

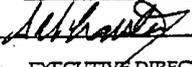
EXECUTIVE SUMMARY

Mass Transit Railway Corporation

Penny's Bay Rail Link:  
*Executive Summary*

February 2000

Reference C1937

For and on behalf of Environmental Resources Management
Approved by: <u>STEVE LAISTER</u>
Signed: <u></u>
Position: <u>EXECUTIVE DIRECTOR</u>
Date: <u>25 February 2000</u>

This report has been prepared by Environmental Resources Management the trading name of Environmental Resources Management Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

## **CONTENTS**

<b>1</b>	<b>INTRODUCTION</b>	<b>1-1</b>
<b>1.1</b>	<b>SCOPE OF THE STUDY</b>	<b>1-1</b>
<b>1.2</b>	<b>PROJECT DESCRIPTION</b>	<b>1-1</b>
<b>1.3</b>	<b>CONSIDERATION OF ALTERNATIVES AND "DO NOTHING" SCENARIO</b>	<b>1-2</b>
<b>1.4</b>	<b>CUMULATIVE IMPACTS</b>	<b>1-3</b>
<b>2</b>	<b>KEY ENVIRONMENTAL ISSUES</b>	<b>2-1</b>
<b>2.2</b>	<b>NOISE ISSUES</b>	<b>2-1</b>
<b>2.3</b>	<b>AIR QUALITY</b>	<b>2-2</b>
<b>2.4</b>	<b>WATER QUALITY ISSUES</b>	<b>2-3</b>
<b>2.5</b>	<b>WASTE MANAGEMENT ISSUES</b>	<b>2-3</b>
<b>2.6</b>	<b>LANDSCAPE AND VISUAL ISSUES</b>	<b>2-4</b>
<b>3</b>	<b>FUTURE REQUIREMENTS</b>	<b>3-1</b>
<b>3.1</b>	<b>ENVIRONMENTAL MONITORING AND AUDIT</b>	<b>3-1</b>
<b>4</b>	<b>OVERALL CONCLUSIONS</b>	<b>4-1</b>

## **1. INTRODUCTION**

This executive summary presents the key findings resulting from the Environmental Impact Assessment (EIA) of the proposed Penny's Bay Rail Link (PBRL). The EIA has considered the impacts associated with the construction and operation of the railway, and the principal findings are set out below.

### **1.1 SCOPE OF THE STUDY**

ERM-Hong Kong Ltd. has been commissioned to undertake an Environmental Impact Assessment (EIA) of the *Penny's Bay Rail Link* (PBRL) for the Mass Transit Railway Corporation (MTRC) in accordance with the requirements of the *Environmental Impact Assessment Study Brief No. ESB - 043/1999 for Construction of An International Theme Park in Penny's Bay of North Lantau and Its Essential Associated Infrastructures*. ERM-Hong Kong Ltd. is supported by Urbis Limited in undertaking specialist study of landscape and visual impacts.

The PBRL EIA forms part of a wider EIA for the theme park, essential infrastructures including road works, water supplies, stormwater drains, a multi-purpose lake and various other utilities being developed by Civil Engineering Department (CED). The assessment of PBRL is part of this wider study but, as required by the EIA applicant, CED, is provided by MTRC as a standalone EIA to be included as an Appendix to CED's submission under the EIA Study Brief and in accordance with the *Technical Memorandum on the Environmental Impact Assessment Ordinance* (EIAO).

The EIA Report includes a detailed assessment of the environmental impacts arising from the construction and operation of the PBRL and identifies potential impacts relating to air quality, noise, water quality, waste management, and landscape and visual resources.

### **1.2 PROJECT DESCRIPTION**

The proposed Penny' Bay Rail Link(PBRL) comprises a new 3.6 km link from the existing Tung Chung Line at Yam O to the Penny's Bay site of the proposed new Disney Theme Park as shown by *Figure 1.2a*.

