestors/ personal experience on lifeboat, pilots and lighthouse service, father ran patrol boat in WWII, diver and bottle collector with 35 years diving experience in Bay			1860s
Ferrier, Lewis	**LF**	**P**					a,P	a,P		f,a		P			P				Fisherman for 64 years. Father former South Channel Pile Light keeper. Ancestral fishing family background. Father/ 37 years personal experience on lifeboat, Intermittent experience as shearer and labourer	1924	79	1860s
Forrest, Helen	**HF**													h					Husband lived in Queenscliff for many years c 1950s onwards	1946	60	
Frank Ferrier	**FF**						a, P	a, P		f,a					P				Fisherman. Ancestral fishing family background. Ancestral/ personal experience on lifeboat			1860s

Appendix A-3: Table of Informants Backgrounds

Elstone, Craig	**CE**															P	P	Commercial Diver with 20+ years experience			
Gianuzzi, Alex	**AG**																	Manager Education, Marine Discovery Centre			
Gorfine, Harry	**HG**															P	P	Diver, Victorian Institute of Marine Science. Queenscliff (for at least 15 years)			
Grant, Jocelyn	**JG**															P		President Queenscliff Historical Society and Museum			
Harvey, Peter	**PH**															P	P	Manager, Maritime Heritage Uni, Heritage Victoria			
Henderson, Geoff	**GH**														P	P		Swan Bay farmer since 1942	1929	75	1942
Henderson, Helen	**HeH**														P	P		Swan Bay farmer since 1942			1942
Higgenbotham Adrian	**AH**				a		a									P		Ancestral fishing family background. Familial defence background			1860s
Hosty, Kieran	**KH**															P		Former Maritime Archaeology Unit Maritime Archaeologist			
Hudson, Henry	**HH**															P		QMM Secretary, HSAC member. Former research chemist.			
Hughs, Steve	**SH**				P											P		Qcliff Fort Museum Curator	1951	55	
Irving Dusting, Les	**LID**				f		a		**P**					a, P	a, f	P		Former Telstra Employee, - Lived all of life in Queenscliff, -Grandparents in fishing industry in Port Fairy, moved to Qcliff in 1904. Father fish hawker and café owner also worked as carpenter at Swan Island Naval Depot	1947	56	1901
Jackson Lauchlan	**LJ**															P		Parks Victoria Officer - 13 years experience in region, Responsible for Mud Islands Reserve			
Johnson, Sandra	**SJ**															P		Ex QMM Administrator/ Long time Queenscliff resident		50s	
Langenburg, Eric	**EL**																P	MAAV Diver			
Lawson, Roy	**RL**				a		a									P		QHS member. Researching Benitos Treasure	1931	73	
Love, Don	**DL**															P	P	MAAV, Local Diver in PPBay for many years. Published several shipwreck research books			
Bob Marmion	**BMn**				P													PhD researcher in military history			
Mather, Joan	**JM**						a	a			a			a, P		P		Parents ran baths, fishing family, defence force, early family women involved in boarding houses, related to Shapter family	1923	78	1860s
Mills, Lyall	**LM**												a, P			P	P	Diver MAAV of 40 years experience diving in Bay, Family were tourists to area	1946	56	1900s
Mitchell, Bill	**BM**						a,P											Bass Strait and PPBay and Westernport Bay fisherman since 1944. Familial history of boatbuilding	1931	73	1920s
Mouchmore, Harry	**HM**				f,c		a, P, b	c							a, P	P		Started cray fishing when 14, 3 brothers were couta fishers	1920	81	
Munster, Peter	**PM**															P		Deakin University History Lecturer			
Naylor, Wendy	**WN**				f, aunt		m, a							a		P		Former Marine Science Labs employee, Father in military, Mother fishing family, Grandparents merchants, guesthouses and market garden aunt worked at Swan Island Mine Depot	1956	48	1864
Patrick, John	**JP**				f						f			m		P		Electrical Engineer - One time childhood Qcliff resident, Father seamen with Navy and Pilots, Swan Island Mine Depot, Mother in guesthouses	1931	73	1930s
Paolini, Carl	**CP**																P	Recreational diver of some 35 years experience in PPBay			
Rodrigues, Mark	**MR**																P	Parks Victoria/ Victorian Maritime Institute of Science Diver/ Ranger - at least 15 years diving experience in area			
Rogers, Gus	**GR**									P	P				P	P	P	Ex Port of Melbourne Authority worker/ Diver. Pt Lonsdale Liggthouse signal station port controller		50s	1970s
Ronald, Peter	**PR**																P	Former Director Flagstaff Hill Maritime Centre, Former HSAC Chair			
Savage, Ira	**IS**						P									P		Victorian Waders Study Group member - 35 years experience at Mud Islands	1924	79	
Shapter, Colin	**CS**					a, P	a, P	a, P						P		P		Fisherman, Lengthy family history for area dating back to at least 1865	1913	88	1860s

Appendix A-3: Table of Informants Backgrounds

Smitt, Dianne	**DS**				f		m, a						a, P			P		Former Marine Science Labs employee, Father in military, Mother fishing family, Grandparents merchants, guesthouses and market garden	1948	56	1864
Smithyman, Steve	**SS**															P		Swan Bay Catchment Officer, Extensive management experience and knowledge of sites on Swan Bay foreshore			
Springhall, Colin	**CSp**				f					P			a					Pilot for 26 years, father in Navy, grandfather undertaker and builder	1912	89	
Staniforth, Mark	**MS**															P	P	Former Manager Maritime Archaeology Unit			
Strachan, Shirley	**SSt**																P	Former Manager Maritime Archaeology Unit	1956		
Taylor, Peter	**PT**																P	MAAV Diver			
Venturoni, Malcolm	**MV**																P	MAAV / Comercial Diver			
Werry, George	**GW**		f				a		P				P	a, P	a	P		butcher, then local council - father and grandfather local cartage operators, transferrals from ships at pier, - greatgrandfather was afisherman entitling him to lease crown land on the Flat	1930	73	1863
Wilson, Graeme	**GrW**															P	P	Parks Victoria Ranger. Local resident and diver			
Wright, Margaret	**MW**				a		a									P		Heralds from marriage between army and fishing families	1930s		
Yukovic, Geoff	**GY**															P		PhD on Mud Islands			
Zanoni, Lyle	**LZ**						a											Fishing family background	1964	39	1860s

Code key:	
P	personal experience
f	father
b	brother
h	husband
m	mother
s	sister
a	ancestral - family tradition/history - any family history from grandparents backwards

Appendix A-4: Overview of Maritime Archaeological Infrastructure Sites Studies

The archaeological record is often over-represented by large official, administrative or mercantile themes (e.g. defence, quarantine, navigation and harbour services, tourism) which have generated often substantial and extensive original structures and networks of sites during their period of use. Many less well historically documented themes, particularly extractive industries (such as fishing), tend to evidence leaner archaeological records, either because they are historically unknown, they are less attractive targets for archaeological research, or because they inherently produce minimal or less durable archaeological records compared to other maritime themes, and as such are sometimes archaeologically unknown. However, if archaeological characterisations of these sites could be developed, they offer potentially rich data resources for often under-investigated and historically invisible industries.

Similarly, shipwreck sites produce extensive archaeological signatures. As these types of sites are often the popular foci of archaeological research, which has further biased the recorded archaeological resource towards those areas high profile sites. Until recently, maritime archaeology's primary research focus has been on the investigation of shipwreck sites. Several researchers (e.g. Cederlund 1999:37; McCarthy 2003) have recognized the potential to widen the scope of maritime archaeological studies through the investigation of maritime infrastructure and littoral zone archaeological sites as an integrated cultural network between the land and sea. Many site based investigations into maritime infrastructure sites have been undertaken worldwide (e.g. Milne and Hobley 1981; Raban 1992), many of which are site specific in nature. However, in recent years with the adoption of a cultural landscape approach to maritime archaeological studies, there has been a growing awareness of the need to examine other types of maritime sites (Aberg and Lewis 2000; Duncan 2000, 2004c).

Ships do not operate in isolation, but connect to the land via piers, jetties, wharves and docks. Many thematic maritime activities exist in any coastal area including health/quarantine, customs, pilotage and navigation services, defence networks, extractive industries and tourism facilities. All these industries have relied on the construction of maritime infrastructure to service and facilitate their activities. For regional maritime archaeological studies to take place, the breadth of maritime sites must be expanded to include all archaeological signatures of maritime activities, and must include seemingly mundane sites such as training walls (McCarthy 1999), ferry crossings and groynes etc.

Although some attempts have been undertaken to document historic maritime infrastructure sites, this field remains largely unexplored in an Australian context outside of studies of piers, jetties and wharves, and some extractive industry sites. No comprehensive list of possible maritime sites had previously been generated within Australia, and it was therefore necessary to predict the range of possible site types that might occur in the study area prior to fieldwork investigation. Several international sources were consulted to determine the possible types of sites that might exist in the study area, including Milne and Hobley (1981); Crumlin-Pedersen (1991); Olsen et al. (1995); Graham-Campbell (1997); McErlan et al. (1998); Aberg and Lewis (2000); O'Sullivan (2001); Dorn (2003); along with various other historical archaeological journals (e.g. SHA; IJNA and ASHA Journals). Several Australian studies of maritime infrastructure were also investigated, including:

- **General thematic maritime infrastructure studies:** Wolfe (1991; 1994); Kenderdine and Jeffery (1992); Kenderdine (1994, 1995a, 1995b); Cummings et al (1995); Duncan (1994, 2000); Barnard (2000); Nutley (2003)
- **Specific thematic maritime industry studies:** *Defence* (Crosby 1975); *Convict*s (Conlin-Cassella and Frederickson 2001; Tuffin et al. 2004), *Fishing* (Bowen 2003); *Pearling* (MacIlroy 1979; Stanbury 1986; McPhee 2001); *Sealing* (Kostaglou and McCarthy 1991; Anderson 1998; Stuart 1998); *Shipbuilding sites* (Orme 1988); *Whaling* (MacIlroy 1979;

MacIlroy and Merideth 1984; Stanbury 1985; MacIlroy and Kee 1986; Kostaglou and McCarthy 1991; Gibbs 1995; Lawrence and Staniforth 1998; Anderson 1998)

- **Specific maritime infrastructure site types**: *Baths* (Drew 1983, Richards and Lewczak 2002; Rodrigues 2002a, 2002b); *Piers/Jetties/Wharves/Associated Features* (Staniforth 1985; Cummings et al. 1995; McCarthy 2002; Davies and Lawrence 2003; Kerr 2003a); *Drydocks and Graving Docks* (Kenderdine 1992; Jeffery 1995; Austral Archaeology 2002); *Flagstaffs/ Semaphores* (Orme 1987); *Lifeboats* (Jeffery 1989).

These studies were used to generate a database of potential maritime infrastructure sites types (see Appendix 3.5) that might be found in the area, which was supplemented by the author's later regional studies for Heritage Victoria of maritime infrastructure around Victoria (Duncan, 2003a, 2003b, 2004a, 2004b, 2004d). It has been proposed (at a recent AIMA conference in 2003) that this list now be used as a base to formulate a National Database of Maritime Infrastructure sites along with a standardised glossary of terminology for description of these sites (Duncan 2003a, Duncan and Harvey, 2003). Cederlund (1999:40) has recently recognised the need to characterise these types of sites based on the general, natural and cultural factors that affect them.

Many of the types of potential sites identified had either minimally explored or had not been investigated in previous Australian Studies. Many current maritime infrastructure studies have focussed on high profile sites (fortification, lighthouses, maritime industrial sites – e.g. whaling, ship building, pearling etc). However holistic documentation should also include seemingly mundane sites such as training walls (McCarthy 1999, Duncan 2003a; Nutley 2003), beacons (Silvia and Whall 1999; Duncan 2000), groynes, and moorings (Duncan 2003a, 2004a), which offer further insights into the everyday practices and general modification of the maritime environment. Until recently, underwater remains of maritime infrastructure in Australia beyond those located connected to the coastline (e.g. jetties) have remained widely unexplored. However, this thesis will show that substantial archaeological deposits are generated for many isolated offshore maritime infrastructure sites (both structural and personal artefacts), which have until now (with a few exceptions; e.g. Austral Archaeology and Coroneos 1997) remained largely unaddressed in Australia. Similarly, despite exemplary international studies, archaeological deposits generated from moored vessels (Addams and Davis 1998; Addams 2002) and transient maritime traffic remain largely unexplored.

Furthermore, even well known, large scale sites such as swimming baths have been scantly investigated in Australia (e.g. **Holdfast Bay**; Drew, 1983; Richards and Leewzack 2002; Rodrigues 2002a, 2002b; **Victoria**; Duncan 2003a, 2004a). Given the large numbers of bathers using these facilities, particularly during the late nineteenth and early twentieth century, potentially enormous archaeological signatures are anticipated for these types of sites. Furthermore, associated bathing structures such as bathing boxes, groynes and promenades offer potential glimpses into former historical social and cultural attitudes. Mayne-Wilson (2001) has further suggested that coastal rock platforms swimming pools are also places of social heritage value. Given the importance of Beach Culture in Australian society (Wells 1982), this area offers the potential to gain significant insights into recreational aspects of past societies.

It was therefore clear that new types of maritime archaeological sites needed to be investigated to truly appreciate the diverse scope of maritime activities that were undertaken in the study area. Exploration of these types of sites therefore offered the potential to explore new aspects of maritime landscapes that were previously unaddressed within a maritime cultural landscapes context, but also presented challenges as many these types of sites had not been previously documented, and therefore the archaeological characterisations were not well understood (if at all).

Appendix A-5: Potential Maritime Archaeological Site Types

Maritime Archaeological Site Types		
Acoustic Transponder	Blockship	Coldstores/ Freezer Works
Amenity Block	Boat Builder/ Shed	Communications Cable
Ammunition Dump	Boat Harbour	Compass Adjusting Buoys and Moorings
Anchor - Isolated	Boat Ramp	Corduroy Road/ Track
Anchor - Mooring	Boat Shed	Cottages - used by maritime services
Anchorage	Boiling Down Works - Birds	Crane - outline various types
Anglers/ Fisher man/woman Club	Boiling Down Works - Cattle/ Sheep	Crayfish/ Lobster Coff
Aquaculture Shell Spat Ponds Site - Oysters, Mussels etc - subdivide?	Boom Gate	Crayfish/ Lobster Pot
Aquaculture Shell Accretion Site - Articially Placed Rocks Ceramics Etc to encourage shell proliferation	Boom Net	Crossing - Cattle
Aquaculture - Shell Storage Site	Breakwater	Crossing - Transport
Artifical Island	Bridge/ Bridge Piles	Customs Tent
Artillery Range	Buoy	Customs House
Artillery Range Butts/ Range Markers	Butchers Shops??	Cut/ Gulch/ Engineering Works
Ballast Mound	Cable - Communications	Debris - Scattered
Ballast Pond (used by lighters unloading vessels for maintenance - ballast kept in lighters whilst ship repaired)	Cable - Indicator Loop	Degaussing Range
Ballasting Station	Camping Ground	Dock
Ballasting Pier/Wharf	Camp Site - Prehistoric	Dolphin
Ballast Quarry	Camp Site - Historic	Drydock
Bandstand/ Rotunda	Canal - Lined	Drydock - Floating
Bark Gathering Area	Canal - Unlined	Electronic Eye (Detection System)
Barracks - Defence	Careening Site - Intertidal	Esplanade
Bathhouse Pavillion	Careening Site - AHW	Explosives Anchorage
Bathing Box	Carnival	Explosives Hulk
Bathing Machine	Cattle Crossing - Submerged	Explosives Jetty
Bathing Ship	Cattle Race - Intertidal	Exlosives Pier
Baths - Enclosed	Cattle Race - Terrestrial	Explosives Hulk Site
Baths - Hot Water	Cattle Gantry Crane/Race	Explosives Store/ Powder Magazine
Battery	Causeway - Above water	Fertiliser Works
Beach - Recreational Swimming	Causeway - Submerged	Ferry Landing
Beach House/ Shack	Cemetery/ Graveyard/ Burial Ground	Ferry Route
Beach Shelter	Channel - Natural (Debris from Use)	Ferry Site - Cable
Beachmans/ Lifeboat Lookout Tower	Channel - Artificial	Ferry Site - Rowed
Beacon - Obelisk	Channel - Dredged	Firewood Gathering Area
Beacon - Tower	Church/ Church Spire	Fire Station
Bethel Ship Site	Coal Depot	Fishtrap - Timber
Bird Trap Cairn	Coal Hulk	Fishtrap - Stone
Blacksmith Shop (Floating) Site	Coal Staithe (used to house coal for vessels)	Fish Processing Platform
Blockade Site - Permanent (eg timber/ stone)	Coffin Makers Workshop	Fish Processing Site - Byproduct (shells and scales)
Blockade Site - Sunken Vessels	Cold Store - Ice Bunker	Fisherman's Birdwatching Hut/ Huer's Hut

Fishermen's Cooperative Building	Infrared Detection Beam	Navigation Mark - Significant Natural Object eg Tree
Fisherman's Hut/ Shack - Recreational	Immigration Barracks	Navigation Pylon
Fishing Platform	Indicator Loop	Net Drying Rack
Flagstaff	Jetsam Trap	Net Storage Shed
Flagstaff Shed	Jetty	Net Tanning Tank
Floating Dock	Kiosk	Observatory
Floating Orphanage Site	Landing	Observation Post (Defence)
Flotsam Trap	Landing Place (unmodified natural location)	Pavilion
Foghorn/ Shed	Landing Stage	Pearling Site
Ford	Leads/Leading Marks(artificial)	Picnic Site
Foreshore Vegetation	Leads/Leading Marks (natural but introduced eg planted pine trees)	Pier
Fort	Leads/Leading Marks - natural (topographic features)	Pillbox
Fuel Storage Tanks	Lifeboat House/ Shed	Pilots Anchorage
Gangway - Plank	Lifeboat Ramp	Pilots Huts
Gangway - Hinged Plank	Lifesaving Club	Pilots Station
Gas Works	Lifesaving Track	Pilots Tent
Goods Shed/ Wharf Warehouses	Lighterage Ground/ Route	Pipe - Water Intake
Grave (isolated)	Lighterage Transfer Point	Pipe - Sewerage Outfall
Groyne	Lighthouse - Terrestrial	Pipe - Stormwater Outfall
Guano Mining	Lighthouse - Pile Light	Pipe Support Piles/ Jetty
Guard Ship	Lighthouse Keepers Quarters	Police Hulk
Gun	Lighthouse Rubbish Dump	Police Station
Gun Emplacement	Lighthouse Rubbish Dump Chute	Pontoon
Gunnery Range - Terrestrial	Lights - Jetty	Port Control Tower
Gunnery Range - Marine	Lights - Pile	Post Office
Gunnery Range - Tampions and Shot	Lightship	Power/ Electricity Station
Habitat (Underwater)	Lime Kilns	Prison Hulk Site
Halfway Hut	Lock	Promenade
Harbour Trust Building	Magazine	Quarantine Station - Animal
Hard	Marina	Quarantine Station - Human
Hatchelling House (Ropeworks)	Midden - Indigenous	Quarry
Haven	Midden - Other	Railway Goods Shed
Holiday Camp	Migrant Hostels	Railway Line - Land
Hospice House (Shipwreck Survivor Hut)	Mill	Railway Line - Wharf/ Jetty
Hospital	Mine	Railway Station
Hotel	Mine Assembly Shed	Reclaimed Land
Huers Hut	Minefield	Reserve
Hulk - Abandoned	Minefield Cable	Resort
Hulk - Breakwater	Monument/ Memorial	Retail Store
Hulk - Jetty	Mooring	Rifle Butts - Terrestrial
Hulk - Offshore Landing Stage	Mooring Post	Rifle Butts - Marine
Hulk - Strafing Target	Morgue	Rifle Range
Hulk - Store/ Building	Natural Resources Sites - Indigenous Plants	Rifle Range Mounds
Iceworks	Natural Resources Sites - Minerals	Rock Pool - Natural
		Rock Pool - Cut Swimming into Rock Platform

Rocket (Spent) - (Lifesaving)	Ship Breakers Yard	
Rocket Shed (Lifesaving)	Signal Gun	
Ropewalk	Signal Station	
Rowing Club	Slipway	
Rowing Club Ramp	Smoking House	
Rubbish Dump	Smuggling Site	
Sailors Rest/ Home	Spoil Ground	
Saltwater Swimming Pool	Spring - Natural	
Saltworks - Boilers	Spring - Tapped/ Piped	
Saltworks - Saltpans (modified environment)	Stranding Site - Accidental	
Sand Groyne - Stone	Stranding Site - Deliberate	
Sand Groyne - Timber	Submarine Net	
Scallop Dredge	Supply Depot	
Sealing Site/ Station	Swing Basin	
Seaplane Base/ Depot	Swing Bridge	
Seaplane Landing	Telegraph Cable	
Seaplane Ramp	Telegraph Cable - Submarine	
Searchlight Emplacement/ Post/ Station	Telegraph Station	
Seawall/ Retaining Wall	Ticket Office	
Seaweed/ Kelp Grid	Tidal Guage	
Seaweed Processing/Exploitation Site	Tidal Guage House	
Seaweed/ Seagrass Gathering Area (Natural)	Tidal Mill	
Semophore Station	Tie Post/ Mooring Stake	
Sentry Post	Timeball	
Settlement	Torpedo	
Shark Enclosure	Torpedo Ground	
Shark Spotting Lookout Tower	Training Wall	
Shipping Company	Tramway	
Shipping Route	Treasure Hunting Site	
Shipwreck Salvage Site	Trepang/ Beche De Mare Processing Site	
Shipwreck Salvage Camp	Tunnel - Access Route	
Shipwreck Survivor Camp	Tunnel - Sewerage	
Shipwreck/ Hulk	Tryworks - Whaling/ Sealing	
Shipyard/ Boatyard	Turning Basin	
Shed - Buoy	Underwater Habitat	
Shed - Coal		
Shed - Delivery	Waiting Shed/ Shelter Shed	
Shed - Mail	Water Supply Depot	
Shed - Fuel	Well	
Shed - Fishermens (Social Gathering)	Whaling Station	
Shed - Fish (Produce)	Wharf	
Shed - Ice	Winch	
Shed - Net	Windlass	
Shed - Shelter	Wreck Bell/ Distress Bell/ Allarm Bell	
Shed - Winch	Yacht Club	
Sheep Dip	Yacht Racing Course	
Sheet Piling		
Shipwreck		
Shipwreck Survivors Camp		
Shipwreck - Looting Site		

Appendix A-6: Memorandum of Understanding/ Informed Consent Form For Project Participants

Memorandum of Understanding

School: Anthropology, Archaeology and Sociology

Project: Cultural Seascapes: An Investigation of the Application of a Cultural Landscapes Approach to the Maritime Archaeology of Bass Strait

Chief Investigator: Brad Duncan

Contact Details:

Description:
This project is investigating how former maritime use of Port Phillip Bay might be expressed in people's perceptions of the area, and physical remains left over from those past activities. The project aims to provide a holistic view of how previous maritime utilisation of the area shaped subsequent use of the region.

