

Project Profile
for
Proposed Installation of High Pressure Gas Pipeline along Sai Sha Road
from Shui Long Wo to Long Keng
Within Sai Kung West Country Park

Reference : R0161-1.04

Client : The Hong Kong and China Gas Company Limited

Date : December 2004

For and on behalf of CH2M-IDC Hong Kong Limited

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1. BASIC INFORMATION

1.1 PROJECT TITLE

- 1.1.1 Proposed installation of High Pressure Gas Pipeline along Sai Sha Road from Shui Long Wo to Long Keng within Sai Kung West Country Park (hereafter refers as the Project).

1.2 PURPOSE AND NATURE OF THE PROJECT

- 1.2.1 The Hong Kong and China Gas Co. Ltd. (HKCG) is committed to continuous improvement in services for her customers in the territory by providing reliable and sufficient fuel gas supply. In order to secure the gas supply for the local distribution to the Sai Kung area, as well as reinforcing gas supply for both the existing and future customers, HKCG has commissioned the construction of the Eastern Transmission Pipeline (ETP) – Sai Sha Road section.
- 1.2.2 The ETP – Sai Sha Road Section is a high-pressure gas pipeline of 750mm diameter connecting the pipeline in Tai Tung area of Sai Sha Road and roundabout of Sai Sha Road/Tai Mong Tsai Road, totalled about 4.5 km. The pipeline is targeted to commission before end of 2005. In order to minimise the potential impacts on the environment such as felling of trees, the proposed pipeline is designed to basically follow the carriageway or footway of the existing paved Sai Sha Road.
- 1.2.3 During the preliminary design stage, there was no indication of the construction of the Sai Sha Road Section being classified as a designated project under the Environmental Impact Assessment Ordinance (EIAO). The whole pipeline will be constructed following the footprint of the existing paved Sai Sha Road and the works areas are located within the carriageway or footway of the Road. The pipeline construction itself does not fall within either the category H – utility pipelines, transmission pipelines and substations, or within the category Q – Miscellaneous. The proposed alignment of the pipeline does not encroach within any sensitive area described under category Q of schedule 2 of the EIAO. Therefore, no environmental permit is required for the construction work of the Sai Sha Road section in principle. Construction of the Sai Sha Road Section commenced at early 2003 and is scheduled to be constructed in different phases, with each phase consists of about 25m long pipeline installation within a week. Up to October 2004, over 2.3km of the pipeline has been completed.
- 1.2.4 However, during the detail design stage of construction period for the pipeline, it is advised by the Agriculture, Fisheries and Conservation Department (AFCD) that part of the pipeline alignment inevitably fall into the boundary of Sai Kung West Country Park. A section of the Sai Sha Road from Long Keng to Shui Long Wong falls within the Sai Kung West Country Park. This project profile is prepared for the application of the necessary environmental permit for the construction and operation of this pipeline section within the Sai Kung West Country Park.

1.3 NAME OF THE PROJECT PROPONENT

- 1.3.1 Hong Kong and China Gas Company Limited (HKCG)

1.4 LOCATION AND SCALE OF THE PROJECT AND ITS HISTORY

- 1.4.1 The proposed pipeline is a high pressure gas pipeline of 750mm diameter along Sai Sha Road in Sai Kung, with total length of about 4.5 km. The whole pipeline runs along the carriageway or footway of the existing paved Sai Sha Road. The Project is target to be completed before the end of 2005.
- 1.4.2 HKCG has verified the original proposed alignment of the Sai Sha Road section during the preliminary design stage and consulted with various Government departments on its final alignment for construction. As described in section 1.2.3, the proposed alignment of the pipeline is not a designated project and no environmental permit is required prior to its construction. The

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construction of some pipeline sections of the ETP-Sai Sha Road Section was commenced, and over 2km long pipeline section has been completed.

- 1.4.3 Subsequently, part of the proposed pipeline which measures about 865m long between Shui Long Wo and Long Keng, was found potentially falling within the boundary of the Sai Kung West Country Park, as advised by the AFCD (Figure 1). It must be noted that the works area of this proposed pipeline is completely within the carriageway or footway of the existing paved Sai Sha Road (Figure 2-1 to 2-4). No tree is expected to be affected or felled due to the construction of the Project.

- 1.4.4 Since the pipeline sections passing through the country park boundary, the project proponent had submitted a technical paper in September 2004 to AFCD for applying consent of the Country and Marine Parks Authority.

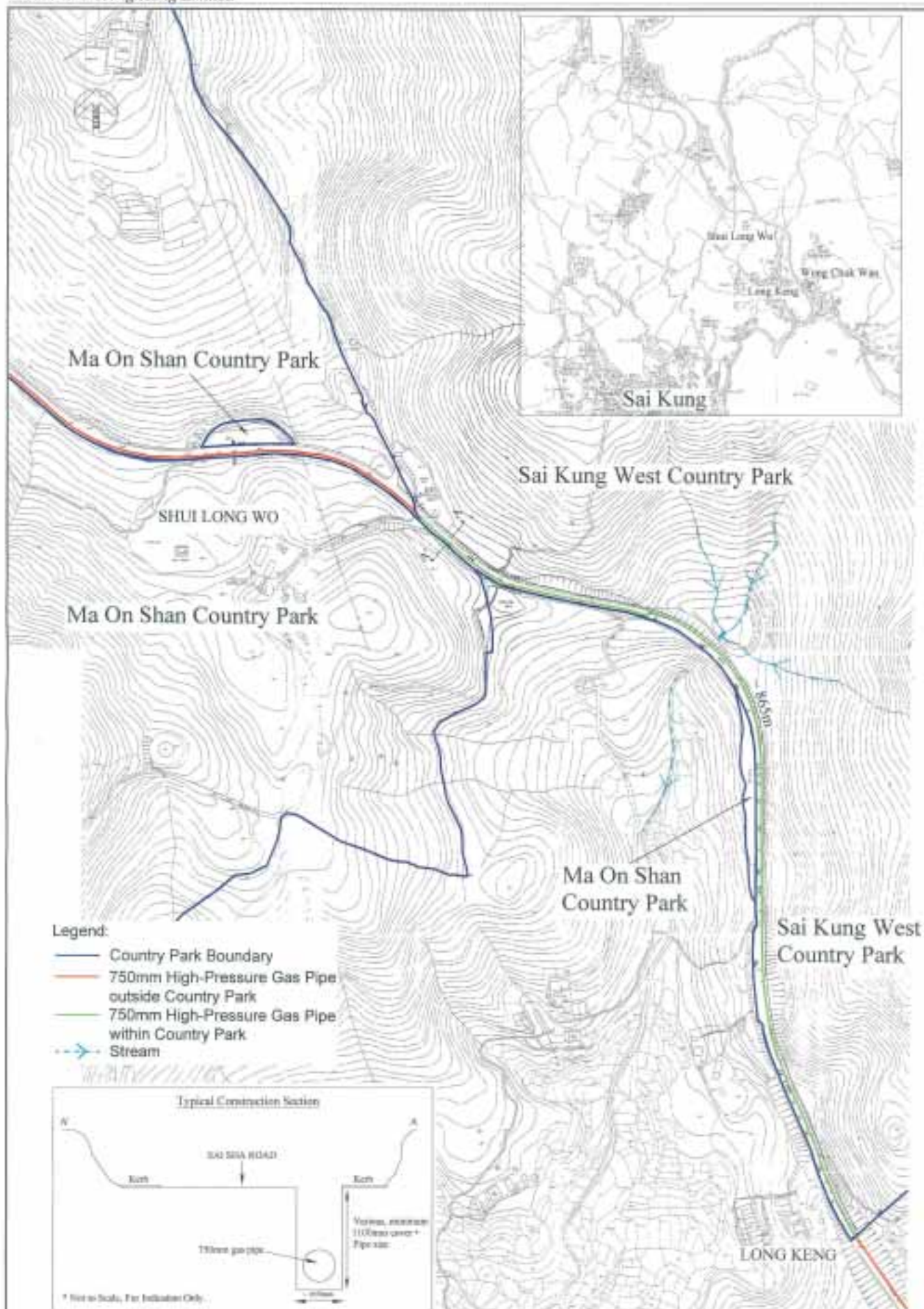
1.5 NUMBER AND TYPES OF DESIGNATED PROJECTS TO BE COVERED BY THE PROJECT PROFILE

- 1.5.1 There is only one designated project (DP) covered in this Project Profile.
- 1.5.2 In accordance with category h of Part 1, Schedule 2 of the EIAO, the section of the Sai Sha Road Section, which runs along the alignment of Sai Sha Road, is not classified as designated project.
- 1.5.3 The proposed pipeline of 750mm diameter (~ 865m out of a totally 4.5 km long ETP – Sai Sha Road Section) along the Sai Sha Road within the Sai Kung West Country Park is regarded as a designated project by virtue of Q.1 in Schedule 2, Part I of the EIA Ordinance without satisfying the cases listed in Q.1 (a) to (j). It is because this proposed pipeline is located within the boundary of the existing country park and its dimension is larger than 120 mm.

