

8. CULTURAL HERITAGE

8.1 Introduction

Tai O is recognised as being historically associated with salt production, one of the earliest “industrial” activities recorded in Hong Kong. The most evident features of these early activities in the Study Area are the man-made bunds, which define the salt fields in which the proposed mangrove planting habitat is to be created.

This chapter describes the history of salt production in Hong Kong and in Tai O and presents an evaluation of the cultural heritage of the Study Area. Thereafter, the potential impacts of the proposed sheltered boat anchorage construction and operation is presented, and mitigation measures proposed.

8.2 Legislation and Applicable Standards

8.2.1 Environmental Impact Assessment Ordinance

The EIA Ordinance stipulates that consideration must be given to issues associated with cultural heritage and archaeology as part of the EIA process. Annexes 10 and 19 of the EIA TM outline criteria for evaluating the impacts on sites of cultural heritage and guidelines for impact assessment, respectively. The EIA TM identifies a general presumption in favour of the protection and conservation of all sites of cultural heritage and requires impacts upon sites of cultural heritage to be ‘kept to the absolute minimum’. There is no quantitative standard for determining the relative importance of sites of cultural heritage, but in general sites of unique, archaeological, historical or architectural value should be considered as highly significant.

8.2.2 Antiquities and Monuments Ordinance

The principal legislation relevant to cultural heritage and archaeological issues is the Antiquities and Monuments Ordinance (Cap 53). Human artefacts, relics and built structures may be gazetted and protected as monuments under the Antiquities and Monuments Ordinance (Cap 53). Under the Ordinance, the Antiquities Authority (Secretary for Home Affairs) may, after consultation with the Antiquities Advisory Board (AAB) and with Government approval, declare any place, building, site or structure which the Antiquities Authority considers to be of public interest by reason of its historical, archaeological or palaeontological significance, to be a monument, historical building, archaeological or palaeontological site or structure. Once declared to be a site of public interest, no person may undertake acts which are prohibited under the Ordinance, such as to demolish or carry out building or other works, unless a permit is obtained from the Antiquities Authority.

The Antiquities and Monuments Office (AMO) of the Home Affairs Bureau is part of the Government Secretariat and comprises the executive arm of the Antiquities Authority. The AMO is the services arm of the AAB and is responsible for advising the Government on sites which merit protection. The AMO has further responsibility for the protection of buildings, items of historical interest and areas of archaeological significance. The excavation and search for such relics requires a licence under the Ordinance.

For archaeological sites, all relics dated prior to 1800AD belong to the Hong Kong Government under the Antiquities and Monuments Ordinance. Once identified as having the potential for conservation, archaeological sites are entered into the record. Archaeological sites are administratively classified by AAB into three categories, as follows:

- **Designated** - those that have been declared as monuments and are to be protected and conserved at all costs;
- **Administrative Protection** - those which are considered to be of significant value but which are not declared as monuments and should be either protected, or if found not possible to protect these sites then salvaged; and
- **Monitored** - those which are of lesser significance or whose potential is not fully assessed which should not be disturbed with the exception of minor works if they are permitted and monitored by AMO.

8.2.3 Archaeological Organisations

In addition to the AMO, the Hong Kong Archaeological Society (HKAS) is an independent organisation with experts and members of the public who have an interest in archaeological matters. The HKAS organises meetings, site visits and excavations of local sites and publishes archaeological journals.

8.3 Study Methodology

There are two aspects to this cultural heritage assessment: an historical investigation of salt production in Tai O and Hong Kong in general; and an investigation of the archaeological aspects of the Study Area. The archaeological investigation includes both the land-based, salt pan area proposed for mangrove habitat creation, as well the offshore area which will be developed as the boat anchorage.

The investigation of the cultural heritage of the area follows the approach identified in the EIA TM and the guidelines established by the AMO. The findings of this chapter are generally based on in-depth desktop studies and site visits. A bibliography of references cited in the text, and list of sources reviewed, are shown in Chapter 11. The table provided at the end of Section 8.8 provides a Chinese translation of key reference terms.

This cultural heritage investigation has been carried out with reference to the following:

- review of available information held by the AMO;
- published and unpublished papers on the history of Tai O, salt production, and archaeology of the area (as shown in Chapter 11);
- review of historical maps and aerial photographs;
- review of relevant Block Crown Lease information and associated survey sheets;

- inspection of archives held by the Royal Naval Hydrographic Office, Taunton;
- site visits;
- review of borehole logs from offshore geotechnical investigations (carried out as part of the design of the breakwater and access channels) ; and
- geophysical survey for archaeological material in the offshore area.

Preliminary investigations identified that the residents of Tai O were not associated with salt production and that the salt-fields were operated by companies based in Hong Kong using workers imported to the town. Whilst the local knowledge base is restricted, reference has been made to the substantial body of interview notes made by Dr James Hayes who interviewed salt-workers and others during the 1960s. Unfortunately all of those who he interviewed have since passed away.

8.4 History of the Salt Industry and Tai O

8.4.1 Early History of Salt Production in Hong Kong

Salt-working is by far Hong Kong's oldest industry. The earliest records indicate that salt-working in Hong Kong probably began in the third century BC, in the time of the Nanyueh dynasty. It has, therefore, a history of more than two thousand years. Most of what is known of the Hong Kong area in the thousand years before 955 AD is connected with the salt industry.

To put the industry in context, there is evidence of the Imperial Salt Monopoly and salt-fields in active use, more than a thousand years before the first mention of Hong Kong's other two ancient industries of incense-wood production and pearl fishing. These salt production activities were also being carried out 1,300 years before the first settlement of any of today's indigenous clans in the area.