The chief investigator will accompany past informants to a number of underwater sites to identify and examine the archaeological signatures of those sites. Any participants in these visits are asked to read and sign the following memorandum of understanding. .

MEMORANDUM OF UNDERSTANDING

This project is an archaeological project, and as such, will be run according to accepted archaeological principles and practices. I understand that due to archaeological, ethical, and administrative constraints imposed upon the chief investigator, no artefacts will be raised during any fieldwork component of this project. I also understand that the chief investigator is legally obliged to report any artefacts that may be raised in the course of this fieldwork component of this investigation. I therefore acknowledge that I will abide by these conditions when participating in any fieldwork investigation conducted as part of this project.

Name: (printed)

Signature: **Date:**

WITNESSED BY THE RESEARCHER

Name: (printed)

Signature: **Date:**

JAMES COOK UNIVERSITY
TOWNSVILLE Queensland 4811 Australia Telephone: (07) 4781 4111

INFORMED CONSENT FORM

SCHOOL : *Anthropology, Archaeology and Sociology*

PROJECT: *Cultural Seascapes: An Investigation of the Application of a Cultural Landscapes Approach the Maritime Archaeology of Bass Strait*

CHIEF INVESTIGATOR: *Brad Duncan*

CONTACT DETAIL: *47 815822 (QLD) / Mobile 042119 7668*

DESCRIPTION:
This project is investigating how former maritime use of Port Phillip Bay might be expressed in people's perceptions of the area, and physical remains left over from those past activities. The project aims to provide a holistic view of how maritime utilisation of the area shaped subsequent use of the region.

Participants will be asked to recount either:
Past reminiscences of the effects of maritime events on the area- and/or
Their personal perceptions of the region.
OR: Personal knowledge of underwater artefact material in the Port Phillip Bay region.

CONSENT

The aims of this study have been clearly explained to me and I understand what is wanted of me. I know that taking part in this study is voluntary and I am aware that I can stop taking part in it at any time and may refuse to answer any questions. I understand any information regarding the location of shipwrecks and their artefacts can not legally be held confidential by the interviewer, and this legislation has been explained to me.

I understand that any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval.

Name: *(printed)*	
Signature:	**Date:**

WITNESSED BY RESEARCHER OBTAINING CONSENT

Name: *(printed)*	
Signature: *(Principal Investigator)*	**Date:**

Campuses at - TOWNSVILLE (07) 4781 4111 CAIRNS (07) 4042 1111 MACKAY (07) 4957 6048

Appendix A-7: Submerged Sites Inspected During Fieldwork

Coles Channel Pile Marker
Duck Island Pier
Geelong Lightship Site
Gellibrand Point Pile Light (Melbourne)
Hobson's Bay Anchorage (Melbourne)
Hobson's Bay Ballast Mound (Melbourne)
J3 Submarine/ *S.F.Hersey*/ Unidentified Shipwrecks, Swan Island
Kakariki Ship-breaking Site (Melbourne)
Marie/ Dumfries Stranding Site, Swan Spit
Mud Islands Pier Site
Popes Eye Annulus
Pt Lonsdale Sand Groynes
Pt Nepean Quarantine Station and associated sites
Pt Nepean Ammunition Pier
Pt Nepean Reef Yard Arm
Pt Nepean Quarantine Cattle Jetty
Queenscliff Bight Baths Site
Queenscliff Fishermen's Pier Site
South Channel Fort
South Channel Pile
SS Barwon Stranding Site (Lonsdale Bight)
Swan Bay Fisher's Slipway
Swan Island to Duck Island Underwater Causeway
Swan Spit Mines
Swan Spit Pile Light
Tip Island Underwater Causeway
Trusty Stranding Site, Pt Nepean
West Channel Pile Light
West Channel Unidentified Rudder
West Channel Lightship Anchors
West Channel Artefact Scatters
West Channel Debris Field

Appendix A-8: Explanation of the GIS Geo-referencing Process and Database Structure Table

1) Overview

An innovative GIS methodology that utilised some similar aspects of Mather and Watts' (1998) methodology was independently developed by the author as the strategy for predictive analysis of archaeological sites in the study region. Historical cartographic sources were overlaid onto modern primary cadastral, hydrographic and aerial image coverages (using a common GIS process called geo-referencing), whereby the location of common permanent geographical feature points in each image are matched from the historic map to the modern GIS coverage, or the historic feature locations are assigned a known modern geographic coordinate based on a modern projection and datum (or a combination of both steps). An algorithmic process then transformed (or geo-referenced) the historic map into a modern projection system to create a new GIS image coverage of the historic map source (see Figure A-8.1). Potential archaeological features were also identified in geo-referenced historic aerial photographic coverages using the same process. The resultant GIS image coverages were digitised (electronically traced) and relevant information entered into an attached database, enabling the actual geographical coordinates for former historical feature locations (such as maritime infrastructure sites and environmental coastlines) to be extracted from the GIS. The positions of the historic sites were then relocated with a GPS (satellite navigation) unit and ground-truthed to determine the existence of archaeological sites which were discovered at these locations. This process further aided comparison of historical feature locations with contemporary behaviour (outlined in oral histories) to investigate potential archaeological site signatures, along with the exploration of the effects of changing environmental conditions on maritime activities.

Numerous primary cartographic data sources (as outlined above) which evidenced different maritime thematic infrastructure were scanned using a large format scanner, and the image was geo-referenced, enabling the extraction of their current geographical positions to aid in fieldwork inspection planning and potential site identification. This process also worked in reverse, where archaeological sites were identified by their correspondence to sites known from historic maps (Duncan 2002). The modern aerial GIS coverage was used to identify potential archaeological features to be investigated, and several visible features (both under and above water) from this coverage proved upon inspection to be archaeological sites. It also enabled the sites identified from geo-referenced historic maps and charts to be overlaid over the aerial imagery, allowing better interpretation of relocated ground features. Although some GIS coverages were only available in different projections, extracted data was converted to a common co-ordinate system (AMG, AGD 1966) to allow the results of all data extracted to be viewed concurrently.

Although it is acknowledged that inaccuracies caused during the map printing process and later physical distortion of the chart map may have occurred (through stretching/ shrinking of the map fabric), the method produced tangible results for relocating actual archaeological sites of historic infrastructure and past landscape use, with accuracies of up to +/- 1 m using cadastral GIS coverages (approx 1:10 000 scale) as the base geo-referencing coverage, and +/- 5 to 20 m using Hydrographic GIS charts (1:25 000 – 1:37 500 scale). The process also worked conversely, where newly identified archaeological site coordinates could be overlaid onto the geo-referenced historical chart coverage to assess their association to former known sites. Even though the accuracy produced for underwater sites was not as exact as those on land, it enabled the size of search area to be dramatically reduced, which is a key factor for relocating

submerged sites given the time/budgetary constraints associated with diving activities. The GIS Hydrographic Chart coverages were initially used to geo-reference all cartographic sources, but was notably problematic for converting terrestrial maps due to the deficient (and sometimes inaccurate) level of detail on the source GIS layer for land based areas. This problem was solved by using a local cadastral GIS layer (from DNRE) which enabled more accurate overlays of large scale terrestrial historical maps in coastal foreshore regions. Miles have been used as the standard unit when producing maps for this study, as this was the common unit used by informants when describing distances, the only exception being when archaeological sites have been surveyed (when metre measurements were adopted for larger scale sites).

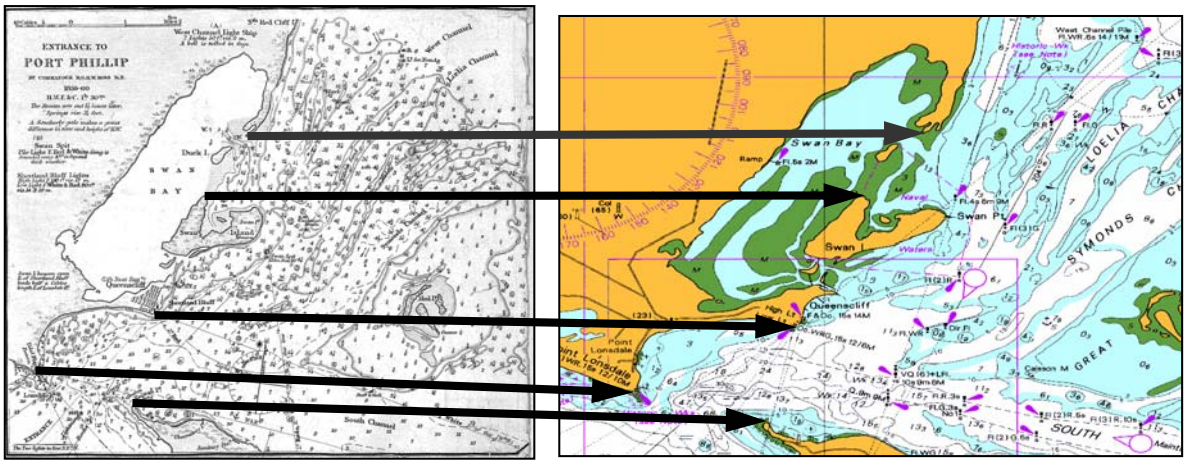

Figure A-8.1: Example of the geo-referencing process, where historic charts (left) are assigned modern geographical coordinates from Hydrographic GIS databases (right). (Note: The ground points used here are for illustrative purposes only, as some are not permanent points)

This method has been used by other archaeological and historical studies to identify former use of a planned excavation area, or to document the accumulated history of a given region (eg Johnson, 2003), but it is possibly the first time (to the author's knowledge) that it has been used to physically identify and locate potential underwater archaeological sites. The method has since been successfully applied by the author in numerous other projects around Victoria, with similar success (Duncan, 2002, 2003a, 2003b, 2004a, 2004b), and by Souter (2003) when using historic aerial photos to identify the location of aircraft wrecks at Broome.

This study employed the method of time slice analysis, where the differences in a sequence of geo-referenced historic maps and charts were examined to analyse changes in channel and shoreline geomorphology of Queenscliff and Port Phillip Bay to identify the effects on maritime coastal use and the probable location of maritime archaeological sites.

2) Problems with this Approach

The problems of using different scale charts together has been well documented, and of course is a factor that has introduced error. However, where possible GIS coverages were produced at a similar scale in the geo-referencing process. Given the detailed knowledge of the underwater environment by both divers and mariners, charts of a larger scale would enable more accurate pinpointing of location of specific landscape features as the hydrographic charts used often generalized or omitted some underwater features. These were not readily accessible for the study area, although some localized bathymetry charts were accessed through the Marine Science Laboratories (1:5000), these contained too much detail, were confusing when plotting regional level detail, and were too large to use in the survey. Ideally, charts of a scale of approximately 1: 10000 – 15000 would be ideal for the survey for plotting large scale detail, but were not available. Despite this, many features identified by informants were locatable and the

accuracy of positions extracted from the charts was usually within (or under) 20-30m of the target, which dramatically reduced the search areas required underwater.

GIS: Scale and cartographic sources

The problems of using different scale charts together has been well documented, and of course is a factor that has introduced error. However, where possible GIS coverages produced at a similar scale in the geo-referencing process. Given the detailed knowledge of the underwater environment by both divers and mariners, charts of a larger scale would enable more accurate pinpointing of location of specific landscape features as the hydrographic charts used often generalized or omitted some underwater features. These were not readily accessible for the study area, although some localized bathymetry charts were accessed through the Marine Science Laboratories (1:5000), these contained too much detail, were confusing when plotting regional level detail, and were too large to use in the survey. Ideally, charts of a scale of approximately 1: 10000 – 15000 would be ideal for the survey for plotting large scale detail, but were not available. Despite this, many features identified by informants were locatable and the accuracy of positions extracted from the charts was usually within (or under) 20-30m of the target, which dramatically reduced the search areas required underwater.

3) Structure of GIS Database

Feature Name	Name of Feature/ Area
Feature Type	eg anchorage/ fort/ quarantine station/ jetty/ wreck etc
Artefact	type of artefact: eg bottle/ wreckage/ wreck/ pile/ gun/ groyne
Fabric	timber/ iron/ ceramic/ glass etc
Artefact - Alcoholic?	y/n
Thematic category - (multiple fields assigned here) - eg defence/ fishing/health/ navigation/ tourism	y/n
Source	who/ what/ when
Source Type	archaeological/ historical/ oral history etc
Date - Interview	
Archaeological - Inspected by Author	y/n
Source inspected- archaeological (seen by informant?) / historical	a/h
Origin of artefact/s - International	y/n
Origin of artefact/s - Interstate/ Colonial	y/n
Origin of artefact/s - Local	Intra Bay - Melbourne/ Geelong/ Mornington etc
Date Historical - Begin	
Date Historical - Range	
Date Historical - End	
Location (Easting)	
Location (Northing)	
Comments	
Hotlink file location	Tree directory location for associated image/ table/ document

Table A-8.1: GIS Database Table Setup.

Appendix B: Selected Historical Data

Appendix B-1: Abbreviated History and Significant Sites of Swan Island

1) History

A) Pastoralism

Swan Island was first to grazie cattle and sheep in 1845, but by the 1860s its pastures were used pasture for breeding mares to foal. A series of cattle and dairy stations were later undertaken on the island, but rabbit damage to the paddocks ended these ventures. The island was also a popular location for rabbit shooting in the 1870s. (Thomson n.d.:1; Dod 1931:26-7).

B) Fishing

Several fishermen occupied the Island from the 1860s-1879, until displaced when the military compulsorily acquired the island in 1879 (Thompson n.d.:1; Dod 1931:26-7). Up until this time, fishers used Stingaree Bight as a safe anchorage in southerly gales (Dod 1931:27), and this practice was allowed to continue until the base was taken over by the army in 1960 [LID]. Another local resident of Swan Island, George Pigdon, who lived at Point Norgate (Swan Island) where he moored his boats. Pigdon was engaged in fishing and rabbiting around the island. According to a number of oral histories, he cut a channel along the northern edge of Pt Norgate so he could safely moor his boats, and also built a small pier [CA; GW].

Fishers also used the eastern foreshore beach of Swan Island as a careening area until the opening of the Cut in 1935. Fishing boats were hauled ashore in this region on greased blocks, where they were recaulked and maintained [CS].

C) Swan Island Defences

War in the Crimea in the 1850s heightened the need for an adequate defence network to protect Melbourne from possible invasion by Russia. Despite a recommendation by General Sir John Burgoyne to a Commission in 1858 for defences to be stationed at the Heads, the distance across the Rip exceeded the capabilities of that generation's guns, and the Commission decided to fortify Hobson's Bay instead. By 1860, the Victorian Government requested expert advice for planning its harbour defences, and Captain Scratchley was appointed for the next 4 years to complete the task. Although he advised the installation of a four gun battery on Swan Island in 1860, works were carried out at Queenscliff and Hobsons Bay. The passing of the Colonial Defence Act in 1865, led to the purchase of the armoured monitor class battleship Cerberus in 1871 and a general increase in defence facilities across Victoria. In 1867, a Victorian representative to London (Verdon) began discussions with Colonel Drummond Jervois (Deputy inspector General of Fortification in Great Britain) as to how to best fortify the Victorian coastline. When Scratchley and Jervois arrived in Victoria in 1876 to provide advice during the Russo – Turkish War, they first proposed a fortress and submarine mining depot for Swan Island (Jervois 1877). Their plans were modified in 1879 due to technological advancements in battery ranges associated with the introduction of the 10" Armstrong guns. A fortress and torpedo depot were planned at Swan Island, with minefields across the inner harbour channels to control any enemy shipping that evaded network of Heads defences at Fort Queenscliff and Nepean (Jervois 1879; Anon.1993a:1-4). Although Swan Island was purchased in1879, a reduction in international tensions led to little work being undertaken over the next 3 years (GA 18/10/1879).

Work on construction of the Swan Island Fort was well underway by 1882. The fort consisted of embankments on 3 sides, along with two powder magazines, two guns mounted in the eastern section, a laboratory, gun shed. A five sided large earthen keep mound provided protection

against a terrestrial landing assault. The facility was accessed from Queenscliff by a horse drawn trolley tramway (6 miles long), which was built by Public Works Department contractors. Other works undertaken during this period included the erection of a torpedo boat shed, cable pond, barracks, stockade around the fort, submarine mine stores and extension of the jetty. The facility was lauded as being the most formidable fortifications in the southern hemisphere (QS 23/12/1882; VPRS 2143; Anon.1993a:5; Raison 2002: 25).

The bombardment of Alexandria led to radical changes in fortress design, where increased protection from artillery and camouflage were given precedence. Earthworks and 5" HP disappearing guns were installed at Swan Island Fort by 1883 which provided further protection for the battery crews. The fort was officially completed by 1884 in time for another war scare associated between Russia and Afghanistan, but works continued until 1887 (Kitson 1987: 1.1, 2.1, 6.4, 6.5, 6.6). By 1886, the Heads defence system was finished, complete with electrical mines operated from South Channel Fort (Noble 1979:106; Kitson 1987:2.2). By 1888, a garrison detachment of Artillery was stationed at Swan Island (Anon.1993a:9). Tenders for the construction of several gun emplacements at Swan Island were advertised in 1890 (QS 15/2/1890), and tenders for four primer pits associated the defences were accepted in 1893 (QS 18/3/1893).