1.6 NAME AND TELEPHONE NUMBER OF CONTACT PERSONS

- 1.6.1 Hong Kong and China Gas Co. Ltd. (HKCG)

<u>Name</u>	<u>Designation</u>	<u>Telephone No.</u>	<u>Fax No.</u>
FONG Wai-Man Edmond	Strategic Projects Manager, Strategic Projects Section	2963 1272	2516 7979



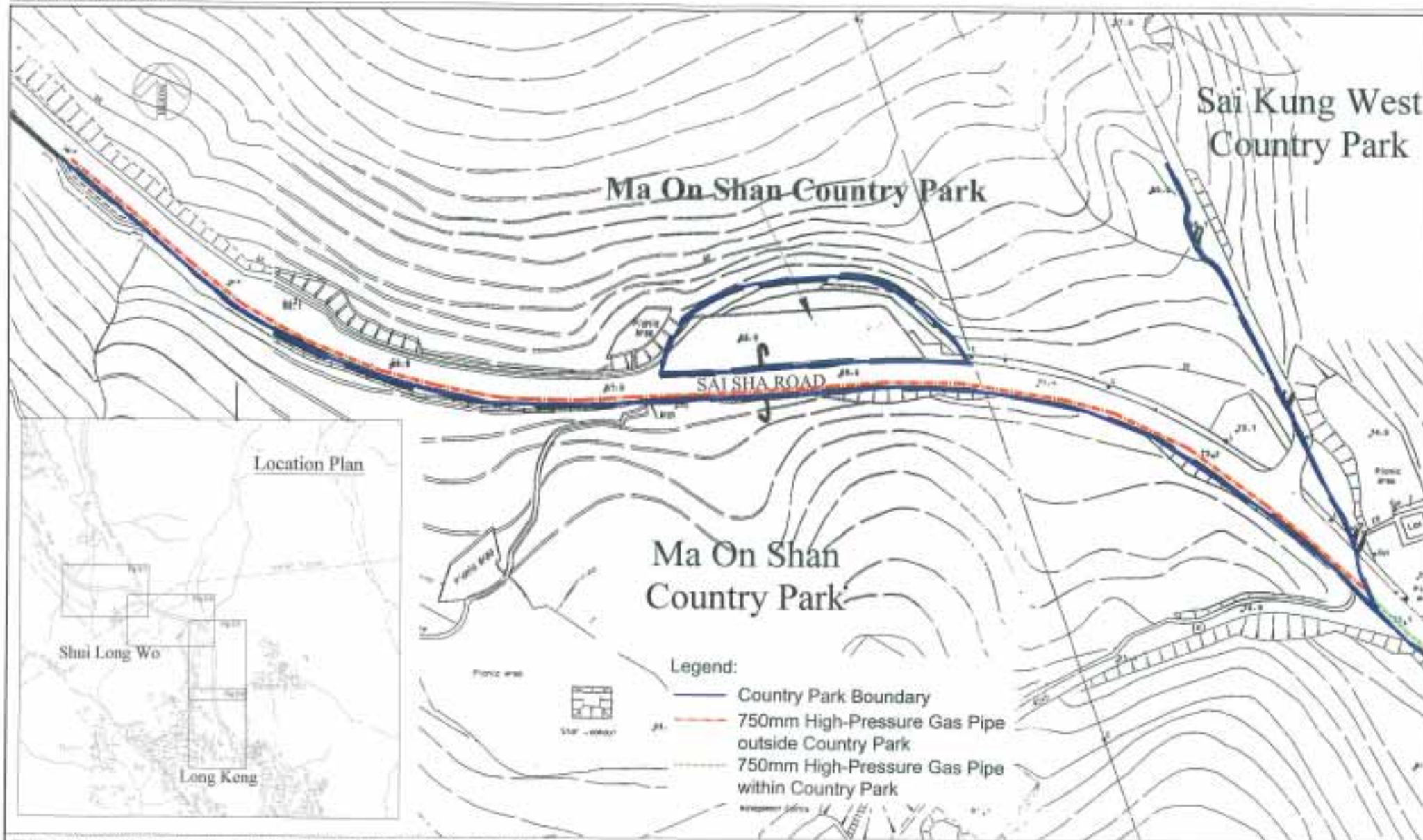
Title: Proposed Pipeline Alignment along Sai Sha Road within the Sai Kung West Country Park

Project: Proposed Installation of High-Pressure Gas Pipeline along Sai Sha Road from Shui Long Wo to Long Keng within Sai Kung West Country Park

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Scale: NTS

Figure: 1



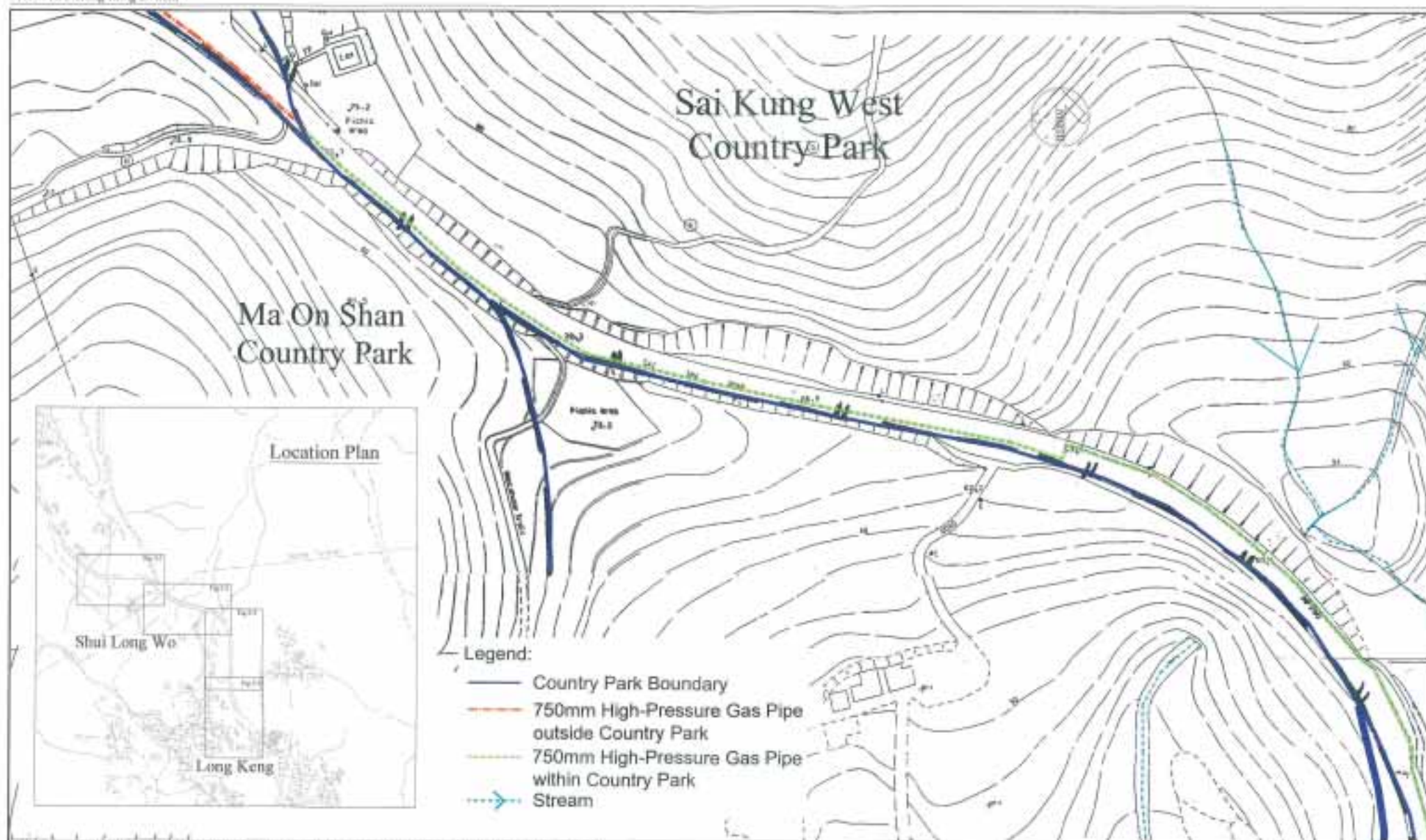
Title: Works Area of the Proposed Pipeline within the Sai Kung West Country Park (Part 1 of 4)