Due to the high revenues that could be collected through taxation, the salt industry was controlled as an Imperial Monopoly and as a result, the early contacts between the Hong Kong area and the Chinese State were also, to a large extent, due to the workings of the salt-industry. The earliest salt-fields in the area were probably in the Deep Bay and Tuen Mun areas, and were under the control and supervision of an Imperial Salt Intendant¹ (refer to translation table at the end of Section 8.8) stationed at Nam Tau, just outside today's boundary of Hong Kong. The origins of the salt industry in Hong Kong are closely connected with the slow sinicisation of the indigenous Yao and Tan inhabitants of the area, and the growth of a Cantonese civilisation in the region. Any existing remains of salt-fields, are therefore a link to the earliest history of Hong Kong, to the pre-Chinese inhabitants of the area, and to the incorporation of the Hong Kong area into the Chinese State and culture.

8.4.2 Early History of Salt Production on Lantau Island

From the tenth century AD (the time of the Nanhan dynasty), salt-working greatly expanded in the area, with four Salt Intendancies and a major growth in the area of local salt-fields across Hong Kong. It is believed that it was at this date that the Imperial Salt Monopoly first began to operate on Lantau Island. A Salt Intendancy² was set up there, and new areas of salt-fields were brought into

operation. Before that date, Lantau was completely undeveloped, the local people were very lightly sinicised and feared for their ferocity. They were conscripted to work in the salt-fields. As Lantau was brought within the framework of the Imperial system, garrisons of soldiers and bureaucrats were stationed there. The extension of the Salt Monopoly to Lantau was effectively the first form of development to occur on the island.

In the later twelfth century, the operation of the Salt Monopoly on Lantau led to a series of revolts by the indigenous people of the island, which ended with their massacre. The background seems to have been a collapse in efficiency by the local Salt Intendancy in the period of Northern Sung dynastic decline (early twelfth century), which allowed illicit salt-making and salt-smuggling to become rife on the island - to the extent that these abuses came to dominate local society. The local Salt Intendancy seems to have become entirely ineffective as an organ of State control. After the Southern Sung had restored order in China, from the 1140s attempts were made to regain control over the Lantau salt-fields. The attempts to do so were heavy-handed, and greatly resented by the locals, who, as a consequence, took to revolt and banditry. Major salt-based Lantau revolts in the mid-century (connected with the name of Chu Yau), and at the very end of the century, are recorded. The Imperial authorities at Canton proved unable to quell these revolts effectively, mostly because the rebels were skilled boatmen, whereas the Imperial troops were not. At one point, the Lantau islanders were even spoken of as threatening Canton. Defeats were inflicted on a number of Imperial forces. Eventually, Tsin Tsz-mong, the Governor of Kwangtung, ordered the massacre of the islanders, an order which seems eventually to have been carried out mercilessly, using stockades across the passes to prohibit the islanders from fleeing from one area to another. These violent episodes, and their bloody and tragic end are too little known. Chu Yau and Tsin tsz-mong are very important figures in our history, and the salt-revolts on Lantau and their suppression are extremely important to our cultural and historical heritage.

8.4.3 Early History of Salt Production at Tai O

The earliest historical evidence for salt-working in Tai O is an inscription in the San Tsuen Tin Hau Temple which indicates the construction of the salt-fields in the mid/late eighteenth century. This is likely to refer to the Salt Field No 1 as shown in **Figure 8.1**. During the late eighteenth and nineteenth century, a considerable area of salt-fields was developed on either bank of the Hang Mei creek. Tai O was essentially a fishing port, but, during this period, salt-working developed as a very important secondary local industry. Much of the output was smuggled out of Tai O to Macau, Hong Kong, the Pearl River Delta, and through Hong Kong to other places on the coast.

Following the arrival of the British, there was a formal policy decision that the Tai O salt industry should be encouraged and expanded. This was achieved through the introduction of the solar-evaporation technique which allowed a greater salt output per acre than the conventional leaching method and the introduction of imported salt-workers from Swabue who knew how to operate this method. The solar-evaporation fields only became fully productive in about 1915-1917.

As before 1898, the Tai O salt-industry was dominated during the first half of this century by the smuggling of salt into China. Apart from smuggling, Tai O salt was traded legitimately to the Philippines and some was sold within Hong Kong, mostly for industrial uses. Leaching-method salt-fields originally sold salt for table salt, but this trade died away in the face of foreign competition after the mid 1920s. From 1936 onwards, the Japanese blockade of the coast of China removed foreign salt from the coastal areas of China, and this encouraged a vast increase in the salt-smuggling trade out of Tai O, so dominating local society.

This trade died away somewhat after the Japanese occupation of Hong Kong, but was replaced with a boom trade in salt to Hong Kong and Macau, where foreign salt was no longer available. After the Second World War, the competition from foreign imported salt became overwhelming after about 1955, and the salt-field operators closed business between 1955 and the mid 1960s, although a few of the salines continued to be worked by the old salt-workers as squatters, until 1969-1970, when the construction of the Tai O Road destroyed the sluice systems.

8.4.4 Recent History of the Salt Fields Surrounding the Study Area

In the 1920s and 1930s, there were about 102 acres of salt-fields in Tai O, arranged in four areas, as shown **Figure 8.1**. Salt Field No 2 is the area allocated for the mangrove planting situated within the Study Area.

In 1904, at the time of the Block Crown Lease Survey, only Salt Field No 1, was in operation. As described above this was likely to have been constructed in the mid/late eighteenth century. The history of Salt Fields Nos 3 and 4 (outside of the Study Area) are more recent. Accounts of the history of Salt-field 3 are limited. However it appears that the area was not designated for salt production in the Block Crown Lease of 1904. The area was leased for salt production a decade later, but it is unlikely that there was substantial use of the area prior to the end of the 1920s.

