

Ocean Park Tai Shue Wan Water World Project

Operation Phase Monthly EM&A Report
May 2022

June 2022

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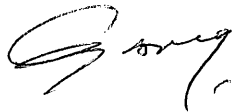
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This Operation Phase Monthly EM&A Report for May 2022 has been reviewed and certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC) as having complied with the requirements as set out in the EM&A Manual in accordance with Condition 3.4 of Environmental Permit No. EP-487/2014/A.

Certified by:



Gary Chow
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date:

13 JUNE 2022

Verified by:



Mandy To
Independent Environmental Checker (IEC)
ERM-Hong Kong Limited

Date:

14 June 2022

Information class: Standard

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Executive summary

Mott MacDonald Hong Kong Ltd. (“MMHK”) has been commissioned by the Ocean Park Corporation to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for the operation phase of Ocean Park Tai Shue Wan Water World (the Project).

This is the 7th Monthly EM&A Report for the operation phase of the Project summarising the findings on EM&A during the period from 1 to 31 May 2022, and is submitted under the Environmental Permit (No. EP-487/2014/A).

Environmental Monitoring and Audit Progress

A summary of the operation phase monitoring activities during the reporting period is listed as below:

- Monitoring of the Ecological Enhancement Area (monthly): 25 May 2022
- Landscape and visual monitoring (bi-monthly): 19 May 2022

1 Introduction

1.1 Background

On 27 August 2014, the Environment Impact Assessment (EIA) Report and Environmental Monitoring and Audit (EM&A) Manual (Register No.: AEIAR-184/2014) for the “Tai Shue Wan Development at Ocean Park” (the Project) was approved and an Environmental Permit (EP) (Permit No.: EP-487/2014) was issued to the Ocean Park Corporation (Project Proponent). Based on the Application for Variation of Environmental Permit No. VEP-539/2017, the current valid EP (Permit No.: EP-487/2014/A) was issued on 10 January 2018. The location and layout of the Project are presented in **Appendix A**.

Upon the completion of construction of the Project in May 2021 and the approved termination of construction phase EM&A programme in July 2021, the Water World opened on 21 September 2021. Mott MacDonald Hong Kong Ltd. (“MMHK”) has been commissioned by the Project Proponent to undertake the Environmental Team (ET) services to carry out operation phase EM&A for the Ocean Park Tai Shue Wan Water World Project.

Under the requirements of Section 3 of EP and the EM&A Manual, environmental monitoring of ecology, landscape and visual are required for one year during operation phase. This is the 7th Operation Phase Monthly EM&A Report summarising the monitoring results for the Project during the Reporting Period from 1 to 31 May 2022.

1.2 Project Organisation

The project organisation and the contacts of key personnel of the Project are shown in **Appendix B**.

1.3 Environmental Status and Programme

The current monitoring is under the operation phase of the Project with all construction activities completed, thus there were no construction works involved.

Monitoring of ecological enhancement area was conducted with a monitoring programme for once per month for 12 months during operation phase.

Landscape and visual monitoring was conducted with a monitoring programme for once in bi-monthly intervals throughout the 12-month establishment period in operation phase.

Submissions required under the EP that were approved by the EPD and deposited to the EIA Ordinance Register Office are as listed below:

- Detailed Vegetation Survey Report
- Woodland Compensation Plan
- Ardeid Inspection Report
- Short-nosed Fruit Bat Inspection Report
- Baseline Monitoring Report
- Ecological Enhancement Plan
- Visual and Landscape Plan
- Detailed Design Report for the Sewerage Facilities
- Noise Audit Report

2 Monitoring of Ecological Enhancement Area

2.1 Monitoring Requirement

As required under the Section 8.3.2.4 of the approved EM&A Manual and the approved Ecological Enhancement Plan under EP Condition 2.8, the Ecological Enhancement Area (EEA) should be monitored monthly after establishment, for one year during operation phase to check the effectiveness of the setting.

