ARDENT LEISURE PTY LTD

Stage 1 Contamination Assessment:
The Spit Marina
Mosman,
NSW.

P0701675JR01_v2
May 2010

martens consulting engineers

ENVIRONMENTAL

WATER

WASTEWATER

GEOTECHNICAL

CIVIL

PROJECT MANAGEMENT

Copyright Statement

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All enquiries regarding this project are to be directed to the Project Manager.

Contents

1 Overview

1.1 Background

The Client (Ardent Leisure Pty Ltd) has commissioned Martens & Associates Pty Ltd (Martens) to carry out a Stage 1 assessment, to support an application to modify The Spit Marina under Part 3A of the Environmental Planning and Assessment Act 1979. This report details findings of a Stage 1 contamination assessment. The marina site comprises maritime leases 101 – 104 DP 1011363 and is located at The Spit, Mosman, adjacent to the Spit Reserve (Lot 7067, DP 1065245).

1.2 Project Scope

The Stage 1 contamination assessment involves:

- Historic aerial photograph interpretation (API) of the site.
- Review of oral site history provided by the Client.
- Inspection of the site to identify any areas of potential contamination.

2 Site Description

2.1 Site Inspection

A meeting and site inspection was undertaken on 20th of November, 2007. Works conducted during the field investigations included a general walkover inspection of the entire site and nearby areas to review existing buildings, local geology, contamination potential and vegetation.

2.2 Location

The site is located on the Spit Rd, Mosman and is within the Mosman Municipal Council (MMC) LGA. The site is located on the western side of Spit Rd, and to the north of the Spit Reserve. The marina's jetty and floating pontoons are located on Middle Harbour to the east. Attachment A provides the site plan with pertinent site features. The client leases the land subject to this application from NSW Maritime.

2.3 Existing Landuse and Vegetation

The site is currently utilised as a Marina, and has been generally operating in its current capacity since the 1960's. Located on the site is an existing marina complex (which includes restaurant, offices and toilets), maintenance / storage sheds, slipway, timber jetty and multiple floating pontoons. There is no vegetation on the site.

2.4 Topography and Drainage

Due to the construction of a sea wall along Middle Harbour and the development of the entire Marina site, the site's original grade is unknown. The existing sea wall along the tidal boundary of the site generates a relatively flat site, which drains to the west to Middle Harbour. The site is entirely covered by hardstand features and buildings.

3 Stage 1 Contamination Assessment

3.1 Existing Land Use

The landward component of the site is currently zoned 3(d) 'The Spit waterside business' under the MMC (1998) LEP. Existing land use and site features pertinent to the Stage 1 assessment are summarised as:

- An existing marina complex with restaurant.
- Slipway, boat maintenance sheds and hardstand areas.
- Sealed carparks and sealed access roads are located on the majority of the site which is not covered by the marina complex.
- Underground fuel storage tanks and associated bowsers (bowsers located on the adjacent timber jetty).
- Waste management and storage areas.

3.2 Site History

3.2.1 Existing Site Usage

Information regarding the existing site was provided by Bill Loader from d'Albora Marinas. Two underground storage tanks (UST's) are understood to be located on the northern side of the marina complex, underneath the sealed carpark. The tanks are approximately 10,000 L, with one storing unleaded petrol and the other diesel.

3.2.2 Aerial Photograph Interpretation

Historical API was conducted using photographs from 1942, 1956, 1970, 1982, 1994 and 2007. An API summary is provided in Table 1. API suggests that site land use from prior to 1942 to the current day has comprised marina's or boating based activities. The site has been refurbished numerous times and floating pontoons added to the marina complex in the period of 1956 to 1970.

Photographs used in the API are provided in Attachment A.

Table 1: Summary of API, detailing photo year and observed site land-use.

