土木工程拓展署
Civil Engineering and Development Department

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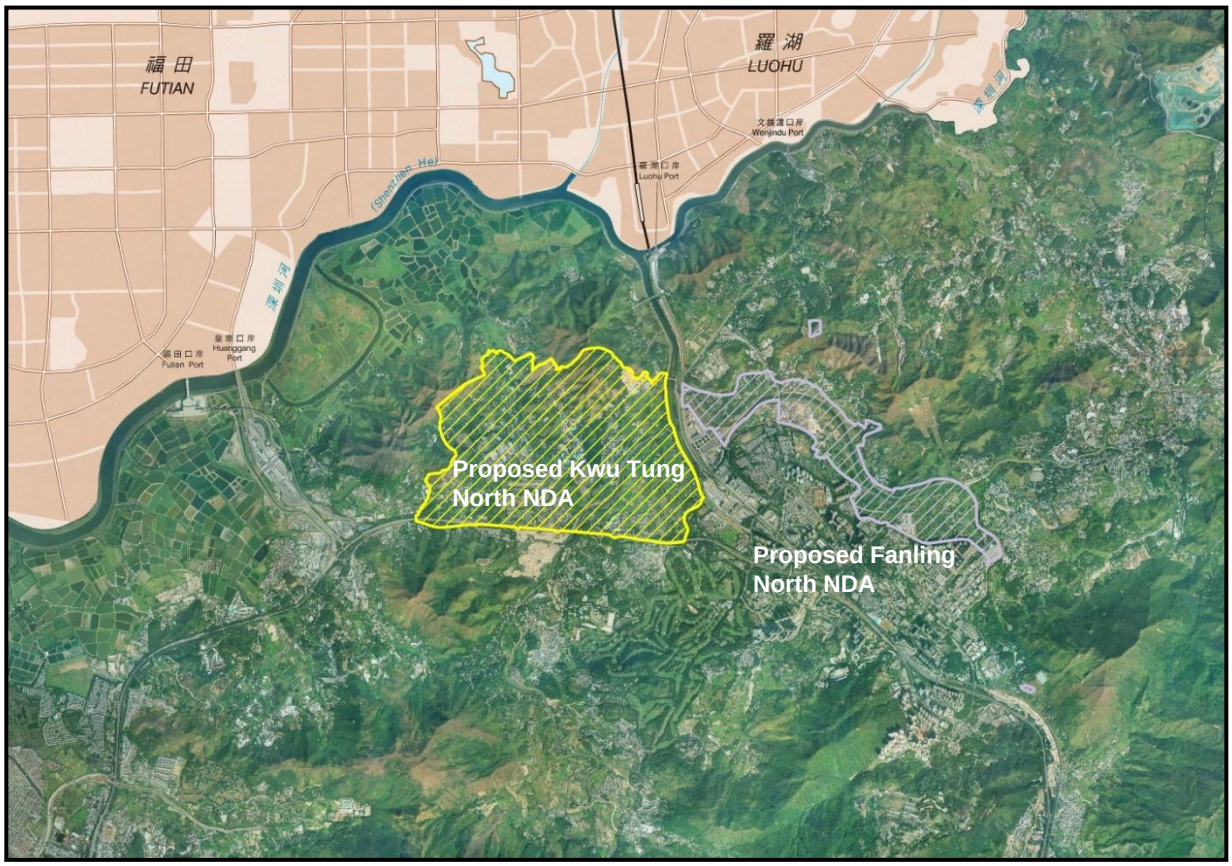
Planning Department

Agreement No. CE 61/2007 (CE)
North East New Territories New Development Areas Planning and Engineering Study – Investigation

Final Environmental Impact Assessment Report – Executive Summary

(Rpt Ref: 136-04)



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1 Introduction

1.1 Project Background

1.1.1 The Planning and Development Study on North East New Territories (NENT Study, CE64/96) commenced in 1998 had identified areas in Kwu Tung North (KTN), Fanling North (FLN) and Ping Che/Ta Kwu Ling (PC/TKL) to be suitable for New Development Areas (NDAs). The NENT Study also confirmed the feasibility of NDAs based on the findings and recommendations from the technical assessments on various aspects including planning, environmental and engineering. In 2003, having regard to the housing demand at the time, the Government decided to shelve the NDAs proposal in the interim pending a comprehensive review of Hong Kong's overall planning under the Study on Hong Kong 2030: Planning Vision and Strategy (HK2030 Study).

1.1.2 The HK2030 Study carried out by the Planning Department (PlanD) completed in 2007 was a comprehensive review of Hong Kong's territorial development strategy for formulating a broad planning framework to guide the future development of Hong Kong up to 2030. It recommended proceeding with KTN, FLN and PC/TKL NDAs (i.e. NENT NDAs) as well as Hung Shui Kui NDA to address long-term housing demand and to provide job opportunities. NENT NDAs and Hung Shui Kui NDA were included as one of ten major infrastructure projects in the 2007-08 Policy Address.

1.1.3 Further to the recommendations for NDAs in HK2030 Study, the Civil Engineering and Development Department (CEDD) and PlanD jointly commissioned the North East New Territories New Development Areas Planning and Engineering Study - Investigation (the Project) to formulate updated development proposals for NENT NDAs. The Project aims to review and update the findings and recommendations of the NENT Study, and to formulate revised proposals for NENT NDAs.

1.1.4 The Project has adopted a three-stage public engagement programme to foster consensus building. The Stage 1 Public Engagement which commenced in mid November 2008 and lasted for about three months aimed to engage key stakeholders (the general public, relevant organisations, district councils and rural committees) in discussions on key issues relating to the development of the NDAs.

