

APPENDIX

SAFEGUARDS AND MITIGATION MEASURES

NParks is satisfied that the LTA has adopted very stringent safeguards and comprehensive and substantial mitigation measures for the proposed site investigation work at the CCNR. These mitigation measures include but are not limited to the following (*denote additional mitigation measures after public disclosure of the EIA report):

Confining and limiting the impact of borehole operations

- Reducing the number of 10 cm-diameter boreholes from 72 to 16 within CCNR.
- Confining the 16 boreholes along existing trails and clearings, away from ecologically sensitive areas directly above the tunnel alignment under consideration.
- Employing alternative measures such as Horizontal Directional Coring (HDC) and geophysical surveys to compensate for the reduction of boreholes, while ensuring that such alternative approaches will be carried out in the most non-intrusive way as far as practicable.
- Engaging a certified arborist to assess and propose methods to avoid damage to the trees due to borehole operations.*

Reducing the intrusiveness of off-trail investigation

- Reducing the width of the geophysical survey corridor from 150m to 100m.
- Conducting the geophysical surveys on existing albeit unmarked trails within the forest and avoiding sensitive locations such as primary rainforests, streams and swampy areas.
- Supervising of geophysical surveys by NParks officers competent in forest ecology to ensure that the surveyors will not trample on plants on the forest floor, and to minimise the impact on fauna.
- Mapping out of specific access routes that will be used by geophysical surveyors. These will be restricted to existing trails in the forest.*

Reducing disturbances to fauna

- Synchronising borehole operations and geophysical surveys so that they are carried out together within the same sector in phases, so as to allow animals to move away from activity zones.

- Restricting all site investigation activities to daylight hours, so as not to affect nocturnal animals.
- Scheduling the geophysical survey to include at least one to two rest days in between surveys, to allow respite for less mobile and sensitive fauna for the duration of borehole operations within the same sector.*

Protecting jungle streams

- Dispensing with the use of the Mackintosh Probes which will remove all works from streams.*

Reducing risk of spillage, soil erosion & compaction

- Locating the HDC worksites outside the forested area of the Central Catchment Nature Reserve.
- Allowing a longer interval before resuming site investigation works after heavy rain to reduce soil erosion into streams and to protect the integrity of the top soil structure. NParks officers are to give consent before resumption of work.*
- Using tracked vehicles in order to reduce ground compaction in the transportation of water and waste material. Waste material will be removed from the site daily to minimise the chance of pollution.
- Modifying the drilling equipment to prevent spillage of slurry and fuel, as well as to reduce noise level.
- Suspending site investigation works during rain to limit occurrence of soil erosion.
- Working with PUB to access boreholes through Bukit Kallang Service Reservoir compound. This will reduce vehicular movement along Terentang trail where it is narrow and undulating, so as to minimise the risk of spillage to the surrounding areas which are ecologically sensitive.*

Reducing noise and light pollution

- Reducing light and noise pollution arising from HDC operations by throttling down equipment when not in use, using acoustic enclosures and erecting temporary shelter over the work sites.
- Modifying the drilling rig further by installing a silencer at the end of the drill engine exhaust to reduce noise. The exhaust pipe will also not be extended to the top of the drilling rig to avoid affecting fauna at the upper canopy levels.*

Enforcing compliance

- Requiring the appointed site investigation contractor to conduct trial runs of the borehole operations and geophysical survey off-site prior to actual works in the Nature Reserve. This provides the opportunity to further fine-tune operations to minimise impacts, while allowing contractors to familiarise themselves with the stringent requirements of working within the Nature Reserve.*
- Issuing of immediate stop-work orders by NParks officers, should there be any breach or deviation from the agreed mitigation measures or when pollution is detected.*
- Inviting representatives from the nature community as observers for the site investigation works to reinforce compliance of the mitigation measures.*