Year	Description of / Changes to Land-use
1942	Marina building observed on the site in similar location to the existing marina complex. The Spit Reserve is cleared of vegetation to the south of the site. Boats are moored in Middle Harbour, however there is no jetty or pontoon observed. Possibly a boat ramp to the north of the building.
1956	As above, however boat ramp to the north of the building is readily observed, and marina building appears to have slightly increased in size. Vegetation has regrown or been planted in the Spit Reserve and foundations for the new Spit Bridge are being constructed next to, and to the east of, the original bridge.
1970	Alignment of the Spit Road has changed (moved to the east) to match the new Spit Bridge. Jetty and pontoons have been added to the marina, and a carpark has been constructed on the eastern side of Spit Reserve. The marina complex appears to have been refurbished.
1982	As above, although the small jetty to the north of the marina building has slightly increased in size.
1994	As above, although the small jetty to the north of the marina building has been replaced with one that is offset from the building.
2007	No significant changes from 1994.

Figure 1: Aerial photograph (2007) showing the site in its environmental context (land based portion of the site outlined).

3.3 Potential for Site Contamination

Our assessment of risk of site contamination is made on the basis of available site history, API and site investigations. We note the following:

1. Site (oral) history indicates the site was been utilised for boating / commercial activities prior to the 1940's. The current marina building is approximately 30 years old.

2. API confirms the oral history.

3. The Spit Reserve has been a vacant reserve since 1942. The adjacent section of Spit Rd and the Spit Bridge were reconstructed in the period of 1952 - 1958.

4. Two underground fuel storage tanks and a sewage pumping station are located to the east of the marina building.

No signs of gross contamination were observed during site inspections due to the majority of the site being covered by pavements / buildings. However, due to the site's use as a boat maintenance operation and the presence of underground storage tanks, there is a potential that contamination exists on the site. Potential areas of general and

'hotspot' contamination are outlined in Table 1 and indicated on the site plan (Attachment A).

Table 1: Potentially contaminated locations, contaminating activities and contaminants.

Location	Activity	Potential Contaminants
Under pavements / behind sea walls	- Fill possibly containing building material, or waste. - Contamination of soil by industrial uses.	HM (particularly copper and tin in anti-fouling paints), hydrocarbons, OCP / OPP, asbestos, PCB's.
Soil adjacent to underground storage tank (UST) locations	Leakage from UST's, unknown material in the backfill.	HM, TRH, BTEX, PAH's.
Under operational areas	Pollution from boat maintenance, UST refilling and other boating activities.	HM (including tin), hydrocarbons.

Note: Heavy metals (HM – to include tin); organo-chlorine pesticides / organo-phosphate pesticides OCP / OPP; Hydrocarbons = total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene's (BTEX), polycyclic aromatic hydrocarbons (PAH's); polychlorinated biphenyls (PCB's).

Based on API and site investigations, potential contamination issues are the underground tank 'hotspot' area, potential contamination from imported fill and through *in-situ* contamination of soil beneath hardstand maintenance areas and contamination of bay sediments.

3.4 Conclusions and Recommendations

3.4.1 Conclusion

Stage One investigations reveal a potential for contaminants at the site. It is recommended that Stage 2 investigation works are conducted to ascertain whether there are impacts from the UST's or whether soil underlying the site hardstand areas is contaminated.

3.4.2 Recommended Sampling Regime

Recommended sampling densities for the Stage 2 contamination assessment are provided below:

Table 3: Number of sampling points for each potentially contaminating location.

Location	Number of samples / sampling points
Under pavements / behind sea wall	3 locations (with 1-2 samples / location)
UST's location	5 locations
Bay sediments under operational areas	3 – 5 locations (at two depths)

Exact sampling locations and sampling depths are to be finalised during inspection based on observed site conditions and access constraints.

3.5 Limitation Statement

It should be noted that the site Stage 1 contamination assessment was undertaken in line with current industry standards. No site soil sampling has been undertaken at this stage and a Stage 2 assessment with site sampling has been recommended.

It is important, however, to note that no site history analysis can be considered to be a complete and exhaustive characterisation of a site nor can it be guaranteed that any assessment shall identify and characterise all areas of potential contamination or all past potentially contaminating landuses. Therefore, this report should not be read as a guarantee that areas other than those identified in this report shall not be identified as contaminated on the site. Should other material be exposed during the site development process which appears due to visual indications or odours to be contaminated, additional testing may be required.

