MTR Corporation Limited

South Island Line (East)

Transplantation Proposal

(*Houttuynia cordata*)

September 2011

Verified by:

Thomas Chan

Independent Environmental Checker

Date:

7 September 2011

MTR Corporation Limited

South Island Line (East)

Transplantation Proposal

(*Houttuynia cordata)*

September 2011

Certified by:

Dr. Glenn Frommer
Environmental Team Leader

Date: - 7 SEP 2011

MTR Corporation Limited

South Island Line (East)

Transplantation Proposal

(*Houttuynia cordata*)

September 2011

Prepared by:

Ida YU

Qualified Ecologist

LO Sai Cheung

Qualified Ecologist

Date: - 7 SEP 2011

South Island Line (East)

Transplantation Proposal
(*Houttuynia cordata)*

MTR Corporation Limited

September 2011

South Island Line (East)

Transplantation Proposal

List of Contents Page

Chapters

Appendices

1 INTRODUCTION

The SIL(E) Environmental Permit (EP) Condition 2.14(b) specifies that the Permit Holder shall deposit with EPD a Transplantation Proposal showing the types and locations of rare/protected and other uncommon plant species identified in the detailed transplanting baseline survey, locations of reception sites for transplantation, methodology and implementation programme of transplantation, and post-transplantation monitoring and maintenance programme.

This Transplantation Proposal is prepared in accordance with the requirements of the above mentioned EP Condition. This Proposal specifies the transplantation baseline survey findings and proposes transplantation methodology and receptor site for a rare herb *Houttuynia cordata* identified within the Project Area. Transplantation Proposals for *Aquilaria sinensis* and *Ailanthus fordii* will be separately deposited with EPD in August 2011.

2 OBJECTIVES OF THE TRANSPLANTATION PROPOSAL

From the revised Detailed Transplantation Baseline Survey Report deposited with EPD in July 2011, two plant species of conservation interest recorded in the degraded woodland to the south of Wong Chuk Hang Nullah, namely herb *H. cordata* and tree *Aq. sinensis* (including seedlings), and four planted young *Ai. fordii* (including two young seedlings) in a plantation area on top of a retaining wall near Hong Kong Park will be influenced by the proposed works. Other unaffected plant species of conservation interest will be protected on-site and appropriate tree protection measures would be established if needed. Transplantation Proposals for *H. cordata, Aq. sinensis* and *Ai. fordii* have been prepared under separate cover.

The general objective of this Transplantation Proposal is to reduce the impact to the rare herb *H. cordata* recorded in the degraded woodland south of Wong Chuk Hang Nullah. As stipulated in the SIL(E) EP Condition 2.14(b), this Transplantation Proposal provides:

- types and locations of the recorded rare herb *H. cordata* ,
- location of the receptor site for transplantation,
- methodology and implementation programme of transplantation, and
- post-transplantation monitoring and maintenance programme.

3 TYPES AND LOCATIONS OF THE IDENTIFIED RARE/PROTECTED PLANTS

According to the Transplantation Baseline Survey Report submitted in May 2011, a small area of the rare herb *H. cordata* (area of approximately 1.5m x 2.6m) was recorded on top of a concreted retaining wall along the degraded woodland south of Wong Chuk Hang Nullah (**Figure 1**). This herb is regarded as "Very Rare" by Xing *et al.* (2000) but under no protection status locally or regionally.

The recorded herb was in good health condition (with approximately 0.1m in height) and grew on a flat, semi-shady ground that can retain moisture on the top of the retaining wall (**Plates 1 & 2**). The overstorey trees on the adjacent man-made slope provide shade to favor the growth and establishment of this herbaceous species.

As reported in the Transplantation Baseline Survey Report, illegal collection of this patch of *H. cordata* by the public was found at its identified locality. The location of the receptor site for the transplanted *H. cordata* should be determined to avoid the illegal collection from the public as far as possible.

4 METHODOLOGY AND IMPLEMENTATION PROGRAMME OF TRANSPLANTATION

Since *H. cordata* is a creeping herbaceous plant that spread vigorously with its underground rhizomes, transplanting this species as a turf mat and planting it directly to the receptor site is regarded as feasible and practical. This method can reduce damage to the rhizomes by remaining a proportion of the rhizome to be intact together even after the transplant.

