

# **Proposed Comprehensive Development at Wo Shang Wai, Yuen Long**

## **Project Profile**

**July 2005**

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### Issue and Revision Record

Rev	Date	Originator	Checker	Approver	Description
A	July 05	Environmental Team	T M Chung	Dr Anne F Kerr	Draft

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## **EXECUTIVE SUMMARY**

### **INTRODUCTION**

- E1 The proposed Project is located at various lots in DD101 and DD105, Wo Shang Wai, Yuen Long and will occupy around 20.74ha net site area. The existing use of the site is currently abandoned grassland and open storage area. To the immediate south and west of the site there are existing residential developments (Royal Palms, Palm Springs and Wo Shang Wai). To the immediate northeast there is open storage with fish ponds to the northwest and village development to the east of the development site. The location of the development site and its surrounding are shown in **Figure 1.1**.
- E2 On the Approved Mai Po and Fairview Park Outline Zoning Plan (Approved OZP) No. S/YL-MP/6, the project site is zoned "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" ["OU(CDWRA)"]. Under this zone, any new development shall not result in excess of a maximum plot ratio of 0.4 and a maximum building height of 6 storeys including car park.
- E3 The proposed development is intended to realize a "GAIN" in the ecological value of Deep Bay through the holistic development of residential dwellings with wetland habitat. A Continuous Public Involvement (CPI) programme is planned with involvement of interested community and conservation groups from the earliest stages of the project.
- E4 The effects of the change in land use from the current situation to the future development will be subject to assessment under the EIA process.

### **MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT**

- E5 Traffic on Castle Peak Road and San Tin Highway are the dominant sources affecting the ambient air quality and noise levels within the study area and its environs. The Zero Discharge Policy for Deep Bay is currently a potential constraint for operational phase.
- E6 The majority of the site is currently abandoned grassland (with a seasonal wetland indicator plants) and open storage area. As the aerial photos indicate the existing/baseline condition for the landscape assessment is the grassland habitat. Residents of the nearby villages and residential development are considered to be the potential sensitive receiver that may be visually affected by the Project.

### **CONCLUSIONS**

- E7 Air quality impacts resulting from the comprehensive development are predicted not to exceed air quality criteria with mitigation measures. Good site practice will further improve air quality.
- E8 Short-term noise impacts from the proposed works during construction could be reduced to an acceptable level with implementation of the mitigation measures.
- E9 Waste management plans and good site practices shall be implemented to minimise the waste generation. Impacts associated with waste are unlikely in both construction and operational phases.

- E10 Potential water quality impacts may arise during construction from site runoff, wastewater and sewage from site workers. However, the implementation of pollution control measures and good site practices can minimise the potential impacts. In addition to this, the proposed works will follow the “Deep Bay Guidelines for Dredging, Reclamation and Drainage Works” and the Zero Discharge Policy for Deep Bay to ensure unlikely adverse water quality impacts on the surrounding sensitive receivers.
- E11 The key ecological impacts resulting from constructing comprehensive development include the permanent exchange of habitats from grassland and open storage area to wetland. This is considered to be an ecological enhancement and is a functional benefit in the wider context of wetland restoration and connection with other wetlands in the Study Area. Whilst impacts to some habitats cannot be avoided by the proposed construction works, good site management practices and relevant mitigation measures will minimise these impacts, and in the longer term the ecological gain offered by the development of the site will be greater than the potential short from construction impacts.
- E12 Landscape and visual mitigation, including compensatory planting, colour scheme design, finishes and texture of building materials used will be fully considered in the design to ensure that the development will be compatible with the landscape setting and surroundings. There is potential for slight visual impacts on nearby residents during the construction phase. Permanent adverse landscape and visual impacts arising from the operational phase are unlikely and there is potential for positive landscape impacts resulting from wetland creation in the longer term.
- E13 Issues associated with cultural heritage resources are not expected at this site.

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## **1 BASIC INFORMATION**

### **1.1 Project Title**

Proposed Comprehensive Development at Wo Shang Wai, Yuen Long

### **1.2 Purpose and Nature of the Project**

According to the statutory requirements of the Approved Mai Po and Fairview Park Outline Zoning Plan No. S/YL-MP/6, the zoning on the plan is “Other Specified Uses - Comprehensive Development to include Wetland Restoration Area”. The development will thus comprise two major uses: residential development and associated infrastructure and wetland restoration.

It is proposed that a comprehensive development will be constructed at Wo Shang Wai. The statutory planning intent is to provide an incentive for the restoration of degraded land through comprehensive residential and/or recreational development to include wetland restoration area. It is also the planned intent to encourage the removal of existing sporadic open storage uses on degraded land. The objective of the Project is to formulate a land use system with creative layout design that will simultaneously benefit both the planned residential community and the created wetland and be sustainable in the long term.

The project will allow wetland restoration to be realised in harmony with residential development and allows an opportunity for innovative ideas to be considered to showcase the planned intent to upgrade degraded areas in the New Territories.

To assist in the smooth implementation of the project, the Proponent is committed to undertaking a Continuous Public Involvement (CPI) process with interested parties. The CPI programme will include, but not be necessarily limited to, involvement of community and conservation groups. Past experience has indicated that inclusion of CPI programme into the project schedule at the earliest stage can be of great help in understanding the goals and objectives of a project and assisting in environmental gain.

### **1.3 Name of Project Proponent**

Profit Point Enterprises Ltd

### **1.4 Contact Persons**

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### **1.5 Location of the Project**

The proposed Project is located at various lots in DD101 and DD105, Wo Shang Wai, Yuen Long as shown in **Figure 1.1**. To the immediate south and west of the site there are existing residential developments (Royal Palms, Palm Springs and Wo Shang Wai). Open storage still exists to the immediate northeast with fish ponds to the northwest and village development to



the east of the development site. The location of the development site and its surrounding are shown in **Figure 1.1**.

## 1.6 Scale of the Project

The project site will occupy about 20.74 ha net site area in the Other Specified Uses (Comprehensive Development to include Wetland Restoration Area) zone OU(CDWRA) and around 21.09ha gross site area. The statutory permissible developable domestic GFA is about 82,960m<sup>2</sup>.

As per the approved Outline Zoning Plan, the maximum plot ratio is 0.4 with a maximum height is 6 storeys including car park.

## 1.7 Existing Condition

Reference to aerial photos indicates that the ponds were filled since 1991. The northwestern portion of the site has been used as open storage and the remaining area left derelict (see **Plate 1**). The existing condition of the site is of degraded land, is of low visual amenity, and is incompatible with the conservation objective and planning intention.

The site is zoned as Other Specified Uses (Comprehensive Development to include Wetland Restoration Area). The purpose of the proposed development is to realize a “GAIN” for the ecological value of Deep Bay by the creation of wetland habitat. In view of this, an increase in wetland by quality or in terms of hectarage will be a benefit i.e. a “CREDIT” which will enhance the regional ecological value of the Deep Bay area.

## 1.8 Number and Types of Designated Projects to be Covered by the Project Profile

The proposed comprehensive development is a designated project (DP) under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) under Category P.1, Part I, Schedule 2 of the EIAO by virtue of "A residential or recreational development, other than New Territories exempted houses, within Deep Bay Buffer Zone 1 or 2". In addition the other designated project identified as being possible for this site, under schedule 2 of the EIAO is included in **Table 1.1** below.

**Table 1.1 List of Designated Project Identified**

Items of Works	EIAO Schedule 2 Identity	Reason for DP designation
<i>Designated Projects</i>		
Proposed Comprehensive Development within Deep Bay Buffer Zone	Category P.1	A residential or recreational development, other than New Territories exempted houses, within Deep Bay Buffer Zone 1 or 2
The reuse of treated sewage effluent	Category F.4	An activity for the reuse of treated sewage effluent from a treatment plant (may be considered)
<b>EIAO Schedule 3</b>		
Proposed Comprehensive Development with a study area covering more than 20 ha	Category 1	Engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000.

## 1.9 Alternatives

Alternatives to be considered during the EIA will include layouts of the development, development options and construction methodologies. Any alternatives for long term operational issues will also be considered.

## **2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

### **2.1 Planning**

A feasibility study and the development of the design for residential development with wetland restoration are currently underway. Design parameters for the development have been reviewed and have been used as a broad basis for the preliminary information contained within the project profile. The proposed comprehensive development at Wo Shang Wai in Yuen Long is being planned and designed by Consultants appointed by Profit Point Enterprises Ltd. The construction works are anticipated to commence in 2008 and to be completed in 2011.

### **2.2 Site Selection**

The degraded site is located in proximity to the RAMAR site at the Mai Po Marshes and Deep Bay. The project offers an opportunity for a holistic design to be developed to allow wetland restoration to be realized as a “gain” in ecological value with the limited residential to be developed under the Statutory Outline Zoning Plan. Such an approach could remove the undesirable open storage uses on site and provide an overall benefit given the context of the subject site.

### **2.3 Rationale for Formulating A Development Plan**

Relevant statutory and non-statutory planning policies provide appropriate planning guidance in terms of the development context for the project site. Such policies also form part of the fundamental factors in designing a development plan for the project site.