Martens & Associates Pty Ltd has undertaken this assessment for the purposes of the current development proposal. No reliance on this report should be made for any other investigation or proposal. Martens & Associates accepts no responsibility, and provides no guarantee regarding the characteristics of areas of the site not specifically studied in this investigation.

4 References

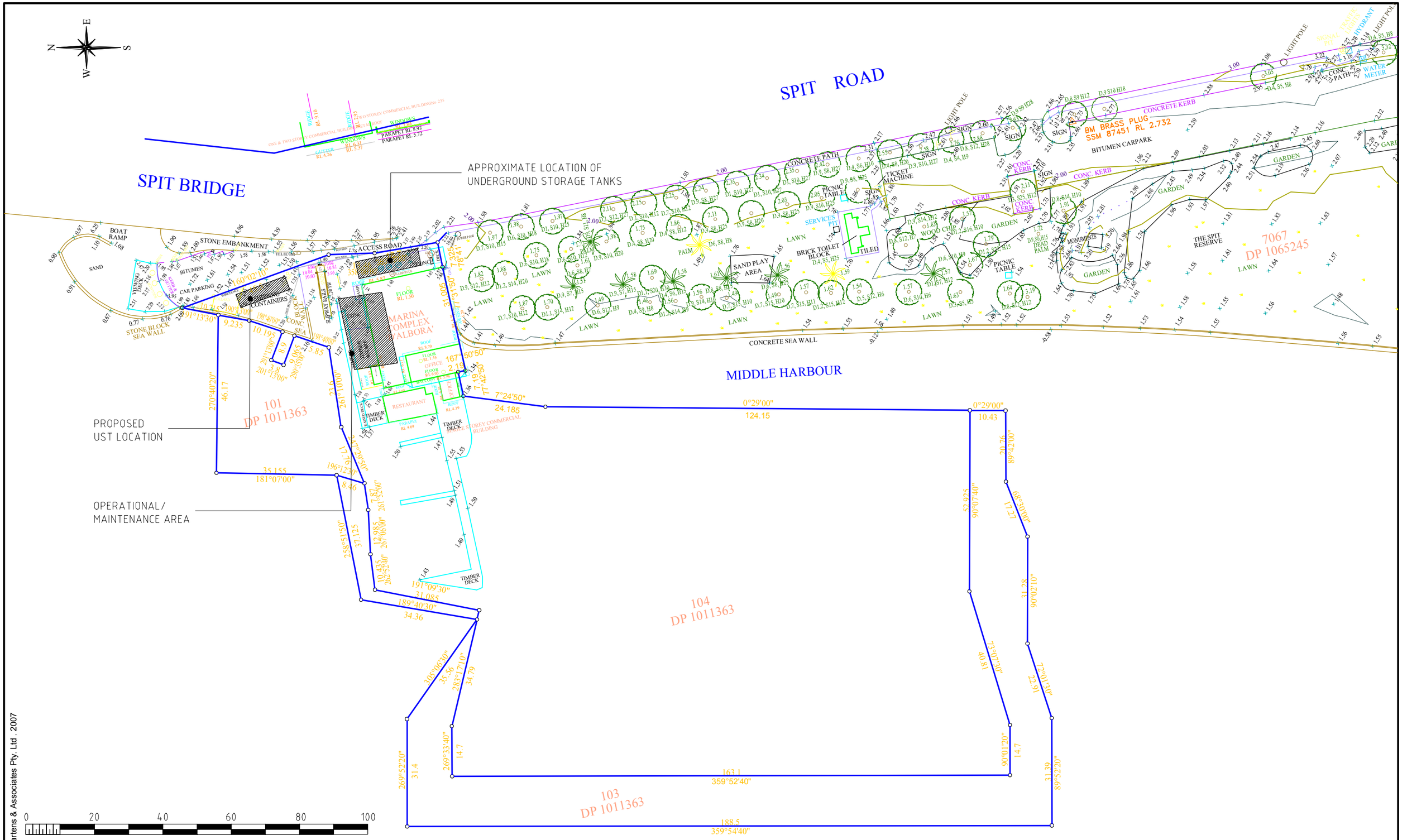
Department of Lands – Map Sales (2007). *Aerial Photographs 1942, 1956, 1970, 1982, 1994, 2007.*

NSW DEC (2006) 2nd Ed. *Site Auditor Guidelines*.

