


Appendix H



Contamination Assessment Plan (CAP)

KOWLOON CANTON RAILWAY CORPORATION

EAST RAIL EXTENSION HUNG HOM TO TSIM SHA TSUI

ENVIRONMENTAL IMPACT ASSESSMENT

Contamination Assessment Plan

November 1999

INTRODUCTION

Hyder Consulting were commissioned by Kowloon Canton Railway to undertake an Environmental Impact Assessment (EIA) for the construction and implementation of the East Rail Extension from Hung Hom to Tsim Sha Tsui (TST) which is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance. As such, the requirements of the Technical Memorandum on Environmental Impact Assessment Process (Ordinance Cap 499, 5.16) (TM-EIAP) were followed. Figure 1 illustrates the alignment of the proposed works.

The assessment of land contamination followed the guidelines outlined under Annex 19 section 3.1 and 3.2 of the TM-EIAP, as required under Clause 3.11 of the Study Brief. For the preparation of the CAP the criteria detailed within the EPD's Practice Note for Professional Persons PN 3/94 "Contaminated Land Assessment and Remediation", has been referenced where appropriate.

SUMMARY OF EIA FINDINGS

An assessment on the potential for land contamination was carried out as part of the EIA Study for the proposed East Rail Hung Hom to East Tsim Sha Tsui Extension. The assessment comprised a desk-based study in conjunction with a walkover of the study area. No intrusive site investigation or analysis was undertaken as part of the assessment.

A walkover of the study area was carried out on 18th March 1999. Current land use within the study area comprises mixed retail, commercial and some residential properties. No current industrial land uses were identified within the study area and no potential sources of land contamination were identified from current uses other than the Caltex petrol filling station on Middle Road and a fuel installation located at the Cross Harbour Tunnel toll gate. The fuel installation at the Cross Harbour Tunnel toll gate lies at least 60m west of the alignment.

Details on both fuel installations was requested from site management and the Fire Services Department (FSD) who are responsible for license issue under the Dangerous Goods Ordinance. FSD reported that since the issue of licenses for both installations, there are no records of any tank or fuel line failure/leakage. No other fuel installations were identified within the immediate vicinity of the East Rail Extension.

Consultation with Caltex management indicated that there were no records of any tank or fuel line failure or repairs since May 1997, when Caltex took possession of the Middle Road site from Shell Hong Kong Ltd. Three underground storage tanks serve the petrol station (11,375 litre capacity for each) and are located to the immediate east of the site, within the Middle Road Children's playground. Tank integrity tests performed in July 1997 demonstrated that the installations were sound and in good condition.

The Cross Harbour Tunnel Co. Ltd. supplied limited information regarding the installation at the Cross Harbour Tunnel toll gate although no records of any tank

failure, repair or leakage was reported. The underground fuel tank has a 1500 gallon capacity and was installed in 1972. There were no records of any tank integrity tests being performed.

A review of historical maps indicated that the Kowloon-Canton railway line previously crossed the eastern edge of the proposed East TST station, with sidings and godowns located to the immediate east.

A moderate to low potential risk for contamination was identified within the area of the Middle Road petrol filling station and the former railway line/godowns, which may have a potential impact upon the East Rail Extension. Due to the distance of the proposed alignment and nature of the works (which will be above ground level), no risk for potential contamination from the Cross Harbour Tunnel fuel installation to impact upon the East Rail Extension is anticipated.

Although available records indicate no reports of any leakages or tank failures at the Middle Road petrol station, Caltex have only occupied the site since 1997. The petrol station has been present from since ~1975 and there is a potential for historic and unrecorded spillages. Given the likely time lapsed since their occurrence and the potential for degradation, the extent of any contamination is likely to be limited. The former railway line and godowns/buildings intercept the proposed East TST station along the eastern side and the extent of any contamination will be dependent upon the nature of operations (the railway line was present for over 60 years). Since extensive below ground works will be involved with the construction of the proposed East TST station within these areas, the presence of any contaminated materials would likely be significant.

A focused, intrusive investigation within these areas was recommended to define the full extent of any contamination and categorise the level of any potential risk.