Several new defence vessels were commissioned as defensive technology evolved. With the introduction of the propelled Whitehead torpedo in 1877, torpedo boats were developed to deploy these devices. In 1884, a number of torpedo boats were purchased for the Victorian Navy, including two second class 12 ton torpedo boats, (*HMVS Lonsdale and Nepean)*, a first class torpedo boat of 75 tons in 1891 (*HMVS Countess of Hopetoun*), a 60 ton torpedo boat (*HMVS Childers*), two heavy gunboats (*Albert* and *Victoria*), and turnabout torpedo launch named *Gordon* (Noble 1979:99). A naval depot was established at the north end of Swan Island in 1887, which provided facilities to compress White head torpedoes and berthing for the torpedo boats, and a harbour refuge was situated close by (Anon.1889:12). The vessels all played active parts in the annual Easter War Games held at Port Phillip Heads, where mock battles were staged to test the colony's defences, and were all strategically anchored around the entrances to the channels, to prevent the entrance of any warship (A11, c.1889; Anonymous 1889 [plan]; HCW, c1939 [plan]; Noble 1979:100). This facility was shared with the Military Torpedo Corps (see below). Nordenfeldt Machine guns and quick firing cannons were later introduced to the Victorian Fleet and forts (including Swan Island) as a countermeasure to enemy use of torpedoes against them (Nicholls 1988:189).

Minefields were an important defence strategy for the early defences of Port Phillip. Three types of mines were I service around the 1880s, but only two were used in the Bay. Observation (or dormant) mines were positioned in lines on the seabed at various depths in the channels, and their charges were manually detonated via an electrical circuit switch from either the Swan Island or South Channel Forts when enemy ships were sighted passing over them. Later developments saw the installation of range finding stations linked to the detonation circuitry. Electro contact mines had a smaller case with a contact sensitive circuit breaker suspended over the top of the main charge drum. When the circuit breaker was tripped by contact with passing shipping, an alarm was sounded in the Test Room at the South Channel Fort, and personnel could assess if it was an enemy contact before deciding to detonate the mine (Kitson 1987:3.1, 2). A submarine cable was installed between Swan Island and the beacon, via Popes Eye Fort to Observatory Point by 1897 and was shown on charts until at least (Yule 1897:436; Chart 1171A [updated 1902]), Cox 1864 [updated 1903] [charts]; and was used to help control and defend the minefields.

From 1878 – 1882, the naval controlled Torpedo and Submarine Corps disbanded and were replaced by the Military Torpedo Corps. In 1884, the Swan Island Submarine Mining Depot commenced operations at Swan Island, and the launch *SS Miner* was obtained for the Permanent Section Torpedo Corps in 1890 (Anon.1993a:15; Tate 1982:61). Submarine mining practice was

regularly undertaken on the northern western extremity of Swan Point from at least 1890 -1907 (QS 29/3/1890; 7/4/1900). By 1907 (Hydrographic Office Admiralty), sailing directions listed a submarine mining practice area had been established on the eastern side of Swan Island.

Swan Island became Commonwealth property with Federation in 1901 (O'Neill 1988:52)

A new rifle firing range was built at Swan Island around 1907 (QS 19/10/1907), and was located just north the golf course. A track was constructed from the second bridge at Swan Island to the rifle range, which could serve as an extension of the Swan Island tramway line, and an underground telephone cable was also installed between each rifle mound and the target butts (QS 30/11/1907). The rifle range was constructed by Royal Australian Artillery, and was to be used by the Queenscliff Rifle Club, whose numbers were dwindling due to wont of a practice range (QS 29/2/1908). The construction of the Queenscliff Golf Club at Swan Island around the same time, led to notices that golfers used the course during rifle practice at their own risk (QS 14/3/1908). It was finally opened in June 1908, and provided range firing from 200 to 1000yards distance, telephone communication between all the butts and Fort Queenscliff (QS 13/6/1908; 21/11/1908). The range was a popular location for shooting practice for troop sports days from Fort Queenscliff in the late 1920s (Tate 1982: 144). The range was being used by the Royal Australian Engineers by 1909 (QS 22/5/1909), but it appears that the range was not open to the public until 1910, when it was first used by the Queenscliff Rifle Club (17/9/1910).

In 1909, the Swan Island Fort Battery was dismounted and handed over to the Navy after the Fort became obsolete with the introduction of longer range guns at Nepean and Queenscliff (QS 13/6/1909; Tate 1982:88,112). Recommendations made in 1911 to replace mines with submarines contributed to the decline of the Swan Island Mines Depot, which eventually led to the reassignment of these troops to manning searchlights around Queenscliff (Anon.1993a:35-6). In 1912, a proposal was raised by the Queenscliff Council that a Naval Base be stationed at Swan Island, in opposition to another proposal at Western Port (QS 11/5/1912). By WWI, the mines depot was on the verge of shutting down, but was used as a training facility, military camp and support base for the *Countess of Hopetoun*, which was Port Phillips principle defence vessel (Anon.1993a:37). The *Countess of Hopetoun* was used as pier and breakwater at Swan Island in 1924 (Foster 1987:39).

After surplus WWI mines were donated to Australian Naval Board by the Admiralty in 1919, the RAN officially took possession of the Island in 1922, although the army retained control of the western rifle range and access rights to the pier. Mine assembly / explosives store sheds were constructed at the north east corner of the island by the 1920s (Anon.1993b:1-4, Appendix 6; Thompson n.d.:8). Later, as these mines became redundant, their charges were removed from 1922 onwards (which were used for blasting in Channel Deepening in the 1920s and 30s), and the cases were used for incinerators across the Bellarine Peninsula, and as coastal erosion prevention along Swan Island (Anon. 1993b:4, 5, 20; [JP]). Timber sand groynes were also installed near the mine assembly to retard erosion [LID].

When the J class submarine fleet was decommissioned in 1922, the J3 was acquired to act as a deepwater jetty and emergency power supply for the island. A rail and crane were extended to the hulk, which provided an 18ft deep berthage at high water in The Swan Island Channel. By 1923, the hulk of the *S. F. Hersey* was stripped and placed close to the submarine to provide a deep water channel (15ft at low water) for loading mines into mine laying vessels, but was quickly became redundant (Anon. 1993b:13-6).

During WWII, Swan Island was heavily involved with the assembly of mines for the war in the Pacific. Mine cases were manufactured at the Geelong Ford Factory, and the detonators and explosives in Maribyrnong, and the units were assembled in sheds near Swan Point. Local civilians were employed for this purpose to supplement the military personnel (Anonymous 1993b:24, 25: Duncan 2004).

Following WWII, the island base functioned predominantly as a mine storage and explosives depot from the 1940s -50s, and the vast explosives stores were gradually transferred to the HMAS Woomera for dumping in Bass Strait throughout the late 1950s. By 1960, the mine depot was scheduled to close, having been made redundant by the impending opening of the Point Wilson Explosives Pier. The base was transferred to the Army in December 1960, which has since used it as a training area (Anonymous 1993b: 35, 39).

D) Golf Course

I) Swan Island Rabbit Proof fences # 1 & 2

The Swan Island Golf Club was conceived in 1907, and was completed by 1908 (Anderson 1984:9; Anonymous 1993a:Appendix 8). The nine hole course was expanded to 18 holes by Cecil Anderson in 1961 ([CA], Thompson n.d.:2). Many fences were installed to prevent rabbits destroying the turf (Anderson 1984:9).

E) Navigation

I) Swan Point High Beacon

A beacon was noted on Swan Island as early as 1843 (Stokes 1843 [chart]). The 50ft high iron cone shaped structure was used in conjunction with the Low Light Tower as an eastern open lead to clear Pt Lonsdale (Ferguson 1854:10; Burdwood 1855:121; Ross 1859 & 1860 [chart]). A replacement beacon had been installed by 1858 (Notices To Mariners, VGG 1858:1135), and was listed as white mast surmounted with a red top on the southeastern extremity of the island in 1868, and was used in conjunction with the Shortlands Bluff cliff face to clear Lonsdale Rock (GA 17/5/1875; Yule 1868:215, 1884:313). It was replaced in 1875 by an 80ft high conical tower made of red gum and oregon that was constructed in Williamstown, and was taken to the site on the 11/5/1875 (GA 17/5/1875). By 1898, it had been extended to an 80ft high white beacon (probably to replace the Swan Spit Pile Light), surmounted with a red cone and ball, and was used in conjunction with the High Lighthouse on Shortlands Bluff to lead clear of Lonsdale Rock (Yule 1898:436). By 1907, the beacon was replaced with a 60ft high tubular steel structure 60ft high, painted white with a red top (HOA 1907:432). By 1913, the Swan Island Beacon had been replaced by a steel framework beacon with sloping sides, surmounted by a staff and globe, and retained its previous colours (HOA 1913: 31). By 1955, a new 22m high steel framed beacon (with white slatted front and red disk top) was placed on the original site, with a triangular walled enclosure on the cope on which was a hut was built (PHB 1959:201).

II) Swan Point Low Beacons

Two beacons were located 300ft apart at the extremity of Swan Point in 1858. The northern beacon was red, and the southern black, both cone shaped with a ball over the top. These beacons were used as marks to clear the knoll in the West Channel, and bore from each other E by S and W by N (NTM VGG 22/6/1858:1134)

III) Swan Spit Lights

The first Swan Spit light ship was installed sometime between 1855 and before 1860 (Burdwood 1855:124) to delineate the bank of the Swan Spit. This light was replaced by a pile lighthouse in 1860, which stood in four metres of water (Noble 1979:47). The timber lighthouse was built upon piles on the SW end of the Swan Spit in 15 feet of water (VGG

15/1/1861:77). By 1868, the timber lighthouse exhibited both white and red sectors, with the latter indicating the entrance to the West Channel, and a fog gong was fitted (Yule 1868:216). The pile light was destroyed in 1881 by the vessel *Omeo*, which when drifting in calm weather completely demolished the structure (Yule 1884:313; Dod 1931:28).

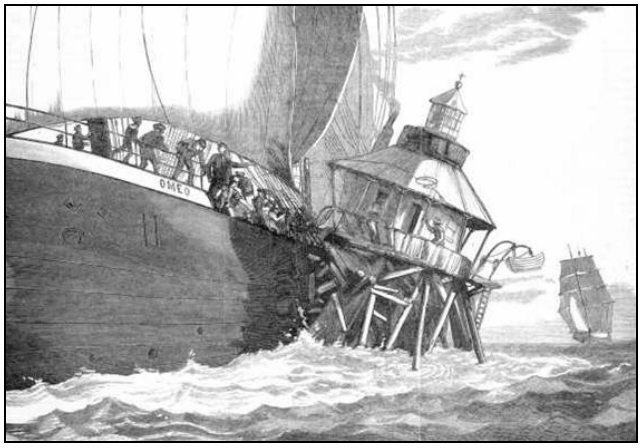

Figure B-1. 1: Vessel *Omeo* Collision with the Swan Spit Pile Light (IAN 5/10/1881, SLV Collection).

A new lightship replaced the former pile light, and was moored one cable ENE of the lighthouse site near the position of the black buoy. A fixed red light visible for 8M was exhibited and a gong was sounded every ten minutes in foggy weather (Yule 1884:314).

A replacement circular iron lightship began duty on 12th September 1887, and continued at this site until 10th October 1894, when it was moved to take up station at Point Gellibrand near Melbourne (COPW 1888; Gibson 2000:8; Noble 1979:47).

F) Wrecks and Strandings

A number of wrecks and strandings have occurred at Swan Spit and Point, including the *Marie*, *Dufries* and *St George* (GA 16/11/1853; MMH 16/11/1853, 31/12/1852). These vessels were carrying luxury goods cargos associated with the Victorian Gold rush (Williams and Searle 1963).

2) Archaeological Deposits

A) Swan Bay Rabbit Proof Fence #1/ Swan Bay Rabbit Proof Fence #2

These fences were installed as part of the original fencing around the Swan Island Golf course in 1907 (Anderson 1984:9). The fences were designed to prevent rabbit access to the golf course. Fence #1 consisted of at least 6 circular timber piles (approx 10cm diameter and up to 1m high) spaced approximately 3m apart extending at least 15m past the high tide mark. Fence # 2 to is 85m long and consisted of tightly spaced timber posts up to 1m high which extend 35 m past the high tide mark into the water.

B) Swan Island Rifle Range Butts

The remains of earthworks and rifle range butts are still extant on Swan Island [CA; LID]. An earthen embankment 23m long x 5m wide runs perpendicular to the shoreline, and contains 4 sets to extant target butts (2m high) on the northern side. The canvas targets would be raised into position via an iron pulley system on each side of the timber supported poles. The timber remains of a possible flagstaff pole are located approximately 5m to the west on the shoreline, with an extant timber telegraph pole and small brick scatter located 6m to the south. Further south along the foreshore lay the remains of an iron framework possibly used to support the butt targets. Another extant timber telegraph pole (possibly associated with communications along the butts) was located 275m along the foreshore to the north east.

C) Pigeon's Gutter and Tie Posts

Pigdon's gutter is evident in aerial photographs of Swan Island (Photo 39w059, Photo Mapping Services), and runs for a distance of 350m from the eastern edge of the Pt Norgate to Duck Island Bank. A number of rectangular and circular section posts were discovered at the northern extremity of Pt Norgate, at the western extremity of Pigdon's Gutter spread over an area of approx 200m. Two sets of paired rectangular section timber posts, with the piles of each pair spaced 25m apart, were probably used as tie posts for a fore and aft boat mooring. The remains of an iron post stump and square sectioned timber post were found at the eastern and western sections of the site (respectively) and may be associated with the former pier known to exist in this region. Several black glass alcoholic bottles tentatively dating to c 1880s were scattered around the site.

D) Stingaree Bight Fishermen's Anchorage

The Queenscliff fishing fleet anchored in this area during southerly gales since at least the 1860s until Swan Island was closed to civilian traffic in the 1960s. Large archaeological deposits are anticipated on the seabed in this area.

E) Swan Island Torpedo Depot/ Naval Base and Torpedo Boat Anchorage

This area has not been inspected, as access clearance is required by the Swan Island Military Base. However, local divers have located an extant post in this area that may have been associated with the torpedo boat moorings. The area lies close to #3 green pile (Swan Point), and has a rock and mud bottom, with a low rock shelf. Black alcoholic and beer bottles dating to the 1850s -90s were produced by predominantly English manufacturers [PF].

F) Swan Island Naval Anchorage #2 (for Gannet, Victoria, Batman)

This large anchorage for the *Gannet*, *Commissioner* and *Victoria* was located approximately 1km offshore from Swan Point (A11, c.1889 [plan]; Anonymous 1889; HCW c.1938 [plan]).

Many bottles (predominantly aerated water, torpedo and lemonade bottles from Melbourne and Geelong) were found concentrated in this naval anchorage area by local divers. The deposits were concentrated in a 360º circle around a mooring anchor and chain which formerly served as a special mooring buoy [DL; PF; SA].

G) Will o The Wisp

This vessel was surveyed by Heritage Victoria in 1995. The ship carried a cargo of timber bricks and potatoes when it went aground in October 1853 (Williams and Searle 1963: 13).

H) J3 Submarine/ S.F.Hersey/ Mystery/ Swan Island Mine Cases/ Swan Point Groynes/

The *J 3* submarine lies intact in about 4m of water 100m offshore from Swan Point. The remains of the *S.F. Hersey* approximately two metres off the north eastern side of the submarine, with a large gutter (up to 2m deep) scoured out between both wrecks. This timber wreck consists of two large sections of robust frames (approx 30cm square) and planks (up to 60cm wide) which are evident for a length of 30m and which are partially buried under sand. A scatter of 38 iron spherical (approx 1.5m diam) and barrel mines (approx 1.7m long) were located on the southern side of the submarine.
The remains of an unidentified timber framed vessel were located under spherical mines at the north western edge of the mine scatter. This wreckage may be the remains of the *Mystery.* Ferrier has reported locating a ceramic toilet, blue torpedo bottles and a 2m long stockless anchor close to this area which he maintains is from the same wreck. Foster (1987:13, 97) records that the hulk of this wreck was used as a breakwater at Swan Island in 1922, but broke apart in a storm, which concords with a local oral histories that the wreck was sunk to provide a solid underwater base for the *J3 Submarine* [PF].

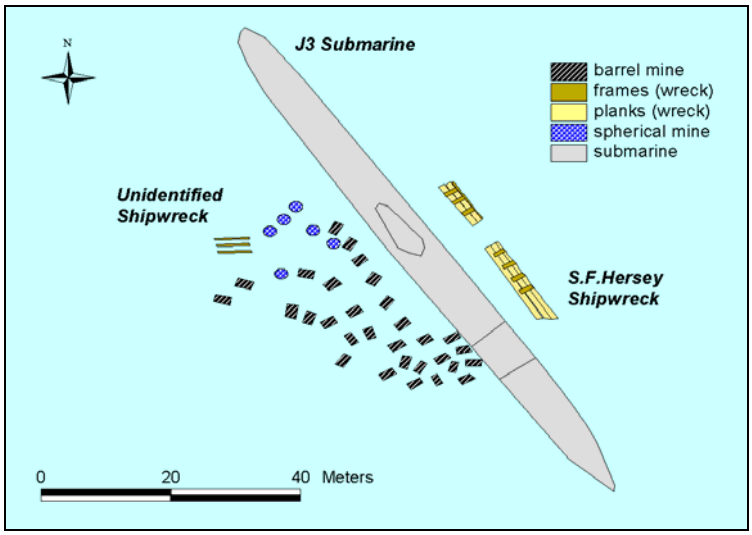

Figure B-1. 2: Sites at Swan Point: J3 Submarine, S.F. Hersey, Unidentified shipwreck and discarded mine shells.

Local divers have reported another mine scatter (of up to a dozen mines) in a gutter (within 50m) to the north of the submarine [DL; PF]. It is probable that the mines were either discarded offshore when their explosives were removed in 1920s/30s, or more likely to be empty shells used to stop coastal erosion in this area (Anon.1993b:4, 5, 20). Underwater timber groynes reported close to the bow of the J3 which run perpendicular to the shoreline [PF] also probably date to this period.

I) Stranding Site (Possibly the Marie or Dumfries)

Many local divers have reported large concentrations of underwater artefacts in an area approximately 600m offshore. Most artefacts in this area of are French origin, and include wines, cognac, vinegars, fish paste, perfume and other French luxury goods, ceramics, and other shipboard items. These finds are consistent with the cargoes carried by the vessels *Marie* and *Dumfries*, both of which discharged large amounts of their cargo when they stranded on Swan Point sandbank. An inspection of this area in 2002 revealed scattered increasing concentrations of broken ceramics. The *Dumfries* was stranded in 1840, and the *Marie* in November 1853. Other stranding sites are anticipated in this area (Duncan 2006)

J) Swan Island Bight Dumping Ground/ Swan Island Bight Skull

Large concentrations of artefacts have been reported from 250 to 800m offshore from the Swan Island Fort from the *Countess of Hopetoun* Hulk to the *J3* submarine. Relics included alcoholic and aerated water bottles (both glass and stoneware), mine calibration devices (used to set the mine), ceramics, and a metre high pile of surplus of knuckle dusters marked with the government broad arrow [DL; PF; SA; TA]. [DL] has suggested that this may be either an offshore dump used by the military, or the remnants of a terrestrial rubbish tip that was washed away with coastal erosion. A skull found by Love in this area in the 1980s was donated to the Queenscliff Historical Society, and probably originated from a shipwreck or drowning victim.

K) Countess of Hopetoun/ Swan Spit Bight Groyne/Swan Island Beacon

The remains of the *Countess of Hopetoun* Peter lie alongside a partially buried stone jetty approximately 100m south west of the Swan Island Fort. The jetty extends 100m offshore. These facilities were installed to act as both a jetty and breakwater to prevent further coastal erosion near the fortress in around 1924 (Ferrier 1991:5; Foster 1987:39). The remains of a collapsed concrete beacon (the Swan Island Beacon) lie on the eastern side of these structures in shallow water. The remains of a rudder (possibly from the Dumfries stranding) has been reported directly (approx 50m) offshore from the beacon. Anti tank landing iron and an ammunition bunker have been observed on the foreshore directly behind these structures [PF]. Further investigation is required of these sites.

L) Swan Island Fortifications/Swan Island to Pt Nepean Communications Cable

Swan Island fort is substantially intact, and is currently used the Australian Army for training [LID]. This is a restricted military zone, which has prevented prior inspection of the site.

A submarine cable was installed between Swan Island and the beacon, via Popes Eye Fort to Observatory Point by 1897 and was shown on charts until at least (Yule, 1897:436; Chart 1171A [updated 1902]), Cox, 1864 [updated 1903] [charts]; and was used to help control and defend the minefields. This cable ran offshore from Swan Island near the fort, and proceeded to Popes Eye. The copper cable has been sighted by numerous divers, especially where it crossed through the *Gambier* Shipwreck. The cable was also often caught by anchors of small boats using the area [DL; LID; PF; SA].

M) Swan Island Bight Wreck

A wreck lays approx 300 m off the foreshore midway between the J3 and the Countess of Hopetoun [PF].

