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1 BASIC INFORMATION

1.1 PROJECT TITLE

Proposed Submarine Gas Pipelines from Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal, Shenzhen to Tai Po Gas Production Plant, Hong Kong.

1.2 PURPOSE AND NATURE OF THE PROJECT

The Hong Kong and China Gas Company Limited (Towngas) is examining the feasibility of developing a natural gas supply system from the Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal (GRT), Shenzhen, People's Republic of China (PRC), to the Towngas Gas Production Plant (GPP) located in the Tai Po Industrial Estate, Hong Kong Special Administrative Region (HKSAR). The system comprises two natural gas pipelines connecting the two sites and associated facilities consisting of a launching station at the GRT and a receiving station at the GPP.

Towngas operates the Towngas Network which supplies gas to domestic, commercial and industrial consumers. The gas (which is a mixture of hydrogen, methane and carbon dioxide) is produced at the Towngas GPP in the Tai Po Industrial Estate and is supplied through a network of transmission and distribution pipelines.

Towngas is presently reviewing the reliability and flexibility of their existing system to meet expected future demand and the proposed gas pipeline system would be used to supply natural gas as alternative feedstock from the Cheng Tou Jiao GRT to produce gas at the existing production plant in Tai Po.

This Project Profile includes a preliminary assessment of the potential environmental impacts associated with the installation of the submarine pipelines. The assessment has been based on information compiled by the Project Proponent describing the construction activities. Once installed, the pipelines are not expected to result in any impact to the environment during their operation.

1.3 NAME OF PROJECT PROPONENT

The Hong Kong and China Gas Company Limited

1.4 LOCATION AND SCALE OF PROJECT AND HISTORY OF SITE

Location plans for the proposed Project are shown in **Annex A**.

The Project includes the following:

- i. a gas receiver facility at the Tai Po Gas Production Plant within the Tai Po Industrial Estate;
- ii. a gas launcher facility at the LNG receiving terminal at Cheng Tou Jiao, Shenzhen; and,
- iii. two submarine gas pipelines connecting the gas receiver and launcher facilities.

The gas launcher facility at the LNG receiving terminal at Cheng Tou Jiao, Shenzhen (item ii above) is not included in this Project Profile as it is not covered by the *Environmental Impact Assessment Ordinance (EIAO)* due to the planned location outside Hong Kong.

The Project site for the gas receiver facility is within the Tai Po Industrial Estate and will be located within the boundary of the existing Gas Production Plant run by The Hong Kong and China Gas Company Limited.

The submarine pipelines will be laid through Tolo Harbour, Tolo Channel and Mirs Bay within a 500m wide corridor shown in **Annex A**. The exact alignment of the pipelines will be determined during the engineering design and EIA Study.

1.5 DESIGNATED PROJECTS TO BE COVERED BY THE PROJECT PROFILE

The project involves the construction and operation of two gas submarine pipelines and a gas receiving station. The submarine gas pipeline component of the project is a Designated Project under item H.2 of Part I of Schedule 2 of the *EIAO*:

- *Schedule 2 (Part I), H.2 - A submarine gas pipeline.*

1.6 NAME AND TELEPHONE NUMBER OF CONTACT PERSON

All queries regarding the project can be addressed to:

2.1 PROJECT PLANNING AND IMPLEMENTATION

The Project Proponent is The Hong Kong and China Gas Company Limited with overall responsibility for the planning, design, construction and operation of the project. The Project Proponent is going to commission an Engineering Consultant to undertake the engineering design work, and an Environmental Consultant to conduct an Environmental Impact Assessment (EIA) Study. The Project will be implemented by Contractor(s) to be appointed by the Project Proponent at a subsequent stage.

2.2 PROJECT PROGRAMME

The construction works for the Proposed Submarine Gas Pipelines from Cheng Tou Jiao, China to Tai Po Gas Production Plant, Hong Kong are provisionally scheduled to commence in late 2003 for completion in 2005. Indicative project milestones include:

- Conduct of EIA Study - November 2001 - December 2002;
- Gazettal under *Foreshore and Seabed (Reclamations) Ordinance* - January 2003 - June 2003;
- Detailed Engineering Design - June 2003 - December 2003;
- Civil Works and Pipelaying - January 2004 - June 2005.