4.1 Preparation before transplanting

The identified area of the herb *H. cordata* will be marked to ease the site preparation and the followed transplantation work. The recorded herb grew on a flat, soil-base ground on top of the concreted retaining wall. The original site of the herb is dominated by clay soil, which is similar to the typical soil type and texture found in natural hillside area. The whole recorded area is almost solely covered by *H. cordata*, with colonization of a few herb species (including *Alocasia ordata*) and presence of decayed wood debris. Before the transplant, any wood debris will be removed, and the roots and vegetated bodies of herbaceous and woody seedlings other than *H. cordata* will be manually weeded to avoid their contamination and recolonization to the proposed receptor site. The concreted retaining wall would be remained intact for transplanting *H. cordata*.

4.2 Transplanting the herb

Transplantation of *H. cordata* will be undertaken immediately after removing the wood debris and unwanted herbs and/or woody seedlings. With the advantages of retaining more undamaged underground rhizomes and quicker establishment in the receptor site, a turf of *H. cordata* will be dug from the soil ground by using a spade. Depends on actual site condition and practicality of transplanting *H. cordata* as a turf, *H. cordata* would be transplanted either in a single turf or into several pieces to fit the final receptor site. An area of about 1.5m x 2.6m and with approximately 0.15m to 0.20m thick of soil will be dug up and transported directly to the receptor site on the same transplant day. During the transport, the dug turf(s) with *H. cordata* will be laid on a burlap sheet and should not be stacked by other vegetation to avoid damage on its vegetated part and rhizomes.

When transported or temporarily stored before the transplant, the dug soil of *H. cordata* should be watered to maintain a wet and mist growth medium to sustain the growth of this herb.

4.3 Preparation of receptor site

A small receptor site, with an area of about 2.0m x 2.6m, is proposed in **Section 5** (**Figure 2**). The selected receptor site is a flat, soil ground with a small stones and some paved structure (**Plate 3**). The receptor site is dominated by fertile topsoil which is similar to farmland soil rich in organic matter. Soil in the receptor site would facilitate the herb establishment with its farmland-type soil condition. It is underneath a spreading canopy of a retained tree *Ficus elastica*, which would provide a semi-shady environ favoring the establishment of *H. cordata*.

Minimal site clearance and preparation will be carried out before transplanting the dug turf(s) of *H. cordata* to the receptor site. A rectangular planting hole with a dimension of 2.0m x 2.6m and a depth of 0.2m will be excavated by spade. The excavation should be undertaken carefully so that roots of the nearby *Ficus elastica* would not be impacted. Any compacted soil around the hole shall be loosened with a spade to facilitate air penetration. Any large stones and concreted materials in the planting hole should be removed.

No soil conditioner or soil mix will be prepared since the herb will be transplanted together with its soil.

4.4 Planting the herb

The turf(s) of *H. cordata* will be transplanted into the prepared planting hole. Should there be any unfilled space in the planting hole after transplanting the turf(s), the space will be backfilled with excavated soil until the level with the surrounding ground to limit future settling and prevent air pockets. The backfill shall not be compacted to a density that inhibits root growth.

The transplanted herbs shall be well watered to maintain a moist growth environment in favoring the plant establishment. If necessary, establishment of shading net shall be considered to provide a semi-shady environment to favor the herb growth.

4.5 Implementation Programme

Transplantation of *H. cordata* should be undertaken prior to the construction work at the existing location of the identified *H. cordata*. To suit the works programme, transplantation of this herb species was conducted on 14 July 2011. A summary of this transplantation work is detailed in **Appendix B**.

5 LOCATIONS OF THE RECEPTOR SITES FOR THE TRANSPLANT

A small area located within an existing fenced area to the northeast of Wong Chuk Hang Road Garden is selected as a receptor site (**Figure 2**, **Plate 3**). Site clearance and preparation will be undertaken to facilitate the transplantation of *H. cordata*, but without causing any adverse damage to the roots of the retained *Ficus elastica*. After the transplant, the receptor site should be fenced and protected to prevent any damage resulting from the adjacent construction works (if any) during the

establishment period (see **Appendix B** for details of the fence established at the receptor site). On-site construction workers should be notified for the presence of this protected species. No collection of this herb and unauthorized entry to the fenced receptor site should be allowed. The fence established around the transplanted herb will be maintained throughout the construction period and will be removed when the construction works at Wong Chuk Hang San Wai is completed. Nevertheless, the receptor site is located within a fenced area at Wong Chuk Hang San Wai and the existing chain-link fence around the receptor site and its vicinity will be maintained. The fenced area will not be freely / easily accessible by the public and this avoids the illegal collection from the public as far as possible.