CH2M-ADC Hong Kong Limited

Project: Proposed installation of High Pressure Gas Pipeline along Sai Sha Road from Shui Long Wo to Long Keng within Sai Kung West Country Park

Scale: 1:1000
in A3 size

Figure: 2-1



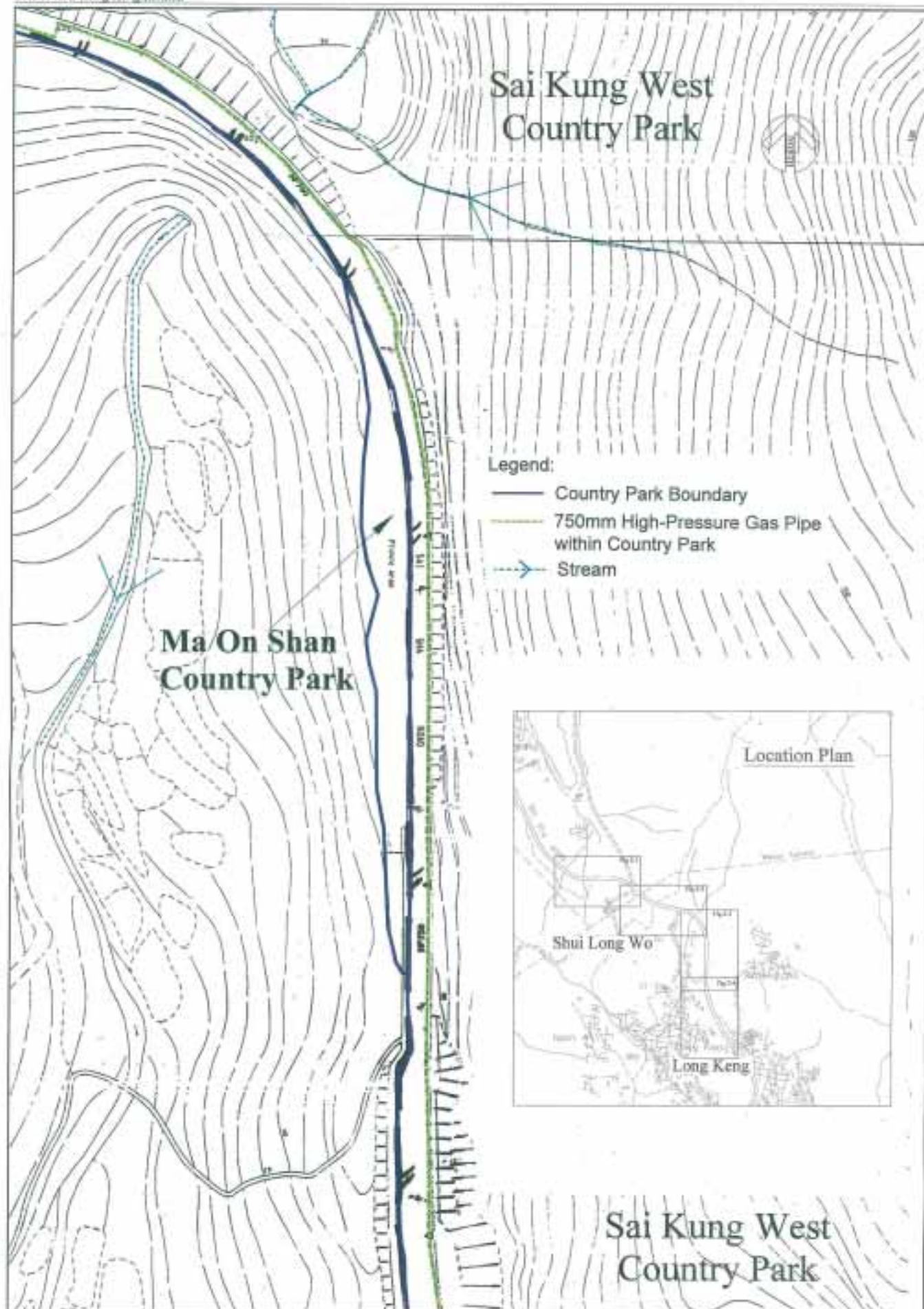
Title: Works Area of the Proposed Pipeline within the Sai Kung West Country Park (Part 2 of 4)

CH2M-IOC Hong Kong Limited

Project: Proposed Installation of High Pressure Gas Pipeline along Sai Sha Road from Shui Long Wo to Long Keng within Sai Kung West Country Park

