

CLP POWER HONG KONG LIMITED

**132kV Overhead Pole Line and
Underground Cable from the Existing Po Lam
Substation to the Existing Tui Min Hoi
Substation – Circuit No. 2**

Environmental Impact Assessment Study

Executive Summary

October 1999

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1 INTRODUCTION

1.1 Background of the Project

At present, the electricity supply to Sai Kung Town is mainly from the two primary substations at Tui Min Hoi and Wong Chuk Wan. They are in-fed by a single 132kV and two sets of parallel 33kV overhead pole lines respectively. These powerlines are inadequate to meet the projected demand for power. In order to maintain a secure supply to and cater for the local growth of electricity in Sai Kung Town area, including the supply to the High Islands Pumping Station, it will be necessary to establish a new 132kV in-fed circuit to Sai Kung Town. Without the installation of this proposed circuit, the supply security to that area will not be improved and may even deteriorate due to the growing load demand.

The proposed 132 kV Overhead Pole Line and Underground Cable from the existing Po Lam Substation to the existing Tui Min Hoi Substation - Circuit No. 2 (hereafter referred to as the Project) commences from Tseung Kwan O, running along the ridges to Pak Kong Village in Sai Kung. The two ends of the route are linked to the existing substations by underground cables. Besides connecting the overhead pole line to the substations, underground cables would also be installed for crossing the Clear Water Bay Road at Pik Uk and the cultivation at Ho Chung. The route length of the proposed overhead pole line and underground cable are about 6.5km and 5.5km respectively. The locations of the routes are shown in Figure 1.1.

The two pairs of existing 33kV powerlines will be removed within 2 years of commissioning of the proposed 132 kV powerline. The route alignments of the 33kV overhead pole lines are shown in Figure 1.2.

The proposed project is a Designated Project under the EIAO by virtue of Section Q.1 of Schedule 2 of the Ordinance. The project profile covers one designated project which is the construction and operation of 132kV overhead pole line and underground cable, parts of which lie within the Ma On Shan Country Park and Conservation Areas in Tseng Lan Shue, Ho Chung and Pak Kong. The Environmental Protection Department has issued an EIA Study Brief in June 1998 for the preparation of an EIA study.

Maunsell Environmental Management Consultants Limited in association Urbis Limited were commissioned by CLP Power Hong Kong Limited in October 1998 to conduct the EIA study. ERM was commissioned under a separate contract to conduct an Ecological Impact (Terrestrial) Assessment for the Project for incorporation into the Environmental Impact Assessment (EIA) study.

1.2 Purpose of the EIA Study

The purpose of the EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the proposed project and

related activities taking place concurrently. This information will contribute to decisions by the Director for Environmental Protection on:

- the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the project;
- the conditions and requirements for the detailed design, construction and operation of the proposed project to mitigate against adverse environmental consequences wherever practicable; and
- the acceptability of residual impacts after the proposed mitigation measures are implemented.

1.3 Overall Approach to the EIA Study

In accordance with the technical requirements mentioned in the Study Brief, all adverse impacts to the affected part of the Ma On Shan Country Park and Conservation Areas in Tseng Lan Shue, Ho Chung and Pak Kong, irrespective of whether they are caused by the parts of the project within or outside the limits of the country park and conservation areas were assessed. The criteria in the relevant sections of the Technical Memorandum on the EIA Process of the EIAO have been referenced. Mitigation measures have been recommended to minimise environmental impacts, where necessary.

Impacts on some environmental aspects (including air quality, land use, people and communities, agriculture and fisheries activities), noise impacts and waste management implications were considered not issues of concern for this Project and hence not covered by the Study Brief. Therefore, details of assessment of these environmental aspects will not be undertaken for the purpose of the current study.

2 DESCRIPTION OF THE PROJECT

2.1 Scope of Work

The proposed 132kV in-fed utilizes transmission overhead pole line and underground cable to deliver electricity from the existing Po Lam substation in Tseung Kwan O to the existing Tui Min Hoi substation in Sai Kung Town. The proposed circuit consists of three sections of overhead pole line (OHL) and four sections of underground cable (cable). The length of the OHL is 6.5km and that of the cable is 5.5km approximately.

