



40/F, Revenue Tower, 5 Gloucester Road, Wan Chai, Hong Kong
香港灣仔告士打道 5 號稅務大樓 40 樓

(ACE-EIA Paper 2/2007)

For advice

Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment
Liquefied Natural Gas (LNG) Receiving Terminal and Associated Facilities

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) Report for the Liquefied Natural Gas (LNG) Receiving Terminal and Associated Facilities in Hong Kong Special Administrative Region (Hong Kong SAR) (hereafter known as the Project) submitted under Section 6(2) of the Environmental Impact Assessment Ordinance (EIAO). The applicant and their consultants will make a presentation.

ADVICE SOUGHT

2. Members' views are sought on the findings and recommendations of the EIA report.

NEED FOR THE PROJECT

3. According to the Castle Peak Power Company Limited (CAPCO), the use of more natural gas is essential for them to reduce its emissions from electricity generation and to meet the 2010 emission caps. CAPCO indicates in the EIA report that the project would provide the infrastructure for a sustainable supply of natural gas. CAPCO also indicates that the project would provide a replacement for the natural gas source currently supplied to CAPCO from the Yacheng gas field. CAPCO has examined various alternative sites for the LNG Terminal within Hong Kong SAR.

DESCRIPTION OF THE PROJECT

4. The proposed Project is to develop a LNG terminal in the Hong Kong SAR. This would involve the construction and operation of a LNG receiving terminal and its associated

facilities at either the South Soko Island or Black Point.

5. For the South Soko Option, it would include the following key items of work:

- (i) Jetty including unloading arms capable of accommodating LNG carriers with capacities ranging from 125,000 m³ up to a class of 215,000 m³;
- (ii) Three full containment cryogenic LNG Tanks (capacity of up to 180,000 m³ each);
- (iii) Low Pressure and High Pressure pumping systems;
- (iv) Vaporization (Re-gasification) Area;
- (v) Seawater intake and outfall systems;
- (vi) 38 km long Submarine natural gas pipeline;
- (vii) A Gas Receiving Station (GRS) at the Black Point Power Station to receive the natural gas and send it to the power station;
- (viii) Submarine power cable and water main to connect the terminal to electricity and water supply sources at Lantau Island;
- (ix) Provision of gas turbines for on-site power generation; and
- (x) Other supporting facilities as listed in the EIA report.

6. For the South Soko Option, the Designated Projects under Schedule 2 of the EIAO include (i) L.2 (*storage, transfer and trans-shipment of liquefied natural gas with a storage capacity of not less than 200 tonnes*); (ii) C.12 (*dredging operation exceeding 500,000m³ or dredging operation < 500m from the nearest boundary of an existing Site of Cultural Heritage*); (iii) H.2 (*a submarine gas pipeline*). The preliminary layout of the Terminal, the proposed alignment of the pipeline and the LNG Carrier Transit Route to South Soko are given in **Appendix 1, 2 and 3** respectively, which are extracted from the EIA report.

7. With regard to the Black Point Option, it would include the following key items of work:

- (i) Jetty including unloading arms capable of accommodating LNG carriers with capacities ranging from 125,000 m³ up to a class of 215,000 m³;
- (ii) Three full containment cryogenic LNG Tanks (capacity of up to 180,000 m³ each);

- (iii) Low Pressure and High Pressure pumping systems;
- (iv) Vaporization (Re-gasification) Area;
- (v) Seawater intake and outfall systems; and
- (vi) Other supporting facilities as listed in the EIA report.

8. For the Black Point Option, the Designated Projects under the Schedule 2 of the EIAO include (i) L.2 (*storage, transfer and trans-shipment of liquefied natural gas with a storage capacity of not less than 200 tonnes*); (ii) C.1 (*reclamation works (including associated dredging works) more than 5 ha in size*); and (iii) C.12 (*dredging operation exceeding 500,000m³*). The preliminary layout for the Proposed Black Point LNG Terminal and the LNG Carrier transit route to Black Point are given in **Appendix 4 and 5** respectively.