2.3 INTERACTIONS WITH OTHER PROJECTS

Design works are presently taking place for the Cheng Tou Jiao GRT and the target commissioning date is 2005. Any changes to the commissioning date will directly affect the construction schedule of the proposed submarine pipelines.

Reclamation works are presently taking place at Pak Shek Kok and in Tolo Harbour for the widening of Tolo Highway. However, due to the distance from this project and probability that the project programmes will not overlap it is considered that no other projects are likely to interact with this proposed Project. The Hong Kong Electric Co. Ltd are planning to install a gas pipeline to the LNG Terminal from the planned extension of the Lamma Power Station. The pipeline will be laid close to some sections of the Hong Kong and China Gas pipelines in Chinese Waters. Transboundary effects will be discussed in *Section 3.10*.

3.1 OUTLINE OF THE PROCESS INVOLVED**3.1.1 Submarine Gas Pipelines**

Based on conceptual design information, the gas pipeline system is expected to comprise of twin 14"~18" OD (350 to 450 mm), API 5L Grade X60 pipelines. The pipelines would have a maximum supply pressure at the launcher station of 8,000 kPa. The pipelines would have a design life of 50 years. The pipelines would be situated either below land or below the seabed to a depth that would be dependent on the conditions and location of the area it traversed.

Land Based Section: The land based construction works associated with the Project would include laying the pipelines through an open trench followed by direct burial. The pipelines would be buried at about 1.1m below ground level within a trench approximately 1m wide. The pipelines would be installed, as far as possible, within existing road corridors from the landing point to the Tai Po Gas Production Plant. The above ground onshore pipeline extensions (at the launching and receiving stations) and the buried onshore pipelines would be coated with protection coating. Cathodic protection will also be provided.

Marine Based Sections: The marine based burial depths would generally be 3 m below the existing seabed level (in accordance with the requirements of the Marine Department). For marine areas that are considered to be of high risk in terms of the potential for damage (such as anchorage areas or within major fairways) or where the pipelines would be required to cross over existing utilities, protective measures would be required and may include trenching the area and overfilling with a stone mattress or concrete slab. The submarine pipelines would be coated externally with an asphalt enamel coat and wrap and would have an outer layer of steel reinforced concrete weight coating.

For the marine works, the pipeline would be installed primarily using a jetting method; however, in high risk areas, conventional trench dredging would need to be used. The jetting method would utilise low pressure, high volume water jets to fluidise the seabed sediments, which would allow the pipeline to sink under the influence of gravity to the desired depth below the surrounding sea bed. The seabed sediments would then slump around the pipelines, burying them and leaving a small depression which would be infilled by natural sedimentation. The jetting method results in less disturbance to seabed sediments and consequently reduces the chance of impacts to water quality.

Along high risk sections, a single trench (approx. 38m wide at the seabed surface, assuming a worse case trench slope of 1:5) would be dredged into

which the pipelines would be lowered. The trench would then be backfilled with gravel and armour rock materials to provide adequate protection. It is expected that the approach at Tai Po would be required to be dredged, as well as a portion of the Inner Tolo Harbour and areas where the pipelines would cross the Yantian Approach Fairway. A typical cross-section of the proposed submarine pipeline dredged trench is shown in **Annex B**.

The pipelines will be designed to accommodate an intelligent Pipe Inspection Gauge (PIG), which will be performed on a routine basis (once every ten years).

Jetting and dredging works will need to proceed on a round the clock basis so night time noise generating activities are expected. A Construction Noise Permit (CNP) will be applied for before any night time or evening works commence.

All nearshore and onshore installation works are expected to be undertaken during normal working hours. If evening or night-time works are later found to be necessary, a CNP will be applied for.