6 POST-TRANSPLANTATION MONITORING AND MAINTENANCE

Regular watering, weeding and pest control should be implemented during the 12-month post-transplantation maintenance period. Regular monitoring of the health condition and growth of the transplanted *H. cordata* should be carried out by the Qualified Ecologist during the same maintenance period.

Fresh water shall be used for watering the transplanted herb at least twice per week in the first three months after the transplant. Watering frequency during the wet season shall be adjusted according to weather condition. Watering shall be applied using a rose or a sprinkler and in such a manner that compaction and washout of soil will not arise.

The receptor site and its vicinity should be kept free from weeds throughout the post-transplantation maintenance period. Any unwanted weeds, such as *Mikania micrantha*, found at the receptor site and its vicinity should be removed by the Contractor once identified or when instructed by the Qualified Ecologist. Weeding shall be carried out by hand as much as possible. Any removed weeds, litter and debris should be disposed appropriately by the Contractor.

The Qualified Ecologist and the Contractor shall regularly check for any insect attack and diseased plant parts of the transplanted *H. cordata*. Appropriate pest control treatment, including the use of pesticide, and/or removal of diseased plant parts shall be applied if necessary.

Monitoring of the transplanted herb will be undertaken throughout the 12-month post-transplantation maintenance period. The monitoring will be conducted once per week in the first month and once in each following month in the remaining monitoring period. Health condition and growth of the transplanted herb will be assessed and photographic records will be undertaken. In general, the performance of monitoring and audit from an ecological prospective will be integrated with the overall monitoring and audit plan for the project as a whole. Monitoring and audit results as well as post-transplantation maintenance and treatment (if any) will be reported in the Monthly EM&A Reports during the monitoring period of the transplanted herbs.

7 REFERENCES

Xing, F.W., Ng, S.C., Chau, K.C., 2000. Gymnosperms and Angiosperms of Hong Kong. *Memoirs of the Hong Kong Natural History Society*, 23: 21 – 135.

Appendix A – Photographic records of *Houttuynia cordata*, existing site condition and the proposed receptor site for the transplanted *H. cordata*

Plate 1. *Houttuynia cordata*.

Plate 2. The identified *Houttuynia cordata* on top of a concreted retaining wall, with decayed wood debris and other herbs colonized the area.

Plate 3. The proposed receptor site for the transplanted *Houttuynia cordata*. Stones and paved structures will be removed during site preparation stage for the transplant.

Appendix B – Inspection Summary of Transplantation Work of *Houttuynia cordata*

1 INTRODUCTION

To suit the works programme, transplantation of the recorded *H. cordata* was scheduled by the Project Contractor. The transplantation was scheduled on 14th July 2011, about one month after the submission of the Transplantation Proposal (*Houttuynia cordata*) in June 2011. The transplantation aims to prevent the impact/disturbance to the recorded *H. cordata* arising from the proposed works and provide a suitable receptor site for the transplanted herb.

EPD's comments on the Transplantation Proposal were received by the Project Proponent on 13th July 2011. Accordingly, both the EPD and AFCD officers were informed as to the arrangement for the scheduled transplant work on 13th July 2011.

This Appendix B will provide a summary of photographic records on the transplantation work conducted by the Transplantation Contractor for the Project on 14th July 2011.

2 INSPECTION FINDINGS (WITH PHOTOGRAPHIC RECORDS)

The transplantation was undertaken by the Transplantation Contractor on 14th July 2011 (rainy day), under the supervision of the Qualified Ecologist (Ms. YU Ming-yee, Ida) and representatives from MTRCL.

As stipulated in the Transplantation Proposal, the Transplantation Contractor for the Project should follow the transplantation methodology for transplanting the *H. cordata* from its original location to the proposed receptor site at Wong Chuk Hang San Wai. Any deviations from the transplantation procedures of *H. cordata* were agreed with the Qualified Ecologist on-site before carrying out the transplantation.

A series of photographic records (with description) will be presented as follows:

Before the transplantation, a temporary steel scaffold, which was established to protect the herb from the adjacent vegetation clearance work, was removed (**Plate 1**).

