



7 Ecological Impact

7.1 Introduction

This section presents an assessment of the potential ecological impacts arising from the construction and operation of the Integrated Waste Management Facilities Phase 2 (I-PARK2 or the Project). According to the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM), baseline conditions for ecological components of the terrestrial and marine environment were evaluated based on information from available literature and field surveys conducted for the purposes of this EIA. Mitigation measures required to mitigate any identified adverse impacts are recommended, where appropriate, and residual impacts assessed.

7.2 Relevant Legislation, Standards and Guidelines

The relevant local legislation, standards, and guidelines applicable to the present study for the assessment of ecological impact include:

- Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislation, the Forestry Regulations (Cap. 96A)
- Wild Animals Protection Ordinance (Cap. 170)
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) and its subsidiary legislation
- Environmental Impact Assessment Ordinance (EIAO) (Cap. 499)
- Annexes 8, 9, 11, 16, 17, 20 and 21 of the Technical Memorandum on EIA Process (EIAO-TM)
- EIAO Guidance Note GN 6/2010 – Some Observations on Ecological Assessment from the Environmental Impact Assessment Ordinance Perspective
- EIAO Guidance Note GN 7/2023 – Ecological Baseline Survey for Ecological Impact Assessment
- EIAO Guidance Note GN 10/2023 – Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys
- EIAO Guidance Note GN 11/2023 – Methodologies for Marine Ecological Baseline Surveys
- Hong Kong Planning Standards and Guidelines (Chapter 10)



- Rare and Precious Plants of Hong Kong
- List of Wild Animals under State Protection

International conventions and guidelines potentially relevant include:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES")
- IUCN Red List of Threatened Species
- United Nations Convention on Biological Diversity (1992)
- Wild Animal Protection Law of the PRC

7.3 Assessment Area

7.3.1 Terrestrial Ecology

According to the requirements of the EIA Study Brief for the Project, the terrestrial ecological Assessment Area shall include areas within 500 m distance from the boundary of the land-based works of the Project or the area likely to be impacted by the Project. The land-based works of the Project will be located within the Project boundary as shown in **Figure 7.1**.

7.3.2 Marine Ecology

The Assessment Area for marine ecological impact shall be the same as the water quality impact Assessment Area or the area likely to be impacted by the Project. The water quality impact Assessment Area shall cover the Deep Bay and North Western Water Control Zones as designated under the Water Pollution Control Ordinance (Cap.358) and water sensitive receivers in the vicinity of the Project. The boundary of marine ecological impact Assessment Area is shown in **Figure 7.2**.

7.4 Assessment Methodology

7.4.1 General

The ecological surveys and impact assessment for this EIA were carried out and prepared in accordance with the EIA Study Brief, criteria, and guidelines in Annexes 8 and 16 of the EIAO-TM, EIAO Guidance Notes GN 6/2010, 7/2023, 10/2023 and 11/2023.

7.4.2 Literature Review

Review of past findings from research or related studies/surveys was conducted to evaluate baseline ecological values/characters of the Assessment Area. Studies carried out in/in vicinity of the Assessment Area and information reviewed include:



- Aerial photos
- AFCD Hong Kong Biodiversity Database
- AFCD Newsletters
- EIAO Register No. AEIAR-106/2007 EIA Report for Liquefied Natural Gas (LNG) Receiving Terminal and Associated Facilities (EPD 2007)
- EIAO Register No. AEIAR-127/2009 EIA Report for Sludge Treatment Facilities (EPD 2009a)
- EIAO Register No. AEIAR-147/2009 EIA Report for West New Territories (WENT) Landfill Extensions (EPD 2009b)
- EIAO Register No. AEIAR-163/2012 EIA Report for Development of the Integrated Waste Management Facilities Phase 1 (IWMF Phase 1) (EPD 2012)
- EIAO Register No.: AEIAR-185/2014 EIA Report for Expansion of Hong Kong International Airport into a Three-Runway System (AAHK 2014)
- EIAO Register No. AEIAR-186/2015 EIA Report for Decommissioning of West Portion of the Middle Ash Lagoon at Tsang Tsui, Tuen Mun (FEHD 2015)
- Contract No. EP/SP/58/08 - Sludge Treatment Facilities, Environmental Monitoring Results in Operation Phase - Post-Construction Phase Ecological Bi-monthly Monitoring Reports (April 2015 – June 2016) (EPD 2016)
- EIAO Register No. AEIAR-197/2016 EIA Report for Additional Gas-fired Generation Units Project (CAPCO 2016)
- Final Review EM&A Report for Decommissioning of West Portion of the Middle Ash Lagoon at Tsang Tsui, Tuen Mun (EPD 2017)
- EIAO Register No. PP-546/2017 Project Profile for Landfill Gas Power Generation Project at the WENT Landfill (CAPCO 2017)
- EIAO Register No. AEIAR-218/2018 EIA Report for Hong Kong Offshore LNG Terminal (CLP 2018)
- Agreement CE 29/2010 (EP) Integrated Waste Management Facilities Phase 1 – Design and Construction. Additional Service – Conducting Marine Ecological Survey for Middle Ash Lagoon in Tsang Tsui, Tuen Mun. Benthos Survey Report (EPD 2021a)
- Agreement CE 29/2010 (EP) Integrated Waste Management Facilities Phase 1 – Design and Construction. Additional Service – Conducting Marine Ecological Survey for Middle Ash Lagoon in Tsang Tsui, Tuen Mun. Dive Survey Report (EPD 2021b)
- Agreement CE 29/2010 (EP) Integrated Waste Management Facilities Phase 1 – Design and Construction. Additional Service – Ecological Assessment and Application for Environmental Permit. Ecological Assessment Report (EPD 2022a)



- EIAO Register No. PP-649/2022 Project Profile of Decommissioning of Remaining Portion of Middle Ash Lagoon in Tsang Tsui (EPD 2022b)
- Agreement CE 6/2015 (EP) WENT Landfill Extension – Design and Construction, Supporting Document for Variation of Environmental Permit, Final, July 2022 (EPD 2022c)
- EIAO Register No. DIR-305/2024 Project Profile of Decommissioning of West Ash Lagoon in Tsang Tsui (EPD 2024)
- Related field books, e.g. A field Guide to the Terrestrial Mammals of Hong Kong and A Field Guide to the Amphibians of Hong Kong

All available information were collated and evaluated to establish the ecological profile of the environment, identify information gap, and determine the scope of ecological surveys.

7.4.3 Ecological Survey Methodology

7.4.3.1 Terrestrial Ecological Survey

7.4.3.1.1 Interfacing Projects of Direct Relevance to this EIA

The proposed I-PARK2 is located in Middle Ash Lagoon, which is currently a works area for the Decommissioning of Remaining Portion of Middle Ash Lagoon in Tsang Tsui (the Decommissioning Project). The Decommissioning Project mainly involves site clearance (including tree and vegetation removal), minor levelling of Pulverized Fuel Ash (PFA) surface and covering of the entire Middle Ash Lagoon including the I-PARK2 site with general fill. The Decommissioning Project is scheduled for completion before the construction of I-PARK2. The direct loss of existing habitats and loss of existing trees and vegetation within the I-PARK2 site in Middle Ash Lagoon were addressed and assessed under this separate Decommissioning Project. Tree transplanting and compensatory planting for the affected trees within the I-PARK2 site will also be carried out under the Decommissioning Project. The Decommissioning Project will turn the remaining portion of Middle Ash Lagoon including the entire I-PARK2 site into an open filled area.

As discussed in **Section 2.6**, the Project area of outfall associated works will be located in the West Ash Lagoon which was used by CLP for PFA storage since 1980s. PFA filling activity in the ash lagoon had been ceased for a few years and the lagoon was surrendered to the Government in 2023. Appropriate environmental precautionary measures, including covering the ash surface with fill materials to prevent the ash deposited in the ash lagoon from causing potential environmental impacts, have been undertaken since mid-December 2023. The implementation of environmental precautionary measures is on-going and scheduled for completion in end 2024 / early 2025. Subsequently, the filled West Ash Lagoon will be further covered with at least 1m thick of general fill to prevent it from being significantly disturbed due to any future development under the project "Decommissioning of West Ash Lagoon in



Tsang Tsui" in 2025/2026. The outfall associated works would be carried out after completion of the decommissioning works in the West Ash Lagoon.

7.4.3.1.2 Survey Scope

Under the EIA Study Brief No. ESB-353/2022 issued on 3 March 2022, a terrestrial ecological survey exercise was carried out in February / March and May in 2023 to update and verify the recent findings obtained in the ecological surveys for the Decommissioning Project (EPD 2022a and EPD 2022b). On 18 April 2024, a new EIA Study Brief No. ESB-365/2024 was issued for the latest Project design. An updated terrestrial ecological survey has been carried out during March to August 2024 in accordance with the latest EIA Study Brief ESB-365/2024 and EIAO-TM and relevant EIAO Guidance Notes revised in 2023 as well as latest Project design.

The purpose of the ecological surveys conducted in 2024 is to collect up-to-date ecological baseline information of the Assessment Area and verify the information from literature review for subsequent assessment of the ecological value of the habitats and species and evaluation of the potential ecological impacts resulting from construction and operation of the Project and in combination with those cumulative impacts from associated works of the Project. According to the requirements in the EIA Study Brief of the Project, a 6-month ecological baseline survey covering wet and dry seasons was proposed for the ecological impact assessment.

7.4.3.1.3 Habitat and Vegetation Survey

Habitat maps of suitable scale showing the type and location of habitats in the Assessment Area with the overlay plot of the Site was produced.

Most updated aerial photos were studied to identify the general land use/ habitat type of the Assessment Area. A preliminary habitat map was generated through translating the visualized condition in the aerial photos.

Ground truthing study was conducted on-site to verify and delineate the habitat type that was identified or missing during the desktop study. All ecological resources within habitats were recorded and a more focused survey on those identified important habitats was conducted to collect further information.

Vegetation surveys were conducted within the ecological Assessment Area by conducting survey walks covering the whole area of each habitat as far as accessible and special attention was paid to species of conservation importance and habitats within the proposed works area of the Project where the vegetation will be directly impacted.

All the flora species with their relative abundance were recorded through visual observation during vegetation surveys. Nomenclature for plant species follows AFCD's Hong Kong Herbarium online Hong Kong Plant Database (2021).



7.4.3.1.4 Mammal Survey

Surveys of mammals was conducted along proposed transect routes (**Figure 7.1**) by direct observation and active searching of traits such as scats, footprints and feeding signs within the Assessment Area during daytime and night surveys. All ad hoc records of sightings, tracks and sign of mammals were identified and recorded.

Bat surveys were carried out by direct counting at potential roosting ground such as abandoned village house, and foraging ground such as hillside grassland, woodland fringe and tree lines. Bat surveys were conducted along proposed transect routes (**Figure 7.1**). Species, abundance and their feeding/foraging behaviours were identified and recorded. Bat detectors were also used to aid identification of insectivore bats, by making reference to the latest local literature, such as Shek & Lau (2006) and Tong (2016). Nomenclature for mammals follows AFCD's Checklist of Terrestrial Mammals of Hong Kong (2023).

7.4.3.1.5 Bird Survey

Bird communities were surveyed using a walk over transect survey method for open area habitats within the Assessment Area (see **Figure 7.1**). Bird surveys were conducted at early morning or late afternoon to collect representative data for most of the bird species, while night-time surveys were conducted for nocturnal birds. All birds seen or heard during the surveys were identified and counted. Species showing notable breeding behaviour, such as breeding, feeding or roosting and the associated habitats were recorded in detail to identify any important breeding/feeding/roosting ground nearby. Ornithological nomenclature follows the List of Hong Kong Birds (2022) published by the Hong Kong Bird Watching Society.

7.4.3.1.6 Herpetofauna Survey

Surveys of herpetofauna were conducted along proposed transect routes (see **Figure 7.1**) through active searching and detection of the mating calls during daytime and night surveys within the Assessment Area. Survey area covered both terrestrial and aquatic environment of various habitat types including drainage channels and wooded areas. Daytime surveys for herpetofauna were carried out in line with mammal, and butterfly and odonate surveys. Night surveys were carried out in wet season when this fauna group is more active. Breeding behaviour (if any) and the associated habitats were also recorded. Nomenclature for amphibians and reptiles follows AFCD's Checklist of Amphibians of Hong Kong (2023) and Checklist of Reptiles of Hong Kong (2023).

7.4.3.1.7 Butterfly and Odonate Survey

Surveys of butterflies and odonates were carried out using transect count method by direct observation along the proposed transect routes (see **Figure 7.1**). All butterflies and odonates observed during the transect survey were identified and counted with an aid of a pair of



binoculars. Nomenclature for butterflies and dragonflies follows AFCD's Checklist of Butterflies of Hong Kong (2023) and Checklist of Dragonflies of Hong Kong (2023).

7.4.3.1.8 Firefly Survey

Firefly surveys were conducted shortly after the dusk using transect count method by direct observation with an aid of binoculars along the proposed transect routes (see **Figure 7.1**). Active searching for flightless adults and larvae on ground was also conducted. Hand-netting was used for assisting the identification of flying adults, when necessary. Permission from AFCD would be sought for the use of hand nets or any applications to capture animals in the surveys. When site situation permitted, lighting devices (e.g. headlamps, torches, etc.) were switched off most of the time to enhance detection of fireflies. Alternatively, the lighting devices were switched off at sufficient intervals to allow detection of fireflies before the surveys progress along the transects.

7.4.3.1.9 Aquatic Fauna Survey

Sizable streams and notable water bodies within the Assessment Area were surveyed for aquatic fauna including freshwater/ brackish fish, invertebrates and macroinvertebrates. Aquatic surveys were performed daytime for diurnal species and night-time for nocturnal species. The aquatic fauna surveys were through direct observation, active searching by hand nets and standard field sampling techniques, such as kick sampling using a D-framed net and trapping using fish traps where necessary at each Freshwater Sampling Point (**Figure 7.1**). Potential hiding places such as boulders and logs within the watercourse were turned over to locate any aquatic animals beneath. Permit from AFCD was sought before use of nets and traps to collect freshwater fauna in streams.

7.4.3.1.10 Survey Programme

The ecological survey was conducted to cover both wet and dry seasons between March 2024 and August 2024. **Table 7-1** shows the survey programme of terrestrial ecological surveys.

Table 7-1 Schedule of Terrestrial Ecological Surveys

Description	2024					
	Mar	Apr	May	Jun	Jul	Aug
Habitat & Vegetation	✓			✓		
Mammal (Day + Night; Dusk for Bats)	✓	✓	✓	✓	✓	✓
Bird (Early Morning + Dusk + Night)	✓	✓	✓	✓	✓	✓
Herpetofauna (Day + Night)	✓	✓	✓		✓	
Butterfly (Day)	✓	✓	✓		✓	
Odonate (Day)	✓	✓	✓		✓	
Firefly (Dusk + Night)	✓	✓	✓	✓	✓	✓
Aquatic fauna (Day + Night)	✓		✓		✓	



7.4.3.2 Marine Ecological Survey

7.4.3.2.1 Proposed Marine Works

Marine construction will be carried out along the artificial shore of Middle Ash Lagoon and West Ash Lagoon for construction of the seawall modification and new berthing facility for I-PARK2. Locations of the Project works are shown in **Figure 2.1**.

7.4.3.2.2 Determination of Information Gap

Past marine ecological survey data collected at or in the vicinity of Tsang Tsui Ash Lagoons (TTAL), including West Ash Lagoon and Middle Ash Lagoon, as well as the nearby marine habitats are abundant (as presented in **Section 7.5.2.2.1** to **Section 7.5.2.2.3** below). All the past studies showed similar results and concluded that the marine ecological values of these habitats were low. The most recent marine ecological survey programme carried out at and near the Middle Ash Lagoon (EPD 2021a, EPD 2021b, EPD 2022a and EPD 2022b) were reviewed to identify information gap. This recent past survey programme comprised dive and benthos surveys conducted in August 2021 (wet season) as well as intertidal survey conducted in December 2020 (dry season) and May 2021 (wet season). The survey locations of these 2020 /2021 surveys are shown in **Figure 7.3**. Marine ecological surveys carried out under this Project to fill the data gap are described in **Section 7.4.3.2.3** below.

7.4.3.2.3 Marine Ecological Survey of this Project

The locations and schedule of marine ecological surveys carried out under this Project are presented in **Figure 7.3** and **Section 7.4.3.3**. The marine ecological field survey reports are attached in **Appendix 7C**.

Intertidal Survey

The coasts of TTAL are composed of artificial seawall. Intertidal survey including qualitative walk-through survey and quantitative transect surveys was carried out under past relevant studies at two locations (T1 and T2) along the seawall of Middle Ash Lagoon and the adjacent areas during dry and wet seasons (EPD, 2021a, 2021b, 2022a and 2022b) as shown in **Figure 7.3**.

Intertidal survey of this Project comprised qualitative walk-through along the coasts where accessible (including T1, T2 and T3) as shown in **Figure 7.3** to verify the findings of previous survey. Quantitative transect survey was also conducted at the same locations (including T1, T2 and T3) as shown in **Figure 7.3**. The survey objective is to produce species lists for the survey areas. The conservation status at local, regional, and international scales were listed for all recorded biota.

Intertidal surveys covered both dry and wet seasons. Local tide tables were checked to assess tidal height at the site and to schedule timing of surveys.



For qualitative walk-through survey, the intertidal flora and fauna encountered, and their relative abundance were recorded.

After the walk-through survey, quantitative transect survey were conducted at the survey locations (T1, T2 and T3). One line transect was deployed at each survey site. The transect was laid perpendicular to shoreline from high water mark down to low water mark during the low tide period (tide level below 1 m). Along the transect, standard ecological sampling quadrat (dimensions 50 cm x 50cm) was laid at 1 m intervals to assess the abundance and diversity of flora and fauna. Intertidal epifauna and flora within each quadrat were identified and counted. In general, mobile fauna were counted in terms of abundance per unit area. Sessile species such as barnacles, oysters, and algae (encrusting, foliose and filamentous) were estimated as percentage cover on substrate surface. Intertidal fauna were identified to species level as far as possible. Representative photographs of intertidal habitat and flora / fauna species identified were taken (**Appendix 7C-1** and **Appendix 7C-2**).

Benthic Survey

Benthos sampling was collected at two sampling sites (namely B1 and B2) in the subtidal soft-bottom habitats around the TTAL (as shown in **Figure 7.3**). One sampling site (B1) was surveyed in August 2021 (wet season) (EPD, 2021a). Thus, benthos sampling at B1 for this EIA covered the dry season only to fill the data gap. Benthos sampling for the remaining sampling site (B2) was carried out in both dry and wet seasons under this EIA.

The sampling sites were fixed by GPS on board. At each sampling site, three replicates of sediment samples were collected. Survey sites were sampled using a modified Van Veen grab sampler with 960 cm² sampling area and 11,000 cm³ capacity as well as a supporting frame attached to a swivelling hydraulic winch cable. Sediments from the grab samples were sieved on board the survey vessel, washed onto a sieve stack (comprising 1 mm² and 500 µm² meshes) and gently rinsed with seawater to remove all fine material. Following rinsing, any materials remaining on the sieves were stored in pre-labelled plastic containers and stained with Rose Bengal for temporary storage.

The samples collected were transferred to the laboratory for sorting and identification. Individual samples were gently rinsed with fresh water into a 250 µm² sieve in the laboratory. Sieves were partially filled while rinsing a specific sample to maximize washing efficiency and prevent loss of material. All materials retained on the sieve were picked up for sorting of organisms. Methodology for the sorting of organisms and taxonomic identification are detailed in **Appendix 7C-3**.

Species and abundance of biota in the samples were identified and reported. Diversity and evenness indices were calculated for evaluation and ranking of ecological values.

Dive Survey



Dive surveys were conducted for corals and other hard substrate marine organisms. Two types of subtidal dive survey were carried out, including spot-check dive and Rapid Ecological Assessment (REA) survey.

Under this EIA, spot-check reconnaissance dives were carried out along the coastline of TTAL (at locations SC1 and SC) as shown in **Figure 7.3**. During the spot dive checks, the substrate type and any presence of coral communities were recorded. Representative photographs of the seabed and associated fauna were taken, where visibility was adequate.