1.1.5 The Stage 2 Public Engagement which aimed at collecting public views on the Preliminary Outline Development Plans (PODPs) for the three NDAs commenced in November 2009 and completed in January 2010.The Stage 3 Public Engagement (PE3) was carried out from mid June to end September 2012, to gauge public views on the Recommended Outline Development Plans (RODPs) for the NDAs. A series of community engagement activities were undertaken for different stakeholders including the Legislative Council Panel on Development, Town Planning Board, Heung Yee Kuk, North District Council, relevant Rural Committees, Advisory Council on the Environment, Housing Authority, Land Development Advisory Committee, professional bodies, local concerns groups and other stakeholders such as green groups.

1.1.6 After careful and comprehensive consideration of comments received during the PE3 and taking into account all relevant considerations including the findings of various technical assessments, the current plan is to proceed with development in KTN and FLN NDAs to accommodate about 174,900 population. The RODPs for KTN and FLN NDAs have been suitably revised. PC/TKL NDA will be critically reviewed and re-planned. According to the 2013 Policy Address, the development potential in New Territories North (NT North) is to be explored in order to provide land to meet the demand for housing and economic development. In this context, it is recommended to include PC/TKL in the

planning of NT North in order to comprehensively review relevant planning considerations. Thus, no revised RODP has been formulated for PC/TKL NDA and as such, no EIA assessment is required for PC/TKL NDA at this juncture.

1.2 The Study Area

1.2.1 The NDAs under this Project including KTN NDA and FLN NDA covering a total area of about 614ha as shown in **Figure 1.1**.

Kwu Tung North (KTN) NDA

1.2.2 KTN NDA is located to the west of Sheung Shui and is generally bounded by Shek Sheung River to the east, Castle Peak Road and Fanling Highway (New Territories Circular Road) to the south, Pak Shek Au and Tit Hang villages to the west and the present Closed Area boundary to the north. The NDA has an area of some 450 ha and is proposed to accommodate a population of about 101,600 people on full development.

Fanling North (FLN) NDA

1.2.3 FLN NDA is located immediately to the north-east of the established Fanling / Sheung Shui New Town and is bounded by Upper Ng Tung River to the north and east, Sha Tau Kok Road to the south, and Ma Sik Road and Tin Ping Road to the south-west. The NDA has an area of around 164ha. FLN NDA is proposed to accommodate a population of about 73,300 people on full development.

1.2.4 KTN and FLN NDAs would become the extension of Fanling/Sheung Shui New Town to form the Fanling/Sheung Shui/Kwu Tung North (FL/SS/KTN) New Town, which will have a total population of about 460,000 upon full development, comparable to such new towns as Tuen Mun and Tseung Kwan O. FL/SS/KTN New Town will be an integrated community providing a wide range of employment opportunities as well as commercial, community, recreation and cultural facilities supporting a larger population.

1.2.5 The environmental impacts of the development of KTN and FLN NDAs are assessed in this EIA report.

1.3 Designated Projects

The Project which covers KTN and FLN NDAs is a designated project (DP) under Item 1 Schedule 3 of EIAO - Engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100,000.

In addition, the following work components in **Tables 1.1a and 1.1b** also fall under various Schedule 2 DP categories. Consideration of feasible alternative options of the Schedule 2 DPs is discussed in Section 2.4.1. The locations of the Schedule 2 DPs are shown in **Figures 1.2 – 1.4**.

Table 1.1a - Schedule 2 Designated Projects in KTN NDA

Item	Work Component	Schedule 2 DP Category		Reason
1	San Tin Highway and Fanling Highway Kwu Tung Section Widening (between San Tin Interchange and Po Shek Wu Interchange) (Major Improvement)	A1	A road which is an expressway, trunk road, primary distributor road or district distributor road including new roads, and major extensions or improvements to	To widen the concerned portion of San Tin Highway and Fanling Highway Kwu Tung Section from dual 3-lane to dual 4-lane configuration

Item	Work Component	Schedule 2 DP Category		Reason
			existing road	
2	Castle Peak Road Diversion (CPR) (Major Improvement)	A1	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 road.	The CPR will be realigned and join with the Pak Shek Au Interchange at the western end and the original CPR near Yin Kong at the eastern end.
3	KTN NDA Road P1 and P2 (New Road) and associated new Kwu Tung Interchange (New Road) and Pak Shek Au Interchange Improvement (Major Improvement)	A1	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 road.	Construction of new primary distributor roads inside KTN NDA.
4	KTN NDA Road D1 to D5 (New Road)	A1	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 road.	Construction of new district distributor roads inside KTN NDA.
5	New Sewage Pumping Stations (SPSs) in KTN NDA	F3	A SPS---(b) with an installed capacity of more than 2,000 m^3 per day and a boundary of which is less than 150 m from an existing or planned residential area or educational institution.	Construction of two new SPSs in KTN with installed capacity of more than 2,000 m^3 per day and less than 150m from existing and planned residential buildings.
6	Proposed railway station and associated facilities in KTN NDA (To be conducted under separate study).	A2	A railway and its associated facilities.	The construction of new Kwu Tung railway station
7*	Utilization of Treated Sewage Effluent (TSE) from Shek Wu Hui Sewage Treatment Works (SWHSTW)	F4	An activity for the reuse of treated sewage effluent from a treatment plant	Construction of service reservoir and watermain for the reuse of treated sewage effluent for reuse in KTN NDA.