2.2 Site Location

The proposed OHL route commences from Tseung Kwan O, runs along the ridges to Pak Kong Village in Sai Kung Town. The two terminals of the OHL will be linked to the existing substations by the cables. Besides connecting the OHL to the substations, cables with outer

diameter of about 68mm - 71mm will also be installed underground for crossing the Clear Water Bay Road at Pik Uk and the cultivation at Ho Chung. The detail of the proposed route is shown in Figure 1.1. The powerline will pass through Conservation Areas of the Draft Outline Zoning Plans (OZP) which include Tseng Lan Shue OZP, Ho Chung OZP, as well as Pak Kong and Sha Kok Mei OZP. A small portion of the OHL will be within the Ma On Shan Country Park.

2.3 Consideration of Alternatives

During the planning stage of the circuit route, the original route alignment was revised after careful consideration in balancing the pros and cons of the requirements and satisfaction of the various government departments and the local villagers. Hence, the proposed circuit route of this project is a consolidation of the opinions of the respective government departments, the Country and Marine Parks Board and the local villagers (through the village representatives, the Sai Kung and Tseung Kwan O Rural Committees). Thus the impact, if any, to the community at large has been minimized.

2.4 Construction Programme

The construction period is divided into several phases. The overall duration is about 18 months. The details are shown on the construction programme in Figure 2.1. The duration for the construction of underground cables will be about 6 months. The approximate construction period of the section of underground cables across the two tributaries of the Ho Chung River will be 3 months.

3 SUMMARY OF POTENTIAL IMPACTS AND RECOMMENDATIONS

Guidelines in the *Technical Memorandum on Environmental Impact Assessment Process* have been adopted for the assessment of environmental impacts likely to arise from the construction and operation of the proposed project. The findings of the prediction and evaluation of potential environmental impacts which may arise during the construction and operation phases of the Project are summarised below for each identified key issue.

3.1 Ecological Impacts

The ecological field surveys undertaken during the period July to November 1998 identified that the main areas of ecological interest include the natural secondary forests and *feng-shui* woods at Ho Chung, Pak Kong and west of Pik Uk, which have high floristic and structural diversity as well as rare or protected plant species. Potential impact due to landtake as well as increased human activities would significantly affect the integrity of the forest habitats. An alternative alignment to avoid these habitats has been recommended and subsequently adopted by CLP Power. Good construction practice is also recommended to minimise any disturbance to Ho Chung Stream during the underground cable construction as well as other terrestrial

ecological resources. The potential impact on terrestrial habitats (e.g. grassland, shrubland/tall shrubland, agricultural land and plantation) would be limited, given the low ecological importance and small areas affected (smaller than 1ha for all habitat types). With the implementation of the recommendations, the residual terrestrial ecological impact is not considered to be significant.

3.2 Hazard to Health

Although there is no conclusive scientific evidence of adverse health effects arising from long term exposure to the electric and magnetic fields generated from high voltage current carrying conductors including overhead transmission lines and underground cables, the subject has still been addressed in this report in accordance with the requirements of the Study Brief.

Measurements and calculations of EMFs for the proposed overhead lines and underground cables demonstrated that the predicted values will be well under the stipulated guideline limits (below 2/5 of guideline limits) issued by the ICNIRP. As such, the existence of EMF associated with the proposed project is not anticipated to pose any adverse impacts on public health. However, field measurements will be carried out to verify compliance with ICNIRP guideline levels upon commissioning of the circuit.

3.3 Landscape and Visual Impacts

The proposed powerline would pass through areas of high landscape amenity, including the well-wooded northern slopes of Hebe Hill, the Ho Chung Valley and the eastern slopes of Buffalo Hill. The landscape character within these areas is diverse and many areas are designated as either Green Belt, Conservation Area or Country Park on account of their high landscape value.

Impacts on landscape resources ranging from moderate to negligible significance are predicted at construction and operational stages for different sections of the proposed alignment. Moderate to negligible visual impacts are also predicted at construction and operational stages on surrounding residents and other users of the project area. Visual impacts include the presence of new powerline structures in the landscape and views of gaps in the woodland cover along some sections of the route alignment.

However, all of the identified potential landscape and visual impacts can be either reduced or offset to a large extent by the implementation of the landscape, ecological and visual impact mitigation measures. At the pole location, the ground will be revegetated with native shrub species to re-establish the former conditions as far as possible. The removal of two sets of 33kV powerlines from the Ma On Shan Country Park would result in a net reduction of approximately 4.9km of power line corridor within the Country Park, thus providing a landscape amenity gain from the project.