Included with the pipelines will be a submarine Tee off point (shown in **Annex A**) which will be installed as a provision for the future connection of other possible sources of natural gas. The assembly will have indicative dimensions of 15m (L) x 4m (W) x 3.5m (H) and is preferably to be placed on the seabed for ease of future operation. Significant dredging works to install the T connection are not expected due to its small size. Detailed design and study will be carried out to confirm the final arrangement.

3.1.2 Gas Receiver Station

The size of the Gas Receiver Facility is indicatively planned to be 60m x 60m and will be located within the Tai Po Gas Production Plant site boundary.

The following sections consider the likely construction and operation activities and the associated potential environmental impacts that may arise.

3.2 WATER QUALITY

Construction phase impacts in terms of the laying of the pipelines are divided into three sections:

- Dredging trenches at the approaches to Tai Po and Cheng Tou Jiao;
- Laying of the pipelines using the jetting method; and
- Laying of the pipelines in dredged trenches, which will be backfilled with gravel and rock to provide armouring to the pipelines.

The potential exists for impacts from the trench dredging at Tai Po to occur at the nearby WSD flushing water intake, which could be caused by elevated suspended sediment concentrations. The sediments to be dredged are

expected to be classified as contaminated, requiring disposal in accordance with the *Works Bureau Technical Circular No. 3/2000* (WBTC 3/2000), and contain high chemical oxygen demand and nutrient concentrations. It is expected that disturbance of these sediments during dredging would have the potential to cause impacts to the waters of Tolo Harbour. It is recommended that mitigation measures be employed to minimise these potential impacts. It is expected that there is little potential for environmental impacts to Hong Kong waters from the trench dredging at the Cheng Tou Jiao approach and as such it is concluded that specific mitigation measures would not be necessary.

The jetting method will cause sediment to be suspended into the water column during laying of the pipelines, but this sediment is expected to rapidly settle onto the seabed. This indicates that sediment would not be transported beyond the immediate vicinity of the jetting machine and as such it is considered unlikely that there would be any impacts to sensitive receivers. Along the section of the pipelines to be laid in Tolo Harbour the sediments contain high levels of pollutants, however, it is expected that there would be little impact on water quality given the limited time that these sediments would be in suspension.

The trench dredging within Tolo Harbour and Mirs Bay has the potential to cause impacts to water quality. In the Tolo Harbour section it is expected that the main concern will be related to the release of contaminants from sediments suspended during dredging leading to unacceptable water quality impacts. In the Mirs Bay section to be dredged it is expected that the main concern would be increases in suspended sediment concentrations in the receiving waters, which could result in breaches of the Water Quality Objective (WQO) for suspended sediment concentrations.

Small scale dredging will be undertaken at the following sections of the proposed pipeline corridor:

- shore approach at Tai Po;
- the section that passes through the Dangerous Good Anchorage within Tolo Harbour; and
- the section that passes through the Yantian Fairway in Mirs Bay.

The estimated length of excavation at the above three locations is 1,000 m for the shore approach, 2,500 m for the Dangerous Good Anchorage and 4,000 m for the Yantian Fairway. The estimated total volume of sediment to be dredged and disposed of for this Project is not expected to exceed 520,000 m³ (assuming a worse case option of a trench with a 1:5 slope). The exact volume will be determined during the EIA and the engineering detailed design, based on the results of the site investigation study.

It is recommended that computer modelling of sediment plume dispersion and water quality be carried out as part of the Environmental Impact Assessment to simulate the impacts from dredging operations. Such modelling would determine the fate of sediments lost to suspension during dredging and the resultant suspended sediment concentrations in the

receiving waters and at sensitive receivers. The modelling would also determine the impacts of the release of contaminants from the suspended sediments on water quality. This second aspect of the modelling would only be required for dredging in Tolo Harbour because of the high levels of contaminants within the seabed sediments.

With respect to the operation of the gas pipelines, no adverse operational water quality impact is envisaged.

