

ADVISORY COUNCIL ON THE ENVIRONMENT

(31.1.94)

(ACE 1/94)
(for advice)

Mass Transit Railway Corporation
Lantau and Airport Railway
Environmental Impact Study (EIS)

BACKGROUND

The Mass Transit Railway Corporation (MTRC) propose to build new railway lines, principally to serve the new Chek Lap Kok Airport and to provide improved public transport services for the Territory. The proposed Lantau and Airport Railway (LAR) will be approximately 34km in length and consist of two railway services:

- (a) the Airport Express Line (AEL) will provide a dedicated high speed service between Hong Kong Central and Chek Lap Kok, stopping only at Kowloon and Tsing Yi; and
- (b) the Lantau Line (LAL) will be a public service linking Central to North Lantau, with stations at Tung Chung, Tsing Yi, Lai King, Tai Kok Tsui and Kowloon.

2. An Environmental Impact Study (EIS) has been carried out by the MTRC's consultant, Environmental Resources Management Hong Kong (ERM), under the management of a Study Management Group consisting of representatives from relevant Government Departments and chaired by EPD. The study has addressed both the cumulative construction and operational impacts that may arise from the proposed LAR in respect of the current specific alignment. Major environmental issues relating to the alignment had been addressed in the Airport Railway Feasibility Study completed in 1991.

3. The working papers on the Western Immersed Tube Tunnel and the Rambler Channel Bridge were submitted to EPCOM at its meeting on 19 July 1993 (EPCOM Paper 28/93). EPCOM endorsed the recommendations contained in the two EIAs.

4. The Executive Summary of the major findings of the EIS, prepared by the MTRC's consultant, is attached. A presentation will be made by the MTRC and their consultants ERM. Copies of the full report in three volumes are available to members on request, should they feel that they need more information about the technical matters discussed in the report.

AN OVERVIEW OF EIS FINDINGS AND RECOMMENDATIONS

Construction Impacts and Mitigation Measures

Noise

5. Noise impacts would arise from general construction activities, dredging works near the shore, excavation, demolition works and percussive piling works in some of the worksites. At some critical sites, the construction noise impact from construction activities and percussive piling could be serious and, without mitigation measures, would exceed the Noise Control Ordinance (NCO) limits or the planning criterion of 75 dB(A) for non-restricted hours. Noise mitigation measures such as temporary noise barriers, noise enclosures and/or restrictions on working hours will be adopted and specified in the construction contracts. The MTRC will require the contractors to submit Method Statements prior to the commencement of works to verify that the measures recommended in the EIS or any equivalent measures would be adopted by the contractors to meet the planning criterion of 75 dB(A) for non-restricted hours or the limits in the Noise Control Ordinance for works to be carried out in restricted hours.

6. The worst construction impacts are predicted to occur at Lai King during the demolition of the Lai King Community Hall and the excavation works, which would last for 2 to 3 weeks and 8 months respectively. Without mitigation measures, the noise could be over 90dB(A). To mitigate the serious construction noise impact, concrete nibblers, which are much quieter than percussive breakers, will be employed in the demolition work and an acoustic cover will be erected over the southern end of the Lai King Station work site during excavation works to bring the noise level down to below 75 dB(A).

Dust

7. Dust is the major cause of air quality impact during construction. Major contributors are concrete batching, reclamation, blasting and tunnelling. Without mitigation measures, high levels of dust exceeding the hourly limit recommended by EPD would occur in some of the worksites. Dust suppression measures are recommended for incorporation into contracts for implementation. Batching plant will be located at least 100m from sensitive land uses. Dust from blasting would only occur during the initial stage (about 2 to 4 weeks) of tunnelling at Lai King, since blasting operations will take place inside the tunnel during the later stage. The study recommends that blasting will take place under favourable wind conditions and in a controlled manner as far as practicable.

Odour

8. Odour impact arising from the construction activities at the former Gin Drinker's Bay Landfill is of concern. Excavation and handling of waste materials in the Gin Drinkers' Landfill will be carried out by a landfill specialist contractor. Waste would be properly covered and contained during transit by sealed containers or trucks. Wastewater from the site will be disposed of to a foul sewer.

9. To mitigate the potential water quality impacts during dredging and marine dumping associated with the construction of the Immersed Tube Tunnel, measures such as the use of sealed grabs, sealed bottom openings of barges and the control of barge and hopper loading are recommended. Marine muds will be disposed of only at appropriate dumping grounds under the control of Dumping Licences issued by EPD.

10. Waste materials generated during construction will be segregated for disposal. Only licensed waste collectors will be used and disposal permits are required under the Waste Disposal Ordinance to ensure proper handling, transportation and disposal of wastes.

Operational Impacts and Mitigation Measures

11. Operation noise of the LAR trains represents the key operational impact and thorough evaluation has been given to this issue. Predictions of the train operating noise have been made on the basis of train rolling stock specification and a railway maintenance programme developed by MTRC. A 'realistic worst' train source strength of 86 dB(A) has led to the identification of a package of noise mitigation measures which effectively bring the operation train noise levels within the NCO standard at all identified noise sensitive receivers (NSRs) at north-west Kowloon and north Lantau in 2011.