#### *Statutory Planning Policies*

On the Approved Mai Po and Fairview Park Outline Zoning Plan (Approved OZP) No. S/YL-MP/6, the project site is zoned "Other Specified Uses" annotated "Comprehensive Development to include Wetland Restoration Area" ["OU(CDWRA)"] rezoned on 18 May 2001. Under this zone, any new development shall not result in excess of a maximum plot ratio of 0.4 and a maximum building height of 6 storeys including car park.

The planning intention and development conditions of particular relevance to the project site are set out in the Statutory Notes and the Explanatory Statement in respect of the OU(CDWRA) zone as follows:

- The zoning intention is to provide an incentive for wetland restoration of the degraded land through comprehensive residential development to include wetland restoration area. It is also intended to encourage removal of existing sporadic open storage uses.
- Development scheme on the degraded land adjoining the fish ponds should include wetland restoration and buffer proposals to minimize its impact on the fish pond areas.
- The applicant should submit to the TPB a comprehensive development scheme to include a layout plan with supporting documents, including:
  - environmental impact study report (which should include, inter alia, an ecological impact assessment (EcoIA) and a visual impact assessment);
  - traffic impact, drainage and sewerage impacts study reports;
  - information on programming, phasing and implementation schedule of development; and

- a wetland restoration and/or creation scheme, including its detailed design, wetland buffer proposals, a long term maintenance and management plan as well as monitoring and implementation mechanisms.
- Any new building should be located farthest away from Deep Bay.

#### *Non-Statutory Planning Policies*

The Town Planning Board Guidelines for Application for Developments within Deep Bay Area under Section 16 of the Town Planning Ordinance" TPB PG-No. 12B set out the land use concept for the Deep Bay Area where the project site is situated.

Under these Guidelines, the project site is within an area that is designated as "Wetland Buffer Area" (WBA).

The following criteria in the guidelines are relevant to the project site:

- As a substantial amount of the fish ponds within the WBA have already been lost over time through filling and certain areas have been degraded by presence of open storage use, these degraded areas may be considered as target areas to allow an appropriate level of residential development so as to provide an incentive to remove open storage use and/or to restore some of the fish ponds lost.
- Residential development proposals on degraded sites to remove/replace existing open storage or container back-up uses and/or to restore lost wetlands may be given sympathetic consideration subject to satisfactory ecological and other impact assessments.
- Development proposals which include restoration of the lost fish ponds or replacement of existing undesirable uses by wetland habitats are encouraged.
- For those disturbed areas directly abutting the WCA, the development should provide a wetland and visual buffer to separate the development from the WCA to minimize its impact on the wetland and to restore some of the lost fish ponds to an appropriate form of wetland adjoining the WCA.
- Residential development projects should be compatible with the surrounding land uses and the rural setting of the area.

Taking account of the history and planning context of the Site, as well as the "Proposed Guidelines on the Approaches for Consideration of On-site and Off-site Mitigation and Implementation of Ecological Compensation for Wetland", a framework for the development of the site has been derived. The framework takes account of the two fundamental elements to be provided viz. residential and associated development (amenities, local road network on site, landscaping requirements etc.) and the wetland restoration plan.

It is important to recognize the integration between the various elements of the development plan for this site and not merely to consider them in isolation. There needs to be transitions from the residential developments through to the wetlands with a buffer zone between the zones.

The project site occupies about 20.74 hectares net site area. With a maximum allowable plot ratio of 0.4 under the OU(CDWRA) zoning of the Approved OZP, the proposed domestic GFA on the project site is about 82,960 (with a max. height of 6 storeys including car park). The scale of the development and the form of the buildings and layouts are still under consideration.

For the derivation of the framework for wetland restoration the process which has been adopted at this early stage of the project is as follows:

- Establish baseline conditions using the survey data obtained between April and June 2005 as well as existing knowledge of the Study Area
- Evaluate the effects of change from the current conditions to the permissible planned land use
- Identify the ecological function of the site based on the information currently available
- Consider a “Like for Like” arrangement if appropriate
- Develop alternative designs to enhance the functions of the site in the overall context of wetland restoration.

The baseline conditions have been identified through surveys of vegetation, fish and birds. The preliminary findings of the surveys are summarized in the following Tables below :

### Vegetation Survey

1. Some small to medium sized trees on the boundary area;
2. The site is overgrown with grasses and wetland indicator plants, although not in abundance
3. No rare or protected flora species were identified within the project site and perimeter adjoining
4. Planted trees/shrubs were recorded and as such a tree survey may be required at late stage of study depending on the site layout
5. Plant species list given in **Table 2.1** below:

**Table 2.1: Plant Species**

植物调查					
科名	种名	中文名	中文科名	onsite	Pond 渔塘边
		三叶草	豆科, 蝶形花科	+	
Euphorbiaceae	<i>Ricinus communis</i>	蓖麻	大戟科	+	
Melastomataceae	<i>Melastoma candidum</i>	野牡丹	野牡丹科	+	
Gramineae	<i>Panicum trypheron</i>	毛黍	禾本科	++++	+++
Compositae	<i>Mikania micrantha</i>	薇甘菊	菊科	++	+++
Amaranthaceae	<i>Alternanthera philoxeroides</i>	空心莲子草	苋科	++	
		雍菜, 心菜		+++	
Gramineae	<i>Phragmites communis</i>	芦苇	禾本科	++	
Rubiaceae	<i>Paederia scandens</i>	鸡矢藤	茜草科	++	
		竹苞草		++	
Gramineae	<i>Pennisetum purpureum</i>	象草	禾本科	+	
Gramineae	<i>Eleusine indica</i>	牛筋草	禾本科	+	
Solanaceae	<i>Solanum photeinocarpum</i>	少花龙葵	茄科	+	
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龙	旋花科	++	
Gramineae	<i>Cynodon dactylon</i>	狗牙根	禾本科	++	
Onagraceae	<i>Ludwigia perennis</i>	细叶丁香蓼	柳葉菜科	+	
Gramineae	<i>Panicum repens</i>	枯骨草	禾本科	++	
Sapindaceae	<i>Litchi chinensis</i>	荔枝	无患子科	+	
Rutaceae	<i>Clausena lansium</i>	黄皮	芸香科	+	
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐	大戟科	+	++
Euphorbiaceae	<i>Sapium sebiferum</i>	乌桕	大戟科	+	+
Mimosaceae	<i>Acacia auriculiformis</i>	耳果相思	含羞草科	+	
Euphorbiaceae	<i>Bridelia tomentosa</i>	土密树	大戟科	+	

植物调查					
科名	种名	中文名	中文科名	onsite	Pond 渔塘边
Compositae	<i>Bidens alba</i>	白花鬼针草	菊科	+	++
Meliaceae	<i>Melia azedarach</i>	苦楝	楝科		+++
Musaceae	<i>Musa paradisiaca</i>	蕉	芭蕉科		+
Myrtaceae	<i>Psidium guajava</i>	番石榴	桃金娘科		+

### Fish Survey

No native species were identified in the drainage ditch running through the site. Exotic fish species namely Tilapia, mosquito fish and catfish were recorded.

### Bird Survey

Some 20-bird species were recorded. Commonly found wetland dependent birds were swallow, heron and egret. Bird species are given in **Table 2.2** below:

**Table 2.2: Bird Species**

Common Name	Scientific Name	Chinese Name	Status	Commonness	Abundance
Spotted Dove	<i>Streptopelia chinensis</i>	珠頸斑鳩	R	C	5
Magpie	<i>Pica pica</i>	喜鵲	R	C	1
Barn Swallow	<i>Hirundo rustica</i>	家燕	PM	C	30
Crested bulbul (Red-whiskered Bulbul)	<i>Pycnonotus jocosus</i>	紅耳鸛	R	C	3
Chinese Bulbul	<i>Pycnonotus sinensis</i>	白頭鸛	R	C	4
Tree Sparrow	<i>Passer montanus</i>	麻鸛	R	C	2
Masked Laughing thrush (Black faced Laughing Thrush)	<i>Garrulax perspicillatus</i>	黑臉噪鶇	R	C	3
White Wagtail	<i>Motacilla alba</i>	白鶇鶇	WV	C	1
Yellow Bellid Prinia	<i>Prinia flaviventris</i>	灰頭鷓鴣	R	C	2
Black Kite	<i>Milvus lineatus</i>	麻鷹	R	C	1
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鷺	R	C	1
Little Egret	<i>Egretta garzetta</i>	小白鷺	R	C	1
Plain Prinia	<i>Prinia inornata</i>	褐頭鷓鴣	R	U	1
Jungle Crow	<i>Corvus macrorhynchus</i>	大咀烏鴉	R	C	1
Nearby Fish Ponds					
Cattle Egret	<i>Bubulcus ibis</i>	牛背鷺	R	C	60
Little Egret	<i>Egretta garzetta</i>	小白鷺	R	C	20
Great Egret	<i>Casmerodius alba</i>	白鷺	R	U	2
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鷺	R	C	2
Magpie Robin	<i>Copsychus saularis</i>	鶇鶇	R	C	
White Wagtail	<i>Motacilla alba</i>	白鶇鶇	WV	C	3
Barn Swallow	<i>Hirundo rustica</i>	家燕	PM	C	6

Common Name	Scientific Name	Chinese Name	Status	Commonness	Abundance
Spotted Dove	<i>Streptopelia chinensis</i>	珠頸斑鳩	R	C	6

From the findings of the surveys carried out to date, 5 species were found which are wetland indicator plants, particularly the phragmites species which is moderately abundant although scattered on site. All the plants found on site are common with no conservation value. The presence of wetland indicator plants suggests the site is performing some limited seasonal wetland function. The extent of the coverage of wetland indicator plants on site is small which supports the foregoing statement. The ecological value of the vegetation on site is considered to be low.