With reference to criteria for evaluation of landscape and visual impacts laid out in Annex 10 of the Technical Memorandum, the residual landscape and visual impacts shall be classified as “*acceptable with mitigation measures*” as the adverse effects of the proposed development can be reduced to a large extent by the specific measures identified above.

3.4 Water Quality Impacts

The existing water quality in Ho Chung River has improved in recent years. However, potential water quality impacts can be caused by the construction works of the Project. These could involve disturbance to natural processes and flow slow down, resuspension of sediment, alteration of supply of organic wastes and nutrients downstream; construction runoff and drainage, debris and rubbish, liquid spillages and sewage effluents. However, it is anticipated that disturbances to water bodies will be temporary and localised during construction.

Minimisation of water deterioration can be achieved through carrying out cable laying work across Ho Chung River during the dry season and implementing adequate mitigation measures such as the use of barriers to contain suspended sediment and control measures on site runoff and drainage. Such measures will significantly limit impacts on downstream water quality and on downstream water sensitive receivers. Proper site management and good housekeeping practices will be essential to ensure that construction activities will not cause non-compliances of WQOs for river water quality. These measures are listed in detail in the main report. Sewage effluent arising from the construction workforce would also require appropriate treatment through provision of portable toilets.

To ensure the effectiveness of the recommended mitigation measures, water quality monitoring and audit will be essential to proactively identify any deterioration in water quality and to check that the construction activities are not causing any non-compliances with the Action / Limit levels.

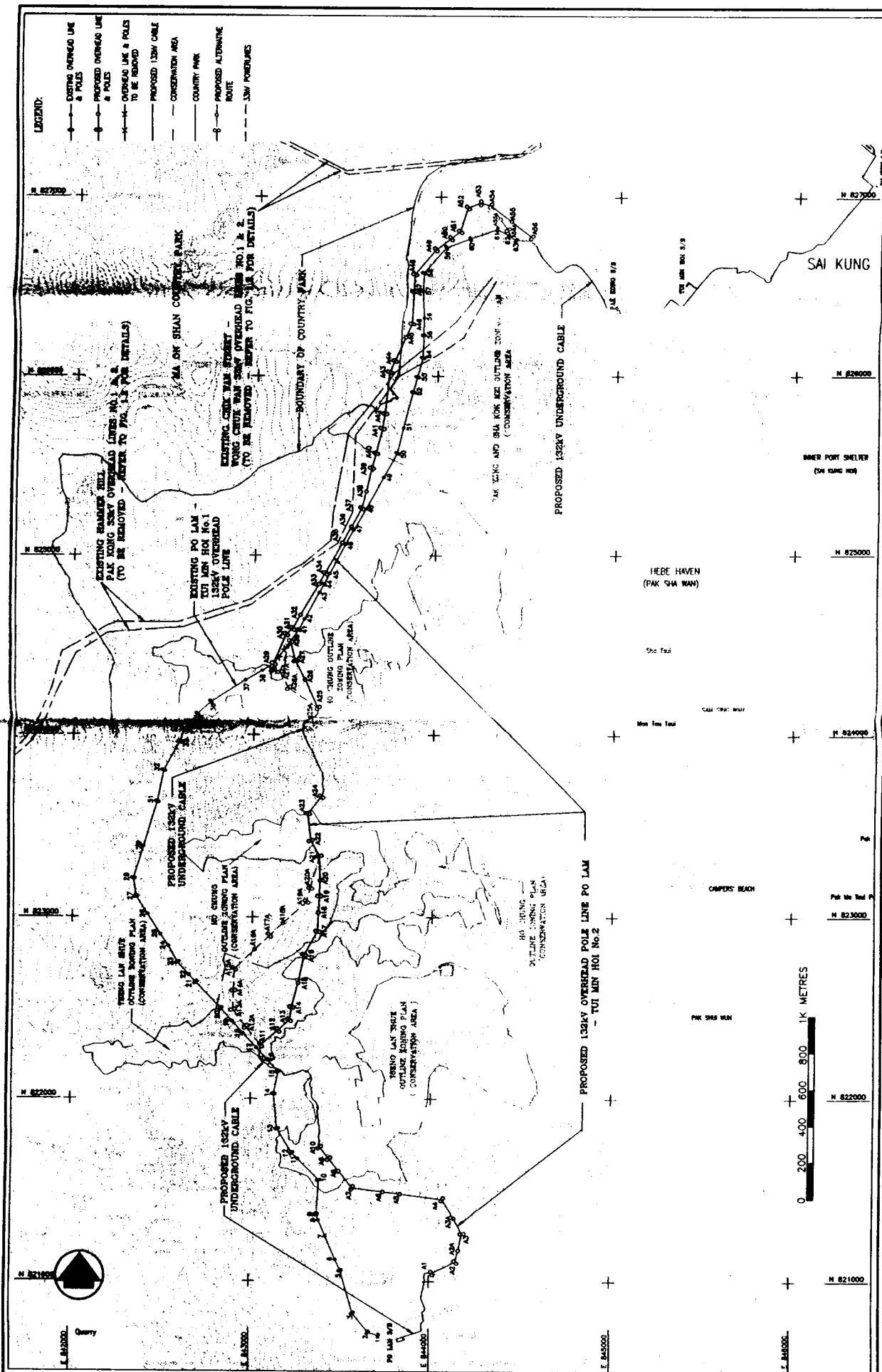
It is considered that through implementation of the recommended mitigation measures, potential water quality impacts can be minimised during construction of the Project. As such, the construction works are not expected to cause exceedance of WQO standards.