A new Yam O Station will be constructed along the existing Tung Chung Line and will have two platforms, for the Tung Chung Line services between Hong Kong and Tung Chung, and an additional, third platform dedicated to the PBRL service. Concourses will be constructed above the three platforms and connected by overhead link bridges.

The PBRL will comprise a single track which will run parallel to the Tung Chung line before passing under the existing Tung Chung and Airport Express formation and the North Lantau Highway and into a 100 m length of cut and cover tunnel. The PBRL then enters the 750 m single cell horse-shoe tunnel to pass below the central hills of North Lantau to emerge to the north of Penny's Bay. A passing loop will be constructed to the south of the portal before the PBRL enters the new Disneyland Station. This station will be built on Penny's Bay Reclamation and will comprise a single platform.

Much of the PBRL is to be constructed at grade. However, portions of the track will be in cutting in the vicinity of Yam O Station, so as to gain sufficient headroom to pass underneath the existing viaducts of the North Lantau Highway, and on the approaches to the Disneyland Station will remain in cutting to minimise visual impacts.

### **1.3 CONSIDERATION OF ALTERNATIVES AND “DO NOTHING” SCENARIO**

Within the Yam O site, the alignment is constrained by the existing and proposed highways, the existing Lantau Airport Railway (LAR), an existing MTR traction substation and the close proximity of the sea wall. Together with the need for the PBRL platform to be parallel with the existing LAR lines, the alignment is essentially predetermined to fit the existing infrastructure. Other options have been examined but these involve only minor deviation in the vicinity of Yam O Station according to platform and connection details.

These constraints determine the alignment to the east and then south, in tunnel through the hill to Penny's Bay, continuing towards the Theme Park site on land to be reclaimed by CED. The layout within the Penny's Bay reclamation is determined by the planning layout of the intended landuses for the platform. Given the proposed arrangement of the landuse in Penny's Bay, there are no other conceivable and practical alignments between Yam O Station and Disneyland Station that would ameliorate environmental impacts, including noise and those to landscape and visual resources.

The existing LAR tracks at Yam O are at approximately +6.2 mPD and the PBRL will be at the same level with a horizontal profile extending from the LAR tracks to the tunnel portal. Throughout the tunnel section, the vertical alignment follows a slight up gradient towards the Penny's Bay reclamation, designed to match with the Government's highway proposals at that portal, then trending downwards to Disneyland Station, where it is at a level of approximately +2.0mPD, which in conjunction with earth bunds, serves to mask train operations from the Theme Park.

While the above constraints allow no alternative alignment, a “Do Nothing” scenario is considered briefly here. The PBRL is proposed in order to improve transport communications for the users of the Theme Park and other new sites proposed on the Penny's Bay reclamation and Northshore Lantau Development. In environmental terms, the projected ridership levels indicate

that the proposed railway will carry up to 30,000 passengers per hour. If the PBRL was not constructed, the travellers to the proposed new land uses would need to find alternative means of transport. It is most likely that the alternative transport options would comprise car and bus journeys. As a consequence, there would be an increased level of vehicles on the road networks in the surrounding areas which would give rise to increased levels of vehicular air pollutants and noise.

#### **1.4 CUMULATIVE IMPACTS**

The potential for cumulative impacts will be fully considered by the Theme Park EIA based upon the impact assessment information provided by the PBRL EIA as, for the exception of the rail noise, common environmental issues are assessed in the wider context of the Theme Park EIA Study's assessment area.

For the assessment of cumulative railway noise, the PBRL EIA assesses the cumulative impact of the Lantau Airport Railway (both Tung Chung Line and Airport Express Services) and PBRL noise.