NSW Environment Protection Authority, 2000. *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites.*

NSW Environment Protection Authority, 1999. Environmental Guidelines – Assessment, Classification and Management of Non-Liquid Wastes.

5 Attachment A – Site Plan & Historic Aerial Photos



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CLIENT/ PROJECT
d'ALBORA MARINAS
THE SPIT
MOSMAN

TITLE
SITE PLAN

THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY
All measurements in mm unless otherwise specified.

PROJECT MANAGER: MR ANDREW NORRIS

DRAWING NUMBER: P0701675JD01_V1

DESIGNED: JSF
DRAWN: JSF
REVIEWED: ASN

DATUM: mAHD
HORIZONTAL RATIO: 1:500 @ A1, 1:1000 @ A3
VERTICAL RATIO: 1:500 @ A1, 1:1000 @ A3

SHEET 1 OF 3 SHEETS
PAPER SIZE: A1 / A3

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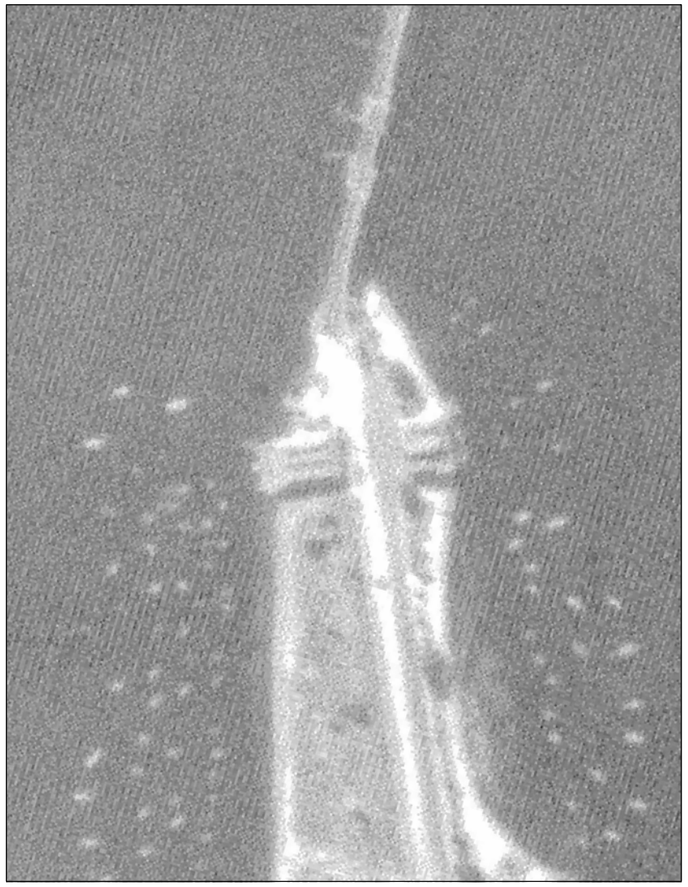

