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## 15th Post-transplantation Monitoring and Audit Report (13th October 2023)

Northeast New Territories Landfill Extension (NENTX) | Contract No. EP/SP/77/15

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Formal Submission

**Veolia Environmental Services Hong Kong Limited**



# Document Control

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# 1. INTRODUCTION

## 1.1 Background of the Project

- 1.1.1 The North East New Territories Landfill Extension (the NENTX Project) is a designated project. The Environmental Impact Assessment (EIA) Report was approved (AEIAR-111/2007) with conditions on 20 September 2007 and the Environmental Permit (EP) EP-292/2007 (the "EP") was issued on 26 November 2007. Moreover, a Further Environmental Permit FEP-01/292/2007 (the "FEP") was also issued under the EIA Ordinance on 28 April 2022.
- 1.1.2 The transplantation works were conducted in fulfilment of Conditions 2.7 and 2.9 of the EP and Conditions 2.5 and 2.7 of the FEP and in accordance with the approved Transplantation Proposal for Plant Species of Conservation Importance (Rev.1) (NENTX-FUG-RP-E-EM-002-I02) (the "approved Proposal"). The Transplantation Report (NENTX-AURE-RP-ZZ-E-007-I-I01) was prepared by a qualified ecologist certified by the Environmental Team (ET) Leader and Independent Environmental Checker (IEC) in accordance with Condition 2.7 of the EP and Condition 2.5 of the FEP.
- 1.1.3 The Transplantation Report details the methodology of the transplantation activities. The actual transplantation works for the plant species of conservation importance was described along with the post-transplantation maintenance. The post-transplantation monitoring and audit and the implementation programme was also detailed. The vegetation survey which investigated the plant species of conservation importance before the transplantation work was detailed in the approved Transplantation Proposal.
- 1.1.4 Before the transplantation activities, a detailed vegetation survey was conducted by direct observation to record the plant species of conservation importance present in NENTX. A total of four floral species of conservation importance were identified within the Project Site, namely Incense Tree *Aquilaria sinensis*, Endospermum *Endospermum chinense*, Lamb of Tartary *Cibotium barometz* and Bottlebrush Orchid *Goodyera procera*. Individuals that were directly impacted by the proposed construction of NENTX Landfill had been selected for transplantation. More details to be found in the approved Transplantation Proposal.
- 1.1.5 Based on the findings of the detailed vegetation survey and verification survey, three plant species of conservation importance were considered suitable for transplantation, i.e., two nos. of Incense Tree saplings, one cluster of Lamb of Tartary, and 19 clusters of Bottlebrush Orchid. The transplantation works was carried out by a landscape contractor and supervised by a qualified ecologist. The qualified ecologist has at least five years of relevant experience in transplantation and/or vegetation survey and assessment and is also an ISA Certified Arborist.

- 1.1.6 The three plant species of conservation importance were transplanted to suitable receptor sites. To further safeguard these species, the selected receptor sites were within or adjacent to the facilities managed by the Contractor. Moreover, the similarity in site conditions between the collection site and receptor site and the accessibility of the receptor for future maintenance and monitoring were also considered in the selection. More details to be found in the Transplantation Report.
- 1.1.7 All the transplanted individuals will be maintained by the Contractor for 12 months (establishment period) after planting to the receptor sites in accordance with Section 4 of the approved Proposal. Moreover, their survival and growth will be monitored by a qualified ecologist or botanist of Fugro in accordance with Section 5 of the approved Proposal.

## **1.2 Purpose of this Document**

- 1.2.1 This 15<sup>th</sup> Post-transplantation Monitoring Report (the "Report") was prepared to present the survival and growth of plant species of conservation importance after transplantation works. Moreover, key maintenance activities conducted this reporting month and recommendations on post-transplantation maintenance are presented in this Report.
- 1.2.2 The post-transplantation monitoring and audit of the transplanted plant species of conservation importance was carried out in accordance with Section 5 of the approved Transplantation Proposal.

## **1.3 Structure of this Document**

Succeeding this introductory section, the remainder of this Report is presented as follows:

- Section 2 details the monitoring results, including the key maintenance activities conducted this reporting month;
- Section 3 presents the succeeding post-transplantation monitoring schedule; and
- Section 4 summarizes the findings of the post-transplantation monitoring and way forward.