Scale: 1:1000
in A3 size

Figure: 2-2



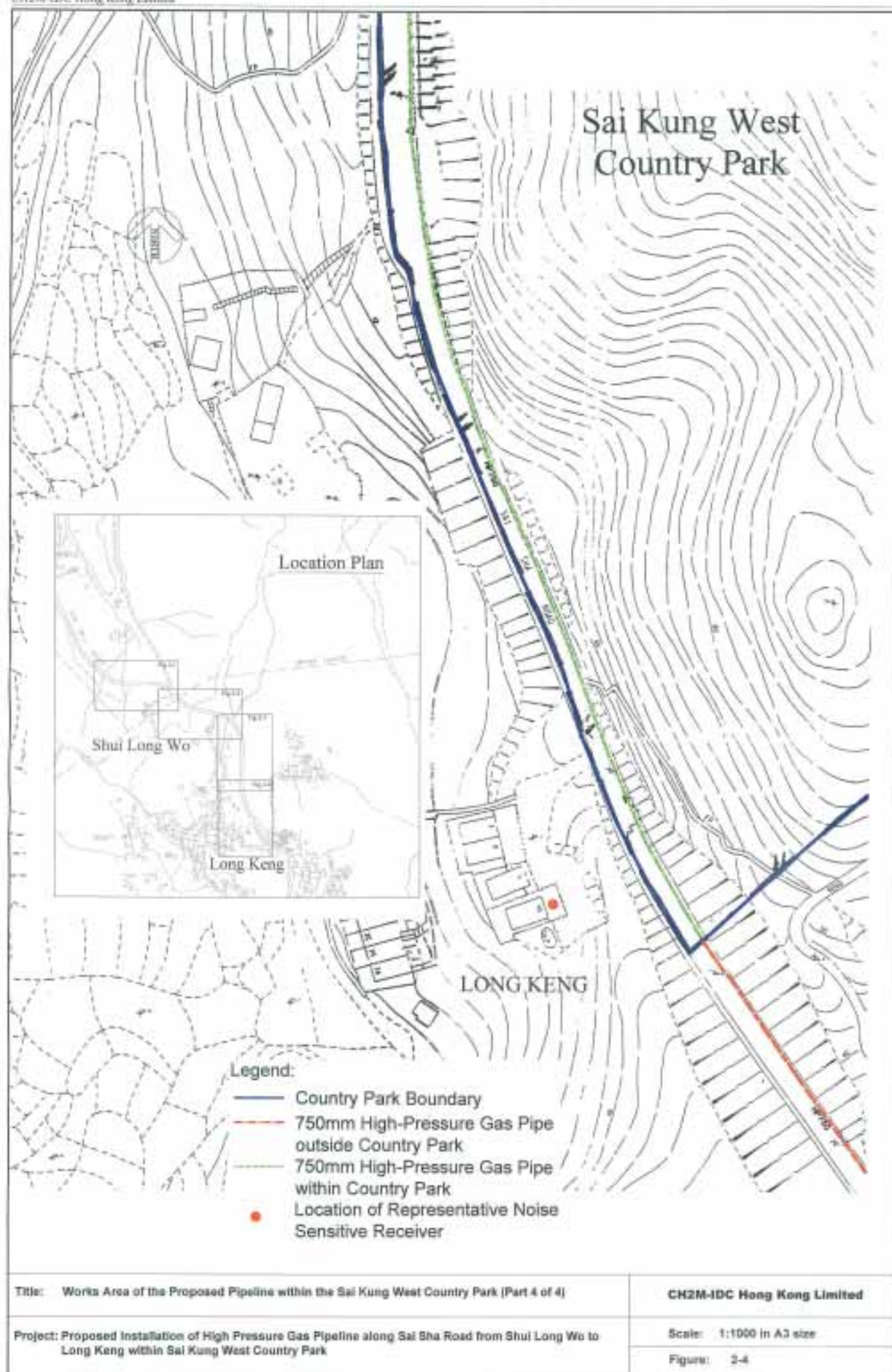
Title: Works Area of the Proposed Pipeline within the Sai Kung West Country Park (Part 3 of 4)

CH2M-IOC Hong Kong Limited

Project: Proposed Installation of High Pressure Gas Pipeline along Sai Sha Road from Shui Long Wo to Long Keng within Sai Kung West Country Park

Scale: 1:1000 in A3 size

Figure: 2-3



2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 PLANNING OF THE PIPELINE ALIGNMENT

- 2.1.1 The Project of installation and operation of the high-pressure gas pipeline (Figure 3) is planned and designed by in-house staff of HKCG. A Contractor will be commissioned by HKCG to install the pipeline in accordance with both statutory standard and other guidelines under the supervision of HKCG. The construction works for the Project will be planned and constructed in different phases due to the site constraint. For the project, about 25m long pipeline is planned to be installed within a week for each phase, under environmentally friendly manner to minimise construction nuisance.

2.2 PROGRAMME OF THE PROJECT

- 2.2.1 As the works is to be carried out along existing carriageway/footway, road closure is required. Transport Department has expressed no adverse comment on HKCG proposed methodology, and other section of pipeline installation works along Sai Sha Road is now in progress. The pipeline installation works in general involves road closure, excavation, pipelaying, backfilling, and reinstatement, which are typical work sequences of the pipeline installation works within road areas. The pipeline installation works for this particular section which falls within the Sai Kung West Country Park is intended to be carried out under the same manner as with those other sections along Sai Sha Road which is being carried out in phases. Typically, road closure along this section which falls within the Sai Kung West Country Park will also be carried out in different phases with each phase of 25m pipeline installation within a week, and no works will be carried out during Saturday, Sunday and public holidays.
- 2.2.2 This section of works which falls within the Sai Kung West Country Park (approx. 865m) is scheduled to commence in December 2004 / January 2005 and to be completed in about 8 months. The whole Sai Sha Road section is scheduled to operate before end of 2005.

2.3 IMPLEMENTATION OF THE PROJECT

Work Description

- 2.3.1 The design of this proposed 750mm diameter steel gas pipeline makes reference to the recommendations of the Institution of Gas Engineers and Managers (IGE/TD/1) and is governed by the Gas Safety Ordinance (Cap. 51). According to the Gas Safety Ordinance (Cap. 51), this type of gas pipeline is classified as "Notifiable Gas Installations" and prior approvals are required for construction and use of this type of installations. Approval was already obtained from the Gas Authority in October 2002. Upon completion of this pipeline, the Use Approval from the Gas Authority will be obtained and is targeted to be carried out before end 2005. Furthermore, excavation permit for this section of pipeline has been registered in Excavation Permit Application System IIUMS of Highways Department.
- 2.3.2 The ETP – Sai Sha Road Section has been started to construct at early 2003 and is scheduled to be constructed in different phases. The proposed pipeline alignment basically follows the footprint of the paved Sai Sha Road and its works areas are mainly located in the carriageway or footway of the Sai Sha Road. Works are carried out concurrently at various locations along Sai Sha Road and each construction location requires road-closure of about 100m.

Minimization of the Alignment encroaching into the Country Park Boundary

- 2.3.3 To cope with the gas requirement date in end 2005, the final proposed gas pipeline route after detailed design was circulated to various government departments including AFCD in August 2002. It was identified that some sections of about 950m long proposed pipeline would fall within the country park boundary including about 85m long section located at Shui Long Wo public car park that falls within the Ma On Shan Country Park, and a about 865m long section

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pipeline located along the existing Sai Sha Road from Shui Long Wo to Long Keng that falls within Sai Kung West Country Park.

- 2.3.4 To minimise the length of the pipeline that falls within the the country park area, about 85m of gas pipeline alignment originally planned to install in Shui Long Wo public carpark was then shifted onto the adjacent Sai Sha Road so as to away from the Ma On Shan Country Park area. After the pipeline route revision, the Shui Long Wo public carpark area that within the Ma On Shan Country Park is not affected. The revised pipeline route in this area is shown in Figure 1.
- 2.3.5 Regarding the remaining about 865m long section, it is located along Sai Sha Road and falls within the Sai Kung West Country Park. According to the information provided by AFCD, this section of Sai Sha Road is located near the boundaries of both the Sai Kung West Country Park and the Ma On Shan Country Park, and the boundary lines of these two country parks are immediate adjacent to each other in this location. Therefore, this 865m long section will inevitably fall within the country park area due to this constraint (Figure 2-1 to 2-4).

Construction Information

- 2.3.6 The major design parameters of the gas pipeline are described at the Table 2-1 at below.

Table 2-1 Major Design Parameter of the Gas Pipeline

Pipeline Size	750mm nominal diameter
Pipeline wall thickness	12.7mm
Material Grade	American Petroleum Institute's API 5L X52 Steel Pipeline
Normal buried depth	1.1m cover or more as required by the Gas Authority

- 2.3.7 As the works is to be carried out along existing carriageway/footway, road closure is required. Transport Department has expressed no adverse comment on HKCG's proposal while other section of works along Sai Sha Road is now in progress. The works in general involves road closure, excavation, pipelaying, backfilling, and reinstatement. The works for this section is intended to be carried out in the same manner as that of other section(s) along Sai Sha Road which is carried out in phases. Typically, road closure along this section will be carried out by 100m in length each time with 25m gas pipeline installed within a week and no works will be carried out during Saturday, Sunday, and public holidays.
- 2.3.8 This section of works (about 865m within Sai Kung West Country Park) is scheduled to commence in December 2004 / January 2005 and to complete in about 8 months.