During the spot dive checks, corals were found along the seawall of TTAL. REA was conducted at two locations along the coastline of West Ash Lagoon and another two locations along the coastline of Middle Ash Lagoon and the adjacent areas. At each REA survey location, a dive was conducted along a transect of 100 m to record the detailed information of corals including their locations, types, sizes, number of colonies, relative coverage, abundance, condition and conservation status. The REA survey technique as specified in the EIAO Guidance Note – Methodologies for Marine Ecological Baseline Surveys was used to obtain semi-quantitative data of the location where corals were found. Details of the spot dive checks and REA surveys are presented in **Appendix 7C-4** and **Appendix 7C-5**.

7.4.3.3 Survey Programme

Marine ecological surveys for this Project were carried out in 2023 and 2024 (covering both dry and wet seasons) as summarized in **Table 7-2**.

**Table 7-2 Marine Ecological Survey Schedule for this EIA**

Description	2023					
	Feb	Mar	Apr	May	Jun	Jul
Marine Ecological Survey Conducted in 2023 (see Figure 7.3)						
Intertidal Site Check at T1 and T2		√				
Intertidal Survey at T3		√				√
Benthos Survey at B1		√				
Benthos Survey at B2		√			√	
Dive Survey around West Ash Lagoon (SC1)			√			
Marine Ecological Survey Conducted in 2024 (see Figure 7.3)						
Description	2024					
	Feb	Mar	Apr	May	Jun	Jul
Intertidal Site Check at T1 and T2					√	
Intertidal Survey at T1 and T2					√	
Dive Survey along Middle Ash Lagoon and adjacent areas (SC)					√	

7.5 Ecological Baseline Condition

7.5.1 Terrestrial Ecology

7.5.1.1 Literature Review

A review of findings from relevant studies/surveys of all available information on the ecological characters of the Project was conducted to identify information gap, if any. Field verification surveys were then conducted to verify desktop review findings and establish an updated and representative ecological profile of the Assessment Area. The findings of the verification surveys are presented in **Section 7.5.1.2**.

7.5.1.1.1 Site of Conservation Importance

No recognized sites of conservation importance were recorded within the Assessment Area from the Project Site.

7.5.1.1.2 Previously Recorded Species of Conservation Importance

A literature review has been conducted to characterize the existing ecological conditions of the Project Site and Assessment Area and to identify habitats and species of conservation importance in the area. Relevant literature that contains baseline information on the terrestrial ecological resources of the Project Site and Assessment Area is listed in **Table 7-3** below. A map showing their study areas, whenever defined, is provided in **Figure 7.4**.



Table 7-3 Previous Study relevant to the Project Site

Study	Survey Period	Flora and Fauna Groups Surveyed
EPD 2024 (DIR-305/2024)	March to May 2024	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterfly & Odonates, Firefly, Freshwater Communities [#]
EPD 2022c (VEP-617/2022)	Not provided	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
EPD 2022b (DIR-294/2022)	November 2020 to January 2021; May 2021 to July 2021	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
CAPCO 2017 (DIR-251/2017)	November and December 2016	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
CLP 2018 (EIA-256/2018)	June 2016 to October 2017	Habitat and Vegetation, Avifauna
CAPCO 2016 (EIA-237/2016)	July and August 2015, November 2015	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
FEHD 2015 (EIA-225/2014)	April to September 2012	Habitat and Vegetation, Terrestrial Mammal, Bat Survey, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
EPD 2012 (EIA-201/2011)	January to August 2009	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
EPD 2009b (EIA-171/2009)	March to August 2007, November 2007	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
EPD 2009a (EIA-155/2008)	March to August 2007, November 2007, March to August 2008	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
EPD 2007 (EIA-125/2006)	February to July 2004, October 2005	Habitat and Vegetation, Terrestrial Mammal, Avifauna, Herpetofauna, Butterflies & Odonates, Freshwater Communities
Notes: # Survey data of DIR-305/2024 (March 2024 – May 2024) within the Assessment Area were reported under Section 7.5.1.2 .		

Habitat and Vegetation

Based on a review of the recent aerial photos and the habitat maps prepared for several approved EIA studies, habitats present within the Assessment Area are generally semi-natural or entirely artificial, of which the identified major habitats are ash lagoon, wasteland, grassland/shrubland mosaic, woodland and developed areas. The other habitats comprise plantation, some channelized watercourses of various extents. Habitats present within the Project Site include ash lagoon, wasteland, developed area, grassland/shrubland mosaic and woodland.

Five flora species of conservation importance were previously recorded within the Assessment Area, but were outside the Project Site (**Figure 7.5**). Details of these flora species of conservation importance are shown in **Table 7-4**.

Table 7-4 Flora Species of Conservation Importance Recorded from Previous Studies

Scientific Name	Chinese Name	Conservation/ Protection Status	Previous Studies
<i>Aquilaria sinensis</i>	土沉香	Cap. 586; China Plant Red Data Book: VU; Status in China (VU) (AFCD, 2003); Category 2 & 3 (AFCD, 2003);	EIA-155/2008, EIA-171/2009 and EIA-201/2011



Scientific Name	Chinese Name	Conservation/ Protection Status	Previous Studies
		RLCHP: EN	
<i>Cibotium barometz</i>	金毛狗	Cap. 586; Status in China (VU) (AFCD, 2003); Category 2 (AFCD, 2003); Wild plant under State protection (category II)	DIR-294/2022
<i>Diospyros vaccinioides</i>	小果柿	IUCN Red List (CR); RLCHP: EN	DIR-294/2022
<i>Ixonanthes reticulata</i>	黏木	Status in China (VU) (AFCD, 2003); Category 2 & 3 (AFCD, 2003); RLCHP: VU	EIA-171/2009
<i>Nepenthes mirabilis</i>	豬籠草	Cap. 96; Cap. 586; Status in China (VU) (AFCD, 2003); Category 4 (AFCD, 2003); RLCHP: VU	EIA-225/2014, EIA-171/2009
<p>Notes:</p> <p>Conservation Status:</p> <ol style="list-style-type: none"> 1. AFCD (2003) Rare and Precious Plants of Hong Kong. Agriculture, Fisheries and Conservation Department, HKSAR, Hong Kong. 2. Cap. 96: Forestry Regulations, the subsidiary legislation of Forests and Countryside Ordinance (Cap. 96). 3. Cap. 586: Protection of Endangered Species of Animals and Plants Ordinance 4. CPRDB: Fu and Jin (1992) China Plant Red Data Book 5. RLCHP: Red List of China's Higher Plants (2020). VU = Vulnerable 6. IUCN: International Union for Conservation of Nature Red List of Threatened Species (2023). VU = Vulnerable, CR = Critically Endangered. 7. Xing, F.W., Ng, S.C., Chau, L.K.C. 2000. Gymnosperms and angiosperms of Hong Kong. Memoirs of the Hong Kong Natural History Society 23: 21-136. 			

Terrestrial Mammal

Eight mammal species of conservation importance were previously recorded within the Assessment Area (**Figure 7.5**). Details of these mammal species of conservation importance are shown in **Table 7-5**.

Table 7-5 Mammal Species of Conservation Importance Recorded from Previous Studies

Common Name	Scientific Name	Chinese Name	Conservation/ Protection Status	Previous Studies
Chinese Horseshoe Bat	<i>Rhinolophus sinicus</i>	中華菊頭蝠	Cap.170	DIR-294/2022
Chinese Pipistrelle	<i>Hypsugo pulveratus</i>	灰伏翼	Cap.170; Fellowes: (LC)	DIR-294/2022
Japanese Pipistrelle	<i>Pipistrellus abramus</i>	東亞家蝠	Cap.170	DIR-294/2022, EIA-225/2014
Short-nosed Fruit Bat	<i>Cynopterus sphinx</i>	短吻果蝠	Cap.170	EIA-225/2014



Common Name	Scientific Name	Chinese Name	Conservation/ Protection Status	Previous Studies
Unidentified Bat species	-	-	Cap. 170	EIA-171/2009
Small Asian Mongoose	<i>Herpestes javanicus</i>	紅頰獾	Cap.170; RLCV(VU); CITES(III)	EIA-171/2009
Small Indian Civet	<i>Viverricula indica</i>	小靈貓	Cap.170; RLCV(VU); CSMPS(II); CITES(III)	EIA-201/2011 Scats of Small Indian Civet were recorded from the following studies: EIA-171/2009, EIA-201/2011, VEP-617/2022
Leopard Cat	<i>Prionailurus bengalensis</i>	豹貓	Cap.170; Cap.586; RLCV(VU); CITES(II)	Scats of Leopard Cat were recorded from VEP-617/2022
<p>Notes:</p> <p>Conservation Status:</p> <ol style="list-style-type: none"> Cap. 170: Protected under Wild Animals Protection Ordinance Cap. 586: Protection of Endangered Species of Animals and Plants Ordinance Fellowes – Fellowes <i>et al.</i> (2002): LC = Local Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence. RLCV – Red List of China's Vertebrate (2020): VU = Vulnerable CITES – Under Appendix II or III of Convention on International Trade in Endangered Species of Wild Fauna and Flora CSMPS – China State Major Protection Status: Appendix II 				

According to McMillan (2021)¹, signs of Eurasian Otter were recorded in the wetland area extending from Fung Lok Wai to Hoo Hok Wai, which is considered the core area of Eurasian Otter's population in Hong Kong. Hui & Chan (2023)² reviewed the occurrence of Eurasian Otter in Hong Kong. Among the post-1962 records, Tap Shek Kok was the nearest record of Eurasian Otter from the Project Site, however, it was over 4.0km away from the Project Site. Nonetheless, findings of McMillan (2021) and Hui & Chan (2023) were recorded outside the Assessment Area. As reported by Kadoorie Farm and Botanic Garden (KFBG) (pers. comm., 2024), sign of Eurasian Otter usage was recorded at Tai Shui Hang, Pak Nai, in 2021 and the recorded location is approximately 1.5km away from the Project Site. KFBG (pers. comm., 2024) also reported records of Small Indian Civet and Leopard Cat during 2022 – 2024 near Tsang Kok Stream, i.e. near W2 on **Figure 7.6**.

Avifauna

¹ McMillan, S.E., 'The Ecology and Conservation of Eurasian Otter (*Lutra lutra*) in Hong Kong' (PhD thesis, The University of Hong Kong 2021)

² Hui, M.K.Y. and Chan, B.P.L. (2024) 'Analysis of a 131-year longitudinal dataset of the Eurasian otter *Lutra lutra* in Hong Kong: implications for conservation', *Oryx*, 58(3), pp. 387–395. doi:10.1017/S0030605323001163.



Thirty-two avifauna species of conservation importance were recorded within the Assessment Area (**Figure 7.5**). A majority of these species of conservation importance were recorded at the wasteland which acted as breeding habitats for Little Grebe and Little Ringed Plover as such it is considered as a habitat of moderate ecological value as stated in previous studies. Details of these avifauna species of conservation importance are shown in **Table 7-6**.

Table 7-6 Avifauna Species of Conservation Importance Recorded from Previous Studies

Common Name	Scientific Name	Chinese Name	Conservation/Protection Status	Previous Studies
Eurasian Wigeon	<i>Mareca penelope</i>	赤頸鴨	Fellowes: RC	EIA-201/2011
Eurasian Teal	<i>Anas crecca</i>	綠翅鴨	Fellowes: RC	DIR-294/2022
Tufted Duck	<i>Aythya fuligula</i>	鳳頭潛鴨	Fellowes: LC	DIR-294/2022
Greater Coucal	<i>Centropus sinensis</i>	褐翅鴉鵂	CSMPS (II)	DIR-294/2022, EIA-225/2014, EIA-171/2009, EIA-155/2008
Lesser Coucal	<i>Centropus bengalensis</i>	小鴉鵂	CSMPS(II)	DIR-294/2022
Eurasian Coot	<i>Fulica atra</i>	骨頂雞	Fellowes: RC	DIR-294/2022, EIA-171/2009
Little Grebe	<i>Tachybaptus ruficollis</i>	小鸕鶿	Fellowes: LC	DIR-294/2022 EIA-225/2014, EIA-171/2009, EIA-155/2008
Black-winged Stilt	<i>Himantopus himantopus</i>	黑翅長腳鸕	Fellowes: RC	EIA-225/2014
Little Ringed Plover	<i>Charadrius dubius</i>	金眶鸕	Fellowes: (LC)	EIA-225/2014, EIA-155/2008
Kentish Plover	<i>Charadrius alexandrinus</i>	環頸鸕	Fellowes: RC	EIA-201/2011
Common Redshank	<i>Tringa totanus</i>	紅腳鸕	Fellowes: RC	EIA-171/2009
Wood Sandpiper	<i>Tringa glareola</i>	林鸕	Fellowes: LC	EIA-155/2008
Great Cormorant	<i>Phalacrocorax carbo</i>	普通鸕鶿	Fellowes: PRC	DIR-294/2022
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	夜鸕	Fellowes: (LC)	EIA-225/2014, EIA-155/2008
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鸕	Fellowes: PRC (RC)	DIR-294/2022, EIA-225/2014, EIA-201/2011, EIA-171/2009, EIA-155/2008
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	牛背鸕	Fellowes: (LC)	EIA-155/2008
Grey Heron	<i>Ardea cinerea</i>	蒼鸕	Fellowes: PRC	DIR-294/2022, EIA-225/2014, EIA-201/2011, EIA-171/2009, EIA-155/2008
Great Egret	<i>Ardea alba</i>	大白鸕	Fellowes: PRC (RC)	DIR-294/2022, EIA-225/2014, EIA-201/2011, EIA-171/2009, EIA-155/2008
Little Egret	<i>Egretta garzetta</i>	小白鸕	Fellowes: PRC (RC)	DIR-294/2022, EIA-225/2014, EIA-201/2011, EIA-171/2009, EIA-



				155/2008
Pacific Reef Heron	<i>Egretta sacra</i>	岩鷺	Fellowes: (LC); CSMPS(II)	EIA-155/2008
Western Osprey	<i>Pandion haliaetus</i>	鵟	Cap.586; Fellowes: RC; CSMPS(II); CITES(II)	EIA-201/2011
Black Kite	<i>Milvus migrans</i>	黑鷲	Cap.586; Fellowes: (RC); CSMPS(II); CITES(II)	DIR-294/2022, EIA- 225/2014, EIA-201/2011, EIA-171/2009
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	白腹海鷲	Cap.586; Fellowes: (RC); RLCV(VU); CSMPS(I); CITES(II)	EIA-171/2009
Eastern Buzzard	<i>Buteo japonicus</i>	普通鷲	Cap.586; CSMPS(II); CITES(II)	EIA-201/2011
Collared Scops Owl	<i>Otus lettia</i>	領角鴞	Cap.586; CSMPS(II); CITES(II)	EIA-225/2014
Brown Fish Owl	<i>Ketupa zeylonensis</i>	褐漁鴞	Cap.586; Fellowes: RC; RLCV(EN); CSMPS(II); CITES(II)	VEP-617/2022
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	白胸翡翠	Fellowes: (LC)	EIA-225/2014, EIA- 171/2009, EIA-155/2008
Black-capped Kingfisher	<i>Halcyon pileata</i>	藍翡翠	Fellowes: (LC); IUCN(VU)	EIA-155/2008, EIA- 171/2009
Pied Kingfisher	<i>Ceryle rudis</i>	斑魚狗	Fellowes: (LC)	EIA-225/2014, EIA- 171/2009, EIA-155/2008
Collared Crow	<i>Corvus torquatus</i>	白頸鴉	Fellowes: LC; IUCN(VU)	DIR-294/2022, VEP- 617/2022
Zitting Cisticola	<i>Cisticola juncidis</i>	棕扇尾鶯	Fellowes: LC	EIA-201/2011
White-shouldered Starling	<i>Sturnia sinensis</i>	灰背椋鳥	Fellowes: (LC)	EIA-225/2014, EIA- 155/2008
<p>Notes:</p> <p>Conservation Status:</p> <ol style="list-style-type: none"> All birds in Hong Kong are protected under Cap. 170 – Protected under Wild Animals Protection Ordinance Cap. 586: Protection of Endangered Species of Animals and Plants Ordinance Fellowes – Fellowes <i>et al.</i> (2002): LC = Local Concern, PRC = Potential Regional Concern, RC = Regional Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence. RLCV – Red List of China’s Vertebrate (2020): VU = Vulnerable CITES (II) – Under Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora CSMPS – China State Major Protection Status: Appendix II Carey <i>et al.</i> (2001) The Avifauna of Hong Kong. Hong Kong Bird Watching Society. Hong Kong. 				

KFBG (pers. comm., 2024) also reported records of Brown Fish Owl during 2022 – 2024 near Tsang Kok Stream, i.e. near W2 on **Figure 7.6**.

Herpetofauna



A reptile species of conservation importance was recorded within the Assessment Area (**Figure 7.5**). Details of this species of conservation importance was shown in **Table 7-7**. No amphibian species of conservation importance were recorded within the Assessment Area.

Table 7-7 Reptile Species of Conservation Importance Recorded from Previous Studies

Common Name	Scientific Name	Chinese Name	Conservation/ Protection Status	Previous Studies
Reptile				
Copperhead Racer	<i>Coelognathus radiatus</i>	三索錦蛇	Fellowes: PRC; RLCV(EN)	EIA-155/2008, EIA-171/2009
Notes: Conservation Status: a. Fellowes – Fellowes <i>et al.</i> (2002): LC = Local Concern; RC = Regional Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence. b. RLCV – Red List of China's Vertebrate (2020): EN = Endangered				

Butterflies & Odonates

Five butterfly species of conservation importance were recorded within the Assessment Area (**Figure 7.5**). Details of these butterfly species of conservation importance are shown in **Table 7-8**.

An odonate species of conservation importance were recorded within the Assessment Area (**Figure 7.5**). Details of the odonate species of conservation importance are shown in **Table 7-8**.

Table 7-8 Butterfly and Odonate Species of Conservation Importance Recorded from Previous Studies

Common Name	Scientific Name	Chinese Name	Conservation/ Protection Status	Previous Studies
Butterfly				
Banded Awl	<i>Hasora chromus</i>	雙斑趾弄蝶	AFCD: Rare	DIR-294/2022
Danaid Eggfly	<i>Hypolimnas misippus</i>	金斑蛺蝶	Fellowes: LC; AFCD: Uncommon	EIA-155/2008
Glassy Bluebottle	<i>Graphium cloanthus</i>	寬帶青鳳蝶	Fellowes: LC; AFCD: Uncommon	EIA-155/2008
Little Branded Swift	<i>Pelopidas agna</i>	南亞穀弄蝶	AFCD: Uncommon	EIA-155/2008
Small Cabbage White	<i>Pieris rapae</i>	菜粉蝶	AFCD: Rare	DIR-294/2022
Odonate				
Coastal Glider	<i>Macrodiplax cora</i>	高翔濼蜻	Fellowes: LC	VEP-617/2022, DIR-294/2022, EIA-225/2014, EIA-201/2011
Notes: Conservation Status:				



- a. Fellowes – Fellowes *et al.* (2002): LC = Local Concern.
 b. AFCD refers to Chan *et al.* 2011. A Review of the Local Restrictedness of Hong Kong Butterflies. Hong Kong Biodiversity 21: 1-12

Freshwater Communities

No freshwater species of conservation concern was recorded within the Assessment Area.

7.5.1.2 Ecological Survey

This section presents the terrestrial ecological surveys conducted between March and August 2024, covering dry and wet seasons. The 2024 survey data is presented in **Appendix 7A**. As discussed in **Section 7.4.3.1.2**, a terrestrial Ecological Baseline Survey was also conducted in 2023. However, due to the changes in habitat, especially the back-filling activities at West Ash Lagoon which was commenced in December 2023, habitat and vegetation data presented in this section refers to the latest findings in the 2024 surveys only. The survey data in 2023 is presented in **Appendix 7B** for reference.

7.5.1.2.1 Habitat and Vegetation

Seven habitat types were identified within the Assessment Area (refer to **Figure 7.6**). The habitats include woodland, plantation, shrubland, developed area, wasteland, ash lagoon, and watercourse. No recognized sites of conservation importance are identified within the Assessment Area. Representative photographs of each habitat are presented in **Appendix 7A**. **Table 7-9** summarizes the area of each habitat recorded within the Assessment Area.