## 2. MONITORING RESULTS

Following the transplantation works on 10 November 2022, the 15<sup>th</sup> post-transplantation monitoring and audit was carried out on 13 October 2023 to check the condition of the transplanted plant individuals.

### 2.1 Condition of the Transplanted Individuals

- 2.1.1 Seven of the transplanted individuals of the 19 clusters of Bottlebrush Orchid *Goodyera procera* were in fair to good condition with only minor health issues observed in some individuals, i.e., slightly chlorotic leaves and presences of holes in the leaves. However, following the Tropical Cyclone Saola, which triggered the T10 alert on 1 September 2023, and also the black rainstorm warning from 7-8 September, some individuals have gone missing.
- 2.1.2 Twelve individuals (GP02–05, GP09, GP11-15, GP18, GP19) are missing in the current monitoring period. This could be due to the Tropical Cyclone Saola, which triggered the T10 alert on 1 September 2023 and the following black rainstorm.
- 2.1.3 The Lamb of Tartary *Cibotium barometz* is in good condition. The new foliage is now very established and have been growing steadily.
- 2.1.4 One saplings of the Incense Tree *Aquilaria sinensis* (AS02) is dead. This could also be due to the recent rainstorm and tropical cyclone. The other (AS03) demonstrated poor health conditions with no foliage and fungi growing.
- 2.1.5 Albeit strict compliance of the transplantation works and post-transplantation maintenance to the approved Transplantation Proposal, transplanted individuals would require time to adapt and establish in the new environment/substrate of the receptor site. Hence, signs of leaf discoloration and/or wilting, dehydration, and even die-off are expected. Thus, succeeding post-transplantation maintenance and monitoring and audit are crucial to assess the progress of recovery and establishment of transplanted individuals in the receptor site.
- 2.1.6 The numbers, measurements, and health conditions of the transplanted plant species of conservation importance during the current monitoring period are shown in **Appendix A**.
- 2.1.7 The photographic records of the transplanted plant species of conservation importance during the current monitoring period are shown in **Appendix B**.

### 2.2 Key Maintenance Activities Conducted in The Reporting Month

- 2.2.1 The key maintenance activities carried out for the current reporting month are the following:
- Watering frequency of the two Incense Tree saplings was 2-3 times per week. The watering dates were 15 Sep, 18 Sep, 22 Sep, 25 Sep, 29 Sep, 2 Oct, 6 Oct, 9 Oct, 13 Oct.

- The watering frequency of the cluster of Lamb of Tartary was 2 times a week. The watering dates were 15 Sep, 18 Sep, 22 Sep, 25 Sep, 29 Sep, 2 Oct, 6 Oct, 9 Oct, 13 Oct .
- Once a week watering of Bottlebrush Orchid. The watering dates were 18 Sep, 25 Sep, 2 Oct, 9 Oct.
- Manual removal of weeds when observed during watering activities; and
- Checking of insect attacks and/or fungal infestation during watering activities.

### 2.3 Recommendation on Post-Transplantation Maintenance

Immediately after the monitoring and audit activity, the following post-transplantation maintenance was discussed with the Contractor for their prompt implementation:

- The watering frequency for the two saplings of Incense Tree should be maintained at 2-3 times a week. Improve/place organic mulch around the two saplings of Incense Tree to retain soil moisture, protect damaged roots against extreme temperatures, and improve soil quality.
- The watering frequency of the cluster of Lamb of Tartary should be maintained at twice a week.
- The watering frequency for all clusters of Bottlebrush Orchid should remain the same. During watering activities, the surrounding dead branches and dry leaves should be removed to ensure no plants are damaged by them.

## 3. POST-TRANSPLANTATION MONITORING SCHEDULE

- 3.1.1 As per Section 10.3 and Table 10.1 of the EM&A Manual, the survival and growth of the transplanted species will be monitored by a qualified ecologist or botanist at least twice a month during the first three months after transplantation and once a month in the following nine months.
- 3.1.2 As the monitoring had been conducted twice a month in December, January, and February, the forthcoming monitoring and audit activities will be conducted monthly until October 2023.
- 3.1.3 This is the last monitoring. No further monitoring will be conducted onwards according to the proposal.