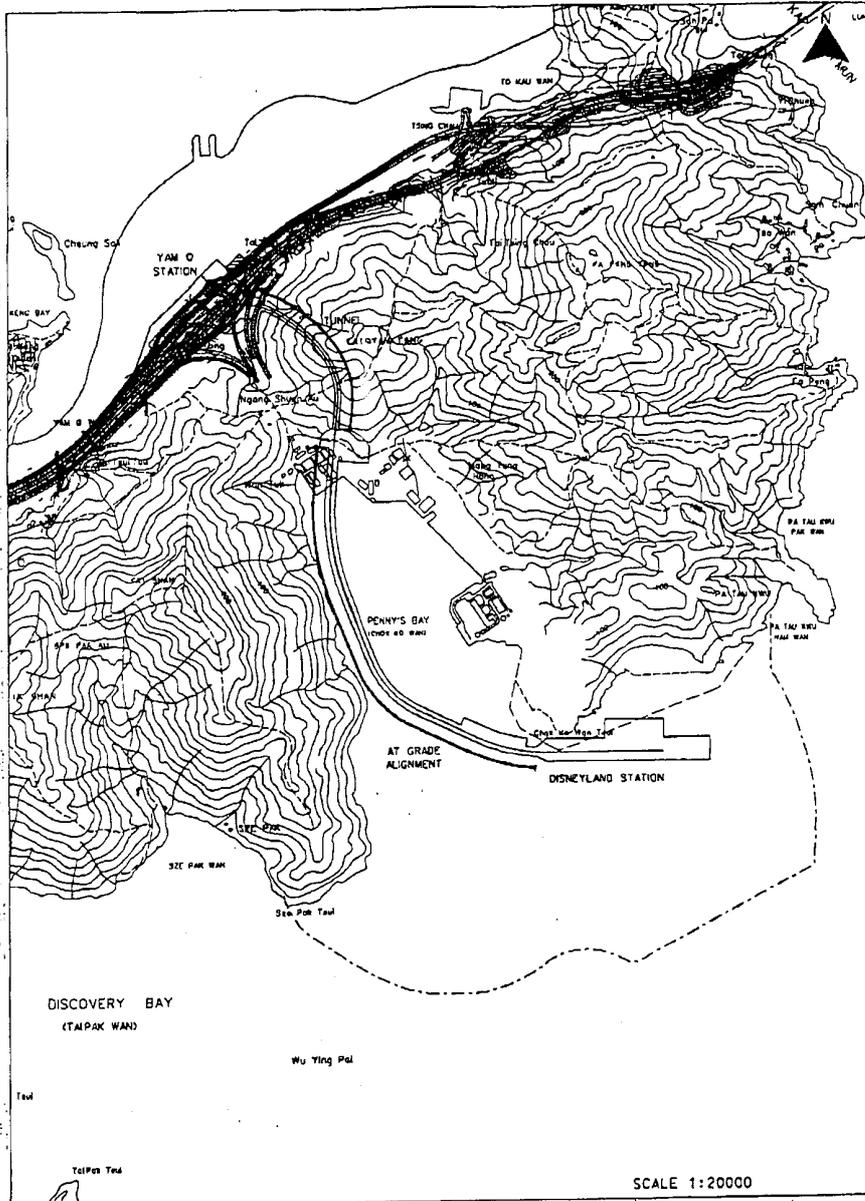


FIGURE 1.20

PROJECT AREA & ROUTE OF PBRL

SCALE 1:20000

USDA FILE: C1537.J5  
DATE: 19/01/00

Environmental  
Resources  
Management



*This page left intentionally blank*

## **2 KEY ENVIRONMENTAL ISSUES**

### **2.1.1 Introduction**

A number of key impacts and issues were identified during the course of the EIA Study. These included impacts that were significant because of their nature or scale. The findings of the EIA in relation to these issues are summarised below.

## **2.2 NOISE ISSUES**

### **2.2.1 Baseline Conditions**

The existing ambient noise levels are mainly affected by the traffic on North Lantau Highway and railway noise from Airport Express Line and Tung Chung Line. Noise emission from the nearby Penny's Bay Power Station also contributes to the background noise level of the area. In the future, the planned Chok Ko Wan Link Road and Route 10 will be new sources of noise directly affecting the area.

The nearest potential sensitive receivers are village type developments located in Luk Keng Tsuen, while the nearest densely populated areas are Discovery Bay and Peng Chau which are more distant from the site. As all the sensitive uses are over 300 m away from PBRL, noise impacts on these NSRs are not expected.