9. CAPCO has identified a preference for the South Soko option for the following reasons:

- (i) South Soko would enable a replacement gas supply earlier, which would assure electricity supply reliability and result in CAPCO burning less coals and avoiding the associated emissions;
- (ii) South Soko would enable CAPCO to meet the Hong Kong SAR Government's emission targets sooner;
- (iii) South Soko would require less land reclamation, while the environmental impacts of its offshore pipeline to Black Point can be adequately mitigated; and
- (iv) the location of South Soko provides for very low numbers of surrounding land and marine-based populations with exposure to both the terminal and the marine transit and all aspects of the marine transit are acceptable from a societal risk standpoint.

VIEWS OF THE DIRECTOR AND RELEVANT AUTHORITIES

10. The Director of Environmental Protection (DEP), in conjunction with the relevant authorities, considers that the report meets the requirements of the EIA Study Brief and the Technical Memorandum (TM) on EIA Process. Comments from the public and the ACE will be taken into account before DEP makes the final decision on the approval of the EIA report.

SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

South Soko Option

Ecological Impacts

11. The LNG terminal, its submarine natural gas pipeline, and other supporting facilities proposed in the EIA report are located within and/or close to areas of high ecological importance, such as the Sha Chau and Lung Kwu Chau Marine Park (SLMP), the potential Soko Marine Park, and the potential Fan Lau Marine Park at West Lantau. The Agriculture, Fisheries and Conservation Department (AFCD), as the relevant authority, indicates that the West Lantau area is currently the most important habitat for Chinese White Dolphin (*Sousa chinensis*) in Hong Kong and the entire Pearl River Estuary in terms of high density of dolphins and high encounter rate of their calves and juveniles. The AFCD also indicates that the marine habitat of South Soko has a high ecological value for marine mammals as it is a unique habitat utilized by both Chinese White Dolphin and Finless porpoise (*Neophocaena phocaenoides*). The South Soko areas also exhibit a high diversity of marine life with the presence of both marine mammal species, corals (e.g. the False pillow coral), fish and fry, and a primitive chordate Amphioxus. To avoid and minimize the potential ecological impacts arising from the South Soko option, the CAPCO has proposed a package of alternative options and mitigation measures in the EIA report for implementation of the South Soko Option. This package of alternative options includes, among others, (i) the relocation of the proposed jetty and turning basin from the original Northern side to the Southern side of South Soko, hence avoiding dredging works in the sensitive areas between the North and South Soko Islands; (ii) deletion of the proposed breakwater in Tung Wan to avoid the impact on habitats of Amphioxus; (iii) the minimization of the size of the reclamation from 13 ha to 0.6 ha by adopting a modified layout; and (iv) the use of marine dredging instead of jetting operation for installation of the submarine natural gas pipeline, etc.

12. In addition, the CAPCO proposed a package of ecological mitigation measures and precautionary measures with a view to minimizing the potential residual ecological impacts. These measures include, among others, the adoption of a daily maximum of 12 hours with daylight operations and implementation of marine mammal exclusion zones for (i) major portion of the dredging works for the natural gas pipeline; (ii) dredging works for the LNG carrier's approach channel and turning basin; and (iii) the piling works for the jetty construction. During the peak calving season of Chinese White Dolphin (i.e. from March to August), the CAPCO proposed to avoid dredging works for the entire submarine natural gas pipeline. Similarly, during the peak calving season of Finless Porpoise (i.e. October to

January), the CAPCO proposed to avoid dredging works for the LNG carrier's approach channel/turning basin and piling works for jetty construction. In addition, the CAPCO proposed deployment of different types of silt curtains during construction of marine works in the vicinity of the Pak Tso Wan and other parts of South Soko, and also during the dredging works for the natural gas pipeline construction near the boundary of SLMP.