*Work component serves both KTN and FLN NDAs.

Table 1.1b - Schedule 2 Designated Projects in FLN NDA

Item	Work Component	Schedule 2 DP Category		Reason
7*	Utilization of TSE from SWHSTW	F4	An activity for the reuse of TSE from a treatment plant	The on-site sewage treatment works will include TSE for reuse in both KTN and FLN NDAs. Construction of service reservoir and watermain for the reuse of treated sewage effluent in FLN NDA.
8	Po Shek Wu Interchange Improvement (Major Improvement)	A1	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 road	Po Shek Wu Road is primary distributor. Major improvement works on primary distributor is a DP
9	Fanling Bypass Western Section (New Road)	A1	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 road	Construction of new district distributor inside FLN NDA.
10	Fanling Bypass Eastern Section (New Road)	A1	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 road.	Construction of new primary distributor inside FLN NDA.
11	Shek Wu Hui Sewage Treatment Works - Further Expansion at FLN NDA	F1	Sewage treatment works with an installed capacity of more than 15,000 m^3 per day.	The design capacity of the proposed expansion and upgrading SWHSTW is of 190,000 m^3 per day.
12	Reprovision of temporary wholesale market in FLN NDA	N3	A wholesale market.	A wholesale market is a DP under EIAO
13	New SPSs in FLN NDA	F3	A SPS---(b) with an installed capacity of more than 2,000 m^3 per day and a boundary of which is less than 150 m from an existing or planned residential area	The installed capacity of 4 new SPSs is more than 2,000m^3 per day and less than 150m from existing or planned residential building or educational institution.

Item	Work Component	Schedule 2 DP Category		Reason
			or educational institution.	

*Work component serve both KTN and FLN NDAs.

2 Project Description

2.1 General Description of the Project

2.1.1 The Project comprises the development of KTN NDA and FLN NDA and associated infrastructure such as road works, sewage treatment works, drainage channel, wholesale market, etc. Taking into account the public comments received and findings of technical assessments, a set of revised Recommended Outline Development Plans (RODPs) has been formulated and preferred options of traffic and transport, basic infrastructure and utilities provisions are also proposed. The Project scope is summarized below.

2.2 Need of Project

2.2.1 The development of NDAs was announced by the Chief Executive in 2007-2008 Policy Address as one of the ten major infrastructure projects for economic growth. According to the policy address, the NDAs were to ease pressure on developed areas and to meet the demand for land arising from population growth. The size of the NDAs would be smaller, less than one fourth of that of the existing new towns such as Tuen Mun and Sha Tin. The NDAs would provide land for various uses such as housing, employment, high value-added and non-polluting industries. Through comprehensive planning, the NDAs would provide quality living space and convenience to both residents and the public. In this connection, the Government commissioned the Project to formulate updated development proposals for NENT NDAs with a view to reviewing and updating the findings and recommendations of the NENT Study and to formulating a revised proposal and implementation strategy for the NDAs.

2.3 Revised Recommended Outline Development Plan

Outline Development Plan Options

2.3.1 In the outset, the drawing up of the PODP avoided and minimised direct encroachment upon ecologically sensitive areas, including the Long Valley (predominant part), major rivers (including Ng Tung River, Shek Sheung River and Sheung Yue River), natural streamcourses (including Ma Tso Lung Stream upper and middle section) and hilly slopes, from proposed urban type development as far as practicable. Other ecologically less sensitive areas, including existing rural developed areas, agricultural land and the areas on the two sides of the major rivers, were included in the proposed development areas, as the NDAs developments are to optimise on the transport and infrastructure provision and to provide land to meet medium and long term needs for housing and economic development, in accordance with the strategic planning intentions stated in HK2030 Planning Vision and Strategy (HK2030). HK2030 (para. 13.4.44 and 45) states that “to ensure a more balanced development pattern and provide a choice of living other than the high-density urban mode, it is recommended that low to medium-density nodal clusters should be developed in the New Territories around rail stations. This proposal could also help to optimise use of rail and other infrastructure, provide housing land (for public and private housing), upgrade the rural environment, revive the rural economy, create boundary/gateway towns, and introduce employment. New development areas should be comprehensively planned for a mixture of land uses, emphasizing both the creation of a quality living/working space as well as resident/user convenience. Such development opportunities have been identified in previous planning studies including the Territorial Development Strategy Review and the consequential planning and engineering studies for North East New Territories and North West New Territories.”

2.3.2 Any ecological impacts, which are not expected to be significant, on the proposed development areas, would be reduced and mitigated with appropriate measures. The PODP was prepared in accordance with a comprehensive planning and urban design framework, with a set of well-defined planning principles, one of which was to devising layout respecting ecology and environment. Suitable zonings (e.g. open space along the major rivers) and mitigation measures were proposed and the residual ecological impacts, if any, were environmentally acceptable.

2.3.3 The PODPs for NDAs proposed in the early stage of this Study is evolved to the Revised RODP presented in this EIA taking into consideration of the public opinions in the stages of public engagement as mentioned in Section2.3.3 as well as the findings of this Study.

Key Project Requirements of Development Plan

Planning Parameters

2.3.4 Taking into account the received public comments during Stage 3 Public Engagement and with careful and comprehensive consideration, the RODPs have been further refined. **Table 2.1** summarizes the major planning parameters of the revised RODP.