The majority of the East Rail Extension is located on reclaimed land (post 1964) and the underlying fill material should be inert and uncontaminated. No potentially contaminating land uses have been identified within the most recently reclaimed areas. Prior to the finalisation of the disposal route the nature of the materials should be verified which may be carried out as part of the geotechnical investigation. [Note : The sampling requirements for the geotechnical investigation are not addressed within this CAP].

SITE INVESTIGATION REQUIREMENTS

A moderate to low potential risk for contamination has been identified within the area of the Middle Road petrol filling station and the former railway line, which may have a potential impact upon the East Rail Extension. The underground tanks for the petrol station are located in Middle Road Children's Playground, at the proposed location of the East TST station. The former railway line intersects the eastern side of the proposed station area (refer to Figure 2).

A focused, intrusive investigation is recommended to define the extent of any contamination within this area. This will enable the need for and scope of any

remedial works and special disposal requirements to be defined. Two key areas requiring investigation to assess the potential for land contamination have been identified:

- i) Middle Road Petrol Filling Station
- ii) Wing On Plaza Gardens (area of former railway line / go downs)

Middle Road Petrol Filling Station

Due to the extent of hardstanding and likely presence of underground services within the area, boreholes are recommended. Boreholes will enable soil samples to be collected and allow standpipes to be installed for groundwater monitoring and to monitor for the potential presence of volatile organic gases. All borehole locations will be dependent upon accessibility and the extent of below ground services.

Provisional borehole locations are indicated on Figures 3a and 3b although these may be subject to re-location due to possible site restrictions. A total of 3 boreholes located on and around the perimeter of the petrol station site are recommended in order to provide an indication of the likelihood that contamination of the underlying ground has occurred. These should be constructed to a depth of approximately 2m below groundwater level. For the detection of potential leaks from the underground storage tank, sampling should be carried out at depths below the bottom of the tank. This will however depend on groundwater levels (i.e. LNPALs potentially present).

Full time supervision of the borehole construction should be provided by a qualified Environmental Scientist, ensuring that the works are carried out to the required standard, at the most suitable locations and that monitoring standpipes are appropriately installed to allow future monitoring. Samples should be taken from all boreholes for subsequent laboratory testing. All soils should be logged and described in accordance with the appropriate standards (e.g. British Standard (BS5930) – Code of Practice for Site Investigation). Typically four samples (3 soil and 1 groundwater) should be submitted for analysis from each borehole as a minimum, although this will be dependent upon site observations.

The sampling depths may vary subject to local constraints and/or any obvious contamination at specific strata. Extra samples at deeper levels will be taken if significant contamination is found in the deepest sample originally planned. This should be determined by the contaminated land specialist during the sampling stage. Groundwater samples will also be taken if groundwater is encountered. The sampling depths may vary subject to local constraints and/or obvious contamination at specific strata. Extra samples at deeper levels will be taken if significant contamination is found in the deepest sample originally planned. This should be determined by the contaminated land specialist during the sampling stage. Groundwater sample will also be taken if encountered.

All samples should be collected in appropriate sample containers, labelled and despatched to the testing laboratory in sealed cool boxes. A HOKLAS accredited

(or equivalent) testing laboratory should be employed to advise on the use of appropriate sample containers, sample handling/storage and to perform the appropriate analysis. Sample analysis will be dependent upon the findings of the intrusive investigation but should include analysis for heavy metals, volatile organics (including BTEX compounds), total petroleum hydrocarbons and PAHs. Leaching tests such as TCLP (Toxicity Characteristic Leaching Procedure) may be required in the event that elevated concentrations of contaminants are detected.

Groundwater monitoring standpipes should be installed into each of the boreholes and completed flush with the ground, appropriately installed to allow future sampling and monitoring of groundwater. All standpipes installed should be purged (typically three well volumes) and sampled following the completion of site works. This will enable the collection of representative groundwater samples which may then be submitted for chemical analysis.