No native species of fish were recorded in the drainage ditch, rather some exotic species (tilapia, mosquito fish and catfish) were recorded, presumably having been released into the watercourse.

The bird survey yielded some 20 species of birds using the site. Commonly found wetland birds including swallows, herons, white wagtails and egrets were observed on site. The site hosts passenger migrants (barn swallow), winter visitors (white wagtail) as well as resident species. All of the species are active during the daytime when they forage and feed and as such during the construction period cognizance will need to be given to developing a works programme to minimize disturbance to the bird populations.

The effects of the change in land use from the current situation to the future development will be subject to assessment under the EIA process. The identification of the ecological function of the site will be determined through the collection of further data and interpretation of such. At present the site performs some wetland function by virtue of it having wetland indicator plants on site. This does not however imply that the site is a “wetland”. The consideration of a “like for like” arrangement for development is not relevant to this site which permits residential development with wetland restoration. Thus the development plan will be based around the enhancement of the “wetland” function of the site in conjunction with the permissible residential development.

## 2.4 Construction Methodology

For construction works, there are fundamentally three components to be considered, namely, site formation, building construction and wetland restoration. In this case it is important to consider the types of building structures that would be suitable in the context of the statutory planning requirement as well as from a geotechnical perspective.

The extent of the excavation or surcharging for the sites to be selected for residential building will be subject to further engineering appraisals.

The development plan permits 6 storey dwellings and it is envisaged there will be a range of 2 to 6 storey residential properties.

The Site is located immediately west of the Scheduled Area No. 2, as delineated by Environment, Transport and Works Bureau (ETWB) Technical Circular (Works) No. 4/2004. Ground investigations will be tailored to identify the presence of geological features which may extend into the Site and thus affect foundations, excavations or the wetland restoration.

In terms of the wetland restoration plans, it is envisaged that the wetland restoration can be formed using clay perimeter bunds and existing marine mud below the ponds, thus avoiding export of this material from site and using the existing materials on-site where possible. Ground investigation will need to be carried out to confirm the depth of existing marine mud. The

edges of the wetland restoration works will be formed at suitably shallow gradients to ensure they remain stable.

Excavated material will be utilised on site where possible (e.g. landscaping), or disposed to a suitable facility. Prior to excavation, contamination testing of the existing fill will be conducted to confirm, or otherwise, that the fill is inert and can be reused. Similarly, sedimentation testing will be carried out in accordance with ETWB Technical Circular (Works) No. 34/2002. This will identify an appropriate disposal strategy for any excavated sediment.

Spike tests are suggested to confirm that potential methane generation from the former fishponds is no longer a hazard.

## **2.5 Project Interfaces**

Project interfaces include the development of the OU(CDWRA) zone, in totality, as well as the existing residential developments at Palm Springs and Royal Palms. The adjacent site which at present is used as an open storage area (see **Figure 2.2**) falls within the same OU(CDWRA) zone. The proposed comprehensive development master plan needs to be compatible with the adjacent/future developments. As there are no known plans for this, it is proposed that two scenarios are considered: one with the open storage remaining, one whereby the open storage area is redeveloped in accordance with the planning intents.

### 3 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

#### 3.1 Air

##### 3.1.1 Existing Environment

The traffic such as that from Castle Peak Road, San Tin Highway and other local roads are considered to be the dominant sources affecting the ambient air quality within the study area and its environs.

##### 3.1.2 Sensitive Receivers

Representative Air Sensitive Receivers (SRs) within 500m of the Project limit have been identified according to the criteria set out in the TM-EIA through site inspections and a review of land use plans. At this site, Sensitive Receivers are the same for noise and air and their horizontal distances to the nearest emission source have been identified and are summarized in the **Table 3.1** below. Locations of the Representative SRs are shown in **Figure 3.1**.

**Table 3.1: Locations of Representative Air and Noise SRs**

SRs	Receiver Description	Usage	Distance to the nearest Emission Source (in metre)
SR1	Royal Palms	Residential	approx 10m
SR2	Palm Springs	Residential	approx 10m
SR3	Wo Shang Wai	Residential	approx 50m
SR4	Village House of Mai Po San Tsuen	Residential	approx 60m

#### 3.2 Noise

##### 3.2.1 Existing Environment

The traffic of Castle Peak Road, San Tin Highway and other local roads (access roads to the Open Storage area to the northeast of the site) are considered to be the major noise sources within the study area.

##### 3.2.2 Sensitive Receivers

Representative Noise Sensitive Receivers (SRs) within 300m of the project limit have been identified according to the criteria set out in the TM-EIA and NCO, through site inspections and a review of land use plans. At this site Sensitive Receivers are the same for noise and air and their horizontal distances to the nearest emission source have been identified and are summarized in **Table 3.1** above. Locations of the SRs are shown in **Figure 3.1**.

#### 3.3 Water

##### 3.3.1 Existing Environment

Within the Project site, there is one drainage ditch located along the south boundary in the east portion of site and some fish ponds immediately to the northwest of the site (refer to **Plates 2-3**). Potential water pollution sources include the effluent from adjacent agricultural activities and the disposal of domestic sewage from the adjacent developments as shown on **Figure 2.2**. The level of treatment provided at these facilities is primary/secondary treatment.



### 3.3.2 *Sensitive Receivers*

The major water sensitive receivers include the fish ponds adjacent to the site which are potentially affected by the Project. The Deep Bay Water Control Zone is an indirect sensitive receiver and cognisance must be given to the Deep Bay Zero Discharge Policy which prevails, when designing the wastewater treatment and disposal facilities for this Project. The Deep Bay Zero Discharge Policy means that there can be no net discharge of pollutants to the receiving waters. There are no public sewers within 5km of the site, and the planned sewerage improvements on the San Tin Highway are not expected until late 2008. Until such times as public sewers are able to be connected into, the Zero Discharge Policy implies that domestic effluent generated on the Project site needs to be treated and disposed of in such a manner to comply with this requirement. Total water management for the site is a key aspect of the design.

## 3.4 Ecology

### 3.4.1 *Existing Environment*

The ecological setting for the site reflects the transformation from tidal marshland to fishponds to open storage, to a currently grassed open area. There are fish ponds in the surrounding areas as shown on **Figure 2.2**, “Conservation Areas” (see **Figure 2.2**) and immediately adjacent to the site there are residential developments and fishponds. In the context of describing the ecological setting the adjacent residential developments this means there is disturbance to the subject site from both an ecological and visual perspective. These factors and the context of the surroundings will be taken into account when developing the plans for the residential developments.

Site surveys were conducted between April and June 2005 to supplement existing information and to indicate the ecological baseline for this particular site. The plants which have been found on site are listed in **Table 3.1** and indicate that the site performs a seasonal wetland function due to the presence of phragmites and other wetland indicator plants. The surveys also indicate the site is used by various bird species both resident and migratory refer to **Table 2.2**. The Study Area comprises various habitats including agricultural land, woodland, shrubland, grassland and wetland (fish ponds). Village houses and residential development are located from south to west along the site as shown on **Figure 2.2**.

“Conservation Area” is located to the northwest of the site with the affected Study Area as shown in **Figure 2.2**.

### 3.4.2 *Sensitive Receivers*

#### **Mai Po and Inner Deep Bay Ramsar Site**

The Mai Po and Inner Deep Bay wetland is the largest remaining wetland in Hong Kong. It is of international importance due to the tens of thousands of migratory birds, including rare, endangered and vulnerable species which use the wetland and provides valuable habitat for species of international importance. The area also supports a diverse community of flora and fauna, including over a dozen endemic invertebrate species. About 1,500ha of the Mai Po and Inner Deep Bay wetland were listed as a Wetland of International Importance (“Ramsar site”) under the Convention<sup>1</sup> in 1995.

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<sup>1</sup> Convention on Wetlands of International Importance Especially as Waterfowl Habitat

## Wetland Conservation Area and Wetland Buffer Area

The wetlands adjacent to the Ramsar site were designated as a Wetland Conservation Area (WCA). A buffer zone (the Wetland Buffer Area, WBA) of 500m was recommended to be established around the conservation area. These recommendations were incorporated into town planning board guidelines (TPB PG-N. 12B). The purpose of these two zones can be summarised as follows:

- **Wetland Conservation Area:** Aside from essential infrastructure works, no development detrimental to wetland habitats should be permitted within the WCA. Any essential works carried out in the WCA must comply with a “no net loss of wetland” policy. Any loss of wetland area or function will require compensatory habitat creation/enhancement.
- **Wetland Buffer Area:** The primary objective of this WBA is to provide a buffer to protect the fish ponds in WCA from disturbance. This objective is to be achieved through the designation of a buffer area and the use of limited residential upzoning to promote removal of the undesirable open storage and incentives for wetland restoration.