Typical Construction Sequence

- 2.3.9 The typical key activities associated with the installation of the gas pipeline are described below.
- If there are any trees, shrubs and any aboveground structure/facilities affected, they will be earmarked and removed from the working area. Since the works area of the Project is within the carriageway or footway of the existing paved Sai Sha Road, there will be no tree to be affected or felled due to the construction of the Project.
 - Temporary pedestrian walkway shall be provided to divert the pedestrian away from the works area where necessary.
 - Existing underground utilities shall be either diverted or exposed before trench excavation to avoid accidental damage.
 - Temporary drainage shall be installed to allow stormwater to pass through the works area into existing U-channel, where necessary.

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- During the course of trench excavation, adequate trench reinforcement such as use of sheet-piles and struts shall be provided to ensure the trench integrity and the stability of adjacent structure/feature/slope.
- Adequate safety trench barriers and lighting shall be provided along the sides of excavated trench to prevent person from falling into the trench, where necessary.
- According to the typical arrangement for installation of high-pressure underground pipeline as recommended in "Steel Pipelines for High Pressure Gas Transmission" published by the Institution of Gas Engineers, UK and **approved by EMSD**. A trench of a minimum depth of 1.85 m and 1.05 m wide along the centreline of the proposed gas pipeline will be constructed (See Figure 3 for details). However, in this designated project (DP), due to the pipe route is located within the kerb zone, as required by the Highways' Conditions of Excavation Permit, the minimum pipe cover within kerb zone is 1.5m measured from the road surface. Therefore, the trench depth in this DP section is 2.4m deep.
- Since temporary stockpiling of excavated material in the existing Sai Sha Road is prohibited, the excavated materials shall be immediately cart away.
- The pipelines will be surrounded by fine sand to 150mm thick. Accordingly, the formed trench will be filled with sand to a level of 150mm before the laying of the pipelines.
- Pipeline shall be fabricated to given length and thoroughly tested in factory before use. The pipeline will be placed into the excavated trench and individual sections are then jointed by welding and followed by non-destructive test to ensure that the pipes are properly jointed.
- The trench will be filled by sand again to a level of 150mm above the top of the pipelines. The trench will then be filled by the excavated materials. A minimum cover of 1.1m will be maintained on top of the laid pipeline as required by Gas Authority for safety reason.
- Suitable parts of the excavated materials will be reused for trench backfilling and shall be properly compacted. During the course of trench backfilling, soil compaction test shall be taken to ensure the degree of compaction.
- Removal of trench shoring will take place upon the completion of backfilling operation. Original aboveground facilities will be reinstated. Any excess material (see section 4.1.9 – 4.1.10), equipment, and construction waste will be cleaned and removed for site handover.

2.4 CONSTRUCTION PHASE EQUIPMENT LIST

- 2.4.1 The following equipment will be employed for the installation of the gas pipeline based on the assumption that the Project will be carried out in a **phased** manner. This equipment list has been commented and agreed by HKCG. The construction will be conducted during daytime. If night-time work is required, construction noise permit will be required, following the procedures as stipulated under the *Noise Control Ordinance*.

Table 2-2 Proposed Powered Mechanical Equipment List for the Construction Work

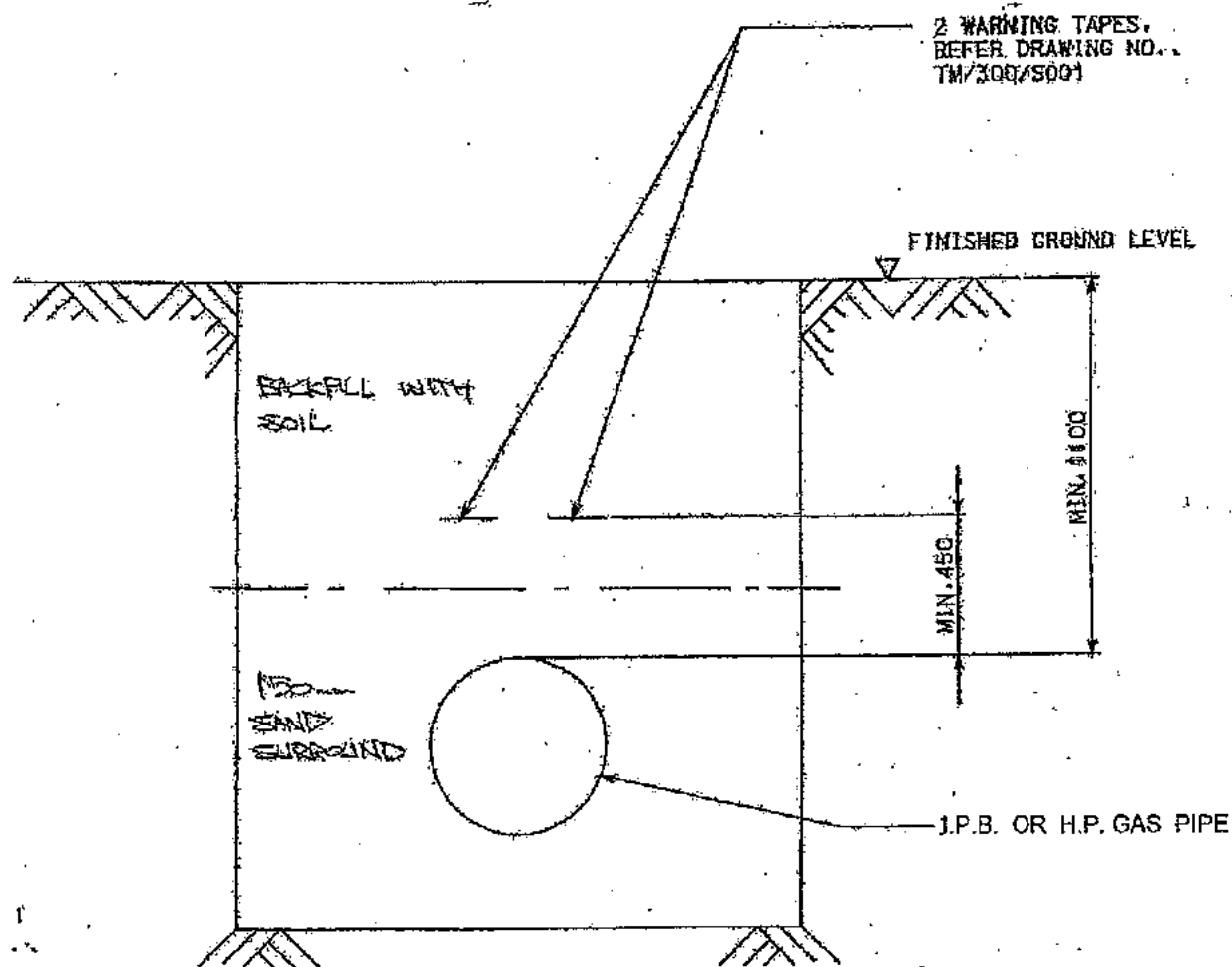
Powered Mechanical Equipment	ID Code	Qty	Sound Level, dB(A)	Power	Utilisation
Road Excavation Works					
Excavator	BS C8-15	1	103		50%
Crane lorry	BS C7-101	1	94		50%
Power generator	CNP 102	1	100		100%
Pump	CNP 283	1	85		100%
Pipeline Laying Works					

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Crane lorry	BS C7-101	1	94	100%
Power generator	CNP 102	1	100	100%
Pump	CNP 283	1	85	100%
Backfilling				
Dump truck	BS C9-39	1	103	50%
Excavator	BS C8-15	1	103	50%
Compactor	CNP 050	1	105	80%
Road Paving Works				
Dump truck	BS C9-39	1	103	50%
Power generator	CNP 102	1	100	100%
Pump	CNP 283	1	85	100%
Compactor	CNP 050	1	105	80%

2.5 INTERACTIONS WITH OTHER PROJECTS IN THE AREA

2.5.1 There is no interaction with other projects in the area.



NOTE:

1. ALL DIMENSION ARE IN MM.
2. IF STEEL CAPPING PLATES ARE USED, THE P.E. WARNING TAPES SHALL BE LOCATED ON TOP OF THE PLATES.

