



The Baroque on Lamma Limited
南丫島博察計劃有限公司

The Baroque on Lamma:
Project Profile
南丫島博察港計劃:
工程項目簡介

May 2011

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Project Profile

May 2011

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For and on behalf of ERM-Hong Kong, Limited	
Approved by:	Frank Wan
Signed:	
Position:	Partner
Date:	11 May 2011

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1 BASIC INFORMATION

1.1 PROJECT TITLE

The Baroque on Lamma

1.2 NAME OF PROJECT PROPONENT

The Baroque on Lamma Limited

1.3 NAME AND TELEPHONE NUMBERS OF CONTACT PERSON

Mr Ken Lam, Corporate Affairs Manager - The Baroque on Lamma Limited

Tel: 2780 8688

1.4 PURPOSE AND NATURE OF THE PROJECT

The Baroque on Lamma Ltd (BoL) is proposing a sustainable marina community development at Tung O, Lamma (hereafter referred to as “the Project”). The Project comprises development of a marina, low-rise residences, and a resort hotel. The vision of the Project embraces four major elements:

- (a) A World Class Marina that hosts international events and trains local athletes so as to establish Hong Kong as the Yachting Capital of Asia;
- (b) A Destination for all that injects dynamics into Hong Kong tourism, promotes eco-tourism, and re-vitalizes local Lamma economy;
- (c) A showcase Sustainable Community that protects local bio-diversity, enhances a sense of place, and embraces cultural heritage through innovative design and technology; and
- (d) Introduction of a unique lifestyle concept by encompassing yacht club, resort, spa and seafront residence in a natural setting.

ERM-Hong Kong, Limited has been commissioned by BoL to provide environmental consultancy services to support the planning and various statutory approvals for the Project.

1.5 LOCATION OF PROJECT

The Project Site is located in a rural area in Tung O, Lamma Island, which is covered by the Lamma Island Outline Zoning Plan (OZP) No. S/I-LI/9. *Figure 1.1* shows the location and boundary of the Project Site.

The whole Project could be a Designated Project (DP) defined under the *Environmental Impact Assessment Ordinance (EIAO)* by virtue of the following design features associated with the proposed Development:

- *Item C.2, Part I, Schedule 2* – Reclamation works (including associated dredging works) more than 1 ha in size and a boundary of which is less than 500 m from the nearest boundary of an existing or planned;
 - Site of cultural heritage;
 - Coastal protection area;
 - Conservation area.
- *Item C.4, Part I, Schedule 2* – A breakwater more than 1 km in length or a breakwater extending into a tidal flushing channel by more than 30% of the channel width;
- *Item F.4, Part I, Schedule 2* – An activity for the reuse of treated sewage effluent from a treatment plant;
- *Item O.2, Part I, Schedule 2* – a marina designed to provide moorings or dry storage for not less than 30 vessels used primarily for pleasure or recreation;
- *Item Q.1, Part I, Schedule 2* – All projects including new access roads, railways, sewers, sewage treatment facilities, earthworks, dredging works and other building works partly or wholly in an existing or gazetted proposed country park or special area, a conservation area, an existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, and a site of special scientific interest.

2.1 OVERVIEW OF THE EXISTING ENVIRONMENT

2.1.1 *The Environ*

Lamma Island is the third largest outlying island in Hong Kong, and is characterised by its low-rise and low-density residential and tourism establishments. The Project Site is located in a typical rural area with three villages in the vicinity, namely Tung O Village, Yung Shue Ha Village and Mo Tat Village. These villages comprise a few low-rise village houses and are connected with each other and to Sok Kwu Wan and Mo Tat Wan by a footpath. There are no other major developments in the vicinity of the Project Site.

The topography of the Project Site comprises the coastal area along the Tung O Wan (with a beach and rocky shore), the lowland area behind the coastline and the upland area on the hillside. The natural character of the area is dominated by grassland/shrubland, woodland, rocky shores and a number of streams. *Figure 2.1* shows an aerial photo of the Project Site and its immediate neighbourhood.

According to the Approved Outline Zoning Plan (OZP) No. S/I-LI-9 shown in *Figure 2.2*, the Project Site is located in areas designated for “Agriculture” (AGR), “Village Type Development” (V), “Conservation Area” (CA), and “Coastal Protection Area” (CPA).

2.1.2 *The Northern Site*

The Northern Site is a strip of land running in a north-south direction along Tung O Wan, extending from the area near Mo Tat Village at the north to Yung Shue Ha Village near Shek Pai Wan at the south (see *Figure 1.1*). It consists of coastal area with rocky formations that continues further inland into hillsides that are covered with natural vegetations. There are undulating crests to the west. Woodland and abandoned farmland with overgrown vegetation are found in the valleys. Uphill towards the crest, natural vegetation is scarce and the area is dominated by grassland/shrubland.

2.1.3 *The Southern Site*

The Southern Site comprises both flat and hillshope areas. The flat area refers to the land between two beaches: Shek Pai Wan and Sham Wan. The area has traditionally been used as an agricultural land. The majority of this piece of flat area has been left vacant and abandoned, resulting in the colonisation of willow and grass. The majority of the flat area will fall within the proposed Conservation Corridor to act as a buffer to the Sham Wan Special Site of Scientific Interest. A spa and resort hotel is proposed at the

hillslope area comprising grassland/shrubland and will be connected to the Northern Site by road. A jetty is proposed in front of the hotel.

2.2 **PROJECT DESCRIPTION**

2.2.1 **Site Layout and Proposed Uses**

The Project will comprise three major development areas as shown in *Figure 1.1* including the Marina Portion, the Northern Area of Landside Portion (the Northern Site) and the Southern Area of Landside Portion (the Southern Site).

The Marina

The Marina Portion occupies an area of about 43 ha, and will provide approximately 500 berths, a 1.2 km long breakwater, a helipad, a yacht club, a sailing academy, commercial facilities, a small quantity of residence (about 50 units) and other yachting supporting amenities (such as repair yard, dry stack block and a small fuel storage facility). It will be connected to the Northern Site by an access road in the form of a bridge. The buildings at the marina will be not more than 4 storeys high. The breakwater also accommodates a public pier in addition to that for the development's ferry service to the Hong Kong Island.

The general public will be able to enjoy the commercial and other public facilities of the marina which will be used to host regattas and various water recreational activities.

The Northern Site

The Northern Site occupies an area of about 21 ha comprising low-rise residential blocks accommodating about 850 units. There will be a small quantity of commercial space as well. The residential blocks are proposed along the slope covered mainly by grassland/shrubland. Cut and fill of existing terrain will be minimised by adopting a terracing design. The residential blocks area also spread out to allow the flow of existing streams. All the residential blocks are of villa or terrace blocks with no more than four storeys in height. Individual villas are placed along the first tier of slope closest to the seashore. The terraced blocks are also arranged in clusters. Further uphill at the edge of the woodland, villa/ terrace houses are formed along the natural terrain in clusters.

The residential blocks are all served by roads of approximately 7 to 12m wide. An access road is provided to connect the Marina Portion to the centre of the Northern Site. Environmental friendly vehicles (such as electric cars) will run along the road for commuting between various developments within the Project Site.

A Conservation Corridor has been designated within the Project Site, which covers mainly the woodland areas. There will be no development within this Corridor except for short sections of access roads serving the residential area.

The purpose of this Conservation Corridor is for conservation and to preserve the existing trees.

Under the current design scheme, several small-scaled fully enclosed sewage treatment plants (tertiary treatment and effluent polishing and disinfection) with a total treatment capacity of 2,000 m³ d⁻¹ will be provided within the Project Site. The sewage treatment plants (STPs) will receive sewage and wastewater from both the marina and the landside portions. The treated effluent will be reused for general washing, toilet flushing, watering of landscaping works, etc so that there will be no effluent discharge to the sea. This not only avoids the discharge of treated effluent to the sea but also minimises the fresh water consumption of the developments.

The Southern Site

A resort hotel is proposed at the Southern Site. It occupies an area of about 5 ha. The proposed hotel is located on the hillslope overlooking the Tung O Wan. The hotel will be characterised by villa type accommodation and including a beach club near Tung O beach. A jetty is proposed in front of the hotel.

In general, a Conservation Corridor (with no development) will be created from Sham Wan beach to protect the nesting place for green turtles. The disposition and landscape treatment of the hotel blocks and access road will be designed so as to reduce the visual impact associated with the building blocks and illuminations on the Sham Wan beach.

A 7 to 12m wide road will connect the Southern Site to the Northern Site. Utilities will be laid in purpose design trench along and underneath the road to minimise the footprint of the development and to facilitate repair and maintenance. .

2.2.2 *Environmental & Sustainable Design Objectives and Considerations*

The design objectives of the Project are summarised as follows:

- (a) The “terraced” low-rise development minimises the site formation and enable the enjoyment of existing natural amenities of the Project Site, the dense woodland, the rocky shore, the beach front, the extensive grassland, and the hilly slopes;
- (b) The combination of different uses of various part of the Project Site enables a variety of recreational activities that is unique to the development such as eco-trail walk, water sports, organic farming, etc;
- (c) The marina is designed to be a focus for international regatta, water recreational activities, sporting events with supporting facilities including an International Yacht Club, Sailing Academy, Ancillary Commercial Facilities, and a world class resort hotel;

- (d) The design of all buildings within the Project Site is well integrated with the tranquil and natural environment of Lamma Island and hence minimise potential visual impact;
- (e) The proposed development adopts all necessary design measures to respect the environmental resources within the Project Site. Conservation of the existing natural environments is of paramount importance to retain character of the island location and yet creating a unique rural lifestyle of the new community;
- (f) The design of the marina will avoid direct impact to the coastline and ensures that the construction of the breakwater will not adversely affect the water flow within the marina. Except for the breakwater, the marina will be built on deck supported by piles which minimise potential impact to marine ecology and water quality;
- (g) The design of breakwater will avoid dredging of marine sediment and minimises the footprint in order to avoid disposal of dredged sediment and minimise potential impacts on marine ecology and water quality; and
- (h) The proposed development will adopt a very high standard in sustainable design and aspire to be at least carbon neutral. Renewable energies will be extensively employed and explored, energy consumption will be minimized, waste water will be treated and reused, food and solid waste materials will be recycled where possible and energy efficient infrastructure will be provided.

The design of the proposed marina is based on an understanding of existing marinas in Europe where the marina is amalgamated with ancillary commercial facilities and residential area to form a community hub.

2.2.3

Construction Methods

The key construction activities associated with the Project will include:

- Construction of the breakwater and the marina;
- Construction of buildings at the marina;
- Site clearance and formation for land based developments;
- Construction of roads and utilities (including the STPs); and
- Construction of the new buildings and landscaping works on land.

Construction at the Marina Portion

The construction activities at the marina include the following key elements:

- *Construction of works staging areas* – three coastal work staging areas are proposed, including two at the breakwater location and one at the jetty location near the hotel development. The staging areas will house a

portable concrete batching plant (with maximum production rate of 1,400 m³ d⁻¹) and will serve as storage of precast concrete elements for the Project.

- *Breakwater foundation works* – the foundation works will be carried out by using the stone columns or vibro-replacement method.
- *Breakwater construction* – this involves the creation of a rubble mound foundation on the seabed for the installation of the precast concrete caissons, which are the main components of the vertical breakwater. Construction of the breakwater will progress as much as possible from the deeper sections on the east end towards the shallower shore areas.
- *Piling works and concrete deck construction* - piling works would commence in the marina area at the leeside of the breakwater. These works include piles for the marina deck and the bridge abutment uniting the on land portion of the Project with the marina deck. Bored piles will be used and they do not require removal of soil inside the piles, and circular steel piles will be filled with concrete for additional corrosion resistance. Soon after piling works begins, the deck construction follows. After piles are driven, rebar is placed in them in anticipation to placing the structural components of the concrete deck. Then, piles are filled with concrete to increase their resistance to corrosion. The sewage, drainage and utilities serving the marina will be installed once the concrete deck is complete.
- *Construction of marina buildings* - it is expected that the construction of buildings on deck would commence as soon as feasible, and its construction would follow a pre-conceived plan regarding the location of anticipated drain, sewage and utilities trenches within the precast concrete elements used to create the concrete deck.
- *Construction of marine floating components* – the basic floating components are made of Styrofoam billets encased either in concrete or rigid plastic casings. Floating berths will be secured by tubular piles driven into the seabed or by a combination of ‘Seaflex’ tethering system moored to concrete anchors or anchors embedded in the bottom of the seabed with sets of piles along the floating pier. Once the floating berths are placed in position and all structural connections are materialised, the installation of all utilities will followed.

Construction at the Landside Portion

Access to the Project Site will be from the sea and the construction materials will be delivered to the Project Site by barges.

Vegetation will first be cleared from the Project Site. After site clearance, the formation works will follow. The formation works will involve removal of both soft and hard material from the hillsides to a maximum depth of approximately 10m, and replacing the same in fill embankments and retained fill sections. Typical cut and fill method will be used to form the site to the designed level. It is estimated that about 250,000 m³ of excavated material

will be generated from the site formation activities. On the other hand, about 583,000 m³ of fill material will be required. Hence, it is the intention to reuse all excavated material for filling.

As the buildings are low-rise in nature, piling is not necessary. Raft foundation will be used. Typical construction method will be used for road construction. For the sections, where the road is on viaduct (such as crossing valleys and streams), bore piling will be used to construct the viaduct foundation. Utilities (including cables, water mains and sewage pipes) will be laid in utility trench under the road to facilitate future maintenance. The packaged STPs will be constructed by assembling the pre-fabricated parts on concrete footings.

Following the construction of the buildings and roads, tree planting and landscaping works will be carried out.

2.2.4 *Envisaged Concurrent Construction Projects*

The Hong Kong Electric Co has proposed to construct a wind farm to the southwest of Lamma Island. However, the programme for its construction and operation is not confirmed yet. There are no other major works in the vicinity of the Project Site.

2.2.5 *Development Program*

The development programme currently envisaged for the Project is outlined in *Table 2.1*.

Table 2.1 *Tentative Project Development Programme*

Activity	Indicative Date
S12A Planning application	2 nd quarter of 2011
Conceptual design and scheme design	2 nd quarter 2011 – 2 nd quarter of 2012
Detailed design and contract procurement	3 rd quarter 2012 – end 2014
Commencement of the construction of the Project (Subject to issuance of EP)	End 2014/early 2015
Completion for Occupation	End 2017/early 2018

3.1 OVERVIEW

The potential environmental impacts that are expected to arise from the Project are scoped in for both the construction and operation phases.

Table 3.1 *Potential Environmental Impacts*

Potential Impact	Construction	Operation
• Gaseous Emissions	✗	✓
• Dust	✓	✗
• Odour	✗	✓
• Noise	✓	✓
• Night-time Operations	✗	✓
• Traffic	✓	✓
• Liquid Effluents, Discharges or Contaminated Runoff	✓	✓
• Generation of Waste or By-products	✓	✓
• Manufacturing, Storage, Use, Handling, Transport, or Disposal of Dangerous Goods, Hazardous Materials or Wastes	✗	✗
• Hazard to Life	✗	✗ (a)
• Landfill Gas Hazard	✗	✗
• Disposal of Spoil Material, including potentially Contaminated Materials	✗	✗
• Disruption of Water Movement or Bottom Sediment	✗	✓
• Unsightly Visual Appearance	✗	✗
• Cultural & Heritage	✓	✗
• Terrestrial Ecology	✓	✓
• Marine Ecology	✓	✓
• Cumulative Impacts	✗	✗

Note:
 ✓ = Possible ✗ = Not Expected
 (a) It is estimated that underground fuel storage tanks of up to 120 m³ capacity are proposed, of which 25 m³ is to be allocated for petrol and remaining being diesel. With this small storage capacity, potential hazard to life is not expected.

3.2 EXISTING ENVIRONMENTAL CONDITIONS

3.2.1 General

Lamma Island is the third largest outlying island in Hong Kong, and is characterised by its low-rise and low-density residential and tourism establishments. The Project Site is located in a typical rural area with three villages in the vicinity, namely Tung O Village, Yung Shue Ha Village and Mo Tat Village. These villages comprise a few low-rise village houses and are connected with each other and to Sok Kwu Wan by a footpath. There are no other major developments in the vicinity of the Project Site.

The Project Site is located in a rural area at Tung O, Lamma Island with only a few existing villages identified to the north and southwest as shown in *Figure 3.1*. Within 500m from the Project Site boundary, there are no existing industrial uses or stacks. The local air quality there is mainly influenced by the general background.

