SECTION 16

Conclusions

16.1 Site History, Site Setting & Waste Disposal

1. The Jelutong dumpsite is located entirely within reclaimed land. The original coastline is understood to be approximately 300m to the west of the site.

2. The site is surrounded by residential / commercial property to the north, Jelutong Expressway to the west and residential apartment blocks to the southwest. The JSTP is located 200m to the west of the site, along the Jelutong Expressway.

3. The shallow geology within and adjacent to the dumpsite is comprised of fill materials, which were used to reclaim the former shallow tidal flats along this section of coastline. Natural geology is comprised of shallow alluviums of silts, sands and clays of the natural coastline. Marine clays understood to be up to 8m thick underlay the dumpsite. Estuarine sands underlay the marine clays sequentially.

4. The coastline is in a groundwater discharge zone. Shallow groundwater from the natural coastline to the west is likely to generally flow towards the dumpsite although mounding from infiltration at the dump site may influence the overall flow pattern. The wastes within the dumpsite, with surrounding shallow fill materials adjacent to the dumpsite, are likely to be tidally-influenced. It is noted that shallow groundwater above the marine clays flows towards the north and east. However, some mounding of shallow groundwater may appear during storm events, as it is expected that high infiltration rates into the wastes will exist during storm events. Two drains are also present immediately north and south of the dumpsite. These have a local effect on shallow groundwater flow directions, particularly during low tide events.

5. It is understood that waste disposal commenced in the early 1990s, where some informal cells were constructed within the former marsh / shallow swamp areas to provide a waste tipping platform. It is understood that wastes have previously been deposited across many parts of this coastline. Construction of the expressway in 2002 led to a consolidation of wastes within the current dumpsite boundary. Residential waste collections were subsequently diverted to an engineered landfill on the mainland after 2002/2003.

6. The predominant waste streams are currently comprised of construction / demolition wastes, soils and green wastes. Soils are predominantly derived from development-led construction works such as piling and earthworks to construct new properties on Penang. It is estimated that 350,000m^3/annum of waste are currently being disposed in the dumpsite. Waste heights have increased by 5-10m in the central area of the site over the last 12 months alone, and are currently at approximately 35m above sea level. The side slopes of the dumpsite are approximately 35-40 degrees, and approximately 55m in length. Waste depths are currently 7m beneath ocean levels along the eastern boundary of the site, where the ocean floor starts to dip to a depth of 13m in the approaches to the Southern Channel.

7. Estimates of approximately 5.5million m^3 to 7.0million m^3 of wastes have been disposed in the dumpsite. Approximately 40% is comprised of putrescible wastes capable of generating landfill gases. These appear to be spread across the site.

8. Since 2005, waste disposal records indicate that the major proportion of wastes are construction and demolition wastes (80% to 90%), with a total waste input ranging from 71,000 tonnes to 569,000 tonnes between 2005 and 2013. The detail of the waste composition from 2005 until 2013 is shown in **Table 1** in **Appendix C**.