Direct observation and counting of ardeids was made from a vantage point (i.e., point count method) at the evening time from an hour before sunset, and last until the nightfall. Before conducting point count survey, the EEA was also inspected and searched for any ardeids, other birds or faunal groups utilising the habitat. Any aggregation of night roosting ardeids in the EEA or adjacent area would be located, and the ardeid species would be identified and counted throughout the monitoring. Moreover, day roost of Black-crowned Night Heron in the EEA or adjacent area would also be recorded if any.

2.2 Monitoring Findings

Monitoring of the EEA was undertaken on 25 May 2022. The EEA was inspected, but no ardeids or day roost of Black-crowned Night Heron were found in the EEA. Individuals of Black Kite (*Milvus migrans*) were observed soaring over the area. Other bird species observed in the EEA include Black-collared Starling (*Gracupica nigricollis*), Chinese Bulbul (*Pycnonotus sinensis*), Oriental Magpie-Robin (*Copsychus saularis*), and Red-whiskered Bulbul (*Pycnonotus jocosus*). A butterfly species Dark Evening Brown (*Melanitis phedima*) was also recorded within the EEA. Field signs i.e. diggings left by wild boars were observed next to the pond within the EEA (as shown in **Figure 2.1**). A group of Short-nosed Fruit Bat (*Cynopterus sphinx*), which is a species listed as “Near Threatened” in Red List of China's Vertebrates (Jiang *et al.*, 2016)¹, was also observed roosting under Chinese Fan-palms within the EEA (see **Figure 2.2**), which echoes the findings of the Short-nosed Fruit Bat Inspection Report submitted prior the construction phase.



Figure 2.1 Diggings left by wild boar in EEA



Figure 2.2 Short-nosed Fruit Bat roosting on frond of Chinese Fan-palm

¹ Jiang, Z. G., Jiang, J.-P., Wang, Y. Z., Zhang, E., Zhang, Y. Y., Li, L.L., Xie, F., Cai, B., Cao, L., Zheng, G. M., Dong, L., Zhang, Z. W., Ding, P., Luo, Z. H., Ding, C. Q., Ma, Z. J., Tang, S. H., Cao, W. X., Li, C. W., Hu, H. J., Ma, Y., Wu, Y., Wang, Y. X., Zhou, K. Y., Liu, S. Y., Chen, Y. Y., Li, J. T., Feng, Z. J., Wang, Y., Wang, B., Li, C., Song, X. L., Cai, L., Zang, C. X., Zeng, Y., Meng, Z. B., Fang, H. X. and Ping, X. G. (2016). Red List of China's Vertebrates. *Biodiversity Science*, 24(5): 500–551.

Point count survey was conducted covering the period from one hour before sunset until nightfall (17:52 to 19:15). Direct observation was made at the vantage point next to the EEA with an unobstructed view covering the EEA, seawall at Tai Shue Wan, Aberdeen Channel and a portion of the East Lamma Channel. The location of the vantage point is indicated in **Appendix C**. Throughout the monitoring period, no ardeids were noted roosting within or flying towards the EEA. On the other hand, an individual of Little Egret was observed resting on the seawall of Tai Shue Wan, while few individuals of Little Egret were observed flying towards the typhoon shelter.

3 Landscape & Visual Monitoring

3.1 Monitoring Requirement

Landscape and visual mitigation measures for the operation phase are listed in Table 9.2 of the Approved EM&A Manual, while the detailed implementation plans are presented in the approved Visual and Landscape Plan.

According to Section 9.1 of the approved EM&A Manual, a Registered Landscape Architect (RLA), as a member of the ET team, would be responsible for monitoring the implementation of landscape and visual measures during the operation phase.

As required under the Section 9.5 of the approved EM&A Manual, all landscape planting shall be monitored bi-monthly during the first year of the operation phase to ensure proper establishment and its effectiveness as landscape and visual mitigation measures. The scope of the site audit during this 12-month establishment period in operation phase shall include the following:

- All necessary horticultural operations and replacement planting are undertaken throughout the 12-month establishment period to ensure healthy establishment.

Any observation of unsatisfactory horticultural maintenance works, failure of establishment of soft landscape or poor condition of established planting shall be recorded for Ocean Park operator to undertake any necessary actions to improve the conditions of the landscape planting.