## Sites of Special Scientific Interest

### *Mai Po Village*

Mai Po Village SSSI was designated in 1979. It is Fung Shui woodland. This woodland is a breeding site for Little Egret, Cattle Egret and Chinese Pond Heron.

### *Mai Po Marshes*

Mai Po Marshes SSSI was designated in 1976. It contains largest and most important area of dwarf mangrove in Hong Kong. The productive serial community and man made key geiwais provides forgoing site and rich food source for both resident and migratory bird.

### *Tsim Bei Tsui*

Tsim Bei Tsui SSSI was designated in 1985. This site contains a mature mangrove community. A rare species *Bruguiera conjugata* is contained in this SSSI site. In addition, this mangrove stand is also the known habitat for the large mangrove pulmonate snail *Ellobium polita*.

### *Tsim Bei Tsui Egretty*

Tsim Bei Tsui Egretty SSSI was designated in 1989. This is an important egretty in Hong Kong. It is the nesting and breeding place for several hundred pairs of egrets and herons. The egretty and its associated bird community is part of Hong Kong's heritage.

### *Inner Deep Bay*

Inner Deep Bay SSSI was designated in 1986. Inner Deep Bay contains the largest and most important dwarf mangrove communities in Hong Kong. The huge mudflats with dwarf mangrove is a highly productive ecosystem which provides feeding and resting ground for over 250 species birds. In addition, mudflats and shallow water habitats also support a wide variety of organism which are of economic value (e.g. Oysters, edible fish, crab and shrimp) and scientific important (e.g. the Pulmonate snail *Ellobium polita*, marine angiosperm *Halophila beccarii*, *Chiromanthes maipoensis* and *Rhycodrilus lutulentus*).

All those mentioned SSSI sites above are situated within the Ramsar Site boundary except the SSSI site at Mai Po Village.

## Conservation Area

The Conservation Area zone is intended to conserve the ecological value of the wetland and fish ponds which form an integral part of the wetland ecosystem in the Deep Bay Area and function

as a substantial source of food supply for birds and as an important habitat for roosting and foraging of waterbirds.

### **Birds**

Marsh, fishponds and meanders can be classified as “wetland” where they support a variety of organisms such as fish, insect, amphibian and small mammal. This is very important since such organisms providing food sources for wetland dependant birds. The noise produced during construction could affect birds foraging on or near the site. It is considered that the birds and the supporting wetland habitats are the major sensitive receivers for the proposed development.

### **Amphibians**

Site inspections indicate that fish ponds and marshy areas within the Study Area are on the whole abundant with aquatic or marsh vegetation. Such vegetation can offer good concealment for amphibians and some birdlife as well as providing food sources. Besides, such places were also the breeding site for the insect where they provide food for amphibian fauna. In addition, the ponds, ditches and small streams provide breeding sites for amphibians and insect life, and as such the fauna and its potential breeding habitats are considered to be the significant ecologically sensitive receivers for the proposed project.

The surveys of the Project site per se however did not reveal any evidence of amphibians or native species of fish. Some fish were found in the drainage ditch but these were all exotic species.

### **Vegetation**

From the findings of the surveys carried out to date, five species were found on-site which are wetland indicator plants, particularly the phragmites species which is moderately abundant although scattered on site. All the plants found on site are common with no conservation value. The presence of wetland indicator plants suggests the site is performing a seasonal wetland function. The ecological value of the vegetation on site is considered to be low.

## **3.5 Landscape and Visual**

### **3.5.1 Existing Environment**

The proposed development is bounded by low-rise residential development to the south and west, fish ponds (wetland) to the north and to the east are village houses and Castle Peak Road. The majority of the site is currently abandoned grassland with a seasonal wetland function and part of it is an open storage area. As the aerial photos indicate the existing/baseline condition for the landscape assessment is the grassland habitat.

### **3.5.2 Sensitive Receivers**

Residents of the nearby villages and residential development are considered to be the potential sensitive receiver that may be visually affected by the Project. The nearest sensitive receivers are Royal Palms and Palm Springs next to the proposed site as well as the Wo Shang Wai Village which is a traditional village with water and fishponds surrounding the house.

## 4 POTENTIAL ENVIRONMENTAL IMPACTS

### 4.1 Introduction

The impacts associated with the proposed comprehensive development are assessed according to the criteria listed in Annexes of the Technical Memorandum on Environmental Impact Assessment Process (TM-EIA). The major potential impacts during construction and operation associated with the project are shown below in **Table 4.1**.

**Table 4.1: Major Potential Impacts during Construction and Operation Associated with the Proposed Comprehensive Development**

Potential Impacts		Phase	
		Construction	Operation
Air quality	Dust pollution	✓	✗
	Odour pollution	✗	✗
	Exhaust emissions	✓	✗
Noise	Night Time Operations	✗	✗
	Machinery	✓	✗
	Traffic	✓	✓
Waste generation	Disposal of spoil	✓	✗
	Disposal of refuse	✓	✓
	Contaminated Land	✓	✗
Water quality	Effluents	✓	✓
	Erosion and site runoff	✓	✗
Ecology	Impacts on fauna	✓	✓
	Impacts to flora	✓	✓
Risks	Dangerous Goods	✗	✗
	Accidental Discharges of	✓	✗
	Pollutants into water courses		
Landscape and visual amenity	Intrusive visual amenity	✓	✓
	Landscape amenity	✓	✓
Cultural Heritage	Artifacts or relics	✗	✗

Notes: ✓ = Possible; ✗ = Not anticipated

### 4.2 Air Quality

#### 4.2.1 Potential Sources of Impact

The potential air quality impacts include the dust and exhaust emissions arising from the construction (e.g. site formation, foundation and formworks etc.). In the operational phase, gaseous emissions from the increased traffic may cause impacts, however this is anticipated to be insignificant due to the limited numbers of vehicles using the site (i.e. only residential use and some vehicles for servicing the facilities).

#### **4.2.2 Evaluation of Impacts**

The construction of the proposed development may cause short-term air quality (i.e. dust) impacts on the surrounding air sensitive receivers. The impacts would be able to be controlled through appropriate design and good site practice outlined in **Section 5.1.1**.

### **4.3 Noise**

#### **4.3.1 Potential Sources of Impact**

Construction activities involving that may generate noise impacts include:

- site clearance of the proposed site;
- excavation;
- formation of the varying levels;
- construction of the houses and the infrastructure i.e. roads, residents club etc.; and
- vehicle movements bringing materials to site and exporting any waste which cannot be reused onsite.

#### **4.3.2 Evaluation of Impacts**

The source of noise nuisance during construction is primarily from the use of Powered Mechanical Equipment (PME) on site. The construction activities involve the use of plant for excavation, construction of the proposed comprehensive development and the traffic travelling to and from the sites. Since the identified construction work is limited in extent and duration it is anticipated that the short-term noise impacts would be reduced to an acceptable level with implementation of the mitigation measures outlined in **Section 5.2.1**. Cognisance will be taken of the Deep Bay Guidelines for phasing the construction works. The implications of the works on the adjacent Conservation Areas will also need to be considered carefully when assessing the impacts and preparing the construction programme.

Traffic noise assessments will be undertaken to determine any orientation or setbacks needed in view of the forecast traffic increases on the San Tin Highway and Castle Peak Road.

### **4.4 Waste**

#### **4.4.1 Potential Sources of Impact**

Waste which is likely to be generated during the construction of the proposed comprehensive development includes the following:

- vegetation and topsoil removed from site clearance around the proposed site; wherever possible these will be reused on-site;
- construction and demolition (C&D) materials;
- excavated materials;
- municipal solid waste generated from workforce, and
- chemical waste from plant and vehicle, maintenance, finishing materials, fitting out etc.

#### **Vegetation and Topsoil Removed from Site Clearance**

The waste arising from site clearance may include the following.

- Topsoil
- Grass

- Low and tall shrub
- Trees

Most of these wastes can be reused for landscaping purposes and this will be the underlying intent.

During the operational phase 'green' wastes will generated be from landscaping works and maintenance of the wetland restoration works.

### **Construction and Demolition Materials**

With limited existing structure on site and by adopting off-site prefabrication and precast construction as far as possible, construction and demolition wastes arising from the proposed works are expected to be minimal, but may include:

- Waste formwork
- Spent concrete and cement screening
- Material and equipment wrappings

### **Excavated Materials**

Excavated materials are expected to be generated from the start of construction. The materials will include excavated mud from the previous fish ponds infill material and underlying materials, depending on the depth to which the excavation takes place.

### **Municipal Solid Waste**

Municipal solid waste will be generated by workers during the construction period, and the waste may include:

- Food waste
- Packaging
- Wastepaper/Aluminium cans/Plastic bottles (all of which should be collected for recycling)

In the operational phase, the wastes arising will mostly be municipal solid wastes which will be collected and disposed of via a registered waste collection agency.

### **Chemical Waste**

Environmental harm due to chemical waste is not anticipated. The only incidence may be the accidental leakage of oil and solvent from the plant and vehicle servicing activities which will be carried out off-site or in specially contained areas.