Fugitive dust is envisaged to be the main air pollutant of concern during the construction phase. As the Project will adopt a terrace design, thus minimising dust that could be generated as a result of slope cutting and site formation. The construction of the breakwater will require installation of a portable on-site concrete batching plant (CBP) at the marina staging area to provide the necessary concrete for the Project due to limited land or marine access to the site. With the implementation of good site practices (general dust suppression measures, wetting and good house-keeping) recommended in the *Air Pollution Control (Construction Dust) Regulation* it is envisaged that dust nuisance will be minimal. Depending on the total silo capacity of the proposed CBPs, they may be classified as *Specified Process* and hence have to be licensed to operate under the *Air Pollution Control (Specified Process) Regulations*. In that case, emission control measures given in the *Guidance Note of Best Practicable Means for Cement Works (Concrete Batching Plant) (BPM 3/2 (93))* will be implemented to minimise potential impacts on the air sensitive receivers.

When the Project is in operation, there will be several sources of air pollution expected which include:

- Gaseous emissions from kitchens exhausts;
- Emissions from the operation of several small on-site STPs and composting plant;
- Emissions from marina and ferry service; and
- Other emissions from the Project such as boiler.

However, the potential impacts can be addressed by adopting a better project design and management control measures including the following:

- STPs and composting plant to be designed as fully enclosed with odour removal and scrubbing system at the exhaust;
- Electric stoves to be used in kitchens;
- Electrostatic precipitators (ESP) will be installed to control the oily fume and cooking odour; and
- Direct the kitchen exhausts vertically upwards and away from nearby air sensitive uses.

It is expected that emissions from yachts and ferries at the marina and pier will be intermittent and will unlikely cause sustained and adverse air quality

impacts. When the yachts are berthed at the marina, their engines will be switched off and connected to the on-shore power supply. No emissions will be generated from the berthed yachts. On-site vehicles will run on clean fuel or electricity. Moreover, electricity will be the main source of energy on-site and the burning of gaseous and liquid fuels is not planned within the development. No adverse air quality and odour impacts are therefore expected from the Project during the operation phase.

3.4 NOISE

The Project Site is located in a rural area in Tung O, Lamma Island, and is covered by the *Lamma Island Outline Zoning Plan (OZP) No. S/I-LI/9*. Background noise levels are typical of a general rural environment. No major existing noise source was identified.

The existing noise sensitive receivers that may potentially be affected within 300m of the Project Site boundary are shown in *Figure 3.2*. The Project Site is also within the *Designated Area (DA)* defined under the *Noise Control Ordinance (NCO)* and therefore implies that the carrying out of *Prescribed Construction Work (PCW)* and the use of *Specified Powered Mechanical Equipment (SPME)* will be put under very stringent control under *Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM)*. The use of *SPME* would need to comply with the requirements of the *DA-TM*, which are 15 dB(A) more stringent than those listed in the *Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM)* before a *Construction Noise Permit (CNP)* can be issued. Therefore the construction of the Project will avoid the restricted hours under the *NCO* as far as possible.

It is envisaged that construction noise during the unrestricted hours should not be a key concern provided that a number of measures listed below are adopted, whenever possible:

- Adopting good construction site practice;
- Use of quiet PME;
- Use of noise barrier and enclosure, where necessary and applicable; and
- Sensible schedule of construction activities.

During the operation phase of the Project, a number of key concerns will be expected including:

- Fixed plant noise due to operation of STPs, composting plant, chillers, ventilation/ exhaust systems;
- Infrequent helicopter flights and the noise due to approaching and departing helicopters as well as hovering above the helipad; and
- Noise from marina and vehicular traffic.

However, the proposed helipad will be sited at the breakwater (>300m from the existing and planned residential developments) with infrequent day-time

flights only unless under emergency situation. The frequency of use of the helipad is expected to be limited to a maximum of a few trips per day during some special occasions. Helicopters will approach and leave the proposed helipad from the sea to the east of the Project Site, so that the flight path will be entirely above waters and keep away from the nearest noise sensitive receivers (NSRs).

Noise enclosure or silencers will be adopted for fixed plant as well as other outdoor equipment of the STPs and composting plant, where necessary. It is envisaged that the relative low vehicular traffic flow and the inherently quiet electrically powered design will not cause unacceptable impacts on the surrounding sensitive uses.

3.5

WATER QUALITY

A review of the Project Site location has indicated that it could affect a number of water sensitive receivers (WSRs) (see *Figure 3.3*) which include:

- Presence of spawning/ nursery grounds and fish culture zone (FCZ) though at a distance;
- Potential coral communities at Nam Tsui to Tai Kok and Lamma Power Station Extension Seawall;
- Horseshoe crab nursery grounds at Sok Kwu Wan;
- Marine mammal habitat at Southwest Lamma Waters;
- Green turtle habitat at Sham Wan;
- Potential marine park at South Lamma;
- Gazetted bathing beaches on Lamma Island, including Hung Shing Yeh and Lo So Shing;
- Gazetted bathing beaches on Hong Kong Island, including Deep Water Bay Beach, Repulse Bay Beach, Middle Bay Beach, South Bay beach, Chung Hom kok Beach and St. Stephen's Beach; and
- Seawater intakes of Lamma Power Station at Yuen Kok.

However, all sensitive uses above are located at more than 1km away from the Project except for the green turtle habitat at Sham Wan.

In view of this high sensitivity to water quality, the Project will adopt non-dredged methods for construction of breakwater but yet would still require certain degree of piling and reclamation. All earthworks will adopt site runoff control measures recommended in the *Practice Note for Professional Persons on Construction Site Drainage (ProPECC PN1/94)* to control silt laden runoff. The use of silt screen can also provide 75% blocking efficiency for piling and filling activities.

It is envisaged that impacts will be surmountable with proper construction planning and mitigation. Quantitative water quality modelling will be

conducted in the EIA to confirm no unacceptable water quality impacts especially for the suspended solids (SS), dissolved oxygen (DO) depletion as well as meeting the Water Quality Objectives (WQO) at various WSRs.

When the Project is in operation, there will be several sources of water quality of concern including:

- Generation of sewage;
- Vessel discharges, maintenance and hull cleaning; and
- Change of hydrodynamic regime, flushing capacity and current speeds due to the marina and breakwater.

To combat these possible sources of pollution, a number of mitigation measures will be implemented:

- All sewage and wastewater generated from the Project Site will be collected and treated at the on-site STPs;
- Re-use of treated effluent and greywater on-site as far as practicable;
- Wastewater and residues from maintenance activities such as hull cleaning and oil and fuel residues will need to be diverted and collected in dedicated systems for off-site disposal by licensed contractors;
- A spill response management plan will be prepared and implemented to mitigate potential impact to water quality from spills and leaks; and
- The marina will offer wastewater pump out and solid waste collection facilities to avoid disposal overboard.

With implementation of adequate mitigation measures presented above, it is envisaged that the construction and operation of the Project will not cause adverse water quality impact. Quantitative water quality impact assessment will be conducted in the EIA to confirm no unacceptable impacts especially for and the change in hydrodynamic regime due to construction of the breakwater.

3.6

WASTE MANAGEMENT

Public fill and construction waste will be generated during the construction phase. The public fill will be re-used on-site for backfilling as far as practicable while the construction waste will be disposed of at the Sok Kwu Wan Transfer Facility for onward disposal at the WENT Landfill.

With respect to the scale of construction activities, it is anticipated that the quantity of chemical waste to be generated will be small. General refuse will also be generated by the construction workers.

The operation of the Project will generate general refuse (including food waste). The food waste will be separated at source and treated at the on-site composting plant. The compost generated will be used on-site for landscaping works. Sludge generated from on-site STPs will be disposed of

and treated at the WENT Landfill or Sludge Treatment Facilities at Nim Wan as designated by the EPD. The storage, handling, transportation and disposal of chemical wastes that are generated from vessels maintenance will be managed in accordance with the requirements of the *Waste Disposal (Chemical Waste) (General) Regulation* and the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*.

With the implementation of general good construction site practices and proposed waste management initiatives, it is envisaged that the construction and operation of the Project will not cause adverse waste management, traffic or secondary environmental impacts.

3.7 *ECOLOGY*

3.7.1 *Terrestrial Ecology*

The known terrestrial ecological resources within 500m of the Project Site are shown in *Figure 3.4*. In general, the Project Site is mainly covered by shrubland/grassland mosaic, secondary woodland, tall shrubland, coastal vegetation, stream and village/urban area. Baseline ecological survey will be required to confirm the habitat type and the flora and fauna species potentially affected by the Project.

Land section of Project Site partly overlaps with areas zoned “Conservation Areas (CA)” and “Coastal Protection Area (CPA)” under the Lamma Island Outline Zoning Plan (OZP) No. S/I-LI/9. The southern portion of the Project is also within 200m of the South Lamma Island SSSI and is close to the Sham Wan SSSI - in which the sandy beach is a Restricted Area designated to protect the known nesting site for green turtles. Records have also shown the existence of Romer’s tree frogs on southern Lamma Island.

The design of the Project aims to avoid the potential impacts on the woodland areas and designates the major woodland areas as Conservation Corridors. There will be no development within this Corridor except for short sections of access roads (bridges will be used for the crossing where possible to minimise the direct impacts to trees) serving the residential area.

It is envisaged that with the implementation of reasonable mitigation measures, there will be no adverse residual impacts during construction and operation phases. These measures may include the adoption of appropriate engineering design, implementation of good construction site practices and control measures for site run-off, vegetation transplantation, fauna translocation and compensatory tree planting. These measures will therefore reduce potential impacts to the surrounding environment.

3.7.2 *Marine Ecology*

Key concerns include:

- Potential impact to resources including inter-tidal and sub-tidal hard and soft bottom habitats;
- Species of special importance include marine mammals - Chinese white dolphins, finless porpoise, and green turtles; and
- Potential marine park at South Lamma according to a Agricultural, Fisheries and Conservation Department (AFCD) study.

The marina location has avoided direct impacts to ecologically sensitive habitats including natural rocky shore and coral habitats at Tung O Wan, Sham Wan green turtle nesting beach, potential Southwest Lamma Marine Park.

A non-dredged construction method for breakwater will be adopted. By adopting the marina concrete deck on pile and floating berths, it will minimise reclamation footprint.

Bored piling has been selected as the preferred construction method for the installation of the marina concrete deck piles. Only indirect, temporary disturbance to marine mammals are expected during the marine piling works, as construction methodologies have been designed to reduce underwater sound transmission. With the adoption of the appropriate mitigation measures, such as marine mammal/sea turtle exclusion zones and completion of the breakwater in advance of major marine piling works, it is envisaged that there will be no unacceptable impacts on these species.

Other specific mitigation measures that will be adopted include the provision of rubble mound/armour rock seawalls on the edges of the breakwater to facilitate colonisation by intertidal and sub-tidal organisms, and restrictions on vessel speed.

The control measures designed to mitigate impacts to water quality to acceptable levels (compliance with assessment criteria) are also expected to work for marine ecological resources.

Operation phase adverse impacts to marine ecological resources are not expected to occur. In particular, unacceptable impacts to marine mammals and sea turtles from the generation of underwater sound levels are not expected to be of concern.

3.8

FISHERIES

A literature review of baseline information on commercial fisheries resources and fishing operations surrounding the waters of the proposed Project has been undertaken and identified sensitive receivers including recognised spawning and nursery grounds, artificial reefs and Fish Culture Zones (FCZ) (see *Figure 3.5*). The habitat in the Project Site is not considered unique, and significant areas of equal importance are located adjacent to the proposed marina development and elsewhere in Hong Kong.

During the construction of the Project, direct impacts arising from the proposed marine works may include permanent loss of fisheries habitat within the physical footprints of the breakwater and marina/ jetty piles and temporary disturbance to habitats within the marine construction works boundaries.

Potential indirect impacts may result from the elevated levels of underwater sound as a result of the construction activities and perturbations to key water quality parameters. Marine construction works will be inherently designed to reduce potential impacts on the water quality which will, in turn, reduce impacts on fisheries resources.

The permanent loss of fisheries habitats from the presence of marina structures, and the loss of access of approximately 50 ha of fishing ground within the marina site, are not considered significant as the area is small in size as compared to the entire southern waters and is not of high fisheries importance. On the other hand, the marina structures provide hard substrate for marine organisms to colonise and this is likely to result in long term beneficial effects to fisheries.

Impacts to fisheries resources may potentially occur if the marina development causes a change in the hydrodynamic regime, and consequentially water quality, of the inner Tung O Wan coastline. The marina and jetty will be constructed on a piled deck structure to maintain water flow within the bay. Potential impacts of the marina including the breakwater on hydrodynamics (eg flushing capacity and current velocities, etc) of the bay would, however, need to be confirmed by computational modelling (see *Section 0*). In the event the modelling predicts adverse impact on hydrodynamics and water quality, design changes, for example, would be proposed to mitigate the impact to within acceptable levels.

3.9 CULTURAL HERITAGE

3.9.1 Built Heritage

Preliminary desktop research and field survey did not identify any declared monuments, graded/proposed historic buildings, and government historic sites listed by the Antiquities and Monument Office (AMO) within 500m of the Project Site. Site survey will be undertaken to identify any pre-1950 built heritage features (which may include built structures, graves and cultural/historical landscape features) to investigate if there will be any direct or indirect impact (such as construction vibration impact).

Avoidance of direct impact on any pre-1950 built heritage features will be the priority during the preparation of the Master Layout Plan for the Project. If direct impact cannot be avoided, mitigation measures such as taking photographic and cartographic records before removal will be implemented. Should potential construction vibration impact be identified appropriate mitigation measure and/or monitoring will be recommended for implementation during the construction and operation phases of the Project.

With the implementation of the recommended mitigation measures, adverse impact on the built heritage resources is not anticipated.

3.9.2 *Terrestrial Archaeology*

Desktop study identified three Sites of Archaeological Interest listed by AMO within or adjacent to the Project Site (Landside Portions) as shown in *Figure 3.6*. Based on the desktop research and field observation, archaeological survey is considered necessary to obtain field data to fill in information gap for subsequent impact assessment.

If impacts are anticipated, appropriate mitigation measures will be recommended, where necessary.

3.9.3 *Marine Archaeology*

Two possible marine archaeological sites (one shipwreck (UKHO No. 62405) and one foul ground (UKHO No. 46598) have been identified within the MAI Study Area as shown in *Figure 3.7*.

The wreck site (UKHO No. 62405) is located at the edge of the MAI Study Area and outside the proposed marina development area. It is also considered as a modern wreck with negligible archaeological significance. Therefore, no impact from marine archaeology perspective is expected.

Although the 'foul ground' (UKHO No. 46598) is located in the Project Site boundary not far from the coast where potential direct impact is anticipated, a review of geophysical survey data supplemented by dive survey indicated that the 'foul ground' no longer exists on the seabed. Therefore, no impact is anticipated.

3.10 *LANDSCAPE & VISUAL IMPACT ASSESSMENT*

3.10.1 *Landscape Impact*

The Project is located in a coastal area dominated by abundant vegetation in the form of shrubby grassland and woodlands in the valley and hillside areas, and rocky shore and beaches along the shoreline. Villages with one to three-storey high houses are also present. Natural stream courses are also a local landscape feature. Patches of abandoned farmland with overgrown vegetation are also found in the Study Area.

The Project is expected to have various landscape and visual impacts during construction and operation phases. The proposed development will cause impacts on the Landscape Character Areas (LCAs) and Landscape Resources (LR) at different stages of its lifetime as outlined including:

- Construction of the breakwater and the marina;
- Construction of buildings at the marina;
- Site clearance and formation of the land based development;

- Construction of roads and utilities;
- Construction of the new buildings on land;
- Presence and operation of construction plant and equipment;
- Stockpiling area of construction and demolition materials, including the excavated materials for reuse;
- Future physical structure and operation of the marina;
- Future physical structure and operation of the residential blocks, and the spa and resort hotel;
- vehicles commuting within the Project Site;
- Ferry services to Hong Kong Island; and
- Landscaping works.

A detailed landscape impact assessment will be conducted as part of the EIA to evaluate the acceptability of the impacts and mitigation measures required.

3.10.2 *Visual Impact*

The general baseline visual character of the area where the Project is to be undertaken is characterised by typical bay area with undulating topography forming hills to the north, west and southwest of the Project Site. The vegetated hills form a backdrop to the Project Site and evoke a generally natural and rural environment. The Tung O Wan is surrounded by rocky shoreline with the beach in Shek Pai Wan being the most prominent shoreline feature. The few village houses in Tung O and Yung Shue Ha and Mo Tat Villages and the footpath are the only man-made features when viewing from the bay. The overall visual character is of high quality due to its natural and undisturbed landscapes.