13. CAPCO has assessed the potential impacts to terrestrial ecology caused by construction of the proposed LNG Terminal at South Soko. The EIA report indicates that the LNG terminal and its associated facilities would be located mainly in habitats of low ecological value such as the ex-detention centre on Soko Island, and therefore concludes that the construction impact on the natural habitats is not significant.

14. The AFCD has confirmed that the EIA report meets the requirements of the EIA Study Brief and the TM on EIA Process.

Water Quality Impact

15. The suspended solids (SS) elevations arising from dredging, reclamation and installation of the submarine gas pipeline during construction stage are the key water quality impact. The modeling results for the construction works predicted that elevations in SS are of short duration and could be mitigated to a level which could comply with the Water Quality Objectives for most sensitive receivers, except for the fish fry habitats at Pak Tso Wan, the subtidal hard bottom habitat at the southern side of South Soko, and in some areas of the SLMP. By adopting the proposed mitigation measures, such as different types of silt curtains (including the movable cage type) and with the incorporation of appropriate conditions imposed under the EIAO, the predicted residual water quality impacts arising from the construction and operation of the Project would comply with the TM on EIA Process.

Waste Management

16. According to the EIA report, a total of approximately 3.89 Mm³ marine sediment would be dredged during the construction stage of the Project. The report also estimated that about 2.34 Mm³ of these sediments are uncontaminated and can be disposed of at open sea disposal sites, and about 1.55Mm³ of them are contaminated sediment (i.e. Category M sediment and Category H sediment). At present, the East of Sha Chau Mud Pits are designated for confined marine sediment disposal. Due to the size of these existing pits, it is noted that the capacity may not be available at the time of disposal. In view of such situation, an alternative site for confined marine sediment disposal would be identified in

discussion with the Marine Fill Committee and the Environmental Protection Department.

Air Quality Impact

17. According to the EIA report, the air quality impacts at all the identified Air Sensitive Receivers would comply with the Air Quality Objectives (AQOs). However, the predicted sulphur dioxide (SO₂) and nitrogen dioxide (NO₂) concentrations are expected to exceed the AQOs at the headland of South Soko Island under certain circumstances. In view of the exceedance of AQOs, the headland of South Soko Island would not be suitable for placing any air sensitive receivers in the future. To ensure compliance with the AQOs at ASRs and to restrict the extent of land use constraint during operation phase, the emission parameter and emission rates adopted in the EIA report will be imposed as appropriate conditions under the EIAO.

Landscape and Visual Impact

18. CAPCO has assessed the potential impacts to the landscape and visual sensitive receivers caused by the proposed LNG Terminal and has proposed a series of measures to minimize the impacts, including the reduction of tank height from 70mPD to 61mPD. The EIA report concludes that the impacts are acceptable with mitigation measures, in accordance with the TM on EIA Process. The Planning Department, as the relevant authority under the EIAO on visual and landscaping aspects, has confirmed that the EIA report meets the requirements of the EIA Study Brief and the TM on EIA Process.

Hazard to Life

19. According to the EIA report, the location of the South Soko Island provided for very low number of surrounding land and marine-based populations with exposure to both the terminal site and the marine transit. The EIA concludes that no unacceptable risks are foreseen as a result of the transit of the LNG carrier to South Soko, the operation of the LNG terminal, the submarine gas pipeline and the GRS's operation. The societal and individual risks are within the Acceptable Region of the Risk Guidelines as stipulated in Figure 1 in Annex 4 of the TM on EIA Process. The Electrical and Mechanical Services Department (EMSD), as the relevant authority under the EIAO on hazard assessment for this Project, has confirmed that the EIA report meets the requirements of the EIA Study Brief and the TM on EIA Process.