### **2.2.2 Construction Noise Impacts**

The source of noise during each construction stage of the Project is mainly from the use of PME on site. The works will require a number of noisy activities including the use of heavy plant for excavation, filling, concreting, tunnelling and station construction.

As the nearest NSR is more than 300 m away from construction site boundaries, noise impacts associated with the construction activities during daytime are not expected. Noise nuisance from site traffic would also be unlikely given the limited traffic on site. Specific noise mitigation measures are therefore not required. However, the Contractor will be responsible for adopting good site practice and maintaining proper on-site management in order to ensure the environmental performance of the works.

### **2.2.3 Operational Noise Impacts**

In view of the setback distance and the operational characteristics of the trains, no noise impacts are anticipated during the operational phase. Accordingly, no mitigation measures will be required and no cumulative impacts with existing sources of railway noise will arise. Fixed plant noise is

also not an issue and can satisfy the EIAO noise limit provided that the recommended good engineering practice noise limit is implemented.

## **2.3 AIR QUALITY**

### **2.3.1 Baseline Conditions**

The main sources of air pollution in Penny's Bay is from vehicle emissions arising from the North Lantau Highway and air emissions from the China Light & Power Ltd (CLP) Penny's Bay Gas Turbine Power Station. Air quality monitoring data provided by CLP indicates that the background pollutant levels for the area are low, with EPD having classified the study area as being rural in character, with the ambient air quality being generally good with low pollutant levels.

The nearest potential sensitive receivers are the village type developments located close to the shore line, Luk Keng Tsuen. Although Penny's Bay Gas Turbine Power Station itself is a pollution source, offices and accommodations within the station are potential sensitive receivers.

### **2.3.2 Construction Air Quality**

The potential air quality impacts arising from the construction of PBRL are likely to be fugitive dust emissions and gaseous emissions from construction plant, construction activities and vehicle movements within the site. These activities are not expected to cause any exceedance of *Air Quality Objectives* due to given the limited number of plant, vehicle movements and the buffer distance from the ASRs. However, it is the responsibility of the Contractor to implement appropriate site management practices and those measures detailed in *Air Pollution Control (Construction Dust) Regulations* in order to ensure the environmental performance of the works.

For the blasting works within the rock tunnel between Yam O and Penny's Bay and the hydraulic breaking activities required inside the cut and cover tunnel at Yam O, the Contractor will be required to adopt the best practical means and measures in undertaking these kinds of works, such as the measures required by the Mines & Quarries Division of the Civil Engineering Department. The outbreak of dust from these activities will be carefully controlled and will not cause dust impacts on the ASRs.

### **2.3.3 Operational Air Quality**

Potential air quality impacts during the operation of PBRL will be limited since electric trains will be used and no air emissions will be produced. However, low levels of dust may be generated by the abrasion and wear of track, electrical pick-up gear and rolling stock during normal operation and from maintenance activities. Ozone will also be generated due to arcing between the power rail and train pick-ups. The amount of air pollutant

generated from such activities will be limited and will have a negligible impact on the ASRs.

## **2.4 WATER QUALITY ISSUES**

### **2.4.1 Baseline Conditions**

The Study Area covers the north-eastern part of Lantau Island which is directly influenced by the main channel flows passing around Ma Wan Island, into and out of the Western Harbour and Victoria Harbour. Any impacts from the construction and operation of the PBRL will occur within two *Water Control Zones*, the North Western and Southern. In 1997, the water quality in the vicinity of the Study Area is generally good, achieving compliance with all *Water Quality Objectives*, except Total Inorganic Nitrogen (TIN), with the data showing that the study area is somewhat influenced by sewage discharges. The influence of sewage discharges in the North Lantau area likely to increase in the future due to increasing flows through the Siu Ho Wan outfall.