A visual impact assessment will be conducted as part of the EIA to analyse the potential visual impacts of the Project on the existing views and the visual amenity, particularly from the visual sensitive receivers (VSRs) within the Zone of Visual Influence (ZVI). In order to illustrate the potential visual impacts of the Project, photomontages will be prepared from selected representative viewpoints to illustrate the change of view during different stages of the Project development. The residual impacts will be evaluated in accordance with the requirements of *Annex 10* of the *EIAO-TM*.

3.11 *SUMMARY OF POTENTIAL IMPACTS AND EVALUATION OF SURMOUNTABILITY*

The proposed Baroque on Lamma is classified as a Designated Project under the *EIA Ordinance* and hence requires an Environmental Permit (EP) for the construction and operation of the development. It is intended to obtain the the EP through an approved EIA Report. This Project Profile is submitted for application of a Study Brief for an EIA Study.

The key concerns, potential mitigation measures, sources of impact and the preliminary review of their acceptability have been discussed in the foregoing sections and summarised in . This Project Profile has also provided an outline of the Project design, the intended construction methods and programme.

The details given in the initial appraisal of the potential environmental impacts have been able to scope and highlight key areas of concern and to enable the drafting of the EIA Study Brief by the Authority.

3.12

USE OF PREVIOUSLY APPROVED EIA REPORTS

AEIAR-152/2010 - Development of a 100MW Offshore Wind Farm in Hong Kong

Table 3.2 Summary of Key Concerns, Sources of Impacts, Envisaged Mitigation Measures & Evaluation of Surmountability

Environmental Impacts	Key Issues/ Concerns	Sources of Impacts	Possible Mitigation Measures	Expected Surmountability of Impacts/ Assessments Needed?
Air Quality (Construction)	<ul style="list-style-type: none"> Reasonably surmountable impacts Not envisaged as a key concern 	<ul style="list-style-type: none"> Project will adopt a terrace design requiring cutting into the slopes, site clearance, and forming of a series of platforms for the villas and hotel developments Construction of breakwater Use of one portable on-site concrete batching plant due to difficult transportation issue – possible Specified Process defined under APCO 	<ul style="list-style-type: none"> General dust suppression measures, wetting and good house-keeping practices etc. recommended in the <i>Air Pollution Control (Construction Dust) Regulation</i> Emission control measures recommended in the <i>Guidance Note of Best Practicable Means for Cement Works (Concrete Batching Plant) (BPM 3/2 (93))</i> 	<ul style="list-style-type: none"> Impacts expected to be surmountable with fugitive dust suppression May require qualitative or quantitative assessment involving modelling of fugitive dust
Air Quality (Operation)	<ul style="list-style-type: none"> Reasonably surmountable impacts Not envisaged as a key concern 	<ul style="list-style-type: none"> Gaseous emissions from kitchen exhausts Emissions from on-site STPs and composting vessel Emissions from marina (incoming/ outgoing powered yacht/ boats) and ferries services Emissions from marina and ferry services, boilers etc 	<ul style="list-style-type: none"> Electric stoves to be used in kitchens Electrostatic precipitators at kitchen exhausts to control oily fume and cooking odour Direct kitchen exhausts vertically upwards and away from nearby air sensitive uses STPs and composting vessel designed to be fully enclosed Odour removal and scrubbing system at STPs and composting vessel exhausts 	<ul style="list-style-type: none"> Impacts expected to be intermittent and surmountable with mitigation May require quantitative assessment involving modelling of TSP, RSP, SO₂ and NO₂

Environmental Impacts	Key Issues/ Concerns	Sources of Impacts	Possible Mitigation Measures	Expected Surmountability of Impacts/ Assessments Needed?
Noise (Construction)	<ul style="list-style-type: none"> Reasonably surmountable impacts Not envisaged as a key concern 	<ul style="list-style-type: none"> Expected works involving PME during the non-restricted hours only Works in the restricted hours require CNP 	<ul style="list-style-type: none"> Adopting good construction site practice Use of quiet PME Use of noise barrier and enclosure, where applicable Sensible schedule of construction activities 	<ul style="list-style-type: none"> Impacts expected to be surmountable with mitigation Quantitative assessment needed at EIA stage
Noise (Operation)	<ul style="list-style-type: none"> Helicopter flights, marina operations, and fixed plant, esp. night-time operations could be a concern for local community 	<ul style="list-style-type: none"> Fixed plant noise due to operation of STPs, composting vessel, chillers, ventilation/ exhaust systems Helicopter noise Approaching and departing helicopters at the breakwater Noise from marina operation Vehicular traffic noise 	<ul style="list-style-type: none"> Siting of helipad away from any NSRs Adopting seaward flight paths for departure and landing Noise enclosure for any outdoor equipment and fixed plant, where necessary 	<ul style="list-style-type: none"> Impacts expected to be surmountable with proper planning, mitigation and management control May require quantitative assessment of fixed plant noise, helicopter noise due to helipad & flight paths
Water Quality (Construction)	<ul style="list-style-type: none"> Presence of spawning/ nursery grounds and fish culture zone but at a distance Potential coral communities at Nam Tsui to Tai Kok and Lamma Power Station Extension Seawall Horseshoe Crab Nursery Grounds at Sok Kwu Wan Marine Mammal Habitat at Southwest Lamma Waters Green Turtle Habitat at Sham Wan Potential marine park at South Lamma Gazetted bathing beaches on 	<ul style="list-style-type: none"> Some piling may be required for construction of the breakwater Possible generation of plumes of suspended solids Accidental spillage Discharge of ballast water from construction vessels Runoff from on-shore activities 	<ul style="list-style-type: none"> Adopt non-dredged methods for construction of breakwater but still requires piling & reclamation Use of uncontaminated fill materials Adopt site runoff control measures in <i>Practice Note for Professional Persons on Construction Site Drainage</i> Use of silt screen to provide 75% blocking efficiency for piling and filling activities Construction vessels with clean ballast systems 	<ul style="list-style-type: none"> Impacts expected to be surmountable with proper construction planning & mitigation Quantitative water quality modelling may be required to justify no unacceptable impacts esp. for SS, DO depletion and WQO

Environmental Impacts	Key Issues/ Concerns	Sources of Impacts	Possible Mitigation Measures	Expected Surmountability of Impacts/ Assessments Needed?
	<p>Lamma Island and south of Hong Kong Island</p> <ul style="list-style-type: none"> • Seawater Intakes of Lamma Power Station at Yuen Kok • All sensitive uses above are more than 1km away except for the green turtle habitat at Shum Wan 			
Water Quality (Operation)	<ul style="list-style-type: none"> • No connection to public sewerage and has to rely on on-site STPs • Stormwater runoff • Change of hydrodynamic regime due to breakwater 	<ul style="list-style-type: none"> • Generation of sewage from residential, hotel and commercial developments • Control of silty / oil laden runoff from getting into the coastal areas • Vessel discharges, maintenance and hull cleaning • Change of hydrodynamic regime, flushing capacity and current speeds due to marina and breakwater 	<ul style="list-style-type: none"> • Wastewater treatment to tertiary level with effluent polishing and disinfection to reuse for general washing, toilet flushing and irrigation of the landscaping area. • Use of silt trap and oil trap to avoid silty/oily stormwater from getting into the coastal waters • Emergency response plan for chemical spillage/ malfunction of STPs • Collection of hull cleaning wastewater by licensed contractors 	<ul style="list-style-type: none"> • Impacts expected to be surmountable with mitigation. • Quantitative water quality assessment may be required to justify no unacceptable impacts due to the change in hydrodynamic regime due to breakwater
Waste Management (Construction)	<ul style="list-style-type: none"> • Reasonably surmountable impacts • Not envisaged as a key concern 	<ul style="list-style-type: none"> • Mainly construction wastes, small amount of chemical wastes, and general refuse 	<ul style="list-style-type: none"> • Reuse inert excavated material on site for site formation works • Non-inert waste to be transported to EPD's Sok Kwu Wan Transfer Facility on Lamma Island by marine vessel for onward disposal at the WENT Landfill 	<ul style="list-style-type: none"> • Impacts expected to be surmountable with mitigation. • Amount of waste generation needs to be quantified in the EIA study
Waste Management (Operation)	<ul style="list-style-type: none"> • Reasonably surmountable impacts • Not envisaged as a key concern 	<ul style="list-style-type: none"> • Sludge from on-site STPs • Chemical wastes generation from vessels maintenance 	<ul style="list-style-type: none"> • Sludge generated from STPs to be disposed of at WENT Landfill or Sludge Treatment Facilities at Nim 	<ul style="list-style-type: none"> • Impacts expected to be surmountable with mitigation. • Amount of waste generation

Environmental Impacts	Key Issues/ Concerns	Sources of Impacts	Possible Mitigation Measures	Expected Surmountability of Impacts/ Assessments Needed?
		<ul style="list-style-type: none"> • General refuse from residential and hotel developments 	<p>Wan as designated by EPD</p> <ul style="list-style-type: none"> • Storage, handling, transportation and disposal of chemical wastes under the requirements stated in the <i>Waste Disposal (Chemical Waste) (General) Regulation</i> and the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> • General refuse to be collected and transported to EPD's Sok Kwu Wan Transfer Facility on Lamma Island by marine vessel for onward disposal at the WENT Landfill • Source separated food waste will be composted on-site 	<p>needs to be quantified in the EIA study with recommendation of disposal options</p>
Terrestrial Ecology	<ul style="list-style-type: none"> • Land section of Project Site partly overlaps with CA and CPA • Southern portion of the Project is within 200m of the South Lamma Island SSSI • Close to the Sham Wan SSSI – in which the sandy beach is a Restricted Area designated to protect the known nesting site for Green Turtles • Known existence of Romer's tree frogs on southern Lamma Island • Habitat potentially of high ecological value, subject to detailed baseline survey 	<ul style="list-style-type: none"> • Habitat loss and fragmentation resulting from land take for project footprint • Associated potential restriction of utilisation of areas by wildlife • Increased human disturbance • Envisaged no direct impact to recognised sites conservation importance, ie SSSIs, Restricted Area • Some loss of habitats within CA and CPA with low to moderate ecological value 	<ul style="list-style-type: none"> • Avoidance of key recognised sites conservation importance, ie SSSIs, Restricted Area • Minimised development footprint • Restriction of earthworks to dry seasons as far as possible • Provision of temporary drainage channel & silt removal facilities • Transplant of vegetation of conservation value if impact cannot be avoided • Translocation of faunal if impact cannot be avoided • Compensation of loss of habitat 	<ul style="list-style-type: none"> • Impacts expected to be surmountable with mitigation. • Baseline ecological survey to confirm habitat value
Marine Ecology	<ul style="list-style-type: none"> • Habitat resources include inter- 	<ul style="list-style-type: none"> • Reclamation and rock filling or 	<ul style="list-style-type: none"> • Adopting no-dredged 	<ul style="list-style-type: none"> • Impacts expected to be

Environmental Impacts	Key Issues/ Concerns	Sources of Impacts	Possible Mitigation Measures	Expected Surmountability of Impacts/ Assessments Needed?
	<p>tidal and sub-tidal hard and soft bottom habitats</p> <ul style="list-style-type: none"> • Species of special importance include marine mammals - Chinese white dolphins, finless porpoise, and green turtles • However, satellite tracking data suggest very rare use of waters within and surrounding the Project Site by green turtle • Potential Marine Park at South Lamma according to an AFCD study • None of the marine ecological resources and habitats in the proposed marina is considered of high ecological value 	<p>Cement Grout Filling for the breakwater</p> <ul style="list-style-type: none"> • Construction of Marina concrete deck on piles and marina floating berths • Construction of the jetty for the hotel 	<p>construction method for breakwater</p> <ul style="list-style-type: none"> • Avoid direct impacts to ecologically sensitive habitats including natural rocky shore and coral habitats at Tung O Wan, Sham Wan green turtle nesting beach, potential Southwest Lamma Marine Park - a result of site selection study • Design Process - reduction in reclamation areas by adopting marina concrete deck on piles and floating berths resulting in a smaller reclamation footprint • Use of silt curtains • If necessary, relocation of hard corals 	<p>surmountable with mitigation.</p>
Fisheries	<ul style="list-style-type: none"> • No Fish Culture Zones (FCZs) located within the proposed marina development • Nearest FCZ at Sok Kwu Wan (4.5km away) and Lo Tik Wan (5km away) • Proposed marina is located within the recognised Southern Waters fish spawning and nursery area • Artificial reefs in the Lo Tik Wan FCZ (located at least 5 km from the Project Site) 	<ul style="list-style-type: none"> • Direct disturbances to habitat • Underwater sound generated from marine construction activities • Perturbations to key water quality parameters - SS, DO depletion, nutrients • Change of hydrodynamic regime & secondary water quality impacts • Long-term changes in benthic habitat 	<ul style="list-style-type: none"> • Use of silt curtains to control water quality during construction • No fishery-specific mitigation measures considered necessary 	<ul style="list-style-type: none"> • Impacts expected to be surmountable with mitigation.

Environmental Impacts	Key Issues/ Concerns	Sources of Impacts	Possible Mitigation Measures	Expected Surmountability of Impacts/ Assessments Needed?
Cultural Heritage	<ul style="list-style-type: none"> • Three Sites of Archaeological Interested (Sham Wan, Tung O and Mo Tat Wan) within or adjacent to the Project Site • Unknown pre-1950s built heritage resources, which could exist within the Project Site 	<ul style="list-style-type: none"> • Direct or indirect (potential vibration impact) impact on the cultural heritage resources by the development footprint 	<ul style="list-style-type: none"> • Avoidance of impact by modification of Master Layout Plan • Photographic and cartographic record for built heritage features which cannot be avoided • Vibration monitoring, if necessary, on built heritage features near the Project Site • Archaeological field survey to confirm the impact on archaeological resources and to determine the necessary mitigation measures 	<ul style="list-style-type: none"> • Impacts expected to be surmountable with mitigation • Terrestrial archaeological field survey will be needed to confirm the impact on archaeological resources
Landscape & Visual (Construction)	<ul style="list-style-type: none"> • Direct impact on the natural landscape resources 	<ul style="list-style-type: none"> • Construction of the breakwater and the marina; • Construction of buildings at the marina; • Site clearance and formation of the land based development; • Construction of roads and utilities; • Construction of the new buildings on land; • Presence and operation of construction plant and equipment; • Stockpiling area of construction and demolition materials, including the excavated materials for reuse; 	<ul style="list-style-type: none"> • Tree protection, preservation and transplantation • Compensatory tree planting • Screening of stockpiles of materials • Light control • Topsoil reuse • Avoid natural streams as far as practicable 	<ul style="list-style-type: none"> • Impacts expected to be surmountable with mitigation

Environmental Impacts	Key Issues/ Concerns	Sources of Impacts	Possible Mitigation Measures	Expected Surmountability of Impacts/ Assessments Needed?
Landscape & Visual (Operation)	<ul style="list-style-type: none"> • Change the landscape and visual character of the Project Site 	<ul style="list-style-type: none"> • Future physical structure and operation of the marina; • Future physical structure and operation of the residential blocks and the resort hotel; • vehicles commuting within the Project Site; • Ferry services to Hong Kong Island; and • Landscaping works 	<ul style="list-style-type: none"> • Landscape planting, green roof, vertical greening • Light control • Colours, materials, textures and forms for the building structures should be chosen to complement the surrounding area 	Impacts expected to be surmountable with mitigation

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1 基本資料

1.1 工程項目名稱

南丫島遊艇會、酒店及住宅綜合計劃

1.2 工程項目倡議人名稱

博寮港有限公司 (The Baroque on Lamma Limited)

1.3 聯絡人姓名及電話號碼

博寮港有限公司企業事務經理 - 林勁之先生
電話：2740 8983


1.4 工程項目的目的和性質

博寮港有限公司倡議在南丫島東澳發展一個可持續的遊艇會社區（以下簡稱「本項目」）。本項目包括一個遊艇會、低座住宅和渡假酒店。本項目的遠景包括以下四個元素：

- (a) 一個世界級的遊艇會，可以舉辦國際賽事和培訓本地運動員，把香港建設成亞洲的遊艇之都；
- (b) 一個受歡迎的旅遊目的地，能夠為香港注入活力、促進生態旅遊和活化南丫島本土經濟；
- (c) 一個模範的可持續發展社區，透過創新的設計和技術來保護本地的生物多樣性、融合文化遺產，發揮地方特色；及
- (d) 把遊艇會、渡假區、水療設施和海濱住宅區融合自然環境，從而引進一種獨特的生活概念。