For Salt Field No 4, the Block Crown Lease and early 1904 maps show the bunds with houses built upon them. The structure of the bunds is similar to those in Salt Field No 1. The evidence indicates that the salt field was considerably re-built around 1904. Information relating to salt production figures and land lease ownership indicates that the Salt Field No 4 may have been in active use from around 1898.

8.4.5 Recent History of the Mangrove Planting Area (Salt Field No 2)

There is strong evidence (from the Block Crown Release, 1904 Maps and anecdotal evidence collected by Dr James Hayes) that the area of Salt Field No 2 was only reclaimed from the sea and brought into full use as a salt-field between about 1903 and 1916. Further anecdotal evidence and salt production figures presented in the District Office Annual Reports (between 1913 and 1943) for the area as a whole indicate that they did not become fully operational until about 1913 to 1917, being operational for about 50 years.

The general arrangement of Salt Field No 2, whilst operational during the period between 1920 and 1950 can be derived from aerial photographs and maps, this is shown in **Figure 8.2**.

Working of the salt fields was characterised by high maintenance, as the fields were prone to silting up. With a drop in salt prices following the Second World War, the northern and southern extremities went out of production and quickly become silted up. By the 1960s, James Hayes observed vegetation colonising some of the flats, with only the central portions useable.

When the Tai O Road was built in 1969-1970, the salt godown and sluice gates were destroyed. Their previous location as shown in **Figure 8.2** is at the site of the current bus terminus. The destruction of the sluice gate halted the remaining salt production in the central portions of the salt field, and the remaining areas quickly became silted and vegetated.

Shortly afterwards the area was developed for fish-traps. The old bunds were bulldozed to form fishponds, such that the current arrangement of bunds bears no resemblance to the pre-1969 layout. The only remaining feature from this period is the highly damaged outer seawall, however, even this shows evidence of subsequent breakage and repair.

8.4.6 Cultural Heritage Interest of Mangrove Planting Area (Salt Field No 2) Outer Seawall

As noted above, the only significant feature of historical interest surviving today is the 1903 - 1904 outer seawall. Much of the seawall has suffered considerable damage, gaps have been broken through the wall to allow water to enter the fish-traps at high tide, other areas have been broken through by typhoon induced damage and where the seawall is exposed to wave action. The southern-most portion of the wall is somewhat protected from wave action and survives in a reasonable condition, in this area, the original stone frontage can be seen in places. However, only at the extreme southern end, (in front of Fan Kwai Tong Village), is there any substantial trace of the original stone-faced earthen bund. This area, which is worthy of conservation, is shown in **Figure 8.3**. Portions of seawall used to reach to about +4mPD, although it is now reduced in height and is heavily overgrown with vegetation.

8.4.7 Maritime History of Tai O

Tai O Bay is strategically located at the heart of the Hong Kong-Macau-Guangzhou triangle. It provides an excellent natural harbour and it is therefore not surprising it has been the focus for a range of maritime activities. Archaeological evidence indicates that the waters of Hong Kong have been used by seafarers for over 6,000 years, since the prehistoric period (Bard 1988). The profusion of sea shore sites and an apparent absence of permanent habitation sites together suggest that the earliest inhabitants were seafarers living on boats, making frequent but brief landings ashore. While there have not been archaeological finds from underwater, the location of coastal sites testifies to the early use of water transport.

From the Qin (255-206BC) and Han (206BC-220AD) periods, Guangzhou became the starting point of the maritime trade route over the South China Sea as well as a meeting place for the exchange of goods, a position which it maintained for 2,000 years. By Tang (618-907AD) and Song (960-1279AD), Guangzhou had grown into the largest commercial port in China. It was the first Chinese city to have a government office to administer foreign trade. When in the Ming (1368-1644) and Qing (1644-1911) periods, China enforced a policy which closed ports to foreign trade, an exemption was made for Guangzhou for a large part of that period. Guangzhou was thus in a unique position to conduct trade with foreign countries and the waters and harbours around Hong Kong would have been full of ships associated with both international and local trade.

During the Ming Dynasty (1368-1644) there arose a great need for coastal defence. This was due to the appearance of a variety of pirates, including the Japanese wako, Chinese pirates and Europeans. In 1521, the Portuguese were defeated in a sea battle having tried to establish a strong hold at Tuen Mun (Lo 1963). In the latter part of the Ming dynasty, around 1536, war boats were added to the wei-so (districts and military divisions) system which had largely been a land based defensive system. The Nam Tau headquarters dispatched war boats to patrol the area from Long Pak, to the south of Macau to the Tai Pang Wan (Mirs Bay) in the east. Within this area, six guard stations were established one of which is recorded as being at Tai O. Its location testifies to the strategic importance of Tai O.

During the Ching dynasty (1641-1911) there was a change in the distribution of military outposts. There were a total of twenty-one within San On County of which seven were situated within the Hong Kong region. There is no longer one listed for Tai O, with the nearest one being at Tuen Mun.

There are no further written references to coastal defence until 1831 when the size of the Tai Pang Battalion was increased and divided into the Left and Right Battalions. The Right Battalion was composed of four hundred and eighty two soldiers and five patrol boats. Its headquarters were located at the Tung Chung Walled City which was built in the same year. After 1847, the Right Battalion had a Garrison of six hundred and forty one soldiers including forty stationed at Tai O (Guangdong Gazetteer 1879)

The presence of the military installations at Tai O testifies to the prevalence of piracy and smuggling in the area. Throughout the south China region these two factors dominated maritime activities until they were finally suppressed in the late nineteenth century. While most of these illegal activities fall outside official records, the 1819 gazetteer of Xin'an records an attempt in 1197 to stop private trading in salt. This curb led to the revolt of the islanders of Lantau who successfully repulsed a government invasion force by mining their harbours with wooden stakes and engaging them in a sea battle. They captured merchant ships, and killed more than three hundred people. Since Tai O was a well established salt producing area at this time it is very likely that Tai O was one of the harbours mined with wooden stakes.