3.5 Impacts on Cultural Heritage

The review of all relevant information shows that the potential archaeological impact of the overhead/underground cable route generally is very low. The only area of any archaeological potential is that of the Ho Chung Valley. It is highly likely that the proposed construction works in that area will not impact on significant in situ cultural deposits. However, to ensure against any loss of archaeological information or materials, rescue excavation will be undertaken to salvage the cultural relics prior to commencement of trenching works across the Ho Chung Valley. Sufficient time will be allowed for carrying out the rescue excavation subject to agreement of AMO.

4 CONCLUSIONS

It is considered that with the implementation of the recommended environmental protection and pollution control measures, there will not be any insurmountable environmental impacts associated with the construction and operation of the proposed project. In addition, no unacceptable residual impacts are anticipated to result from the implementation of the recommended mitigation measures.



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Figure	1.1
Scale	AS SHOWN
Date	OCT 1999

Project
 132KV OVERHEAD POLE LINE & UNDERGROUND CABLE FROM THE EXISTING PC LAM SUBSTATION
 TO THE EXISTING TUI MIN HOI SUBSTATION - CIRCUIT NO. 2

Title
 LOCATION PLAN OF THE PROPOSED OVERHEAD POLE LINE & UNDERGROUND CABLE

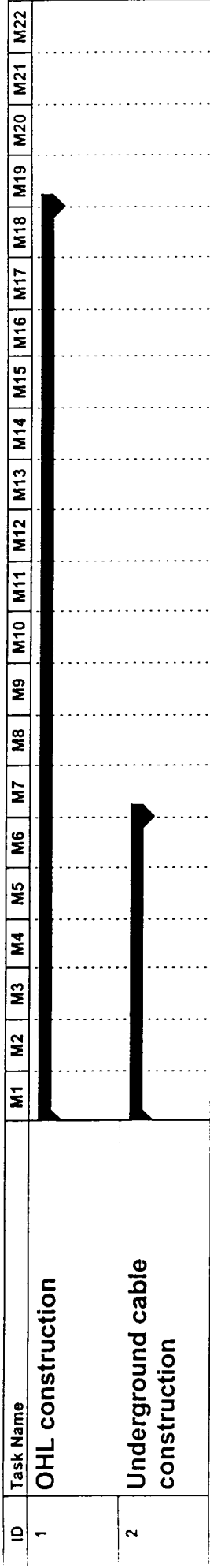


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Figure	1 2
Scale	AS SHOWN
Date	MAY 1993

Project 132KV OVERHEAD POLE LINE & UNDERGROUND CABLE FROM THE EXISTING PO LAM SUBSTATION TO THE EXISTING JI MIN HOI SUBSTATION - CIRCUIT NO 2

**PROPOSED 132KV OVERHEAD POLE LINE AND UNDERGROUND CABLE
FROM EXISTING PO LAM S/S TO EXISTING TUI MIN HOI S/S NO.2**



Project:16-340
Date: Jul 9 '99

Task 

Figure 2.1 Tentative Construction Programme