3.2 Audit Summary

In the reporting period, landscape and visual site inspection was conducted on 19 May 2022 with references to recommended mitigation measures provided in **Appendix D**. The implementation status of the landscape and visual mitigation measures are summarised in **Table 3.1**. Representative photos showing the implementation of the mitigation measures are presented in **Appendix E**.

Follow-up measures by the Project Proponent were observed. Removed trees were replaced by newly transplanted trees in good health condition. The health condition of several trees with poor health observed in the last monitoring period were found to have improved greatly.

For additional observations, several trees were found to be damaged by wild boars. Regular watering and close monitoring of these trees are recommended. *Araucaria* species on site were observed to become frequent targets of attacks by wild boars, and struggled to properly establish given the limited space in the landscape deck area. It is recommended to consider other tree species of smaller sizes for future tree replacement and planting design in the Landscape Deck Area or other ornamental planting areas.

The removal of tree saplings of invasive species on the green roof floor was hindered by the lack of safe access. Removal of such invasive species is recommended to avoid further spreading once safety access is available.

Table 3.1: Landscape and Visual Audit Summary for Operation Phase

Landscape and Visual Mitigation Measures during Operation Phase	Implementation Status
OP01 - Sensitive Design and Disposition OP02 - Compensatory Tree Planting OP03 - Enhancement Planting OP04 - Green Roofs and Vertical Greening OP05 - Re-provision of Flamingo Pond	The implementation of mitigation measures was checked by ET during the bi-monthly site inspection. Implementation of the measures OP01 to OP05 and most of the OP06 was observed. Major observations for follow-up include: <ul style="list-style-type: none"> • Several trees in poor health condition and damaged by wild boars were observed. • Invasive species such as <i>Leucaena leucocephala</i> were observed on the green roof floor. • <i>Araucaria</i> species on site were observed to struggle to establish properly in the Landscape Deck Area.
OP06 - Responsive Lighting Design	It is recommended to monitor closely of the weaker trees, remove weedy species to ensure health of the proposed trees (when safety access is available), and consider other tree species of smaller sizes for future tree replacement and planting design in the Landscape Deck Area or other ornamental planting areas.
OP07 - Woodland Compensation	To be fully implemented (pending for update on the Woodland Compensation Plan)

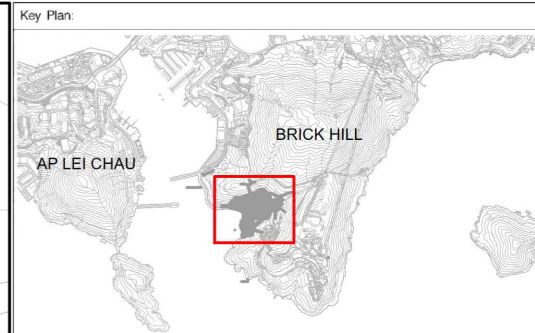
4 Conclusions

Operation phase EM&A works including the monitoring of the EEA and landscape planting were conducted in accordance with the EM&A Manual during the reporting period.

In this month of monitoring of the EEA, survey was conducted on 25 May 2022 covering the period from one hour before sunset until nightfall. No ardeids were noted roosting in the EEA, while a species of conservation importance, Short-nosed Fruit Bat, was observed within the EEA.

Bi-monthly landscape establishment monitoring was conducted on 19 May 2022. Major observations for follow-up include: (1) Several trees found in poor health condition and damaged by wild boars, (2) Weeds found in the green roof areas and (3) *Araucaria* species on site struggling to establish properly in the Landscape Deck Area. It is recommended to monitor closely of the weaker trees, remove weedy species to avoid further spreading (when safe access is available), and consider other tree species of smaller sizes for future tree replacement and planting design in the Landscape Deck Area or other ornamental planting areas.