Documentary evidence indicates that Lantau was one of the favoured haunts of pirates. While there are few specific references to Tai O Bay, the level of pirate activity in the region suggests that it must have been involved. The Tanka people of Tai O have a song which celebrates the exploits of the female pirate, Lady Cheng I Sao and her confederate Chang Pao-tsai who held off an attack of government vessels for a week in Tung Chung Harbour (Balfour 1941).

Towards the end of the Yung-cheng reign (1723-1735), Cheng Lin Fuk, a descendant of Cheng Kin made Lantau Island his hideout against government forces (Siu 1986). Piracy was at its worst proportions between 1807-10 (Murray 1987). Richard Glasbrooke, the mate of an East Indiaman who was captured by them, gave an interesting account of an enforced stay of eleven weeks and three days with a pirate fleet in 1809. According to the record in Neumann's account of these pirates, this fleet spent a long time on and near Lantau, which probably suffered from their levies and depredations. One of these pirates, Cheung Po-tsai was notorious in Hong Kong waters (Lo 1963). With the help of the Macau authorities whose squadron fought a sea battle Lantau in January 1810, Cheung Po-tsai was blockaded in the shallow waters of the bay of Hsiang-shan and was induced to capitulate with over 270 junks, 16,000 men, 5,000 women, 7,000 swords and 1,200 guns (Monalto de Jesus 1926). These figures clearly indicate the scale of the pirate activities in the region.

In November 1854, an expedition was sent to Tai O to deal with pirate junks that had fired on Queen, an American naval steamer. After shelling and attack by the squadron, the pirate junks and storehouses were destroyed. An American naval officer, Lieutenant GH Prebble, who kept a now published diary of these events, captured a pirate flag inscribed with the characters which state "it is the flag of Lue-ming-suy-ming of the Hong Shing-tong Company, Chief of the Sea Squadron, and that he takes from the rich and not from the poor, and his flag can fly anywhere". Local people probably did not see him in this light, for Prebble records "no sooner had we destroyed the piratical vessels, than a large fleet of fishing junks came into Tai O Bay rejoicing

and anchored. These persons had to drive off a pirate attempt to take and make off in their boats during the night." The next morning a deputation of the chief men of the village came on board his steamer "with a present of chickens, pork, fish etc." to thank him of defeating the pirates (Hayes 1983). Another account of this expedition is given in the personal narrative of JS Tronson (1959).

The ruins of Fan Lau Fort are located on the south western tip of Lantau, 7km to the south along the coast from Tai O Bay - it is referred to in the Chinese Gazetteer as Kai Yik Kok Fort. It was erected around 1720-23 when Yang Lin was the governor general of Kwantung and Kwangsi provinces. Its location confirms the strategic importance of the sea passage leading into the Pearl River Estuary and on to Canton (Siu 1979). It guards the waterway to the south of Lantau and has eight cannon places and 20 guard houses.

Little is recorded about Fan Lau Fort; it probably formed part of the coastal defence chain built in the middle of the 17th century. The Chinese Gazetteer refers neither to the year of its construction nor its eventual evacuation. British sources describe it as in ruins by 1841-2: in contradiction to this, however, Chinese sources provide evidence that it was manned until 1898, the year the New Territories were leased. The fort was in ruins until 1985 when it was repaired and declared a historical building of significance to the history of Hong Kong by the AMO.

8.5 Archaeological Potential of the Study Area

Given what we know of the history of Lantau and Tai O with the trade of salt to Mainland China and to Hong Kong, consideration of the potential for archaeological artefacts extends to both the onshore and off-shore areas - this is considered in the sections below.

8.5.1 On-Shore Area

There are two elements for consideration when examining the potential for archaeological remains in the Study Area as follows:

- does the area of the abandoned salt pans have any archaeological potential for previous occupation prior to the earliest known salt production, i.e. from the prehistoric (5,000 B.C - 220 B.C.) or early historical (220 B.C. - 960 A.D.) periods?
- can the date of the construction of the salt pans, or any details of their operation, be established by archaeological investigation?

Pre-historic Archaeological Potential

As indicated in Section 8.4 the salt pans which are to be developed as the mangrove planting habitat were probably reclaimed from an intertidal zone earlier this century. Prior to this date the site would have been intertidal for most of the last 7,000 years. It is considered that due to the relatively recent disturbance at the site, the area's pre-historic archaeological potential is extremely limited.

For the early historical period (first millennium A.D.), sites are well known throughout Hong Kong and are situated in higher sand banks (+3.5 to +8 mPD), as are most prehistoric sites. Dozens of first millennium A.D. sites have been investigated and all are characterised by lime

kilns and/or extensive deposits of kiln debris. In a few instances, the intertidal zone adjacent to the sites has been investigated and found to only have minor debris deposits or no artefactual material at all. In the Tai O area, a series of lime kilns has been recorded at Po Chue Tam, outside of the Study Area north of the main town. Other prime locations where lime kilns are likely to be found are around the rim of higher ground from Nam Chung Tsuen to Leung Uk Tsuen to San Tsuen - all at some distance from the Study Area. Even if kiln sites exist in any of these areas, there is very little possibility of cultural deposits extending into the Study Area.

Archaeological Potential of the Salt Pan Area

As described above, historical evidence suggests that Salt Field No 2 (which comprises the proposed mangrove planting habitat) was reclaimed from the sea during the early years of this century. Moreover, the later re-use of Salt Field No 2 for fish traps, with bulldozing of the entire area behind the outer seawall into a new configuration of ponds and bunds resulted in major destruction of the salt-field. Whilst bulldozing destroyed much of the internal bund features, the outer seawall and its inner edge were probably left intact. However, it must be accepted that most of the original salt field has been destroyed. Whatever small fragments that might have remained are probably of no particular importance and would now be extremely difficult to locate archaeologically.