### **2.4.2 Water Quality Impacts**

Water quality impacts during the construction of PBRL may be associated with discharges of surface waters and collected groundwater from the various construction sites, and sewage from construction workers. However, it is anticipated that there will be no insurmountable residual impacts on water quality, provided that the recommended mitigation measures are effectively implemented and so all the construction site/works area discharges will comply with effluent discharge standards.

With the implementation of all the proposed mitigation measures, there are not predicted to be any potential water quality impacts arising from the operation of the proposed rail development.

## **2.5 WASTE MANAGEMENT ISSUES**

The construction activities will result in the generation of a variety of wastes including excavated material, construction and demolition waste, chemical waste and general refuse. Adherence to the recommended mitigation measures relating to good practice will ensure that adverse impacts are prevented and that the opportunities for waste minimisation and reuse are taken.

The amount of general refuse, industrial and chemical wastes arising from the operation of the PBRL is expected to be small.

The implementation of appropriate mitigation measures will reduce the potential environmental impacts associated with the storage, handling, collection, transport, and disposal of wastes arising from the construction and operation of the PBRL will meet the criteria specified in the *EIAO* and no unacceptable environmental impacts are anticipated.

## **2.6 LANDSCAPE AND VISUAL ISSUES**

### **2.6.1 Baseline Conditions**

The existing environment is rural in nature, with Penny's Bay located between two upland areas of Fa Peng Teng and Tai Shan and the low-lying saddle at Ta Shui Wan. The landscape comprises of smooth undulating hillsides with small areas of shrub and woodland on the lower slopes.

The views from the study area are restricted by the eastern and western hillsides, with views on a clear day to the south showing Peng Chau, Siu Kau Yi Chau and Kau Yi Chau and in the far distance Lamma Island and Hong Kong Island. Within Penny's Bay, extensive rock-cut slopes have been formed behind, to the south of Penny's Bay Power Station and Cheoy Lee Shipyard, and these create an unattractive visual impact on the surrounding areas.

### **2.6.2 Landscape and Visual Impacts**

The assessment has indicated that the most significant impacts during the construction phase would be visual impacts caused by the construction of the cut and cover tunnel and slope stabilisation works at the north portal and the temporary works area and slope stabilisation works at the south portal. However, with the implementation of the proposed mitigation works, it is anticipated that the residual impacts would be reduced to slight significance.

During the operational phase, the most significant impacts would be the landscape and visual impacts associated with the southern tunnel portal and vent structure and associated geotechnical slope stabilisation works, and the section of the at-grade railway that curves around the edge of the Water Recreation Centre. However, if the proposed mitigation measures are adopted, the residual impacts would be reduced to slight significance. With regard to the Water Recreation Centre, the railway would be clearly visible to users of the Centre who would subsequently suffer residual adverse impacts of moderate significance. However, it would be quite possible for the designers of the Centre (which will be built concurrently with the railway) to provide berming and screening with the Centre to screen the railway if so desired.

Overall, it is considered that, the landscape and visual impacts are acceptable with the implementation of the recommended mitigation measures.

### **3 FUTURE REQUIREMENTS**

#### **3.1 ENVIRONMENTAL MONITORING AND AUDIT**

To ensure that the mitigation measures recommended within the EIA Report are carried forward and implemented at the appropriate stage of the project, an Implementation Schedule has been produced. For each of the mitigation measures the Implementation Schedule defines the stage and location at which the measure should be implemented together with the responsible agent. An Environmental Management System has also been proposed as a means of ensuring the full implementation of the mitigation measures.

*This page left intentionally blank*

#### **4 OVERALL CONCLUSIONS**

The implementation of the recommended mitigation measures will ensure that there are no residual environmental impacts from the construction or operation of the PBRL.

The mitigation measures recommended in the EIA represent accepted measures which may be employed to ensure compliance with statutory requirements, Government guidelines and other environmental standards agreed with the EPD. The Environmental Monitoring and Audit programme which will be adopted during the construction of the PBRL will also help ensure compliance with statutory and recommended criteria.

*This page left intentionally blank*