Black Point Option

20. The hazard to life, among others, is the key issue relating to the Black Point Option. After reviewing the EIA report, the relevant authorities, including EMSD and Marine Department (MD) have come to the following views:

- (i) the risk associated with the Black Point Option with LNG carriers going through Ma Wan Channel is in the As Low As Reasonably Practicable (ALARP) region and therefore needs to be mitigated;
- (ii) CAPCO's proposed mitigation measures for the Black Point Option are not considered implementable at this stage, hence the risk associated with the Black Point Option cannot be practically mitigated to be within the acceptable region;
- (iii) the CAPCO's selection of South Soko Option, which is considered acceptable according to the risk criteria under the TM on EIA Process, to avoid adding additional risk to Ma Wan follows the principle to avoid and minimize risk to human life.

ENVIRONMENTAL MONITORING AND AUDIT (EM&A)

21. The EM&A programme is for monitoring the environmental impacts during the construction and operation stages, in particular the marine water quality and the status of relevant marine organisms during the construction and/or operation stages of the project. The EM&A requirements will be enforced as Environmental Permit conditions.

PUBLIC CONSULTATION

22. CAPCO has made the EIA report and the Executive Summary available for the public to comment under the EIAO from 27 December 2006 to 25 January 2007. Members will be briefed on any comments received from the public at the meeting.