N) Swan Island Bight Wreckage

Scattered wreckage has been sighted approximately 300m south west of the J# submarine extending over an area 300m long parallel to the shoreline about 100m offshore [PF]. [DL] described the wreck as "a side of a ship. There are planks, possibly from the side of the Lady Harvey. You drift with the current up the channel and you'll find two 10ft lengths of wreckage".

O) Swan Island Bight Wreckage #2

Parts of a broken up vessel have been reported by [PF] approx 1km south east of the *Countess of Hopetoun* spread over an area of approximately 300m radius

P) Swan Spit Anchor and Chain

A large admiralty anchor and chain lie approximately 1.5km south east of the Countess of Hopetoun. [PF] has suggested that these relics may be associated with the former- possible mooring for Swan Spit Lightship, which once located close to this site.

Q) Swan Spit Pile Light

The remains of the Swan Spit Pile Light lie at two distinct locations approximately 200m apart. When the light was hit by the Ship *Omeo*, the top section containing the accommodation quarters and the light were carried about 200m before it fell to the seabed. Artefacts located from this site included lead roofing gutters and downpipe; handrails, and personal effects. The rest of the pile light is scattered over a 20m area concentrated around the remains of the light's piles. A large iron water tank and chimney remains are located 20m from several upright timber piles, between which is a scatter of wire cut bricks (marked "Allan and Mann, Government Patent Glasgow"), black glass alcoholic bottles (one marked "black horse whiskey"). A tide signal has also been found in this location. Artefacts are concentrated for 20m around this area, but disappear completely outside this region, suggesting that they may be associated with daily life on the light. The site tends to scour out in a strong tidal ebb flow, or during prevailing northerly or easterly winds ([LM; PF]; Heritage Victoria Site Report S810). The latter site has been inspected by Heritage Victoria.

R) Swan Spit anchor and chain#2

Another large anchor and chain are located approximately 1.5km south east of the *Countess of Hopetoun* shipwreck [PF].

S) Swan Spit Ammunition Boxes

A number of isolated rifle cartridges boxes have been sighted by many divers south of the Swan Spit Light. The 50mm small bore rifle bullets with paper cartridges are still in their in wooden crates, and are scattered up the Swan Spit and West Channel. The unfired bullets are wrapped in waxed paper, and are American ammunition dated to 1942 [PF; DL; LM; SA; SH].

T) Queenscliff Bight Anchor

A chain with an attached 2m long anchor extends from the *Qa* Pile (which is the first pile on the north side of Queenscliff) towards the south west in 35 ft of water. The chain runs at right angles to the tide, suggesting it may belong to a navigational mooring. A ceramic

water filter marked "Boston England" and broken timber wreckage have also been found in this vicinity [PF].

All the sites on the Swan Island Spit and Point require further investigation

U) Popes Eye Bank Anchors and Wreckage

Two anchors have been located on the northwest side of Popes Eye, along with bottle scatters. One anchor lies in a gutter close to the Popes Eye Fort, and an attached chain runs towards the annulus. It is also rumoured amongst the local diving community that a lighter that was wrecked during the construction of the annulus has been located nearby [PF; SA].

V) West Channel Entrance Marker buoys and chains

[PF] has reported an anchor near West Channel #4 marker buoy.

W) Old West Channel Pile #4

To the north of the old #5 West Channel marker is an old pile structure, which was similar to the old Woodrift dolphin pile. The structure has just been broken off and pushed over. [GR]

Appendix B-2: Extractive Industries

1) Salt

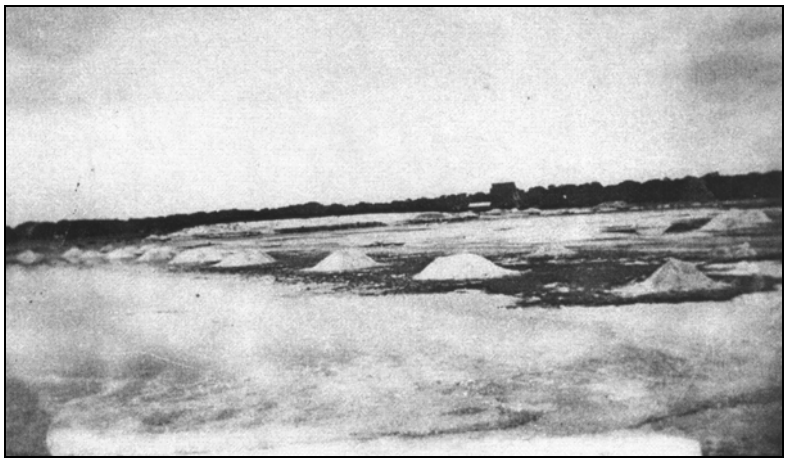

Figure B-2. 1: Alex Laker's first and only salt harvest at Lake Victoria (PH 4216, QHM Collection).

Salt works were established at the Salt Lakes in 1863, but were later closed down (Dunn 1963: 20; Cuzens 1912: 6). In 1875, J. Shaw was granted a licence to produce salt at Lake Victoria, and extensive works were built under the supervision of a Mr Harrison. Two other companies also established works in this precinct (one shipping its plant from Warrnambool), with The Lake Victoria Saltworks sold by Messr Kendall to Samuel Harrison in April 1876 after spending hundreds of pounds testing the Lake for the viability of salt production. However by 1882, the Lake Victoria Saltworks were auctioned after dissolution of the partnership (GA 27/9/1875, 14/6/1876; Dod 1931:53; Wynd 1988: 133).

In 1934, Alex Laker undertook his first an only harvest of salt from Salt Lake, where he was later to establish a shell grit extraction industry (Photo PH4216 - QHM Collection).

2) Sand

A) Pt Norgate, Swan Island

Sand was mined from the northern end of Swan Island to fill in the fort moat, and also to construct the Bowling Green [CA; RF]. The mining site is still evident by an extensive sand dune area that is almost devoid of undergrowth, and extends for approximately the entire length of Pt Norgate above the 12th hole of the golf club.

B) Edwards Point

Sand extraction was undertaken at Edwards Point

> There was an early sand quarry there. You go down Cliff Road into the right - you can still see the hole they made there. They used a big earth mover in the 1950s, which got stuck there. The middle finger of the point has material on it, possibly to do with the sand quarrying [PM].

C) Mud Islands

Sand was also exploited from the Mud Island:

> They used to take sand around the Mud Islands. Boats from the glassworks at Melbourne had their own fleet of small craft that got sand for the Melbourne glassworks at the entrance to the Yarra [River]. It was never sure where the mosquito fleet got their ballast from. Did they used shellgrit or sand for the return trip. They would often unload bricks and slate here, and probably used cargoes of shell grit and sand to get back again. [PF]

3) Shell Grit

A) Mud Islands/ Flounder/ Jetty/ Shell Grit Extraction:

Sand and shell grit was also extracted from the waters around the Mud Islands to be used for glass manufacturing in Melbourne at Spotswood (Evans 1978:81). A small mosquito fleet of vessels would transport the sand and shells to Melbourne, and it was likely that these vessels first delivered bricks and slate delivered to Queenscliff, and then used the sand and shell grit for an economically viable ballast for the return trip home [PF]. [BM] recalled:

> We used to go over there to spear flounder when we were young. We'd go over for the weekend, and go all round it. We used to lay on the jetty down from the lagoon. A bloke used to collect shell grit there, lived on the east side. He'd send the shell grit to Limeburners Bay in Geelong, and they'd use it for glazing tiles. A ship would come down from there and collect it. There are still piles there from the Mud Island Jetty, on the east side of the island. They used to go up to 60ft offshore, and were just up from the lagoon on the east side. People used to shovel up the shells and sieve them to get the shells from the sand. Jim (Buck) Rodgers told me that when I was 15, and he was in his seventies then. There were ashes evident where people used to cook there dinners on the old hut platforms [concrete pads]. Water was delivered to the island in barrels, as there was none there, and Jim Rodgers would take the shells back with him [BM]

Shell grit was removed from Lake Connewarre, Geelong and the Bellarine Peninsula as its lime content was useful in improving soil quality on farms. A government issued licence was required to remove the product (probably due to the widespread practice of often removing loam from above the high water mark or shell from recently constructed roads). This led to conflict between shell carters, and farmers, who believed what lay on the beach in front of their land belonged to them, even though the farmers entitlement only extended to the high water mark (Wynd 1988:54).

B) Shell Grit Mining: Laker's Cut

Alex Laker later turned his attention to shell grit mining, and by 1945 had established a works at Salt Lake (Lake Victoria) where he established plant to process and bag the product (Photo PH4221, QHS):

> Alex Laker mined all the way through the Lonsdale Lakes area. He had his own railway siding, and the trains came on Thursdays and would leave the trucks fro him to fill up, and took out the full ones. That was after WWII in the 1940s and 50s. He had two trucks a Leyland and a Bedford, Laker was a capable man, he could turn a hand to all sorts of things. He used the trucks for years to collect shell grit, and took back soil. Lakers Cut came later. He mined the shell grit from between the Queenscliff to Geelong Road and Shell Road. He went through the area and took off the top layer of dirt to get to the shell, which he put through his washing plant. He first worked the area near the old Queenscliff

race track that was in this area. There were other race tracks in the area, there was one below Wilson's Hill, and one near Ocean Grove. The mining there was done up until the 1950s at least, and was started sometime before 1948. [JP]

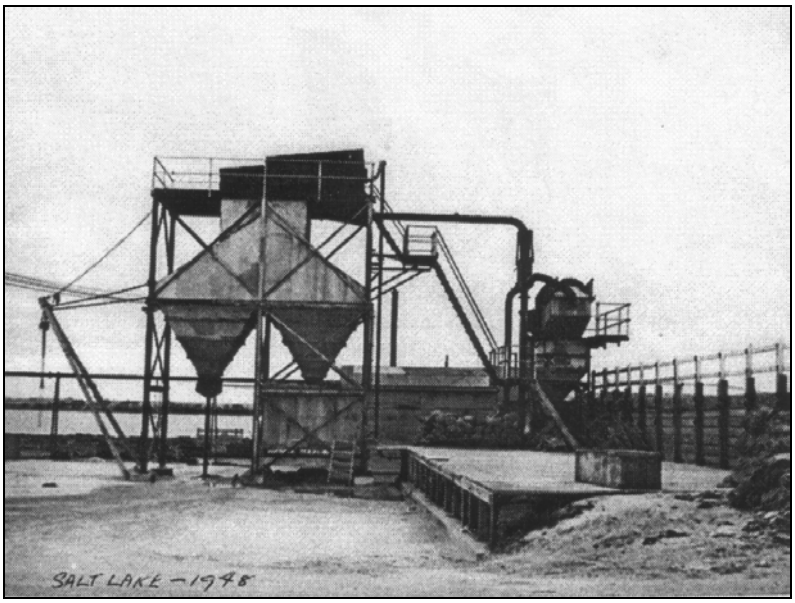

Figure B-2. 2: The first shell grit processing plant at Lake Victoria, Pt Lonsdale in 1948 (Photo: PH4214, QHM Collection).

A large inlet at the southern end of Swan Bay is actually a manmade cutting that was made by the Lakers in 1959 to extract shell grit the Australian Glass Manufacturers in Spotswood (Melbourne) and for chook feed and pathways. The Queenscliff Railway line was re-opened specifically to cater for this industry, which had its own branch line, and up to 1000 tons a week of grit was railed out of the area each week. When the Laker family lost the shell grit contract in 1973, the railway closed 3 years later (QH June 2004: 6; [DB;PF; SS]).

McMahons Shell grit mining has operated in the Pt Lonsdale area near Lake Victoria since 1930, and expanded their operation into the Lake in 1994 (Rip Rumour May 1994:1; [SS]).

The area at the bottom SW corner of Swan Bay was not originally part of Swan Bay, but was an area where shell grit was extracted. Laker put a cut into a lagoon from Swan Bay, and left a big hole there. [DB]

C) Portarlington and Avalon

Small vessels from the local mosquito fleet continued to take shells from the banks off Portarlington and Avalon right up until the 1920s. The shell was used in glass production at the manufacturers in Spotswood on the Yarra River (Loney 1981: 87).

4) Lime Burning

A) Point Lonsdale

Lime burning was one of the earliest industries in Port Phillip, with limestone resources initially exploited at Collins settlement at Sorrento in 1803, and later extensive mining along the Mornington Peninsula from at least 1836 onwards. La Trobe noted the first lime extraction at Queenscliff in 1844 (but was probably referring to deposits at Pt Lonsdale), and its affects on

the denudation of local forests. He further commented on the constant traffic of lime boats around this portion of the Bay (Harrington 1997: 21, 31). An account of the grounding of the Victory in 1850 describes the presence of lime boats in the area of Lonsdale Bight (Intelligencer 31/8/1850:902, as cited in Ballieu Collection #51).

After the first lands sales in 1852, a brick yard and lime kiln had been established near Marcus Hill (Dod 1931:4), and by 1854 James Hutchins and James Cooper had started small farms and lime kilns in the back country at Point Lonsdale, about a mile from the Signal Station (Simkin n.d.:4; Dunn 1949:35, 1963:20; Harrington 2000:32).

[CA] recalled the presence of a number of limeburning facilities at Pt Lonsdale:

> My great grandfather (Hutchins) was a lime burner at Point Lonsdale. Then he became a brickmaker. He also made Marcus Hill bricks. He settled in the area near the golf club (Point Lonsdale)". There were remains from this once near the tennis club, and on Gill Rd at the bottom end of the Golf Club. The road was named after Judy Batching's grandfather (Gill). Gill worked for my great grandfather, and that when (great grandfather) went broke, Gill took over the business. The Allisons were also limemakers at Pt Lonsdale and they later taught brick making to the Andersons who started a brickworks at St Leonards. There were 3 brickworks at St Leonards. The train started in 1879, and that was built to service the fort and provide building materials. They must have taken the lime out by boat to Melbourne. I think they had as much lime as they could get there, and it may have been used for building locally

Harrington (2000:32) has identified a potential Limeburners quarry site near the corner of Gill and Fellows Road (Pt Lonsdale), along with another brick kiln site 1km further south that was dismantled about 35 years ago.

B) St Leonards

Lime kiln sites were also known at St Leonards:

> The Allisons were also limemakers at Pt Lonsdale and they later taught brick making to the Andersons who started a brickworks at St Leonards. There were 3 brickworks at St Leonards. [CA]

C) East Bellarine Methodist Church Site

The location of this site has not been identified:

> There was an old lime kiln site that was mentioned in council records in 1867 that was near the site of the Eastern Bellarine Methodist Church. Later in 1871, a William Downs was quoted as running a lime kiln site on Widey Beach Road (Wynd 1988:134).

5) Firewood and Bark Collection

Wattle bark collection was a common early extractive industry in Port Phillip Bay and along the Victorian Coast (Wynd 1988:115, Hunt 1999:17). Wattle bark was used as a tanning agent for leather goods, and stripped trees were subsequently felled for firewood. Wattle Bark was recognised as the most powerful bark (for tanning) in the world in 1878, and as exports demand grew for both bark and tanned leather goods, bark cutting was widespread right across the Bellarine Peninsula. Bush land brought higher premiums than cleared farmland, as it offered

prospective farmers an alternative income source to regular crops (Wynd 1988: 54). The Port Phillip Bay mosquito fleet were heavily involved in the transport of lime, firewood and bark for tanning in Melbourne, and would bring supplies down to Sorrento and Queenscliff, for the fishermen and lime burners, and would return with either lime, pre-cut timber lengths for the Swallow and Arial biscuit factories, or wattle bark for the tanneries in the Yarra and Maribyrnong Rivers (Field 1962:36; Loney 1981: 87; [DB; GH; HeH; JB; PF]. Teams of up to 200 men were employed to harvest the timber of surrounding hills. This practice greatly assisted the development of agriculture in the area, as farmers were either paid to clear their land (or tendered the process to bark strippers) supply the markets in Melbourne, and continued until at least the 1950s ([GH; HeH]; GA 11/3/1878; Wynd 1988:54).

Geoff Henderson, a former farmer in Swan Bay, described the process:

> The wood clearing suited the local farmers as it helped them clear their land for farming. The last woodcutters were going on until the 1950s, and they were still stripping wattle bark. They grew wattle wood for the bakeries in Melbourne. The Shepherds family grew wattle on their property, and took a dray out into the water to load onto the boats, which would be taken out to the bigger ships waiting offshore. Tanning of leather was big in Geelong, and wattle bark was needed for the tanning process. That's why they would strip the bark from the trees. The golden wattle (tree) has a relatively short life. It only lives for 15-20 years. They stripped the bark when its 8-10 years old. The woodcutter would cut off the branches. And then prise the bark off from the bottom. It comes off in strips. They would pack and fold the bark into three foot square packages and then load it into the cart… There were a number of (corrugated) roads in this area that went out into the water. They took dray loads of timber out to boats in the water, and the boats would take the timber out to something bigger (a ship) offshore. There was a track into the water at Shepherds Road. [GH]

Wattle bark and firewood was also taken from the southern section of Swan Bay, near the creek at Basil's Farm near Nye Rd. A sailing barge was also constructed in this area on the banks of the creek, which was used for this purpose [JB]:

> There was big sheoak and little sheoak, where they moored the barges in Swan Bay for taking out the wattle bark. They used to go into the creek at Walpole. They would go in there and load up the barges with wood and bark. There was a sailing barge that was built on the banks of the creek, it was called the *Fidge*, and it was 50 ft long. It was located down the road just before the service station on the way to Portarlington. As you go round the bend before the farmhouse, Dunrobbins, it was just over the hill, and you would go down to the right. It is fenced off now and you'd have to get permission to go onto the land (North of Nye St). They built a barge there on the creek entrance. They got wattle bark out from there, and they would float the boats into the creek and pick up the bark. There are just a few sticks left there now. The barge would go ashore, and at low water a horse and cart were used to bring bark out and wattle tress for the bakeries at Melbourne. They would be loading while the tide was out, and the barge would sit there for three or four days until it was loaded up. [JB]

Large numbers of woodcutters were employed by George Cole based out of St Leonards, who had established a pier and small township there as early as 1855. By 1865, numerous woodcutters and their families inhabited the surrounding area, and small vessels of 15 to 70 tons provided firewood for Melbourne Williamstown and Sandridge. Firewood was still an important trade at St Leonards in the 1870s (Wynd 1988:115, 130).

The corduroy roads were still evident until recent years [DB; GH; HeH; SS; WN].

The effects of timber getting and bark collection left minimal structural archaeological evidence, except for a few piers and corduroy roads (Coles Pier - St Leonards; St Leonards pier piles; Swan Bay Corduroy Roads, McDonalds Pier, Andersons Road Pier, Shepherds Road Pier). However, the effects of this trade are still spatially evident in the denudation of the peninsula foothills, an observation also made by Nutley in NSW (2003:61). The land clearance also led to increased silting of Swan Bay (Grant pers comms), which effectively reduced the water depth and retarded further maritime development of the area. However, although the land clearance greatly aided the development and spread of the local farming community, it ultimately had a negligible effect on the local maritime populations in the Queenscliff area, as most of the produce from the area was shipped out of Portarlington.

A) Archaeological Evidence

Firewood and wattle bark extraction was popular in Swan Bay and St Leonards for most of the nineteenth century until around the 1950s [GH]. The most salient evidence of this trade is the denuded farmland hills that line Swan Bay. This has contributed to increased silting of Swan Bay [JG], which effectively reduced the water depth and retarded further maritime development of the area. [SS] has indicated that wattle trees usually grow after indigenous fire-stick regimes have decreased or ceased, and that many areas where wattle was harvested were once grasslands. This observation is notable as it might be used in the determination of contact/ colonization periods with indigenous peoples.

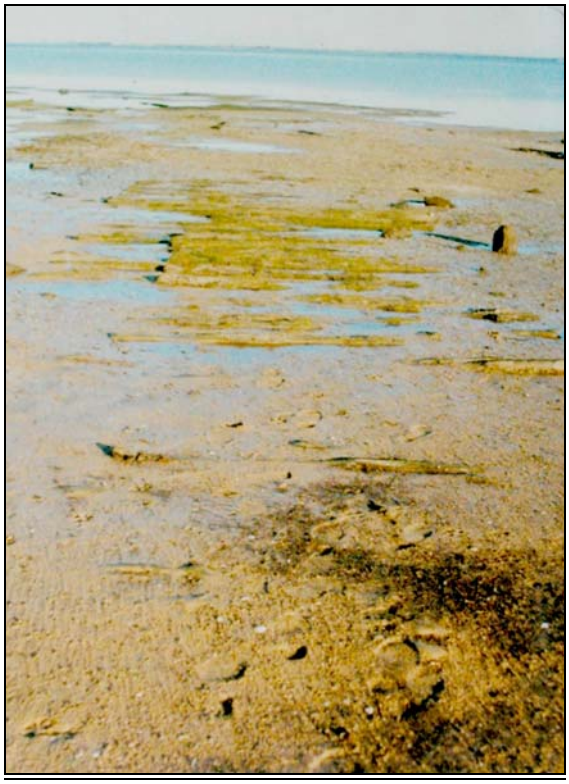

Figure B-2. 3: Andersons Road corduroy road (Photo: Courtesy Geoff and Helen Henderson Collection).