3.3

WASTE MANAGEMENT

The most significant construction waste impact for the proposed gas pipelines will be handling and disposal of potentially contaminated marine sediment associated with the underwater trench formation. The management and disposal of the dredged material from the trenching works will follow the procedures and requirements specified in WBTC 3/2000, and a Marine Dumping Permit will be obtained. Assuming the potential adverse impacts associated with disposal of contaminated sediment are minimised by following the above procedures, no insurmountable adverse environmental impacts are anticipated.

Other construction wastes such as land excavated material and general refuse will be limited and normal waste management practices will be implemented.

With respect to the operation of the gas pipelines, no adverse operational waste impact is envisaged.

3.4

MARINE ECOLOGY & FISHERIES

A preliminary review of existing information on the marine ecological and fisheries resources surrounding the pipelines alignment has identified the area as supporting benthic fauna which are of low ecological value and fisheries of low to high ranking in terms of fisheries production. The information reviewed also indicates that hard corals of conservation importance are present in the Study Area. Soft-bottom subtidal organisms that will be disturbed during the laying of the gas pipelines are of low ecological value and commonly recorded elsewhere in Hong Kong waters, and therefore, the minor loss of benthic organisms directly along the pipelines route is not considered to represent an unacceptable ecological impact. The rapid reinstatement of the seabed will result in the area being available for prompt recolonisation, and hence, no permanent impacts are likely to occur.

Desktop information on the seabed conditions within the proposed routing corridor indicates that the seabed is composed mainly of soft muds that are repeatedly reworked by the demersal trawlers that operate in the area. As a consequence of this, it is not expected that organisms of high ecological value, such as soft and hard corals, will be located directly within the pipelines routing corridor.

Due to the low current speeds in the area sediment dispersed by the pipeline laying operations is not expected to travel far and consequently is not expected to impact any of the identified marine ecological or fisheries sensitive receivers, including coral and fish culture zones. However, sediment plume modelling, recommended to be conducted as part of the EIA, is necessary for a detailed assessment of impacts to water quality which is, in turn, essential for a thorough evaluation of indirect impacts to marine ecological and fisheries resources.

3.5 ***NOISE IMPACT***

Construction noise impacts arising from the proposed submarine pipelines are not expected to lead to exceedances of daytime and evening noise criteria at the identified Noise Sensitive Receivers (NSRs). However, due to the expected high area sensitivity rating, exceedances of allowable noise levels may occur during the night-time period.

Noise impacts are not expected from the operation of the proposed submarine pipelines and the receiver facility.

3.6 ***AIR QUALITY***

Dust impact during construction of the receiver facility of the proposed submarine pipelines would be generated from site clearance, ground excavation, materials handling and vehicle movements on haul roads. Mitigation measures in accordance with the *Air Pollution Control (Construction Dust) Regulation* will be recommended, if deemed necessary, to reduce the dust impact and, therefore, exceedance of the dust criteria is not expected.

Air quality impacts associated with gaseous emissions from the required marine pipeline installation vessels (such as grab/trailer dredger, hopper barge or injection barge) are expected to have negligible impact on background air quality.

Emissions of pollutants are not expected from the normal operation of the proposed submarine pipelines and the receiving facility. Therefore no adverse air quality impact is anticipated due to the operation of the proposed Project.

3.7 ***CULTURAL AND HERITAGE***

The pipelines routing corridor is in proximity to some land based archaeological sites, such as those at Yim Tin Tsai, A Chau, Sai O and Lai Chi Chong (North). As these sites are based on land, the submarine pipelines are not expected to cause any impacts to them.

The pipelines routing corridor has marine archaeological potential due to the historical use of both Tolo Harbour and Channel for fishing and salt pan activities. Consequently, the potential exists for impacts to occur to marine archaeological materials. The procedures outlined by the Antiquities & Monuments Office (AMO) of the Leisure & Cultural Services Department will be followed which consist of the following:

- Baseline review of existing information;
- Geophysical survey of the dredging areas using high resolution boomer, side scan sonar and an echo sounder;
- Establishment of archaeological potential will then be determined from Tasks 1 and 2 and a written report with charts provided to AMO.