There are several pertinent points to consider in weighing the possible archaeological value of the salt pan area:

- i) there is no historical evidence of salt production in Tai O prior to the 18th century;
- ii) if there were salt fields prior to the 18th century in Tai O they would almost certainly not have been sited in the area of Salt Field No 2;
- iii) the construction of Salt Field No 2 most likely took place in the 19th or early 20th century;
- iv) Salt Field No 2 underwent serious, near-total destruction in the 1960's when re-worked into fish trap ponds; and
- v) only the outer seawall remains partly intact today and possibly some fragments of the original salt beds.

Whilst the outer seawall is the only area of Salt Field No 2 that remains from the period of active salt production, it is considered to have very little archaeological potential, this is due to difficulties in precisely dating such late historical features (especially the earth walls) and doubts about the value of such data even if it were obtainable.

It would be very difficult in normal conditions to distinguish archaeologically between an earth bund constructed in say 1820 and one constructed in 1910. Common villageware ceramic types did not change much over this span of time, and diagnostic items such as coins or special types of pottery would be very rare and are not reliable as chronological markers. Residual artefacts from the 19th century would certainly be present in the later construction (having been present already in the earth used to construct the bund), and intrusive artefacts from the early 20th century present in the earlier one (especially small objects such as coins or potsherds which

move down easily through disturbances in soil). Field walls generally contain few artefacts in any event. Carbon 14 dating has no value for dating purposes within the last 300 years and is not accurate enough to distinguish between 100 years.

In addition to the above, even if a probabilistic assessment could be made from the results of an excavation suggesting that the bund was constructed in the 19th rather than the 20th century, this information would not contribute significantly to our knowledge of Tai O history. It would provide minor corroboration as to when the salt fields were constructed and contribute little to an understanding of the period since no information on the operation of the salt field could be expected to be obtained from the bund.

The archaeological potential of the site must, therefore, be rated as very poor and as such, an archaeological investigation of the on-shore areas has not been undertaken. However, where possible, the existing outer seawall (western bund) should be retained as a remnant of the pre-1969 salt working practices (refer to Section 8.4.6).

8.5.2 Off-Shore Area

Tai O Bay was the subject of a vibrocore seabed sampling programme undertaken to facilitate the design of the sheltered boat anchorage, offshore breakwater and access channels. Vibrocores generated from the investigation were inspected for their potential archaeological significance. Vibrocores have the ability to provide palaeo-environmental data, but in this instance there was no evidence indicating previous human occupation or use. It was, therefore, assumed that there are no inundated occupation sites within the Study Area. The focus of the investigation was therefore potential shipwreck sites and their associated artefacts.

From existing data available in the Hong Kong region, very little is known about the archaeological potential of seabed deposits. The only archaeological discovery in the seabed of Hong Kong was the remains (large planks and associated artefacts) of a late Sung/early Ming boat. The site was found in 1974 when the sea had been pumped out of a narrow channel between High Island and the Sai Kung peninsula and a wide drainage ditch excavated in the seabed. The remains were found when the edge of the drainage ditch was inspected by people walking on the exposed seabed (Frost 1974).

No shipwreck or other vessel remains have been found underwater in the seabed of Hong Kong, despite many years of dredging, diving and other underwater activities. Undoubtedly, the reason is that such remains have either been buried and thus invisible, or they have been exposed for a very brief period by erosion or dredging of the seabed, only to be destroyed after exposure by the same natural or artificial processes. Until the introduction of the EIA Ordinance there had been no systematic survey for marine archaeological material and the previous marine activities may have ignored archaeological material.

The history and physical location of Tai O gives it high potential for marine archaeological material. The large bay to the west and south of Tai O town is probably the source of the name Tai O and was certainly the main sea access to the town for centuries.

The bay is filled with soft marine sediments up to 15m deep which would provide an excellent preservation environment for buried material. It is possible, therefore, that remains of boats, canoes, rafts and other vessels could be buried and preserved within the marine sediments.

It is also possible that the Study Area may contain isolated artefacts, originating either from objects dropped overboard from vessels or washed into the seabed from the erosion of onshore deposits. Normally perishable material could be recovered, benefiting from anaerobic and/or waterlogged conditions favouring preservation.

Such objects would generally be of reduced scientific value, since they are not *in situ* and thus have no contextual information to assist in their dating and evaluation. With the exception of a few cannons, no such items have ever been recovered from seabed deposits in Hong Kong, but the possibility of their occurrence cannot be ruled out.

Based on historical evidence, it is considered that the seabed in Tai O Bay certainly does have the potential to contain the remains of boats. Furthermore, any such remains are likely to be buried as sedimentation has increased markedly in this bay in the 20th century. The soft nature of the marine deposits would also facilitate the burial and preservation of archaeological material. For these reasons the AMO recommended that detailed geophysical survey was carried out.

8.5.3 Results of the Marine Archaeology Geophysical Survey

Bathymetric and Sub Bottom Profiler Survey

The data collected by the Knudsen 320M Precise Digital Echo Sounder was used to prepare a bathymetric chart of the Study Area. While providing accurate information about water depths within Tai O Bay, the survey did not reveal any anomalous seabed features suggesting the presence of archaeological material.

Before the survey, it was anticipated that the equipment would also provide detailed data about the sub-surface stratigraphy. The results showed that there is a thick layer of marine deposit within the bay but it was not possible to determine the exact stratigraphy of the marine deposits. The data did not reveal any buried features.