The above site investigation recommendations are based upon the assumption that the underground tanks and fuel lines remain in place. In the event that the tanks and fuel lines are removed prior to commencing the main project works, the potential for contamination can be evaluated. A qualified Environmental Scientist should be present on site to supervise the removal of any tanks/fuel lines and to assess the potential for the presence of contamination. Confirmatory soil samples should be collected from the base of all excavations and submitted for analysis (subject to the procedures highlighted above). The scope and need for any further investigation works within the area of the petrol station may then be re-assessed and revised if necessary.

Wing On Plaza Gardens

Boreholes are also recommended within Wing On Plaza Gardens in view of the potential extent of underground services. Trial pits however may replace some borehole locations if the engineers undertaking the investigation works determine that the potential risk for intercepting underground structures/services is low.

Provisional locations for exploratory holes are indicated on Figure 3a although these may be subject to re-location due to possible site restrictions. To provide adequate coverage of the area and to define the potential presence of contamination, 8 exploratory locations are recommended based upon an approximate 25m square grid. In view of the historic nature of any potential contamination and the current use of the site (recreational), the smaller sampling grid suggested by ProPECC PN 3/94 is not considered necessary.

Trial pits should be excavated to 3-4m below ground level or terminated when groundwater is reached (whichever is encountered first). Boreholes should be constructed to a depth of approximately 2m below groundwater level and groundwater monitoring standpipes installed into 3 boreholes. Installations should be completed flush with the ground, appropriately installed to allow future sampling and monitoring of groundwater.

As for the Middle Road site, full time supervision of the investigation works should be provided by a qualified Environmental Scientist, ensuring that the works are carried out to the required standard, at the most suitable locations and that monitoring standpipes are appropriately installed to allow for future monitoring. The collection, logging and handling of all samples should also comply with the criteria outlined for the Middle Road petrol station. Analysis of the samples will be dependent upon the findings of the intrusive investigation but should include analysis for volatile organics, total petroleum hydrocarbons, pH, metals (including lead), sulphate and PAHs. Leaching tests such as TCLP (Toxicity Characteristic Leaching Procedure) may be required in the event that elevated concentrations of contaminants are detected.

HEALTH AND SAFETY FOR SITE WORKERS

The investigation will be focused on areas of potential contamination which include areas of fuel storage and use. The potential contaminants which may arise as a result of these previous uses are summarised below :

Potential Contaminants	Exposure Pathway	Protective Clothing / Control
Petroleum Hydrocarbons (oils, petrol., diesel)	Skin absorption, ingestion and inhalation	Nitrile gloves and disposal suits to be worn during site works in all areas. Vapour masks should be available in the event that high concentrations are found.
PAHs, Heavy metals	Skin absorption, ingestion and inhalation	Nitrile gloves and disposal suits to be worn during site works in all areas. Dust masks to be worn in the event of dusty conditions.

During the site works appropriate health and safety measures must be in place to ensure that site workers are not exposed to unnecessary risks. Implementation of "standard" civil engineering techniques will ensure that direct contact by site workers is avoided (e.g. by provisions of overalls, gloves etc., no eating or smoking on site). The provision of the personnel protective equipment (PPE) highlighted within the table above, should be also be available in the event that contamination is present.

REMEDIATION REQUIREMENTS

The results of site investigation should be assessed on a risk-based approach, taking into consideration international contaminated land guidelines (e.g. Dutch and UK guidance documents), their relevance to Hong Kong and the proposed site use.