12. Prediction of the train rolling noise has been made using the most appropriate train noise source level of 86dB(A). The adoption of this figure takes into account MTRC's commitment to a rigorous maintenance programme combined with an extensive train noise monitoring scheme. Different types of noise barriers are recommended for noise mitigation according to the severity of noise exposure and site conditions. Ground-borne noise and vibration are not considered to be serious in the majority of the railway sections because of the resilient track mounting system. The recommended package of noise mitigation measures comprises the following key elements:

- (a) a total of 20.7 km long absorptive and reflective trackside barriers at a number of location and along different lines of the LAR;

- (b) a concrete structure, which is quieter than a metal one, for the Rambler Channel Bridge;
- (c) a resilient track mounted system;
- (d) 530m long noise enclosures at Tsing Yi and Tung Chung, together with cover tunnels at all stations;
- (e) specification on the maximum sound pressure level for fixed plant to ensure that sensitive receptors are protected from excessive noise;
- (f) absorptive lining in plant rooms and vibration isolation of machinery for inclusion into the detailed design; and
- (g) self protecting building design at developments above stations.

13. For the Lantau Fixed Crossing section, the most appropriate trackform and supporting members providing the best acoustical and engineering performance will be adopted. The predicted night-time noise levels will be expected to be in the range between 57-65 dB(A) exceeding the NCO standards of 55 dB(A) for that particular area. In view of the exceedance, noise protecting building design will be adopted in the Ma Wan redevelopment in such a manner that blank facade would be provided to those planned developments facing the Lantau Fixed Crossing.

14. At the Siu Ho Wan Depot, the predicted noise levels from train movements in the busiest night-time periods would be within the NCO limits, but noise from wheel squeal in the fan area may cause annoyance. The employment of train wheel and rail lubrication techniques will be employed to mitigate wheel squeal and the depot design would allow for the possible erection of noise cover and/or barriers, if needed.

15. The identified sources of air pollutants during the operation of the LAR will only give rise to very small levels of emissions and concentrations.

16. The potential for contaminated track runoff, tunnel drainage and station cooling discharges will be the principal water quality concern associated with the railway operation. As the majority of the LAR is covered, the volume of track runoff will be minimal. Regular inspection and maintenance of the lining and seals of the tunnels to monitor the ingress of groundwater will be undertaken. The consultants have estimated that, under the worst case scenario, the 2°C temperature rise limit due to cooling water discharges would be confined to an area approximately 120m offshore. As there are no biologically sensitive receivers such as mariculture zones or bathing beaches within this zone, it is considered that this will not create any problems.

IMPLEMENTATION & MONITORING ISSUES

18. For a project of such a scale and spanning such a long period, it is important to establish a clear framework for implementing the measures recommended in the EIS to ensure continued environmental acceptability. The EIS has determined an ultimate package of noise mitigation measures for the full operation of the railway in the year 2011. The measures like enclosures, resilient track mounting and structural supports for barriers, which could not be installed at later stage without disturbing the train operation, will be in place before the commissioning of the LAR train. A phased implementation of the identified trackside barriers is preferred by the MTRC in the course of increasing train operation starting from Day 1 running up to 2011. The MTRC have agreed to enhance the barrier provision in phases in 2001, 2005 and 2008 to match the increase in train operation. In this respect, the standards in the NCO at both the existing and planned NSRs at north-west Kowloon and north Lantau will be met at all times.

17. The detailed recommendations of mitigation measures will be incorporated into the contract documents for implementation. The consultants have specified a system of environmental monitoring and auditing requirements for compliance and post-project audit. A detailed Code of Construction Practice (CCP) will be drawn up for each of the construction contracts. The CCP will include an event contingency plan and monitoring and audit requirements. A detailed Code of Operation Practice (COP) will also be drawn up to cover the operational activities of the railway. The COP will set out environmental performance standards and required environmental management practices.

18. The MTRC has committed to employ an independent environmental consultant to draw up detailed EM&A protocols and mitigation implementation schedules and to oversee the environmental performance of the project during both the construction and operation of the railway. An environmental monitoring and audit manual will be prepared by the future consultant for agreement with EPD for implementation.

SUMMARY

19. The environmental impacts of the construction and operation of the LAR have been thoroughly assessed and evaluated in the EIS. With suitable design and proper implementation of the mitigation measures recommended in the EIS, the environmental impacts can be controlled within the limits laid down in relevant ordinances and Hong Kong Planning Standards and Guidelines. There are no outstanding issues in relation to the EIS. The MTRC has agreed to implement all the recommendations of the EIS. The implementation of the monitoring and audit programme by MTRC would ensure that the recommended measures would be effectively put into place. The MTRC agrees to implement the enhancement of barriers in stages to ensure compliance at all times and in all

areas, and to submit the details of the barrier enhancement programme for EPD's agreement within the first year of the operation.

Advice Sought

20. Members' views are sought on the findings and recommendations of the EIS.

Environmental Protection Department
January 1994