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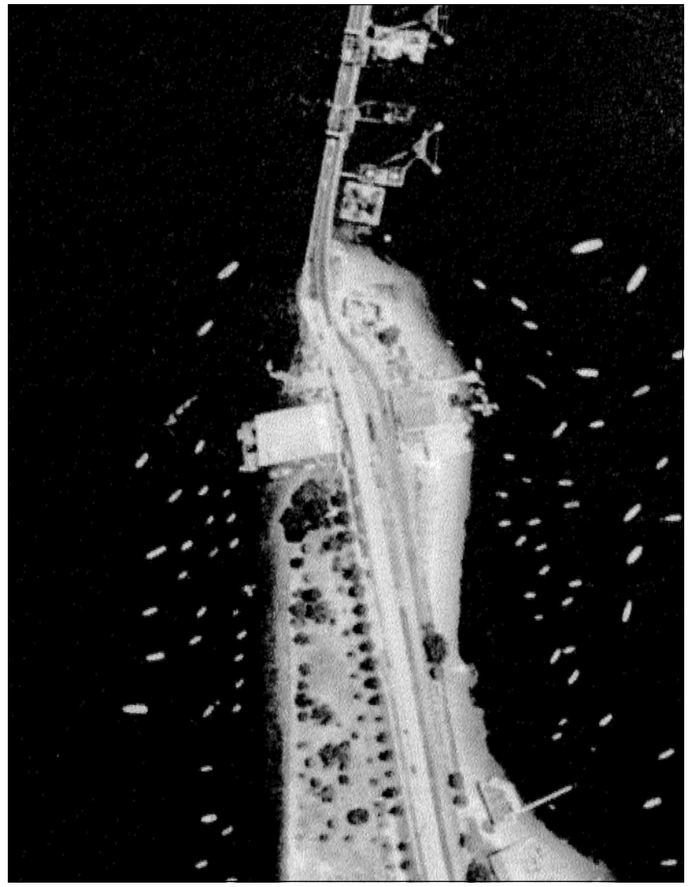

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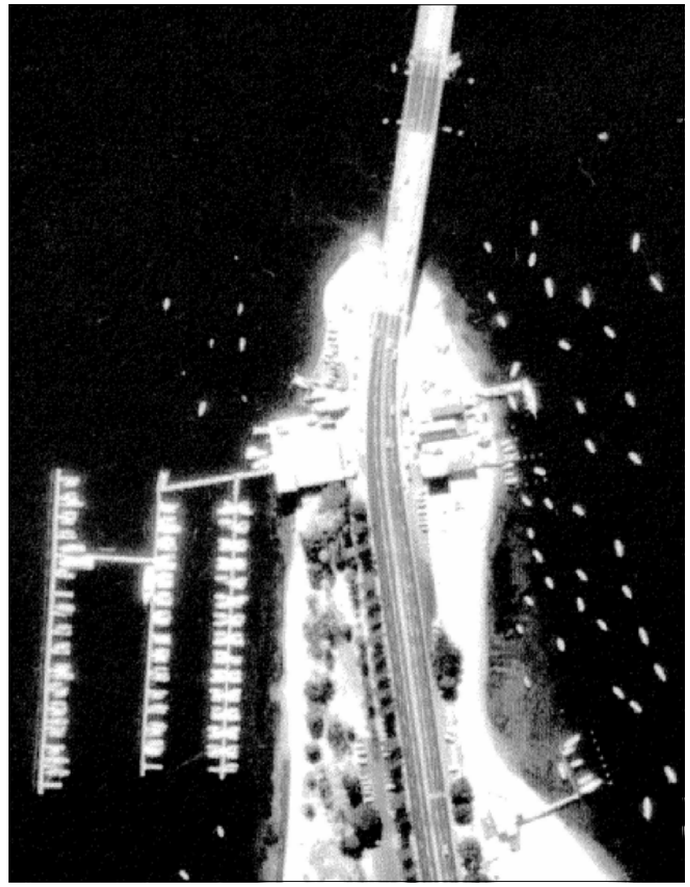

1970

0 40 80 120 160 200

UNITS - METRES

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HISTORIC AERIAL PHOTOGRAPHS

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REVIEWED: ASN

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HORIZONTAL RATIO: 1:1500 @ A1, 1:3000 @ A3