Title: Typical Section of a High Pressure Gas Pipeline

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Project: Proposed Installation of High Pressure Gas Pipeline along Sai Sha Road from Shui Long Wo to Long Keng within Sai Kung West Country Park

Scale: NTS

Figure: 3

3. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

3.1 EXISTING AND PLANNING SENSITIVE RECEIVERS AND SENSITIVE PARTS

- 3.1.1 The Project is located at the rural Sai Kung North Area but within the existing paved Sai Sha Road which fall within part of the Sai Kung West Country Park. The major land uses surrounding this section of the Sai Sha Road is hill side. Some village houses are found at Long Keng, at the south of the Project Site (see Figures 2-1 to 2-4 for details).

Ecology

Sai Kung West Country Park

- 3.1.2 The works area of the Project is within the carriageway of the existing paved Sai Sha Road. No vegetation would exist along this section of pipeline alignment.
- 3.1.3 In general, there were no species of restricted distribution or conservation concern detected on-site.

Noise

- 3.1.4 For this proposed pipeline section, village houses at Long Keng are the nearest sensitive uses which may be subject to the environmental nuisance due to the Project. Figure 2-4 shows the location of the representative sensitive receivers along the alignment of the proposed gas pipeline beside the Sai Sha Road.

Air Quality

- 3.1.5 The sensitive receiver associated with air quality is the same as those described above for noise issue.

Water Quality

- 3.1.6 Since the works area of the Project is within the carriageway of the Sai Sha Road, there is no water course immediate next to the Project. A small stream is identified in the vicinity of the middle section of the Project and its location is shown in Figure2-2.

Visual and Landscape

- 3.1.7 The works area for the Project lies within the carriageway of existing paved road. No specific visual and landscape features identified within and surrounding the works area of the Project.

3.2 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT AND LAND USE

- 3.2.1 Sai Kung North is a rural area between the semi-urbanized Sai Kung Town and the newly developed Ma On Shan area. The proposed gas pipeline will be installed underground along the existing paved Sai Sha Roads. The Project itself is not regarded as a sensitive receiver. The Sai Kung West Country Park, where the proposed pipeline is passing through, is the major sensitive use.
- 3.2.2 Moreover, the land use history does not indicate any potential land contamination and hazard impact.

4. POSSIBLE IMPACT ON THE ENVIRONMENT

4.1 CONSTRUCTION PHASE

4.1.1 The proposed pipeline section encroached in the country park area will be conducted in phases with each section of about 100m long in which 25m long pipeline installed within a week. This construction schedule will definitely reduce the scale of construction area for each phase and minimising the potential environmental nuisances, by restricting the number of construction equipment concurrently on site. The impact of the construction work is expected to be limited.

4.1.2 A few potential environmental issues could be arisen during the construction phase of the proposed pipeline and they are discussed in details in the following sections

Ecological Impact

4.1.3 Since the works area of the proposed alignment run along the carriageway of the paved Sai Sha Road, there is neither ecological sensitive area nor vegetation found within the boundary of the construction site. Table 3-1 summarizes the ecological impact during construction phase of the Project. It is found that there is no adverse ecological impact due to the construction of the proposed pipeline, as no tree will be required to be felled.

Table 4-1 Summary of the Ecological Impact during Construction Phase

Criteria	Remarks
<i>Habitat quality</i>	The habitat of the works area is Existing Road which is very low quality in terms of ecology
<i>Species</i>	Species diversity, richness and abundance were very low or none. No vegetation is found in the works area because it is completely within carriageway of the Sai Sha Road.
<i>Size/Abundance</i>	The works area is within Sai Sha Road. No felling of trees will be required.
<i>Duration</i>	Construction period for the proposed pipeline is about 8 months.
<i>Magnitude</i>	No ecological impact is expected since no tree felling will be involved.
<i>Reversibility</i>	100%

Fugitive Dust Impact

4.1.4 The installation work will be carried out in phased manner with each phase works area is about 100m long and installation of 25m long pipeline within a week, thus restricting the number of equipment to be used on site. The works area and in turn the amount of material to be excavated and handled is limited in each phase of the construction site. Since temporary stockpiling of excavated material in the existing Sai Sha Road is prohibited, the excavated materials shall be immediately cart away. These excavated materials shall be reused as backfilling materials after completion of gas pipeline installation as much practical as possible. Stockpiling outside the works area may cause a minor localised dust nuisance, if it is not properly handled and managed. However, as the area of excavation for pipeline lying of each phase is relatively limited and short duration, the potential dust nuisance is expected to be minimal.

4.1.5 In addition, effective control measures shall be implemented by contractor under the supervision of HKCG, the nuisance from construction site and plants could be eliminated.

4.1.6 Furthermore, as the nearest residential area to the works area within the country park boundary is the village houses which is about 35m away from the gas pipeline route. There is also no stockpile of excavated material on site due to the space constraint. It is expected that the potential dust nuisance to the adjacent sensitive receivers will be acceptable and insignificant due to this sufficient buffer distance coped with the proposed environmental protection measures in section 5.1.6 – 5.1.7 at below.

Construction Noise Impact

- 4.1.7 Construction noise impact due to the use of powered mechanical equipment is limited because of the small works area, proper scheduling of the equipment and the selection of silenced mechanical powered equipment adopted for the work. Summary of construction assessment due to the Project is shown in Table 4-2. Details of the calculation of the construction noise impact are shown in Appendix A. The assessment results found that the nearest sensitive receivers near this proposed country park pipeline section, i.e. village houses at Long Keng, is unlikely to experience unacceptable noise nuisance.

Table 4-2 Predicted Construction Noise Level at Selected representative NSR at various construction phase

Construction Activities	Shortest Distance from the Project (m)	Predicted Noise Level, dB(A)	Standard Noise Level, dB(A)
Road Excavation	35	67	75
Pipeline Laying Works	35	65	75
Backfilling	35	71	75
Paving Works	35	71	75

Surface Run Off Impact

- 4.1.8 Water quality impacts may arise due to site effluent including site surface runoff and potential washouts, fuel contaminated fluids and improper site housekeeping, especially during the rainy season. It must be noted that there is only a small stream located adjacent to the works area (Figure 1 and Figure 2-2). However, with the proposed protection measures at section 5.1.9 – 5.1.11, it is expected that the potential water quality will be minimised and is expected not to be significant.

Waste Management

- 4.1.9 Construction and demolition (C&D) materials will be generated from the excavation works. General refuse, construction chemical waste (e.g. oil and lubricant) and C&D materials of normal quantity are expected and will be handled and disposed in accordance with the Government procedures. C&D materials will be reused for backfilling wherever engineering possible, and only surplus materials shall be disposed off-site.
- 4.1.10 The size of the pipeline laying trench, as advised by HKCG, will be about 2.4m depth x 1.05m wide. Therefore, it is expected that there would be approximately 2600 m³ inert materials to be excavated from the proposed country park pipeline section (about 865m long). Out of these, as described at section 3.1.9 above, suitable material will be backfilled as much as engineering possible. It is estimated that the amount of materials to be disposed off-site from the country park boundary pipeline section is about 1370 m³.

Cultural Heritage Impact

- 4.1.11 It has been checked with the Antiques and Monuments Office that the construction site does not fall within the sites of any cultural heritage. No cultural heritage impact is expected.

Landscape and Visual Impact

- 4.1.12 Since the construction of the proposed pipeline is in a phased manner, the construction period of each phase is expected to be limited. Most importantly, the works area of the Project is within the paved carriageway and there is very little sensitive use in the vicinity. It is expected that the potential landscape and visual impact will be minor and very localised.