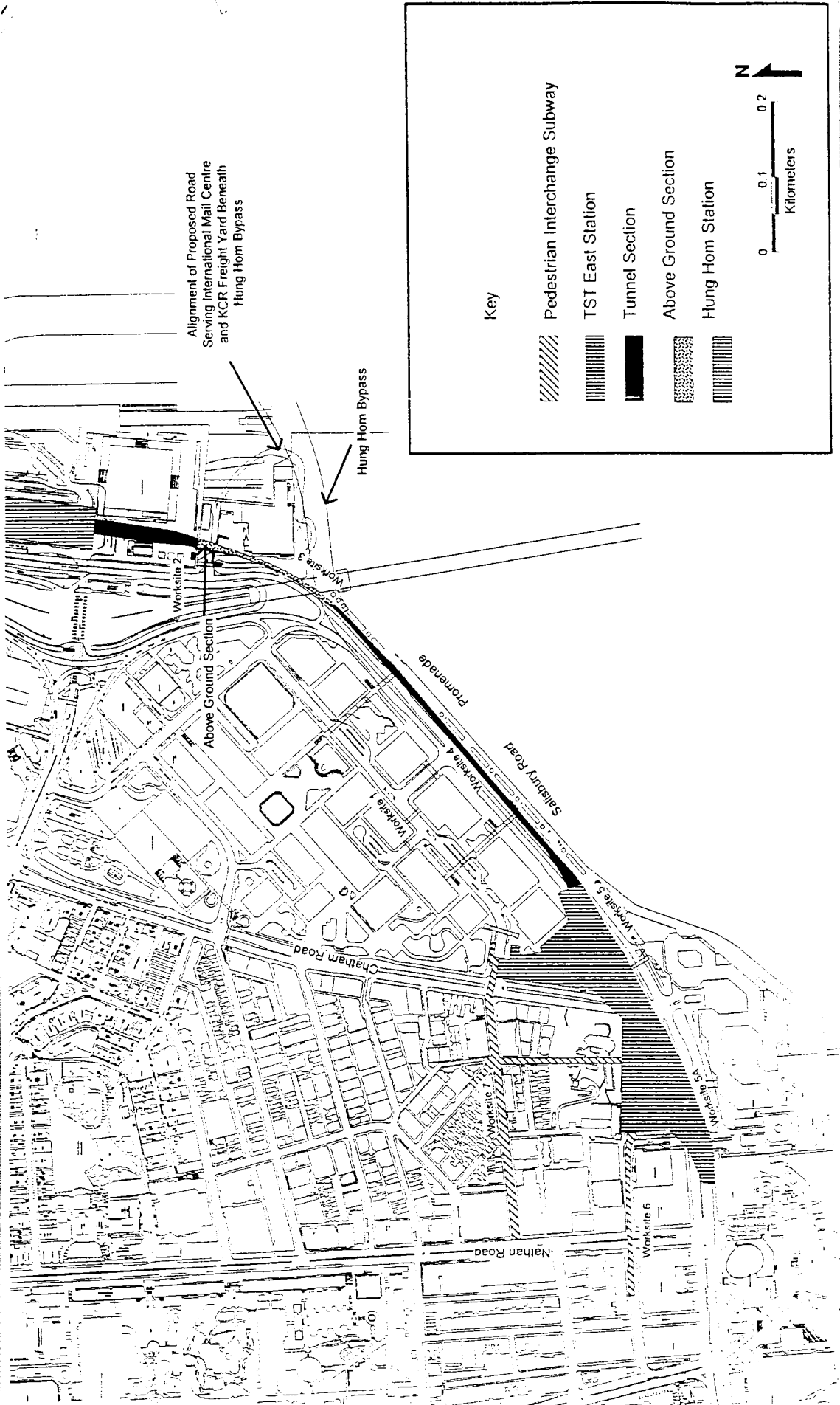
All available data should be reviewed and the health, safety and environmental considerations assessed by adopting a site-specific qualitative risk assessment. Recommendations with regard to any remedial works should be made based upon the results for the site investigation and should include an outline design of any

remedial works, broad cost estimates and consideration of potential liability/risk management in the long term.

In the event that contaminated materials are present, any material excavated as part of the construction works will require special disposal considerations. Special handling and health and safety procedures must be highlighted to ensure that site workers are not exposed to any unacceptable risks and no adverse impacts are sustained to the local receiving environment (including air and water quality). Contaminated material left in-situ may result in a potential risk to the underground structure and building design control measures may be required.

REFERENCES

1. Kowloon-Canton Railway Corporation East Rail Extension Hung Hom to Tsim Sha Tsui – Draft Environmental Impact Assessment. June 1999. Hyder Consulting Ltd.
2. Practice Note for Professional Persons PN 3/94 “Contaminated Land Assessment and Remediation”. Environmental Protection Department.
3. Works Branch Technical Circular 22/92 (Marine Disposal of Dredged Muds).
4. EPD Technical Circular 1-1-92 (Classification of Dredged Sediments for Marine Disposal).