VERTICAL RATIO: 1:1500 @ A1, 1:3000 @ A3

SHEET 2 OF 3 SHEETS

PAPER SIZE: A1 / A3

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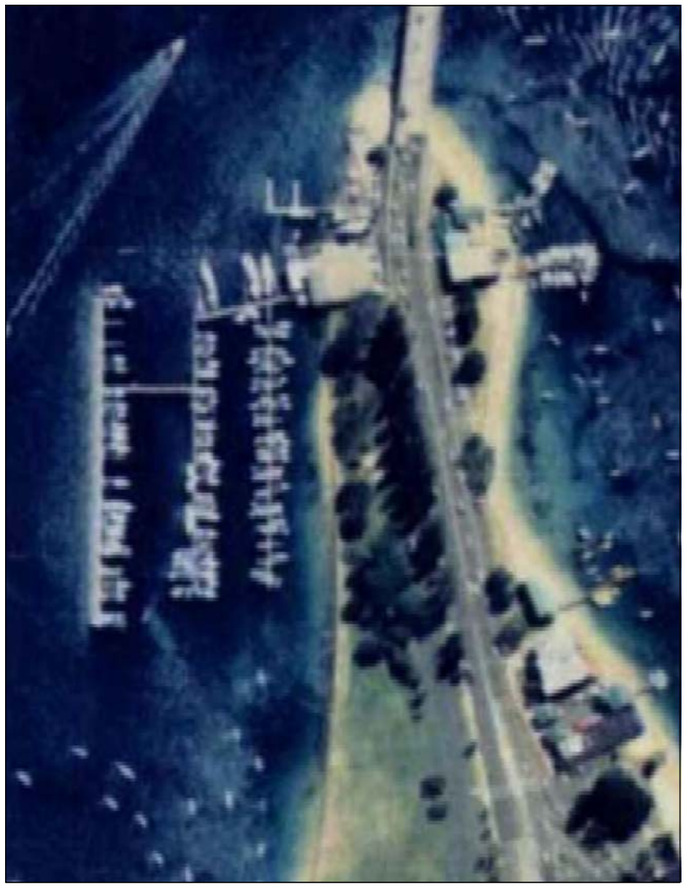
N
W E
S

1982



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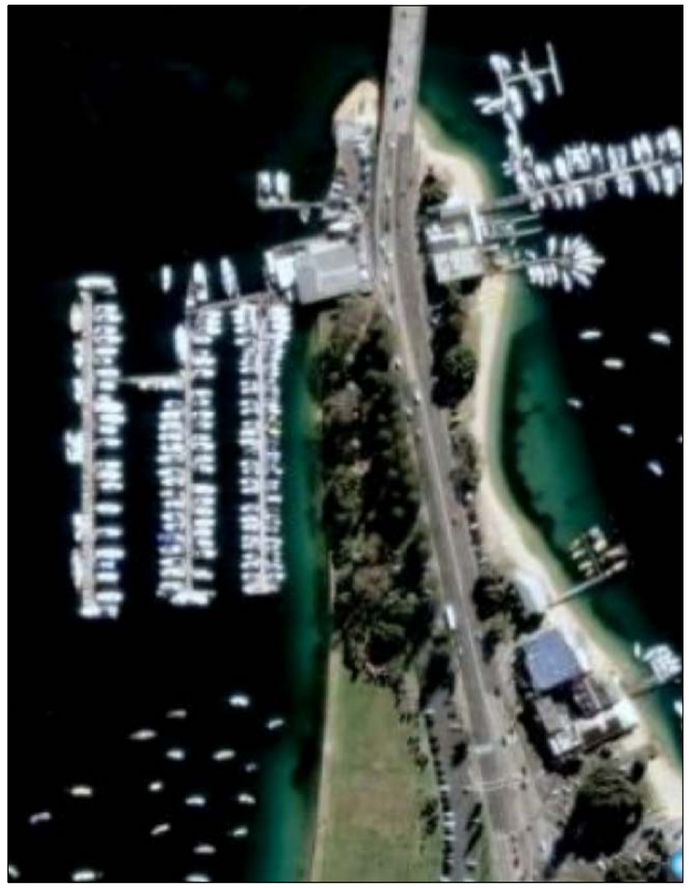

2007

0 40 80 120 160 200

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