Table 7-9 Area of Each Habitat Identified in the Assessment Area

Habitat	Area within the boundary of Project Site (ha)	Area within Assessment Area (ha)	Length within Assessment Area (km)	Percentage (%) of Assessment Area
Woodland	N/A	14.2	N/A	10.2%
Plantation	N/A	12.2	N/A	8.7%
Shrubland	N/A	32.5	N/A	23.2%
Developed Area	3.3	42.1	N/A	30.0%
Wasteland	18.5	22.6	N/A	16.1%
Ash Lagoon	2.3	16.5	N/A	11.8%
Watercourse	N/A	N/A	1.7	-
Total	24.2	140.1	1.7	

Note:

- N/A: Not Applicable

A total of 151 flora species were recorded within the Assessment Area (refer to **Appendix 7A**). No flora species of conservation importance was recorded within the Assessment Area.

Woodland

Woodland is mainly recorded to the southeast of the West Ash Lagoon, where it spreads towards Nim Wan Road. The canopy was about 5-8m tall, comprising trees like *Celtis sinensis*, *Litsea rotundifolia* var. *oblongifolia*, and *Mangifera indica*. A layer of shrubs or small trees (3-



5m tall) were also recorded, including *Bridelia tomentosa*, *Microcos nervosa*, and *Psychotria asiatica*. Climbers and herbs like *Sageretia thea*, *Desmos chinensis*, and *Embelia laeta* were also recorded. No floral species of conservation importance were recorded within this habitat.

Plantation

Plantation is mainly recorded on the small hill to the southwest of the West Ash Lagoon. Patches of fragmented plantation are also recorded to both sides of Nim Wan Road. The canopy was about 5-8m tall, comprising exotic trees such as *Acacia confusa*, *Eucalyptus* sp., *Lophostemon confertus*. Shrubs like *Ligustrum sinense* and *Polyspora axillaris* were also recorded. Herb species such as *Bidens alba*, *Cyclosorus parasiticus*, and *Dicranopteris pedata* were also recorded at the understorey. No floral species of conservation importance were recorded within this habitat.

Shrubland

Shrubland is mainly recorded at the southern portion of the Assessment Area, located to the immediate east of the Black Point Power Station and the south of Y■Park. The vegetation was dominated by shrub species and was generally <5m tall. Dominant species included *Baeckea frutescens*, *Lygodium japonicum*, and *Rhodomyrtus tomentosa*. Herb species like *Bidens alba* was also recorded. No floral species of conservation importance were recorded within this habitat.

Developed Area

Developed Area within the Assessment Area is mostly recorded at existing roads, open storage, T■Park, existing Y■Park (to the south of T■Park), WENT Landfill and Tsang Tsui Columbarium. An enhancement pond (approximately 0.1ha in size) was recorded in the north-eastern part of T■Park. The enhancement pond was meant to be a mitigation pond for Little Grebe. Herb species such as *Cyperus* spp., *Fimbristylis* spp., *Ludwigia octovalvis*, *Ludwigia perennis*, were recorded at the pond. Except for T■Park and Y■Park, where landscape vegetation such as *Duranta erecta*, *Plumeria rubra*, *Rhododendron* sp. was recorded, limited vegetation is recorded within these locations. Herb or climber species such as *Bidens alba*, *Lantana camara*, *Leucaena leucocephala*. No floral species of conservation importance were recorded within Developed Area.

Wasteland

Wasteland is mainly recorded at the Middle Ash Lagoon, which is currently a construction site, and at the areas near Tsang Tsui Columbarium. Limited herb species were recorded, such as *Bidens alba*, *Panicum maximum*, and *Sageretia thea*. No floral species of conservation importance were recorded within this habitat.

Ash Lagoon



Ash Lagoon is only recorded at West Ash Lagoon. However, the pond-like status was only a transient stage of the overall life-cycle of the West Ash Lagoon. West Ash Lagoon which was used by CLP for PFA storage since 1980s. PFA filling activity in the ash lagoon had been ceased for a few years and the lagoon was surrendered to the Government in 2023. Covering the ash surface with fill materials, as an environmental precautionary measure, has been undertaken and it will then be decommissioned in 2025/2026. The decommissioned West Ash Lagoon would become an open filled area (developed area) by the time when the construction of I.PARK2 commences. The precautionary filling works has been observed upon survey. Herb species were recorded surrounding West Ash Lagoon, such as *Leucaena leucocephala* and *Neyraudia reynaudiana*. *Phragmites australis* was also recorded in the water. No floral species of conservation importance were recorded within this habitat.

Watercourse

Three watercourses, W1, W2, and W3, have been identified within the Assessment Area (refer to **Appendix 7A** and **Figure 7.6**). These watercourses are located outside the Project Site. W1 eventually joins W2, while W3 converges with W2 into a major tidal channel around the eastern boundary of T■Park, which flows to Deep Bay eventually. Due to the proposed Tsang Kok Stream outfall modification works associated with WENT Landfill Extension project, these watercourses might be subject to further changes and disturbance.

W1 is a modified watercourse with a sandy bottom and is approximately 1m in width with around 10cm water depth. The waterflow of W1 is permanent. Riparian vegetation was recorded at this habitat, such as herb *Bidens alba*, *Cyclosorus parasiticus*, *Mikania micrantha*, etc. Shrub/tree species such as *Hibiscus tiliaceus* and *Leucaena leucocephala* were also recorded at the riparian zone. No floral species of conservation importance were recorded within this habitat.

W2 is a modified watercourse with concreted bank. The waterflow of W2 is permanent. W2 is approximately 10m in width with ~5-20cm water depth. Brackish habitat was found in this section and mangrove species such as *Kandelia obovata* was recorded. Riparian vegetation was recorded along the bankside of W2, including *Bidens alba*, *Ficus variegata*, *Mikania micrantha*, *Schefflera heptaphylla*, etc. No floral species of conservation importance were recorded within this habitat.

W3 is a modified watercourse with concreted bank. The waterflow of W3 is permanent. W3 is approximately 10m in width with ~5-20cm water depth. No vegetation was recorded within this habitat.

7.5.1.2.2 Terrestrial Fauna

Mammal



A total of eight mammalian species were recorded within the Assessment Area during the 2024 survey (**Appendix 7A** and **Figure 7.6**), while three mammalian species were recorded within the Assessment Area during Terrestrial Ecological Baseline Survey conducted in 2023 (**Appendix 7B**). No breeding activities of bats were recorded. **Table 7-10** presents the mammalian species of conservation importance recorded within the Assessment Area.

Table 7-10 Mammalian Species of Conservation Importance Recorded Within the Assessment Area

Common Name	Scientific Name	Chinese Name	Conservation Status	Recorded Habitat
Chinese Horseshoe Bat	<i>Rhinolophus sinicus</i>	中華菊頭蝠	Cap.170	Developed Area
Intermediate Horseshoe Bat	<i>Rhinolophus affinis</i>	中菊頭蝠	Cap.170; Fellowes: (LC)	Wasteland
Himalayan Leaf-nosed Bat	<i>Hipposideros armiger</i>	大蹄蝠	Cap.170; Fellowes: (LC)	Ash Lagoon, Developed Area*
Chinese Noctule	<i>Nyctalus plancyi</i>	中華山蝠	Cap.170; Fellowes: PRC (RC)	Developed Area, Wasteland, Ash Lagoon
Japanese Pipistrelle	<i>Pipistrellus abramus</i>	東亞家蝠	Cap.170	Woodland, Plantation, Developed Area, Wasteland, Ash Lagoon
Least Pipistrelle	<i>Pipistrellus tenuis</i>	小伏翼	Cap.170	Woodland, Developed Area, Wasteland, Ash Lagoon
Chinese Pipistrelle	<i>Hypsugo pulveratus</i>	灰伏翼	Cap.170; Fellowes: (LC)	Plantation, Shrubland, Developed Area, Ash Lagoon
Pallas's Squirrel	<i>Callosciurus erythraeus</i>	赤腹松鼠	Cap. 170	Wasteland*
Leopard Cat (scats)	<i>Prionailurus bengalensis</i>	豹貓	Cap.170; Cap.586; RLCV(VU); CITES(II)	Developed Area, Ash Lagoon

*Recorded only in 2023 Terrestrial Ecological Baseline Survey
 Note on Conservation Status:
^a Cap. 170: Scheduled under Wild Animals Protection Ordinance
^b Cap. 586: Scheduled under Endangered Species of Animals and Plants Ordinance
^c RLCV – Red List of China’s Vertebrate (2020): VU = Vulnerable
^d Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* 25:123-159. PRC = Potential Regional Concern; RC = Regional Concern; LC = Local Concern. Letters in brackets represents the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
^e CITES – Under Appendix (I), Appendix (II) or Appendix (III) of Convention on International Trade in Endangered Species of Wild Flora and Fauna

Avifauna

A total of 75 avifauna species were recorded within the Assessment Area during the 2024 survey (**Appendix 7A** and **Figure 7.6**) while 54 avifauna species were recorded within the Assessment Area during Terrestrial Ecological Baseline Survey conducted in 2023 (**Appendix 7B**). Nests and juveniles of Little Grebe were recorded outside the Project Site at West Ash Lagoon during the survey conducted in July and August 2024. **Table 7-11** presents the avifauna species of conservation importance recorded within the Assessment Area.



Table 7-11 Avifauna Species of Conservation Importance Recorded Within the Assessment Area

Common Name	Scientific Name	Chinese Name	Conservation Status	Recorded Habitat within the Assessment Area
Northern Shoveler	<i>Spatula clypeata</i>	琵嘴鴨	Fellowes: RC	Ash Lagoon
Eurasian Wigeon	<i>Mareca penelope</i>	赤頸鴨	Fellowes: RC	Ash Lagoon
Tufted Duck	<i>Aythya fuligula</i>	鳳頭潛鴨	Fellowes: LC	Ash Lagoon
Greater Coucal	<i>Centropus sinensis</i>	褐翅鴉鵂	CSMPS(II)	Woodland, Plantation, Wasteland, Ash Lagoon
Eurasian Coot	<i>Fulica atra</i>	骨頂雞	Fellowes: RC	Ash Lagoon
Slaty-legged Crake	<i>Rallina eurizonoides</i>	灰腳秧雞	RLCV(VU)	Ash Lagoon
Little Grebe	<i>Tachybaptus ruficollis</i>	小鸕鶿	Fellowes: LC	Developed Area, Ash Lagoon
Black-winged Stilt	<i>Himantopus himantopus</i>	黑翅長腳鸕	Fellowes: RC	Ash Lagoon
Little Ringed Plover	<i>Charadrius dubius</i>	金眶鸕	Fellowes: (LC)	Ash Lagoon
Oriental Pratincole	<i>Glareola maldivarum</i>	普通燕鸕	Fellowes: LC	Developed Area, Wasteland
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	夜鷺	Fellowes: (LC)	Wasteland, Ash Lagoon
Striated Heron	<i>Butorides striata</i>	綠鷺	Fellowes: (LC)	Ash Lagoon
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鷺	Fellowes: PRC (RC)	Developed Area, Ash Lagoon, Watercourse
Grey Heron	<i>Ardea cinerea</i>	蒼鷺	Fellowes: PRC	Ash Lagoon
Great Egret	<i>Ardea alba</i>	大白鷺	Fellowes: PRC (RC)	Developed Area*, Ash Lagoon, Watercourse, Recorded in-flight
Little Egret	<i>Egretta garzetta</i>	小白鷺	Fellowes: PRC (RC)	Wasteland*, Ash Lagoon, Watercourse
Crested Serpent Eagle	<i>Spilornis cheela</i>	蛇鷲	Cap. 586; Fellowes: (LC)	Developed Area*, Shrubland*
Besra	<i>Accipiter virgatus</i>	松雀鷹	Cap.586; CSMPS(II); CITES(II)	Developed Area, Recorded in-flight
Black Kite	<i>Milvus migrans</i>	黑鷲	Cap.586; Fellowes: (RC); CSMPS(II); CITES(II)	Woodland*, Plantation, Shrubland, Developed Area, Wasteland, Ash Lagoon, Watercourse, Recorded in-flight
Eastern Buzzard	<i>Buteo japonicus</i>	普通鵟	Cap.586; CSMPS(II); CITES(II)	Recorded in-flight
Northern Boobook	<i>Ninox japonica</i>	鷹鴞	Cap.586; CSMPS(II); CITES(II)	Developed Area
Collared Scops Owl	<i>Otus lettia</i>	領角鴞	Cap.586; CSMPS(II); CITES(II)	Plantation*, Wasteland, Watercourse
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	白胸翡翠	Fellowes: (LC)	Developed Area, Wasteland, Ash Lagoon, Watercourse
Pied Kingfisher	<i>Ceryle rudis</i>	斑魚狗	Fellowes: (LC)	Developed Area, Ash Lagoon
Japanese Paradise Flycatcher	<i>Terpsiphone atrocaudata</i>	紫綬帶	Fellowes: LC	Developed Area



Common Name	Scientific Name	Chinese Name	Conservation Status	Recorded Habitat within the Assessment Area
Collared Crow	<i>Corvus torquatus</i>	白頸鴉	Fellowes: LC; IUCN(VU)	Wasteland, Ash Lagoon
White-shouldered Starling	<i>Sturnia sinensis</i>	灰背椋鳥	Fellowes: (LC)	Wasteland, Ash Lagoon
Red-breasted Flycatcher	<i>Ficedula parva</i>	紅胸姬鶯	CITES (III)	Woodland
<p>*Recorded only in 2023 Terrestrial Ecological Baseline Survey</p> <p>Note on Conservation Status:</p> <p>^a All birds in Hong Kong are protected by Cap. 170 – Scheduled under Wild Animals Protection Ordinance</p> <p>^b Cap. 586: Protection of Endangered Species of Animals and Plants Ordinance</p> <p>^c Fellowes et al. (2002): LC = Local Concern, PRC = Potential Regional Concern, RC = Regional Concern. Letters in parentheses indicate that the assessment is based on restrictedness in breeding and/or roosting sites rather than in general occurrence.</p> <p>^d RLCV – Red List of China’s Vertebrates (2020). VU = Vulnerable</p> <p>^e CSMPs – China State Major Protection Status: Appendix I/II/III</p> <p>^f IUCN – International Union for Conservation of Nature Red List of Threatened Species (2023). VU = Vulnerable</p> <p>^g CITES – Appendix I, II or III of Convention on International Trade in Endangered Species of Wild Flora and Fauna</p>				

Amphibian

A total of six amphibian species were recorded within the Assessment Area during the 2024 survey (**Appendix 7A**) while five amphibian species were recorded within the Assessment Area during Terrestrial Ecological Baseline Survey conducted in 2023 (**Appendix 7B**). No amphibian species of conservation importance were recorded within the Assessment Area.

Reptile

A total of six reptile species were recorded within the Assessment Area both during the 2024 survey (**Appendix 7A**) while five reptile species were recorded within the Assessment Area during Terrestrial Ecological Baseline Survey conducted in 2023 (**Appendix 7B**). **Table 7-12** presents the reptile species of conservation importance recorded within the Assessment Area.

Table 7-12 Reptile Species of Conservation Importance Recorded Within the Assessment Area

Common Name	Scientific Name	Chinese Name	Conservation Status	Recorded Habitat within the Assessment Area
Indo-Chinese Rat Snake	<i>Ptyas korros</i>	灰鼠蛇	Fellowes: PRC; RLCV(VU)	Watercourse*
<p>*Recorded only in 2023 Terrestrial Ecological Baseline Survey</p> <p>Note on Conservation Status:</p> <p>^a Fellowes et al. (2002): PRC = Potential Regional Concern.</p> <p>^b RLCV – Red List of China’s Vertebrates (2020) VU = Vulnerable</p>				

Butterfly

A total of 25 butterfly species were recorded within the Assessment Area during the 2024 survey (**Appendix 7A**) while 40 butterfly species were recorded within the Assessment Area during Terrestrial Ecological Baseline Survey conducted in 2023 (**Appendix 7B**). **Table 7-13**



presents the butterfly species of conservation importance recorded within the Assessment Area.

Table 7-13 Butterfly Species of Conservation Importance Recorded Within the Assessment Area

Common Name	Scientific Name	Chinese Name	Conservation Status	Recorded Habitat within the Assessment Area
Forget-me-not	<i>Catochrysops strabo</i>	咖灰蝶	Very rare	Developed Area*
Tiny Grass Blue	<i>Zizula hylax</i>	長腹灰蝶	Very rare	Wasteland*
Plain Hedge Blue	<i>Celastrina lavendularis</i>	薰衣琉璃灰蝶	Fellowes: LC; Very rare	Wasteland*
Small Cabbage White	<i>Pieris rapae</i>	菜粉蝶	Rare	Wasteland*
*Recorded only in 2023 Terrestrial Ecological Baseline Survey Note on Conservation Status: ^a Fellowes et al. (2002): LC = Local Concern. ^b Chan, A., Cheung, J., Sze, P., Wong, A., Wong, E., Yau, E. (2011). A Review of the Local Restrictedness of Hong Kong Butterflies. <i>Hong Kong Biodiversity</i> . 21:1-12.				

Odonate

A total of seven odonate species were recorded within the Assessment Area during the 2024 survey (**Appendix 7A**) while eight odonate species were recorded within the Assessment Area during Terrestrial Ecological Baseline Survey conducted in 2023 (**Appendix 7B**). No odonate species of conservation importance recorded within the Assessment Area.

Firefly

No firefly species were recorded within the Assessment Area during the surveys.

Aquatic Fauna

A total of 20 freshwater fauna species were recorded within the Assessment Area during the 2024 survey (**Appendix 7A** and **Figure 7.6**) while 41 freshwater fauna species were recorded within the Assessment Area during Terrestrial Ecological Baseline Survey conducted in 2023 (**Appendix 7B**). **Table 7-14** presents the freshwater fauna species of conservation importance recorded within the Assessment Area.

Table 7-14 Freshwater Fauna Species of Conservation Importance Recorded Within the Assessment Area

Common Name	Scientific Name	Chinese Name	Conservation Status	Recorded Habitat within the Assessment Area
Tawny Hooktail (Larva)	<i>Paragomphus capricornis</i>	鈎尾副春蜓 (稚蟲)	Fellowes: RC; Reels: CI	Watercourse
Note on Conservation Status: ^a Fellowes et al. (2002): RC = Regional Concern. ^b Reels. G. (2019): CI = Species of Conservation Importance.				



7.5.2 Marine Ecology

7.5.2.1 Recognised Sites of Conservation Importance

Recognized site of conservation importance identified within the Assessment Area includes the Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP) as shown in **Figure 7.2**. The SCLKCMP was designated in November 1996 for conservation of the Chinese White Dolphins (CWDs). It is located in the open waters on the north western waters of Hong Kong and is over 4.5 km away from the Project. With the deployment of artificial reef, the Marine Park has very rich fisheries resources, particularly fishes of *Engraulidae*, *Sciaenidae* and *Clupeidae* which are the primary food sources for CWDs. It therefore serves as an important feeding ground for the dolphins. Pak Nai SSSI, a sandpit used as a high tide roost site for gulls and terns in the Deep Bay area, is located over 3.7 km from the Project site. No other recognised sites of conservation importance, such as country park and Conservation Area (CA), etc., were identified within the Assessment Area.

7.5.2.2 Marine Ecological Resources

The marine ecological habitats within and in the vicinity of the proposed marine works areas near TTAL have undergone anthropogenic disturbance including the marine traffic for delivery of MSW to the WENT Landfill via the existing navigation channel and maintenance dredging along the shore of TTAL by the existing WENT Landfill Contractor.

The intertidal habitats at and near the Project site mainly comprise artificial seawalls including the seawalls around TTAL, WENT Landfill to the east and Black Point Power Station (BPPS) to the west. The nearest natural shores identified within the Assessment Area are the natural rocky shores at Black Headland (to the south of BPPS) as well as the soft shores (mudflat and mangrove stands) to the east of WENT Landfill. All of these natural shores are located over 2 km away from the proposed marine works of this Project.