Appendix A Project Layout



Notes:

Key to symbols:

LEGEND

 PROJECT AREA

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JUL 2021	KN		HL	GC

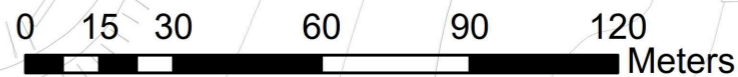
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**TAI SHUE WAN DEVELOPMENT
AT OCEAN PARK**

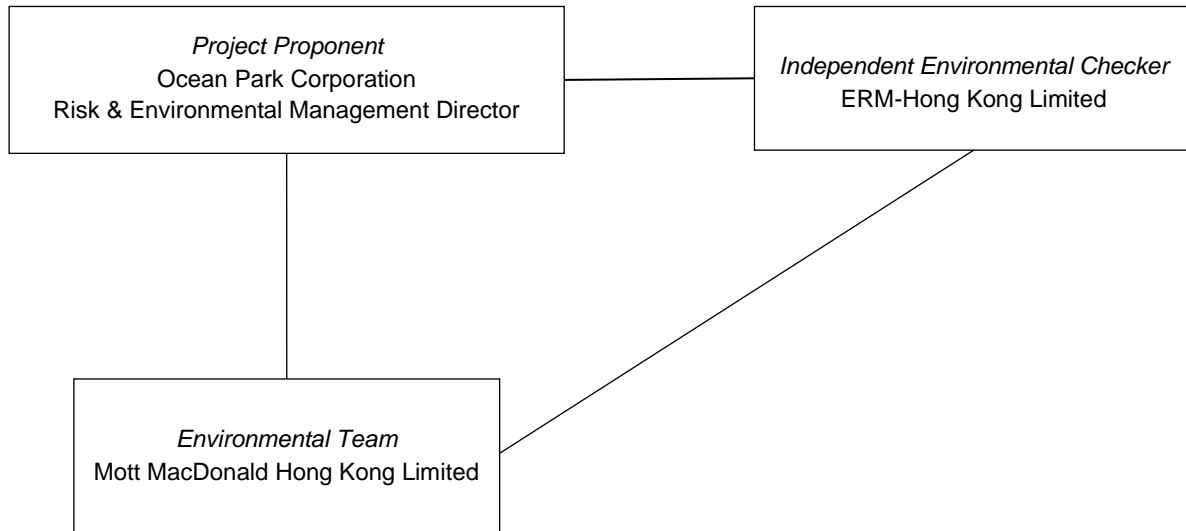
LOCATION OF THE PROJECT

Designed		Eng check	
Drawn		Coordination	
Dwg check		Approved	
Scale at A3	Status	Rev	