Should high potential for archaeological material be identified, then recommendations will be made for a watching brief to be maintained during dredging operations.

3.8 ***HAZARD & RISK TO LIFE***

The potential risks associated with the operation of the submarine pipelines will be required to be quantified. Appropriate mitigation measures to reduce the predicted risks to within acceptable levels will be recommended once the acceptability of the estimated risks has been evaluated against criteria laid down in the *EIAO TM*.

3.9 ***OTHERS***

Terrestrial Ecology: No impacts to terrestrial ecology will arise from the construction and operation of the submarine pipelines or the receiver facility.

Visual Impacts: No unacceptable impacts are expected for the construction phase of the project as the seawall on Tai Po Waterfront will be replaced by similar materials thus reinstating the original condition and visual context. No unacceptable operational visual impacts are expected as the receiver facility will be located within the existing Tai Po Gas Production Plant site boundary.

3.10 ***TRANSBOUNDARY EFFECTS***

An Environmental Permit will have to be obtained by The Hong Kong and China Gas Company limited for the portions of the Project that are outside of Hong Kong waters.

Limited geophysical information from the area indicates that there is little or no hard bottom habitat along the routing corridor and, therefore, it is unlikely that there are ecological resources of high ecological value present. This would have to be confirmed with and by the relevant Mainland Authority.

The area is known to be of recreational importance but assuming that construction and operation of the pipeline system is performed according to, or above, the standards in Hong Kong, it is unlikely that insurmountable environmental impacts or societal risks will occur. This, however, will have to be confirmed by the relevant authorities in Shenzhen.

A focus of the water quality assessment will be to determine the effects of the pipeline laying works on the attainment of the WQO for Mirs Bay at the boundary of the HKSAR waters. Should unacceptable impacts be predicted, then mitigation measures will be formulated so that the works can proceed without breaching the WQO at the HKSAR boundary. The impacts of the pipeline laying works in Mainland waters on sensitive receivers in Hong Kong will also be examined.

The land based section of the Project will be within the Tai Po Industrial Estate aside from the trenching works from the landing point to the Tai Po Gas Production Plant.

There are some existing constraints to the submarine pipeline route, which have confined the alignment of the pipelines to a narrow corridor. The following constraints have been avoided, as far as practicable.

- Designated Marine Parks at Yan Chau Tong, Hoi Ha Wan and Ping Chau (proposed).
- Fish Culture Zones at Yim Tin Tsai, Yim Tin Tsai (East), Yung Shue Au, Lo Fu Wat and Tap Mun.
- Sites of Special Scientific Interest (SSSIs) at Ting Kok and Kei Ling Ha.
- Proposed and Gazetted Artificial Reef Deployment Sites at Yan Chau Tong, Hoi Ha Wan and Long Harbour.
- Proposed Fisheries Protection Area within Tolo Channel and Long Harbour.
- Seawater Intake Points at Tai Po, the Shatin seafront and the WSD flushing water intake at Tai Po Industrial Estate.

The EIA study will pay particular attention to impacts to the above sensitive receivers and any necessary mitigation measures will be proposed in accordance with the requirements laid down in the *EIAO*.

5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

5.1 WATER QUALITY

A number of mitigation measures are expected to be required for the dredging, both for the Tai Po approach and the sections within Tolo Harbour and Mirs Bay, which would serve to control the potential impacts to within acceptable levels. The mitigation measures are divided into two facets, general operating procedures and specific measures to reduce the quantities of sediment lost to suspension during dredging and potential transport towards sensitive receivers. The general mitigation measures relate to the use of closed, watertight grabs, the speed of lowering of the grab, the loading of barges and the operating condition of the barges. The type of likely mitigation measures envisaged are summarised below:

- A reduction in the rate of dredging; and
- The use of silt curtains within Tolo Harbour.