香港環境資源管理顧問有限公司受博寮港有限公司委託，為本項目提供環境顧問服務，以支援有關的規劃和各項法定審批程序。

1.5 工程項目地點

項目地點位於南丫島東澳的鄉郊地區，屬於南丫島分區計劃大綱圖 S/I-LI/9 號所涵蓋的範圍。展示了本工程項目地點的位置和邊界。

1.6 本工程項目簡介所涵蓋的指定工程項目

由於建議發展計劃的下列設計特色，本工程項目會是《環境影響評估條例》所界定的指定工程項目：

- *附表 2 第 I 部 C.2 項* - 面積超過 1 公頃的填海工程（包括相聯挖泥工程），而其一條界線距離一個現有的或計劃中的：
 - 文化遺產地點；
 - 海濱保護區；
 - 自然保育區；
 的最近界線少於 500 米。
- *附表 2 第 I 部 C.4 項* - 長度超過 1 公里的防波堤或伸展入潮水沖洗渠道超過該渠道寬度的 30% 的防波堤；
- *附表 2 第 I 部 F.4 項* - 對從處理廠流出並經處理的污水進行再使用的活動；
- *附表 2 第 I 部 O.2 項* - 在設計上是為不少於 30 艘主要是用於遊樂或康樂的船隻提供碇泊處或作乾性貯存的遊艇停放處；
- *附表 2 第 I 部 Q.1 項* - 包括下述項目在內的全部工程項目：新通路、鐵路、下水道、污水處理設施、土木工事、挖泥工程及其他建築工程，而該等項目部分或全部位於現有的郊野公園或特別地區或經憲報刊登的建議中的郊野公園或特別地區、自然保育區、現有的海岸公園或海岸保護區或經憲報刊登的建議中的海岸公園或海岸保護區、文化遺產地點和具有特別科學價值的地點。

2 項目資料

2.1 現有環境概覽

2.1.1 四周環境

南丫島是香港第三大的離島。島上大都是低層和低密度的住宅和旅遊設施。項目地點位於一個典型的鄉郊地區，附近有三條村落：東澳村、榕樹下村和模達村。這些鄉村都是由一些低層的村屋組成，村落之間有一條行人路連接，並通往索罟灣及模達灣。本項目地點附近沒有其他重要發展項目。

項目地點的地形包括東澳灣的海岸區（有一沙灘和岩岸）、海岸線後的低地和山坡上的高地。區內的天然特色主要是草地／灌木地、林地、岩岸和數條小溪。圖2.1展示了項目地點及其附近地區的空中鳥瞰照片。

根據圖2.2所展示的已獲批准分區計劃大綱圖S/I-LI-9號，本項目位於一些已劃作「農地」、「鄉村式發展」、「自然保育區」和「海岸保護區」的地區內。

2.1.2 北發展區

北發展區是指沿著東澳灣的一條呈南北走向的狹長地帶，從北面的模達村附近地區開始，伸延至南面石排灣附近的榕樹下村（見圖1.1）。區內有海岸地帶，其岩石地質向內陸伸延，直至有天然植被的山腳。西面的山勢起伏。山谷內有林地和長滿植物的棄耕農地。近峰頂山坡的天然植物稀疏，主要是草地／灌木地。

2.1.3 南發展區

南發展區區內有平地 and 山坡。平地是指位於石排灣和深灣兩個海灘之間的土地。這片土地傳統上都被用作農地。現時卻已大部份成為棄耕荒地，由野草和柳樹覆蓋。當中，大部份平地都位於擬設的保育走廊內，作為深灣具特殊科學價值地點的緩衝區。本項目建議在山坡的草地／灌木地建造一個水療及度假酒店，並以道路連接項目地點的北發展區。此外，亦建議在酒店前建造一個碼頭。

2.2 工程項目說明

2.2.1 工地佈局及建議用途

從圖1.1可見，本項目會由三個主要發展區組成，包括：遊艇停泊區（即「遊艇區」）、陸上北發展區（即「北發展區」）和陸上南發展區（即「南發展區」）。

遊艇區

遊艇區佔地約43公頃，將會提供約500個泊位、一條1.2公里長的防波堤、一個直升機坪、一個遊艇會、一個風帆訓練中心、商業設施，小量住宅（約50個單

位)和其他遊艇後勤設施(例如維修廠,小船乾倉和小型燃料儲存設施)。遊艇區會以橋樑形式提供連接北發展區的通道。區內的建築物都不會超過四層高。本項目除了會提供來往香港島的渡輪碼頭之外,還會在防波堤設置公眾碼頭。

市民可享用商業及其他公共設施,遊艇區並會用作舉辦賽船和各種水上康樂活動。

北發展區

北發展區佔地約21公頃,區內會建造低層住宅樓宇,提供約850個單位,另有少量商業面積。這些房屋主要會沿著由草地/灌木地覆蓋的山坡建造,並會採用階梯式設計,以減少對現有地貌的切削和填土工程。住宅樓宇區也會因應現有河溪而分佈。所有住宅樓宇都會是不超過四層高的獨立別墅或階梯式排屋。獨立別墅會安排在最靠近海邊的斜坡第一層。這些房屋亦會以建築群形式分佈。位於山坡高處林地邊緣的階梯式排屋,都會以建築群的形式順著天然地形建造。

所有房屋都有闊約7至12米的道路連接。此外,亦有一條通道從北發展區的中心連接至遊艇區,並會以環保車輛(例如電動車)沿著這條通道往來本項目的各個發展區。

本項目地點內會設置一條「保育走廊」,主要是設於林地範圍內。在這條走廊內,除了通往住宅區的短程路段之外,不會有任何發展項目。設置這條「保育走廊」的目的,是要保育自然環境和保留現有樹木。

根據現時的設計方案,項目地點內會設置數個小型全封閉式污水處理廠(進行第三級處理及流出物洗刷和消毒),總處理量達每日2,000立方米。

污水處理廠會接受來自遊艇區和陸上發展區的污水和廢水。經過處理後的清水會被用於一般沖洗、沖廁、園景灌溉等用途,務求無需排入海中。此外,亦能減少使用淡水。

南發展區

根據倡議,南發展區佔地約5公頃,會興建一所度假酒店。擬建的酒店位於山坡上,俯瞰東澳灣。該酒店會以別墅式住宿為主,並會在東澳海灘設置海灘會所。此外,亦建議在酒店前興建一個碼頭。

大致上,「保育走廊」(沒有發展項目)會伸延至深灣海灘,藉此保護綠海龜的產卵地區。酒店房屋和通道的佈局和園景處理,都會採用可以減少建築物視覺影響的設計,亦會減少對深灣海灘產生照明影響。

南部位址與北部位址會有一條7至12米闊的道路相連。公用設施則會敷設於道路之下的特設溝內,以減少發展項目的佔地範圍,而且方便維修保養。

2.2.2

環保及可持續發展的設計目標和考慮因素

本項目的設計目標如下：

- (a) 階梯式的低層屋宇發展方式會減少工地平整工程，亦不會遮擋項目地點現有的天然景色、茂密的林地、岩岸、沙灘、廣闊的草地和山坡；
- (b) 利用項目地點的不同部份作不同用途組合，使本項目可以進行多種獨特的康樂活動，例如生態徑、水上運動、有關耕種等；
- (c) 遊艇區是要設計成一個焦點地區，可以進行國際賽船、水上康樂活動、體育活動，並設有各種後勤設施，包括國際遊艇會、帆船學校、附屬商業設施和一家國際級的渡假酒店；
- (d) 項目地點內所有建築物的設計，都與南丫島上平靜和天然的環境融合，因此可以減少潛在視覺影響；
- (e) 擬議發展計劃會在設計上採用所有必要措施來保護項目地點內的環境資源；爲了保留島上特色，並爲新社區締造獨特的鄉郊生活模式，保育現有天然環境極之重要；
- (f) 遊艇區的設計，會避免直接影響海岸線，並會確保防波堤建造工程不會對遊艇區內的水流造成不良影響；除了防波堤外，整個遊艇區都會建於由支柱支撐的平台上，務求盡量減少對海洋生態和水質的潛在影響；
- (g) 防波堤的設計會避免挖掘海洋沉積物，亦會盡量減少佔地面積，務求避免產生需要棄置的被挖出沉積物，以及盡量減少對海洋生態和水質的潛在影響；及
- (h) 建議的發展將採取一個非常高標準的可持續設計和期望至少達至「碳中和」。可再生能源將被廣泛探討及採用、能源消耗將減少、廢水會經處理後再用、食品和固體廢棄物將盡可能被回收再用。項目並將引進高效及節能的基礎設施。

擬議遊艇區是根據歐洲現有遊艇會的經驗設計。當地的遊艇會大都結合附屬商業設施和住宅區，從而形成一個社區中心。

2.2.3

施工方法

本項目的主要施工活動會包括下列各項：

- 建造防波堤和遊艇區；
- 建造遊艇區的建築物；
- 爲各個陸上發展項目清理和平整工地；
- 建造道路和公用設施（包括污水處理廠）；及
- 建造陸上的新建築物和進行園景美化工程。

遊艇區的建築工程

遊艇區的主要建築工程如下：

- *後勤區建造工程* - 建議設置三個岸邊後勤區，包括兩個設於防波堤的所在地，另一個則設於酒店項目附近的碼頭工地。後勤區內會設置一個流動混凝土攪拌廠（最高產量為每日 1,400 立方米），並會存放本項目的預製混凝土構件。
- *防波堤地基工程* - 地基工程會採用石柱或振動置換法進行。
- *防波堤建造工程* - 需要在海床建造一個毛石堆地基，然後裝設預製的混凝土沉箱作為垂直防波堤的主要組件。防波堤會盡量從東端較深水的部份開始建造，然後向較淺水的海岸區推進。
- *打樁工程和混凝土平台建造工程* - 打樁工程會在防波堤近岸一側的遊艇區展開。這些工程包括遊艇區平台的樁柱，以及連接本項目陸上部份和遊艇區平台的橋樑所需的橋墩。本項目會採用無需清理樁內泥土的鑽孔樁，並會在環形鋼樁內填注混凝土，以增加其抗腐蝕能力。在打樁工程展開後，平台建築工程也會跟著動工。打樁完成後，便會樁柱內放置鋼筋，務求能夠承托混凝土平台的主要結構。然後會以混凝土灌柱樁柱，以增加其抗腐蝕能力。在混凝土平台建成後，便會裝設遊艇區的污水渠、雨水渠和公用設施。
- *遊艇區房屋建造工程* - 預計當平台適宜進行建築工程時，便會在平台上預先規劃好的位置開始建造房屋。建造平台的預製混凝土構件內，亦會按照已經規劃的位置，準備好裝設雨水渠、污水渠和公用設施的槽溝。
- *遊艇區浮動組件建造工程* - 基本的浮動組件是以配有混凝土或硬膠外殼的發泡膠磚造成。浮動泊位會以植入海床的管樁繫緊，或以“Seaflex”繫縛系統固定於混凝土繫錨或植入海床底的繫錨上，並會沿著浮動碼頭設置多套繫泊柱。在建造和安裝好浮動碼頭和所有連接結構後，便會裝設各種公用設施。

陸上的建築工程

本項目會從海路來往項目地點，並會以躉船運送建築物料。

首先會清除項目地點的植物。然後再進行工地平整工程。平整工程包括從山坡移走泥土和石塊，最深處約達10米，並把這些土石堆填於填土路堤和有護牆的填土路段上。這項工程會以一般的明掘回填法把工地平整至相關設計所要求的標高。估計這些工地平整工程會產生約250,000立方米的掘出物料。另一方面，本項目需要約583,000立方米的填料。因此，本項目打算把所有被掘出的物料都重新用作填料。

由於各項建築物都屬低層樓宇，因此無需進行打樁工程，而是採用筏式地基。道路的建築工程則會採用一般施工方法。架空的路段（例如橫過山谷和河溪）會用鑽孔樁來建造高架橋的地基。各種公用設施（包括電纜、輸水管和排污

渠) 都會安裝在車道下的預留管道, 以便日後進行維修。組裝式的污水處理廠則會以預製構件裝設在混凝土基腳上。

在各種建築物和道路落成後, 便會進行植樹和園景工程。

2.2.4 **預料會於同期施工的項目**

香港電燈公司已經建議在南丫島西南面建造一個風力發電場。然而有關的施工和運作計劃尚未確定。除此之外, 項目地點附近再沒有其他重大工程。

2.2.5 **發展計劃**

表2.1羅列了本項目現時可以預見的發展計劃。

表 2.1 **本項目暫定發展計劃**

活動	大概日期
S12A的規劃申請	2011年第2季
概念設計	2011年第2季至2012年第2季
工程設計及簽訂合約	2012年第3季至2014年年底
本項目動工(視乎是否獲發環境許可證而定)	2014年底/2015年初
落成啓用	2017年底/2018年初

3 潛在環境影響

3.1 概覽

本項目在施工和運作階段的潛在環境影響均羅列於表3.1。

表 3.1 潛在環境影響

潛在影響	施工階段	運作階段
• 氣體排放物	x	✓
• 塵埃	✓	x
• 氣味	x	✓
• 噪音	✓	✓
• 晚間操作	x	✓
• 交通	✓	✓
• 液體流出物、排放物或已受污染的徑流	✓	✓
• 產生廢物或副產品	✓	✓
• 製造、存放、使用、處理、運送或棄置危險物品、有害物料或廢物	x	x
• 危害生命	x	x (a)
• 堆填區沼氣危險	x	x
• 棄置廢舊物料，包括可能受污染的物料	x	x
• 干擾水流或底部沉積物	x	✓
• 有礙瞻的外貌	x	x
• 文化遺產	✓	x
• 陸地生態	✓	✓
• 海洋生態	✓	✓
• 累積影響	x	x

註：
✓ = 可能 x = 預計沒有
(a) 估計擬建的地底燃料儲存缸的容量會達 120 立方米，其中 25 立方米會存放汽油，其餘部份則存放柴油。預計如此細小的儲存量不會對生命造成潛在危險。

3.2 現有環境影響

3.2.1 一般情況

南丫島是香港第三大的離島，島上大都是低層和低密度的住宅和旅遊設施。項目地點位於一個典型的鄉郊地區，附近有三條村落：東澳村、榕樹下村和模達村。這些鄉村都是由一些低層的村屋組成，村落之間有一條行人路連接，並通往索罟灣及模達灣。本項目地點附近沒有其他重要發展項目。

項目地點位於南丫島東澳的一個鄉郊地區，只有北面和西南面有數條現存村落，詳情見圖3.1。在項目地點邊界的500米範圍內，都沒有現存的工業設施或煙囪。當地的空氣質素主要是受四周的背景空氣質素影響。

預計揚塵將會是施工階段需予關注的主要空氣污染物。由於本項目會採用階梯式的設計，因此會減少由切削斜坡和平整工地而產生的塵埃。由於前往建造防波堤工地的陸路和海路都很少，因此，需要在遊艇區的工程後勤區設置流動混凝土攪拌廠，以便提供本項目所需要的混凝土。預計在實施《空氣污染管制（建造工程塵埃）規例》所建議的良好施工方法後（一般減少塵埃措施、洒水和良好工地管理辦法），便能把塵埃滋擾減至最輕微的程度。視乎擬議混凝土攪拌廠的筒倉容量而定，它們可能屬於「指明工序」，因此，按照《空氣污染管制（指明工序）規例》的規定，可能需要領取牌照才能運作。若情形真的如此，便會實施《水泥工程（混凝土攪拌廠）最好的切實可行方法指引》（BPM 3/2 (93)）所闡述的排放物控制措施，務求減少對空氣質素敏感受體的潛在影響。

本項目在運作期間會有多個空氣污染來源，其中包括：

- 廚房抽氣扇所排放的氣體；
- 現場多個小型污水處理設施和堆肥設施排出的氣體；
- 遊艇區和渡輪所排放的氣體；及
- 本項目的其他廢氣來源，例如鍋爐。

然而，這些潛在影響都可以透過採用較佳的項目設計和管理控制措施來處理，包括：

- 把污水處理廠和堆肥廠設計成完全封閉的設施，並在排氣口設置關味和洗刷系統；
- 在廚房使用電爐；
- 會裝設靜電過濾器，藉此控制油煙和煮食氣味；及
- 把廚房抽氣扇的排氣方向調校為垂直向上，並遠離附近的空氣敏感受體。