The existing marine ecological resources in the Assessment Area are subject to the influences of the freshwater discharges from Pearl River with low salinity level, relatively high Suspended Solids (SS) and nutrient levels in particular during the wet season when the river flow rate is high. Ecological resources in the Assessment Area are expected to tolerate a wider range of environmental conditions as compared to those receivers located outside the Pearl River Estuary.

7.5.2.2.1 Intertidal Fauna

Past Studies

Hard Shore Communities

Survey of the artificial seawalls around the East Ash Lagoon showed that the species diversity was low (EPD 2009a). The mid and low shores of East Ash Lagoon were dominated by sessile



encrusting fauna such as bivalves (*Saccostrea cucullata*), nerites (*Nerita albicilla*) and encrusting algae (*Hildenbrandia rubra*). Barnacles (*Balanus amphitrite*) were more abundant on more exposed shore.

Under another study (EPD 2009b), the artificial seawalls of TTAL were surveyed at two locations near the East Ash Lagoon and West Ash Lagoon respectively and the associated intertidal communities were found to be of very low in diversity and abundance. The only dominant organisms were rock oyster *Saccostrea cucullata*, but even this species was in low abundance.

Intertidal survey was conducted at two locations along the artificial seawall of Middle Ash Lagoon (EPD 2012). The low shore was dominated by rock oyster (*Saccostrea cucullata*) and erect/encrusting algae. The middle shore was abundant in rock oyster (*Saccostrea cucullata*) and nerite (*Nerita albicilla*). The high shore was dominated by nerites (*Nerita albicilla*) and periwinkles (*Echinolittorina radiata* and *Littoraria articulata*). Mobile species such as crab (*Hemigrapsus sanguineus*) and sea slater (*Ligia exotica*) were mainly found at the low shore. Other species found included tubeworm, sea anemone, gastropods, bivalves and crustacean. All species recorded are common and widespread in Hong Kong.

Another intertidal survey (EPD 2022a) was also conducted along the artificial seawall of TTAL (at two locations near the Middle Ash Lagoon). Similar to previous findings, all species recorded at the artificial seawall were common or very common species in Hong Kong. Dominant species recorded include algae (*Chorococcus* sp.) and bivalves (*Saccostrea cucullata*).

Past intertidal surveys at the artificial sloping seawalls of the BPPS (to the west of the Project site) indicated that this habitat comprised low abundances/ densities of common and widespread rocky shore species (CAPCO 2016). Dominant species recorded include cyanobacteria (*Kyrtuthrix maculans*), littorinid snails (*Echinolittorina radiata* and *Littoraria articulata*), limpet (*Nipponacmea concinna*), common dogwhelk (*Reishia clavigera*), rock oyster (*Saccostrea cucullata*), topshell (*Monodonta labio*), nerite (*Nerita albicilla*).

Natural rocky shores at the Black Point headland (to the south of the Project site) were also surveyed and results indicated that this habitat was also comprised of common and widespread rocky shore species (CAPCO 2016). Dominant species recorded include littorinid snail (*Echinolittorina radiata*), topshell (*Monodonta labio*) and encrusting alga (*Hildenbrandia rubra*).

No hard shore communities of conservation importance were recorded in all past studies.

Soft Shore Communities

Intertidal mudflats with mangroves and seagrass were present at Ha Pak Nai to the east of WENT Landfill (AFCD 2023a, 2023b and 2023c). The mudflat at Ha Pak Nai was over 2 km from the I-PARK2 Site. The mudflat expands eastward and formed part of the coastal mudflat along Deep Bay coastline. Juvenile horseshoe crabs were found at mudflats at Ha Pak Nai in Deep



Bay (Morton 2011, Shin et al. 2009). Ha Pak Nai was considered as one of the important nursery grounds for juvenile horseshoe crabs as it had a higher abundance of horseshoe crabs among the sites surveyed (Shin et al. 2007).

The mudflat at Ha Pak Nai were surveyed along two transects in a past study (EPD 2009b). A total of three species of infauna (all were polychaetes) was found. There were burrows in the mudflat. Snails *Nassarius festivus* and crab species, *Macrophthalmus sp.*, *Charybdis affinis*, *Hemigrapsus penicillatus*, and *Hemigrapsus sanguineus* were recorded. All species found are common mudflat species with no conservation importance. Horseshoe crab juveniles were not found during this past study, but a fragment of a horseshoe crab moult and a carcass of a juvenile *Tachypleus tridentatus* were sighted during the survey, indicating that the nearby area is used by horseshoe crab juveniles. There was also no seagrass found during this past survey.

Recent Survey Results of this Project

Intertidal survey was carried out around the TTAL to verify the findings of the recent study (EPD 2022a). The intertidal habitat within the Assessment Area is composed of artificial seawall with sloping boulders. A total of 19 floral and faunal species were recorded in the walk-through and transect surveys. Similar to all previous studies, none of the recorded species was rare or considered as species of conservation importance. Detailed results of the intertidal surveys are presented in **Appendix 7C-1** and **Appendix 7C-2**. Generally, rock oyster *Saccostrea cucullata* and barnacles *Tetraclita squamosa* were the dominant species at the lower tidal level, while periwinkles *Echinolittorina radiata* was dominant at the higher tidal level.

7.5.2.2.2 Benthic Communities

Past Studies

Past territory-wide study on the subtidal benthic communities (AFCD 2002) showed that the benthos habitat in outer Deep Bay offshore to the Project site was composed of very fine sand and/or silt/clay. Species diversity and evenness in this habitat was moderate, represented by the bivalve (*Potamocorbula larvis*) and polychaetes (*Mediomastus californiensis* and *Mediomastus sp.*) in summer, and polychaetes (*Nephtys polybranchia*, *Spionidae sp.*, *Heteromastus filiformis*, *Otopsis sp.*, *Mediomastus sp.* and *Neanthes sp.*) in winter. No benthic species of conservation concern was recorded in Deep Bay under this past study.

Seasonal benthic surveys conducted in another study (CAPCO 2016) showed that infaunal assemblages off the Black Point in outer Deep Bay were dominated by polychaete worms and bivalves (*Ruditapes philippinarum* and *Potamocorbula laevis*). The surveyed areas around Black Point consisted of common and widespread species typical of this part of Hong Kong. No species of conservation importance or rare species were recorded previously around the Black Point area.



Marine benthic samples were collected at one location off the Middle Ash Lagoon (near the Project site) under a recent study (EPD 2021a). A total of eight species of benthic animal were recorded during the benthic sampling which mainly belong to polychaeta. *Prionospio sp.* was the dominant species. No rare or species of conservation importance was recorded during the survey.

Recent Survey Results of this Project

Under this EIA, marine benthic samples were collected at two locations along the Middle Ash Lagoon and West Ash Lagoon respectively. The surveyed area was dominated by annelida (more than 80%) during both wet and dry seasons. The recorded species mainly belong to the polychaeta species and they are all common species. No rare species or species with conservation important was recorded during the survey. The survey sites are considered of low ecological value. Details of the survey results are presented in **Appendix 7C-3**.

7.5.2.2.3 Coral Communities

Past Studies

The geographical distribution of reef-building scleractinian corals in Hong Kong is influenced by the water salinity. The western waters nearer to the Pearl River tend to support low coverage and diversity of hard corals mainly due to its estuarine environment. Results from the intensive underwater surveys confirmed the low hard coral coverage and species diversity in the western waters of Hong Kong (Chan et al. 2005, AFCD 2023d).

The artificial seawalls of Middle Ash Lagoon and the adjacent seawalls (covering part of the West Ash Lagoon and East Ash Lagoon) were surveyed under a past study (EPD 2012). Very low coverage (<1%) of single gorgonian species *Echinomuricea sp.* was found along these artificial seawalls. Their size was small and their condition was unhealthy. Part of the gorgonian was dead. *Echinomuricea sp.* is common across Hong Kong waters and tolerant to turbid and harsh environment.

The artificial seawalls of Middle Ash Lagoon and the nearby seawalls were surveyed again under a recent study (EPD 2021b). Only one common species of gorgonian coral *Guaiaigorgia sp* was recorded with low coverage of <1%. All the gorgonian coral colonies recorded during the survey showed unhealthy condition with mortality rates ranging from 30% to 70%. This gorgonian coral species is common across Hong Kong waters and tolerant to turbid and harsh environment.

Isolated colonies of ahermatypic cup coral *Balanophyllia sp.* and octocoral species, *Guaiaigorgia sp.* were recorded with < 5 % coverage along the artificial seawall of BPPS to the west of the Project site (CAPCO 2016).



In the North Western waters outside Deep Bay, the closest major coral sites were identified at Sha Chau. Ahermatypic cup corals *Balanophyllia sp.* and octocoral *Guaiaigorgia sp.* were recorded at Sha Chau with a low coverage of 5 to 10% (AAHK 2014).

Recent Survey Results of this Project

There are abundant data from past studies that showed a very low coverage of a single common gorgonian coral species along the TTAL. Dive survey of this Project was carried out around the proposed marine works area of this Project covering the coastline of Middle Ash Lagoon and West Ash Lagoon. The survey results showed that the artificial seawall of the two lagoons was composed of artificial boulders with scattered rock. Thick sediment was found on boulder surfaces. The survey of this Project revealed that the site around the ash lagoons supported limited marine life including common green mussel *Perna viridis* and common rock oyster *Saccostrea cucullata*. Very low coverage (<1%) of single coral gorgonian species *Guaiaigorgia sp.* was found around the Middle Ash Lagoon and West Ash Lagoon. The size of gorgonians ranged from 4 to 16 cm in height, and their conditions were unhealthy. The mortality within each gorgonian colony was relatively high and ranged from 50% to 80%. *Guaiaigorgia sp.* is common across Hong Kong waters and tolerant to turbid and harsh environment. The dive survey data collected around the ash lagoons under this Project are in consistent with the findings of the recent survey (EPD 2021b). In summary, very low abundance and very low diversity of marine life were recorded around the ash lagoons.

Seabed stretching outward further offshore was observed to be all muddy with scattered small boulder and rocks. No marine life was recorded. Details of the dive survey results are presented in **Appendix 7C-4** and **Appendix 7C-5**.

7.5.2.2.4 Marine Mammals

Chinese White Dolphin (*Sousa chinensis*) and Finless Porpoise (*Neophocaena phocaenoides*) are the two most commonly found marine mammals in Hong Kong.

In 2022, the most important Chinese White Dolphin (CWD) habitats were concentrated along the West Lantau coast as well as the western end of Southwest Lantau waters, mainly extending from Tai O Peninsula toward Fan Lau Peninsula (AFCD 2023). In the past decade, dolphin occurrence in the North Lantau region has greatly diminished, with no apparent signs of recovery owing to the consecutive implementation of major reclamation and coastal development works (AFCD 2023). Continuous and alarming declines in dolphin usage were observed within the Brothers Marine Park and the Sha Chau and Lung Kwu Chau Marine Park (AFCD 2023). On the contrary their usage has remained fairly steady and high within the Southwest Lantau Marine Park in the past decade (AFCD 2023). No CWDs were sighted in Deep Bay at all in 2022 (AFCD 2023 and **Figure 7.5**). The coastal waters around TTAL and the adjacent waters recorded zero dolphin density since 2014 (**Figure 7.6**).



Finless Porpoise mainly occurs in the eastern and southern waters of Hong Kong (AFCD 2023) and was seldomly recorded from the north-western waters including the Assessment Area.

The coastal waters around the Project site are heavily disturbed by human activities including heavy marine traffic and maintenance dredging works associated with existing landfill operation. The Deep Bay waters in particular the coastal waters around the Project site with shallow water depths are not considered as a preferred habitat of Chinese White Dolphin or Finless Porpoise from the long-term marine mammals monitoring data collected by AFCD. Considering that the proposed marine works of this Project are small in scale, direct or permanent impact to marine mammals is not anticipated. No additional marine mammal survey is deemed necessary for this Project.

7.6 Evaluation of Baseline Ecological Conditions

7.6.1 Habitat within Assessment Area

The ecological importance evaluation of each habitat type within the Assessment Area is presented in **Table 7-15 – Table 7-24**.

Table 7-15 Evaluation of Woodland within the Assessment Area

Criteria	Woodland
Naturalness	Habitat is dominated by native species but is secondary in nature.
Size	Approx. 14.2 ha within the Assessment Area
Diversity	Low to moderate diversity of plant species and structural complexity Low diversity of fauna species
Rarity	No floral species of conservation importance were recorded. Fauna species of conservation importance recorded during the surveys include: Mammal – Japanese Pipistrelle, Least Pipistrelle Avifauna – Greater Coucal, Black Kite, Red-breasted Flycatcher
Re-creatability	It takes approximately several decades to re-create the habitat.
Fragmentation	Fragmented by several access roads and developed areas
Ecological Linkage	Not functionally or structurally linked to any nearby highly valuable habitat
Potential Value	Moderate
Nursery/ Breeding Ground	No significant nursery or breeding ground recorded
Age	Young in view of the structural complexity and community composition
Abundance/ Richness of Wildlife	Low to moderate
Overall Ecological Value	Low to moderate

**Table 7-16 Evaluation of Plantation within the Assessment Area**

Criteria	Plantation
Naturalness	Planted man-made habitat dominated by exotic species
Size	Approx. 12.2 ha within the Assessment Area
Diversity	Low diversity of plant species and structural complexity Low diversity of fauna species
Rarity	No floral species of conservation importance were recorded. Fauna species of conservation importance recorded during the surveys include: Mammal – Japanese Pipistrelle, Chinese Pipistrelle Avifauna – Greater Coucal, Black Kite, Collared Scops Owl
Re-creatability	High
Fragmentation	Fragmented by several access roads
Ecological Linkage	Not functionally or structurally linked to any nearby highly valuable habitat
Potential Value	Low
Nursery/ Breeding Ground	No significant nursery or breeding ground recorded
Age	Relatively young in terms of succession pathway
Abundance/ Richness of Wildlife	Low
Overall Ecological Value	Low

Table 7-17 Evaluation of Shrubland within the Assessment Area

Criteria	Shrubland
Naturalness	Habitat is largely natural but likely to be frequently disturbed by human-induced activities such as fires.
Size	Approx. 32.5 ha within the Assessment Area
Diversity	Low diversity of plant species and structural complexity Low diversity of fauna species
Rarity	No floral species of conservation importance were recorded. Fauna species of conservation importance recorded during the surveys include: Mammal – Chinese Pipistrelle Avifauna – Black Kite, Crested Serpent Eagle
Re-creatability	High
Fragmentation	Fragmented by access roads and engineered slopes
Ecological Linkage	Not functionally or structurally linked to any nearby highly valuable habitat
Potential Value	Low
Nursery/ Breeding Ground	No significant nursery or breeding ground recorded
Age	Relatively young in terms of succession pathway
Abundance/ Richness of Wildlife	Low



Criteria	Shrubland
Wildlife	
Overall Ecological Value	Low

Table 7-18 Evaluation of Developed Area within the Assessment Area

Criteria	Developed Area
Naturalness	Man-made habitat
Size	Approx. 42.1 ha within the Assessment Area
Diversity	Low diversity of plant species Low diversity of fauna species
Rarity	No floral species of conservation importance were recorded. Fauna species of conservation importance recorded during the surveys include: Mammal – Chinese Horseshoe Bat, Himalayan Leaf-nosed Bat, Chinese Noctule, Japanese Pipistrelle, Least Pipistrelle, Chinese Pipistrelle Avifauna – Little Grebe, Oriental Pratincole, Chinese Pond Heron, Great Egret, Crested Serpent Eagle, Besra, Black Kite, Northern Boobook, White-throated Kingfisher, Pied Kingfisher, Japanese Paradise Flycatcher Butterfly – Forget-me-not
Re-creatability	High
Fragmentation	Not applicable
Ecological Linkage	Not functionally or structurally linked to any nearby highly valuable habitat
Potential Value	Low
Nursery/ Breeding Ground	No significant nursery or breeding ground recorded
Age	Not applicable
Abundance/ Richness of Wildlife	Low
Overall Ecological Value	Low



Table 7-19 Evaluation of Wasteland within the Assessment Area

Criteria	Wasteland
Naturalness	Man-made habitat
Size	Approx. 22.6 ha within the Assessment Area
Diversity	Low diversity of plant species Low diversity of fauna species
Rarity	No floral species of conservation importance were recorded. Fauna species of conservation importance recorded during the surveys include: Mammal – Intermediate Horseshoe Bat, Chinese Noctule, Japanese Pipistrelle, Least Pipistrelle, Pallas's Squirrel Avifauna – Greater Coucal, Oriental Pratincole, Black-crowned Night Heron, Little Egret, Black Kite, Collared Scops Owl, White-throated Kingfisher, Collared Crow, White-shouldered Starling Butterfly – Tiny Grass Blue, Plain Hedge Blue, Small Cabbage White
Re-creatability	High
Fragmentation	Not applicable
Ecological Linkage	Not functionally or structurally linked to any nearby highly valuable habitat
Potential Value	Low
Nursery/ Breeding Ground	No significant nursery or breeding ground recorded
Age	Not applicable
Abundance/ Richness of Wildlife	Low
Overall Ecological Value	Low

Table 7-20 Evaluation of Ash Lagoon within the Assessment Area

Criteria	Ash Lagoon
Naturalness	Man-made habitat
Size	Approx. 16.5 ha within the Assessment Area
Diversity	Low diversity of plant species Low to moderate diversity of fauna species
Rarity	No floral species of conservation importance were recorded. Fauna species of conservation importance recorded during the surveys include: Mammal – Himalayan Leaf-nosed Bat, Chinese Noctule, Japanese Pipistrelle, Least Pipistrelle, Chinese Pipistrelle, Leopard Cat Avifauna – Northern Shoveler, Eurasian Wigeon, Tufted Duck, Greater Coucal, Eurasian Coot, Slaty-legged Crake, Little Grebe, Black-winged Stilt, Little Ringed Plover, Black-crowned Night Heron, Striated Heron, Chinese Pond Heron, Grey Heron, Great Egret, Little Egret, Black Kite, White-throated Kingfisher, Pied Kingfisher, Collared Crow, White-shouldered Starling
Re-creatability	High



Criteria	Ash Lagoon
Fragmentation	Not applicable
Ecological Linkage	Not functionally or structurally linked to any nearby highly valuable habitat
Potential Value	Low
Nursery/ Breeding Ground	Potential breeding ground for Little Grebe, an avifauna species of conservation importance, given adequate water level and presence of emergent vegetation during the breeding season.
Age	Not applicable
Abundance/ Richness of Wildlife	Low to moderate
Overall Ecological Value	Low (Note 1)
<p>Note 1: Based on the existing condition of the Ash Lagoon habitat, the overall ecological value of Ash Lagoon is considered to be “Low to Moderate” considering the criteria listed above. However, given the pond-like status is only a transient stage of the overall life-cycle of the West Ash Lagoon and the decommissioned West Ash Lagoon would become an open filled area (developed area) by the time when the construction of I.PARK2 commences, the overall ecological value is expected to be Low after the completion of decommissioning of West Ash Lagoon.</p>	

Table 7-21 Evaluation of Watercourse within the Assessment Area

Criteria	Watercourse
Naturalness	The watercourses are man-made channels with concrete bed.
Size	Approx. 1.7 km within the Assessment Area
Diversity	Low diversity of plant species Low diversity of fauna species
Rarity	No floral species of conservation importance were recorded. Fauna species of conservation importance recorded during the surveys include: Avifauna – Chinese Pond Heron, Great Egret, Little Egret, Black Kite, Collared Scops Owl, White-throated Kingfisher Reptile – Indo-Chinese Rat Snake Freshwater Community – Tawny Hooktail (Larva)
Re-creatability	Re-creatable as it is a modified watercourse
Fragmentation	Not fragmented from the watercourse in the hilly areas nearby
Ecological Linkage	Not functionally or structurally linked to any nearby highly valuable habitat
Potential Value	Low
Nursery/ Breeding Ground	No significant nursery or breeding ground recorded
Age	Not applicable
Abundance/ Richness of Wildlife	Low
Overall Ecological Value	Low

**Table 7-22 Evaluation of Intertidal Habitat**

Criteria	Intertidal Habitat
Naturalness	Intertidal habitat mainly comprised man-made seawall in close proximity to heavy marine traffic
Size	The length of artificial seawall to be affected is about 1.1 km
Diversity	Low diversity of intertidal fauna and flora
Rarity	No species of conservation importance recorded.
Re-creatability	Artificial seawall is re-creatable
Fragmentation	Not applicable
Ecological Linkage	Not observed
Potential Value	Low
Nursery/ Breeding Ground	Not found
Age	Artificial seawall was created in 1980s about 40 years ago
Abundance/ Richness of Wildlife	High abundance of gastropods, but low species richness.
Overall Ecological Value	Low

Table 7-23 Evaluation of Benthic Environment

Criterion	Benthic Environment
Naturalness	Natural but subject to human disturbance including maintenance dredging associated with existing landfill operation
Size	The area of benthic environment to be affected by the proposed seawall modification / berthing facility is 4.4 ha (including 1.8 ha of permanent habitat loss and 2.6 ha of temporary construction works area).
Diversity	Medium diversity index
Rarity	No species of conservation importance recorded.
Re-creatability	Disturbance is reversible
Fragmentation	Not applicable
Ecological Linkage	Not observed
Potential Value	Low
Nursery/ Breeding Ground	Not found
Age	Not applicable
Abundance/ Richness of Wildlife	Low abundance
Overall Ecological Value	Low

Table 7-24 Evaluation of Sub-tidal Environment

Criterion	Sub-tidal Environment
Naturalness	Artificial shoreline consisted of mainly large boulders
Size	The length of artificial shoreline to be affected is about 1.1 km
Diversity	Very low diversity (1 coral species recorded)
Rarity	The gorgonian coral species is common across Hong Kong waters and tolerant to turbid and harsh environment.