Drawing Number **FIGURE 1.1**

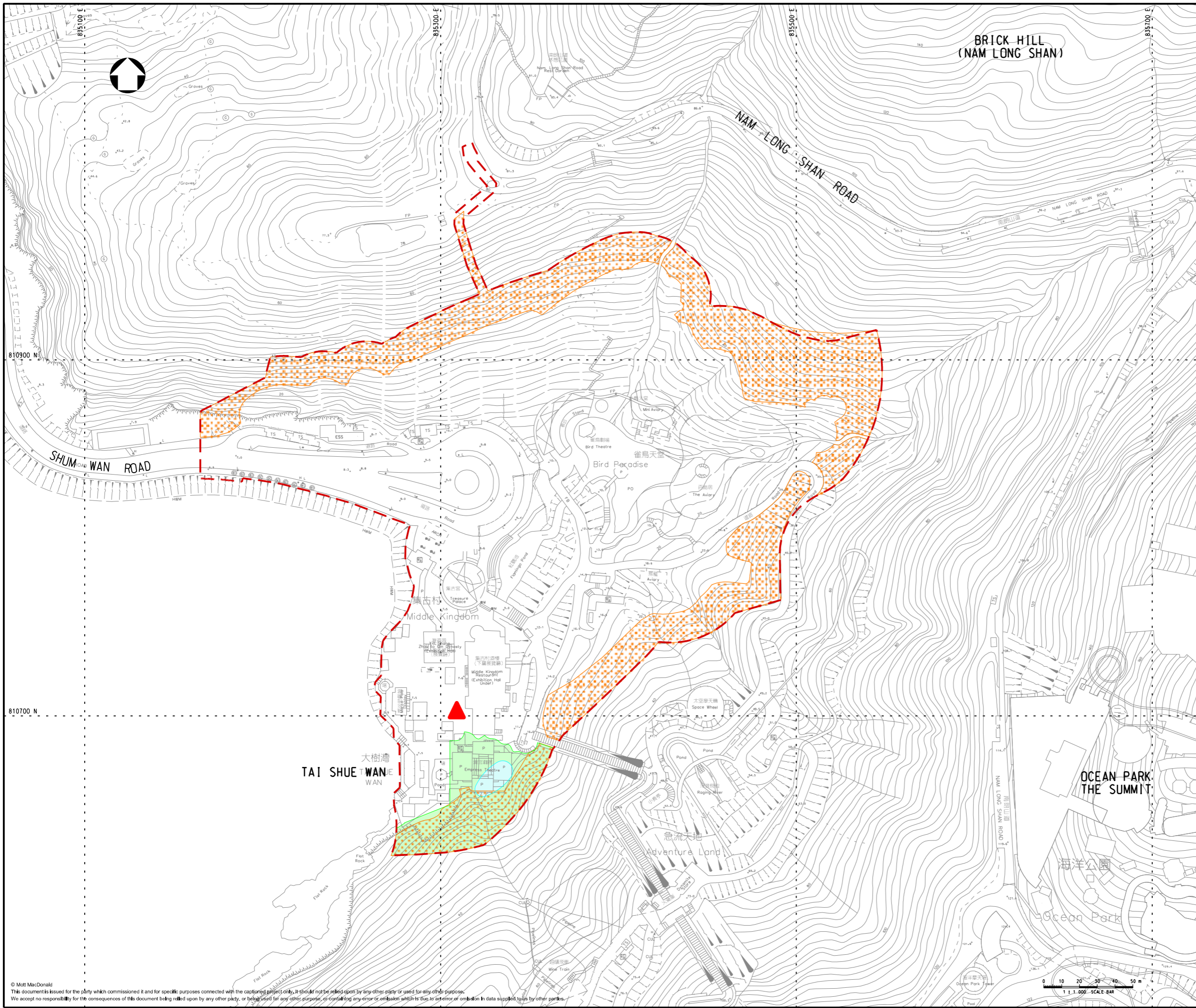
Appendix B Project Organisation



Contact information

Company / Department	Position	Name	Telephone / Mobile	Fax No.
Ocean Park Corporation	Risk & Environmental Management Director	Mr Frankie Hau	3923 2528	2518 4738
ERM-Hong Kong Ltd.	Independent Environmental Checker	Ms Mandy To	2271 3113	3015 8052
Mott MacDonald Hong Kong Ltd.	Environmental Team Leader	Mr Gary Chow	2828 5874	2827 1823

Appendix C Location of Vantage Point



Notes

Key to symbols

- PROPOSED PROJECT BOUNDARY
- PROPOSED WOODLAND COMPENSATION AREA
- PROPOSED ECOLOGICAL ENHANCEMENT AREA
- PROPOSED FRESHWATER POND
- ▲ PROPOSED VANTAGE POINT

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	DEC 19	MING	FIRST ISSUE	HY	EC

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Project

**TAI SHUE WAN DEVELOPMENT
AT OCEAN PARK**

Title

**LOCATION OF VANTAGE POINT
FOR MONITORING**

Designed	HY	Eng check	HY
Drawn	MING	Coordination	HY
Dwg check	HY	Approved	EC
Scale at A1	1:1000	Status	PRE
Rev			P1
Drawing Number	APPENDIX C		

Appendix D Recommended Landscape & Visual Mitigation Measures for Operation Phase