Plate 1

Dimensions of the area to be transplanted were marked. Manual removal of weedy herbs, grass, tree seedlings and wood debris was carried out by the Transplantation Contractor (**Plate 2**).

Plate 2

Numerous pieces of dug herbs were transferred to either a plastic box or wooden plate with a burlap sheet overlay for temporary storage before transplanting to the final receptor site (**Plate 3**) as a single complete turf of herb could not be dug with a spade due to the large area to be transplanted. Special care was taken to dig up the herbs with intact soil (about 5 cm soil depths) and undisturbed rhizomes (**Plates 3 – 5**).

Plate 3

Plate 4

Plate 5

Soil found in the original site of *H. cordata* was dominated by clay soil, which is similar to the typical soil type and texture found in natural hillside area (**Plate 6**).

Plate 6

All dug herbs were transported directly to the final receptor site at Wong Chuk Hang San Wai on the same day (**Plate 7**). No stacking of dug herbs was observed during the transportation.

Plate 7

Before planting the herbs, all vegetation and stones at the selected area (about 2.0m x 2.5m) were removed, exposing the fertile topsoil of the selected receptor site (**Plates 8 – 10**). The receptor site was dominated by black-coloured soil, which is similar to farmland soil rich in organic matter (**Plate 10**).

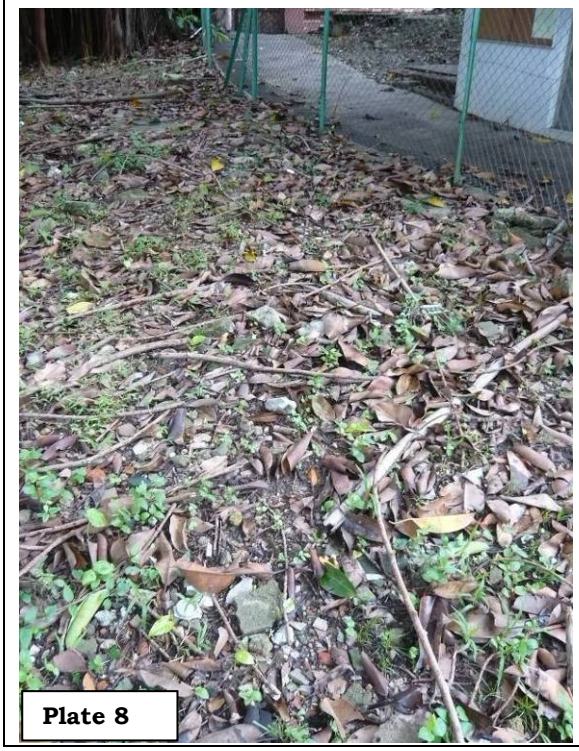

Plate 8

Plate 9

Plate 10

As only a relatively thin soil layer (about 5cm) with herbs was dug from the original plant location, a thin layer of topsoil was ploughed at the receptor site. The dug herbs were carefully planted and laid on the ploughed topsoil (**Plates 11 – 12**).

Plate11

Plate 12

Special care to spread the rhizomes and position the upright plant parts was observed. No excess soil was backfilled around the transplanted herbs (**Plate 13**).

Plate13

All dug herbs were transplanted to the final receptor area of 1.4m x 2.2m, with simple banks constructed around this area to retain water (**Plates 14 – 15**). The receptor site is under the shade of a *Ficus elastica* (OCP-T2128(R)). The transplanted herb was wetted by rain after the planting.

Plate 14

Plate 15

A protection fence was established around the final receptor site (**Plate 16**). The on-site construction workers were notified as to the presence of this transplanted rare herb and no collection of this herb and unauthorized entry to the fenced receptor site is allowed.

Plate 16

An inspection of the transplanted *H. cordata* was carried out on 20th July 2011 (monitoring will be conducted once per week in the first month and once in each following month in the remaining monitoring period as stated in the Transplantation Proposal). The transplanted herb has remained in fair condition (**Plate 17**).

Plate 17

The transplanted herb has remained in good condition as shown in the inspections on 27 July and 4 August 2011. No significant dieback or wilt leaves was observed from the transplanted patches. The protection fence has been maintained properly surrounding the receptor site (**Plate 18**).

Plate 18