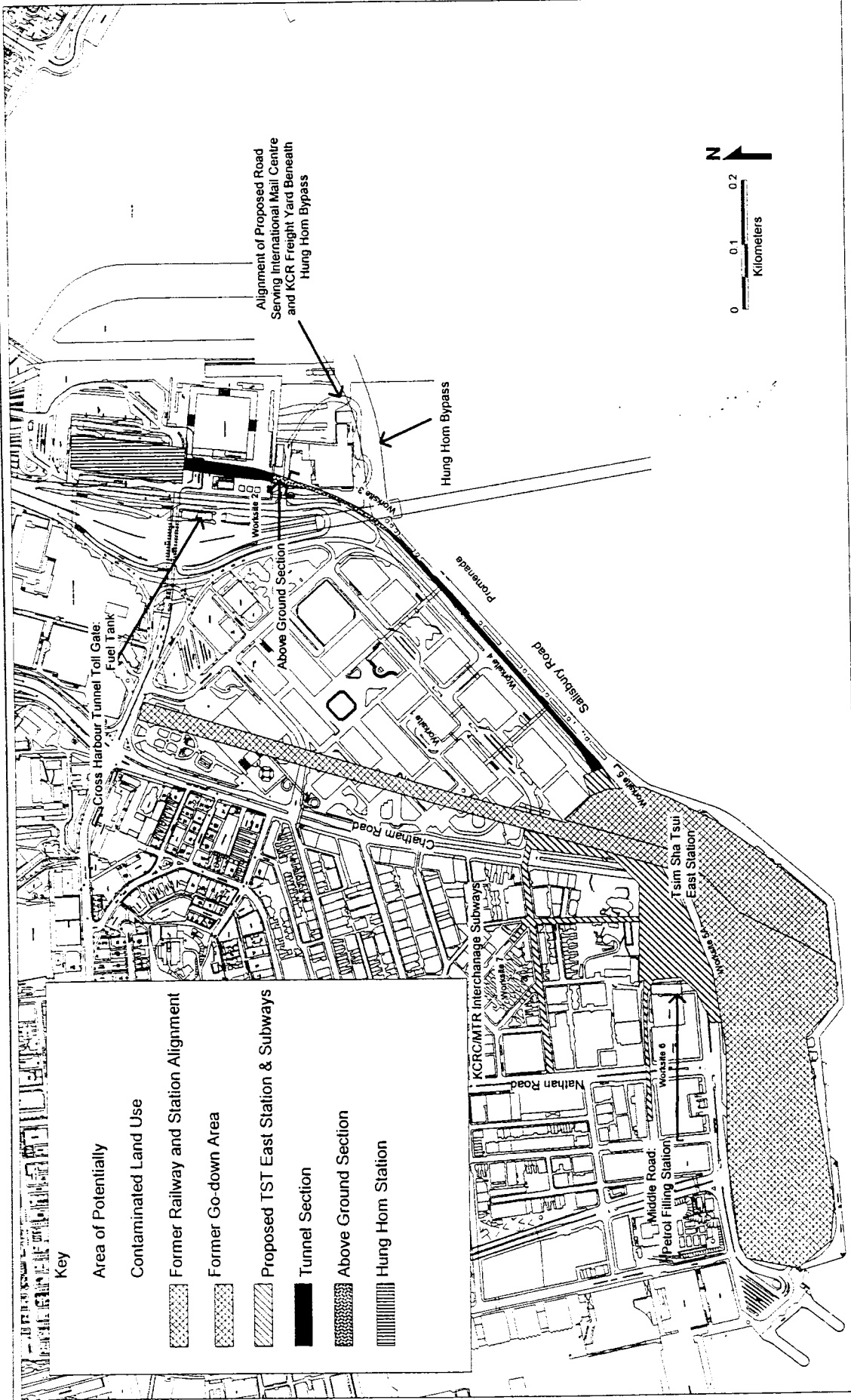


East Rail - Hung Hom to Tsim Sha Tsui Extension EIA



Figure 1 Study Area and Rail Extension Alignment