## 4. SUMMARY AND CONCLUSION

- 4.1.1 The health of seven of the transplanted individuals of Bottlebrush Orchid were in fair to good condition, but the rest of the individuals are missing. The missing of individuals could be caused by the Tropical Cyclone Soala and the following black rainstorm. One individual of Incense Tree saplings was in poor health condition and the other one is now dead. The poor health condition could be due to transplantation shock brought about by the changes in the environment and the individual has not acclimated to these changes yet. The dead individual could also be caused by the recent natural disasters. Lastly, the transplanted cluster of Lamb of Tartary is now in good health condition. The new foliage is growing steadily and are becoming more established. As aforementioned, it takes time for newly transplanted plants to grow accustomed to the new environment of the recipient site. Therefore, signs of leaf discoloration and/or wilting, dehydration, and even die-off are expected.
- 4.1.2 It is recommended to pay additional attention to the health conditions of the Bottlebrush Orchid and the Incense Tree saplings. Moreover, should there be drastic change in the health conditions of these individuals observed during post-transplantation maintenance activities, the Contractor is advised to immediately advise the ecologist to discuss possible remedial actions.



# Appendix A

Conditions of Transplanted Plant  
Species of Conservation  
Importance

13/10/2023

Post-Transplantation Monitoring  
Conditions of Transplanted Plants at Receptor Sites

P. of

Date of Submission:

Surveyor:

Date of Monitoring and Maintenance	Receptor Site	No.	Species	Plant Size Measurements			Amenity Value (High/ Medium/ Low)	Form (Good/ Fair/ Poor)	Health Condition (Good/ Fair/ Poor)	Structural Condition (Good/ Fair/ Poor)	Recommendation on Post-Transplantation Maintenance	Key Maintenance Activities Conducted	Remark
				DBH (mm)	Crown Spread (m)	Height (m) cm							
13/10/23	A	AS02	A. sinensis			—		—					dead
"	A	AS03	"			175		poor					Fungi growing
"	B	CB01	C. borometz			85		good					
"	B	GP01	G. procera			16		good					soil loose
"	B	GP02	"			—		—					missing
"	B	GP03	"			—		—					"
"	B	GP04	"			—		—					"
"	B	GP05	"			—		—					"
"	B	GP06	"			6		fair					chlorotic leaves
"	B	GP07	"			13		good					
"	B	GP08	"			13		fair					"
"	B	GP09	"			—		—					missing
"	B	GP10	"			11		fair					partially wilted leaves
"	B	GP11	"			—		—					missing
"	B	GP12	"			—		—					"
"	B	GP13	"			—		—					"
"	B	GP14	"			—		—					"
"	B	GP15	"			—		—					"
"	B	GP16	"			14		fair					chlorotic leaves
"	B	GP17	"			8		fair					holes on leaves
"	B	GP18	"			—		—					missing
"	B	GP19	"			—		—					missing

Note:

1. Measurements of spread and DBH are not applicable for undersized tree, shrubs, herbs and ferns.

" = same as above

# Appendix B

Photographic Records of  
Transplanted Plant Species

**B.1 Incense Tree *Aquilaria sinensis***



Photo B.1.1 : General view of the transplanted individual AS-03.



Photo B.1.2 : Branch condition of the transplanted individual AS-03.



Photo B.1.3 : General view of the transplanted individual AS-02.



Photo B.1.4 : Broken stem of the transplanted individual AS-02.

**B.2 Lamb of Tartary *Cibotium barometz***



Photo B.2.1. : General view of the transplanted individual CB-01.



Photo B.2.2. : Leaf condition of the transplanted individual CB-01.



Photo B.2.3. : Leaf condition of the transplanted individual CB-01.



Photo B.2.4. : Leaf condition of the transplanted individual CB-01.

**B.3** Bottlebrush Orchid *Goodyera procera*



Photo B.3.1: Individual GP-01.



Photo B.3.2: Individual GP-06.



Photo B.3.3: Individual GP-07.



Photo B.3.4: Individual GP-08.



Photo B.3.5: Individual GP-10.



Photo B.3.6: Individual GP-16.



Photo B.3.7: Individual GP-17.