The need and scale of these mitigation measures would be determined through the use of computer modelling of sediment plume dispersion and water quality. This modelling work would be carried out during the EIA. The effectiveness of any mitigation measures would be determined during monitoring of the construction works.

Although it is expected that unacceptable impacts to water quality will not be caused by jetting, a number of potential mitigation measures are outlined and are summarised below. Such measures could be implemented if exceedances are detected during monitoring of the construction works.

- A reduction in the speed of the jetting machine;
- A reduction in the pressure of the water jets;
- The use of silt curtains within Tolo Harbour; and
- Temporary suspension of the works.

It is expected that an Environmental Monitoring and Audit (EM&A) programme will be required to monitor impacts to water quality during both dredging and jetting. This monitoring programme would be able to confirm that the necessary mitigation measures are being implemented and that impacts are within acceptable levels. Should unacceptable impacts be detected then the EM&A programme would serve to trigger additional mitigation measures.

5.2 MARINE ECOLOGY & FISHERIES

All steps should be taken to minimise impacts to water quality during dredging/jetting so as to prevent subsequent impacts to marine ecological

and fisheries resources. It is believed that any measures recommended to control water quality impacts to within acceptable levels, are also expected to control impacts to ecological and fisheries resources. Hence, no specific mitigation measures for marine ecology and fisheries are required during construction.

5.3 NOISE

In order to protect any affected NSRs from night-time construction activities, the following mitigation measures may be required:

- Prohibition of construction activities associated with trenching and backfilling within a radius of 1900 m from NSRs at Wu Kai Sha Youth Village, Li Po Chun United World College & Symphony Bay during the night-time period; and
- Prohibition of construction activities associated with jetting within a radius of 1000 m from NSR Lo Fu Wat Village House during the night-time period.

With the implementation of the above measures, the noise levels from the construction activities can be mitigated to comply with the night-time construction criteria at the affected NSRs.

As it is expected that dredging and jetting may take place during restricted hours, a Construction Noise Permit will be applied for from EPD in accordance with the requirements of the *Noise Control Ordinance*.

5.4 AIR QUALITY

In accordance with the *Air Pollution Control (Construction Dust) Regulation*, the following control requirements should be employed in the worksite and incorporated in the Contract Specification to minimise potential dust nuisance arising from the works:

- the heights from which materials are dropped should be controlled to a minimum practical height to control fugitive dust arising from unloading;
- materials should not be loaded to a level higher than the side and tail boards, and should be dampened or covered before transport;
- water sprays should be applied to maintain the work site wet;
- all dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;
- the load carried by the vehicle should be covered by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
- the excavation working area should be sprayed with water after the operation so as to maintain the entire surface wet;
- the haul road should be located away from the sensitive receivers, regular watering is recommended; and

- wheel washing facilities should be provided at the exit of work site.

With the above dust suppression measures, dust emissions from the site will be reduced. Adverse dust impact is therefore not expected.

5.5 POSSIBLE SEVERITY, DISTRIBUTION AND DURATION OF ENVIRONMENTAL EFFECTS

Potential environmental impacts identified will mainly be associated with the construction phase of the works (an expected period of 18 months). As such the effects are considered to be temporary and short term. With the implementation of appropriate mitigation measures, no insurmountable impacts are expected.

5.6 USE OF PREVIOUSLY APPROVED EIA REPORTS

No previous EIA report has been approved or submitted for this Project.

Similar recent projects that have been conducted under the *EIAO* in the HKSAR include the following:

- *Environmental Impact Assessment of a 1,800MW Gas-Fired Power Station at Lamma Extension*. The EIA Report for this Study was submitted to EPD in February 1999. The Study concluded that there would be no adverse long term or cumulative effects/impacts on the environment and the Environmental Permit was granted on 8 August 2000 (EP-071/2000/A).

