

1 INTRODUCTION

1.1 Project Background

1.1.1 The Lion Rock Tunnel (LRT) is an urban trunk road consisting of two tunnel tubes each with two traffic lanes, which have been put in use for over 40 years. There are signs of deterioration and need for rehabilitation for the tunnels. Meanwhile, with the increase of traffic flow over the years, the existing capacity of the LRT cannot cope with the traffic demand during peak hours now, long traffic queues appear at the connecting roads including the LRT Road on Shatin side, as well as the Lung Cheung Road and the Waterloo Road on Kowloon side. Enhancing the capacity of the LRT and the connecting roads as far as possible is therefore necessary to improve the traffic flow at this critical link between Shatin and Kowloon.

1.1.2 In 2019, AECOM Asia Company Limited (AECOM) was commissioned by Highways Department (HyD) to undertake the assignment of Agreement No. CE 48/2018 (HY) Improvement of Lion Rock Tunnel – Investigation (hereafter called “the Project”).

1.1.3 The purpose of the Project is to rehabilitate and improve the existing tunnel tubes of the LRT and to take this opportunity to enhance the capacity of the tunnel and the connecting roads as far as possible, with a view to extending the service life of the LRT and help alleviating the traffic congestion at the LRT during peak hours and the traffic impact during maintenance.

1.2 Designated Projects under Environmental Impact Assessment Ordinance

1.2.1 A Project Profile (No. PP-589/2019) was submitted to the Environmental Protection Department (EPD) on 24 September 2019 under Environmental Impact Assessment Ordinance (EIAO) and the EIA Study Brief (No. ESB-323/2019) for the Project was issued on 6 November 2019 under the EIAO.

1.2.2 The Project comprises the following elements which are classified as Designated Projects (DPs) as per Schedule 2, Part I of the EIAO. The DPs elements of this Project is summarized in **Table 1.1**.

Table 1.1 Schedule 2 Designated Projects in this Project

Schedule 2 Designated Project		Designated Project Element under the Project
Item A.1, Part I	A road which is an expressway, trunk road, primary distributor road or district distributor road including new roads, and major extensions or improvements to existing roads.	<p>The road sections under the Project comprises of:</p> <p>(i) construction of a new vehicular bridge next to existing K7A Vehicular Bridge. The new vehicular bridge will connect existing Waterloo Road northbound (N/B) to Lion Rock Tunnel Road N/B which are “trunk road” under TD’s classification, therefore, this new vehicular bridge is classified as “trunk road”.</p> <p>(ii) widening/re-alignment the existing roads including Lion Rock Tunnel Road which is considered as major extensions or improvement to existing roads.</p>

Schedule 2 Designated Project		Designated Project Element under the Project
Item A.7, Part I	A road or railway tunnel more than 800 m in length between portals.	(i) The proposed new tunnel is more than 800m in length between portals. (ii) Enlargement of the existing Kowloon bound tunnel, which is more than 800m in length between portals (an exempted DP).
Item Q1, Part I	All projects including new access roads, railways, sewers, sewage treatment facilities, earthworks, dredging works and other building works partly or wholly in an existing country park.	The proposed re-aligned southbound LRT Road at Shatin area partly in existing Lion Rock Country Park.

1.3 Purpose of the EIA Study

1.3.1 The purpose of the EIA Study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project and associated works that will take place concurrently. This information will contribute to decisions by Director:

- the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;
- the conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable; and
- the acceptability of residual impacts after the proposed mitigation measures are implemented.

1.4 Objectives of this EIA Study

- (i) to describe the Project and associated works together with the requirements and environmental benefits for carrying out the Project;
- (ii) to identify and describe the elements of the community and environment likely to be affected by the Project and/or likely to cause adverse impacts to the Project, including both the nature and man-made environment and the associated environmental constraints;
- (iii) to identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potential affected uses;
- (iv) to identify and quantify potential waste management issues and impacts arising as a result of the construction and operation activities of the Project;
- (v) to identify and quantify contaminated land within any Project Area for development works, and to propose measures to avoid disposal in the first instance;

- (vi) to identify and quantify any potential ecological impacts arising from the construction and operation of the Project, including potential losses or damage to flora, fauna and natural habitats, and to propose measures to mitigate these impacts;
- (vii) to identify any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (viii) to identify any adverse impacts on cultural heritage and to propose measures to mitigate these impacts;
- (ix) to identify potential hazard to life from Sha Tin Water Treatment Works (STWTW), which is a Potentially Hazardous Installation (PHI), and/or any other Notifiable Gas Installation (NGI) as defined in the Gas Safety Ordinance (Cap.51), and to propose mitigation measures;
- (x) to propose the provision of infrastructure or mitigation measures so as to minimise pollution, environmental disturbance and nuisance during construction and operation of the Project;
- (xi) to investigate the feasibility, effectiveness and implications of the proposed mitigation measures;
- (xii) to identify, predict and evaluate the residual (i.e. after practicable mitigation) environmental impacts and the cumulative effects expected to arise during the construction and operation phases of the Project in relation to the sensitive receivers and potential affected uses;
- (xiii) to identify, assess and specify methods, measures and standards, to be included in the detailed design, construction and operation of the Project which are necessary to mitigate these residual environmental impacts and cumulative effects and reduce them to acceptable levels;
- (xiv) to investigate the extent of the secondary environmental impacts that may arise from the proposed mitigation measures and to identify constraints associated with the mitigation measures recommended in the EIA study, as well as the provision of any necessary modification;
- (xv) to design and specify the environmental monitoring and audit requirements; and
- (xvi) to identify any additional studies necessary to implement the mitigation measures of monitoring and proposals recommended in the EIA Report.

1.5 Structure of the EIA Report

1.5.1 The background of the Project, purpose and objectives of this Report are introduced in this section. A description of the Project and details of options consideration are provided in **Section 2**. **Sections 3 to 11** detail the assessment of each key environmental issues covering relevant legislation, assessment criteria, baseline environmental conditions, assessment criteria, methodology and assessment findings.

1.5.2 Sections 3 to 11 are outlined as below:-

- Section 3 – Air Quality Impact
- Section 4 – Noise Impact
- Section 5 – Water Quality Impact
- Section 6 – Waste Management Implication

- Section 7 – Land Contamination
 - Section 8 – Ecology (Terrestrial)
 - Section 9 – Cultural Heritage
 - Section 10 – Landscape and Visual Impact
 - Section 11 – Hazard to Life
- 1.5.3 An outline of the requirements for the Environmental Monitoring and Audit (EM&A) programme is presented in **Section 12**. The EM&A programme is presented in detailed in a separate EM&A Manual. A detailed implementation schedule of the recommended mitigation measures is provided in **Section 13**. A summary of environmental outcomes and conclusions is presented in **Section 14**.
- 1.5.4 An Executive Summary has been prepared as a separate document in both Chinese and English, which contains summaries of the key findings, recommendations and conclusions of the EIA Report.