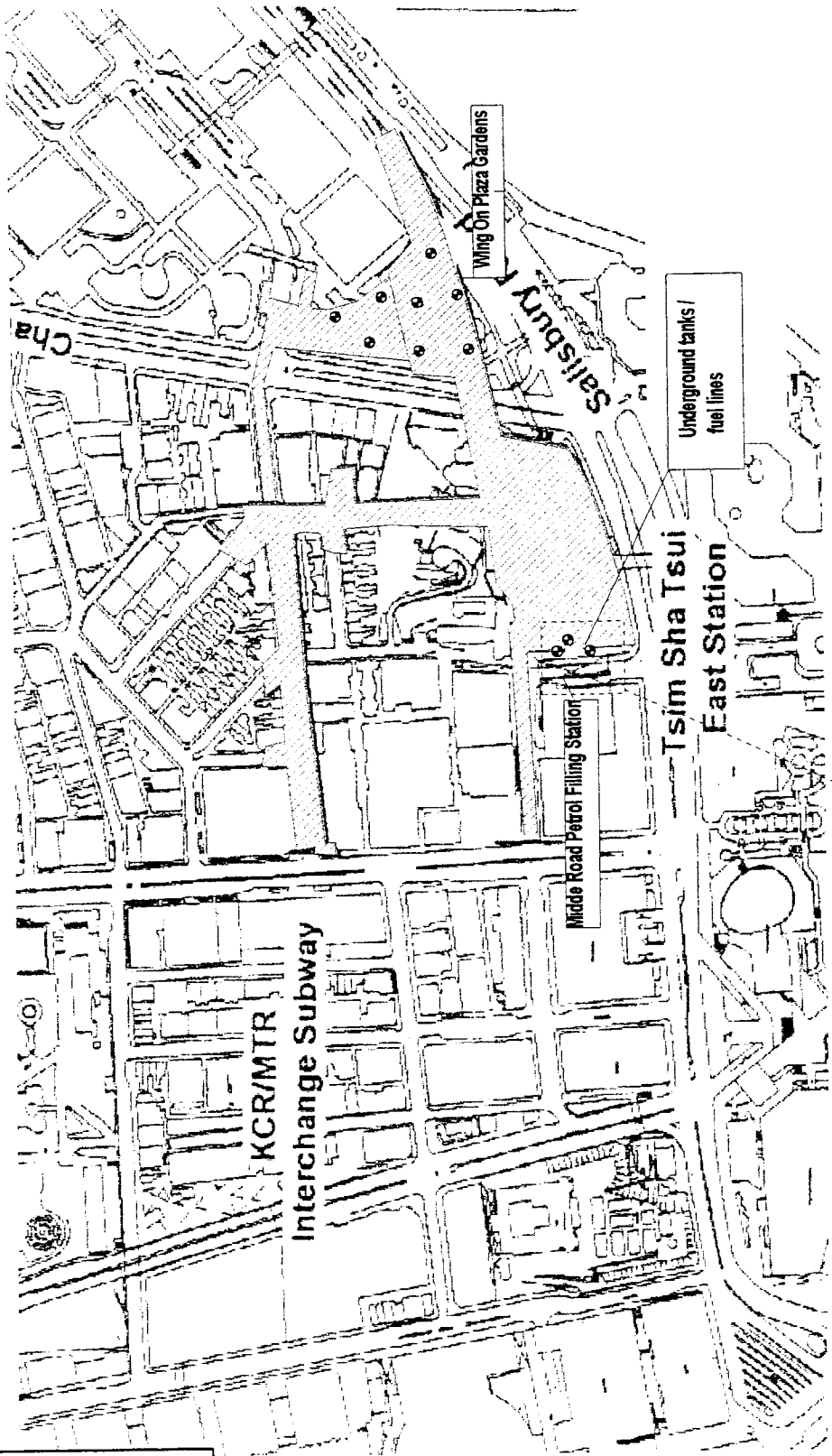
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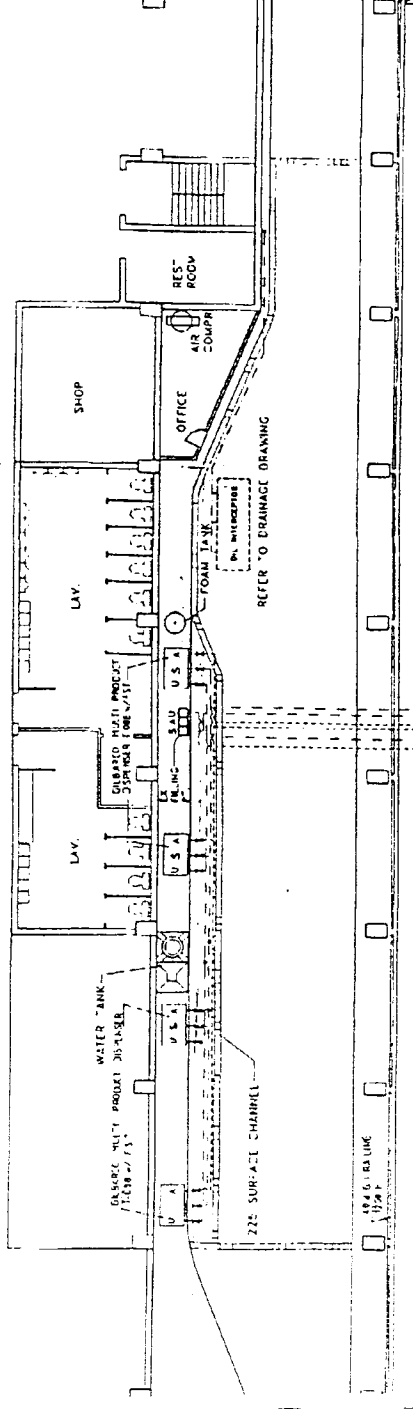
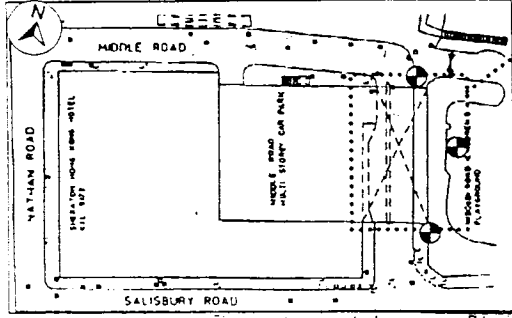