5.7 BENEFICIAL EFFECTS

Implementation of the proposed gas submarine pipelines and receiver facility is considered to give rise over the long term to the following potential beneficial operational impacts as a result of the reduction in reliance by The Hong Kong and China Gas Company Limited on Naphtha for the production of Towngas:

- reduction in emissions of CO₂ from the Tai Po Gas Production Plant; and
- reduction in the chance of collision of the Naphtha tankers *en route* to the unloading facility at Ma Shi Chau and consequent reduction in the chance of an accidental spill of polluting/hazardous materials.

Government departments have been consulted and the preliminary selection of a route corridor for the pipelines has been completed. The landfall site for the pipelines at Tai Po Waterfront Park will be finalised with the Leisure and Cultural Services Department.

Consultation has commenced on preliminary routing options with NGOs including World Wide Fund for Nature Hong Kong, Friends of the Earth (HK), Greenpower, The Conservancy Association and various representatives of Fishermen's Associations of the Tai Po and Northeast New Territories area.

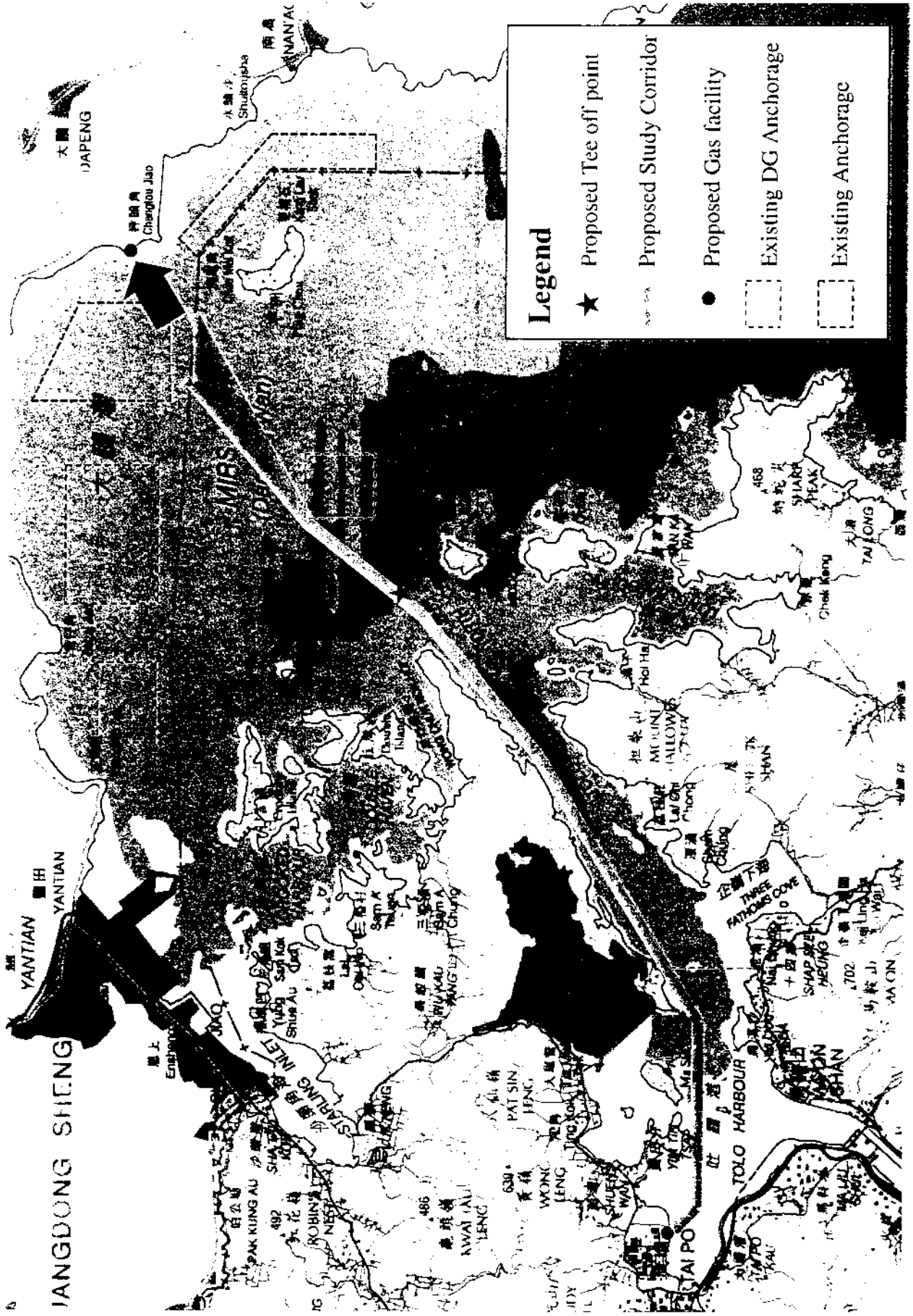
Before implementation the project will require gazettal under the *Foreshore and Seabed (Reclamations) Ordinance*. The Hong Kong and China Gas Company Limited will prepare the necessary information and submit to the Tai Po Districts Lands Office in 2002/2003.