Table 2.1 - Major planning parameters of the RODPs

	KTN NDA	FLN NDA	Total
Development Theme	Mixed Development Node	Riverside Community	-
Major Land Uses	Residential; Commercial, Research & Development; Long Valley Nature Park; Agriculture Uses; Recreational Facilities	Residential; Government Facilities	-
Total Area	450 ha	164 ha	614 ha
New Population[(a)]	101,600	73,300	174,900
New Flats	35,400	25,300	60,700
New PRH Flats (% Total)	17,700 (49.9%)	14,000 (55.3%)	31,700 (52.2%)
New HOS Flats (% Total)	2,700 (7.7%)	2,200 (8.8%)	4,900 (8.1%)
New Private Flats[(b)] **(% Total)**	15,000 (42.4%)	9,100 (35.9%)	24,100 (39.7%)
Plot Ratio	3.5 – 6	2 – 6	-
Maximum Building Height	35 storeys	35 storeys	-

Note

(a) Excluding those resided in the indigenous villages, affected village houses/building lots under the village removal term (VRT), and existing/committed developments. If these people are included, the total population of the two NDAs would be 179,000 (105,500 in KTN and 73,500 in FLN).

(b) Excluding the two "R4" sites.

2.4 Nature, Benefit and Scope of the Project

Nature of Project

2.4.1 This Project is an urban development project with a study area covered 614 ha involving a total population of about 174,900 and accommodation of about 37,700 employment. KTN and FLN NDAs will provide a mix of housing types as well as basic infrastructure and community facilities. The NDAs are planned according to four guiding principles, namely, strategic roles of the NDAs, people-oriented communities, sustainable living environment and appropriate implementation mechanism.

Benefits of Project

2.4.2 The benefits of the Project, are described below:

- Providing Housing Land to Better Meet Long-term Housing Needs Particularly for Meeting Public Housing Needs
  - Provide about 102 ha of housing land supply
  - Provide about 60,700 new residential flats
  - Accommodate about 174,900 new population
- Catering for Various Land Use Needs for Promoting Economic Development
  - Serve to meet strategic land use requirements and offer development spaces for industries which Hong Kong enjoys clear advantages
  - Provide connection to Lok Ma Chau (LMC) Loop and reserve about 8 ha of land for research and development uses in support of LMC Loop development in KTN NDA
  - Develop a cluster of “Commercial, Research and Development” sites (about 14 ha) along Fanling Highway in the KTN NDA
  - Provide employment in support of the local needs, including retail, services and community, in KTN and FLN NDAs. About 37,700 new jobs will be created
- Providing wider choice of social and community facilities
  - As an extension of Fanling/Sheung Shui New Town to form the Fanling/Sheung Shui/Kwu Tung North New Town, it will have a total population of about 460,000 upon full development and provide a wide range of employment, commercial, social, community, recreational and cultural facilities for the expanded new town
- Conservation of Long Valley
  - Designate core area of Long Valley as “Nature Park” to enhance and conserve the existing ecological environment
- Improving Transport Network
  - Enhance the accessibility of the Kwu Tung area (including the planned population and existing residents in nearby areas) by implementing the proposed Kwu Tung Station on the Lok Ma Chau Spur Line
  - Improve the traffic condition in the Fanling and Sheung Shui area by the proposed Fanling Bypass
- Pursuing Greener Living Environment

- Adopt rail-based development approach in planning NDAs to reduce road traffic
- Reuse of Treated Sewage Effluent to conserve water and reduce treated sewage effluent as well as sewage pollution loading discharged to Deep Bay

2.4.3 The specific environmental benefits of the NDAs development are broadly described below:

- The project will improve the sewerage infrastructure and sewage treatment facilities of the areas, which would benefit both the existing and new population;
- The project will help improving the existing interface problems of residential/ open storage/ rural industrial uses;
- The project will provide the opportunity to clean-up existing contaminated land;
- The project will provide long-term conservation for Long Valley;
- The Project makes use of existing land for building sustainable and green communities, rather than forming new land through reclamation works.

Scope of Project

2.4.4 The project is proposed to be divided into 6 packages, which are summarized below.

Development Package
Advance Works Package – Infrastructure and Development at KTN and FLN
Package 1 – First Stage of Infrastructure and Development at KTN and FLN
Package 2 – Remaining Infrastructure and Development at KTN (South)
Package 3 – Remaining Infrastructure and Development at KTN (North)
Package 4 – Remaining Infrastructure and Development at FLN (East)
Package 5 – Remaining Infrastructure and Development at FLN (West)

Advance Works Package – Infrastructure and Development at KTN and FLN

2.4.5 The advance works will consist of the following works:

- The infrastructures for the first population intake in year 2023 in both KTN and FLN would be constructed.
- In KTN, the site formation and the associated roadworks of the southwest portion of the KTN NDA would be carried out.
- The essential underground utilities for the future site development in KTN, such as sewerage, watermain, power supply cables will be laid along the existing Fanling Highway.
- To provide water supply to the future site development in KTN, a secondary fresh water service reservoir and a flushing water service reservoir in Tai Shek Mo and the associated watermain will be constructed.

- In FLN, the site formation and the associated roadworks of the East portion of the NDA would be carried out
- A new road connecting the existing Jockey Club Road and the proposed core residential district in FLN and the essential underground utilities for the future site development in FLN, such as sewerage, watermain, power supply cables will also be laid along the existing road and the new road.
- The new road Fanling Bypass Eastern Section will be constructed. The existing North District Temporary Wholesale Market to be affected by the construction of Fanling Bypass will be reprovisioned.
- E&M works for the extension of the existing Shek Wu Hui Sewage Treatment Works.
- A site near Sheung Shui Wan Shan for the existing site subjected to VRT in FLN affected in the Advance Works Package will be formed.
- Two stockpiling areas in KTN and two in FLN will be provided for the excavated material generated in the early stage of the project.