Other evidence located during the study included tie posts and an artificial channel at Swan Island which was used to moor firewood barges. Several timber corrugated roads, which consisted of branches laid over mudflats to facilitate cart access to barges in shallow water were identified [DB; GH; HeH; LJ; RB; SS; WN] but were not located (as the area was covered in seagrass). Pictures supplied by [GH; HeH] showed the 2m wide roads were constructed of branches, with small piles on one side (possibly for a walkway pier). Similar structures used in

relation to the firewood and timber trades have been observed by the author at Toora (Gippsland, Victoria), and have been described by [BM] at Westernport Bay.

Firewood/ Bark	Corduroy road into shallow/muddy waters
	Denudation of local trees
	Silting and land encroachment
	Tree stumps/ copiced trees

Table B-2.1: Archaeological signatures of firewood/bark extraction.

6) Kelp/Seagrass

The use of seaweed for fertiliser, fuel, potash and iodine and caulking in Medieval and late periods in Europe has been documented (Allen 1995:30,152; Vivian 1969:32; McErlean et al. 2002:334, 336, 337, 344; Williams and McErlean 2002:509), and includes stone grids (to encourage kelp growth), stone walls for boundary resource demarcation, storage houses and kilns.

A) Seagrass Insulation

A marine seagrass known locally as eel, sea or swan grass, was used extensively amongst the community for the insulation of houses. and other public buildings such as the football ground grandstand and the Barwon Heads Golf Club [LID; GW]. Resourced principally from Swan Bay, the string like grass was found in great quantities there, especially during the winter months. The grass had excellent insulation properties for both sound and heat, and was used in many houses, especially in the fishing community, where it was stuffed into the recesses between the walls and ceilings [LID; PF]:

> …they [the fishermen] used eel grass as insulation in many houses. It had really good insulation qualities. [PF]
>
> Swan grass from Swan Bay was used (to insulate) in the football ground grandstand. It had very good sound insulation. It could be roaring outside, and you couldn't hear a thing inside…it doesn't rot or burn, must be because its damp, I don't know, but its very good for insulation. [GW]
>
> The seagrass did not rot and was non-combustible, and it was also used by the local iceworks manufacturer (Icy Jones) to insulate the insides of kerosene (Jonette) heaters…Swan grass was used for insulation in many homes in Queenscliff, especially amongst fishing families. Eel grass had good insulation properties, and also did not burn. It was also used by Icey Jones, an ex army engineer, who ran the iceworks, who also built Jonette heaters made with eelgrass insulation. The Barwon Heads Golf Club also used the seagrass for insulation. [LID]

Swan Grass was also harvested in commercial quantities along the eastern coast of Westernport Bay until at least 30 years ago for housing insulation use in Melbourne:

> Seagrass was once harvested in the Bay (Westernport) here. It was taken to Melbourne for packing between the walls. Every autumn, the seagrass sheds its leaves, and was pushed by the SW swell, they wash up on the beach in truckloads (between Settlement Point and Cobbs Bluff). There was a bloke from Cowes who ran a business called...[Bill couldn't recall and asked son-in-law Greg, who also didn't know]. He used to cart it to Melbourne in wagon loads bailed up like hay bales. They'd use it in the ceilings and

> walls. That was going back at least 30 years, and it was going on a long time before that. [BM]

Similar practices using marine resources (e.g. reeds, shells) and other agricultural produce discard (oat and corn husks, walnut shells, straw) for insulation were known to exist in Suffolk and East Anglia in England until at least the 19th century (Evans 1966: 43-4), and it is possible that these practices were transposed here by early settlers from those regions.

B) Fertiliser

Several attempts were made in Queenscliff to encourage the establishment of a kelp industry. In 1893, the Queenscliff Kelp Manure Company Advertised kelp manure available via rail trucks for 6 s a ton (QS 23/9/1893). The virtues of establishing a kelp industry were again extolled in 1894 in an editorial by A Hodge (who was coincidently agent for the company). Hodge demonstrated that local farmers at the Springs (Mr Werry) was already using kelp with good results, especially as its salt content controlled snails, slugs and take all worms, and that it was free of the weeds normally contained in animal manure. He advocated that if the new industry could be established it would open up a new market between Queenscliff and Drysdale (QS 8/12/1894). No mention of this industry or company was found in any of the Mercantile Directories of the time (Sands and McDougal 1888-1898; Wise and Co. 1888 – 1898), although Hodge was listed as the publisher of the Queenscliff Sentinel (Wise and Co. 1891:250, 620), and it appears that kelp farming does not appear to have been a viable industry in Queenscliff at that time.

A former resident of Queenscliff, Bill Mitchell, recalled the use of kelp for fertiliser at Barwon Heads. "They grew asparagus on it until about 40-50 years ago. Kelp is a good fertiliser, but seagrass is not. I took some home for my garden and you can dig it up two years later and its still there[BM]. [JP] reaffirmed this observation: "It wasn't uncommon for people to bring home kelp as manure. They used kelp, and seagrass from Swan Bay. Ernie's mum used kelp from the shore in her garden". The author also observed seagrass being taken from the Swan Bay foreshore in 2004. Upon approaching those concerned, the (unidentified) person stated that they were using the seagrass to grow asparagus, as they had always gotten good results when using it.

C) Potash/ Iodine

McErlean (et al. 2002, 334, 336, 337, 344) and Vivian (1969:32) have documented how kelp was burnt in the United Kingdom and France in the seventeenth and eighteenth century to extract potash soda for use in glass manufacturing. The species used was *Ascophyllum nodosum*. However, kelp (which was the product of burning seaweed) was used to extract iodine in the late 19th and early twentieth centuries in Ireland and Scotland. Due to its high iodine content the *Laminaria digitata* species was exploited, which was abundance along those coastlines and was found in the subtidal regions. The discovery of iodine as an element in 1812 and in seaweed slag led to its subsequent use in dyes and medicines, and as a later integral ingredient in photography.

The prospect of a kelp burning industry at Queenscliff was raised in 1916 (QS 5/2/1916), when the practice of burning seaweed for potash, bromine and iodine became popular in Ireland Norway, USA and Japan due shortages caused by WWI supply blockades. It was at that time successfully dried and used as a fertiliser in New England where potash was deficient in the soil. An editorial in the Queenscliff Sentinel suggested that further research was required to test the viability of this industry.

Several local informants indicated that although seaweed farming had not been tried in their area (to their knowledge), they knew of traditional practices undertaken by the past local indigenous community, where kelp was wrapped around cuts and sores and used as a natural healing aid:

> The local aboriginals would come and wrap themselves up in it [kelp/ seaweed] for their sores. When they took off the seaweed the sores were healed...my dad told me that. [GW]

[JP] also observed that after storms kelp would was up on the beach in banks, and water would often be trapped behind it in small pools. This discoloured water was often used by visiting Italians to paddle in, as the warm water was impregnated with the iodine from the kelp which was good fro their feet.

7) Guano Mining

Guano mining in Victoria was undertaken at a number of venues around the state, and mines were operated at both the Mud Islands and Duck Island (Prescott 1970; Yugovic 1998:20). The Mud Islands deposits were reputed to have the largest guano deposits in the state (Yugovic 1998:20, 21). However, like most other guano deposits around the world, they were exhausted by the late 19th Century.

A) Duck Island

Guano mining was undertaken at Duck Island (Yugovic 1998:20), and appears to have been largely exploited to meet the needs of local farmers. A number of local residents recalled the guano mining:

> Dad said his uncle shifted guano from Duck Island on a horse and cart …that was somewhere around 1924…Jack Werry, my great uncle dug that site [at Duck Island]. He died in 1936, so it must have been sometime before then. He had market garden at the back of the cemetery at Point Lonsdale, so I suppose he could have used it there. [GW]

> There was a bloke who used to take a horse and dray to Duck Island from Swan Island. He had a jetty for loading guano at Swan Island. It was just for local supply I think. There was a boat channel near it, but I think it has since silted up. [CS]

Another local resident of Swan Island, George Pigdon, lived at Point Norgate (Swan Island) and moored his boats there. Two Queenscliff residents recalled:

> Old George Pigdon lived in Stingaree Bight…He moored his boats there in Stingaree Bight. They called him the Bishop of Swan Island. He used to do rabbiting and fishing (for whiting) [GW].

> The Pigdons cut a channel around the back of Swan Island between Rabbit [Duck] Island and Swan Island so they could moor their boats there. They cut it close to Swan Island near the track over to the island. It was always rumoured that there was a track over to Duck Island, but I never saw it [CA]

It is unclear whether the Pigdon family was also involved in guano extraction at Duck Island, but anecdotal and historical evidence that they were either fruit and vegetable merchants (C. Anderson, pers comms) or farmers (Sutherland 1888b:168; Wynd 1988: 176; Weaver 1996:11) suggests that they may have been using this guano on their own market gardens. Beazley (pers comms) has also suggested that Pigdon's boat moorings were used to tether barges used in the Swan Bay firewood and bark trade, and it may be possible that these barges were utilized to

transport guano from this area to Pigdon's market gardens, before they were loaded with timber and bark.

There is also strong evidence to suggest the presence of an underwater causeway across the strait between Swan and Duck Islands:

> As kids we would come across from Swan Island to Duck Island looking for black rabbits. … We had a net boat in Stingaree Bight. There were rats everywhere there, and we had to keep a rabbit trap on the step boat to catch the rats, to stop them eating the nets. We would go to Duck Island and net there, and we would come back around 1am. We would wheel the boxes up to the boat, and box up the fish, and then wheel the boxes back to Queenscliff [CS]

Local knowledge [JB; KH] has confirmed the presence of a hard seabed floor in this area, which is also visible from aerial photographs.

The guano mining activities are still evident at Duck Island in a large area denuded of larger vegetation and grassy undergrowth (that is in abundance everywhere else on the island), and has various nineteenth century artefacts scattered around this location. Several small deposits of possible guano (or guano saturated bedrock) were located, along with several bottle scatters and concrete filed kerosene tins, which were possibly used for structural purposes. Posts associated with Pigdon's gutter and boat moorings were still extant at Pt Norgate, although no trace of a pier or jetty was evident.

The island had always been known for its fertile soils, and in the 1860s, George Admans, (owner of Swan Hill Hotel) set up a poultry farm and market garden on the (then Rabbit Island) that was run by Bob "Dinghy" Tommy who lived in a two roomed hut ("Native" 1887; "Queenscliff Boy" 1910; Dod 1931:29). The eggs and vegetables were transported round to Queenscliff when the tide permitted.

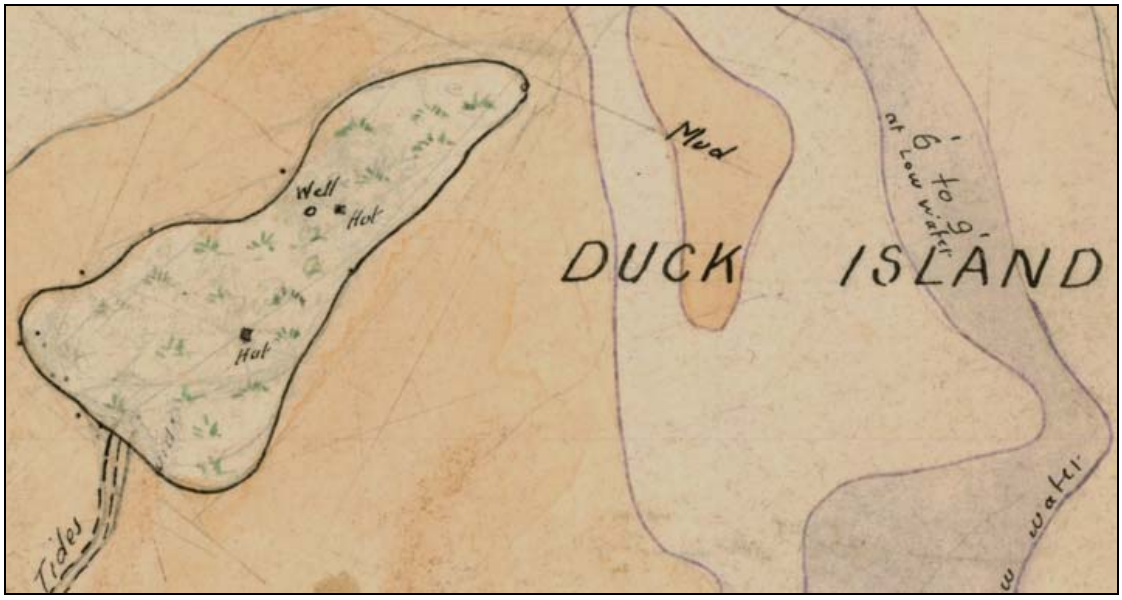

Figure B-2. 4: Duck Island house sites c. 1916 (After Barret Plan n.d. FQM Collection).

B) Mud Islands

I) Environmental Description

The Pt Lonsdale to Queenscliff shoreline consists of broad shore platforms cut in Pleistocene dunes faced by rugged cliffs. Shallow shelly lagoons line inland between dune calcarenite ridges. Swan Bay is characterized by a shallow landlocked tidal marine region connecting to Port Phillip, and is partly enclosed by spits and barrier islands, and bordered by extensive salt marsh, and was formed by the flooding of low lying valley. Edwards Point Spit is a recurved sand and shingle spit lined with salt marshes, shallow lagoons and fringing sandy recurves, and is a state faunal reserve. Swan Island is characterized by a large mobile sandy foreshore and spit, which is known for its constant deposition and erosion. The Pt Nepean to Observatory Point foreshore is of similar description to Pt Lonsdale, but also with parallel dune ridges on the inside of the bay and steep rugged cliffs fronted by shore platforms on the exposed ocean precincts (Bird 1977:52, 56). Located in the centre of the delta banks lies the Mud Islands, which are enclosed low lying sandy and swampy barrier islands around a central lagoon and salt marsh enclave formed by wave action (Bird 1977:56). The Mud Islands are formed by Boatswain Island in the south, Western Island, Middle Island and Eastern Island (the latter two of which have amalgamated in recent years).

II) History

The Mud Islands were first discovered by Lt Murray of the Lady Nelson in February 1802 who named them the *Swan Isles* (Lee 1915:45) after their prolific populations of swans and pelicans. These archipelago have been variously referred to as the *Signet Islands* in 1803 (Yugovic, 1998:232); the *Flat Islands* because of their low elevation (Symonds and Henry 1836 [chart]; Wells, 1840; Burdwood 1855:124); and the *Sand Isles Flat* (Stokes 1843 [chart]). They were renamed the Mud Islands sometime after 1855 when another survey of the area was undertaken (Ross, 1859-1860 [chart]), but were referred to as the Mud Isles in Hydrographic Sailing Directions from 1868 until 1897 (Yule 1868:221, 1876:281, 1884: 320) when the common name was substituted from 1897 onwards (Yule 1897:445).

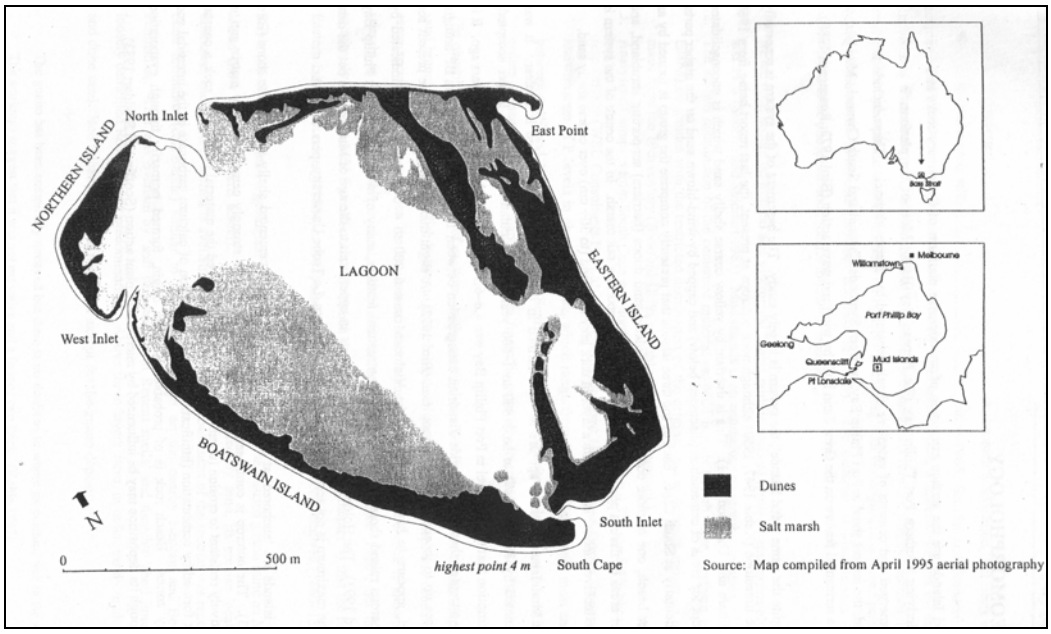

Figure B-2. 5: Mud Islands showing major island locations (In Yugovic 1998).

The islands have been exploited by a variety of extractive industries and have housed semipermanent populations since at least 1859. The earliest historical known use of the islands appeared on a British Admiralty chart of 1856 (Polkinghorne 1856 [chart]: as cited in Yugovic, 1998:90, 232), although the nature of the exploitation was not indicated.

Guano deposits were discovered at the Mud Islands in 1852 by a Mr Kyte, and were reputed to have the largest guano deposits in the state (J. F. Levien, as cited in GA 1/11/1877). The guano was concentrated on Middle, Eastern and Boatswain Islands. The first known occupation of the islands was by John Grace in 1852, who was issued a permit to construct buildings and a garden (Hansard 17/9/1884:1421, as cited in Yugovic 1998:90). Several maps refer to the availability of Guano at the south east point of Boatswain Island (Ross 1859-1860; [updated 1863][chart]; [updated 1880] [chart]), and structures or yards were evident on the eastern side of Middle Island, and the south eastern tip of Boatswain Island by 1868 (Ross 1859-1860 [updated 1868][chart]). The islands were commercially exploited by at least five different commercial operators from 1859-1902 (see Table B-1.1) until the deposits were exhausted (Yugovic 1998:20, 21, 30, 90, 244; Prescott 1970). Excavation of pure guano (bird droppings) was undertaken from 1859-1877. When the true guano deposits were exhausted by 1877, all the huts and equipment associated with this period were removed from the island. Although concern was expressed in the intermittent period over the environmental effects of this industry on island erosion and impropriety amongst certain government ministers (The Age 24/7/1843, 6/1/1877, as cited in Yugovic 1998:91), quarrying resumed of phosphate rock or marl (guano impregnated sedimentary rock and sand formed below the former layer) from 1884-1902. A house and other industrial plant were built by 1884, and by 1902 a trolley tramway line was used to load guano onto boats from a small jetty at Eastern Island which transported the material to St Leonards for crushing and sale as powdered fertilizer and for Levien's own onion farm [JY]. In 1902, five men lived on Eastern Island in a hut they had built (or possibly a rebuilt fishers hut - see below) but returned home on weekends (Yugovic 1998:90-95). The location of guano mining in 1884 was shown in Figure B-2.7 (Anon. c. 1884 [chart]). Guano mining had evidently ceased at the site by 1903 (Cox 1864 [updated 1903] [chart]).

Years	Lease/ Licence Holder	Comments
1860-65	John Grace & Joseph Askunas	Market gardener. Guano mined after discovery of Marl. Askunas bought out by Kyte in 1862
1865-69	Ambrose Kyte	No mining undertaken
1869-73	Jonas Levien	Applied for rent reduction in 1871 as best deposits already removed
1876-77	Jonas Levien	Licence for 6 acres. Small deposit still near old workings (Middle Island?). Ground at site leveled and grasses planted after works ceased. Bartlett acted as overseer.
1884 -85	Robert Bartlett	Middle Island and SE tip of Boatswain Island
c. 1902-03	Mr Holden	Mining undertaken for 2 years - sketch map of works by Garnsworthy (not located)

Table B-2.2: Guano mining leases/ licences on the Mud Islands (After Yugovic 1998:243-4).