#### **4.4.2 Evaluation of Impacts**

Waste materials have the potential to cause adverse environmental impacts during generation, storage, transport and disposal. Potential impacts comprise causing nuisance, insects and vermin as well as polluting surrounding environment. The following waste impacts may arise during construction.

### **Vegetation and Topsoil Removed from Site Clearance**

It is anticipated that the vegetation cleared will not require disposal off-site as it is made up of grassland and low shrub communities that are expected to generate very low amount of waste.

These are anticipated to be fully utilised for landscaping purposes on-site. There are only a few trees within the project site and these will be retained or transplanted on site as far as possible so it is not anticipated that tree felling will be necessary.

### **Construction and Demolition Materials**

Although it is considered that the construction and demolition materials (C&D) will be minimal on this site. They will be separated and stockpiled for reuse in the construction as far as possible. The reuse of inert C&D materials on-site will be maximised.

A similar approach to the Construction and Demolition Material Management Plan given in ETWB TC No. 33/2002 shall be followed to reduce the generated waste.

### **Excavated Materials**

The works will be implemented to minimise construction impacts (i.e. materials used on site where possible). In particular the underlying mud which previously formed the base of the fishponds will be a valuable resource in the generation of the wetlands and could be used to prepare bunds and wetland features and interfaces and keep the construction period to the minimum. Phasing of the works will also considered taking account of the restrictions imposed by the Deep Bay Guidelines and the adjacent Conservation Area. Consideration will be given to some advanced works contracts for the wetland restoration component of the works to allow the establishment of the ecological habitats prior to operation. Every effort will be made to minimise disturbance both on-site and to the adjacent developments through effective construction sequencing. With this implementation strategy put in place, the cumulative and overall environmental impacts could be minimised.

### **Municipal Solid Waste**

In accordance with Figure 11 in EPD's Monitoring of Solid Waste in 1999, the projection of per capita generation rates in year 2006 is 0.55 kg/employee/day (the employment size of this value includes all sectors under the Hong Kong Standard Industrial Classification). This value is adopted to estimate the quantity of municipal solid waste generated on-site by workforce.

The total volume of waste generated depends on the number of workers to be employed on-site.

If not appropriately managed, municipal solid waste generated by site workers. This may give rise to adverse environmental impacts for both workers and nearby villagers. Disposal will be the responsibility of the Contractor who shall, according to the general avoidance of nuisances measures (required under the Contract), remove materials at such a frequency to avoid nuisance. The measures include set-up a temporary refuse collection facilities by the Contractor and store waste in appropriate containers prior to collection and disposal.

Operational phase waste management issues relate to municipal solid waste and the 'green' waste arisings from landscaping works.

### **Chemical Waste**

Environmental harm due to chemical waste is not anticipated. The only incidence may be the accidental leakage of oil and solvent from the plant and vehicle servicing activities which will be carried out off-site in specially banded/contained areas.

## 4.5 Water

### Construction Phase

#### 4.5.1 Potential Sources of Impact

In the construction phase, potential water quality impacts on the sensitive receivers may arise from the following activities:

- Site runoff from construction site for instance wash water from dust suppression sprays which may contain suspended solid and contaminants; and
- Sewage generated from site workers.

#### 4.5.2 Evaluation of Impacts

Various construction works may have the potential to cause spillages or discharge into the receiving waters (such as fuels and chemicals) during construction. These include the offsite runoff from dust suppression measures, such impacts can be avoided by proper pollution control measures recommended in ProPECC PN1/94 (detail in **Section 5.4**), such as minimising the production of wastewater as far as practicable, using bunds round any temporary stockpiled materials to prevent washout into nearby watercourses, collecting and providing treatment (such as desilting tanks for treatment of surface runoff prior to discharge) for potentially contaminated water to appropriate standards.

In addition, sewage will be arisen from the workforce during the construction. The amount of sewage is estimated to be 0.06m<sup>3</sup>/day according such impacts to DSD's Sewerage Manual (Part 1) published in 1995. Facilities such as mulching or chemical toilets (with disposal off-site) could be considered especially to ensure that no sewage is discharged directly into receiving environment.

Site runoff, wastewater and sewage from construction works and site workers are the major pollution sources during construction. With appropriate pollution control measures, the wastewater from construction works is expected to be minimal and controlled. Also, no adverse impacts are anticipated due to workforces given that sanitary facilities will be provided with the implementation of proper management and cleaning procedure.

### Operational Phase

#### 4.5.3 Potential Sources of Impact

In the operational phase, potential water quality impacts on the sensitive receivers may be arisen from the following activities:

- Domestic effluent;
- Re-use of treated sewage effluent if this being considered.

#### 4.5.4 Evaluation of Impact

Wastewater will be treated at the proposed Sewage Treatment Plant within the development site. Wastewater (domestic effluent) will need to be treated prior to discharge and the requirements of the no net increase in pollution load to Deep Bay will be a design constraint. If the implementation of the proposed San Tin Trunk Sewerage Project is completed as currently planned (by late 2008) then the Zero Discharge Policy will not be an issue as the wastewater would be able to be discharged to public sewer (assuming the sewer capacity has been designed to take account of the proposed development).



There is the potential application for re-use of the treated sewage effluent for irrigating plants in the landscape areas of the development during the operational phase. The standards to be achieved for irrigation will need to be carefully checked against the quality of the treated effluent.

## 4.6 Ecology

### 4.6.1 Potential Sources of Impact

The likely ecological impact on ecological components for the project is summarised in **Table 4.2** below with comparison of important habitat types defined in TM of EIA Ordinance of HKSAR.

**Table 4.2: Important Habitat Types in the SAR and Likely Impact of the Proposed Works**

Important habitat type as listed in table (1) of Annex 8 of the TM of the EIA Ordinance (EPD 1997)	Relevance to Comprehensive Development
1. Mature native woodland larger than one hectare	Not relevant
2. Undisturbed natural coastal area larger than one hectare or longer than 500 metres in linear measurement	Not relevant
3. Intertidal mudflats larger than one hectare	Not relevant
4. Established mangrove stands of any size	Not relevant
5. Brackish or freshwater marshes larger than one hectare.	Site currently has marshland indicator plants growing on site
6. Established sea grass beds of any size.	Not relevant
7. Natural stream courses and rivers longer than 500 metres.	Not relevant
8. Established coral communities of any size.	Not relevant
9. Other habitats found to have special conservation importance by documented scientific studies.	Not directly relevant, but in close proximity to RAMSAR sites and Deep Bay, SSSI.

### 4.6.2 Evaluation of Impacts

The ecological evaluation and impact assessment presented in this report is conducted in accordance with the guidelines set forth in the Technical Memorandum of the EIA Ordinance (TM-EIA), particularly Annexes 8 and 16. The TM-EIA guidelines are considered to be the most systematic available in Hong Kong for ecological assessment.

Impact Evaluation Criteria: The significance of ecological impacts has been evaluated based primarily on the criteria set out in Table 1 of Annex 8 of the TM-EIA:

- habitat quality;
- species affected;
- size/abundance of habitats affected;
- reversibility of impacts; and
- magnitude of environmental changes.

Impacts are generally ranked as "minor", "moderate" or "severe". The ranking of a given impact will vary based on the criteria listed above. For example, an impact might be ranked as "minor" if it affected only common species and habitats, or if it affected only small numbers of individuals or small areas, whereas it might be ranked as "severe" if it affected rare species or habitats, large numbers of individuals or large areas. As noted in Annex 16 of the Technical Memorandum, a degree of professional judgment is involved in the evaluation of impacts.

### ***Construction Phase***

#### **Noise and Disturbance**

The potential disturbance to ecology includes disturbance from human presence and noise. Birds are sensitive to noise that may lead to changes in behaviour patterns, disturbance to breeding activities and foraging and feeding behaviour. Overall indirect ecological impacts are considered "Low".

#### **Dust**

Dust derived from construction activities may smother adjacent vegetation, and increase suspended sediments within watercourses. However, good management practices as detailed in **Section 5.1.1** will minimise such impacts.

#### **Site run-off and Sewage Effluent**

During construction, surface site run-off and sewage effluent could result in contaminants including sediments, organic, oil, grease and solvents entering water courses. However, implementation of a variety of protective measures as summarised in the Water/Waste chapters will mitigate these issues. In addition to this, the proposed works will follow the "Deep Bay Guidelines for Dredging, Reclamation and Drainage Works" to ensure appropriate mitigation measures to be adopted for carrying out works within the Deep Bay area.

#### **Habitat Loss**

The proposed works at the site would require the formation of land and construction of comprehensive development. Impacts would mainly involve re-arrangement of the site for residential development with an adjustment of the type of plants / vegetative species, with an enhancement of the site due to the creation of diverse habitats through the formation of wetlands and associated landscaped features. This is seen as a positive contribution to the ecological resources in the Deep Bay Area.

#### **Summary of Ecological Impacts for Construction Phase**

The key ecological impacts resulting from developing the site in accordance with the statutory planning framework includes the restoration of a portion of the site for wetlands, while a portion of the site will be converted to residential development. It should be emphasised that the ecological value and the quality of the site at present is low. By developing a diverse ecosystem on the site, integrated with the residential development it is possible to provide no net loss of resources and indeed provide an ecological gain.