Package 1 – First Stage of Infrastructure and Development at KTN and FLN

2.4.6 Package 1 will consist of the following works:

- The other infrastructure and development in the early stage of the NDA development in KTN and FLN will be carried out.
- The Wetland Enhancement and the Visitor Centre of the Long Valley Nature Park in KTN will be carried out.
- The existing Fan Garden Junior Police Officer's Police Married Quarters and District Headquarter Associated Married Staff Quarters will be reprovisioned in KTN.
- The existing Police Driving and Traffic Complex, Weapon Training Division in Fan Garden will also be reprovisioned in FLN.
- Planting for Relocation of Man Kam To Egretry at FLN will be carried out in a mitigation meander on the north side of the Ng Tung River in FLN area A1-7 which is proposed to be zoned as Conservation Area (CA).
- A site near Ho Sheung Heung for the existing site subjected to VRT in KTN to be affected in the Package 2 & 3 development will be formed.

Package 2 – Remaining Infrastructure and Development at KTN (South)

2.4.7 Package 2 will consis of the following works:

- The remaining infrastructure and development in the southern part of KTN.
- The widening of existing Fanling Highway, diversion of existing Castle Peak Road, construction of Kwu Tung Interchange and Pak Shek Au Interchange improvement.
- The site formation of the remaining developable area in the southern part of KTN and the associated new road and utilities.
- A trunk watermain connecting the existing Ngau Tam Mei Primary Fresh Water Service Reservoir to the existing and proposed Kwu Tung Fresh Water Service Reservoir and the associated pumping station.

- The site formation of the district cooling system in the southwest of KTN.

Package 3 – Remaining Infrastructure and Development at KTN (North)

2.4.8 Package 3 will consist of the following works:

- The remaining infrastructure and development in the northern part of KTN.
- The site formation of the remaining developable area in the northern part of KTN and the associated new road and utilities.
- The site formation of the proposed HKPF's district headquarters and divisional Police Station in KTN.
- The site formation of the potential activity centre.

Package 4 – Remaining Infrastructure and Development at FLN (East)

2.4.9 Package 4 will consist of the following works:

- The remaining infrastructure and development in the eastern part of FLN.
- A secondary fresh water service reservoir and a flushing water service reservoir in FLN and the associated watermain.
- The Fanling Bypass western section, connection between Man Kam To Road, Sha Tau Kok Road, and Po Shek Wu interchange improvement.
- The site formation of the remaining developable area in the eastern part of FLN and the associated new road and utilities.

Package 5 – Remaining Infrastructure and Development at FLN (West)

2.4.10 Package 5 will consist of the following works:

- The remaining infrastructure and development in the western part of FLN.
- The further extension of the existing Shek Wu Hui Sewage Treatment Works.
- The site formation of the remaining developable area in the western part of FLN and the associated new road and utilities.

2.5 Construction Method

2.5.1 Site-specific construction methodologies have been developed for the following works:

- Fanling Bypass;
- Fanling Highway Widening;
- Treatment of Arsenic-Containing Soil in KTN;
- Establishment of Long Valley Nature Park;
- Planting for Relocation of Man Kam To Egretry at FLN;

Other earth filling/cutting, roadworks, utilities, civil structures and landscape works at Open Spaces and Amenity Areas, etc. would be constructed using conventional approach.

2.5.2 The substructures of the Fanling Bypass Viaduct will take the form of reinforced concrete (RC) columns & pilecaps founded on RC bored-piles. The superstructures of the Fanling Bypass Viaduct will be constructed by either

precast segmental method or in-situ balanced-cantilever method. Cut-and-Cover method would be adopted for the underpass at Sha Tau Kok Interchange.

2.5.3 For the Fanling Highway Widening, the substructures of the viaduct of Kwu Tung Interchange and Pak Shek Au Interchange will take the form of RC columns & pilecaps founded on RC bored-piles. The superstructures of the viaduct of Kwu Tung Interchange and Pak Shek Au Interchange will be constructed by cast in-situ deck method.

2.5.4 In-situ solidification/stabilization treatment will be adopted for the arsenic-containing soil identified in KTN NDA. The soil after treatment will be re-used as backfilling materials within the NDAs.

2.5.5 Long Valley Nature Park (LVNP) is established to compensate for the loss of wetland habitat as a result of the Project. Approximately 37ha of Long Valley with high to very high ecological value are proposed to be zoned as "Other Specified Uses (Nature Park)", with a view that management with nature conservation objectives has the potential to maintain and enhance the wetland function. Long-term and strategic management such as provision of specific wetland types, periodic habitat changes and adoption of crop rotation, etc. will be implemented. In addition, improvement of water supply system and construction of visitor centre would be carried out.

2.5.6 It is proposed that loss of the Man Kam To egretry should be mitigated by appropriate planting of trees and bamboo to provide compensatory habitat for breeding ardeids, with the intention that this could provide an alternative nesting site for birds from the Man Kam To Road egretry. Measures including placing decoys (models) in potential breeding sites and use of recordings of breeding ardeids should be implemented to create an attraction to the site. Accidental or deliberate disturbance by people should be minimised by giving consideration to surrounding the site with water and fencing.