Several fishing families occupied the islands from at least 1884, when a fisher couple occupied Boatswain Island (Hansard 13/8/1884:985, as cited in Yugovic 1998:90). In 1889, two huts were extant on the islands when a fishing family with several children arrived to earn a living from fishing from a yacht. By 1890, six fishers huts had been built near a pier on Eastern Island, and at least one fishing family (the McLeods) were still resident. At least four different fishing families resided here between 1880-1900. They lived on fish and brought their supplies from Queenscliff when they sent their catches to market, and collected water from hut roofs into tanks. The fishers were forced to vacate the islands as continual bad weather restricted their

ability to fish or resupply (Yugovic 1998:90). Some lived in driftwood shacks on the North West corner of the group, netted fish and launched directly off the beach [LF]. Those known to have occupied the island included the Fitzimmons family, who occupied the island in bad weather up to the 1920s (QH 2001:19, 2002:12); the Lee, Stevens and Culliver families [LF; HM; PF]. The surrounding shallow waters of the Great Sands were also leased to a William Mentiplay for 21 years from 1879 for oyster cultivation (Ross 1859-60 [updated 1880] [chart]; Anon. c.1884 [chart]), but it is unclear if this operation was ever undertaken as it was unknown amongst the local Queenscliff fishing community.

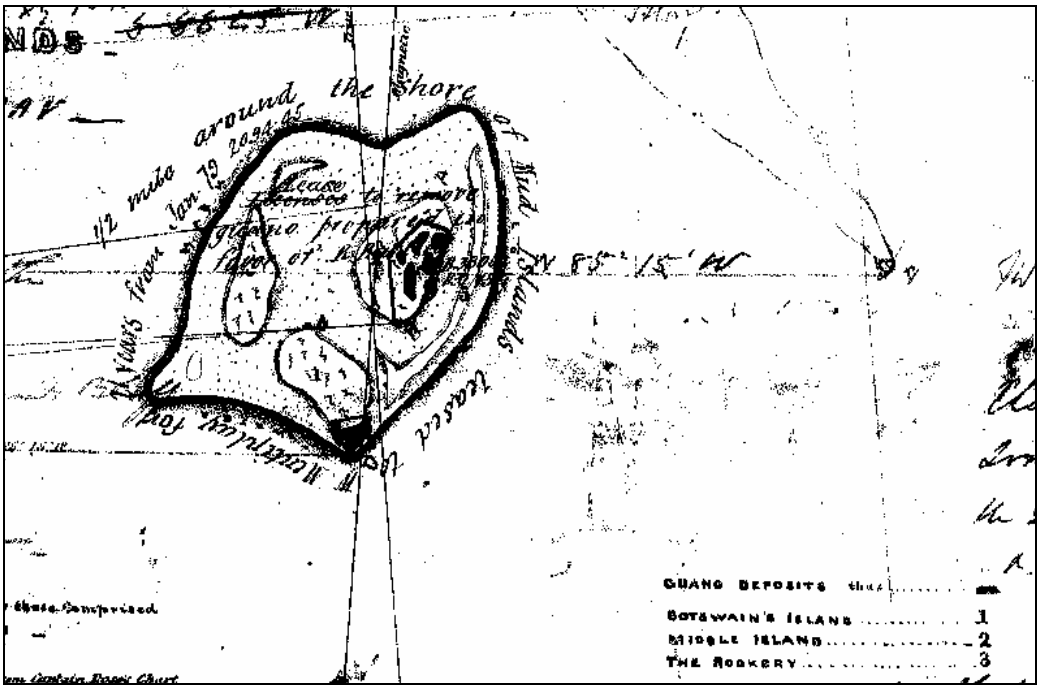

Figure B-2. 6: Mud Islands guano deposits and oyster lease (Anon. c. 1884 [plan]).

The island was also used for other extractive industries. Sand mining was undertaken on the sandbanks around the Islands [PF] to supply the Spotswood Glass Bottle Works (see Duncan, 2003:151). Shell grit was extensively extracted from the east side of the Mud Islands (Hansard 13.8.1884:988, cited in Yugovic 1998:93) for use in glass production in Melbourne and for ceramic pipe salt glazing in Geelong [BM] (Evans 1978: 81; Wynd 1988:54).

The strategic importance of the islands during the Franco Prussian war of the early 1870-71 led to their declaration as a temporary defence reserve in anticipation of a probable fortification in 1872 (VGG 19/1/1872, cited in Yugovic 1998:233), and may have slowed or halted guano mining on the islands around that time. However, these plans were shelved in favour of the construction of two artificial island fortresses at Popes Eye and north of the South Channel (Wiseman et al. 1864:37; Jervois 1879: 4; Kitson, 1987:1.1, 6.1).

The islands were also popular for daily tourist picnics from the 1870s onwards (Beavis and Raison 1982:9; [CA;LF]), and continued to be used by young men as a haven for parties and other antisocial behaviour up until at least the 1960s [JA; GR;LM]. Local recreational sailors regularly visited the island for picnics, and a local yachtsman built a small pier inside the lagoon near the SE end of the islands in the 1960s, where a shallow channel provided access for small yachts at high tide [CA].

Renewed opposition to guano mining from 1884 onwards, along with the discovery of Storm Petrel habitats in 1882, led to the proclamation of the islands as a bird sanctuary under the Game Act in 1902, as a State Wildlife Reserve by 1961, State Nature Reserve 1985, and as a

component of the Port Phillip Heads Marine Park by the end of the twentieth century. The Mud Islands are also listed on The Register of the National Estate, and on the Ramsar List of Wetlands of International Importance (Yugovic 1998:22, 95, 233)

III) Coastal Erosion and Changes

The islands have changed markedly over time, and were particularly affected by rock blasting in the Rip during the 20th century, which supposedly altered the wave action and hence the configuration of the Islands (Bird 1873, as cited in Yugovic 1998:31). The only stable sections have been Boatswain Island and Middle Island, which has subsequently been incorporated into Eastern Island (Yugovic 1998:29-33). A number of anecdotal and historical records recorded that the coastline changed dramatically after 1935, when channel deepening was begun at the Heads (Yugovic 1998:33, 99, 194; [CS]). Rabbits were first noted on the islands in 1889, and it is speculated that fishers introduced them in the nineteenth century as an alternative food supply. By 1945, they were in plague proportions, and when their burrows affected the storm petrel population and further contributed to coastal erosion, an aggressive eradication program was undertaken in 1960, and 1980 which led to their extinction on the islands (Yugovic 1998:96-7; [LJ]).

C) Archaeological Evidence

I) Eastern Island/ Middle Island (Mud Islands)

A large excavated area which was denuded of undergrowth located towards the northern end of Eastern/ Middle Islands in 2004, is the quarry formed by excavation of the phosphate rock. The area known to local birdwatchers as "The Airstrip" is almost certainly the remains of the former tramway line, and is now covered in hollyhock vegetation. Pier piles once extended up to 60 ft offshore and several concrete hut platforms were visible here in the 1940s [BM]. Several piles from the former pier were still extant in this area up until c. 2000, but many have been burnt for firewood by visiting tourists. A single pile from the former pier is still evident at the eastern (foreshore) end of the tramway line approximately 5m inland (Yugovic 1998:95; [GrW; IR; JY; LJ]), which suggests that the tramway line was either elevated on piles, or that the foreshore has since prograded. "Black" alcoholic and torpedo bottles tentatively dating to the 1880s have also been reported up to 200m offshore along this entire area [SA].

Many large lagoons in this area are probably the remains of former guano quarries, although no archaeological material was found in this area due to very thick vegetation coverage.

II) Boatswain Island (Mud Islands)

A shack was formerly visible on the south east corner of Boatswain Island [LJ], but no traces of these structures were evident during an inspection in 2004. However a large flattened area approximately 10m square was visible in this area, along with numerous stands of exotic shrubs. This area may have been part of the original garden occupied by Grace in the 1860s, one of the many fishing or guano residences that once occupied the islands. The location of this flat area was ideally suited to a hut site, as it was sheltered from southerly winds by a large dune, and was adjacent to the lagoon and its southern entrance. [IR] reported finding a German Beer bottle (whose company was later purchased by Carlton Breweries) was later officially dated to 1895, and other Queenscliff residents have also found bottles in this area [PF]. Native plant remains in this area (Malva Australiana) were known to be confined to disturbed high nitrogen rich environments, such as guano mines [NW], and may in themselves be an indicator of guano mining activities.

A timber pile and plank and a black alcoholic bottle base that were discovered on the foreshore approx 180 m to the north west are probably related to this site, as the land in this region was swampy with no suitable space to house any other structure. It is possible that the pile was used either for a vernacular pier or as a tie post for a small boat.

The remains of a timber breakwater installed in the 1940s were located on the western side of the island. Two 5m lengths of 4x 2" timber with a 2m section of cross bracing were relocated in the intertidal zone midway along the south western side of this island, and appear to have been displaced by from their original location by storms.

Figure B-2. 7: Malva australiana (formerly known as Lavatera plebeia var. tomentosa), Boatswain Island (Mud Islands).

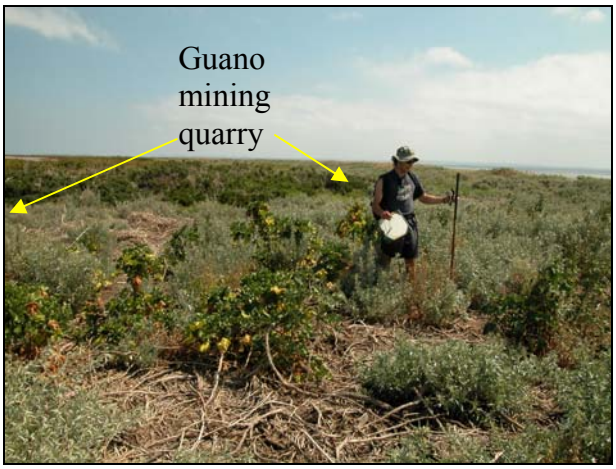

Figure B-2. 8: Guano mining quarry, Eastern Island, Mud Islands, 2004.

Figure B-2. 9: Possible Guano Mine Eastern Island (Pt# 5).

III) Western Island (Mud Islands)

Although temporary camp sites were reported on the North West dune of this island near the lagoon [BM] no archaeological evidence aside from flattened dunes were located during the 2004 inspection.

IV) Lagoon (Mud Islands)

A single square timber pile was located in the western side of Eastern Island inside the lagoon, and was probably the remains of a small pier constructed by visiting yachtsmen in the 1960s.

Note. It is likely that most archaeological deposits on the Mud Islands will be highly disturbed, given the prevalence of rabbit burrows for almost 100 years.

V) Coastal Erosion (Mud Islands)

It appears that the north-west section of the Mud Islands has been subject to extensive erosion since in the period between 2004 -2006, and this may have removed any archaeological sites located in the foreshore area, especially on Northern Island. Although the foreshore of Boatswain Island currently appears to have been relatively stable in this period, the disappearance of two small islands formerly located to the south (see AUS Chart 158) is of concern, as their presence would have formerly sheltered this area. Given the presence of many archaeological sites in this area, this region should be closely monitored in the future. Furthermore, any changes to local shoreline dynamics might significantly affect any archaeological sites on the islands, given their low elevation (approx less than three metres maximum), especially if they are subject to inundation. It is recommended that the Mud Islands' shoreline be monitored to detect any significant changes in coastal geomorphological processes that might threaten the Islands' archaeological resources.

VI) General Archaeological Evidence at Mud and Duck Islands

Two guano extraction sites were identified in the study area at Duck Island and Mud Islands. Both were characterized by a small lightweight vernacular pier located close to channels in shallow water (with 1880s alcohol bottles in this area at the Mud Islands – [SA]), excavated areas denuded of undergrowth, and remains of shacks built of timber frame and corrugated iron with household artefacts [LJ; GrW]. Both also were recorded historical sites of former market gardens (Dod 1931; Yugovic 1998: 1858: The first permit to occupy the Mud Islands was granted in 1858 to John Grace, which allowed him to construct buildings and a garden (Hansard, 17/9/1884: 1421, as cited in Yugovic 1998:), which is not surprising given the rich guano deposits in those regions.

A calcified deposit, possibly guano saturated limestone was also discovered at Duck Island. A possible causeway was between Duck and Swan Island [CA; CS; GW] was visible from aerial photographs (Figure??), and upright timber boat mooring tie posts at Pt Norgate were also be associated with this venture (or the firewood trade). The Mud Islands site also exhibited a narrow compacted flat area that was the remains of a tramway to the pier, and a similar cleared area was also located on Duck Island at the northern extremity. Another unexpected possible archaeological signature was the presence of an un-described example of the Malva Australiana, which is confined to disturbed nitrogen rich soil matrices such as guano sites like the Mud Islands (Walsh 2006). A summary of archaeological signatures of guano mining is presented in Table B-2.3.

Figure B-2. 10: Duck Island house site.

Figure B-2. 11: Duck Island house site.

Figure B-2. 12: Duck Island pier piles which extend to the man in the distance.

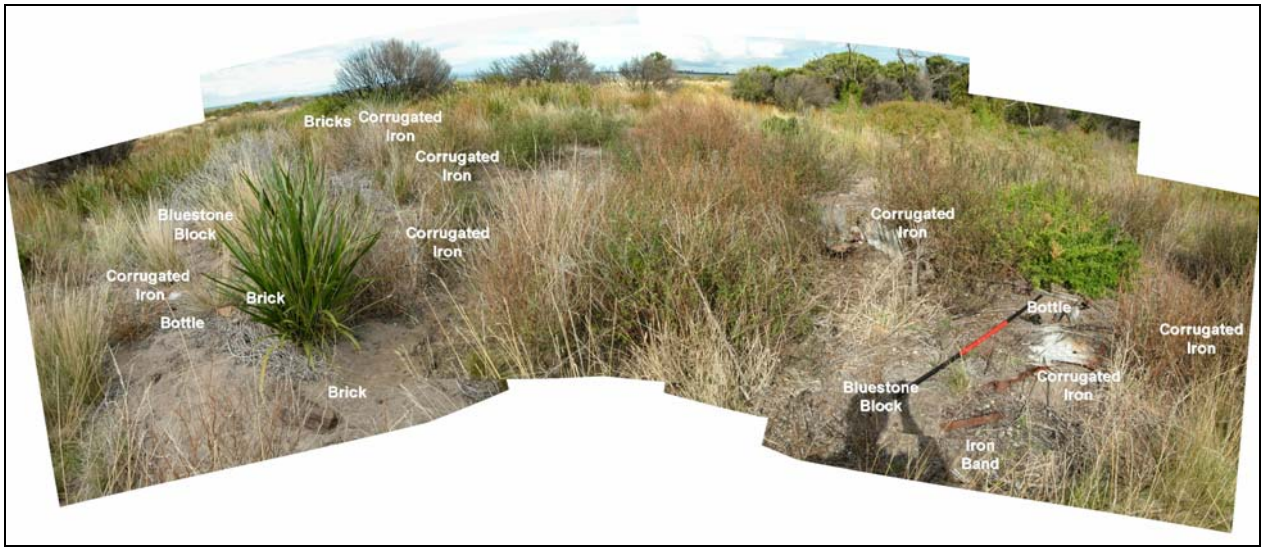

Figure B-2. 13: Duck Island house site artefact locations.

Guano Mining	Bird populations/ sanctuaries
	Boat Channel
	Bottles - Alcoholic
	Causeway (natural)
	Cleared approach to mine site from pier
	Denudation of vegetation
	Guano/ Phosphate saturated rock
	House sites - concrete pads
	Native vegetation - *Malva australiana*
	Mine Holes
	Pier Piles

Table B-2.3 Archaeological signatures of guano mining at Swan and Duck Islands.

Appendix B-3: Queenscliff and Swan Bay Piers

1) Queenscliff Bight

A) Queenscliff Jetty/ Fishermen's Pier/ Old Pier

Around the time of the first land sales in 1855, a public meeting in Queenscliff called for the construction of a public pier or wharf to facilitate access to the township via sea. The proposed pier would run out to a depth of twelve feet, and estimated construction costs would be about £1800 (GA 27/11/1855:2).

The small pier was constructed in 1856, and was linked to Queenscliff via a plank road (built in 1857) that traversed the marsh area up the current Gellibrand St (Cuzens 1912:1, Allom Lovell 1985:161). A lifeboat was added in 1856 (Fanning, In QS 10/12/1892) along with a lifeboat shed in 1860. A tide gauge house was added in 1858, along with unspecified repairs and additions in 1860 (VPRS 2143:58/101, 60/68). The jetty where the small steamers called at Queenscliff in 1858 was small, and made of the trunks of trees, some of which had their bark still attached (Bluelight, In: QS 27/1/1912), and later became known as the Fishermen's Pier when the first stage of the New Pier was begun in 1884 (Raison, 1987:24; QS, 19/7/1884). The plank road was replaced by a formed roadway in 1871 (Allom Lovell 1985:161).

A generalised geological map from 1861 (Daintree 1861 [plan]) shows the bent pier with a blunt end. Raison (1987:23) maintains that a northern arm was added in 1860, but the first clear map of the pier located was from 1863 (Cox 1863 [plan]) does not show this, which shows the pier extending 150m to seaward, with a small knuckle arm to the south that was later to become the base for the fishermen's shed. With the arrival of regular Bay Steamer passengers services (*Golden Crown*) from the 1870s, the pier was used extensively used for the tourist trade (Allom Lovell 1985:161). Several extensions were undertaken over the years, a crane and tramway jetty in 1861, and unspecified works in 1870, an extension in 1872 (VPRS 2143:61/157, 70/123, 72.3/192).

The *Queenscliff Jetty* was being extended in 1875, when new piles were driven, along with the underwork and flooring being laid. The work was scheduled to be completed for the tourist season, and it was anticipated that a further extension to the south would be undertaken to provide further accommodation (GA 21/7/1875:2). A goods shed was added in 1876 (VPRS 2143:76.7/150)

In 1877, the construction of the Geelong to Queenscliff railway was approved by the Legislative Council in September (GA 13/9/1877:2), and by 1879 the line was opened with regular services to Melbourne and Geelong (Allom Lovell 1985:160). A branch line was constructed to the pier to service the fishermen's deliveries to Melbourne. Two sheds located at the end of this line, the fish shed (used to load fish) and the pilots coal shed (Kilsby 190 [plan]), and by 1928 the coal shed had been replaced with the Ports and Harbours Buoy Shed (Larkin 1928 [plan]). Although the spur line has been removed, its route was until recently still evident in a series of laneways through the Fishermen's Flat.

Numerous repairs were undertaken in 1881-82 (VPRS 2143: 81.2/13, 82.3/4) A lifeboat shed that was mounted on the northern side of the pier the west of a 60m northern extension (Surveyor Generals Office 1882 [plan]) had been removed by 1883 (Norgate 1883 [plan]), which may have been due to repairs were undertaken at the pier in 1882, after the decking was considered dangerous (QS 23/12/1882). When the pier proved to be too shallow to service the new deeper drafted bay steamers, a new pier, almost twice as long as the original was proposed to the south to accommodate the larger vessels (QS 22/6/1889). In 1888, a 400ft extension was

added to the pier, bringing its total length to 1450ft, with dogleg to the north (Sutherland, 1888b:158).
When fishermen expressed concern about the lack of a railway connection to the pier in 1893, a surveyor from the Railways Department was despatched to assess the situation at the request of Mr Levien (QS 22/7/1893).

By 1906, the shoreline was prograding out towards the pier, and it appears from a plan from this time (Smith 1906 [plan]) that surveys had been undertaken of the water depth directly to seaward. The lifeboat shed was now mounted on the New Pier 1894 (VPRS 2143: 94.5/196). In 1908, fishermen expressed concern about silting at the old pier, and the inconvenience of offloading fish at the New Pier, especially due to its use by the Bay Steamers. It was advocated that the recent work on both piers to reduce siltation had failed (piles had been removed and lateral beams attached to encourage scouring), and that the approaches to the Old Pier were silting up, as was the whole bay. A suggestion was made to extend the Old Pier 200ft to the edge of the seaward channel where tidal influence would keep the approaches clear, but this was rejected by the Ports and Harbours Department, who favoured waiting for the effects of the pile removal to become evident (QS 21/11/1908). By 1914, a 210ft long seaward extension had been added to the pier, presumably to counteract a marked progradation of the shoreline that threatened to engulf the dogleg arm of the pier (Stewart 1914 [plan]).