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4.2 OPERATIONAL PHASE IMPACT

- 4.2.1 The buried high pressure gas pipeline will be used to transmit fuel gas after stringent examinations by the HKCG and Gas Standards Office of the Government following established procedures. No air, water quality, ecology, noise and waste impacts are expected to be generated during the operation of the pipeline.
- 4.2.2 The proposed pipeline will be installed underground. The aboveground paved road will be reinstated after construction. Landscape and visual impact is not anticipated after the reinstatement.
- 4.2.3 The underground pipeline has been thoroughly tested and buried underground in accordance with the Gas Authority's requirement to avoid any damage of the pipework. No significant risk impact is anticipated.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED**5.1 PROTECTION MEASURES TO MINIMISE ENVIRONMENTAL IMPACTS**

- 5.1.1 No unacceptable environmental impact is envisaged during the operational phase of the Project. The remaining paragraphs of this section will focus on measures between construction phase and post-construction works.

General Principle

- 5.1.2 In general, the alignment of the ETP – Sai Sha Road section has been thoroughly considered in order not to encroach or even approach any sensitive areas such as vegetation zones of greenbelt areas, site of cultural heritage, areas with dense populations, etc, by limiting the works area basically within the carriageway and footway of the existing paved Sai Sha Road.
- 5.1.3 To further reduce the extent of the potential impact during the construction, the installation of the gas pipeline will be carried out in a phased manner to reduce the nuisance to the public and the surrounding environment. The gas pipeline installation works will be divided into different phases, so that both the works area and equipment utilised at any time of the construction phase can be limited and in turn individual environmental impact can be reduced to minimum. For the Project with about 865m in total length, it is estimated that the Project could be completed in about 8 months.
- 5.1.4 The following sections recommended the protection measures for implementation during the construction and operation phase of the project to further minimise the potential insignificant environmental impacts.

Ecological Mitigation Measures

- 5.1.5 No specific ecological mitigation measures are required, because there is no felling of tree or encroaching within any ecological sensitive receivers.

Fugitive Dust Control Measures

- 5.1.6 Any works that involve the handling of dusty materials are regulated under the *Air Pollution Control (Construction Dust) Regulation* and it is a requirement of the Contractor to observe and implement. In accordance with the requirements of the regulation, sufficient dust control/mitigation measures shall be implemented by the Contractor to ensure full protection of the nearby Air Sensitive Receivers. The dust control measures will be incorporated into the construction contract of the proposed pipeline by HKCG so that the potential environmental nuisance can be kept to minimum.
- 5.1.7 For the offsite temporary stockpile, it is proposed that the stockpile could be covered by waterproof material (e.g. impervious sheet) or placed in an area sheltered on the top and three sides to minimise the potential dust nuisance, where practical. If the stockpile area will be stated

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in a very long period, it is recommended to compact the stockpile, and implementing turfing, hydroseeding or vegetation planting on the stockpile to minimise the potential dust nuisance due to the stockpile, where necessary and practical.

Construction Noise Management

- 5.1.8 In general, the construction noise protection measures including use of quiet equipment and proper schedule of the power equipment at the limited works area have been adopted in the construction as a standard provision, and it is found that these protection measures are sufficient. No further mitigation measure will be required.

Water Quality Control Measures

- 5.1.9 The Contractor shall fully comply with the requirements of the Water Pollution Control Ordinance (WPCO) and its relevant regulations. The guidelines for handling and disposal of construction site discharges as detailed in EPD's Professional Persons Environmental Consultative Committee Practice Note (ProPECC PN) 1/94 "Construction Site Drainage" should be followed. The Contractor should be responsible for the design, construction, operation and maintenance of all the identified mitigation measures and practices specified in this ProPECC Note.
- 5.1.10 In general, the Contractor should ensure that all runoff arising from the works area are properly treated, e.g. by the use of sedimentation tank or silt trap, up to the discharge standards as stipulated by the technical memorandum made under WPCO. In addition, in order to further minimise the potential construction impacts on the stream identified in Figure 1, it is recommended to lay a series of sand bag along the side of the works area boundary close to the stream to prevent the potential surface run-off from the works area entering into the stream, where practical.
- 5.1.11 Due to the site constraint, the C&D materials will be properly stockpiled outside the works area with at least three sides enclosed or to be covered by waterproof material to avoid washing away due to surface runoff, where practical.

Waste Management

- 5.1.12 The excavated construction and demolition (C&D) materials will be temporary stockpiled offsite due to the site constraint. The C&D materials will be reused for backfilling onsite wherever engineering possible. The Contractor is also required to maximise the reuse of the materials in other projects if practicable. Only surplus materials should be transported to public filling areas or landfills for disposal. Disposal of the C&D materials will be monitored through the trip-ticket system following the guideline stipulated by the Works Bureau Technical Circular No 15/2003 to prevent any illegal dumping.
- 5.1.13 C&D materials shall be properly stockpiled at the area with at least three sides enclosed or to be covered by waterproof material to avoid wind erosion and washing away due to surface runoff, where practical. Limited construction-related chemical waste and general wastes are expected due to relatively small scale of the project and limited number of construction equipment. Given the limited amount of materials to be removed, the burden on the public filling facilities is considered insignificant.

Landscape and Visual Impact

- 5.1.14 No specific landscape and visual mitigation measures required. The works area will be reinstated to be paved road similar to the existing road.

5.2 POSSIBLE DISTRIBUTION AND DURATION OF THE ENVIRONMENTAL EFFECTS

- 5.2.1 The duration of the works will be short, given that the project construction (totally about 865m long) is expected to be completed within 8 months and constructed in phases; thus the construction will only affect a localised area. In addition, the works area of the Project is within the carriageway of the paved road and there are very few sensitive areas surrounding the works

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area. No adverse residual impacts on ecology, noise, air quality, water quality, waste or landscape and visual are predicted with the implementation of the protection measures as well as necessary pollution control clauses described above.

5.3 COMMENT ON ANY FURTHER IMPLICATIONS

5.3.1 The ETP – Sai Sha section requires the installation and operation of a 4.5 km long high-pressure gas pipeline running underneath through the existing paved Sai Sha Road. With due consideration of the gas pipeline alignment within the existing carriageway or footway of the paved Sai Sha Road, the extent of impact during the construction and operational phases of the pipeline has already been significantly reduced.

5.3.2 It is envisaged that no significant nor unacceptable environmental impact will be resulted during the operational phase of the Project. The extent of temporary environmental impacts during the construction phase have been minimised through proper implementation of the recommended protection measures in above. The construction of the Project will not cause unacceptable environmental impact due to its small in scale, the simple nature of works, and the implementation of mitigation measures such as dust, noise, site run-off and waste management.

5.4 USE OF PREVIOUSLY APPROVED EIA REPORTS

5.4.1 No previous approved EIA reports were used in this Project.

6. OVERALL CONCLUSION

6.1.1 Although the works area of the ETP – Pipeline Section along Sai Sha Road from Tai Tung to Tai Mong Tsai is located partly within the country park boundary, the alignment and its associated works areas are completely within the carriageway or footpath of the existing paved Sai Sha Road, in order to avoid and/or minimise the potential environmental impact due to its construction. There will be no tree felling required for this proposed country park pipeline section. In addition, in order to reduce the pipeline section encroaching within the country park boundary, a section of the pipeline, which is originally passing through the existing Shui Long Wo public carpark within the Ma On Shan Country Park boundary, has been shifted onto the adjacent Sai Sha Road to reduce the length of the pipeline falling within the country park boundary. Therefore, under this project, there will be only a section of the proposed pipeline with about 865m long between Long Keng and Shui Long Wo passing through the Sai Sha Road at the edge of the Sai Kung West Country Park inevitability.

6.1.2 It must be noted that the works area for this country park pipeline section are completely within the carriageway of the paved Sai Sha Road. In addition, the duration of the construction works for this proposed country park pipeline section will be about 8 months. Given that the whole pipeline construction will be scheduled in different phases and each phase is about 25m long per week, it is expected that there will be only localised area to be affect by each of the construction phase. No adverse residual impacts on ecology, noise, air quality, water quality, waste or landscape and visual are predicted due to the site condition. The insignificant potential environmental impact due to the proposed country park pipeline section construction is expected to be further reduced after the implementation of the proposed protection measures. The project itself will not adversely affect the Sai Kung West Country Park. An implementation schedule of the suggested environmental protection measures is shown in Appendix 2.