預計在遊艇區和碼頭的遊艇和渡輪只會間歇地排出氣體，因此不會造成持續的不良空氣質素影響。當遊艇在區內停泊時，會關上引擎並連接岸上的電力供應。因此，已停泊的遊艇不會產生廢氣。本項目的車輛會以清潔的燃料或電力驅動。此外，電力會是本項目的主要能源；按照計劃，發展區內不會使用氣體和液體燃料。因此，預計本項目在運作階段不會造成不良的空氣質素和氣味影響。

噪音

項目地點位於南丫島東澳的鄉郊地區，屬於南丫島分區計劃大綱圖 S/I-LI/9 號所涵蓋的範圍。區內的背景噪音聲級是一般鄉郊環境常見的情況。當地沒有發現任何主要的現有噪音來源。

圖3.2所示，是在項目地點邊界300米範圍內可能會受影響的現有噪音敏感受體。由於項目地點也位於《噪音管制條例》所界定的「指定範圍」內，因此，在進行「訂明建築工程」和使用「指定機動設備」時，將會受到《管制指定範圍的建築工程噪音技術備忘錄》的非常嚴格管制。在使用「指定機動設備」前，必須先領取「建築噪音許可證」，而發出許可證的條件，是必須符合《管制指定範圍的建築工程噪音技術備忘錄》的要求，其標準比羅列於《管制建築工程噪音（撞擊式打樁除外）技術備忘錄》的要求嚴格了15分貝（A）。因此，本項目會盡量避免在《噪音管制條例》所限制的時段內施工。

若盡可能採用下列各項措施，預計在無限制時段內施工所產生的建築噪音將不會成為主要問題：

- 採用良好施工方法；
- 使用低噪音機動設備；
- 在有需要和適合的地方使用隔音屏障和隔音罩；及
- 合理的施工時間表。

預計本項目在運作階段會有以下幾個主要的噪音源，包括：

- 污水處理廠、堆肥廠、冷卻器、通風／排氣系統在運作時產生的固定機器噪音；
- 在偶然需要使用直升機時，到達和離開直升機坪，以及在直升機坪上盤旋時都會發出噪音；及
- 遊艇和車輛所產生的噪音。

然而，擬建的直升機坪會設於防波堤上（距離現有和規劃的住宅發展區超過300米），而且，若非出現緊急情況，直升機只會在日間飛行。預計只會在特殊情況下使用直升機，最多每日數次。直升機會從項目地點東面的海上靠近和離開直升機坪，務求飛行路線全部在海域上空，而且遠離最接近的噪音敏感受體。

若有需要，會為污水處理廠和堆肥廠的固定機器和其他戶外設備裝設隔音罩或減音器。在車輛方面，預料流量會較低，再加上電動車本身的低噪音設計，因此本項目不會對四周的敏感受體造成不可接受的影響。

水質

對本項目位置的檢討結果顯示，本項目可以影響多個水質敏感受體（見圖3.3）其中包括：

- 距離頗遠的魚類繁殖／育幼場和魚類養殖區；

- 在南咀至大角一帶，以及在南丫發電廠擴建區海堤可能存在的珊瑚群落；
- 索罟灣的馬蹄蟹育幼區；
- 南丫島西南海域的海洋哺乳類動物生境；
- 深灣的綠海龜生境；
- 南丫島南面可能設置的海岸公園；
- 南丫島的已刊憲泳灘，包括洪聖爺和蘆鬚城；
- 香港島的已刊憲泳灘，包括深水灣泳灘、淺水灣泳灘、中灣泳灘、南灣泳灘、舂坎角泳灘和聖士提反泳灘；及
- 位於圓角的南丫發電廠海水進水口。

然而，上述各個敏感受體當中，除了位於深灣的綠海龜生境之外，全部都距離本項目超過1公里。

由於這個生境對水質高度敏感，因此，本項目會採用非挖泥的方法來建造防波堤，但仍需進行一定程度的打樁和填海工程。所有土方工程都會採用《專業人士環保事務諮詢委員會專業守則之建築工地的排水渠（專業守則1/94）》所建議的工地徑流控制措施來控制含有沙泥的徑流。使用隔泥網也可以為打樁和填土工程提供75%的隔泥效率。

若能對施工活動進行妥善規劃和緩解，便可以克服本項目造成的影響。在進行環境影響評估時，會為本項目進行定量水質模擬，藉以確定本項目不會造成不可接受的水質影響，特別是在懸浮固體和溶解氧消耗量方面，並確定各個水質敏感受體都能夠符合水質指標。

本項目在運作期間會有多項值得關注的水質事宜，包括：

- 污水的產生；
- 船隻的排放物、維修和船身清潔；及
- 遊艇區和防波堤都會改變該區的水流模式、沖刷能力和水流速度。

為了處理這些潛在污染源，本項目會實施多項緩解措施：

- 項目地點所產生的所有污水和廢水都會被收集，並在現場的污水處理廠處理；
- 經過處理的污水和雨水都會盡量在現場再用；
- 維修工作（例如船身清洗等）所產生的廢水和渣滓，以及汽油和剩餘燃料等，都必須加以截流，並輸送至專用的系統予以收集，以便交由持牌承辦商運往場外處置。
- 本項目會擬訂溢漏應變管理計劃並予以實施，藉以緩解溢漏事故所造成的潛在水質影響。
- 遊艇區會提供廢水泵和固體廢物收集設施，以免船隻把這些物品棄於船外。

在充份實施上述各項緩解措施後，預計本項目在施工和運作期間都不會造成不良水質影響。在進行環境影響評估時，會進行定量水質影響評估，藉此確定本項目不會造成不可接受的影響，特別是建造防波堤對水流模式的影響。

3.6

廢物管理

本項目會在施工階段產生公眾填料和建築廢物。其中的公眾填料會盡可能在現場作回填之用，而建築廢物則會被運往索罟灣轉運設施，以便轉運至新界西堆填區棄置。

按照施工規模估計，本項目只會產生小量化學廢物。此外，建築工人也會產生一般垃圾。

本項目在運作時會產生一般垃圾（包括食品廢物）。食品廢物會在源頭分類，並在現場的推肥廠加以處理。該廠所生產的堆肥會被用於現場的園景設施中。現場污水處理廠所產生的淤泥會按照環保署的指示，運往新界西堆填區或稔灣的淤泥處理設施加以處理。在船隻維修時產生的化學廢物，均會按照《廢物處置（化學廢物）（一般）規例》和《包裝、標識及存放化學廢物的工作守則》的要求加以存放、處理、運送和處置。

若能實施一般良好施工方法和各項建議的廢物管理措施，預計本項目在施工和運作階段都不會造成不良的廢物管理、交通或次生環境影響。

3.7

生態

3.7.1

陸地生態

圖B.4所示，是在項目地點邊界500米範圍內的已知陸地生態資源。一般而言，項目地點的生境主要包括灌木地／草地混雜區、次生林地、高枝灌木地、岸邊植物、河溪和鄉村／發展土地。因此，需要進行基線生態調查，以便確定可能會受到本項目影響的生境及其動物和植物品種。

項目地點的陸上部份與南丫島分區計劃大綱圖S/I-LI/9號所劃定的「自然保育區」和「海岸保護區」有部份重疊。本項目的南部位址亦位於南丫島南部具特殊科學價值地點的200米範圍內，而且貼近深灣具特殊科學價值地點，其沙灘已被劃為「限制地區」，以便保護已知的綠海龜產卵地點。根據記錄，南丫島南部也有盧文氏樹蛙存在。

本項目的設計，旨在避免對林地造成潛在影響，並把主要的林地劃為「保育走廊」。在這條走廊內不會有任何發展項目，但通往住宅區的短程路段之外除外（會盡可能以橋樑跨過該走廊，務求減少對樹木的直接影響）。

預計本項目在實施合理的緩解措施後，施工和運作階段都不會造成不良的剩餘影響。這些措施包括：採用適當的工程設計、實施良好施工方法和工地徑流控制措施、移種植物、遷徙動物和補償植樹。若能實施這些措施，便可以減少四周環境的潛在影響。

需予關注的主要事項包括：

- 本項目對海洋生態資源的影響，包括潮間和潮下的硬底和軟底生境；
- 具特殊價值的物種，包括海洋哺乳類動物 – 中華白海豚、江豚和綠海龜；和
- 根據漁農自然護理署（漁護署）的一項研究，可能會在南丫島設立海岸公園。

遊艇區的位置已經避免直接影響對生態敏感的生境，其中包括位於東澳灣的天然岩岸和珊瑚生境、深灣的綠海龜產卵沙灘及可能設立的南丫島西南海岸公園。

此外，亦會採用非挖泥式建築方法來建造防波堤。同時，透過把遊艇區的混凝土平台建於樁柱上，並採用浮動碼頭，本項目的填海範圍便會減至最少。

至於遊艇區混凝土平台的樁柱，則選用鑽孔樁作為最可取的裝設方法。由於已經採用可以減少水底聲音傳播的施工方法，因此在進行海洋打樁工程時，只會對海洋哺乳類動物造成間接和短暫的滋擾。若能採用適當的緩解措施，例如海洋哺乳類動物／海龜專用區，以及在建成防波堤之後才進行主要海洋打樁工程，便不會對這些生物造成不可接受的影響。

本項目還會採用的其他特定緩解措施包括：在防波堤的邊緣建造石堆／石塊護面海堤，以便潮間和潮下生物聚集，而且可以限制船隻航速。

為了把水質影響緩解至可接受水平（符合評估準則）而設計的控制措施，也適用於海洋生態資源。

預計本項目在運作階段不會對海洋生態資源造成不良影響。特別是本項目所產生的水底聲級，將不會對海洋哺乳類動物和海龜造成不可接受的影響。

是次研究進行了一次文獻檢閱，回顧了有關本項目附近海域的商業漁業資源和捕漁作業的基線情況資料，並找出了各個敏感受體，其中包括已知的產卵和育幼區、人工魚礁和魚類養殖區（見圖3.5）。本項目地點內的生境都並非獨一無二的種類。在擬議遊艇區旁邊和在香港其他地方，都有面積頗大而且具有同等價值的生境。

本項目在施工期間，各項擬議海事工程可能造成的直接影響會包括：防波堤和遊艇區／突堤碼頭樁柱所佔範圍內的漁業生境會永久消失，以及在海事建設工程區內的生境會受到短暫滋擾。

此外，海事工程會令水底噪音聲級升高，亦會改變一些主要水質參數，因此，可能會對有關海域和生物造成間接影響。海事建設工程會採用足以減少潛在水質影響的設計，因此，亦會減少對漁業資源的影響。

遊艇區的結構會令部份漁業生境永久消失，亦會令遊艇區內約50公頃的捕漁區不再可用，但這些影響並不明顯，因為受影響的範圍相對於整個南部海域而言面積細小，而且漁業價值亦不高。另一方面，遊艇區的結構會提供硬質基底供海洋生物聚集，因此會為漁業帶來長期效益。

倘若遊艇區的發展令東澳灣內港的水流模式改變，並最終影響灣內水質，便可能會影響該區的漁業資源。因此，遊艇區和突堤式碼頭都會建於由樁柱承托的平台上，藉此保持灣內的水流模式。然而，遊艇區及防波堤對海灣的水流力學方面的潛在影響（例如沖刷能力和水流速度等），則需要進行計算機模擬來確定。倘若模擬結果預測水流力學的模式和水質都會受到不良影響，本項目便會建議作出適當改變，例如修改設計，務求把影響緩解至可接受程度。

3.9 文化遺產

3.9.1 建築文物

初步的文獻檢閱和實地調查都沒有在項目地點的500米範圍內發現任何法定古蹟、已評級／建議歷史建築，以及古物古蹟辦事處所羅列的政府文物地點。本項目會進行工地勘察，藉此找出任何1950年以前的建築文物（可能包括建築結構、墳墓和具文化／歷史意義的園林特色），以便探討本項目會否對這些文物造成任何直接或間接影響（例如施工振動影響）。

本項目在擬訂總綱發展藍圖時，會優先考慮如何避免直接影響1950年之前的建築文物。倘若沒法避免造成直接影響，便會在清除該等元素前實施適當的緩解措施，例如以拍照和繪圖方式記錄受影響元素。假如發現潛在的施工振動影響，便會為本項目的施工和運作階段建議適當的緩解措施及／或監察計劃。在實施各項建議的緩解措施後，預計本項目不會對建築文物資源造成不良影響。

3.9.2 陸地考古

案頭的文獻研究發現，在項目地點（陸地部份）範圍內或毗鄰地方，有古物古蹟辦事處列出的三個具考古價值地點，一如圖 3.6 所示。根據文獻研究和實地觀察的結果，有需要進行考古調查，以便取得實地數據，為稍後進行的影響評估填補尚欠的資料。

倘若預計本項目會造成考古影響，便會在有需要的地方建議適當的緩解措施。

3.9.3 海洋考古

是次研究在海洋考古勘察區發現兩個可能的海洋考古遺址（一個沉船遺址（英國水文局編號 62405）和一個異物（英國水文局編號 46598）），一如圖 3.7 所示。

沉船地點（英國水文局編號 62405）位於海洋考古勘察區的邊緣，但在擬議發展的遊艇區之外。而且，該艘沉船是現代船隻，其考古價值微不足道。因此，從海洋考古角度而言，本項目不會造成任何影響。

雖然該異物英國水文局編號 46598) 位於項目地點範圍內，距離海岸不遠，可能會受到直接影響，然而，在檢討過地球物理調查數據後，再加上實地潛水調查的結果顯示，該異物已從海床上消失。因此，本項目不會造成任何影響。

3.10 景觀與視覺影響評估

3.10.1 景觀影響

本項目位於海岸地帶，主要是灌木、草地和林地茂密的山谷和山坡，以及海岸線上的岩岸和沙灘。區內亦有一些由一至三層高房屋組成的村落。天然河溪的河道也是當地景觀特色之一。研究範圍也有被植物覆蓋的棄耕農地。

因此，預計本項目在施工和運作階段會造成各種景觀及視覺影響。本項目在下列各個不同階段均會對景觀特色區和景觀資源造成影響：

- 防波堤和遊艇區建造工程；
- 遊艇區建築物的建造工程；
- 陸上發展項目的工地清理和平整工程；
- 道路和公用設施的建造工程；
- 陸上新建築物的建造工程；
- 建築機器和設備的放置和使用；
- 建造及拆卸物料堆放區，包括將會重新再用的掘出物料；
- 遊艇區日後的實質結構和運作；
- 住宅樓宇、水療設施和渡假酒店日後的實質結構和運作；
- 在項目地點內行駛的車輛；
- 來往香港島的渡輪服務；及
- 園景美化工程。

在進行環境影響評估時，也會對景觀影響作出詳細評估，藉此探討相關影響的可接受程度和所需要的緩解措施。

3.10.2 視覺影響

本項目所在地區的一般基線視覺特徵是典型的海灣地區特點，當中地勢起伏，並在北、西和西南面形成丘陵。在植物覆蓋下的山巒形成項目地點的背景，也呈現出自然和鄉郊環境的特色。東澳灣四周都是岩岸，當中以石排灣海灣的海岸線最突出。從海灣看去，只有東澳村、榕樹下村和模達村的村屋和行人路是人工結構。四周未受滋擾的天然景觀令該區有優質的整體視覺特色。

在進行環境影響評估時，也會評估視覺影響，以便分析本項目對現有的視野的潛在影響，特別是在視覺影響區域內的視覺敏感受體可能受到的潛在影響。為了說明本項目的潛在視覺影響，本項目會從具代表性的視覺敏感受體拍照，並製成集成照片，以便展示本項目在不同發展階段所造成的視野變化。此外，本

項目也會按照《環境影響評技術備忘錄》附件10的要求，評估有關的剩餘影響。

3.11 **潛在影響摘要及可緩解程度的評估**

根據《環境影響評技條例》的準則，擬議進行的南丫島遊艇會、酒店及住宅綜合計劃是一個指定工程項目，因此，必須取得環境許可證才能施工和營運。本項目打算以一份獲得批准的環評報告來申請環境許可證。本《工程項目簡介》是為申請環評研究的《環評研究大綱》而提交。

上文已經探討了本項目的主要問題、可用的緩解措施和各種影響來源，也初步檢討了這些影響的可接受程度。表3.2是這些項目的摘要。本《工程項目簡介》也概述了本項目的設計，以及打算採用的施工方法和施工計劃。