Side Scan Sonar Survey

Under optimum conditions, a side scan sonar survey is able to provide accurate data about the seabed surface with clear delineation of natural topography and anthropogenic features. Unfortunately the acquired survey data did not facilitate the assessment of the presence of archaeological material within Tai O Bay. It is possible that data quality was degraded by the very shallow water depth of the Study Area.

It is noted that AMO plan to undertake an additional geophysical marine archaeology survey in Tai O Bay during the detailed design stage in order to assess the presence or absence of archaeological remains.

8.6 Fung Shui of the Study Area

8.6.1 Background

Fung Shui is the science of calculating the flows of life-forces through a site. The life force can be masculine, forceful, penetrating, vigorous and even violent (this is the *yang* force) or else feminine,

quiescent, receptive, life-giving and slow (this is the *yin* force). Ideally, a site should lie where one or more *yang* force line interacts with one or more *yin* line. Excessive *yang* is dangerous, as this would open the site to the violent forces of nature. Excessive *yin* is also dangerous, as this would give rise to disease and rankness. The ideal site is one where the forces balance.

At the same time, there are wholly negative forces (*Shat Hei*)[†] which must be avoided or countered. These are particularly the forces engendered in land which is without any clear shape or form. Featureless plains, and especially the sea, produce *Shat Hei* forces. These forces are unpredictable, and inimical to settled life. An unanchored *yang* forceline which runs towards the front of a site is also, in some circumstances, a *Shat Hei* line for the site in question, although such a forceline might be beneficial for another site somewhere else.

Important *yang* Fung Shui lines rise at some prominent peaks given that peaks are a sign of an up-welling of the *yang* force. Because of their vigour, *yang* forces tend to travel in straight lines, or approximately straight lines. *Yin* forces, on the other hand, given their quiescent and yielding character, rise at the heads of valleys, near springs (springs of water are a sign of an up-welling of the *yin* force) and flow in soft bends and curves.

Yang force lines ideally rise at a strong *yang* up-welling, flow through the site and then sink down at an "anchor-point" on the further side of the site. The slopes between the up-welling and the site should not be too steep (for then the force would be excessively violent), nor should the "anchor-point" be too distant or too insignificant (since then the *yang* force would be uncontrollable). The ideal site, as far as the *yang* force goes, is one where the *yang* force runs steadily and abundantly, but not excessively, through the site, and thence to a solid "anchor-point": this ensures a steady circulating flow of the benevolent *yang* force, without the risk of excess.

At the same time, the *yin* force line should be well-curved and re-curved. Too straight a line followed by the *yin* force would be a sign of weakness. Equally, the *yin* force should run through (or, better, immediately alongside) the site, and thence to a broad and flat area where the force can sink away to allow a proper circulation to exist. As noted above, the *yin* and *yang* lines should be intimately inter-related.

Where a site is threatened by a *Shat Hei* corridor, then where possible this should be countered by a strong *yang* forceline running directly opposite to the *Shat Hei* line. Such a *yang* forceline can be called a "defensive" line. Such a line would rise at a strong *yang* up-welling and would be as strong and vigorous as possible. There would be no anchor-point to such a line, as the aim of the line would be to counter the *Shat Hei* force with as much raw Fung Shui power as possible. A "defensive" Fung Shui line of this character might well be dangerous to live near, as having too much violence in its make-up. A "defensive" Fung Shui line aimed at countering a *Shat Hei* corridor should not be intimately linked with a *yin* line, as strength, not balance, is required here, and a *yin* line might weaken the attacking power of the Fung Shui defence.

Woods are generally of a *yin* character, and Fung Shui woods exist primarily either to strengthen a *yin* line (e.g. where woods are planted around a *yin* up-welling, or along the line of the *yin* force), or to weaken a *yang* line (e.g. where a *yang* line is running faster than is desirable and where slowing the flow is desirable). The Fung Shui woods behind villages are mostly of this second character, since it is at the point where the *yang* force enters the site that control over its flow is most essential. Fung Shui woods are also used to defend against a *Shat Hei* attack. A strong *yang* forceline can destroy such an attack by head-on opposition; but a Fung Shui wood at the

appropriate location can also act as a filter to reduce the flow of the *Shat Hei* force until it becomes of no serious significance.

8.6.2 Fung Shui of the Study Area

The Fung Shui of the Tai O Salt Field No 2 is generally very simple. The major Fung Shui lines in the area are shown in **Figure 8.4**. The oldest part of Tai O town lies on the island. There are three temples there, the Kwan Tai/Tin Hau Temple in the centre of the town, the Yeung Hau Wong Temple at the eastern entrance to Tai O Creek, and the Hung Shing Temple to the west of the town. The major Fung Shui lines of the town are the *yang* forcelines which run through these three temples and the *yin* forcelines which complement and interact with them. It is these lines which form the basic Fung Shui structure of the town and ensure the town's commercial and social success.

As shown in **Figure 8.4**, each *yang* line rises at one of the smaller peaks along the main ridge of the island, or, in the case of the Yeung Hau Wong Temple, at the summit of the small islet the temple stands on. In each case, the flow of the Fung Shui is from north to south and in each case the flow is anchored on one of the peaks which form the southern wall of Tai O Bay. Thus, the island is tied into the adjacent mainland by its Fung Shui. The *yin* forceline runs along the creek, it interacts well with the *yang* line of the Yeung Hau Wong Temple and adequately with that of the Kwan Tai/Tin Hau Temple. The Yeung Hau Wong Temple *yang* line has a very impressive anchor-point to the south: the line runs straight along the ridgeline of the Lion Ridge (Sze Ling) and then anchors on the small peak above it, and then on a prominent peak of the main Lantau mountain chain. This Yeung Hau Wong Temple *yin/yang* system which provides the core of the beneficial Fung Shui system of the town.