December 2006

Environmental Assessment Division

Environmental Protection Department

Appendix 1

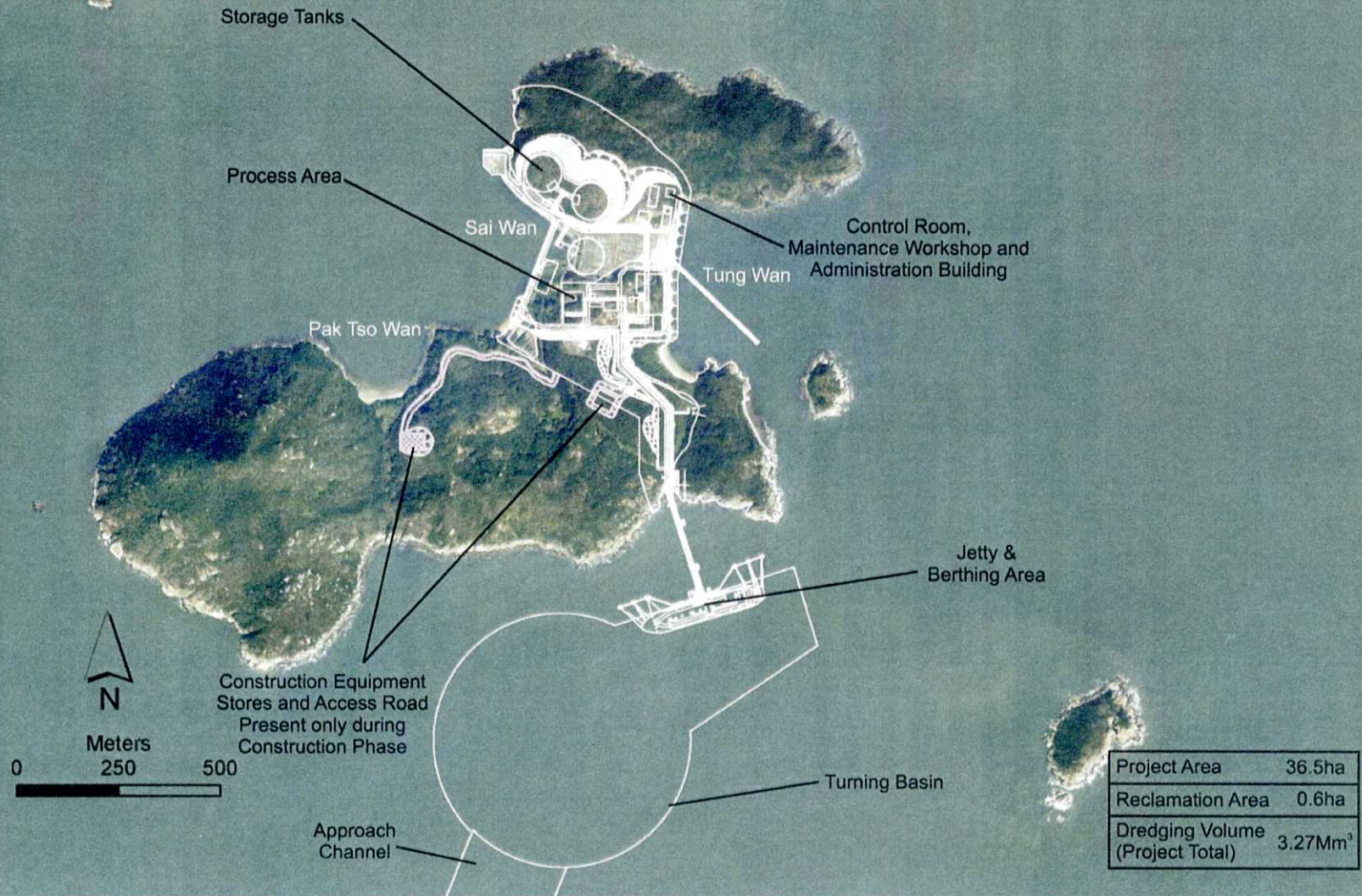


Figure 2.1

Preliminary Indicative Layout for the Proposed South Soko LNG Terminal
(Aerial photograph source: Lands Department)