### ***Operational Phase***

The integrated planned functions of the site provide an opportunity for significant ecological benefit to be accrued through the implementation of the Comprehensive Development Area, and wetland restoration plan.

## 4.7 Risks

### 4.7.1 Potential Sources of Impact

Potential risk arising from the construction phase may come from the followings:

- Spillages of fuels and chemicals into the receiving waters; and
- fire.

### 4.7.2 Prediction of Potential Impacts

Consumption of chemicals may cause risk of fire and accidental spillage. The control procedures and mitigation measures will be developed when more details on the development are available.

## 4.8 Landscape and Visual

### 4.8.1 Potential Sources of Impact

The project may cause temporary landscape and visual impacts. Permanent landscape and visual impacts are less likely due to the poor visual amenity and somewhat degraded landscape character of the site at present. Sensitive receivers will include the *Landscape Resources* of the site itself, *Landscape Character* and *Sensitive Visual Receivers*, in particular, nearby residents in Wo Shang Wai, Palm Springs and Royal Palms.

Temporary landscape and visual impacts will arise from disturbance to the existing landscape of the site, from construction works and plant and from the presence of temporary structures, such as false work for structural elements.

Sources of permanent adverse landscape and visual impact might include residential units and associated highways, clubhouse, etc. The creation of wetland is likely to represent a source of positive landscape/visual impact in the longer term.

### 4.7.2 Evaluation of Impacts

**Impacts on Sensitive Visual Receivers** notably residents of surrounding villages / developments may be significant during the construction phase, due to the removal of existing vegetation, the presence of construction works, activity and partly completed structures in the landscape. Sensitive visual receivers are located only 10m from the project. During the operational phase, design of mitigation measures including screen planting, building colour scheme, finishes and texture of materials will be fully considered to ensure that the development will be compatible with the landscape setting and it is considered that adverse Visual Receivers are unlikely.

**Impacts on Landscape Resources** are unlikely to be very significant during the construction or operational phases, due to the limited sensitivity of resources currently on site. Impacts may ultimately be positive in the longer term, after creation of the wetland. Tree felling will be avoided wherever possible by good planning of the development. If tree removal cannot be avoided, transplanting affected trees to an appropriate location will be considered. Compensatory planting will also be provided to compensate for the loss of any vegetation.

**Impacts on Landscape Character** may be significant during the construction phase resulting from the presence of construction plant, activity and partly completed structures. Permanent long term impacts are less likely during the operational phase.

## **4.9 Cultural Heritage**

### ***4.9.1 Potential Sources of Impact***

The Project site was previously fishponds and prior to that tidal paddy which indicates cultural heritage resources are not expected to be located at this site.

### ***4.9.2 Evaluation of Impacts***

It is not anticipated that there were any cultural heritage resources affected by this development as there are and were no structures or dwellings previously on this site.

## **5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS**

### **5.1 Air**

It is expected that dust levels will not exceed air quality criteria with implementation of the mitigation measures. As good site practice the following dust control measures are proposed. Dust control measures for construction activities associated with the earthworks for Comprehensive Development Works are outlined below.

#### **5.1.1 Recommended Mitigation Measures during Construction**

##### **Vehicle Movements on Unpaved Site Road**

- the load on the vehicles should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
- vehicle speeds limited to 10 kph to reduce the traffic induced dust dispersion and re-suspension within the site; and
- damping of unpaved roads.

##### **Earthworks**

The amount of exposed soil should be kept in minimal by re-vegetation of completed earthworks.

### **5.2 Noise**

It is anticipated that short-term noise impacts from the proposed works during construction could be reduced to an acceptable level with implementation of the mitigation measures.

#### **5.2.1 Recommended Noise Mitigation Measures during Construction**

Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during of construction:

- only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works;
- machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs;
- mobile plant should be sited as far away from NSRs as possible; and
- material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.

Mitigation measures of noise impacts from plant/method of working as recommended in the Deep Bay Guidelines which are outlined as follows:

- “ • enclosing stationary plant;
- specifying specially silenced plant;
- specifying sequence of working to avoid working close to noise sensitive receivers at designated times;
- specifying limitations on amount of plant working at designated times

- designing the works and specifying the sequence of construction so that permanent noise barriers are provided at an early stage of the project;
- designing temporary noise barriers where appropriate;
- arranging clearance of isolated noise sensitive receivers\* if this is an economic method of reducing restrictions on continuous working;
- prohibiting work during specific times of the day, for example:
  - no work between 10 pm and 7 am daily
  - working only during the hours not restricted by the Noise Control Ordinance”

\* if not against the general policy on clearance

### **5.2.2 Recommended Noise Mitigation Measures during Operation**

Noise mitigating designs should follow the Practice Note for Professional Persons (ProPECC PN1/97) for the planning of residential developments against road traffic noise. Noise mitigation measures such as screening by non-noise sensitive blocks, podium structures or purpose-built barriers, orientation, or disposition and internal layout of buildings should be explored and implemented wherever practicable to minimize road traffic noise impacts on the residential development. Where there are residential units still exposed to road traffic noise exceeding the HK Planning Standards and Guidelines (HKPSG) standard after the adoption of those noise mitigation designs, acoustic insulation (windows with good noise-reduction and air-conditioning) should be provided. For more detailed noise mitigation measures, reference shall be made to ProPECC PN4/93 Planning and Design Noise Sensitive Developments.

## **5.3 Waste Management Systems and Practices**

### **5.3.1 Recommended Waste Management Systems and Practices**

From environmental point of view, waste management practices which will be implemented include:

- avoidance and minimisation, i.e. avoid / minimise the waste generation through changing or improving practices and design (vis. use of minipiles); and
- reuse of materials, for landscaping etc.

The Contractor shall consult EPD on the final disposal of surplus materials waste.

### **5.3.2 Control/Mitigation Measures**

Mitigation measures to avoid or minimise potential impacts may include the reuse of C&D material in the construction. A disposal plan will be required to detail disposal sites for waste that cannot be recycled on-site and adopting a similar system to the trip-ticketing system, to monitor disposal and hence prevent illegal dumping. The waste management plan / control measures are summarised as follow:

#### **Minimisation of Waste Generation**

- segregate waste materials at source as far as practicable according to types to facilitate reuse and recycling; and
- co-ordinate material deliveries to minimise storage times on-site to avoid damage and producing waste material.

### **Storage, Collection and Transportation**

Permitted waste hauliers shall be used to collect and transport waste to the disposal points. The following measures to minimise adverse impacts shall be instigated:

- handle and store waste in a manner to ensure that they are held securely without loss or leakage, thereby minimising the potential for pollution;
- use authorised / licensed waste hauliers to collect specific category of waste;
- remove waste in a timely manner;
- maintain and clean waste storage area regularly;
- minimise windblown litter and dust during transportation by either covering trucks or transporting waste in enclosed containers;
- obtain the necessary waste disposal permits from the appropriate authorities, if they are required;
- dispose of waste at licensed waste disposal facilities, and
- maintain records of the quantities of waste generated, recycled and disposed.

### **Construction and Demolition (C & D) Materials**

The Contractor shall recycle C&D materials on-site. Proper segregation of waste on-site will increase the feasibility of certain components of the waste stream by the recycling contractors. Different areas of the worksite shall be designated for such segregation and storage wherever site conditions permit.

Trip-ticket system should be established to monitor the disposal of C&D material and solid waste at public filling facilities and landfills, and to control fly-tipping.

### **Surplus Excavated Material-Dust**

- Wetting the surface of the stockpiled soil with water to keep the surface wet especially during the dry season;
- Covering the stockpiled soil with sheets; and enclosure of the stockpiling areas.

### **Chemical Waste**

The storage and disposal of chemical waste shall:

- be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary);
- be arranged so that incompatible materials are adequately separated;
- register as chemical waste producer;
- be via a licensed waste collector, and
- be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers.

### **Municipal Solid Waste**

General refuse shall be stored in enclosed bins or compaction units separate from C&D and chemical waste. Waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D and chemical waste, on a daily or every second day basis to minimise odour, pest and litter impacts. Burning of refuse on construction-sites is prohibited by law.

A co-ordinator for the management of waste should be identified who shall prepare a Waste Management Plan.

## 5.4 Water

### 5.4.1 Recommended Mitigation Measures during Construction / Operation

Mitigation measures for the construction site drainage can follow the ProPECC PN 1/94 that gives the basic environmental guidelines for the handling and disposal of construction site discharges. The following general mitigation measures are proposed.

All wastewater generated on-site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.

The Contractor should construct, maintain, remove and reinstate, as necessary, temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the works. He shall also provide adequate precautions to ensure that no spoil or debris of any kind is allowed to be pushed, washed down, fall or be deposited.

The Contractor shall not permit any sewage, wastewater or other effluent containing sand, cement, suspended or dissolved material to flow from the site onto any adjoining land or allow any solid waste to be deposited anywhere within the Site or onto any adjoining land and shall have all such materials removed from the site.

The Contractor shall at all times ensure that existing drainage systems and drains within, and adjacent to the Site are kept safe and free from any debris and any excavated materials arising from the Works. The Contractor shall ensure that chemicals and materials such as concrete agitator washings are not deposited in watercourses.