本《簡介》就各種潛在環境影響所闡述的初步評估結果，已經說明了本項目的規模和需予關注的主要範疇，以便當局擬訂《環評研究大綱》。

3.12 **使用先前通過的環評報告**

AEIAR-152/2010 - 在香港發展一個100兆瓦海上風力發電場。

表 3.2 主要事宜、影響來源、可能需要的緩解措施和可緩解程度的評估

環境影響	主要事宜／關注	影響來源	可能需要的緩解措施	預計可緩解程度／是否需要進行評估？
空氣質素 (施工階段)	<ul style="list-style-type: none"> 可以合理地克服的影響 預料並非主要問題 	<ul style="list-style-type: none"> 本項目會採用階梯形的設計，因此需要削去部份山坡、清理工地，並平整出一系列平台，以便建造別墅和酒店。 建造防波堤。 由於運輸困難，所以會在現場使用一個混凝土攪拌廠 - 可能屬於《空氣污染管制條例》所界定的「指明工序」。 	<ul style="list-style-type: none"> 《空氣污染管制（建造工程塵埃）規例》所建議的一般減少塵埃措施、洒水和良好工地管理辦法等。 《水泥工程（混凝土攪拌廠）最好的切實可行方法指引》（BPM 3/2 (93)）所建議的排放物控制措施。 	<ul style="list-style-type: none"> 預計減少揚塵後，便可以緩解有關影響。 可能需要進行定性評估，或有關塵埃飄散情況的模擬和定量評估。
空氣質素 (運作階段)	<ul style="list-style-type: none"> 可以合理地克服的影響 預料並非主要問題 	<ul style="list-style-type: none"> 廚房抽氣扇所排放的氣體 現場污水處理廠和堆肥設施所排放的氣體 遊艇區（進出該區的機動船隻）和渡輪服務所產生的廢氣 遊艇區和渡輪、鍋爐等所排放的氣體等等 	<ul style="list-style-type: none"> 在廚房使用電爐 在廚房通氣口裝設靜電過濾器，藉此控制油煙和煮食氣味 把廚房抽氣扇的排氣方向調校為垂直向上，並遠離附近的空氣敏感受體。 污水處理廠和堆肥設施均採用全密封的設計 在污水處理廠和堆肥設施的排氣口裝設氣味辟除和洗刷系統 	<ul style="list-style-type: none"> 預料有關的影響都是間歇性，而且可以透過適當措施加以緩解。 可能需要進行有關懸浮粒子總量、可吸入懸浮粒子、二氧化硫和二氧化氮的模擬和定量評估。
噪音 (施工階段)	<ul style="list-style-type: none"> 可以合理地克服的影響 預料並非主要問題 	<ul style="list-style-type: none"> 在非受限制時段內進行需要使用機動設備的工程 在受限制時段內進行的工程需要取得《建築噪音許可證》 	<ul style="list-style-type: none"> 採用良好工地管理方法 使用低噪音機動設備 在適當地方使用隔音屏障和隔音罩 合理的施工時間表 	<ul style="list-style-type: none"> 預料有關的影響都可以透過適當措施克服 需要在環評階段進行定量評估
噪音 (運作階段)	<ul style="list-style-type: none"> 直升機的飛行、遊艇區的運作和固定機器等在晚間的運作都會是當地社區關注的事項 	<ul style="list-style-type: none"> 污水處理廠、堆肥設施、冷卻器、通風／排氣系統在運作時產生的固定機器噪音 直升機噪音 在防波堤升降、往來的直升機 遊艇區運作所產生的噪音 車輛、船隻所產生的噪音 	<ul style="list-style-type: none"> 把直升機坪安排在遠離所有噪音敏感受體的地方 往來直升機坪都採用向海的飛行路線 若有需要，為所有戶外的設備和固定機器裝設隔音罩 	<ul style="list-style-type: none"> 預料有關的影響都可以透過適當的規劃、緩解和管理措施而加以克服 可能需要對直升機坪和飛行路線造成的固定機器噪音和直升機噪音進行定量評估

環境影響	主要事宜／關注	影響來源	可能需要的緩解措施	預計可緩解程度／是否需要進行評估？
水質 (施工階段)	<ul style="list-style-type: none"> 有魚類繁殖／育幼場和魚類養殖區存在，但距離頗遠 在南咀至大角一帶，以及在南丫發電廠擴建區海堤可能存在的珊瑚群落 位於索罟灣的馬蹄蟹育幼區 於南丫島西南面海域的海洋哺乳類動物生境 於深灣的綠海龜生境 位於南丫島南面的潛在海岸公園 位於南丫島上和香港島南面的已刊憲泳灘 位於圓角的南丫發電廠海水進水口 除了位於深灣的綠海龜生境之外，上述所有敏感受距離本項目都超過 1 公里 	<ul style="list-style-type: none"> 建造防波堤可能需要進行打樁工程 可能會產生懸浮固體的捲流 意外的溢流 從建築船隻排出壓艙配重水 岸上活動所產生的徑流 	<ul style="list-style-type: none"> 會採用非挖泥的方法建造防波堤，但仍需要進行打樁和填海 使用未受污染的充填物料 採用《專業人士專業守則之建築工地的排水渠》所闡述的工地徑流控制措施 為打樁和填土工程裝設隔泥網，藉此提供 75% 的隔泥效果 建築船隻的壓重系統應該保持清潔 	<ul style="list-style-type: none"> 預料有關的影響都可以透過適當的施工規劃和緩解措施而克服 可能需要進行定量模擬，藉以證明本項目不會造成不可接受的影響，特別是在懸浮固體、溶解氧消耗量和水質指標方面
水質 (運作階段)	<ul style="list-style-type: none"> 沒法接駁公共排污系統，因此要依賴現場的污水處理廠 雨水徑流 防波堤令水流模式改變 	<ul style="list-style-type: none"> 住宅、酒店和商業設施所產生的污水 控制含泥／油的徑流，以免流入海岸區 船隻的排放物、維修和船身清潔 遊艇區和防波堤都會改變該區的水流模式、沖刷能力和水流速度 	<ul style="list-style-type: none"> 廢水處理達到第三級水平，連同流出物洗刷和消毒，以便重新用於一般清潔、沖廁和灌溉園景區 使用泥隔和油隔，以免含泥／油的雨水流入近岸海域 為污水處理廠制訂化學品溢出／失靈時的緊急應變計劃 由持牌承辦商收集清潔船身所產生的廢水 	<ul style="list-style-type: none"> 預料有關的影響可以透過適當措施加以緩解 可能需要進行定量水質評估，藉以證明由防波堤導致的水流模式改變，不會造成不可接受的影響
廢物管理 (施工階段)	<ul style="list-style-type: none"> 可以合理地克服的影響 預料並非主要問題 	<ul style="list-style-type: none"> 主要是建築廢物、小量化學廢物和一般垃圾 	<ul style="list-style-type: none"> 把掘出的惰性物料在現場重新用於工地平整工程 用船把非惰性廢物運送至環保署設於南丫島的索罟灣轉運設施，以便轉運至新界西堆填區 	<ul style="list-style-type: none"> 預料有關的影響可以透過適當措施加以緩解 需要在環評研究中找出廢物產生量的具體數字

環境影響	主要事宜／關注	影響來源	可能需要的緩解措施	預計可緩解程度／是否需要進行評估？
廢物管理 (運作階段)	<ul style="list-style-type: none"> 可以合理地克服的影響 預料並非主要問題 	<ul style="list-style-type: none"> 現場污水處理廠所產生淤泥 船隻維修所產生的化學廢物 住宅和酒店發展項目所產生的一般垃圾 	<ul style="list-style-type: none"> 現場污水處理廠所產生的淤泥會按照環保署的指示，運往新界西堆填區或稔灣的淤泥處理設施 化學廢物的存放、處理、運送和處置，都按照《廢物處置（化學廢物）（一般）規例》和《包裝、標識及存放化學廢物的工作守則》的要求進行 收集一般垃圾，並用船運送至環保署設於南丫島的索罟灣轉運設施，以便轉運至新界西堆填區 已在源頭分類的食品廢物會在現場作堆肥 	<ul style="list-style-type: none"> 預料有關的影響可以透過適當措施加以緩解 需要在環評研究中找出廢物產生量的具體數字，並建議處置方案
陸地生態	<ul style="list-style-type: none"> 項目地點的陸地部份與自然保育區和海岸保護區有部份重疊 本項目的南部位址距離南丫島具特殊科學價值地點不足 200 米 接近深灣具特殊科學價值地點 - 該處的沙灘是一個「限制地區」，旨在保護已知的綠海龜產卵地點 已知南丫島南部有盧文氏樹蛙存在 區內生境可能具有較高的生態價值，但需進行詳細基線調查 	<ul style="list-style-type: none"> 在本項目取得所需土地後，區內的生境會消失或被分割 上述情況可能會令野生動物在使用該區時受到限制 人類滋擾增加 預料不會直接影響已知的具保育價值地點，即：具特殊科學價值地點、限制地區等 位於自然保育區和海岸保護區內的部份具較低至中等生態價值的生境將會損失 	<ul style="list-style-type: none"> 避開重要的具保育價值地點，即：具特殊科學價值地點、限制地區等 盡量縮小發展計劃的佔地面積 盡量把土方工程限制在旱季進行 設置臨時排水道和沙泥清理設施 倘若未能避免造成影響，便需移植具保育價值的植物 倘若未能避免造成影響，便需遷徙可能受影響的動物 補償受損的生境 	<ul style="list-style-type: none"> 預料有關的影響可以透過適當措施加以緩解 進行基線生態調查，以便確定生境的價值
海洋生態	<ul style="list-style-type: none"> 生境資源包括潮間和潮下的硬底和軟底生境 具特殊價值的物種，包括海洋哺乳類動物 - 中華白海豚、江豚和綠海龜 然而，衛星的追蹤數據顯示，綠海龜極少使用項目地點範圍內和附近海域 	<ul style="list-style-type: none"> 為建防波堤而進行的填海和石塊充填工程，或英泥灌漿工程 建造以樁柱承托的遊艇區混凝土平台及浮動泊位 建造酒店的突堤式碼頭 	<ul style="list-style-type: none"> 採用非挖泥式施工方法建造防波堤 避免直接影響對生態敏感的生境，其中包括位於東澳灣的天然岩岸和珊瑚生境、深灣的綠海龜產卵沙灘、可能設立的南丫島西南海岸公園（根據選址研究結果） 設計過程 - 採用以樁柱承托的遊艇區混凝土平台和浮動泊位來縮小填海面 	<ul style="list-style-type: none"> 預料有關的影響可以透過適當措施加以緩解

環境影響	主要事宜／關注	影響來源	可能需要的緩解措施	預計可緩解程度／是否需要進行評估？
	<ul style="list-style-type: none"> 根據漁護署的一項研究，可能會在南丫島南部設立海岸公園 在擬建的遊艇區內，沒有具高生態價值的海洋生態資源和生境 		<ul style="list-style-type: none"> 積，因而縮小了填海區所佔用的範圍 使用隔泥幕 若有需要，重置硬珊瑚 	
漁業	<ul style="list-style-type: none"> 在擬議發展的遊艇區內沒有任何魚類養殖區 最近的魚類養殖區位於索罟灣（相隔 4.5 公里）和蘆荻灣（相隔 5 公里） 擬建的遊艇區位於已知的香港南部海域魚類繁殖區和育幼區範圍內 位於蘆荻灣魚類養殖區內的人工魚礁（距離本項目最少 5 公里） 	<ul style="list-style-type: none"> 對生境造成直接滋擾 海事建設工程所產生的水底噪音 影響主要水質參數 - 懸浮固體、溶解氧消耗量、營養 改變水流模式和次生水質影響 海底生境的長期轉變 	<ul style="list-style-type: none"> 在施工時使用隔泥幕來控制水質 無需實施任何漁業特有的緩解措施 	<ul style="list-style-type: none"> 預料有關的影響可以透過適當措施加以緩解
文化遺產	<ul style="list-style-type: none"> 位於項目地點內或旁邊的三個具考古價值地點（深灣、東澳和模達灣） 未知的 1950 年以前建築文物資源，可能位於項目地點內 	<ul style="list-style-type: none"> 本項目對文化遺產資源的直接或間接影響（潛在振動影響） 	<ul style="list-style-type: none"> 修改總綱發展藍圖，務求避免造成影響 對未能避免受影響的建築文物以拍照和繪圖方法加以記錄 若有需要，對項目地點附近的建築文物進行振動監察 進行實地考古調查，以便確定考古資源所受到的影響，並決定各項必要的緩解措施 	<ul style="list-style-type: none"> 預料有關的影響都可以透過適當措施加以緩解 需要進行實地陸上考古調查，以便確定考古資源所受到的影響
景觀與視覺 (施工階段)	<ul style="list-style-type: none"> 對天然景觀資源的直接影響 	<ul style="list-style-type: none"> 防波堤和遊艇區建造工程； 遊艇區建築物的建造工程； 陸上發展項目的工地清理和平整工程； 道路和公用設施的建造工程； 陸上新建築物的建造工程； 建築機器和設備的放置和使用；及 建造及拆卸物料堆放區，包括將會重新再用的掘出物料 	<ul style="list-style-type: none"> 保護、保存和移植樹木 補償植樹 為物料堆加上屏蔽 燈光控制 把表土重新再用 盡可能避開天然河溪 	<ul style="list-style-type: none"> 預料有關的影響都可以透過適當措施加以緩解

環境影響	主要事宜／關注	影響來源	可能需要的緩解措施	預計可緩解程度／是否需要進行評估？
景觀與視覺 (運作階段)	<ul style="list-style-type: none"> 改變了項目地點的景觀和視覺特徵 	<ul style="list-style-type: none"> 遊艇區日後的實質結構和運作； 住宅樓宇和渡假酒店日後的實質結構和運作； 在項目地點內行駛的車輛； 來往香港島的渡輪服務；及 園景美化工程 	<ul style="list-style-type: none"> 園景美化種植、綠化屋頂、綠化外牆 燈光控制 在選擇建築結構的顏色、物料、質感和外型時，應該配合四周地區 	<p>預料有關的影響都可以透過適當措施加以緩解</p>