Since the flow of the forces along these lines is from north to south, anyone resident on the south shore of the bay where these lines cross the shore would be facing directly into the line, a highly undesirable feature. In fact, however, the lines all cross the shore at uninhabited places: in the case of the Kwan Tai/Tin Hau Temple line, this is the gap between Nam Chung and Leung Uk villages.

It will be noted, however, that part of the Lung Tin Estate crosses the Yeung Hau Wong Temple line, and that some of the buildings of this estate have questionable Fung Shui as a result.

There are a number of other Fung Shui lines which exist in this area (for instance the line linking Nam Chung and Fan Kwai Tong villages, the peaks behind them and the western peaks of Tai O Island), but these are all of less significance than the three mentioned above. However, the western front of the outer seawall which protects Salt-field No. 2 lies immediately along the line linking the highest point of Tai O Island and the secondary, eastern peak of Nga Ying Shan (this line is shown on **Figure 8.4**). The reason this area of salt-fields was designed to end along this line is that this very powerful Fung Shui *yang* line acted as a defence to the whole area against any *Shat Hei* approaching the site from the open sea to the west, in practice, this Fung Shui line would have been seen as protecting the area (in particular from typhoons) and is considered to be of some importance. This Fung Shui line is associated with a small shrine on Tai O island, at the foot of the hill: the Fung Shui line crosses this shrine as it passes out into the bay. The Kwan Tai/Tin Hau Temple Fung Shui line lies in the same relationship with the older western bund of Salt Field No 1 (i.e. the eastern bund of Salt Field No 2): again this would have been for defence of the area against Fung Shui attack, especially in the form of typhoons.

It is clear from **Figure 8.4** that none of these significant Fung Shui lines cross the area of Salt Field No 2, nor do they cross the area proposed for the sheltered boat anchorage.

There is only one Fung Shui line which crosses this area directly, but this is a very important one. There is a major *Shat Hei* corridor to the west, where influences from the open sea enter Tai O Bay. It will be noted that the oldest settlements on Tai O Island (Shek Tsai Po, and the area of the town east of the Kwan Tai/Tin Hau Temple) are all so placed that they face away from this direction. However, the open bay was always an important part of the anchorage, since it was here that the deepest waters were. It was felt necessary to defend this anchorage by a strong Fung Shui line.

The line chosen was centred on the Tin Hau Temple at San Tsuen. Behind this temple is a very strongly featured peak, with very steep slopes. The *yang* forceline from this peak is then funnelled through the gap between the two smaller peaks of the Lion Ridge and then descends precipitously down to the temple, which stands at the foot of the steepest part of the hill. It is then funnelled through the temple, with the altar to the deity lying precisely across the line of the flow. The forceline then runs out into the bay, almost half-way between the two headlands which form the entrance to the bay. This forceline is a classic "defensive" line. The raw power of the *yang* force here is very great, and coupled with the spiritual powers of the deity, should be ample to control the *Shat Hei* flowing in here from the open sea. This forceline is of great importance and any damage to it would be serious. The Fung Shui line along the front face of the salt-fields is also defensive in character, but subordinate to this line through the temple. However, the point where the lines cross is particularly sensitive - refer to **Figure 8.4**.

It is apparent from the temple inscriptions in the San Tsuen Tin Hau Temple that this temple was originally built to protect the town from this *Shat Hei* corridor, and in particular, the fishing boats moored in the bay. The 1838 inscription states:

"The temple was built in the first year of Shun Tsz (1644) or thereabouts. It assists the creek to the south with the protection of the mountain to the north. The salt-fields were built here in the Chien Lung period^a. The site receives the abundant pulse of the Phoenix Mountain, and the vigorous influence of the Lion Ridge. The waters of the anchorage coil and recoil around it, with quiet waves and gentle billows."

The inscription also notes that the temple protects the premises on Wing On and Tai Ping Streets, south of Tai O Creek. These streets are rather more exposed to the *Shat Hei* than the streets north of the creek.

Another inscription in the same temple, of 1895, states:

"Because this site is near the sea-coast, it is necessary to rely on the power of the deity ... Tin Hau ... protects all living things, and is especially propitious to the honourable sea-kingdom ..."

From these inscriptions it is clear that the temple was primarily built to protect the fishing and other boats using the anchorage in front of the temple. It was not built with a view to protecting the salt-

^a) This section of the inscription is mis-transcribed in D. Faure, B. Luk and A. Ng, The Historical Inscriptions of Hong Kong, (Urban Council, Hong Kong, 1986 Vol. 1, p. 90). The relevant section is as indicated as reference ⁵ in the translation table presented in Section 8.8.

works: indeed, the 1838 inscription suggests that the salt-works were added after the temple was built and that they were seen as something of an embarrassment to the main purpose of the temple.

The three temples on the northern side of Tai O Creek also all claim a role in the protection of vessels in the port. All stress the donations made to their restorations by the boat-people. The Kwan Tai/Tin Hau Temple in the market, in an inscription of 1903, stresses that all four of the deities in the temple protect the anchorage (and not just Tin Hau alone), and a further inscription there, of 1959, points out that every boat entering the anchorage sails past the temple, and thus falls under the protection of its deities. However, the three northern temples protect essentially only those vessels entering the creek: those moored in the open bay are the responsibility of the San Tsuen Tin Hau alone.

8.6.3 The Effects of the Proposed Works on Fung Shui

The development proposals are unlikely to impinge significantly on any major local Fung Shui issues. Salt fields seem to have been largely transparent to Fung Shui: in other words, their presence or absence makes little difference to the Fung Shui. Thus the 1838 and 1895 inscriptions from the San Tsuen temple largely ignore the saltworks. The 1838 inscription mentions them, but only it would seem, to suggest that their presence had rendered the temple a little more remote than before from the boats it protected. Mangroves are also transparent to Fung Shui; it is of the sea and its force is the same as an area of sea. By bringing boats back once again to the area immediately in front of the San Tsuen temple, it is possible that the temple will be seen as providing again in full its duties of protecting the sea-people.