3 SUMMARY OF KEY FINDINGS IN EIA STUDY

3.1 Air Quality

3.1.1 The potential air quality impacts during both construction and operation phases of the NENT NDA Project have been assessed.

Construction Phase

3.1.2 Dust is the key pollutant during the construction phase of NENT NDA development. Dust impacts during certain construction periods may be high due to extensive activities at the work site and proximity of the ASRs. With the implementation of dust suppression measures, dust impacts are expected to be reduced significantly.

3.1.3 Quantitative fugitive dust assessments have been conducted and results suggested that watering once per hour would be required to control the fugitive dust impact to acceptable levels. In addition, effective dust control following the requirements given in the Air Pollution Control (Construction Dust) Regulation and in accordance with the EM&A programme during construction are recommended.

3.1.4 With such measures, all the 1-hour, 24-hour and annual TSP concentrations at both existing and future ASRs at KTN NDA and FLN NDA will comply with the dust criterion based on the latest construction programme. Hence, it is concluded that there are no adverse residual air quality impacts during construction phase.

Operational Phase

3.1.5 Vehicular emissions from open roads are expected to be the major air pollutants during the operational phase of NENT NDA development. Fixed polluting sources such as existing industrial emissions, odour emission from sewage treatment facilities, slaughtering house will also create air quality impacts on ASRs.

3.1.6 Based on the assessment, no adverse cumulative chimney and vehicular emission impacts are anticipated. Hence, no mitigation measures would be required.

3.1.7 Odour impact assessments have been conducted for the proposed SWHSTW expansion. With the implementation of odour control measures, such as covering the major odour sources and provision of deodourising treatment, it is anticipated that the odour impact may not be significant.

3.2 Noise

Construction Phase

3.2.1 Construction noise assessment associated with the use of Powered Mechanical Equipment (PME) has been conducted. With the implementation of practical mitigation measures including good site management practices, use of site hoarding, use of movable noise barrier & full enclosure, use of “quiet” plant and working method, construction noise impacts at all neighbouring noise sensitive uses would be controlled to acceptable levels.

3.2.2 However, residual impacts are anticipated for some residential premises and educational institutions during examination period even after implementing all practicable mitigation measures and rearrangement of works group. To further minimise the impact for residential premises, the Contractor should investigate the necessity in using noisy PME such as rock drill, breaker and concrete lorry mixer.

On the other hand, for some educational institutions, it is recommended that the contractor should closely liaise with the educational institutions to avoid noisy construction works during examination period and the Contractor should investigate the necessity in using noisy PME such as bullodzer, rock drill, vertical band drain installation rig, breaker and concrete lorry mixer..

Operational Phase

3.2.3 Operational noise impacts associated with helicopter noise, industrial noise, fixed noise sources and road traffic noise have also been investigated. Fixed noise source sound power level limits are specified for district cooling system (DCS), sewage treatment works (STW) extension, sewage pumping station (SPS) and pumping station (PS) with necessary noise control measures to comply with statutory criteria.

3.2.4 Provision of acoustic insulation with air conditioning is recommended to the landuse (KTN D1-12, KTN D1-13, KTN F1-3 and KTN F1-4) which is affected by helicopter noise and shooting noise near Lo Wu Classification Range.

3.2.5 Operational road traffic noise impact on the sensitive uses outside NDA area and existing sensitive uses within NDA area would be mitigated by provision of vertical noise barriers, vertical noise barriers with cantilevered arm, low noise surfacing and semi-enclosures / full enclosures which the sensitive uses can be controlled to acceptable noise levels. The contribution due to the Project road is less than 1dB(A) and the noise level from Project road is also within the respective noise criterion. Similar mitigation measures have been recommended for the planned noise sensitive uses within NDA area to comply with the statutory criteria. Provision of acoustic insulation with air conditioning has been proposed for educational institutions (FLN C2-9, east and south facades between 4/F to 8/F).

3.3 Water Quality

3.3.1 During construction phase, potential water pollution sources have been identified as construction site runoff, alteration of natural streams, possible groundwater from contaminated area, and sewage from workforce. Mitigation measures including the implementation of cofferdams or diaphragm walls during stream diversion and good site practices in accordance with ProPECC PN 1/94 are recommended to mitigate any potential water quality impact.

3.3.2 During operational phase, potential water quality sources have been identified, including sewage and sewerage system, discharge from district cooling system, runoff from roads/open areas, drainage system and reuse of treated sewage effluent. Mitigation measures including collection all sewage into the upgraded/expanded Shek Wu Hui Sewage Treatment Works (STW) and implementation of proper drainage system with silt traps and oil interceptors are recommended to mitigate any potential water quality impact during operational phase.

3.3.3 With implementation of recommended mitigation measures, no residual water quality impact is anticipated.

3.4 Sewerage Management

3.4.1 The proposed NDAs will generate additional sewage flows which cannot be handled by existing sewerage system and SWH STW and therefore will require additional sewerage infrastructure. In order to meet the prevailing water quality policy with no net increase in pollution load to Deep Bay, SWH STW is required to be upgraded to cater for additional loading.

3.4.2 Reuse of treated sewage effluent (TSE) is recommended for non-potable uses such as toilet flushing, irrigation and DCS. With TSE reuse, part of the TSE would be reused and the amount of TSE discharged to Deep Bay would be reduced. Hence, the discharge pollutant loading to the Deep Bay will also be reduced. Nevertheless, even if TSE reuse is not implemented, the proposed discharge standard from SWHSTW could be able to comply with both the WPCO TM for the discharge into inland waters and 'no net increase in pollution loads to the Deep Bay' Policy.