Figures 圖

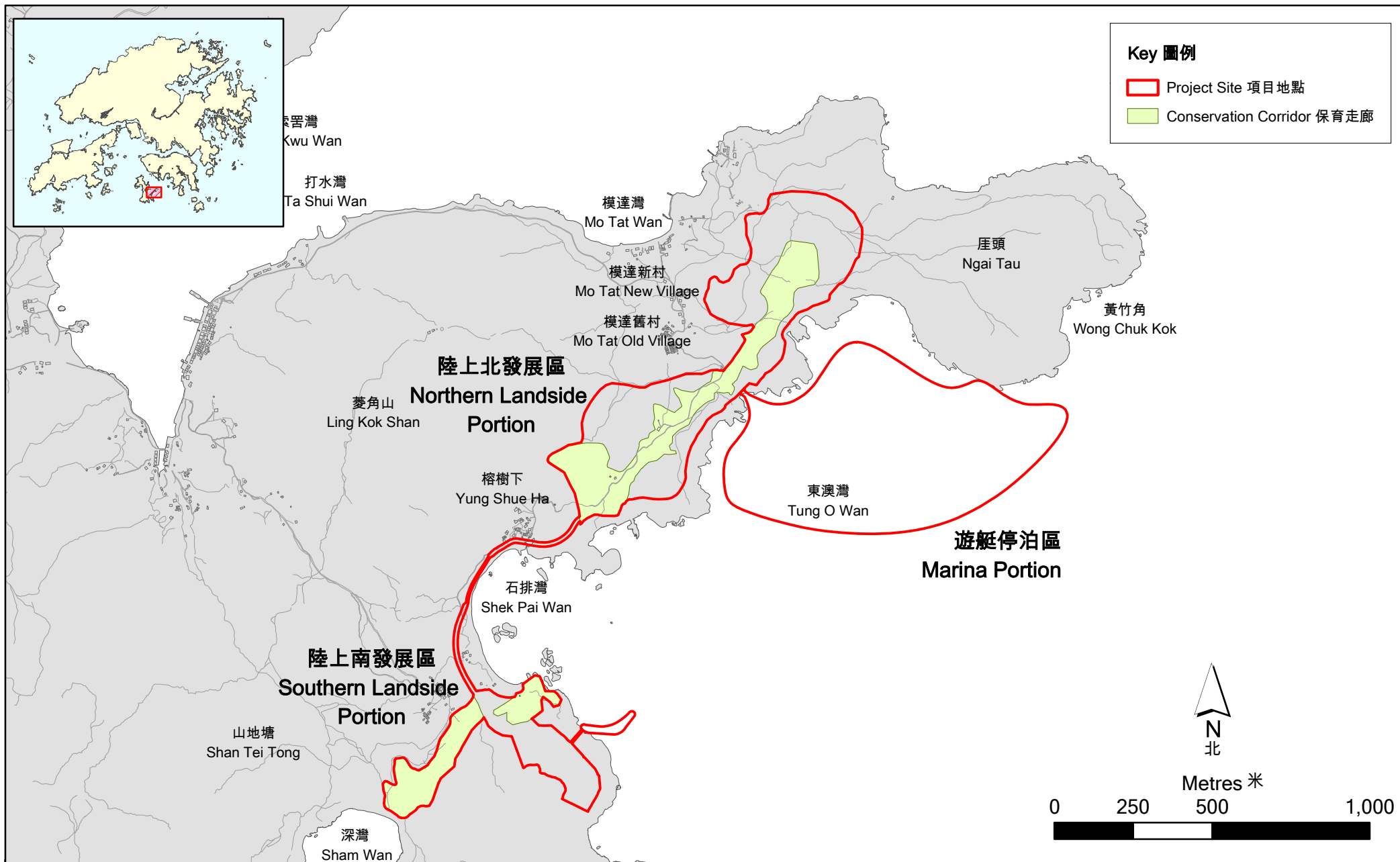


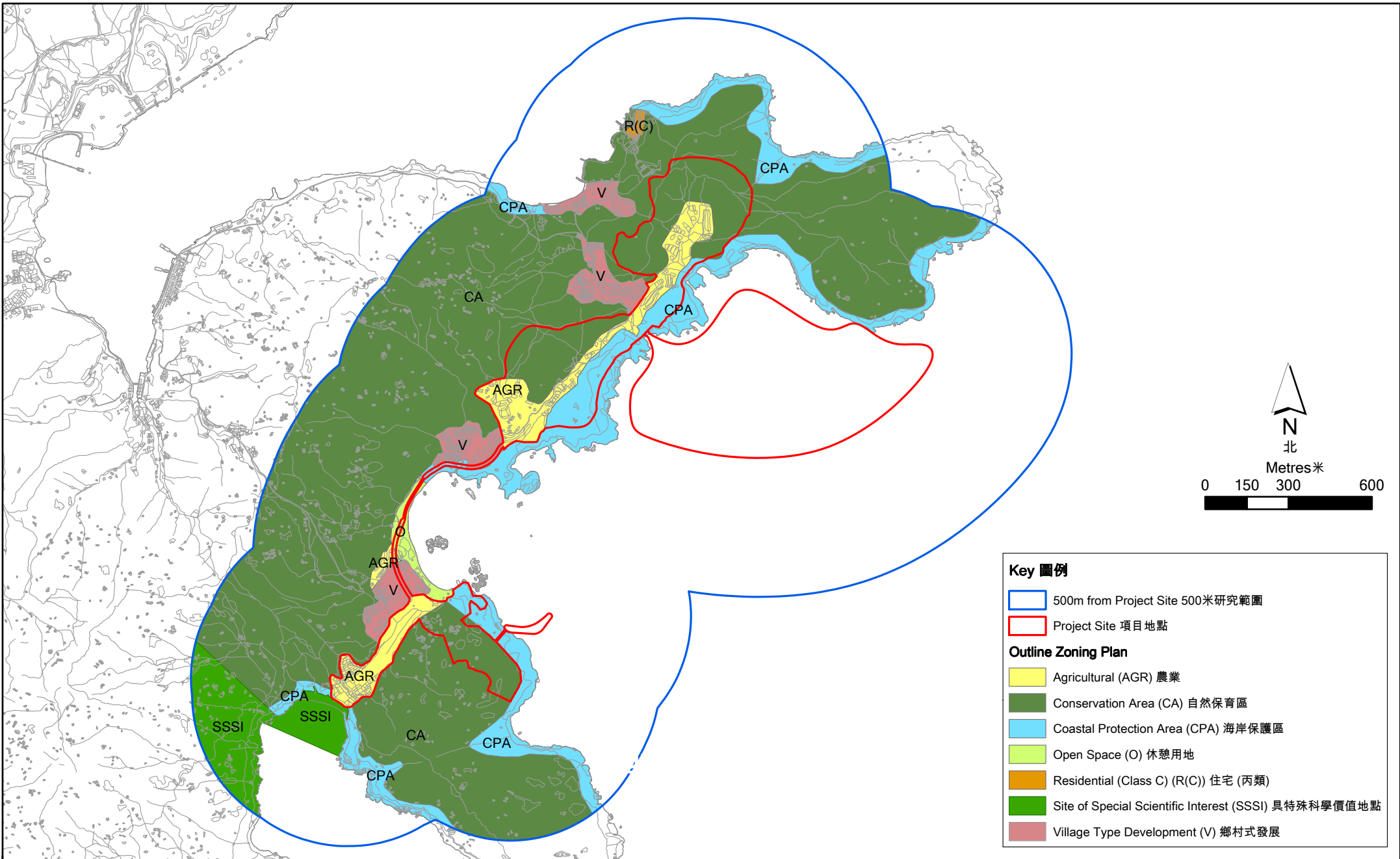
Figure 圖 1.1

Location of the Project
項目位置



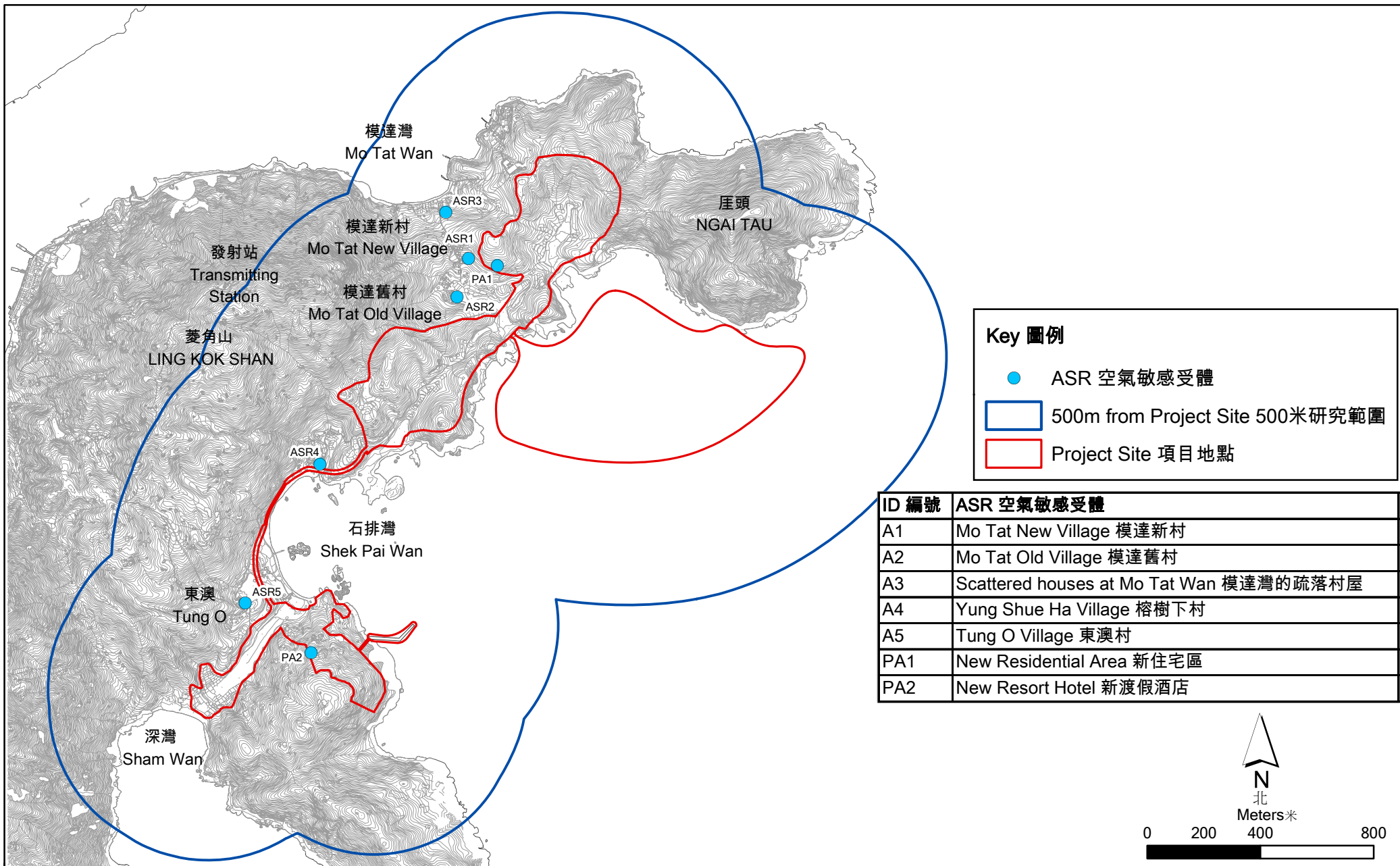
Figure圖 2.1

Aerial View of the Project Site
 項目地點空中鳥瞰圖



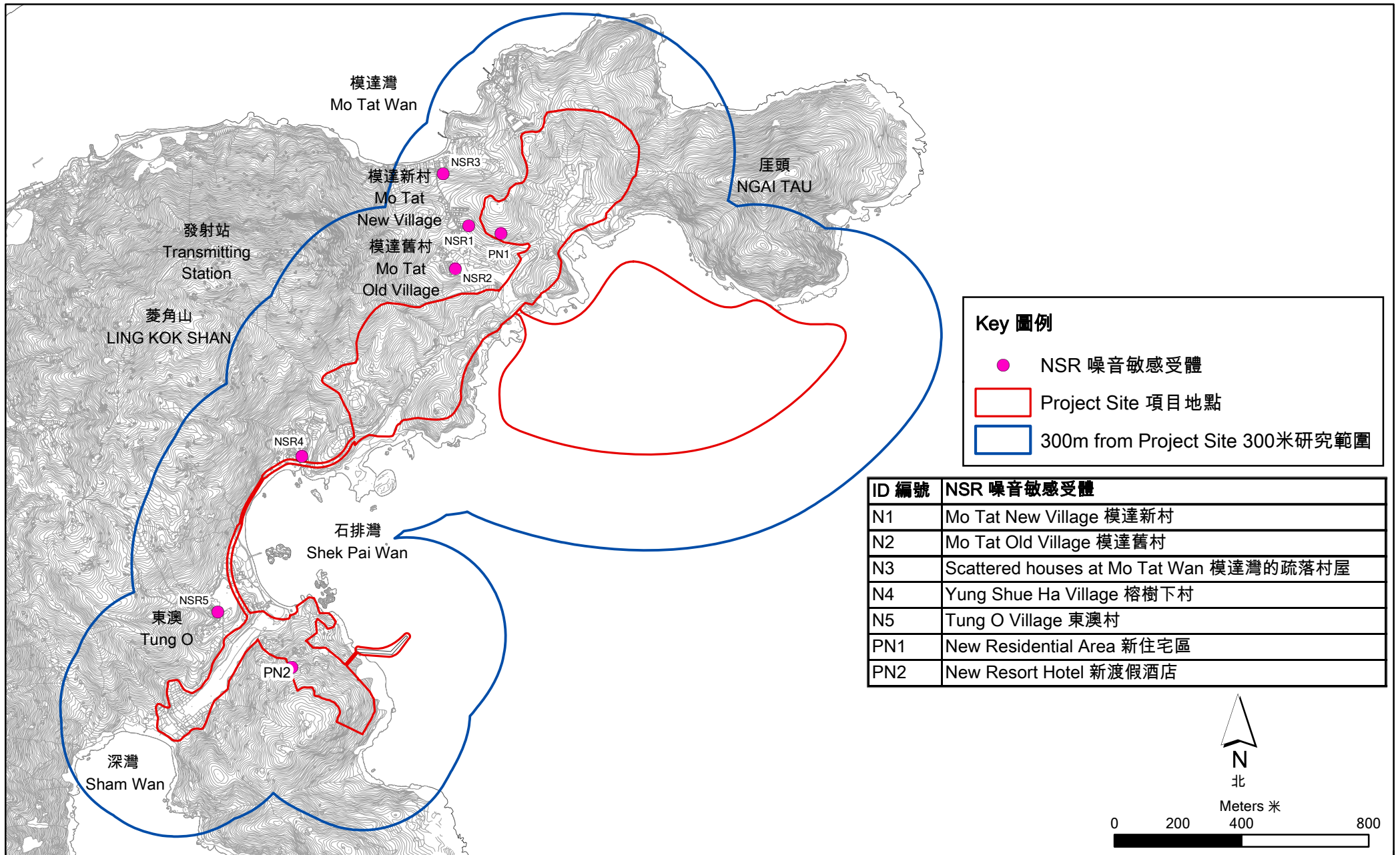
Figure圖 2.2

Extract of Lamma Island Outline Zoning Plan No. S/I-LI-9
南丫島分區計劃大綱圖 S/1-4-9號 (摘錄)