Mitigation Code	Responsible Agent for Mitigation Implementation	Mitigation Measures
OP01	OPC via Contractor	<p>Sensitive Design and Disposition</p> <ul style="list-style-type: none"> All proposed hard structures should be sensitively designed in a manner that responds to the existing and planned landscape context, and minimises potential adverse landscape and visual impacts. The structural design should seek to reduce the apparent visual mass through the use of natural materials such as wooden frame and semi-transparent panels. Subdued tones should be considered for the colour palette with non-reflective finishes to reduce glare effect. Site specific measures, such as the disposition of the key structures closer to the northern slopes, the design of building forms as extension along the existing slope topography, the use of concave roof form and the location of ride platforms on or near the slopes to minimise structural support, should also be considered for better integration with the surroundings and minimisation of potential visual impacts.
OP02	OPC via Contractor	<p>Compensatory Tree Planting</p> <ul style="list-style-type: none"> Existing trees to be felled should be compensated as far as practicable. Native species should be proposed as far as practicable to re-create a native landscape, restore the ecological habitats and blend in with the existing native vegetation. A compensatory tree planting proposal should be submitted together with the tree removal application for approval by relevant authorities in accordance with LAO Practice Note No. 7/2007. It is recommended that approximately 608 heavy standard trees and approximately 18,202 whip trees* could be planted on-site. The availability of off-site compensatory tree planting area is still subject to further investigation and agreement with relevant authorities.
OP03	OPC via Contractor	<p>Enhancement Planting</p> <ul style="list-style-type: none"> Other than compensatory tree planting, additional trees, shrubs, groundcovers and lawn should also be considered to maximise greening within the redevelopment area.
OP04	OPC via Contractor	<p>Green Roofs and Vertical Greening</p> <ul style="list-style-type: none"> Green Roofs and Vertical Greening should be provided where feasible and appropriate to screen and soften the hard edges of building structures.
OP05	OPC via Contractor	<p>Reprovision of Flamingo Pond</p> <ul style="list-style-type: none"> A pond is recommended to replace the demolished Flamingo Pond as compensation for the loss of semi-natural ponds, where wildlife, such as birds, can utilise.
OP06	OPC via Contractor	<p>Responsive Lighting Design</p> <ul style="list-style-type: none"> Overall lighting design would carefully consider a reasonable level of functional and thematic lighting with due consideration of possible light pollution and night-time glare to the surroundings. Consideration shall be made by the lighting designers to the following measures: <ul style="list-style-type: none"> Lighting shall be designed with due consideration of mounting height and direction of light fixtures so as not to point directly towards any sensitive receiver. Lighting shall be arranged with due consideration of reflectance so as to avoid glare effect. Lighting shall be regularly monitored during operation. Lights located adjacent or in proximity to neighbours shall be carefully designed to prevent possible light intrusion. Lighting operation schedule shall specify only lights necessary for security to be left on after business hours. Paving materials should be selected as necessary to reduce potential glare from surface reflectance. Particular attention should be paid to the use of lighting having a high intensity or harsher tone (e.g. metal halide lamps). Lights shall generally be models having precise cut-off range (such as full cut-off optics where available and practicable) and if necessary be fitted with adjustable anti-glare shields.
OP07	OPC via Contractor	<p>Woodland Compensation</p> <ul style="list-style-type: none"> 1.53ha of affected woodland is recommended to be reinstated / compensated by 1.62ha of whip tree planting adjacent to the existing unaffected woodland and tall shrubland. Native species should be proposed as far as practicable to re-create a native landscape, restore the ecological habitats and blend in with the existing native vegetation.

* With reference to the updated Tree and Preservation Removal Proposal, no. of heavy standard trees and whip trees should be 534 and 2,309 respectively.

Appendix E Representative Photos for Implementation of Mitigation Measures



OP01 Sensitive Design and Disposition – Color palette of the design was mostly in subdued tones. Floor and walls were painted with non-reflective finishing.



OP02 Compensatory Tree Planting – General view of whip trees newly planted.



OP03 Enhancement Planting – Additional trees and shrubs were planted along the pedestrian walkway.



OP04 Green Roofs and Vertical Greening – General view of green roof and vertical green in establishment.



OP05 Re-provision of Flamingo Pond – General view



OP06 Responsive Lighting Design – General view of lighting design with appropriate level of lighting to reduce potential impact