Appendix 2

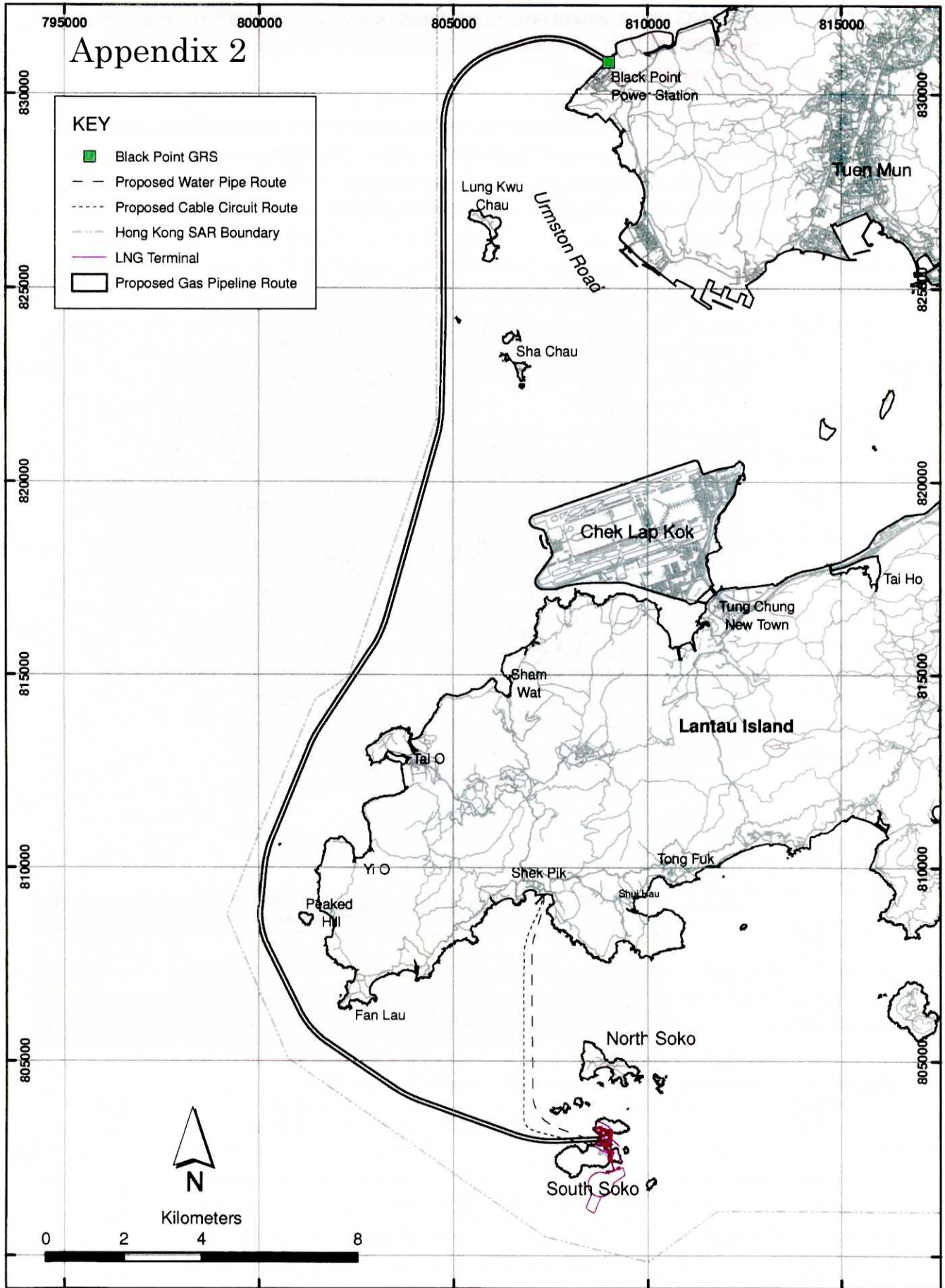
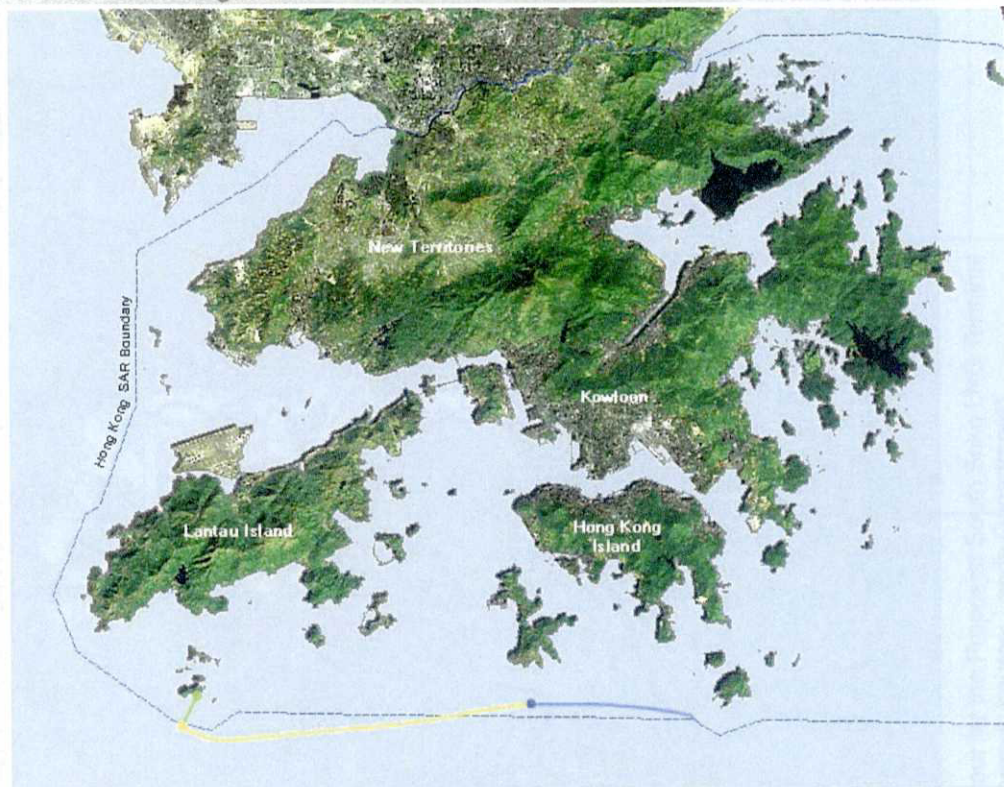