A Marine Impact Assessment will be prepared in accordance with Marine Department's requirements for their approval. In addition, a 'Notifiable Gas Installation' approval must be obtained from the Gas Authority before the pipelaying works.

Annex A
附件 A

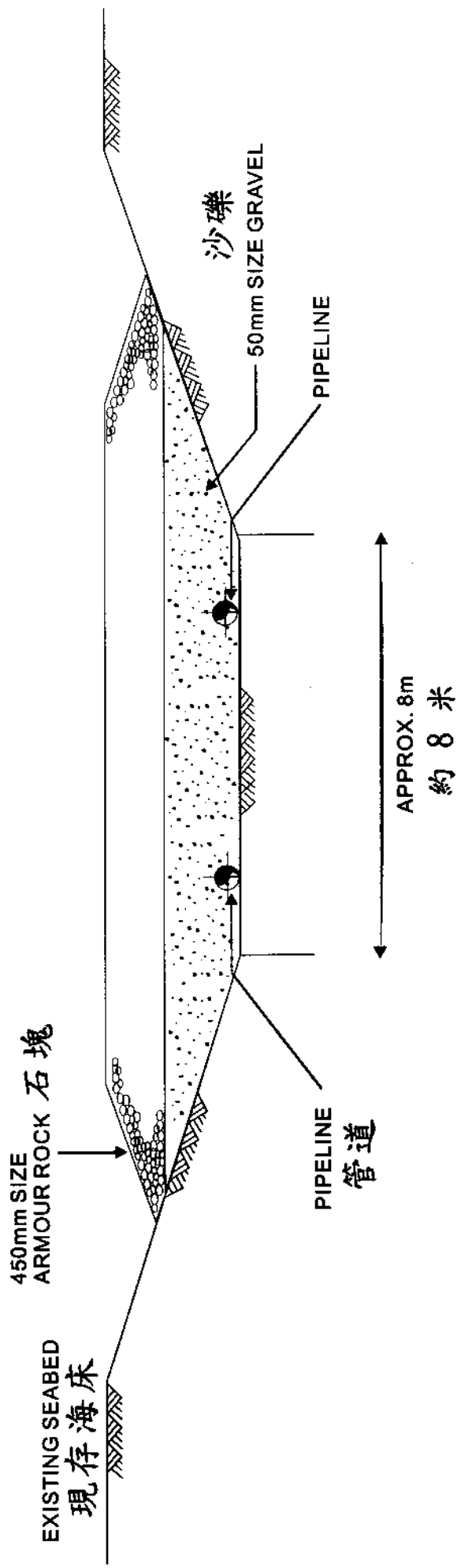
Proposed Submarine Gas Pipelines Corridor
擬建海底輸氣管道走廊

Annex A Proposed Submarine Gas Pipelines Corridor



Annex B
附件 B

Typical Cross Section of Pipeline Trench
典型管道溝槽的橫切面



TYPICAL CROSS SECTION OF PIPELINE TRENCH
典型管道溝槽的橫切面