6.1.3 It is anticipated that the surrounding environment are unlikely to be adversely affected, and with the implementation of the protection measures as described in the Project Profile, the requirements as stipulated in the Technical Memorandum made under the ELAO shall be met.

APPENDIX 1

CALCULATION OF CONSTRUCTION NOISE IMPACT

Table A1.1a Calculation of Sound Power Level for the Road Excavation Works

Equipment	No. of equipment	Utilisation rate	CNP	Referenced SWL, dB(A)	Corr. for no. of equipment	Corr. for use	SWL after corr.
Excavator	1	50%	BS C8-15	103	0	-3	100.0
Crane lorry	1	50%	BS C7-101	94	0	-3	91.0
Power generator	1	100%	CNP 102	100	0	0	100.0
Pump	1	100%	CNP 283	85	0	0	85.0
Overall SWL							103.3

Table A1.1b Calculation of Sound Power Level for the Pipe Laying Works

Equipment	No. of equipment	Utilisation rate	CNP	Referenced SWL, dB(A)	Corr. for no. of equipment	Corr. for use	SWL after corr.
Crane lorry	1	100%	BS C7-101	94	0	0	94.0
Power generator	1	100%	CNP 102	100	0	0	100.0
Pump	1	100%	CNP 283	85	0	0	85.0
Overall SWL							101.1

Table A1.1c Calculation of Sound Power Level for the Backfilling

Equipment	No. of equipment	Utilisation rate	CNP	Referenced SWL, dB(A)	Corr. for no. of equipment	Corr. for use	SWL after corr.
Dump truck	1	50%	BS C9-39	103	0	-3	100.0
Excavator	1	50%	BS C8-15	103	0	-3	100.0
Compactor	1	80%	CNP 050	105	0	-1	104.0
Overall SWL							106.6

Table A1.1d Calculation of Sound Power Level for the Paving Works

Equipment	No. of equipment	Utilisation rate	CNP	Referenced SWL, dB(A)	Corr. for no. of equipment	Corr. for use	SWL after corr.
Dump truck	1	50%	BS C9-39	103	0	-3	100.0
Power generator	1	100%	CNP 102	100	0	0	100.0
Pump	1	100%	CNP 283	85	0	0	85.0
Compactor	1	80%	CNP 050	105	0	-1	104.0
Overall SWL							106.6

Table A1.2a Calculation of Predicted Construction Noise Level at the NSRs due to Road Excavation

Distance (m)	Dist. Corr., dB(A)	Façade Corr, dB(A)	Overall Leq, dB(A)	Standard, Leq, dB(A)	Sensitive Uses
35	-38.9	3	67	75	Village House at Long Keng

Table A1.2b Calculation of Predicted Construction Noise Level at the NSRs due to Pipe Laying Work

Distance (m)	Dist. Corr., dB(A)	Façade Corr, dB(A)	Overall Leq, dB(A)	Standard, Leq, dB(A)	Sensitive Uses
35	-38.9	3	65	75	Village House at Long Keng

Table A1.2c Calculation of Predicted Construction Noise Level at the NSRs due to Backfilling

Distance (m)	Dist. Corr., dB(A)	Façade Corr, dB(A)	Overall Leq, dB(A)	Standard, Leq, dB(A)	Sensitive Uses
35	-38.9	3	71	75	Village House at Long Keng

Table A1.2d Calculation of Predicted Construction Noise Level at the NSRs due to Road Paving

Distance (m)	Dist. Corr., dB(A)	Façade Corr, dB(A)	Overall Leq, dB(A)	Standard, Leq, dB(A)	Sensitive Uses
35	-38.9	3	71	75	Village House at Long Keng

APPENDIX 2

IMPLEMENTATION SCHEDULE

Appendix 2
Implementation Schedule for Recommended Protection Measures

Project Profile Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
				Des	C	O	
	CONSTRUCTION PHASE MITIGATION MEASURES						
	AIR (Construction Phase) <i>Dust Mitigation Measures</i>						
5.1.6	Handling dusty materials under the Air Pollution Control (Construction Dust) Regulation requirements	Whole construction sites / Whole construction periods / Before and during construction works	Construction Contractor		✓		Air Pollution Control Ordinance, Air Pollution Control (Construction Dust) Regulation
5.1.6	The Contractor shall be responsible for the design and implementation of these recommended measures to ensure full protection of the nearby Air Sensitive Receivers (ASRs).	Whole construction sites / Whole construction periods / Before and during construction works	Construction Contractor		✓		Air Pollution Control Ordinance, Air Pollution Control (Construction Dust) Regulation
5.1.7	The off-site temporary stockpile could be covered by waterproof material or placed in an area sheltered on the top and three sides to minimize the potential dust nuisance, where practical. If the stockpile area will be stated in a very long period, it is recommended to compact the stockpile, and implementing turfing, hydroseeding or vegetation planting on the stockpile to minimise the potential dust nuisance due to the stockpile, where necessary and practical.	Whole construction sites / Whole construction periods / Before and during construction works	Construction Contractor		✓		Air Pollution Control Ordinance, Air Pollution Control (Construction Dust) Regulation
	NOISE (Construction Phase) <i>Use of Quiet Plant</i>						
5.1.8	Use of quiet plant (also referred as silenced equipment) can provide significant reduction in noise level. Quiet plant is defined as PME whose actual sound power level is less than the value specified in TM on Noise from Construction Work other than Percussive Piling for the same piece of equipment.	Whole construction sites / During the whole construction period / Before and during construction works	Construction Contractor		✓		TMEIA

Project Profile Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
				Des	C	O	
2.3.7/5.1.8	Phasing of Construction Works The installation of the gas pipe will be carried out in a phased manner.	Whole construction sites / During the whole construction period / Before and during construction works	Construction Contractor		✓		TMEIA
5.1.9	WATER QUALITY (Construction Phase) Contractor will be required to note and comply with the Water Pollution Control Ordinance and its subsidiary regulations	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.1.10	The guidelines for handling and disposal of construction site discharges as detailed in EPD's ProPECC Note PN1/94 "Construction Site Drainage" shall be followed. In general, these measures include provision of san/silt removal facilities such as sand traps, silt traps and sediment basins, where practical. These facilities should be regularly inspected and maintained, and the deposited silt and grit should be removed regularly. A row of sand bags can also be placed along the boundary of the works area to prevent any excess earth or storm water flowing down to the nearby stream, where practical. Any trade effluent or foul or contaminated or cooling or hot water should not be discharged into public sewer, stormwater drain, channel or stream course.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters

Project Profile Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
				Des	C	O	
5.1.12 - 13	WASTE (Construction Phase) The excavated construction and demolition materials will be stockpiled and reused for backfilling onsite wherever possible. The Contractor is also required to maximise the reuse of the materials in other projects if practicable. The remaining materials should be transported to public filling areas for disposal. Construction and demolition materials will be properly stockpiled with waterproof covering or at least three sides enclosed to avoid wind erosion and washing away due to surface runoff. Limited construction chemical and general wastes are expected due to relatively small scale of the project and limited number of construction equipment.	Whole construction site / Whole construction phase / Before and during construction works	Construction Contractor		✓		WDO
5.1.12	A trip ticket system following the guideline stipulated in Works Bureau Technical Circular No 15/2003 is proposed to ensure the C&D material will be disposal of to designated public filling area.	Whole construction site / Whole construction phase / Before and during construction works	Construction Contractor		✓		WDO

Notes:

Des: Detailed Design Stage

C: Construction Stage

O: Operational Stage

APCO: Air Pollution Control Ordinance

NCO: Noise Control Ordinance

WDO: Waste Disposal Ordinance

WPCO: Water Pollution Control Ordinance

TMEIA: Technical Memorandum on Environmental Impact Assessment Process

TM: Technical Memorandum

WBTC: Works Branch Technical Circular

N/A: Not Applicable