The Contractor should wherever practicable recycle the wastewater generated from the washing down of equipment.

All Contractor's equipment shall be designed and maintained to minimise the risk of contaminants being released into the water column or deposited in other than designated locations.

To reduce water quality impacts from construction sites the Contractor will endeavour to:

- reduce the amount of water used to dampen any surfaces or stockpiles;
- any liquid generated on-site should be treated and disposed of in accordance with the provisions of the Technical Memorandum (TM) on Standards for Effluents Discharged into Drainage, Sewerage, Inland and Coastal Waters and shall be acceptable to relevant parties, e.g. DSD, WSD and EPD;
- all domestic effluent arising from the construction workforces, any work camps, or canteen facilities should also be collected, treated and disposed of according to the provisions of the TM, and
- any special works areas which may be provided for material storage or mixing, should be surrounded by bunds and have drainage collection systems to contain any spillages.

Water management issues and in particular, sewage disposal i.e. Zero Discharge to Deep Bay will be carefully considered in the detailed EIA report.



## 5.5 Ecology

### 5.5.1 Recommended Mitigation Measures during Construction / Operation

Construction should be avoided during the breeding season in accordance with the Deep Bay Guidelines. Construction works should be as quiet as possible with minimal disturbance, as appropriate to avoid the disturbance to migratory or local birds. The wetland restorations should be developed at an appropriate time to allow early establishment of the features, prior to handing over the residential units to owners/management company.

Management issues for the wetland restoration plans will be carefully considered in the detailed EIA report.

## 5.6 Landscape and Visual

### 5.6.1 Recommended Mitigation Measures during Construction / Operation

Mitigation measures should be undertaken to reduce the potential landscape and visual impacts. The proposed mitigation measures comprise:

**Optimal Site Layout** - Selection of a layout that minimises landscape and visual impacts. A number of alternative layouts will be considered to ensure that landscape and visual impacts are minimised.

**Retention of Valuable Landscape Resources on Site** - valuable landscape resources found on site (including trees, topsoil, pond bund material, etc) will be retained where possible for reuse in the works.

**Good Construction Practice** – Landscape and visual impacts will be minimised by regulation of working hours, minimisation of the duration of the works; and minimising export of material off-site, etc.

**Tree Protection** - Trees to be retained within or adjacent to the works area will be carefully protected to avoid damage by machinery as well as to prevent contractors compacting soil around tree roots or dumping materials.

**Tree Transplanting** - Any trees identified as affected by the Project will be first considered for transplanting to nearby suitable sites. The feasibility of transplantation will depend on a number of factors such as size, health and species of trees as well as the condition of the local terrain. Adequate time (a minimum of 3 months) should be allowed for preparing trees for transplantation.

**Compensatory Amenity and Wetland Landscape** – the creation of water bodies as well as the planting of amenity and habitat landscapes will act as mitigation for any loss of vegetation currently on site.

**Screen Planting** - Planting of dense belts of trees at the periphery of the site will assist in screening visual impacts from surrounding VSRs.

**Aesthetic Treatment of Buildings** Sensitive chromatic treatment of residential buildings will assist in reducing their visual impact.

## 5.7 Cultural Heritage

### ***5.7.1 Recommended Mitigation Measures during Construction / Operation***

In the operational phase, no adverse impacts on cultural heritage are anticipated, so no mitigation measures are required.

## **6 PREVIOUSLY APPROVED EIA REPORTS**

This Project Profile utilised information from the following approved EIAs.

- Development of an EcoPark in Tuen Mun Area 38 EIA
- Yuen Long and Kam Tin Sewerage and Sewage Disposal Stage 2 EIA
- Improvement to San Tin Interchange EIA
- Sheung Shui to Lok Ma Chau Spur Line EIA
- Shenzhen River Regulation Project Stage III EIA

## **7 CONCLUSIONS**

### **7.1 Air**

Air quality impacts resulting from the comprehensive development are predicted not to exceed air quality criteria with mitigation measures. Nonetheless the above measures are good site practice and will further improve air quality.

### **7.2 Noise**

Short-term noise impacts from the proposed works during construction could be reduced to an acceptable level with implementation of the mitigation measures.

### **7.3 Waste**

Waste management plans and good site practices shall be implemented to minimise the waste generation. Wastes arising can be reused on-site, so the off-site waste disposal can be reduced. Impacts associated with waste are unlikely in both construction and operational phases.

### **7.4 Water**

Potential water quality impacts may arise during construction from site runoff, wastewater and sewage from site workers. However, the implementation of pollution control measures and good site practices can minimise the potential impacts. In addition to this, the proposed works will follow the “Deep Bay Guidelines for Dredging, Reclamation and Drainage Works” and the Zero Discharge Policy for Deep Bay to ensure unlikely adverse water quality impacts on the surrounding sensitive receivers.

### **7.5 Ecology**

The key ecological impacts resulting from constructing comprehensive development include the permanent exchange of habitats from grassland and open storage area to wetland. This is considered to be an ecological enhancement and is a functional benefit in the wider context of wetland restoration and connection with other wetlands in the Study Area. Whilst impacts to some habitats cannot be avoided by the proposed construction works, good site management practices and relevant mitigation measures will minimise these impacts, and in the longer term the ecological gain offered by the development of the site will be greater than the potential short form construction impacts.

### **7.6 Landscape and Visual**

Landscape and visual mitigation, including compensatory planting, colour scheme design, finishes and texture of building materials used will be fully considered in the design to ensure that the development will be compatible with the landscape setting and surroundings. There is potential for slight visual impacts on nearby residents during the construction phase. Permanent adverse landscape and visual impacts arising from the operational phase are unlikely and there is potential for positive landscape impacts resulting from wetland creation in the longer term.

## **7.7 Cultural Heritage**

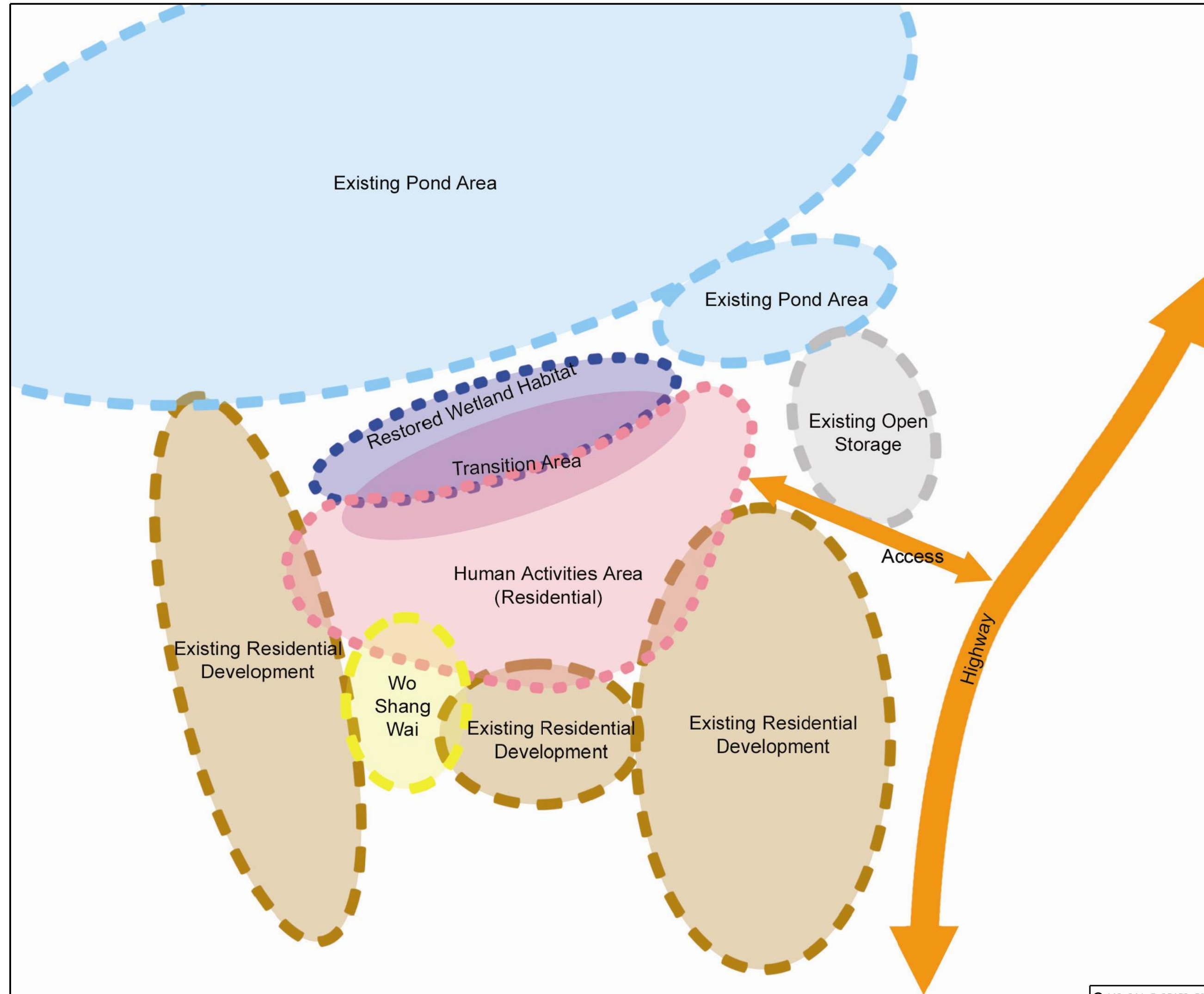
Issues associated with cultural heritage resources are not expected to be located at this site.