Figure 2.2

Locations of Works

Environmental
Resources
Management





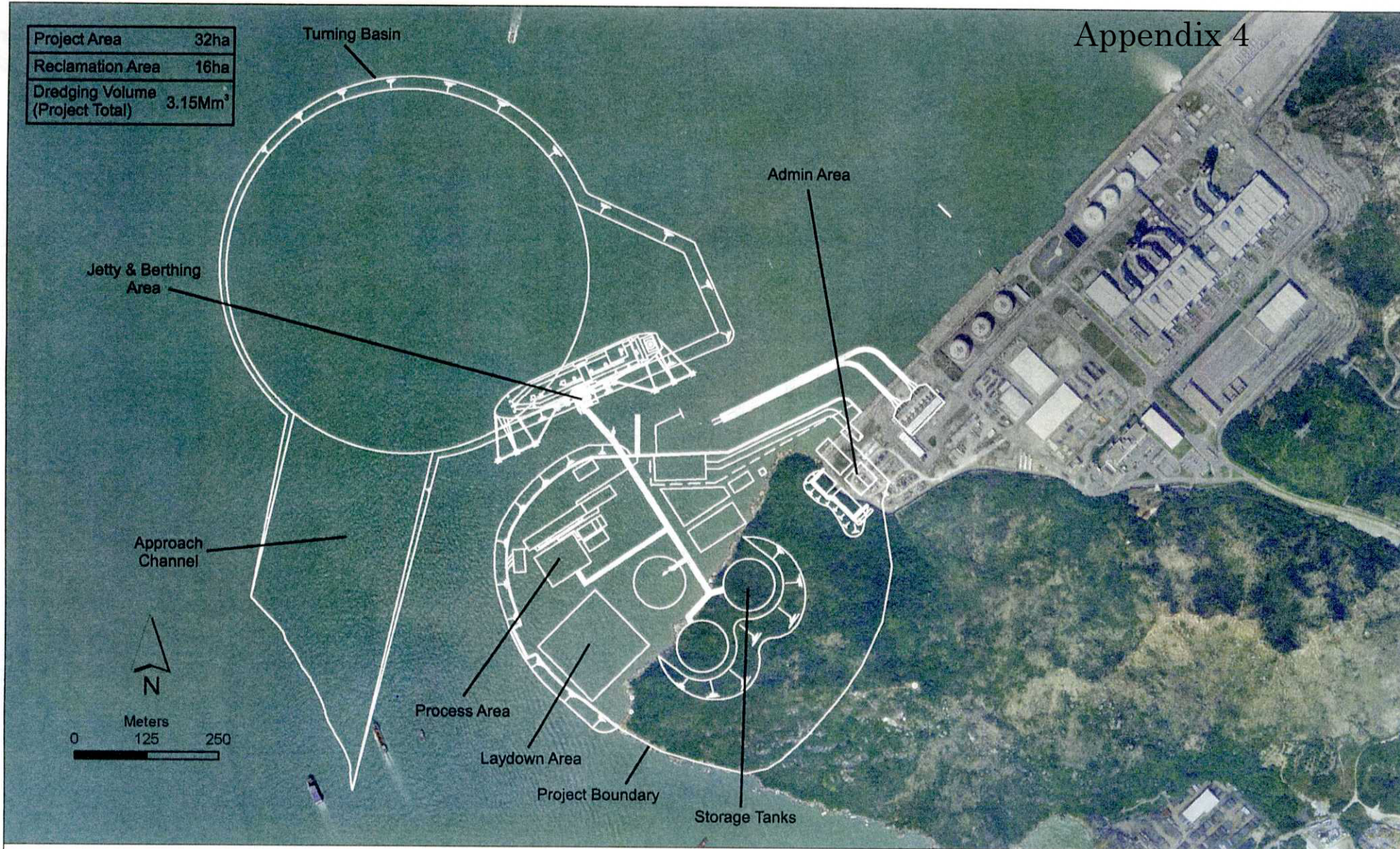


Figure 3.1

Layout for the Proposed Black Point LNG Terminal
(Aerial photograph source: Lands Department)

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