Another extension was added between 1913-1915, when a second dogleg was added. This aligned with the dogleg extension of the New Pier, between which was built an island pier (dolphin) to provide additional shelter for the fishing fleet in bad weather, and was also used to land craypots and store coal for the *Mars* (Allom Lovell, 1985:162; [LID; PF]; Larkin 1928 [plan]). A storm tested the breakwater of the old pier, which reduced the impact of the NW storm on the town (QS 8/4/1916).

Following the pier's extension, a new lifeboathouse was constructed between 1926-1928, to house the new lifeboat *Queenscliffe* (Larkin 1928 [plan]; Allom Lovell 1985:162).

A buoy shed was located at the root of the pier by 1928, and was connected to the pier via a narrow walkway (Larkin 1928 [plan]). By 1948, there were 4 sheds on the Fishernmen's Pier:

- Rope Shed: Used for storing fishing ropes and tackle;

- Fishermens Shed: Used as a waiting shed/ communal hall by fishers prior to leaving for the days work;
- Lifeboat Shed: The old rowed lifeboat was replaced by a motorised lifeboat at this location. Siltation was a problem at this location, especially after the cut had been completed. When the Goorangi Shipwreck occurred in 1940, the lifeboat grounded and had to be dug out of the sand. The lifeboat was shifted to a new shed on the new pier in 1948 [GW].
- Slipshed: Housed a winch which was used to pull the fishing boats up the slip. All fishing boats were pulled out of the water in rough weather and stored on the pier [GW]

The pier had silted up and was buried along almost half of its length by the late 1950s, and the exposed section was demolished in 1963 ([JP]; Raison, 2002:24), but it is unclear of all the piles were removed [GW].

B) Boat Jetty/ Doctors Jetty

In 1852 the Health Officer previously stationed at Portsea was transferred to Queenscliff, and the Doctors Jetty was built some years later on the site of the current Pilots Jetty (Dod 1931:9 Noble 1979:43). However, Simkin (n.d.:7) states that there was no pier in the township around 1853-54, which was reiterated by Fanning, In QS 10/12/1892), who commented that when an

ordinary ship's lifeboat was put into service at Shortlands Bluff in 1856, it was moored off the Customs Quarters as there was no shed or jetty. It was noted that in 1866, the boats of the Health Officer were stored on davits at the Doctors Jetty in 1866 (Bluelight, In QS 19/8/1911). A pier known as the Boat Jetty was built on this site in 1864, with four timber davits were installed the next year (McWilliams n.d.[plan]; VPRS 2143: 64/288, 65/92, 65/159) was almost certainly the same structure. The Doctors jetty is mentioned in regards to the war games in 1886 (QS 1/5/1886).

> There was a jetty originally for the Doctors boat to land at. It was situated on the site of the current Pilots Jetty. The Doctor would row out to incoming vessels to check for any infectious diseases [PF]

A pile in the water near the current Pilots Pier was used to help in the launching of beached boats, where a line was attached to the boat which was then hauled out [JP].

C) New Pier

With the increase in passenger steamships servicing the town, a new pier was proposed to alleviate the pressure on the old pier. In 1882, the QS (23/12/1882) reported that funds had been promised by the government to build a new pier at a cost of £15000. The new pier was approved by 1884, and was to be built to a length of 300ft in 13ft of water at the end of Simmonds Street, with further extensions to follow (QS 10/5/1884). By July that year, £5000 had been allocated to the construction of the pier, and tenders had yet to be let (QS 19/7/1884). The 702 ft pier was constructed from 1884-1885 (VPRS 2143: 84.5/257; Allom Lovell 1985:161), and further calls were made to extensions in 1886 (QS 3/4/1886), when it was lengthened by another 300ft (VPRS 2143:86/209). In 1886-1887, another 200ft extension along with a 300ft dogleg extremity, a new shelter shed (still extant), repairs to the existing shelter shed, life boat shed, and tramway tracks were undertaken (VPRS 2143:87/1~2, 87/210, 87/133, 87/298; Allom Lovell 1985:161), and further work was undertaken in 1888 (COPW 1888). By 1889, the pier was not of practical use, despite ample "L" shaped loading facilities and it being twice the length of the Fishermens Pier, as the water at its extremity proved to be the same as that at the other pier. The older pier was used in preference to the new one, due to its shorter length for passenger disembarkation (QS 22/6/1889). A new pier was proposed as a replacement (see below), but this was vigorously opposed by some community members, who advocated that a 900ft extension should be added to the new pier at a cost of £15000, thus rendering the newly erected expensive L section redundant.

In 1888-1889, a lifeboat shed was built to house the davit hung lifeboat transferred from the Fishermen's Pier, and was located on one of the (since demolished) landing stages on the southern side of the pier (Allom Lovell 1985:161).

In 1911, after lobbying the previous year by fishermen, a new 300ft L shaped breakwater extension was approved for the New Pier along with the opening of two bays on both piers to alleviate the siltation problems (QS 17/9/1910). A new breakwater was built at the New Pier to provide better protection for fishermen's v\boats during storms. Until this time the fishermen had to shelter their boats behind Swan Island in rough weather (QS 19/8/1911). Breakwater planks were installed on the new pier to provide protection for the fishing vessels moored between the two piers [GW]. The installation of the breakwaters on both piers is an important archaeological signature of the mooring area for fishing boats between them. The angle of the dogleg was fitted in 1922-1923 (Allom Lovell 1985:162).

There were 4 sheds on the Fishermen's Pier:

- 1st Lifeboat Shed: This was the first lifeboat provided in Queenscliff, and was later moved the Fishermen's Pier. The shed housed a rowboat, manned by 16 rowers. The lifeboat was

used at the Pt Lonsdale Lifeboat shed for some years, but it was often unsafe to launch it and often could not recover it there, so it had to be brought back to Queenscliff until the weather abated. The lifeboat was sold in 1947 and used in Welshpool to cart timber until it was again sold and converted into a crayboat. All dinghies were stored on the new pier, and were sculled out to the couta boats moored between the two jetties [GW];

- Waiting Shed: This structure was built provide shelter for the Bay Steamer tourism trade passengers;
- New Lifeboat Shed: This shed was shifted to this location in 1948 after the fishermen's pier became silted and unusable for launches [GW];
- Coal Shed: Used to resupply the defence boats *Mars* and *Vulcan* and possibly also the Bay Steamers if needed;
- Landing: A landing on the north side of the pier that was used by the lifeboat. Another landing seaward of that was used for transferring bullet cases to the *Mars*. It was used by the army vessel *Mars* which was sold after the war (1946) [GW].

Concern was raised about the safety of pier's dogleg in 1979, at which time the end was falling apart and was about to be removed (GA 4/12/1979).

D) Island Pier/ Dolphin

There was a dolphin between the Old and New Piers. This was used by the fishermen to dump their nets on for security. It didn't have a ladder to climb up the side. I saw it in the 1950s when I was on holidays with my family [LM].

E) Proposed New Pier Under Fort at Shortlands Bluff

In 1889, after agitation from a number of "agitators" within the community, a fourth pier was proposed under the fort at Shortlands Bluff. In June 1889, the Commissioner of Customs (Mr Patterson) visited the township to assess the necessity and possible location for the new jetty. The jetty was opposed by the Defence Department, due to its proximity to the fort, and by a number of community members, who lamented the slow progress of the New Pier, and that the proposed construction of another pier would either divert badly needed money away from it, or sink both projects. The new jetty's location was proposed under the site of the lighthouse, and would extend into 27ft of water at a cost of £8500. It was advocated that ocean going steamers would be able to unload here in preference to Williamstown, which could have had major implications for the development of Queenscliff as a major international port (QS, 22/6/1889).

F) Silting

Silting appears to have been a serious problem around the Queenscliff coastline for some time. In 1907, the QS (20/4/1907, 2/11/1907) reported that several hundreds of tons of sand had accumulated around the Old Pier, severely inconveniencing fishermen and local trading vessels, but that it was likely that the sand would again be washed away with time. By November 1907, plans were being made to cut and blast away the "forest of (old disused) piles" which had been left under the pier, and to remove landings from the pier. The dredge Pioneer was also employed to remove silt to a navigational depth alongside the Old Pier (QS 30/11/1907), and completed works there in February 1908 (QS 29/2/1908). Further works were undertaken at both piers to remove piles to encourage scouring underneath the piers (QS 29/2/1908).

G) Tobins Jetty

Tobin's Jetty stood just in front of the present railway station (QS 24/12/1910).

H) Swan Creek Slipway

A new slip was being built at Swan Creek in 1912 to allow boats to be slipped and cleaned after the crane was removed from the old Pier (QS 25/5/1912).

I) Swan Ponds Pier

A small pier was built by fishers who lived on the Swan Bay side of Queenscliff to service the small craft they kept there possibly as early as 1913 [CA]. In the 1970s, a small channel was dug in Swan Bay to service this pier [LID].

> Several boats from people living on the hill used to moor boats there… that would go back to the early part of the century…there was once a deep water channel there. Fishing boats were moored there…round built boats - small fishing boats that were just used in Swan Bay. The bridge to Swan Island used to be 1ft high, so boats couldn't get out to the bay from there. The area has silted up heaps since then, when the first jetty was installed in 1913). There were 40-50 boats (moored) there in the 1960s [CA].

J) Swan Bay Yacht Club Pier and Slipway

One local resident recalled the piers associated with yachting in Swan Bay:

> The Swan Bay Yacht Club started in the 1920s and later became the Queenscliff Yacht Club. The channels were wider then, we used to race boats around the channels (in Swan Bay) in the mid 1920s. Blairgarie and Ballarat Teams would often participate in Queenscliff regattas… there was once 60 boats…Queenscliff teams would also go to their regattas. It was a big do, the opening of the yacht club, and there was always a band and a big spread. The yacht club had a shed in the 1920s. It was an 8 x 8 ft clubhouse. I have been yachting in Queenscliff since 1926. There was once a short pier, about 100ft long with 6ft of water at the end. The pier went to the end of the slipway, on the right hand side of the slip. The first jetty was built here in 1913. The pier was rebuilt in 1948, after the club had been through a phase where it existed technically only between 1930- 47. A meeting in that year revived the club. The slip was built in three nights (in the 1960's) [CA].

K) Swan Bay Outlet Pipes

Three pipe outlets were built to the west of the current bridge in 1899, and another to the west of the fort on the Queenscliff Back Beach after problems were experienced with sewerage seeping into the main streets. All these pipes were regularly flushed using the elevated water tower in the southern reserve, and led to the recognition of Queenscliff as one of the cleanest towns in the Commonwealth (Cuzens 1912:5). Repairs were reported to have been made on the main Swan Bay outlet pipes in 1911 (QS 11/2/1911). One pipe is still visible near the northern end of Mercer St, and two others were located at the ends of Learmonth and Hesse St [AH; CA]. These pipes were used extensively by locals for recreational fishing, as they gave access to deeper water in the bay [AH; LID].

2) Swan Island Piers

A jetty is mentioned at Swan Island during the Easter War Games in 1886 (QS 1/5/1886).

> When the Navy had it (the fort), if you belonged to the Royal yacht Club you could use the (Swan Ponds) dock, but that stopped when the army took over… the dock was there when I was a kid [c. 1930s] [GW].

3) McDonalds Pier/ Swan Bay Jetty

A pier was built on the western shore of Swan Bay by the McDonald family, who were farmers who also engaged in fishing (but it is unclear if they were recreational or professional fishers).

4) Portarlington Pier

The estimates for the additions to Portarlington Pier would be £3000 (QS, 19/7/1884).

Further information of other piers identified in this area through archaeological surveys are contained in forthcoming chapters, and other historical information was investigated (particularly cartographic sources and summary contracts books) but has not yet been collated for this study.

Appendix B-4: Submerged Causeway Networks of Swan Bay

1) Submerged Causeways and Across Bay Terrestrial Travel Networks

Several submerged tracks were revealed during oral history interviews. These narrow submerged causeways traversed various sections of Swan Bay, and were used by carts as a shortcut across the Bay or to access islands. These causeways at first presented a conundrum for the author, who was first dubious about their existence, but later field surveys revealed their tangible presence of at least one track, as did a number of historic documentary sources. The tracks were usually associated with primary industries and/or garbage disposal, as will be revealed below.

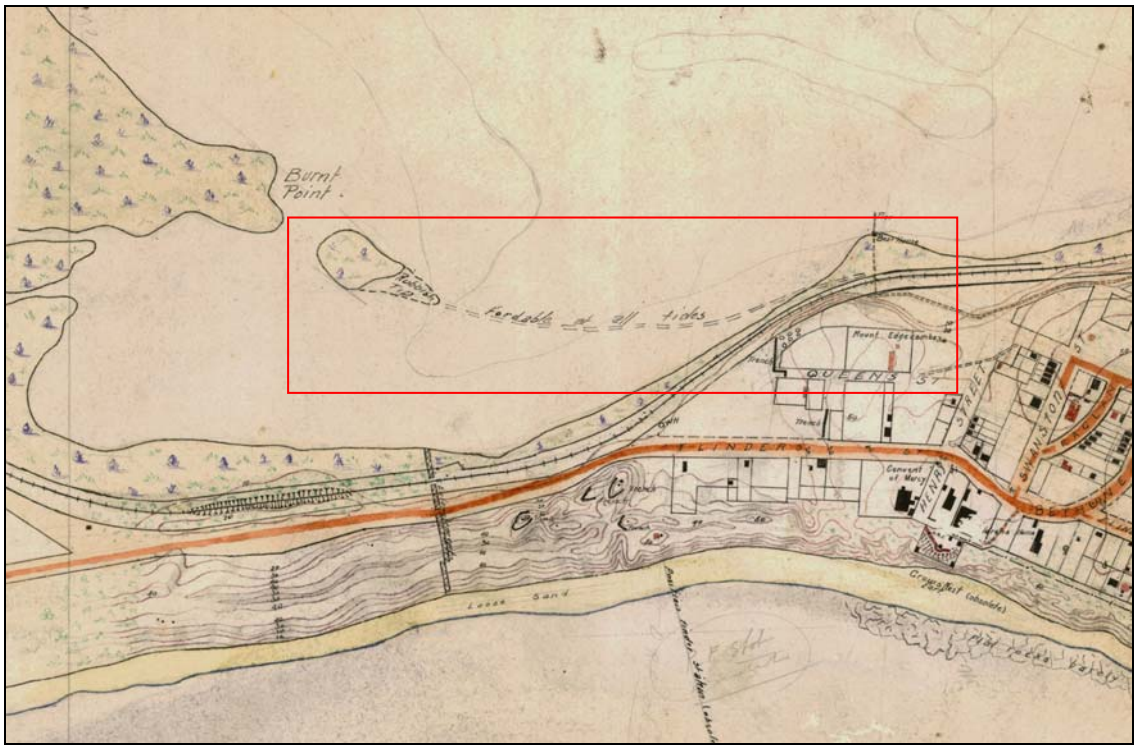

Figure B-4. 1: Plan showing location of Tip Island Causeway (After Plan: Barrett 1916, FQ Collection).

A) Tip Island Causeway (Queenscliff Yacht Club to Burnt Point)

The presence of a submerged road between Tip Island and the Queenscliff yacht Club was widely known amongst local residents ([CA; CS; GW; JP; LID; WN] – see below). These sources indicated that the track was used both as an unofficial track into the township, and as an alternative route for refuse and nightsoil disposal to Tip Island and Burnt Pt respectively. All these sources revealed that the track was made either of compacted limestone or shells, and was surrounded by quicksand or very deep mud.

Documentary evidence of this feature was eventually also located. The first postmaster of Queenscliff, Charles Dod (1931:54), recalled this shortcut across Swan Ponds was a 20 ft wide limestone track. It was used by a firewood collector (John Bryant) in the 1860s, whose bullock team started home on one occasion without him and missed the track, and the animals subsequently

drowned or died of exposure in the quicksand at high tide. Dod recalled seeing the carcasses of the bullocks being dragged ashore as a schoolboy, and indicated that the track lay between Burnt Point and "the Butts" (rifle butts - see Appendix C-4:1) on the cliff side. He again mentioned the track in regards to another occasion where woodcutters from Swan Bay rowed across to the pub at Queenscliff, and were drunk going back and missed the landing. One woodcutter slept in the boat and died of exposure, and the police were led to the boat over the short cut track. The track was again highlighted during the Easter encampment exercises, when a Frederick Sargood was in command of forces to block a mock invasion force into Queenscliff across the narrows. The invading army took the short cut route across the Swan Bay and captured the hill behind the sleeping camp (Dod 1931: 55).

In 1890, the Council expressed a strong opinion that nightsoil needed to be carted away from the township (QS 22/11/1890). The site was used for many years prior to being closed by 1894 (Council minutes, In QS 10/3/1894). The road to Burnt Point across Swan Bay had been closed by 1894 (Council minutes, In QS 10/3/1894), which caused some dissention amongst Burnt Point farmers as their only other access to Queenscliff was blocked by the railway gates and bad roads in that area (QS 7/4/1894). The appearance of tenders for road construction at Burnt Point by 1895 probably indicates that the bay crossing was never reopened (QS 1/6/1895). The existence of the road during WWII was obviously perceived by the military as a possible defence threat, and in 1944 the area was surveyed for barbed wire entanglements (Tate 1982: 104).

I) Oral accounts

> Rubbish was once dumped at Tip Island, where a cart transported the rubbish there via a narrow stone causeway across the Swan Bay swamp…The first road to Qcliff bypassed the sand dunes of Flinders Road (which were often impassable due to sand drift movements) and instead used a narrow limestone ridge causeway across Swan Bay. This causeway was used for subsequent dumping of nightsoil at Burnt Point and Rubbish at Tip Island [LID].
>
> A dray used to go over to Tip Island via a limestone track. I went over one day in the dray at high tide, and when we got there the whole island was a moving mass of rats. .. All the town rubbish went to the island. The sanitary man buried the waste nightsoil near Nelson Road. He would dump it in a furrow that was then covered over. He used to cross the channel to Burnt Point in his cart. There used to be heaps of tomato plants that grew in the shit. There was a limestone ledge that went over to Burnt Point. The track went over to the tip. [CS]

II) Tip Island

> Grandfather took the rubbish from the guesthouses. He was a Bob Beggood, and he took the rubbish out in the 1940s on a dray to the island. He arrived from Gippsland here in 1919. He built a house near Pt Lonsdale near the board of works in the late 1930s. Bob went fishing for food. [WN]
>
> They used to dump rubbish there…there was a corrugated causeway of hard sand (across to the island). If you go to where the Yacht Club (Swan Bay) is, and head straight towards the island you'll find it. It was marked when Jack Davis was the rubbish man, as he didn't know where the track was. We used to go over when we were kids, but didn't dare go off the track. There was supposed to be quicksand there on either side…the mud is quite deep around there…Bruce Priddle stepped out of their boat near the railway and went up to their waist in sand…it looks like sand on top, but is dark mud underneath…You used to line up the [power

> line] wires to get across…the causeway was at the meeting of where the two channels meet. [GW]

Mr Glennon, (we knew him as 'Bus') was the garbage man and he would tip all his rubbish on the island. He also had a few pigs at Burnet Point, just east of Tip Island, and Archie Warren and I would walk over to Burnt Point (Monk 2003:10).

> There was a road that went across the bay to McDonalds. There were once posts that marked the track to Tip Island. They were just sticks, and you lined them up with the big pine tree at Mt Nagle and kept to the left of that. Mt Nagle is the hill where there is the Roman Catholic Holiday Home, Mt Edgecombe call is in the street parallel to Flinders St. If you go up Flinders St go up 3-4 houses and look strait across and over. That was run for many years by Mrs Currima. There is a big Norfolk pine there. [JP]

III) Burnt Point Causeway:

> …the nightsoil man and his bullock wagon disappeared on the way to Burnt Point. The night soil man had been drinking in the Bendigo Hotel, and left to go to Burnt Point, but wasn't seen again. The track still goes across there. [GW]

> The Butts: Queenscliff had a rifle range called "the butts" near the junction of the Geelong Road at the former Queenscliff High School site. A tree there was used to support the rifles when firing out over Swan Bay. This site retarded the use of the causeway across Swan Bay, as it was in the firing line [LID].