3.4.3 Based upon preliminary sewerage impact assessment as described in this section, it can be concluded that the proposed development is sustainable from sewerage collection, treatment and disposal perspective

3.5 Waste Management

Construction Phase

3.5.1 During the construction phase, typical wastes include site clearance waste, excavated materials, construction and demolition (C&D) materials, asbestos containing materials, chemical wastes, general refuse and sewage. Potential waste management implications from the generation of waste during the construction phase have been evaluated. Measures, including the opportunity for on-site sorting, reusing excavated fill materials, etc., are devised in the construction methodology to minimise the surplus materials to be disposed. Recommendations have been made for implementation by the Contractor during the construction period to minimise waste generation and off-site disposal. The disposal quantities for C&D materials and their disposal methods have also been assessed.

Operational Phase

3.5.2 The operational phase of the proposed developments would generate municipal solid waste, chemical waste and sewage sludge. Recommendations have been made to ensure proper treatment and disposal of these wastes. No adverse impacts on the environment would be anticipated with the implementation of the recommended mitigation measures.

3.6 Land Contamination

3.6.1 The potential land contamination impacts of the Project have been assessed. The assessment involved site appraisal, site investigation, assessment of contamination level, and health risk assessment for arsenic-containing soil detected in KTN.

3.6.2 Site investigation works involving sampling and testing of soil and groundwater were conducted at 4 identified government sites (i.e. 3 in KTN and 1 in FLN). No soil and groundwater contamination was detected, except the anomalistic high arsenic was detected in all 3 sites in KTN.

3.6.3 All other potentially contaminated sites identified in 2 NDAs (include Fanling Bypass) were inaccessible and hence, no soil and groundwater sample was collected during the course of this land contamination assessment study. Nevertheless, detailed SI for these sites should be conducted when they are resumed and handed over to the Project Proponent (PP).

3.6.4 On the other hand, although many of the sites were not identified as potentially contaminated or could not be accessed for visual inspection during the site survey, these sites would still be in operation until commencement of construction. Any potential change of land uses (e.g. change of uses to say

chemical storage area, dismantling workshop, etc) may result in potential land contamination. Re-appraisal of these sites is therefore required if they become part of the land requirement for NDA development.

3.6.5 The Project Proponent (PP) would prepare and submit the Supplementary CAP to EPD prior to the commencement of SI works. Following on from the submission of CAP and completion of SI, the PP would prepare CAR, RAP and RR for contaminants other than As, which should follow the recommendation of HRA, and submit to EPD for contaminants other than Arsenic which should follow the recommendations made in the Health Risk Assessment, for agreement prior to commencement of the development works on these sites.

3.6.6 Anomalistic high arsenic detected in KTN was investigated. The investigation results indicated that the high arsenic in KTN is likely to be naturally occurred. A Health Risk Assessment was conducted for assessing the health risk levels due to the inhalation of arsenic-containing dust during construction stage and incidental ingestion of arsenic-containing soil during operational stage. A Health Risk Assessment Report was prepared to summarize the extent mapping of arsenic level and health risk assessment findings. The Health Risk Assessment confirmed that the soil with arsenic level above 571 mg/kg is required to be treated. The treatment method “Cement Stabilization/Solidification” for treating the arsenic-containing soil was proposed.

3.7 Hazard to Life

3.7.1 A quantitative risk assessment (QRA) has been carried out since part of the proposed NDAs development (KTN and FLN) resides in the 1-km Consultation Zone (CZ) of Sheung Shui Water Treatment Works (SSWTW), which is a potentially hazardous installation (PHI). The assessment has been conducted to determine the risk associated with the storage, use and transport of chlorine at SSWTW for the construction and operation stages of the NDAs development.

3.7.2 The assessment has concluded that the risks are acceptable as per the individual and societal risk criteria set out in Annex 4 of the EIAO-TM.

3.8 Landfill Gas Hazard

3.8.1 The potential landfill gas hazards of the Project have been assessed. A qualitative assessment on potential hazards associated with LFG migration from Ma Tso Lung Landfill (MTLL) to the proposed development in KTN NDA has been conducted.

3.8.2 The MTLL is considered as a “Medium” source of gas migration since LFG monitoring results in past five years in MTLL have indicated methane concentrations were at very low level and only one data of carbon dioxide concentration was above the background levels. The risk categories associated with the source-pathway-target have been identified. It is concluded that the potential risk during construction phase is “medium” and during operational phase is ‘low’ to ‘high’ depending upon the location and nature of the target being considered. Therefore, this implied “some precautionary measures” to “significant engineering measures” required by the future site developers to protect the proposed development. To avoid engineering measures, underground rooms or void should be avoided as far as practicable. It is recommended that further LFG monitoring should be carried out prior to the commencement of the detailed design of the developments to provide the latest LFG data for the detailed QLFGHA.

3.8.3 General protection and precautionary measures have been proposed for consideration during the design, construction and operational phases of the

developments. In addition, the design, construction and operation of the proposed development within the MTLL (i.e. the proposed recreational area in site E1-1) should be fully compatible with the landfill restoration and aftercare works and impose no adverse impact to them. Caution should be exercised to ensure long term integrity of the capping system and other restoration facilities. The design and construction method of the proposed development within MTLL should also be provided to EPD for agreement during the design stage.