Criterion	Sub-tidal Environment
Re-creatability	Artificial seawall is re-creatable
Fragmentation	Not applicable
Ecological Linkage	Not observed
Potential Value	Low
Nursery/ Breeding Ground	Not found.
Age	Artificial seawall was created in 1980s about 40 years ago
Abundance/ Richness of Wildlife	Very low coverage of < 1%
Overall Ecological Value	Low

7.6.2 Species of Conservation Importance

The species of conservation importance identified within the Assessment Area during the surveys are evaluated in **Table 7-25**, in accordance with Annex 8 of EIAO-TM. The photographic records and the locations of the species of conservation importance for the surveys conducted in 2024 are presented in **Appendix 7A** and **Figure 7.6**, respectively, while that for the surveys conducted in 2023 are presented in **Appendix 7B**.

The isolated patches of unhealthy and small coral colonies of common species identified along the artificial shore of TTAL and Black Point Power Station are regarded as of low ecological value and are not considered as sensitive coral site nor species of conservation importance.



Table 7-25 Evaluation of Species of Conservation Importance recorded during Survey within the Assessment Area

Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
Flora							
Incense Tree	<i>Aquilaria sinensis</i>	<ul style="list-style-type: none"> Protected under Cap. 586 Under State protection (Category II) in China (AFCD, 2003) Listed as "Vulnerable" in China Plant Red Data Book and Included in Illustrations of Rare & Endangered Plant in Guangdong Province Listed as "Vulnerable" in Threatened Species List of China's Higher Plants (2020) Listed as "Vulnerable" in International Union for Conservation of Nature Red List of Threatened Species (IUCN) (2023) Appendix (II) of Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) 	Common in Hong Kong	✓ EIA-155/2008, EIA-171/2009 and EIA-201/2011	-	-	-
Lamb of Tartary	<i>Cibotium barometz</i>	<ul style="list-style-type: none"> Protected under Cap. 586 Listed in AFCD (2003) Rare and Precious Plants of Hong Kong of "Vulnerable" status in China Wild plant under State protection (category II) 	Very common in Hong Kong	✓ DIR-294/2022	-	-	-
Small Persimmon	<i>Diospyros vaccinioides</i>	<ul style="list-style-type: none"> Listed as "Endangered" in Threatened Species List of China's Higher Plants (2020) Listed as "Critically Endangered" in International Union for Conservation of Nature Red List 	Common all around forests and hillslopes of Hong Kong	✓ DIR-294/2022	-	-	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
		of Threatened Species (IUCN) (2023)					
Ixonanthes	<i>Ixonanthes reticulata</i>	<ul style="list-style-type: none"> Listed in AFCD (2003) Rare and Precious Plants of Hong Kong of "Vulnerable" status in China Listed as "Vulnerable" in Threatened Species List of China's Higher Plants (2020) Listed as "Vulnerable" in International Union for Conservation of Nature Red List of Threatened Species (IUCN) (2023) 	Common. Distributed in forests	✓ EIA-171/2009	-	-	-
Pitcher Plant	<i>Nepenthes mirabilis</i>	<ul style="list-style-type: none"> Protected under Cap. 96 and Cap. 586 Listed in AFCD (2003) Rare and Precious Plants of Hong Kong of "Vulnerable" status in China Listed as "Vulnerable" in Threatened Species List of China's Higher Plants (2020) Under Appendix (II) of Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) 	Distribution can be found in Tai Lam Chung, So Kwun Wat, Castle Peak, Lantau Island	✓ EIA-225/2014, EIA-171/2009	-	-	-
Mammal							
Short-nosed Fruit Bat	<i>Cynopterus sphinx</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) 	Very widely distributed in urban and countryside areas throughout Hong Kong.	✓ EIA-237/2016, EIA-225/2014, EIA-171/2009, EIA-125/2006	-	-	-
Chinese Horseshoe Bat	<i>Rhinolophus sinicus</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) 	Widely distributed in countryside areas throughout Hong Kong.	✓ DIR-294/2022	✓	-	-
Intermediate Horseshoe Bat	<i>Rhinolophus affinis</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) Breeding/ roosting site listed as Local Concern by Fellowes et al. 	Widely distributed in countryside areas throughout Hong Kong.	-	✓	✓	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
		(2002)					
Himalayan Leaf-nosed Bat	<i>Hipposideros armiger</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Widely distributed in countryside areas throughout Hong Kong.	-	✓	-	-
Chinese Noctule	<i>Nyctalus plancyi</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) Potential Regional Concern by Fellowes et al. (2002) 	Fairly widely distributed in countryside areas throughout Hong Kong.	-	✓	-	-
Japanese Pipistrelle	<i>Pipistrellus abramus</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) 	Widely distributed throughout Hong Kong.	✓ CE-26/2022 (EP), DIR-294/2022, EIA-237/2016, EIA-225/2014, EIA-171/2009, EIA-155/2008, EIA-125/2006	✓	✓	-
Least Pipistrelle	<i>Pipistrellus tenuis</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) 	Ten-something records found in Nam Chung, Sheung Wo Hang, Lin Ma Hang, Plover Cove Country Park, Yuen Long, Shek Pik, Deep Water Bay, Ho Pui and Ho Chung.	-	✓	-	-
Chinese Pipistrelle	<i>Hypsugo pulveratus</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Only several records in the countryside areas at Ting Kau, Ma On Shan and Lin Ma Hang, and several records of stray individuals inside buildings.	✓ DIR-294/2022	✓	-	-
Pallas's Squirrel	<i>Callosciurus erythraeus</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) 	Fairly widely distributed, with the styani subspecies found in the New Territories (e.g. Tai Lam, Shing Mun and Tai Po Kau), and the thai subspecies found on the Hong Kong Island (e.g. Tai Tam and Pok Fu Lam).	-	✓	-	-
Small Indian Civet	<i>Viverricula indica</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) 	Very widely distributed in countryside areas throughout Hong	✓ EIA-171/2009, EIA-	-	-	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
		<ul style="list-style-type: none"> Vulnerable on Red List of China's Vertebrate (2020) Appendix II of China State Major Protection Status Appendix III of CITES 	Kong, except for Lantau Island.	155/2008			
Small Asian Mongoose	<i>Herpestes javanicus</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) Vulnerable on Red List of China's Vertebrate (2020) Appendix III of CITES 	Fairly widely distributed in countryside areas in the New Territories.	✓ EIA-171/2009	-	-	-
Leopard Cat	<i>Prionailurus bengalensis</i>	<ul style="list-style-type: none"> Protected under Wild Animals Protection Ordinance (Cap. 170) Protected under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) Vulnerable on Red List of China's Vertebrate (2020) Appendix II of CITES 	Widely distributed in countryside areas throughout Hong Kong, except for Lantau Island.	-	✓	-	Scats of Leopard Cat were recorded at Ash Lagoon
Avifauna ^a							
Northern Shoveler	<i>Spatula clypeata</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Abundant winter visitor. Found in Deep Bay area.	-	✓	-	-
Eurasian Wigeon	<i>Mareca penelope</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Winter visitor. Found in Deep Bay area, Tai Lam Chung.	✓ EIA-225/2014	✓	-	-
Eurasian Teal	<i>Anas crecca</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Common winter visitor. Found in Deep Bay area, Shuen Wan, Tai Lam Chung Reservoir, Victoria Harbour, urban parks.	✓ DIR-294/2022	-	-	-
Tufted Duck	<i>Aythya fuligula</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Abundant winter visitor. Found in Deep Bay area, Nam Chung, Starling Inlet.	✓ DIR-294/2022, EIA-225/2014	✓	-	-
Greater Coucal	<i>Centropus sinensis</i>	<ul style="list-style-type: none"> Appendix II of China State Major Protection Status 	Common resident. Widely distributed in Hong Kong.	✓ CE-26/2022 (EP), DIR-294/2022, EIA-225/2014, EIA-171/2009, EIA-155/2008, EIA-125/2006	✓	✓	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
Lesser Coucal	<i>Centropus bengalensis</i>	<ul style="list-style-type: none"> Appendix II of China State Major Protection Status 	Uncommon resident. Widely distributed in Hong Kong.	✓ DIR-294/2022	-	-	-
Eurasian Coot	<i>Fulica atra</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Uncommon winter visitor. Found in Deep Bay area, Plover Cove Reservoir, Shuen Wan.	✓ DIR-294/2022, EIA-171/2009	✓	-	-
Slaty-legged Crake	<i>Rallina eurizonoides</i>	<ul style="list-style-type: none"> Listed as Vulnerable in Red List of China's Vertebrate (2020) 	Locally common breeding season visitor, migrant and scarce winter visitor. Found in Shuen Wan, Tai Mei Tuk catchment, Kadoorie Agricultural Research Centre and Kadoorie Farm & Botanic Garden, Kau To Shan, Ting Kok, Mong Tseng, Lung Fu Shan, Shing Mun Country Park, Hok Tau, Tai Tam Country Park.	-	✓	-	-
Little Grebe	<i>Tachybaptus ruficollis</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Common resident. Found in Deep Bay area.	✓ DIR-294/2022 EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	-	-
Black-winged Stilt	<i>Himantopus himantopus</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Common migrant and winter visitor. Found in Deep Bay area, Long Valley, Kam Tin.	✓ EIA-155/2008	✓	-	-
Little Ringed Plover	<i>Charadrius dubius</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Resident, common winter visitor and passage migrant. Widely distributed in freshwater areas throughout Hong Kong.	✓ EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	-	-
Kentish Plover	<i>Charadrius alexandrinus</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Abundant winter visitor and scarce migrant. Found in Deep Bay area, Chek Lap Kok, Shuen Wan, Sai Kung, Lantau Island.	✓ EIA-225/2014, EIA-171/2009, EIA-155/2008	-	-	-
Common Redshank	<i>Tringa tetanus</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Abundant passage migrant and winter visitor. Found in Deep Bay area.	✓ EIA-155/2008	-	-	-
Wood Sandpiper	<i>Tringa glareola</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Common migrant and winter visitor. Widely distributed in wetland area throughout Hong	✓ EIA-155/2008	-	-	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
			Kong.				
Oriental Pratincole	<i>Glareola maldivarum</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Passage migrant. Found in Mai Po, Tsim Bei Tsui.	-	✓	✓	-
Great Cormorant	<i>Phalacrocorax carbo</i>	<ul style="list-style-type: none"> Potential Regional Concern by Fellowes et al. (2002) 	Common winter visitor. Widely distributed in coastal areas throughout Hong Kong.	✓ DIR-294/2022	-	-	-
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Common resident and migrant. Widely distributed in Hong Kong.	✓ EIA-225/2014, EIA-155/2008	✓	✓	-
Striated Heron	<i>Butorides striata</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Common summer visitor. Widely distributed in Hong Kong.	-	✓	-	-
Chinese Pond Heron	<i>Ardeola bacchus</i>	<ul style="list-style-type: none"> Potential Regional Concern by Fellowes et al. (2002) Breeding/ roosting site listed as Regional Concern by Fellowes et al. (2002) 	Common resident. Widely distributed in Hong Kong.	✓ DIR-294/2022, EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	-	-
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Resident and common passage migrant. Widely distributed in Hong Kong.	✓ EIA-155/2008	-	-	-
Grey Heron	<i>Ardea cinerea</i>	<ul style="list-style-type: none"> Potential Regional Concern by Fellowes et al. (2002) 	Common winter visitor. Found in Deep Bay area, Starling Inlet, Kowloon Park, Cape D'Aguilar.	✓ DIR-294/2022, EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	-	-
Great Egret	<i>Ardea alba</i>	<ul style="list-style-type: none"> Potential Regional Concern by Fellowes et al. (2002) Breeding/ roosting site listed as Regional Concern by Fellowes et al. (2002) 	Common resident, migrant and winter visitor. Widely distributed in Hong Kong	✓ DIR-294/2022, EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	-	-
Little Egret	<i>Egretta garzetta</i>	<ul style="list-style-type: none"> Potential Regional Concern by Fellowes et al. (2002) Breeding/ roosting site listed as Regional Concern by Fellowes et al. (2002) 	Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong.	✓ DIR-294/2022, EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	✓	-
Pacific Reef Heron	<i>Egretta sacra</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Common resident. Widely distributed in coastal area throughout Hong Kong.	✓ EIA-155/2008	-	-	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
		<ul style="list-style-type: none"> Appendix II of China State Major Protection Status 					
Western Osprey	<i>Pandion haliaetus</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Regional Concern by Fellowes et al. (2002) Appendix II of China State Major Protection Status Appendix II of CITES 	Common winter visitor. Widely distributed in coastal areas throughout Hong Kong.	✓ EIA-201/2011	-	-	-
Crested Serpent Eagle	<i>Spilornis cheela</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Listed as "Near Threatened" in International Union for Conservation of Nature Red List of Threatened Species (IUCN) (2023) Local Concern by Fellowes et al. (2002) 	Common resident. Widely distributed in shrublands on hillsides throughout Hong Kong.	-	✓	-	-
Besra	<i>Accipiter virgatus</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Appendix II of China State Major Protection Status Appendix II of CITES 	Common resident and migrant. Found in Tai Po Kau, Deep Bay area, Chek Lap Kok, Cheung Chau, Soko Islands.	-	✓	-	-
Black Kite	<i>Milvus migrans</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Breeding/ roosting site listed as Regional Concern by Fellowes et al. (2002) Appendix II of China State Major 	Common resident and winter visitor. Widely distributed in Hong Kong.	✓ DIR-294/2022, EIA-237/2016, EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	✓	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
		Protection Status • Appendix II of CITES					
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Breeding/ roosting site listed as Regional Concern by Fellowes et al. (2002) Vulnerable on Red List of China's Vertebrate (2020) Appendix I of China State Major Protection Status Appendix II of CITES 	Locally common resident. Widely distributed in coastal areas throughout Hong Kong.	✓ EIA-171/2009, EIA-125/2006	-	-	-
Eastern Buzzard	<i>Buteo japonicus</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Appendix II of China State Major Protection Status Appendix II of CITES 	Common winter visitor. Widely distributed in Hong Kong.	✓ EIA-171/2009	✓	-	-
Northern Boobook	<i>Ninox japonica</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Appendix II of China State Major Protection Status Appendix II of CITES 	Uncommon passage migrant. Found in Stanley, Cheung Chau, Hong Kong University, Zoological and Botanical Gardens, Mount Nicholson, Magazine Gap Road, Barker Road, Tai Koo Shing, Shek Wu Wai, Cloudy Hill, Tung Chung, Mirs Bay.	-	✓	-	-
Collared Scops Owl	<i>Otus lettia</i>	<ul style="list-style-type: none"> Protected under Protection of Endangered Species and Animals and Plants Ordinance (Cap. 586) Appendix II of China State Major Protection Status Appendix II of CITES 	Common resident. Widely distributed in shrubland throughout Hong Kong	✓ EIA-225/2014, EIA-171/2009	✓	✓	-
Brown Fish Owl	<i>Ketupa zeylonensis</i>	<ul style="list-style-type: none"> Protected under Protection of 	Scarce resident. Widely distributed	✓	-	-	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
		<p>Endangered Species and Animals and Plants Ordinance (Cap. 586)</p> <ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) Endangered on Red List of China's Vertebrate (2020) Appendix II of China State Major Protection Status Appendix II of CITES 	in Hong Kong.	VEP-617/2022			
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Common resident. Widely distributed in coastal areas throughout Hong Kong.	✓ EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	✓	-
Black-capped Kingfisher	<i>Halcyon pileata</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) Listed as "Vulnerable" in International Union for Conservation of Nature Red List of Threatened Species (IUCN) (2023) 	Uncommon passage migrant and winter visitor. Widely distributed in coastal areas throughout Hong Kong.	✓ EIA-171/2009	-	-	-
Pied Kingfisher	<i>Ceryle rudis</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Common resident. Widely distributed in lakes and ponds throughout Hong Kong.	✓ EIA-225/2014, EIA-171/2009, EIA-155/2008	✓	-	-
Japanese Paradise Flycatcher	<i>Terpsiphone atrocaudata</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Uncommon passage migrant. Found in Tai Po Kau, Mai Po, Pok Fu Lam, Victoria Peak.	-	✓	-	-
Collared Crow	<i>Corvus torquatus</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) Listed as "Critically Endangered" in International Union for Conservation of Nature Red List of Threatened Species (IUCN) (2023) 	Locally common resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.	✓ DIR-294/2022, VEP-617/2022	✓	✓	-
Zitting Cisticola	<i>Cisticola juncidis</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. 	Common passage migrant and	✓	-	-	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
		(2002)	winter visitor. Widely distributed in grassland throughout Hong Kong	EIA-155/2008			
White-shouldered Starling	<i>Sturnia sinensis</i>	<ul style="list-style-type: none"> Breeding/ roosting site listed as Local Concern by Fellowes et al. (2002) 	Locally common passage migrant and uncommon winter visitor. Found in Kam Tin, Deep Bay area, Po Toi Island, Long Valley, Victoria Park, Ho Chung, Ma Tso Lung, Mui Wo, Lam Tsuen Valley	✓ EIA-225/2014, EIA-155/2008	✓	✓	
Red-breasted Flycatcher	<i>Ficedula parva</i>	<ul style="list-style-type: none"> Appendix III of CITES 	Scarce passage migrant and winter visitor. Found in Po Toi, Shek Kong	-	✓	-	-
Reptile							
Copperhead Racer	<i>Coelognathus radiatus</i>	<ul style="list-style-type: none"> Potential Regional Concern by Fellowes et al. (2002) Endangered on Red List of China's Vertebrate (2020) 	Widely distributed throughout Hong Kong	✓ EIA-155/2008, EIA-171/2009	-	-	-
Indo-chinese Rat Snake	<i>Ptyas korros</i>	<ul style="list-style-type: none"> Potential Regional Concern by Fellowes et al. (2002) Vulnerable on Red List of China's Vertebrate (2020) 	Widely distributed throughout Hong Kong	-	✓	-	-
Butterfly							
Banded Awl	<i>Hasora chromus</i>	-	Rare, distributed in Sham Wat, Lai Chi Wo, Po Toi.	✓ DIR-294/2022, EIA-225/2014	-	-	-
Danaid Eggfly	<i>Hypolimnas misippus</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Uncommon, distributed in Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang.	✓ EIA-155/2008	-	-	-
Forget-me-not	<i>Catochrysops strabo</i>	-	Very rare, distributed in Pui O, Tai Po Kau, Fung Yuen, Shing Mun, Sha Lo Wan.	-	✓	-	-
Glassy Bluebottle	<i>Graphium cloanthus</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Uncommon, distributed in Tai Po Kau, Shing Mun, Cloudy Hill, Kadoorie Farm and Botanic Garden, Lam Tsuen, Lai Chi Hang, Tai Lam Wu.	✓ EIA-155/2008	-	-	-
Little Branded Swift	<i>Pelopidas agna</i>	-	Uncommon; widely distributed throughout Hong Kong.	✓ EIA-155/2008	-	-	-



Common Name	Scientific Name	Protection Status	Distribution, Rarity and other Notes	Literature	Surveys	Presence within Project Site	Remarks
Plain Hedge Blue	<i>Celastrina lavendularis</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Very rare, distributed in Chuen Lung, Kap Lung, Tai Po Kau, Shing Mun Country Park, Tai Lam Country Park, Kadoorie Farm and Botanic Garden, Ngau Ngak Shan.	-	✓	-	-
Small Cabbage White	<i>Pieris rapae</i>	-	Rare, distributed in Shep Mun Kap, Fan Lau, Ngong Ping, Kam Tin, Ho Chung, Luk Keng, Tuen Mun Ash Lagoon.	✓ DIR-294/2022, EIA-225/2014	✓	✓	-
Tiny Grass Blue	<i>Zizula hylax</i>	-	Very rare, distributed in Lung Kwu Tan, Fung Yuen, Sha Lo Wan.	-	✓	✓	-
Odonate							
Coastal Glider	<i>Macrodiplax cora</i>	<ul style="list-style-type: none"> Local Concern by Fellowes et al. (2002) 	Frequents marshes and ponds with dense vegetation, especially adjacent to coastal areas	✓ DIR-294/2022, EIA-225/2014	-	-	-
Freshwater Community							
Tawny Hooktail (Larva)	<i>Paragomphus capricornis</i>	<ul style="list-style-type: none"> Regional Concern by Fellowes et al. (2002) 	Found in woodland streams with fine to coarse sand beds. Recorded in Lion Rock Country Park, Lung Kwu Tang, Sham Tseng, Tai Lam Country Park, Tai Tong and Yeung Ka Tsuen	-	✓	-	-

Note on Conservation status:

^a All birds are protected under Wild Animals Protection Ordinance (Cap. 170)



7.7 Identification and Evaluation of Terrestrial Ecological Impacts

7.7.1 Construction Phase

7.7.1.1 Direct Impact

7.7.1.1.1 Habitat and Vegetation Loss

Potential direct habitat loss (permanent and temporary), including wasteland (18.5 ha), developed area (3.4 ha) and ash lagoon (2.3 ha), is expected to occur within the Project Site. Developed areas are considered to be temporary loss as no habitat change would occur after construction phase and they would be re-provided during the operational phase.