> There was a limestone road going across from the Yacht Club to Tip Island that was underwater that was used by the tip cart. We used to walk across to Tip Island as kids, and the water never got any higher than your knees. The way across was marked out with sticks, so you wouldn't get off the track. There was supposed to be quicksand on either side, and I tell you we made sure we never went off the track. They marked out the track for the new driver who didn't know the way over. One day a bullock dray went over on their own and got stuck in the mud and drowned. They were pulling dead bullocks out of the mud for some time after that. The whole island was alive with rats. I used to go over with my dad, and my foxy, the fox terrier, would have a great time killing them. He would dig them out and shake them until they were dead, and then grab hold of another one and so on until he was too tired to kill any more. When it started off they used to dump the rubbish on part of the track, I think there was a small island there, but it was on the path of the road, and the rubbish formed part of Tip Island. They stopped using it in the 1940s, but it was used right up until then. I remember it was a very bumpy tracked when you went across on the cart. The cart would be shaking up and down. It was like the corrugations you get on the dirt roads, and you would be shaken up and down all the way over. The track used to go from just the other side (west) of the Yacht Club, and wind its way across to Tip Island. It wasn't straight, but wound its way across. There was supposed to be quicksand in the area, but we looked all over that area and never came across it. There's supposed to be a lot of quicksand around here. They nearly lost a horse one day over at Swan Island, when it got stuck in the mud, and they had to plank it out to get it free of the mud. One day we had a bloke jump out of our boat in Swan Bay, and he disappeared up to his waist in mud. He would have been in real trouble if we hadn't been there to pull him out. [GW]

> The nightsoil man and his bullock wagon disappeared on the way to Burnt Point. The night soil man had been drinking in the Bendigo Hotel, and left to go to Burnt Point, but wasn't seen again. The track still goes across there. [GW]

B) Burnt Point to Knights Road

There were many anecdotal accounts of a causeway that road from Burnt Point to Knights Road that may have been used as a shortcut into Queenscliff.

> I have heard stories of people taking firewood across Burnt Point on a causeway. [GH]

There was once a government reserve above the high tide mark north east of Knights Road, but not SW of that point. Peter Munster, a local historian, has suggested to Steve that this was because the Portarlington Road reserve stretched as far as Knights Road and then cut across Swan Bay via a causeway to Queenscliff (NOTE: Les Dusting has suggested the causeway was more likely to have crossed to Burnt Point.). [SS] spoke to Bob McDonald who owns the property directly across from the Swan Bay General Store (run by Dawn and Robert Beames) – he said that a road ran across from Knights Road to the end of Burnt Point.

> It was a narrow natural shell grit road that was covered with shallow water, with quicksand on one side. The road had always been underwater, and was a narrow natural feature. [SS]

> When told about the information from Parks Victoria Staff that there was a causeway from Knights Road Les thinks the causeway was likely to have crossed from Knights Road to Burnt Point, as the water was too deep for a direct crossing to Queenscliff across Swan Bay. Les stated that there was a fault line running along the western edge of Swan Bay, which provided a solid base for the Portarlington Road, and hence his reasoning that the causeway crossed to Burnt Point, which lies in a more direct route that may follow this fault line. [LID]

> There was a road from Knights Road to Burnt Point. Some of the locals have early memories of that [GW]

Ask Bob McDonald 52581801. He lives at Blairwood in Mannerim. He is 80, and his grandfather, and great grandfather lived there. Gordon, his brother lives on the other side 52512530 [JP]

C) Duck Island to Pt Norgate (Swan Island) Causeway – Guano Mining

Duck Island had always been known for its fertile soils, and in the 1860s, George Admans (owner of Swan Hill Hotel) set up a poultry farm and market garden on the (then known as Rabbit Island) that was run by Bob "Dinghy" Tommy. The eggs and vegetables were transported round to Queenscliff when the tide permitted (Queenscliff Boy, QS 24/12/1910; Dod 1931:29). Guano mining was also undertaken at Duck Island (Yugovic 1998:20). Many oral accounts hinted at the presence of a causeway between Pt Norgate on Swan Island and Duck Island in Swan Bay, which was used to transport guano mined at Duck Island and appears to have been largely exploited to meet the needs of local farmers.

Local residents recalled:

> Dad said his uncle shifted guano from Duck Island on a horse and cart…that was somewhere around 1924…Jack Werry, my great uncle dug that site (at Duck Island). He died in 1936, so it must have been sometime before then. He had market garden at the back of the cemetery at Point Lonsdale, so I suppose he could have used it there...[GW]

There is also strong evidence to suggest the presence of an underwater causeway across the strait between Swan and Duck Islands. [CS] recalled:

> There was a bloke who used to take a horse and dray to Duck Island from Swan Island. He had a jetty for loading guano at Swan Island. It was just for local supply I think. There was a boat channel near it, but I think it has since silted up. [CS]

Local knowledge [JB; KH] has confirmed the presence of a hard seabed floor in this area, which is also visible from aerial photographs.

Another local resident of Swan Island, George Pigdon, lived at Point Norgate (Swan Island) and moored his boats there.

> Old George Pigdon lived in Stingaree Bight…He moored his boats there in Stingaree Bight. They called him the Bishop of Swan Island. He used to go rabbiting and fishing for whiting. [GW]

> The Pigdons cut a channel around the back of Swan Island between Rabbit (Duck) Island and Swan Island so they could moor their boats there. They cut it close to Swan Island near the track over to the island. It was always rumoured that there was a track over to Duck Island, but I never saw it. [CA]

It is unclear whether the Pigdon family was also involved in guano extraction at Duck Island, but anecdotal and historical evidence that they were either fruit and vegetable merchants [CA] or farmers (Sutherland 1888b:168; Wynd 1988:176; Weaver 1996:11) suggests that they may have been using this guano on their own market gardens. [JB] has also suggested that Pigdon's boat moorings were used to tether barges used in the Swan Bay firewood and bark trade, and it may be possible that these barges were utilized to transport guano from this area to Pigdon's market gardens, before they were loaded with timber and bark.

As kids we would come across from Swan Island to Duck Island looking for black rabbits…We had a net boat in Stingaree Bight. There were rats everywhere there, and we had to keep a rabbit trap on the step boat to catch the rats, to stop them eating the

> nets. We would go to Duck Island and net there, and we would come back around 1am. We would wheel the boxes up to the boat, and box up the fish, and then wheel the boxes back to Queenscliff. [CS]

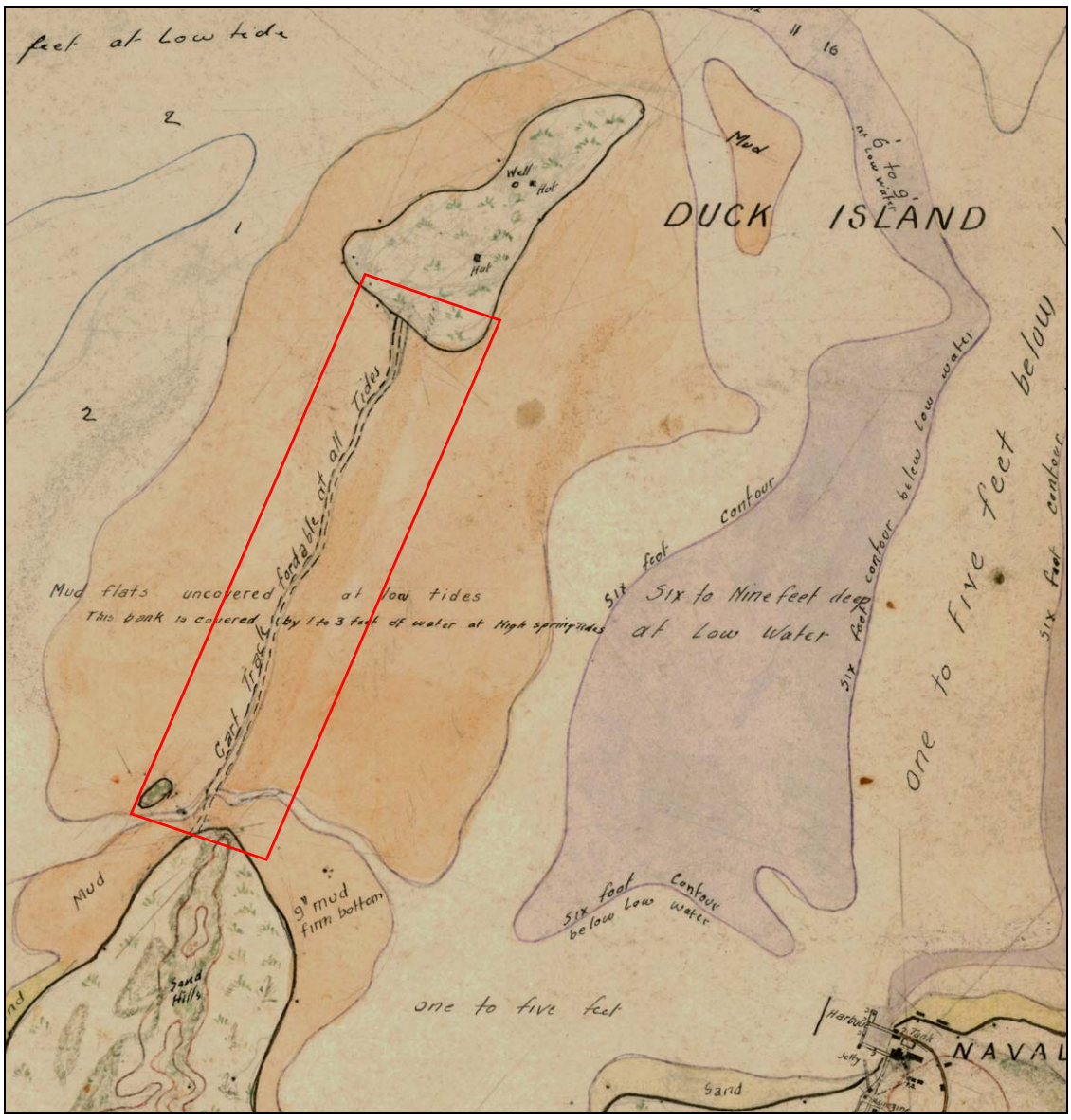

Figure B-4. 2: Duck Island to Pt Norgate Causeway, c. 1918 (After Barret n.d., FQM Collection).

The guano mining activities are still evident at Duck Island in a large area denuded of most larger vegetation and grassy undergrowth (that is in abundance everywhere else on the island), and has various nineteenth century artefacts scattered around this location. Several small deposits of possible guano (or guano saturated bedrock) were located, along with several bottle scatters and concrete filed kerosene tins, possibly used for structural purposes. Posts associated with Pigdon's gutter and boat, moorings were still extant at Pt Norgate, although no trace of a pier or jetty was evident.

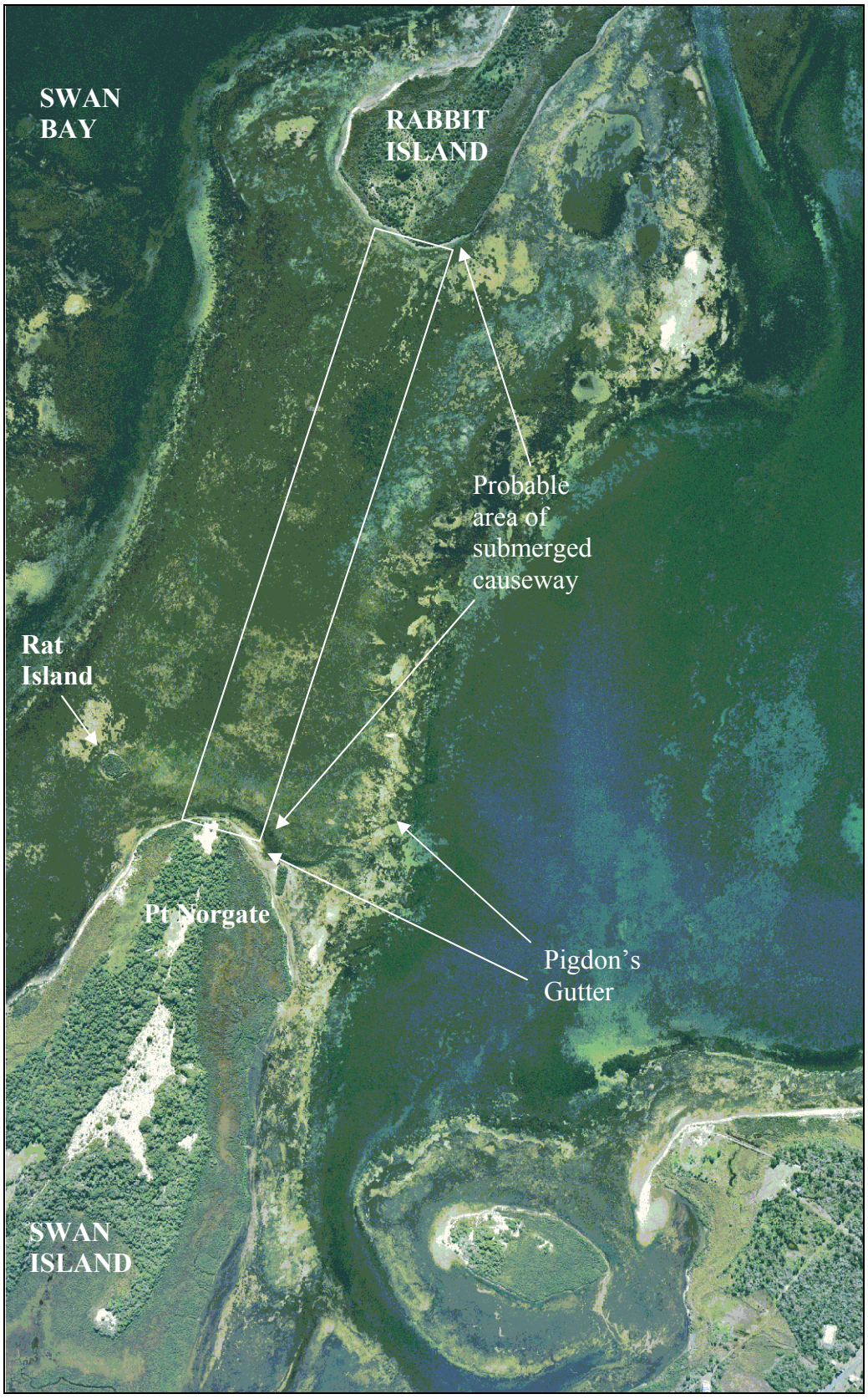

Figure B-4. 3: Aerial photo showing location of Pigdon's Gutter and possible causeway location (Photo: Photo Mapping Service).

2) Rubbish Dumps

Several rubbish dump areas were identified during the survey and these were particularly clustered around the western end of the town along the cliffs at Swan Bay, and on Tip Island. Remains of cliff top rubbish dumping is still evident on the slopes in this area, and consists of a wide range of general artefacts including ceramics, iron and glass. In particular, Tip Island demonstrated huge archaeological deposits, along with an access causeway that was evident by compacted shell and limestone, and scattered refuse. Another narrow causeway from the Island led to Burnt Point, where a Nightsoil pan dump was discovered.

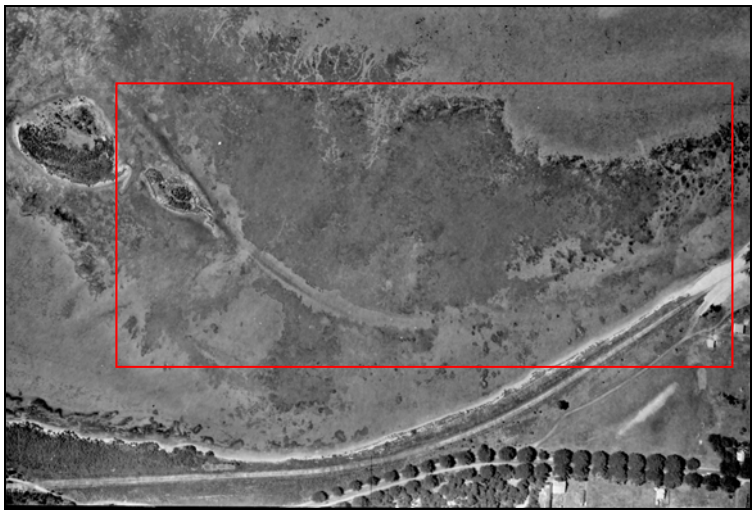

Figure B-4. 4: 1955 aerial image showing location of Tip Island Causeway (PH 3007, QHM Collection).

Figure B-4. 5: Tip Island causeway probe survey.

Figure B-4. 6: Tip Island artefact Survey.

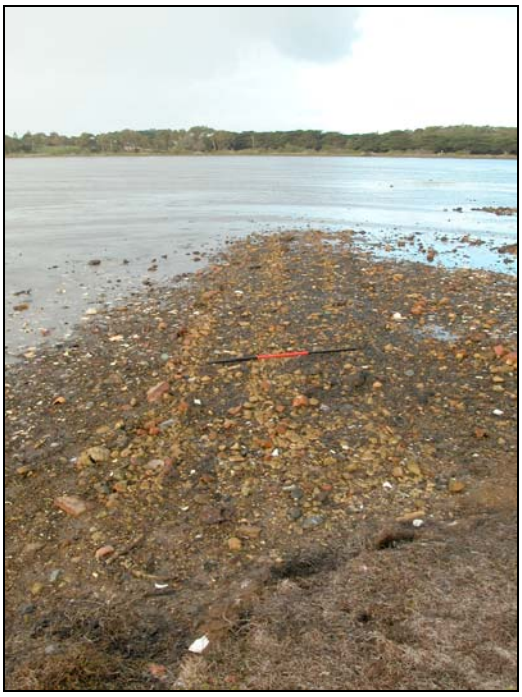

Figure B-4. 7: Western end of Tip Island Causeway.

Figure B-4. 8: Nightsoil pans, Burnt Point (Scale =1.5m).

Rubbish was also dumped from the Swan Island Bridge, and divers have reported finding a variety of household refuge in this area. Other dumps have also been found in the water offshore from various military bases and have already been outlined above.

The comparative lack of glass artefacts at Tip Island may be explained either by the recycling of bottles into jam jars and oil containers in the community [PF] or that they may have been purchased for glass recycling by the Australian Glass Manufacturer (QS 20/4/1918).

A) Nightsoil Removal/ Tip Island Rubbish Disposal

In 1890, the Council expressed a strong opinion that nightsoil needed to be carted away from the township (QS 22/11/1890).

The road to Burnt Point across Swan Bay had been closed by 1894 (Council minutes, In QS 10/3/1894), which caused some dissention amongst Burnt Point farmers as their only other access to Queenscliff was blocked by the railway gates and bad roads in that area (QS 7/4/1894). The appearance of tenders for road construction at Burnt Point by 1895 probably indicates that the bay crossing was never reopened (QS 1/6/1895). The existence of the road during WWII was obviously perceived by the military as a possible defence threat, and in 1944 the area was surveyed for barbed wire entanglements (Tate 1982: 104). Shapter recalled the existence of the track during the 1930s:

> A dray used to go over to Tip Island via a limestone track. I went over one day in the dray at high tide, and when we got there the whole island was a moving mass of rats... All the town rubbish went to the island. The sanitary man buried the waste nightsoil near Nelson Road. He would dump it in a furrow that was then covered over. He used to

> cross the channel to Burnt Point in his cart. There used to be heaps of tomato plants that grew in the shit. There was a limestone ledge that went over to Burnt Point. The track went over to the tip. [CS]

Tip Island has been used for rubbish disposal for many years, and was approached via the an underwater causeway that started near the Swan Boat Yacht Club and proceeded west before branching directly across the bay north to the island itself. An inspection of the site revealed literally thousands of artefacts, predominantly ceramics, with fewer than expected glass bottles evident. This may be explained by the recycling of glass during this period, both commercially (see advertisement to buy, In QS 16/3/1895), and domestically where they were used as both jam jars and oil containers for fishing boats [PF].

B) Swan Bay Cliff Top Rubbish Disposal

In 1884, the area to the east of the Rifle Butts was used as an informal rubbish dump by many of the town's residents. For 200 yards in every direction, "*every conceivable kind of filth is here deposited".* Rubbish was also reported to be everywhere at the Narrows area (Paul Pry, In QS 19/7/1884).

The area around the Swan Bay Boat Club was also used at one time as a tip, and [CA] reported that during the early days of the club some young boys dug under the floor of the current clubhouse and were pulling out bottle by the armful.

There was also a rubbish tip located opposite Tip Island that was used for many years [CA].