Legend

-  Proposed location for exploratory holes
-  Proposed East TST Station & Subways





Refer to Main Plan

LEGEND -

- SYMBOL UNLEADED GASOLINE
- AUTO DIESEL OIL
- UNLEADED GASOLINE
- GATE VALVE
- MULTI-PRODUCT DISPENSER (MPS) MODEL NO.108E

Proposed borehole location

840 DELIVERY PIPE FOR THREE UNLEADED GASOLINE
 840 DELIVERY PIPE FOR AUTO DIESEL OIL
 865 FILLING PIPE FOR SUPER UNLEADED GASOLINE TANK
 865 FILLING PIPE FOR AUTO DIESEL OIL TANK
 840 DELIVERY PIPE FOR UNLEADED GASOLINE
 865 FILLING PIPE FOR UNLEADED GASOLINE TANK

EXISTING 3RD OPENINGS TO BE SEALED UP WITH 150mm DIA. CONCRETE ENCLOSURE

EX 11 375 LITRES U/G TANK FOR UNLEADED GASOLINE

EXISTING 100mm DIA. OPENING TO BE SEALED UP WITH 200mm DIA. CONCRETE ENCLOSURE

PROPOSED 2 NO. RED JACKET P13053 SUBMERSIBLE PUMPS

EX 11 375 LITRES U/G TANK FOR AUTO DIESEL OIL

EXISTING 3 NOS 840 VENT PIPES AT MIN 1.5M ABOVE GROUND

PROPOSED 1 NO RED JACKET P13053 SUBMERSIBLE PUMP

PROPOSED 2 NOS VLEDER ROOT WAGNET RESTRICTIVE PROBE MODEL NO.847550

EX 11 375 LITRES U/G TANK FOR SUPER UNLEADED GASOLINE

MIDDLE ROAD CHILDREN'S PLAYGROUND



Consulting

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Figure 3b Middle Road Petrol Station Underground tank and fuel line locations

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