As mentioned in **Section 7.5.1.2.1**, the wasteland at the Middle Ash Lagoon is currently a construction site for the separate Decommissioning Project. The Decommissioning Project is scheduled for completion before the construction of I-PARK2. The potential ecological impacts due to direct loss of existing habitats and removal of existing vegetation in the Middle Ash Lagoon within the Project Site have been addressed and assessed under the Decommissioning Project. The future open filled area (developed area) of the decommissioned Middle Ash Lagoon site within the Project site is expected to have low potential to support vegetation and wildlife.

As mentioned in **Section 7.4.3.1.1**, for the West Ash Lagoon, covering the ash surface with fill materials, as an environmental precautionary measure, has been undertaken and it will then be decommissioned in 2025/2026. The decommissioned West Ash Lagoon would become an open filled area (developed area) by the time when the construction of I.PARK2 commences, which would be expected to have low potential to support vegetation and wildlife.

There was no floral species of conservation importance identified within the Project Site. The existing Project Site supported low floral diversity and low to moderate faunal diversity. The Project construction would cause a loss of 24.2 ha of habitat with limited ecological value. The associated ecological impacts would be **low**.

As mentioned in **Section 2.7.2.1**, temporary off-site works areas may be used for site office, temporary accommodation of labour, open storage of construction materials / equipment, etc. during construction of I-PARK2. Considering the temporary off-site works areas would occupy developed areas and would not involve major construction activities, adverse ecological impact is not anticipated.

The extent of direct habitat loss (permanent and temporary) for each habitat within the Project Site due to the Project is presented in **Table 7-26**.



Table 7-26 Potential Direct Habitat Loss within Project Site

Habitat Type	Wasteland (within Project Site)	Developed Area (within Project Site)	Ash Lagoon (within Project Site)
Habitat Quality	Low	Low	Low (after the decommissioning of the West Ash Lagoon)
Species	No flora species of conservation importance A total of two (2) mammalian species of conservation importance, nine (9) avifauna species of conservation importance, and two (2) butterfly species of conservation importance were recorded.	No flora species of conservation importance No fauna species of conservation importance	No flora species of conservation importance One (1) mammalian species of conservation importance was recorded.
Size/Abundance	Permanent loss of ~18.5 ha Low diversity of flora and fauna	Temporary loss of ~3.3 ha Low diversity of flora and fauna	Temporary loss ⁽²⁾ of ~2.3 ha Low diversity of flora Low to moderate diversity of fauna
Duration	The impact will persist during construction and operational phases	The impact will persist during construction phase	The impact will persist during construction and operational phases
Reversibility	Irreversible	Reversible	Irreversible
Magnitude	Low	Low	Low
Regional significance	Low	Low	Low
Overall Impact Severity	Low	Low	Low
Note: ⁽¹⁾ Wasteland in Middle Ash Lagoon and ash lagoon in West Ash Lagoon would become open filled area (developed area) after the corresponding decommissioning works under separate projects. ⁽²⁾ Works involved (after the West Ash Lagoon is decommissioned) at Ash Lagoon within Project Site include temporary works for access roads, which is temporary in nature, and the area would be reinstated afterwards. However, it should be noted that when the construction of I.PARK2 commences, Ash Lagoon would have already become open filled area (developed area).			

7.7.1.1.2 Direct Impact to Wildlife

The construction activities associated with the development of I-PARK2 could result in direct injury or mortality on fauna species of conservation importance, particularly for the fauna with low mobility, such as amphibian and the juveniles of avifauna. However, low to moderate fauna diversity and abundance were recorded within the Project Site during the ecological surveys,



and the fauna species of conservation importance recorded within the Project site generally are highly mobile. Thus, potential impact of direct injury or mortality due to this Project is considered as **low**.

7.7.1.2 Indirect Impact

7.7.1.2.1 Disturbance Impact to Wildlife

Indirect impacts from disturbances (including human activities, noise from traffic and construction equipment, light and glare from construction site and contaminants in the ash lagoon due to re-suspension and dispersion of pulverized fuel ash (PFA) during construction) to the habitats adjacent to the Project site and their associated fauna would be anticipated.

A large portion of the Assessment Area have been developed and comprises industrial establishments. Woodland and shrubland around the Project site are fragmented by developed areas, engineering slopes and access roads. Currently, wildlife utilizing the Assessment Area is subject to the prevailing high level of disturbance from anthropogenic activities including the operation of T■Park, WENT Landfill, Tsang Tsui Columbarium and BPPS as well as the Nim Wan Road with road traffic to / from the WENT Landfill. As such, most of the habitats identified in the Assessment Area supported only low abundance and low diversity of fauna.

Currently, the nocturnal species of conservation importance recorded in/near the Project site (e.g. *Otus lettia* (Collared Scops Owl), *Pipistrellus abramus* (Japanese Pipistrelle), *Hipposideros armiger* (Himalayan Leaf-nosed Bat)) are already under a certain level of glare disturbance from the existing artificial lighting in the industrial establishments and along Nim Wan Road. With good site practice and proper mitigation measures, it is anticipated that the increase in disturbance during construction phase will not pose significant light and glare impact to these species of conservation importance.

The fauna abundance and diversity recorded during the ecological survey at the West Ash Lagoon are relatively higher. However, the pond-like status was only a transient stage of the overall life-cycle of the West Ash Lagoon. Actually, the West Ash Lagoon was surrendered to the Government in 2023. Covering the ash surface with fill materials, as an environmental precautionary measure, has been undertaken in the West Ash Lagoon which will then be decommissioned in 2025/2026 as discussed in **Section 7.4.3.1.1**. The decommissioned West Ash Lagoon would become a developed area which would be expected to have low potential to support vegetation and wildlife.

Re-suspension and dispersion of pulverized fuel ash (PFA) may arise from the excavation / handling of PFA within the decommissioned ash lagoons and would cause potential disturbance impacts to the wildlife during construction phase. As mentioned in **Section 2.7.2.1**, any PFA excavated from the earth works and construction activities of this Project will be reused for backfilling on-site. No off-site disposal of the PFA is proposed. The dust control



measures described in Section 3.10.1 and 7.10.3.1.1 will serve the purpose of minimizing the re-suspension and dispersion of PFA and associated adverse impact would not be anticipated.

Disturbance including noise, dust, glare and/or human activities may increase during construction phase and potentially affect the animal behaviours. The abundance and distribution of fauna around the Project site might be temporarily reduced. Species recorded in the Assessment Area are considered tolerant of human activities (including the noise / air emissions from the existing vehicles entering/leaving the WENT Landfill) in the current situation. Moreover, these species are already subjected to a certain level of disturbance from the activity of covering the ash surface with fill materials as environmental precautionary measures by other party. The Project construction is not expected to significantly intensify the disturbance impact to wildlife in the areas. On the other hand, fauna recorded in the nearby woodland / shrubland are able to move further away to hillside to the southwest. The overall disturbance impacts from the Project construction are considered **low**.

Potential disturbance to nearby habitats is presented in **Table 7-27**.



Table 7-27 Potential Disturbance to Nearby Habitats within Assessment Area

Habitat Type	Woodland	Plantation	Shrubland	Developed Area	Wasteland	Ash Lagoon	Watercourse
Habitat Quality	Low to Moderate	Low	Low	Low	Low	Low (after the decommissioning of the West Ash Lagoon)	Low
Species	No flora species of conservation importance Fauna species of conservation importance: Japanese Pipistrelle, Least Pipistrelle, Greater Coucal, Black Kite, Red-breasted Flycatcher	No flora species of conservation importance Fauna species of conservation importance: Japanese Pipistrelle, Chinese Pipistrelle, Greater Coucal, Black Kite, Collared Scops Owl	No flora species of conservation importance Fauna species of conservation importance: Chinese Pipistrelle, Black Kite, Crested Serpent Eagle	No flora species of conservation importance Fauna species of conservation importance: Chinese Horseshoe Bat, Himalayan Leaf-nosed Bat, Chinese Noctule, Japanese Pipistrelle, Least Pipistrelle, Chinese Pipistrelle, Little Grebe, Oriental Pratincole, Chinese Pond Heron, Great Egret, Crested	No flora species of conservation importance Fauna species of conservation importance: Intermediate Horseshoe Bat, Chinese Noctule, Japanese Pipistrelle, Least Pipistrelle, Pallas's Squirrel, Greater Coucal, Oriental Pratincole, Black-crowned Night Heron, Little Egret, Black Kite, Collared Scops Owl, White-	No flora species of conservation importance Fauna species of conservation importance: Himalayan Leaf-nosed Bat, Chinese Noctule, Japanese Pipistrelle, Least Pipistrelle, Chinese Pipistrelle, Leopard Cat, Northern Shoveler, Eurasian Wigeon, Tufted Duck, Greater Coucal, Eurasian Coot,	No flora species of conservation importance Fauna species of conservation importance: Chinese Pond Heron, Great Egret, Little Egret, Black Kite, Collared Scops Owl, White-throated Kingfisher, Indo-Chinese Rat Snake, Tawny Hooktail (Larva)



Habitat Type	Woodland	Plantation	Shrubland	Developed Area	Wasteland	Ash Lagoon	Watercourse
				Serpent Eagle, Besra, Black Kite, Northern Boobook, White-throated Kingfisher, Pied Kingfisher, Japanese Paradise Flycatcher, Forget-me-not	throated Kingfisher, Collared Crow, White-shouldered Starling, Tiny Grass Blue, Plain Hedge Blue, Small Cabbage White	Slaty-legged Crake, Little Grebe, Black-winged Stilt, Little Ringed Plover, Black-crowned Night Heron, Striated Heron, Chinese Pond Heron, Grey Heron, Great Egret, Little Egret, Black Kite, White-throated Kingfisher, Pied Kingfisher, Collared Crow, White-shouldered Starling	
Size/ Abundance	~14.2 ha Low to moderate diversity of flora species Low diversity of fauna species	~12.2 ha Low diversity of flora and fauna species	~32.5 ha Low diversity of flora and fauna species	~42.1 ha Low diversity of flora and fauna species	~22.6 ha Low diversity of flora and fauna species	~16.5 ha Low diversity of flora Low to Moderate diversity of fauna species	~1.7 km Low diversity of flora and fauna species



Habitat Type	Woodland	Plantation	Shrubland	Developed Area	Wasteland	Ash Lagoon	Watercourse
Duration	Last during working hours in construction phase						
Reversibility	Reversible, disturbance will be ceased once works stopped/ completed						
Magnitude	Low, as the works of the Project are temporary						
Regional Significance	Low	Low	Low	Low	Low	Low	Low
Overall Impact Severity	Low	Low	Low	Low	Low	Low	Low



7.7.1.3 Habitat Fragmentation and Isolation

Construction activities could lead to a direct 'barrier' effect, where the movement of animals through an area would be obstructed. The division of the habitat may lead to fragmentation and isolation impacts. Habitat fragmentation and isolation may also cause restriction of wildlife to utilize the habitat as foraging and roosting ground and are more sensitive to inactive / less mobile / habitat-specific wildlife (e.g. nests and juveniles of avifauna).

The Project construction would mainly be carried out in the wasteland or developed area, which has low abundance and distribution of wildlife. No nesting or breeding activities were observed in the Project site and the recorded fauna are all highly mobile in the recent surveys. As a result, no unacceptable impact on habitat fragmentation and isolation is anticipated from the Project.

7.7.1.4 Impact on Ecological Carrying Capacity

The Project works would occupy an area with low ecological value (after the decommissioning works at Middle Ash Lagoon and West Ash Lagoon). As presented in **Section 7.7.1.1**, the impact of habitat loss arising from the Project would be low. Reduction of species abundance/diversity due to this Project would be insignificant. No loss of sensitive habitats such as nesting / breeding / feeding grounds are anticipated. The Project would not degrade the overall habitat quality/ ecological function and ecological carrying capacity of the Assessment Area.

7.7.2 Operational Phase

7.7.2.1 Direct Impact

The operation phase activities would be confined to the proposed site boundary. No additional land would be occupied during operation. Hence, no direct impacts are anticipated during the operation phase.

7.7.2.2 Indirect Impact

7.7.2.2.1 Indirect Disturbance Impact to Wildlife

The MSW currently delivered directly to WENT Landfill by land transport will be diverted to I-PARK2. The waste delivery truck trip number per day and waste delivery route would be not much difference for with or without the Project development. As such, the indirect disturbance impact to wildlife associated with the traffic would be considered as insignificant.

Currently, the nocturnal species of conservation importance recorded in/near the Project site (e.g. Collared Scops Owl, Japanese House Bat, Himalayan Leaf-nosed Bat) are already under a certain level of glare disturbance from the existing artificial lighting in the industrial establishments and along Nim Wan Road. It is anticipated that the increase in disturbance



during operational phase will not pose significant light and glare impact to these species of conservation importance.

Air pollutants from stack emissions of the Project may cause indirect impact to the flora and fauna species. With the implementation of air pollution control measures proposed in **Section 3.10.2**, no unacceptable indirect disturbance impact to wildlife would be expected.

The heat and fume from stack emissions of the Project may cause avoidance of the area in vicinity of the stack by avifauna. In view of the immediate dispersion and cooling down of fume at the exhaust, no unacceptable indirect disturbance impact to wildlife would be expected.

As discussed above, the existing fauna recorded in the Assessment Area are currently subject to the prevailing high level of disturbance from existing industrial activities and vehicular traffic to and from the existing WENT Landfill. The recorded species are considered tolerant of similar activities induced by this Project. Little Grebe and ardeids were observed in the West Ash Lagoon during the ecological survey but these species are known to be less susceptible to traffic noise than to human disturbance. Majority of Little Grebe population in Hong Kong is in fact recorded in Deep Bay area other than the ash lagoon. According to the Hong Kong Bird Atlas 2016 -2019, Little Grebe is mainly distributed in the Northern New Territories (e.g. in Mai Po and Sam Po Shue wetland areas) outside the Assessment Area of this EIA. As stated in **Section 7.7.1.2.1**, the pond-like status was only a transient stage of the overall life-cycle of the West Ash Lagoon. The decommissioned West Ash Lagoon would become a developed area which would be expected to have low potential to support vegetation and wildlife. The additional disturbance impact induced by this Project upon the habitats within the West Ash Lagoon would be **low**.

The fauna diversity and abundance in other parts of the Assessment Area are generally low. In view of the intermittent nature of increase in human disturbance, and the presence of alternative habitat nearby, the disturbance impact to fauna recorded in other habitats such as the nearby fragmented woodland and shrubland is also expected to be **low**.

7.8 Identification and Evaluation of Potential Marine Ecological Impacts

7.8.1 Construction Phase

7.8.1.1 Direct Loss of Artificial Seawall and Nearby Marine Habitat

Direct loss of artificial seawall and marine habitat would arise from the proposed seawall modification and new berthing facility for I-PARK2. The proposed marine works are however minor in scale. The marine habitat to be affected during the construction phase is about 4.4



ha (including 1.8 ha of permanent habitat loss and 2.6 ha of temporary construction works area).

The affected area including the artificial seawall and nearby marine habitat has a low ecological value and represents only a minimal portion of Deep Bay.

No species of conservation importance nor recognized sites of conservation importance would be directly affected by the proposed marine construction works. No unacceptable direct marine ecological impact is anticipated during the construction phase.

7.8.1.2 Indirect Water Quality Changes

7.8.1.2.1 Land-based Construction

Discharge from land-based construction works of the Project (including wastewater generated from construction activities, construction site run-off, accidental chemical spillage, sewage effluent from construction workforce, etc.) may cause a temporary increase in water pollution level, if uncontrolled. With the implementation of appropriate measures to control run-off and wastewater from the construction site, as well as the adoption of the relevant guidelines and good site practices for handling and disposal of construction discharges (recommended under the water quality impact assessment in **Section 5.8**), no unacceptable impacts on water quality and marine ecology due to water quality deterioration by land-based construction works would arise.

7.8.1.2.2 Marine Construction

Indirect water quality impact would arise from the seawall modification and construction of new berthing facility for I-PARK2. Details of potential water quality impacts arising from the marine construction works are presented in **Section 5.5.1.7** and **Section 5.7.1.6**. A summary of the potential indirect water quality impact is presented as follows.

Deep Cement Mixing

The non-dredged method, i.e. Deep Cement Mixing (DCM), will be adopted for construction of the foundation for the proposed seawall modification and berthing facility. The DCM involves injecting controlled volumes of cement into the underlying materials whilst simultaneously mixing the cement with the *in-situ* materials to improve their strength. The DCM method enables *in-situ* stabilisation of the underlying sediments without excavation, dredging, shoring or dewatering, and thus there is less exposure of wastes to the water environment. By placing the sand blanket layer on top of the DCM works areas before the DCM treatment as proposed in the construction design, release of fines and cement slurry from the DCM operation and the associated water quality impact would be negligible.

Suspended Solids



The proposed sand blanket laying work would potentially cause a release of fines into the water column and increase the Suspended solid (SS) level in the marine water. Marine organisms such as fish and sessile filter feeders would be susceptible to elevated SS in the water column through smothering and clogging of their respiratory and feeding apparatus. Elevation of SS in marine environment could lead to lethal (e.g. mortality) and sub-lethal (e.g. respiratory distress, adverse growth and development) effect on marine life. The threshold value of SS elevations is 30% increase from ambient level in accordance with the Water Quality Objective (WQO) stipulated under the Water Pollution Control Ordinance (WPCO) as presented in **Section 5.6.2.2.2**.