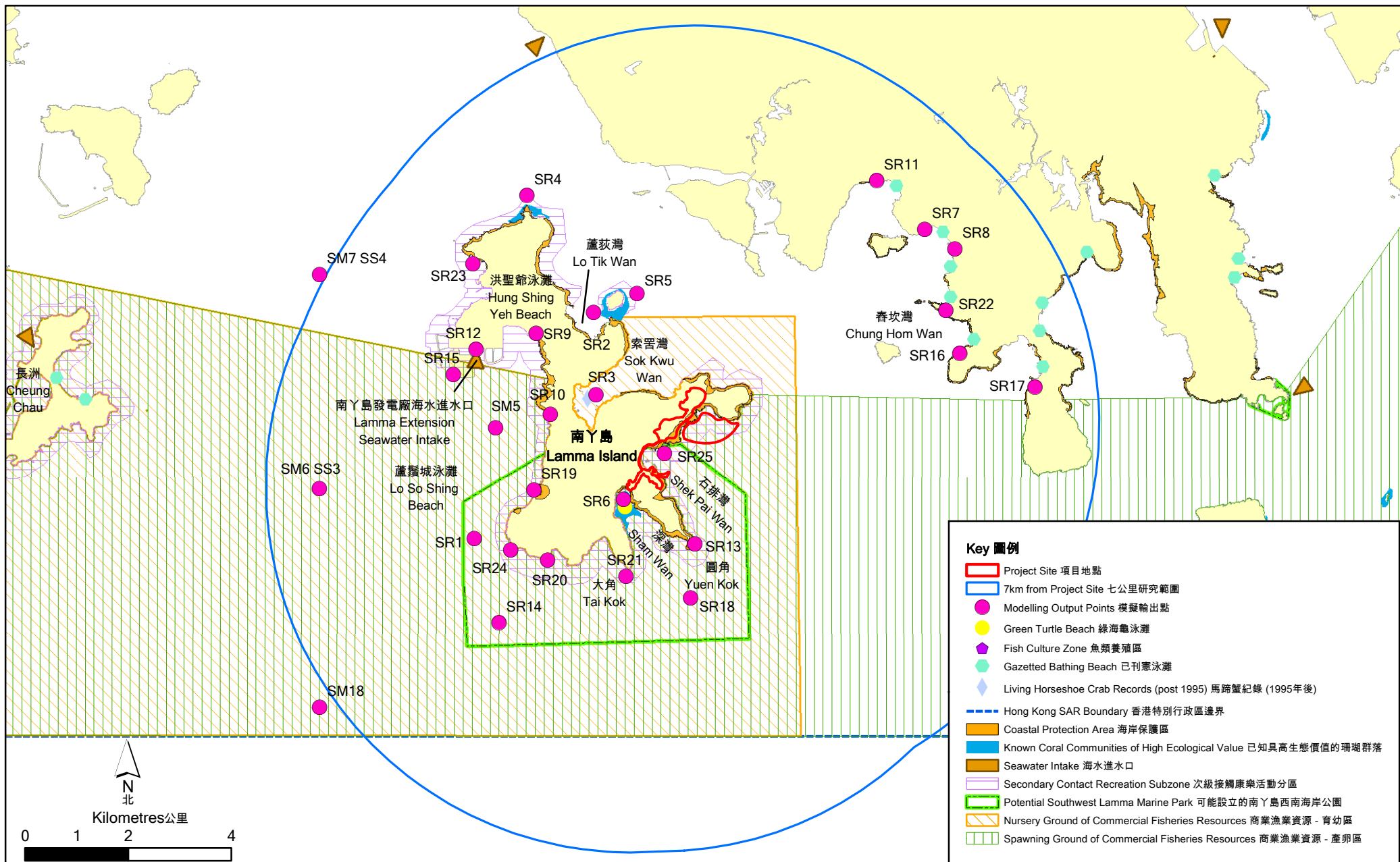
Figure圖 3.1

Location of Air Sensitive Receivers
空氣敏感受體位置圖



Figure圖 3.2

Location of Noise Sensitive Receivers
噪音敏感受體位置圖

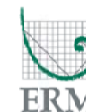


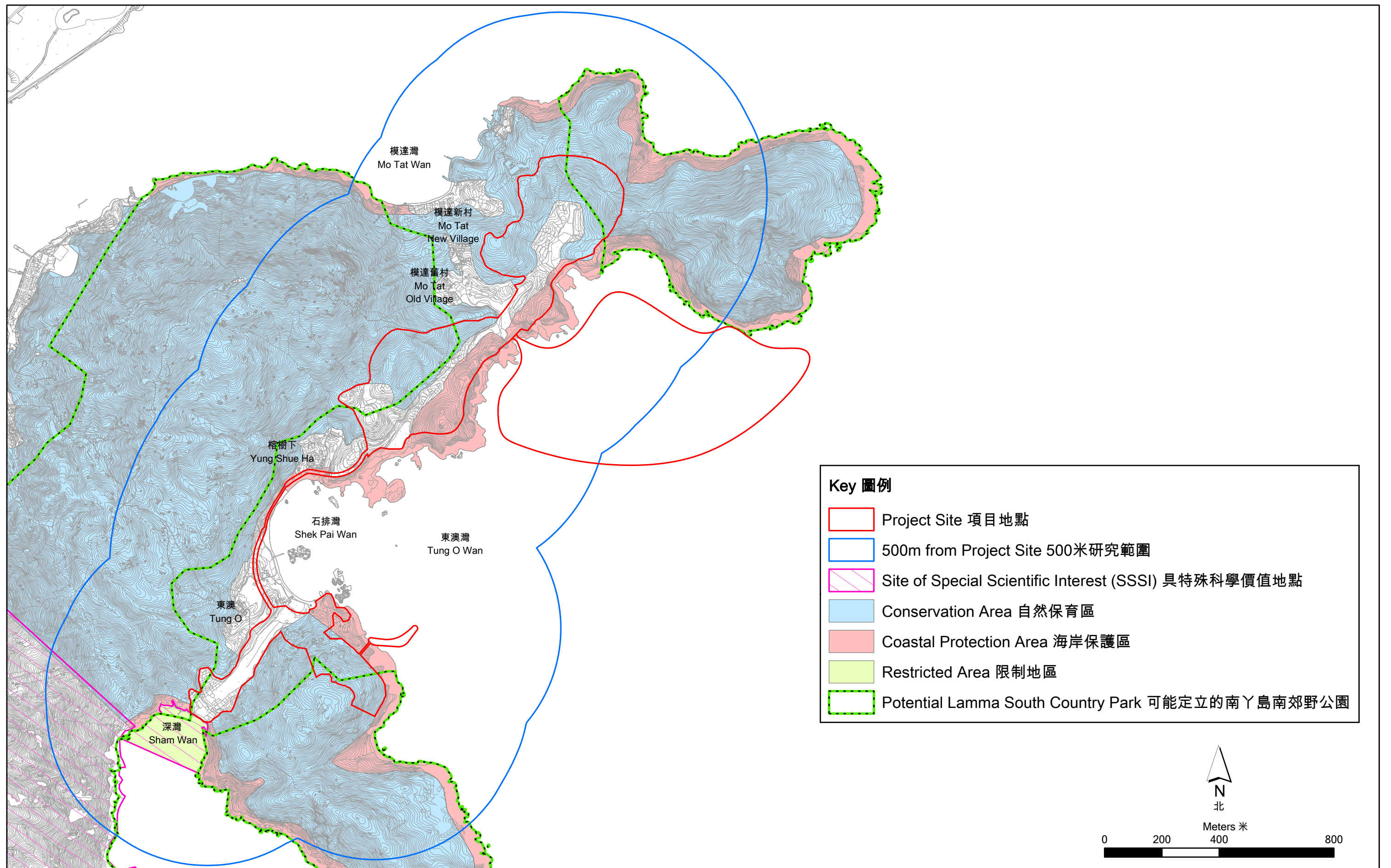
Figure圖 3.3

Water Sensitive Receivers for the Project
水質敏感受體位置圖

File: PP10116093_WestLammaSite-c.mxd
Date: 08/04/2011

Environmental
Resources
Management





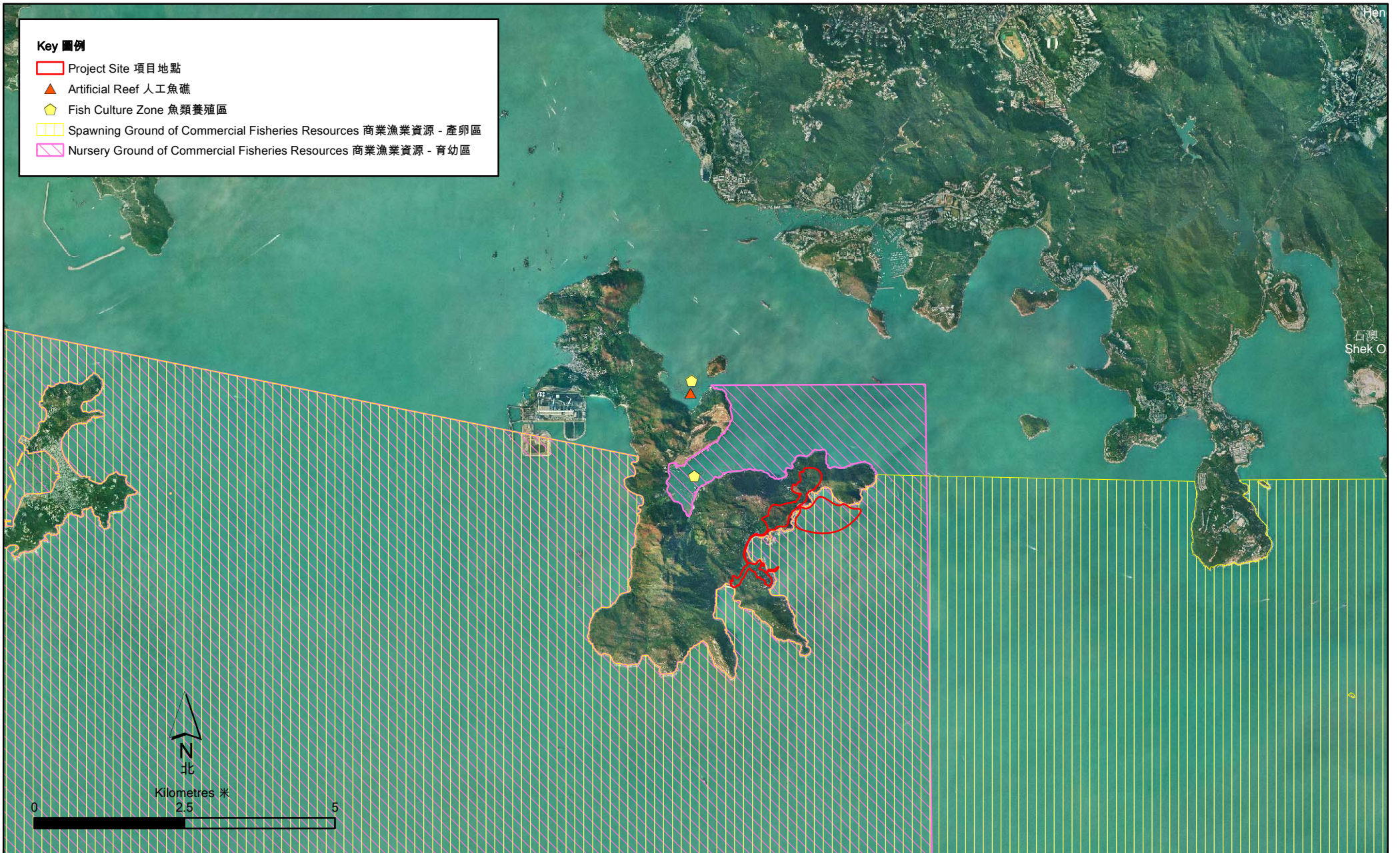
Figure圖 3.4

Terrestrial Ecology Resources
陸地生態資源

File: PP\0116093_Terrestrial
Ecology Assessment_landscpae-c.mxd
Date: 14/04/2011

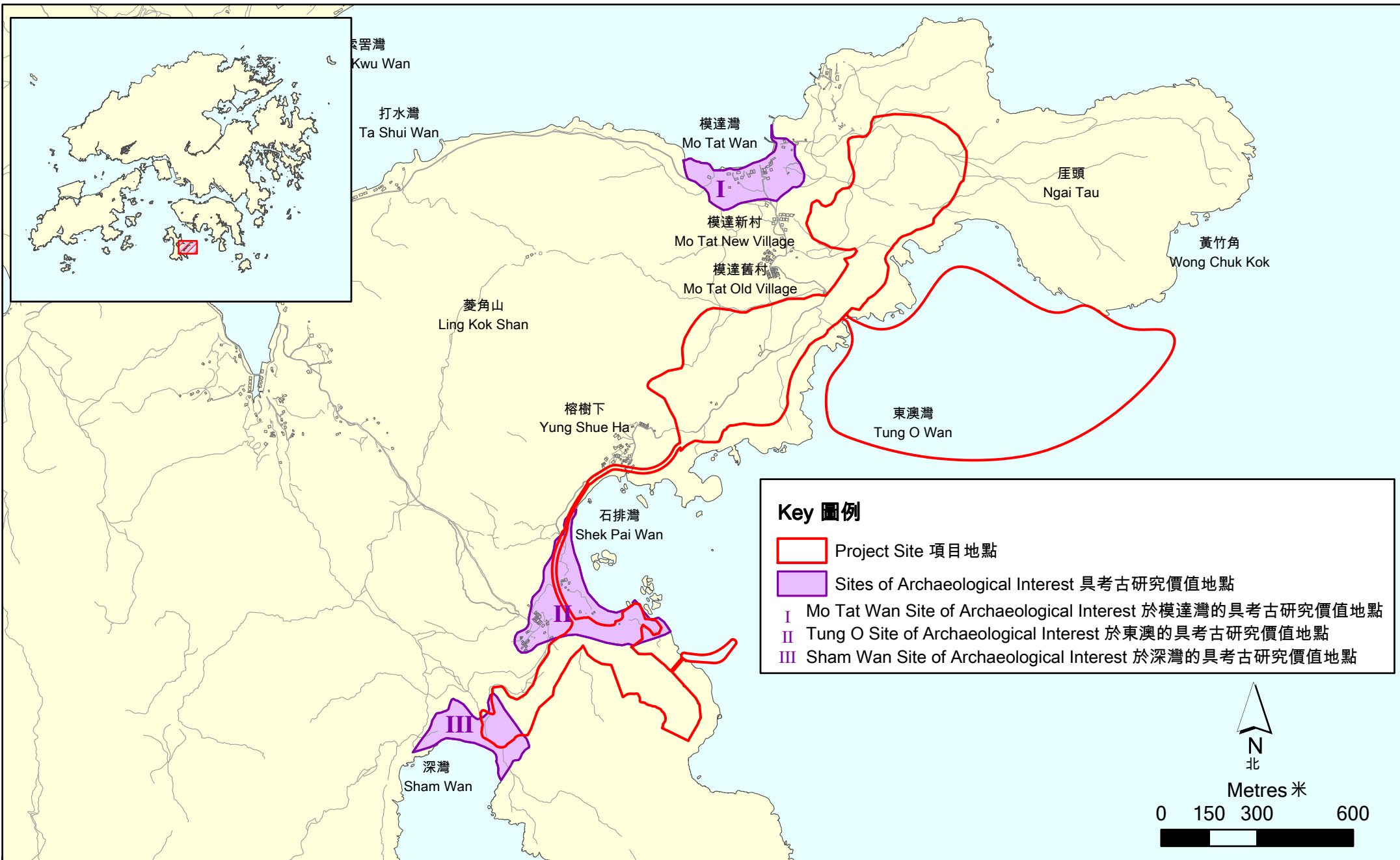
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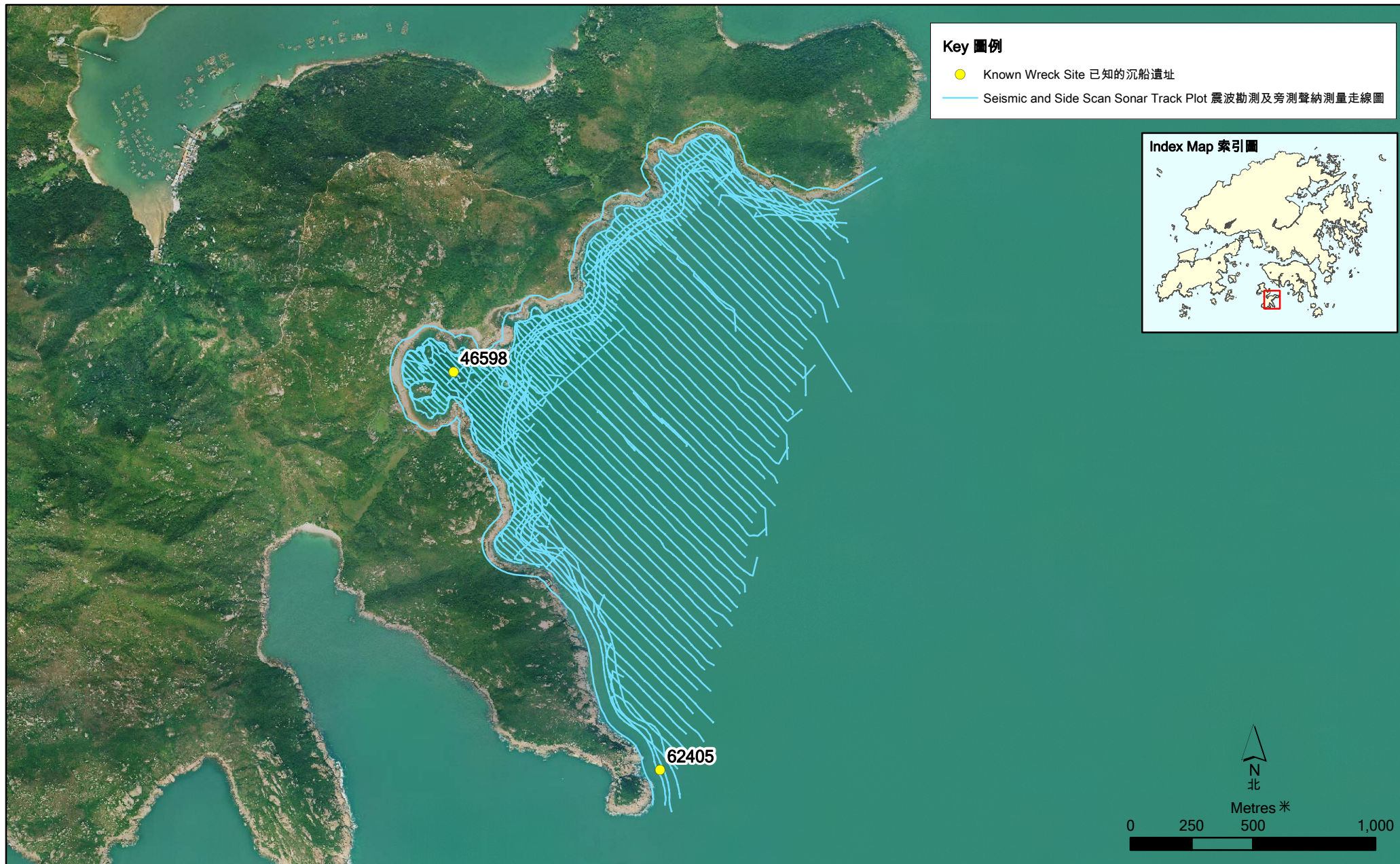
Figure圖 3.5

Fisheries Sensitive Receivers
漁業敏感受體位置圖



Figure圖 3.6

Locations of Identified Sites of Archaeological Interest
已確認的具考古研究價值的地點



Figure圖 3.7

Two Known Wreck Sites Recorded in Tung O Wan
於東澳灣的兩個沉船遺址