## **FIGURES**

# PLATES







Rev	Date	Drawn	Description	Chk'd	App'd
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**Mott Connell**  
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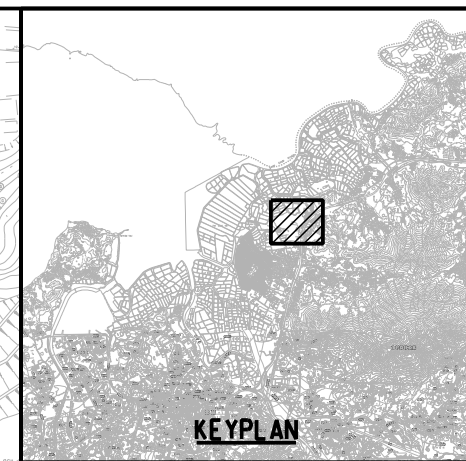
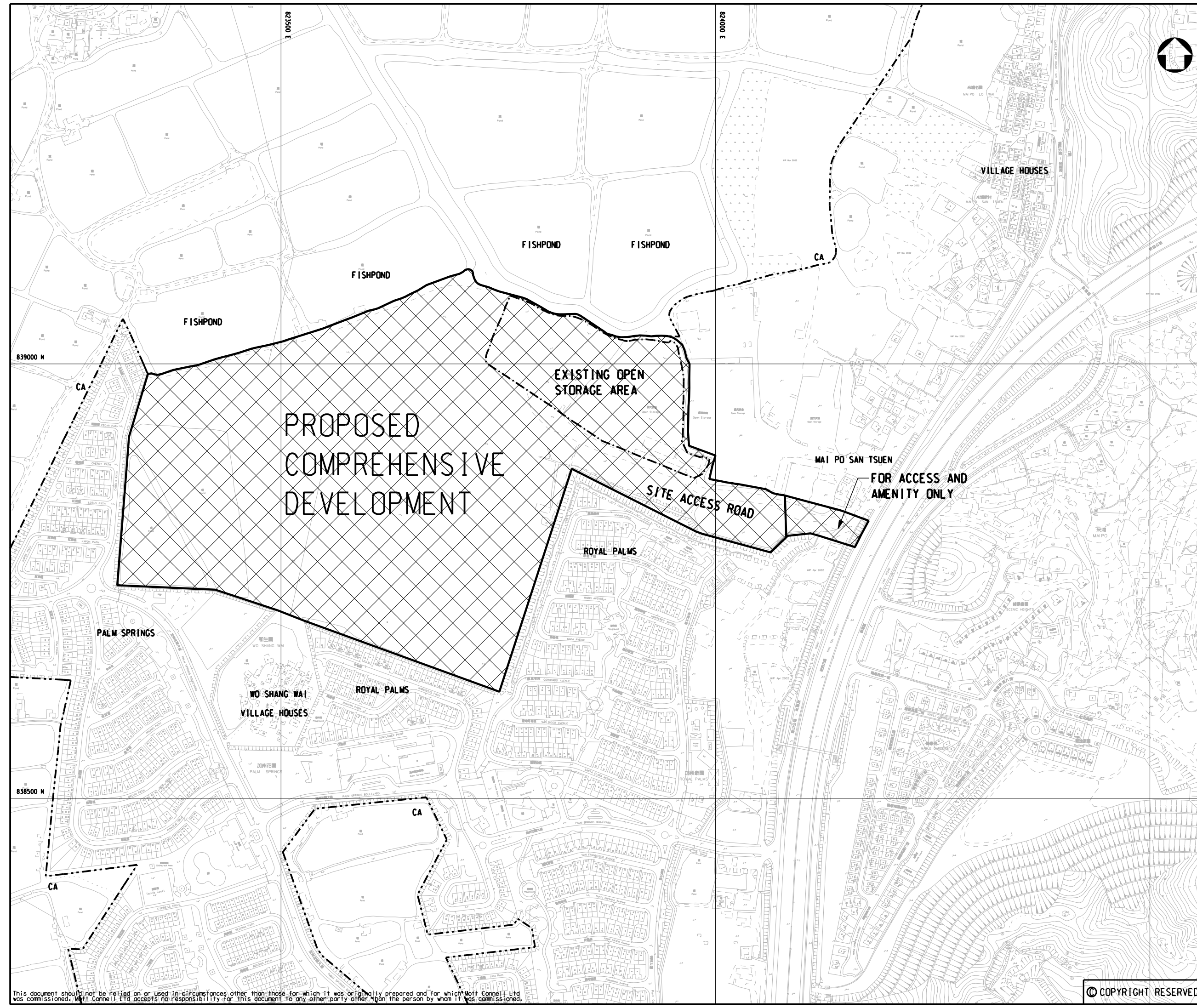
Project  
 PROPOSED COMPREHENSIVE DEVELOPMENT  
 AT WO SHANG WAI, YUEN LONG

Title  
 PRELIMINARY DEVELOPMENT CONCEPT

Designed		Eng.Chk.	
Drawn		Coordination	
Dwg.Chk.		Approved	
Scale	N.T.S.	Project	Status
Drawing No.	FIGURE 2.1	CAD File J:\22005\FIGURE\ENV\project_profile\ENV\FIG2.Ldgn	Rev

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**LEGEND:**

	CONSERVATION AREA
	EXISTING OPEN STORAGE AREA

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Client  
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Project  
**PROPOSED COMPREHENSIVE DEVELOPMENT  
AT WO SHANG WAI, YUEN LONG**

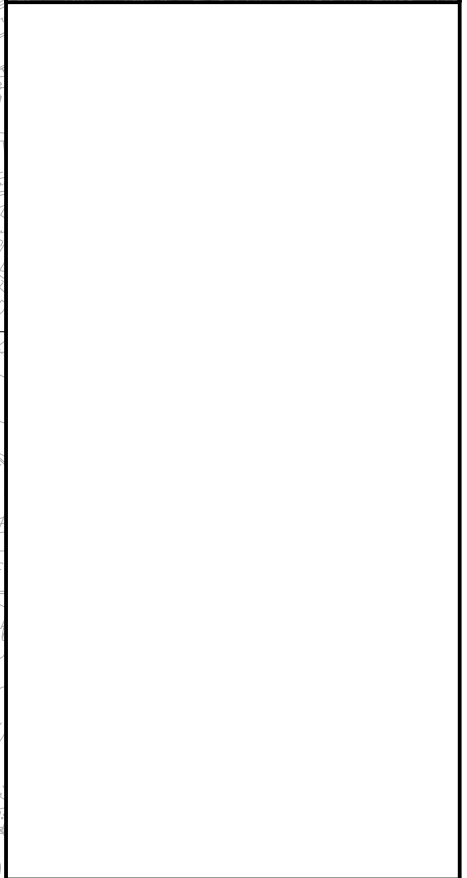
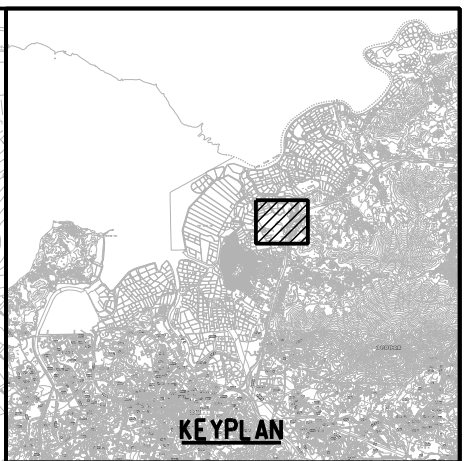
Title  
**LOCATIONS OF CONSERVATION AREAS  
AND THE ADJACENT SITE WITH  
POTENTIAL PROJECT INTERFACES**

Designed		Eng.Chk.	
Drawn		Coordination	
Dwg.Chk.		Approved	
Scale	1:2000@A1	Project	Status
Drawing No.		CAD File JA22005\FIGURE\ENV\project profile\NEW\FIG2.2.dgn	Rev

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FIGURE 2.2

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Project  
**PROPOSED COMPREHENSIVE DEVELOPMENT  
AT WO SHANG WAI, YUEN LONG**

Title  
**LOCATIONS OF THE AIR AND  
NOISE SENSITIVE RECEIVERS**

Designed		Eng.Chk.	
Drawn		Coordination	
Dwg.Chk.		Approved	
Scale	1:2000@A1	Project	Status
Drawing No.		CAD File JA22005\FIGURE\ENV\project profile\NEW\FIG3.Ldgn	Rev

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FIGURE 3.1

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**Plate 1 : Aerial Photo for 1991 overviewing the site of Wo Shang Wai**



**Plate 2 : Site Photo for the Drainage Ditch of Wo Shang Wai**



**Plate 3 : Site Photo for Fishpond of Wo Shang Wai which is  
Outside the Subject Site**