Potential impacts on benthic organisms, e.g. seagrass, may arise through excessive sediment deposition. Increased loading of fine sediments is often implicated in seagrass declines (Thrush et al. 2004). The magnitude of the potential impacts is assessed based on the predicted sedimentation rate. There is no existing legislative standard on sedimentation rate in Hong Kong. The reference criterion of no more than 100 g/m²/day, as adopted in other recent EIA projects, is employed in this EIA for protecting the sediment sensitive ecological resources as presented in **Section 5.3.5**.

The possible SS elevation and sedimentation impact caused by the small-scale sand blanket laying work was quantitatively assessed by mathematical modelling. Mitigation measure including deployment of silt curtain around the marine construction works is recommended to minimize the SS and sedimentation impact upon the marine ecological receivers including the mudflat / seagrass / horseshoe crab at Ha Pak Nai (E1) and Sheung Pak Nai (E2) as well as the SCLKCMP (E3). Based on the modelling results for mitigated scenarios as presented in **Table 5-17** and **Table 5-18**, the maximum SS elevation predicted at all identified marine ecological sensitive receivers (E1, E2 and E3) is no more than 0.1 mg/L. The predicted SS elevations are considered minimal and well within the respective WQO. Under the mitigated scenarios, the predicted maximum sedimentation rate at the nearest marine ecological receiver i.e. seagrass identified in Ha Pak Nai (E1) is less than 3 g/m²/day, which is considered negligible as compared to the criterion of 100 g/m²/day.

As shown in the model contour maps in **Appendix 5G**, the sediment plumes generated from the Project is considered localized and confined near the marine works area of the Project.

No unacceptable water quality impact on marine ecology is predicted from the Project.

Dissolved Oxygen

Dissolved oxygen (DO) is essential to marine life and a key health indicator of the marine ecosystem. Dispersion of SS may release sediment-bounded pollutant into the water column. Readily-biodegradable organic compounds could be taken up by micro-organism and result in DO depletion.



An assessment of DO depletion during sand blanket laying was conducted (see **Section 5.7.1.6.2**). The maximum DO depletion was estimated to be <0.01 mg/L at all identified marine ecological sensitive receivers (E1, E2 and E3) under the mitigated scenario. The transient DO depletion of <0.01 mg/L would cause negligible impact upon the marine ecological resources.

7.8.2 Operational Phase

7.8.2.1 Permanent Loss of Artificial Seawall and Nearby Marine Habitat

Due to the seawall modification and new berthing facility of I-PARK2, there will be a permanent loss of artificial seawall and marine habitat along the shore of the Middle Ash Lagoon and West Ash Lagoon. The affected area is small of about 1.8 ha. Its marine ecological value is also low.

No species of conservation importance nor recognized sites of conservation importance would be directly affected by the seawall modification and new berthing facility. No unacceptable direct marine ecological impact is anticipated from the Project operation.

7.8.2.2 Impingement and Entrainment of Ecological Resources

The proposed desalination plant and seawater cooling system of the Project would require seawater intakes. The proposed seawater intakes of the Project would be located at the modified seawall of Middle Ash Lagoon.

The design flow rate of seawater intake of this Project would be $4,000 \text{ m}^3$ per day for the proposed desalination plant. There would be seasonal variation of the design effluent flow of the proposed seawater cooling system as detailed in **Appendix 5F**. The annual average effluent flow would be about $1.1\text{M} \text{ m}^3$ per day. Direct ecological impact due to impingement and entrainment of marine life in the intake systems is considered possible. Impingement may cause physical damage to marine life due to collision with the screening system of the intake. Entrainment would mainly affect any small marine organisms, planktonic larvae, crustaceans and eggs, which are small enough to pass through the intake screen mesh.

Based on all past and recent marine ecological survey results, the existing abundance and diversity of marine life along the sloping artificial seawall of TTAL was low. The proposed seawater intake would be installed at the modified seawall of the Middle Ash Lagoon, which supports limited marine ecological resources. No recognized sites of conservation importance nor species of conservation importance are located at or near the proposed seawater intake systems. The nursery grounds for juvenile horseshoe crabs at Ha Pak Nai is approximately 2km away from the intake. No recognized site of conservation importance would be affected by the intake. Any potential impact on local marine ecological resources due to impingement and entrainment of the proposed seawater intake is considered minor and acceptable.



7.8.2.3 Indirect Water Quality Changes

7.8.2.3.1 Discharges from Desalination and Seawater Cooling Systems

The key water quality concern would be the discharges from the proposed desalination plant and seawater cooling system of the Project.

The proposed desalination plant will provide freshwater supply to the I-PARK2. Brine is an unavoidable product of the desalination process and would be discharged into the marine water via the seawall outfall.

The proposed seawater cooling system is considered one of the feasible cooling options for I-PARK2. It would abstract seawater for exchange of the heat from the low-pressure steam generated in incineration process. The spent cooling water would also be discharged back into the sea via the seawall outfall.

Chlorine will be used as an anti-fouling agent for the proposed desalination and seawater cooling systems. Sodium Metabisulphite (SMBS) may be dosed and used for dechlorination in the proposed seawater intake and outfall systems as required.

The proposed seawall outfall discharges could have negative effects on the surrounding marine environment and its marine life due to the increased salinity / temperature, as well as the presence of Total Residual Chlorine (TRC) in the effluent discharges. Elevated salinity and temperature could inhibit the growth and reproduction of marine ecological resources. TRC is potentially toxic to marine life. The SMBS is decayable and non-toxic to aquatic life (refers to **Section 5.5.2.2.3**). SMBS is a reducing agent and therefore the key concern would be its potential contribution to an increase in chemical oxygen demand and possible DO depletion the water column.

TRC

The TRC is subject to continuous decay once they are dosed in the seawater system and will continue to decay after it is discharged into the marine environment. Based on the water quality modelling results as presented in **Table 5-21** and **Table 5-22**, the maximum 4-day average TRC level and the maximum 1-hour average TRC level predicted at all identified marine ecological receivers (E1, E2 and E3) is 0.0001 mg/L and 0.0002 mg/L, which are the well below criteria value of 0.0075 mg/L and 0.013 mg/L respectively.

The model contour maps in **Appendix 5H-1** showed that the mixing zone for mean TRC level caused by the Project is localized and confined close to the Project site.

Temperature and Salinity

The annual maximum temperature elevations predicted at all identified marine ecological sensitive receivers (E1, E2 and E3) are no more than 0.8 °C, which is well within the WQO of no



more than 2 °C (see **Table 5-23**). The annual maximum salinity changes at these ecological sensitive receivers (E1, E2 and E3) are no more than 2%, which is also well below the WQO of no more than 10% (see **Table 5-26**).

The average levels of temperature rises and salinity changes are well within their respective WQOs in areas close to the Project discharges as shown in the model contour plots in **Appendix 5H-2** and **Appendix 5H-3**.

Dissolved Oxygen

As presented in **Section 5.7.2.1.5**, the maximum DO depletion caused by the SMBS discharge would be less than 0.004 mg/L at all identified marine ecological receivers (E1, E2 and E3). The predicted DO depletions are considered negligible as compared to the ambient levels, which ranged from 4.29 mg/L to 4.73 mg/L at E1, E2 and E3. No adverse DO impact on marine ecology is predicted.

Summary

Full water quality compliances on TRC, temperature and salinity are predicted at all the identified ecological sensitive receivers. In addition, the brine and spent cooling effluent discharges would not cause any adverse DO impact. No species nor sites of conservation importance are identified near the proposed seawall discharges in Deep Bay. No unacceptable marine ecological impact is predicted.

7.8.2.3.2 Wastewater Generation

Wastewater, which may contain SS, BOD₅, COD, ammonia, organic contaminants (including POPs), heavy metals and other contaminants, and sewage arising from operation of the Project shall be treated for reuse within I-PARK2 or discharged into the existing Urmston Road Submarine Outfall in the North Western Water Control Zone (NWWCZ) outside Deep Bay after meeting relevant standards. The quantity of effluent discharge from I-PARK2 to NWWCZ would be about 3,000 m³ per day. A discharge licence for discharge of effluent from I-PARK2 shall be applied under the WPCO. The discharge is subject to control of the WPCO and shall meet the terms and conditions in the licence. As presented in **Section 5.7.2.4**, the scale and pollution loading contribution from the effluent discharge are small and provided that the discharge shall comply with the WPCO licence requirements, no adverse water quality impact upon the marine water in NW WCZ is expected. Thus, there would be no additional marine ecological impact in NWWCZ.

7.8.2.3.3 Maintenance Dredging

Under the current operation, most of the municipal solid waste (MSW) is delivered to the West New Territories (WENT) Landfill via marine route. This marine route passes through the seafront of the I-PARK2 site. During the operational phase of I-PARK2, MSW will be delivered



to I-PARK2 using the same marine route. Maintenance dredging of the existing marine route to facilitate navigation of waste delivery vessels to and from the proposed berthing facility may be required on an as-needed basis subject to the seabed level, which would be similar to the current operation associated with the WENT Landfill. As only very infrequent maintenance dredging is required to maintain the water depth along the existing marine route, the associated water quality impact would be minor. Since the maintenance dredging work is an existing operation, any future maintenance dredging during the I-PARK2 operation would not create any additional water quality impact. The water quality impacts would be similar to those under the existing baseline scenario. No additional marine ecological impact would arise from the maintenance dredging of I-PARK2.

7.8.2.4 Change of Hydrodynamics Regime

The proposed brine and heated cooling water discharges together with the changes of coastline configuration due to the proposed seawall modification and berthing facility of I-PARK2 may change the hydrodynamic regime in Deep Bay. Significant changes of the hydrodynamic conditions may affect the dispersion of pollutants and the water quality in the Assessment Area. Hydrodynamics modelling was carried out to address the potential impact. The change of coastline configuration due to the seawall modification and berthing facility together with all the Project discharges were incorporated / input into the model for cumulative assessment. Based on the cumulative hydrodynamics modelling results presented in **Section 5.7.2.2**, the predicted flow regime and hydrodynamics conditions are similar before and after the I-PARK2 implementation. No marine ecological impact with respect to the hydrodynamics change would occur.

7.9 Summary of Potential Ecological Impacts

The potential direct and indirect ecological impacts arising from the proposed Project works are assessed and summarized in **Table 7-28** below.



Table 7-28 Summary of Predicted Potential Ecological Impacts

Description of Impact	Habitat Quality	Species	Size/Abundance	Duration	Reversibility	Magnitude	Regional Significance	Overall Impact Severity
<u>Terrestrial Ecology</u>								
Construction Phase								
Direct impact of habitat loss within the Project site	* Wasteland / developed area: low; ash lagoon: low (after the decommissioning of the West Ash Lagoon)	Low flora diversity and low to moderate fauna diversity	Wasteland: 18.5 ha; developed area: 3.3 ha; ash lagoon: 2.3 ha	Developed area / ash lagoon: temporary; Wasteland: permanent	Developed area: reversible; Wasteland / ash lagoon: irreversible	Low	Low	Low (due to generally low ecological value of affected habitat)
Direct impact to wildlife within the Project site	* Wasteland / developed area: low; ash lagoon: low (after the decommissioning of the West Ash Lagoon)	Terrestrial fauna	"Low" to "low to moderate" abundance	Permanent	Irreversible	Low	Low	Low (due to generally low fauna abundance and diversity and high mobility of recorded species)
Indirect disturbance impact to wildlife during construction phase	"low" to "low to moderate" (for habitats within Assessment Area)	Terrestrial fauna	"Low" to "low to moderate" abundance	Temporary during construction hours	Reversible	Low during construction hours; very low during non-construction hours	Low	Low (due to the general low fauna diversity and abundance within the Assessment Area; the ability of fauna to move away from source of disturbance; and availability of alternative habitats nearby)



Description of Impact	Habitat Quality	Species	Size/Abundance	Duration	Reversibility	Magnitude	Regional Significance	Overall Impact Severity
Habitat fragmentation and isolation	* Wasteland / developed area: low; ash lagoon: low (after the decommissioning of the West Ash Lagoon)	Terrestrial fauna	"Low" to "low to moderate" abundance	N/A	N/A	N/A	N/A	Impact not expected
Impact on ecological carrying capacity	"Very low" to "low to moderate" (for habitats within Assessment Area)	Terrestrial fauna	"Low" to "low to moderate" abundance	N/A	N/A	N/A	N/A	Impact not expected
Operation Phase								
Indirect disturbance impact to wildlife during operational phase	"Very low" to "low to moderate" (for habitats within Assessment Area)	Terrestrial fauna	"Low" to "low to moderate" abundance	Permanent	Irreversible	Low	Low	Low (due to the general low fauna diversity and abundance within the Assessment Area; the ability of fauna to move away from source of disturbance; and availability of alternative habitats nearby)
<u>Marine Ecology</u>								
Construction Phase								
Direct loss of artificial seawall and marine habitat	Low (for artificial seawall and nearby marine habitat)	Low diversity of intertidal fauna and flora	4.4 ha (including 1.8 ha of permanent habitat loss and 2.6 ha of temporary)	Permanent (for seawall modification / berthing facility)	Irreversible (for seawall modification)	Low	Low	Low (due to low ecological value of affected habitat)



Description of Impact	Habitat Quality	Species	Size/Abundance	Duration	Reversibility	Magnitude	Regional Significance	Overall Impact Severity
along the ash lagoons			construction works area)	Temporary (for temporary works area)	and berthing facility) Reversible (for temporary works area			and small size of habitat loss of 4.4 ha)
Indirect water quality changes during marine construction	Low (for habitat near marine construction)	Low (for habitat near marine construction)	Low	Temporary	Reversible	Very low	Very low	Negligible (due to the minor scale of marine construction and predicted negligible changes of water quality, i.e. SS, sedimentation rates and DO, at all identified ecological sensitive receivers)
Operation Phase								
Direct loss of artificial seawall and marine habitat along the ash lagoons	Low (for artificial seawall and nearby marine habitat)	Low (for artificial seawall and nearby marine habitat)	1.8 ha	Permanent	Irreversible	Low	Low	Low (due to low ecological value of affected habitat and small size of habitat loss of 1.8 ha)
Impingement and entrainment of marine life in proposed seawater intake systems	Low (for habitat at or near the seawall intake)	Low (for habitat at or near the seawall intake)	Low	Permanent	Irreversible	Low	Low	Low (due to low ecological sensitivity at and near the seawall intake and large separation distances from the recognized sites or



Description of Impact	Habitat Quality	Species	Size/Abundance	Duration	Reversibility	Magnitude	Regional Significance	Overall Impact Severity
								species of conservation importance)
Indirect water quality changes due to brine and spent seawater cooling water discharges	Low (for habitat at or near the effluent discharges)	Low (for habitat at or near the effluent discharges)	Low	Permanent	Irreversible	Low	Low	Low (due to low ecological sensitivity of affected marine water and full water quality compliances predicted at all identified ecological sensitive receivers)
Indirect water quality changes due to maintenance dredging	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Impact not expected
Change of Hydrodynamics Regime	N/A	N/A	Low	N/A	N/A	N/A	N/A	Impact not expected

Note:

* Wasteland in Middle Ash Lagoon and ash lagoon in West Ash Lagoon would become open filled area (developed area) after corresponding decommissioning works under separate projects.

- N/A: Not Applicable



7.10 Mitigation Measures

7.10.1 Introduction

The feasibility, practicability, programming and effectiveness of the recommended mitigation measures have been reviewed by engineer. In accordance with the guidelines in Annex 16 of the EIAO-TM, the general policy for alleviating mitigating impacts on important habitats and wildlife in order of priority are avoidance, minimization and compensation.

7.10.2 Avoidance

7.10.2.1 Terrestrial Ecology

The Project would avoid direct impacts on terrestrial natural habitats (i.e. woodland / shrubland and natural streams) and recognized site of conservation importance.

7.10.2.2 Marine Ecology

Non-dredged method will be adopted for the proposed marine construction works to prevent mud dredging and seabed disturbance. Potential marine ecological impacts due to the release of bed sediments and any sediment-bound contaminants would be avoided.

The marine construction works would be confined in close vicinity of the artificial seawall of Middle Ash Lagoon and West Ash Lagoon with low ecological value, and thus avoiding the potential impacts to natural shores and areas with high ecological sensitivity. The associated water quality changes, in terms of SS elevation, sedimentation and DO depletion, are predicted to be localized.

As presented in **Sections 5.7.2.3** and **5.7.2.4**, wastewater and sewage arising from operation of the Project shall be treated for reuse within I-PARK2 or discharged into the existing Urmston Road Submarine Outfall in the NWWCZ outside Deep Bay after meeting relevant standards. The receiving water in NWWCZ is an open water with strong tidal flushing to assimilate the effluent discharge. The proposed wastewater treatment and management scheme would avoid adverse marine ecological impact in the sensitive Deep Bay water.

The proposed seawater intake and outfall systems of the Project are isolated systems and free from any process water, MSW, leachate, ash and domestic sewage. Discharges from these seawater intake and outfall systems are predicted to cause only localized and insignificant water quality changes in Deep Bay.



7.10.3 Minimization

7.10.3.1 Terrestrial Ecology

7.10.3.1.1 Construction Phase

Precautionary Site Check(s)

As a precautionary measure, site check(s) by qualified ecologist(s) before commencement of the construction phase are recommended to be carried out to confirm that there is no breeding activity of avifauna species of conservation importance within the Project site. A report shall be prepared after the site check to keep record of relevant information (e.g. date & time, route, personnel, results & etc.).

Environmental Awareness and Construction Works Boundary

In general, as mentioned, disturbance can be in the form of human activities (construction workers), noise, run-off and dust. Construction workers should be briefed regarding the ecological resources in the nearby areas before the commencement of the works and requested not to disturb any nearby ecological sensitive areas. Furthermore, the works boundary of the Project construction should be clearly defined (i.e. fenced with screening materials) and any works beyond the boundary should be strictly prohibited.

Consideration of Alternative Piling Method

Quieter (non-percussive) piling method, namely pre-bored steel H piles is proposed for the foundation construction of this Project to minimize the noise disturbances to the nearby habitats. Pre-bored steel H piles would involve a hole (usually 600mm dia.) formed by rotary drill into the ground and to the rock where the upper section in soil is supported by a steel casing. The steel H piles is then inserted and grout is pumped into the hole while the steel casing is removed. No percussive action is required for forming the holes. Based on the preliminary Ground Investigation (GI) data, this quiet piling method is suitable at the Project site.

Good Site Practices

Good site practice and noise management techniques should be adopted to reduce the noise impact from construction site activities. The following measures should be practised during construction.

- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme
- Machines and plant (such as trucks, breakers) 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, where possible, be orientated so that the noise is directed away from the nearby ecological sensitive areas and woodland
- Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works
- Mobile plant should be sited as far away from nearby ecological sensitive areas as possible and practicable
- Material stockpiles, site office and other structures should be effectively utilized, where practicable, to screen noise from on-site construction activities

Use of Quality Powered Mechanical Equipment

The Quality Powered Mechanical Equipment (QPME) system was developed by EPD to benchmark construction equipment items which are notably quieter and more environmentally friendly. The Contractor should source quiet plant associated with the construction works from the Powered Mechanical Equipment (PME) listed in the QPME system and other commonly used PME listed in EPD web pages as far as possible.

Control of Construction Site Run-off

As recommended in Section 5.8.1.1, the relevant best practices including the requirements specified in the Professional Persons Environmental Consultative Committee Practice Note on Construction Site Drainage (ProPECC PN 2/23) should be followed to minimize the water quality impacts. All temporarily exposed surfaces, dusty stockpiles and earth working areas should be securely covered immediately after the works have been completed to prevent soil erosion. Earthwork final surfaces should be well compacted and subsequent permanent work or surface protection should be immediately performed. The construction site run-off should be collected by the temporary drainage system installed by the Contractor and then treated on-site before discharging into the storm drains via silt removal facilities.

Construction Dust Suppression Measures

The dust control measures stipulated in the Air Pollution Control (Construction Dust) Regulations should be implemented for the construction of the proposed Project, where applicable, to minimize the construction dust impacts. Key mitigation measure include regular watering of exposed site surfaces and dusty materials, avoidance or covering open dusty material and stockpiles, tarpaulin covering of all dusty vehicle loads transported to, from and between site locations and establishment and use of vehicle wheel washing facilities at the exit points of the construction site.