However, it must be noted that any construction of any building in front of the temple would be a major interference to the Fung Shui. A broad area, as shown on **Figure 8.4**, should be left free of all buildings, such that the temple's power can still reach the whole of the bay area and specifically, to the whole of the proposed anchorage.

8.7 Project Impact Prediction and Recommended Mitigation Measures

8.7.1 On-Shore Areas

This historical and cultural heritage chapter has illustrated that whilst not of particular intrinsic archaeological potential, the salt pan area is an important local and regional relic of the salt industry in Hong Kong and the South China area. As such, this cultural significance should be preserved as far as possible, in particular the southern portion of the outer seawall. In order to achieve this, the following mitigation measures are recommended:

- the detailed design should ensure that breakages of the outer seawall for water circulation avoid the southern portion of the outer seawall. In addition, breaches to the outer seawall to facilitate tidal flushing should be kept to a minimum and should only be considered in areas of the seawall that are already badly degraded and broken;
- all sections of outer seawall that are to be retained should be “flagged” during construction activities to ensure that it is not damaged.

The current scheme involves the installation of protective sheet piling wall placed within the sediments in front of the existing outer seawall in order to protect the seawall during anchorage

operation. This will prevent erosion of the outer seawall due to the increased occurrence of boat-generated wake.

Whilst the design of the proposed mangrove planting area is outside the scope of this EIA, it is recommended that the mitigation measures presented herein are incorporated into the contract documentation for that project. The recommendations for the mangrove layout (refer to the Tai O Mangrove Layout Plan, Scott Wilson 1999) achieve the objectives for preservation of the outer seawall as highlighted above. In addition, where possible, any building structures should minimise the impact upon Fung Shui of the mangrove planting area.

In addition to the above, it is stressed that the salt pan mangrove habitat creation programme will not destroy the salt pan area, as would be the case if the area were to be fully reclaimed for say a housing/infrastructure project. As such, the mangrove restoration aspect of the development is itself considered to be an effective method of salt pan area preservation.

8.7.2 Off-Shore Areas

Dredging may have either a direct or indirect impact on marine archaeological resources. A direct threat to archaeological material occurs when the dredging equipment makes physical impact with archaeological material resulting in its destruction. An indirect threat occurs when a good preservation environment is destabilised by the dredging process. A change in the sediment dynamics of an area may expose archaeological material which may then be vulnerable to other forces.

All aspects of the proposed engineering works would have a harmful impact on marine archaeological material, if present. The removal of dredged material would result in the destruction of any archaeological material on or beneath the present seabed. The greatest volume of material will be removed from the areas of the sheltered boat anchorage and breakwater trench. Such dredging would result in the complete loss of archaeological material, if present.

Given the above, the feasibility of monitoring the dredging operations should be considered. This would facilitate the identification and retrieval of any archaeological material during the dredging works. Such a watching brief is standard archaeological practice and is defined as "*a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons within a specified area or site on land or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed*" (Institute of Field Archaeologists (1997) Standard Guidance for Archaeological Watching Briefs). If archaeological material were to be found, AMO would be contacted immediately to seek guidance on its significance and appropriate mitigation measures would be prepared. It is noted that AMO plan to undertake an additional geophysical marine archaeology survey in Tai O Bay during the detailed design stage. Following completion of this geophysical survey, the requirement for a archaeological watching brief during the dredging works should be re-evaluated.

8.8 Conclusions

The earliest recorded use of the identified salt fields at Tai O are from 1898 at Salt Field No 1. Apart from the very small fields on the north Sai Kung peninsula area, Salt Field No 4 to the east of the Hang Mei creek represents the only remaining salt field in Hong Kong today and warrants protection. The fields at Sha Tau Kok, Tuen Mun, Shuen Wan and Salt Fields No 1, 2 and 3 at Tai O have all been destroyed.

Salt Field No 2 comprises the site of the proposed mangrove planting habitat - the area was reclaimed from the sea after 1903 and only functioned as a salt field for about fifty years. It was undamaged until 1969 - 1970 when its sluice system and the salt-godown which served the area, were destroyed by the building of the Tai O Road. Shortly afterwards, the area was bulldozed out to form a series of seven large fish-traps. There are no buildings of historical interest on or adjacent to the site or Monuments, "Declared" or "Deemed". The area is thus considered to have limited potential for any archaeological relics.

The only significant feature of historical interest surviving today in this area is the 1903 - 1904 outer seawall of the salt field. Although very seriously damaged, the southern part in front of Fan Kwai Tong Village survives in quite good condition, and should be preserved in its present condition. Of the outer seawall the most important area which should, if possible, not be disturbed, is that strip where the two Fung Shui lines intersect (the San Tsuen Tin Hau Temple main Fung Shui line and the Fung Shui line which runs along the outer seawall). It is noted that breaches to the outer seawall to facilitate tidal flushing in the proposed mangrove habitat should be kept to a minimum and should only be considered in areas of the seawall that are already badly degraded and broken.

Assuming any redevelopment is sympathetic to the main Fung Shui line of the San Tsuen Tin Hau Temple, then there would be no Fung Shui impediment to re-development of the site of Salt Field No 2. The San Tsuen Tin Hau Temple Fung Shui line requires there to be no substantial buildings in the whole area in front of the temple, including the whole of the Salt Field No 2 site.

In order to ensure that any marine archaeological material is protected during the dredging works, the inclusion of a watching brief should be considered. However, it is noted that AMO plan to undertake an additional geophysical marine archaeology survey, after which the requirement for a watching brief during the dredging works should be re-evaluated.