Light and Glare Control Measures

All lights provided in the Project site should have the following features to minimize light and glare impact:



- The number of lighting should be kept minimum.
- The lux level should be designed just sufficient for safety purpose.
- Light should be pointed towards the Project site to minimize light spill outside the Project boundary.
- Where light has to be pointed upward, the light direction should be adjusted to minimize light spillage outside the Project site.
- Light should be shielded with hood to prevent sky glow.

7.10.3.1.2 Operational Phase

During the operational phase, quieter equipment for fixed noise sources shall be adopted as far as practicable. Air pollution control measures, such as bag filter for particulates removal, would be implemented for the I-PARK2 operation as presented in the Air Quality Impact Assessment of this EIA. Mitigation measures such as landscape planting are recommended in the Visual Impact Assessment of this EIA to screen the visual interface and limit public access to the nearby habitat and the associated wildlife. Best Management Practices (BMP) would be implemented during the Project operation to control non-point source surface runoff as presented in the Water Quality Impact Assessment. The light and glare control measures as described in **Section 7.10.3.1.1** should be implemented in the I-PARK2 site. These mitigation and design measures are considered sufficient for mitigating the potential disturbance impacts.

7.10.3.2 Marine Ecology

7.10.3.2.1 Construction Phase

The design and mitigation measures for the proposed marine construction works and good site practices for construction vessels recommended in the water quality impact assessment in **Section 5.8** will also serve to protect marine ecological resources and ensure no unacceptable impact on marine life. Further minimization measure specific to marine ecology is considered not necessary.

7.10.3.2.2 Operational Phase

The effect on marine ecology due to the Project operation is predicted to be minor and acceptable. The ecological value of the affected marine habitat is low. No marine ecological mitigation measures are proposed.

7.10.4 Compensation

No loss of habitat or species of conservation importance due to the Project is anticipated. Compensation measure is considered not necessary.



7.11 Evaluation of Cumulative Impacts

7.11.1 Terrestrial Ecology

7.11.1.1 Direct Habitat Loss

I-PARK2 would cause a direct habitat loss of an open filled area (developed area) with limited ecological value (after the decommissioning works at Middle Ash Lagoon and West Ash Lagoon). The associated direct ecological impact would be considered negligible and thus would not induce any unacceptable cumulative habitat loss with other concurrent projects in Tsang Tsui.

7.11.1.2 Indirect Disturbances During Construction and Operational Phases

The I-PARK2 construction and operation would coincide with the construction / implementation programmes of WENTX as well as Decommissioning of West Ash Lagoon in Tsang Tsui.

The construction and operational activities of I-PARK2 would be confined within the Middle Ash Lagoon. Mitigation and design measures would be implemented for I-PARK2 as presented in **Section 7.10**. The potential disturbance impact from I-PARK2 is expected to be localized with mitigation measures in place.

According to the approved EIA report (AEIAR-147/2009) and Supporting Document for Variation of Environmental Permit for the WENTX in 2022, mitigation measures and good site practices are also recommended for WENTX to control their environmental impacts including but not limited to the following:

- Establish tree buffer planting at the early stage of WENTX
- Establish an earth bund along existing Nim Wan Road prior to the commencement of the WENTX operation to shield the potential disturbance from the landfill

Mitigation measures and good site practices would be implemented for the Decommissioning of West Ash Lagoon in Tsang Tsui. The mitigation measures would reduce predicted disturbance impacts to an acceptable level.

With proper implementation of mitigation and design measures recommended under this EIA, the I-PARK2 development would not contribute any unacceptable cumulative disturbance impacts with the concurrent projects in Tsang Tsui.



7.11.2 Marine Ecology

7.11.2.1 Construction Phase

The potential marine ecological impact generated from the Project construction would be localized and insignificant. No concurrent marine construction activities are identified during the construction phase of the Project. No unacceptable cumulative marine ecology impact would arise during the construction phase.

7.11.2.2 Operational Phase

The indirect water quality impact from the Project operation is predicted to be localized. The marine ecological impact due to the direct loss of marine habitat along the artificial shore of Middle Ash Lagoon and West Ash Lagoon is also considered insignificant. Therefore, the Project operation would not contribute any unacceptable cumulative marine ecological impact.

7.12 Residual Ecological Impacts

7.12.1 Terrestrial Ecology

A direct loss of 24.2 ha of habitat would be resulted from the Project development. The affected habitat is considered to be of limited ecological value. Therefore, the residual impact due to this direct habitat loss is considered as acceptable.

With the proper implementation of mitigation measures suggested in **Section 7.10**, potential disturbance impact to the wildlife in the nearby habitats would be minimized and the residual impact is considered to be acceptable during the construction and operational phases.

7.12.2 Marine Ecology

The overall impact severity for the loss of marine habitat during construction and operational phases, the impingement and entrainment effect due to the operation of the proposed seawater intake systems as well as the indirect water quality changes during the construction and operational phases have been assessed to be low to negligible. No unacceptable residual marine ecological impact is predicted.

7.13 Environmental Monitoring and Audit (EM&A)



Requirement

7.13.1 Terrestrial Ecology

The ecological impacts of the proposed Project have been evaluated in this assessment. It is concluded the overall impacts on terrestrial ecology would be of low to negligible significance and no unacceptable impact is anticipated with mitigation measures in place. The recommended mitigation measures and good site practices as presented in **Section 7.10** should be audited regularly as part of the EM&A programme during the construction phase.

As for operational phase, mitigation measures proposed under Air Quality Impact Assessment, Landscape and Visual Impact Assessment, Water Quality Impact Assessment would also serve to mitigate indirect disturbance impacts to ecology. These assessments already have their own EM&A requirement. Therefore, no EM&A requirement specific to terrestrial ecology is proposed for operational phase.

7.13.2 Marine Ecology

Water quality monitoring and audit programmes are proposed during the construction and operational phases of the Project to verify the water quality predictions and the effectiveness of the recommended water quality mitigation measures and good site practices. A summary of the water quality monitoring programmes is presented in **Section 5.11**. Details of the EM&A programmes are presented in the standalone EM&A Manual. Discharge license(s) should be obtained under the WPCO for all effluent discharges from the Project. Monitoring of the effluent discharges shall be carried out in accordance with requirements stipulated in the WPCO discharge licenses. No monitoring specific to marine ecology is required for the Project.

7.14 Conclusion

7.14.1 Terrestrial Ecology

The proposed Project would cause a direct loss of about 24.2 ha of habitat, including 18.5 ha of wasteland (permanent), 3.3 ha of developed area (temporary), and 2.3 ha of ash lagoon (temporary) in the Project Site but most of the wasteland and ash lagoon would become open filled area (developed area) after decommissioning works in Middle Ash Lagoon and West Ash Lagoon before commencement of the Project.

The construction activities associated with the development of I-PARK2 could result in direct injury or mortality on wildlife, particularly for the fauna with low mobility, such as amphibian and the juveniles of avifauna. As low to moderate fauna diversity and abundance were recorded within the Project Site and the fauna recorded within the Project Site generally are highly mobile, the direct impact to wildlife due to the Project is expected to be low.



Indirect impacts would include noise and human disturbance, air pollutants and site runoff etc. during construction and operational phases. The potential disturbance impacts can however be mitigated through the implementation of good site practices and design measures recommended in this EIA.

With proper implementation of the recommended mitigation measures, no unacceptable terrestrial ecological impact due to the construction and operation of I-PARK2 would be expected. The implementation of mitigation measures during the construction phase would be subject to regular audit as part of the EM&A programme.

7.14.2 Marine Ecology

The Project would cause a minor loss of marine habitat along the artificial shore of Middle Ash Lagoon and West Ash Lagoon due to the construction and operation of the seawall modification and new berthing facility. The affected area would be small of 4.4 ha during the construction phase and 1.8 ha during the operational phase. The ecological value of the affected habitat would also be low. The loss of marine habitat caused by this Project is considered insignificant.

Marine construction works have been designed to reduce potential impacts on the water quality which will, in turn, reduce impacts on marine ecological resources. Indirect water quality changes to marine life in terms of SS elevations, sedimentation rates and DO depletion arising from the proposed marine construction works are predicted to be insignificant. The predicted water quality changes are short term and localised to immediate vicinity of the works area. No adverse water quality impact is predicted at all identified marine ecological sensitive receivers.

During the operational phase, the water quality effects due to the brine and seawater cooling effluent discharges would be localised in close vicinity of the seawall outfalls. Wastewater and sewage arising from operation of the Project shall be treated for reuse within I-PARK2 or discharged into the existing Urmston Road Submarine Outfall in the NWWCZ with high tidal flushing and pollutant assimilation capacity. Discharge licenses should be obtained under the WPCO for all effluent discharges from the Project and effluent monitoring programme should be implemented in accordance with the WPCO license requirements. No adverse water quality impact due to the effluent discharges are predicted at all identified marine ecological sensitive receivers during the Project operation.

No marine species nor recognized sites of conservation importance are located at and near the I-PARK2 site. No significant impacts are expected due to the impingement and entrainment of marine life in the proposed seawater intake systems of the Project.



No unacceptable marine ecological impact is predicted during the construction and operational phases of the Project. Water quality monitoring and audit programme would be implemented during the construction and operational phases to verify the water quality predications and effectiveness of the recommended mitigation measures.

7.15 References

1. Agriculture, Fisheries and Conservation Department (AFCD). (2002). Consultancy Study on Marine Benthic Communities in Hong Kong. (AFCD 2002)
2. AFCD. (2010). Internal Biodiversity Survey in 2010 (unpublished). (AFCD 2010)
3. AFCD. (2011b). Newsletter Issue No. 21: A Review of the Local Restrictedness of Hong Kong Butterflies. (AFCD 2011b)
4. AFCD. (2022). Monitoring of Marine Mammals in Hong Kong Waters (2022-23). (Contract Ref.: AFCD/SQ/260/20/C). Final Report (1 April 2022 to 31 March 2023). (AFCD 2023)
5. AFCD. (2023a). Mangroves in Hong Kong. Distribution. [online] https://www.afcd.gov.hk/english/conservation/con_wet/con_wet_man/con_wet_man_dis/images/mangomap.jpg. Last Review Date: 13 January 2023. (AFCD 2023a)
6. AFCD. (2023b). Distribution of Seagrass in Hong Kong [data collected from 2002 to 2019]. [online] https://www.afcd.gov.hk/english/conservation/con_wet/con_wet_sea/con_wet_sea_dis/con_wet_sea_dis.html. Last Review Date: 31 January 2023. (AFCD 2023b)
7. AFCD. (2023c). Hong Kong Biodiversity Information Hub. [online] <https://bih.gov.hk/en/species-database/index.html>. Last Accessed: 16 June 2023. (AFCD 2023c)
8. AFCD. (2023d). Coral Field Guide. [online] https://www.afcd.gov.hk/english/conservation/con_mar/con_mar_cor/con_mar_cor_cor/on_mar_cor_cor_1.html. Last Review Date: 5 July 2023. (AFCD 2023d)
9. Chan, A, Choi C, McCorry D, Chan K, Lee MW, Put A Jr. (2005). Field Guide to Hard Coral of Hong Kong. Friends of the Country Parks. (Chan, A et al. 2005)
10. Chan, A., Cheung, J., Sze, P., Wong, A., Wong, E., & Yau, E. (2011). A Review of the Local Restrictedness of Hong Kong Butterflies. Agriculture, Fisheries and Conservation Department. [online]. <https://bih.gov.hk/filemanager/newsletter/en/upload/24/IssueNo21.pdf>. (Chan, A et al. 2011)
11. Chan, S. K. F., Cheung, K. S., Ho, C. Y., Lam, F. N., & Tang, W. S. (2005). A Field Guide to the Amphibians of Hong Kong. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks, Cosmos Books Ltd, Hong Kong SAR. (Chan et al. 2005)
12. Chan, S. K. F., Cheung, K. S., Ho, C. Y., Lam, F. N., & Tang, W. S. (2006). The Geckos of Hong Kong. Agriculture, Fisheries and Conservation Department. [online].



https://www.afcd.gov.hk/english/publications/publications_con/files/hkbonewsletter13.pdf. (Chan et al. 2006)

13. CAPCO. (2017). Project Profile of Land fill Gas Power Generation Project at the West New Territories (WENT) Landfill. (CAPCO 2017)
14. Corlett, R., Xing, F., Ng, S. C., Chau, L., Wong, L. (2000). Hong Kong vascular plants: Distribution and status. *Memoirs of the Hong Kong Natural History Society*. 23. 1-157. (Corlett et al. 2000)
15. Dudgeon, D. (2003). *Hillstreams*. Agriculture Fisheries and Conservation Department, Government of Hong Kong SAR & Wan Li Book, Co. Ltd., Hong Kong: 133 pp. (Dudgeon 2003)
16. Environmental Protection Department (EPD). (2007). Environmental Impact Assessment Report for Liquefied Natural Gas (LNG) Receiving Terminal and Associated Facilities. (EPD 2007)
17. EPD. (2009a). Environmental Impact Assessment Report of Sludge Treatment Facilities. (EPD 2009a)
18. EPD. (2009b). Environmental Impact Assessment Report of West New Territories (WENT) Landfill Extensions. (EPD 2009b)
19. EPD. (2012). Environmental Impact Assessment Report of Engineering Investigation and Environmental Studies for Integrated Waste Management Facilities Phase 1 – Feasibility Study. (EPD 2012)
20. EPD. (2016). Contract No. EP/SP/58/08 - Sludge Treatment Facilities, Environmental Monitoring Results in Operation Phase - Post-Construction Phase Ecological Bi-monthly Monitoring Reports (April 2015 – June 2016). (EPD 2016)
21. EPD. (2017). Final Review EM&A Report for Decommissioning of West Portion of the Middle Ash Lagoon at Tsang Tsui, Tuen Mun. (EPD 2017)
22. EPD. (2021a). Agreement CE 29/2010 (EP) Integrated Waste Management Facilities Phase 1 – Design and Construction. Additional Service – Conducting Marine Ecological Survey for Middle Ash Lagoon In Tsang Tsui, Tuen Mun. Benthos Survey Report. (EPD 2021a)
23. EPD. (2021b). Agreement CE 29/2010 (EP) Integrated Waste Management Facilities Phase 1 – Design and Construction. Additional Service – Conducting Marine Ecological Survey for Middle Ash Lagoon In Tsang Tsui, Tuen Mun. Dive Survey Report. (EPD 2021b)
24. EPD. (2022a). Agreement CE 29/2010 (EP) Integrated Waste Management Facilities Phase 1 – Design and Construction. Additional Service – Ecological Assessment and Application for Environmental Permit. Ecological Assessment Report. (EPD 2022a)
25. EPD. (2022b). EIAO Register No. PP-649/2022 Project Profile of Decommissioning of Remaining Portion of Middle Ash Lagoon in Tsang Tsui. (EPD 2022b)
26. EPD. (2022c). Agreement CE 6/2015 (EP) West New Territories (WENT) Landfill Extension – Design and Construction, Supporting Document for Variation of Environmental Permit, Final, July 2022. (EPD 2022c)



27. EPD. (2024). EIAO Register No. DIR-305/2024 Project Profile of Decommissioning of West Ash Lagoon in Tsang Tsui. (EPD 2024)
28. FEHD. (2015). Environmental Impact Assessment Report of Decommissioning of West Portion of the Middle Ash Lagoon at Tsang Tsui, Tuen Mun. (FEHD 2015)
29. Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. and Yu, Y.T. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation importance in Hong Kong. *Memoirs of the Hong Kong Natural History Society*, 25: 123-159. (Fellowes et al. 2002)
30. Feng, Z.J., Li, Z.K., Li, B.T., Xue, C.G., Liu, J.B. and He, Y.Q. (2002). Study on Rare and Endangered Plants and National Key Protected Plants in Guangdong. *Journal of South China Agricultural University* 3: 24-27. (Feng et al. 2002)
31. Fu L. & Chin C. (1992). *China Plant Red Data Book: Rare and Endangered Plants*. Science Press, Beijing, China. (Fu 1992)
32. Hu Q., Wu T., Xia N., Xing F., Lai P.C.C. & Yip K. (2003), *Rare and Precious Plants of Hong Kong*. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks, Cosmos Books Ltd, Hong Kong SAR. 234pp. (Hu 2003)
33. Hui, M.K.Y. and Chan, B.P.L. (2024) 'Analysis of a 131-year longitudinal dataset of the Eurasian otter *Lutra lutra* in Hong Kong: implications for conservation', *Oryx*, 58(3), pp. 387–395. doi:10.1017/S0030605323001163.
34. HKBWS. (2023). Hong Kong Bird Watching Society. [online]. <https://cms.hkbws.org.hk/cms/en/> Last Assessed: 30 October 2023. (HKBWS 2023)
35. Hong Kong Herbarium. (2023). HK Plant Database. [online] <https://www.herbarium.gov.hk/en/home/index.html>. Last Accessed: 6 June 2023. (Hong Kong Herbarium 2023)
36. IUCN. (2023). IUCN Red List of Threatened Species Version 2022-2. [online] <https://www.iucnredlist.org/>. Last Accessed: 6 June 2023. (IUCN 2023)
37. Jiang, Z.G. et al. (2016). Red List of China's Vertebrates. *Biodiversity Science*. 24. 500–551. 10.17520/biods.2016076. (Jiang et al. 2016)
38. Lee, W. H., Liu, E., Choi, I. C., Tsim, S. T. (2004). Summer Breeding and Winter Night Roosting Sites of Egrets in Hong Kong 2003. *Hong Kong Biodiversity* 6:10-12. (Lee et al, 2004)
39. Qin, et al. (2017). Threatened Species List of China's Higher Plants. *Biodiversity Science* 25(7): 696-747. (Qin et al. 2017)
40. Morton B, Lee CN. (2011) Spatial and temporal distribution of juvenile horseshoe crabs (Arthropoda: Chelicerata) approaching extirpation along northwestern shoreline of the New Territories of Hong Kong SAR, China. *Journal of Natural History* 45:227-251. (Morton 2011)
41. McMillan, S.E. (2021). 'The Ecology and Conservation of Eurasian Otter (*Lutra lutra*) in Hong Kong' (PhD thesis, The University of Hong Kong 2021). (McMillan 2021)
42. Reels, G. (2019). Faunistic Studies in South-east Asian and Pacific Island Odonata: An Annotated Check List of Hong Kong Dragonflies and Assessment of Their Local



- Conservation Significance. *Journal of the International Dragonfly Fund* 30: 1-49. (Reels 2019)
43. SF Thrush, JE Hewitt, VJ Cummings, JI Ellis, C. Hatton, A. Lohrer, A. Norkko (2004). Muddy waters: elevating sediment input to coastal and estuarine habitats. *Frontiers on Ecology and the Environment*, Volume 2, Issue 6. (Thrush et al. 2004)
44. Shek, C. T. (2006). *A Field Guide to the Terrestrial Mammals of Hong Kong*. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks, Hong Kong SAR. (Shek 2006)
45. Shin P, Cheung SG, and Kong R. (2007). Conservation of Horseshoe Crabs in Hong Kong. (Shin et al. 2007) (Shin et al. 2007)
46. Shin P, Li HY, and Cheung SG. (2009). Horseshoe Crabs in Hong Kong: Current Population Status and Human Exploitation. *Biology and Conservation of Horseshoe Crabs*. Springer US. 347-360. (Shin et al. 2009)
47. Tam et. al. (2008). Current Status of Dragonflies (Odonata) and Their Representation in Protected Areas of Hong Kong. Agriculture, Fisheries and Conservation Department. [online]. <https://bih.gov.hk/filemanager/newsletter/en/upload/19/IssueNo16.pdf>. (Tam et. al. 2008)
48. Xing, F.W., Ng, S.C. and Chau, L.K.C. (2000). Gymnosperms and Angiosperms of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23: 21-136. (Xing et al. 2000)
49. Zhao, E.M. (1998). *China Red Data Book of Endangered Animals. Amphibia and Reptilia*. First Edition. Beijing: Science Press. (Zhao 1998)
50. Zheng, G.M. and Wang, Q.S. (1998). *China Red Data Book of Endangered Animals: Aves*. First Edition. Beijing: Science Press. (Zheng & Wang 1998)