3.8.4 It is expected that with the proposed precautionary measures in place, the potential risk of LFG migration from MTLL to KTN development would be minimal. Nevertheless, a detailed QLFGHA should be undertaken during the detailed design stage of the developments to review the need and practicality of the protection and precautionary measures proposed and provide recommendations on the detailed protection and precautionary measures to be adopted. Such requirement could be imposed on developers by including it in the lease conditions by Lands D.

3.9 Cultural Heritage

Archaeology

3.9.1 One sites of archaeological interest is identified in the CHAA, direct impact is anticipated to part of the site.

3.9.2 In addition, archaeological surveys conducted in 2000-2001 and 2010 identified 20 locations of archaeological potential within the CHAA. The locations are presented in **Figure 11.4** of the EIA report. 12 locations including Sites 1, 2, 3 and 4 and Spots A and C to I in KTN NDA CHAA; and 5 \ locations including Sites 5, 6, 7, 8 and 10 in FLN NDA CHAA were identified to be potentially impacted by the proposed development. All potential impacts are considered acceptable with appropriate mitigation measures.

3.9.3 The recommended archaeological mitigation measures include preservation in-situ, further archaeological survey if necessary, and Survey-cum-Rescue Excavation on impacted areas of Sites 1 to 3, Spots C and I, and Site 5 after land resumption but before construction. The purpose is to determine the precise archaeological extent and preserve the impacted archaeological deposits as far as possible.

3.9.4 Besides, based on the results of the evaluation of archaeological potential, evaluation and further archaeological surveys have been recommended after land resumption but before construction in the not-yet-surveyed-areas with medium archaeological potential located in the areas with proposed development to comprehensively assess their archaeological potential and potential impacts caused by the development. Appropriate mitigation measures will be recommended if necessary.

3.9.5 Induction training should be provided to the construction contractor before the commencement of the excavation works in Spots A, D to H and Sites 4 and 10. An induction will be conducted as part of the environmental health and safety induction programme to all site staff before they are deployed on site. The induction will include an introduction on the historical development of the Site, the possible archaeological remains that may be encountered during ground excavation works as well as the reporting procedures in case suspected archaeological remains are identified. A set of the presentation material (in the form of power point presentation) with content details will be prepared by an archaeologist and submitted to AMO for reference and record purpose. The first induction briefing will be video recorded and it will be used as induction briefing material for new site staff.

3.9.6 An Archaeological Impact Assessment after land resumption and before construction when detail construction information is available to determine the need for archaeological follow up actions in the impacted area (Area B1-8 and B1-9 at A1) is recommended. Should there be any development work within the rest of A1, it is recommended that an Archaeological Impact Assessment is required after land resumption and before construction when detail construction work information is available to determine the need for further archaeological follow up actions.

3.9.7 The recommended archaeological mitigation measures including preservation in-situ, further archaeological survey if necessary, further archaeological survey, further archaeological survey before any follow up actions, and Survey-cum-Excavation should be conducted by a professional archaeologist and prior to fieldwork commencement, the archaeologist should obtain a Licence to Excavate and Search for Antiquities from the Authority under the AM Ordinance. Prior to the application for the licence, archaeological proposals detailing the objectives,

work scope, methodology, staffing plan and work programme of the archaeological works should be agreed with the AMO. For preservation in-situ with further archaeological survey (if necessary), appropriate follow-up actions, including preservation of the significant archaeological deposits in-situ would then be considered based on the survey result with the consent of AMO.

3.9.8 Pursuant to the Antiquities and Monuments Ordinance, the construction contractor should inform the AMO immediately in case of discovery of antiquities or supposed antiquities in the course of soil excavation works in construction stage.

Built Heritage

3.9.9 Literature review supplemented by built heritage survey identified two Declared Monuments, two Grade 1 historic building, three Grade 2 historic buildings, seven Grade 3 historic buildings, two nil grade historic buildings, one Proposed Grade 1 historic building, 25 historic buildings and structures and 104 landscape features within the CHAA.

3.9.10 Within KTN NDA CHAA, no direct impact is expected on any declared monuments and graded/proposed historic buildings. Potential vibration impacts on two Grade 2 (G202 and G203), two Grade 3 (G303 and G308) historic buildings are anticipated. Regarding built heritage items not listed by AMO, six historic buildings and structures (ancillary structures of G303, HKT01, HKT02, HKT03 (Entrance Gate), HKT04 and HKT08) and thirty-one landscape features (KT01 – KT10, KT12, KT13, KT16, KT17, KT18, KT36, KT38 – KT41, KT43 – KT45, KT47, KT50, KT52, KT54, KT61 – KT63 and KT69) are identified to have direct impact arising from the proposed development, and one historic building (HKT03 (Main Building)) and one landscape feature (KT57) are potentially affected by the vibration due to the construction works at adjacent area. Relocation may be required for HKT01, HKT02, and Entrance Gate of HKT03 under KTN NDA.

3.9.11 Within FLN NDA CHAA, no direct and indirect impacts is anticipated for the built heritage items listed by AMO. Regarding built heritage items not listed by AMO, no direct impact is expected on historic buildings but six landscape features (FL01, FL11, FL16, FL19, FL33 and FL35) are expected to have direct impact. One historical building (HFL05) and nine landscape features (FL02, FL04, FL05, FL18, FL22, FL24, FL27, FL31 and FL36) are potentially affected by vibration due to the construction works at adjacent area. Relocation may be required for FL19 under FLN NDA.

3.9.12 Appropriate mitigation measures comprising a baseline condition survey and baseline vibration impact assessment to be conducted during pre-construction stage to be conducted by qualified building surveyor or qualified structural engineer to define the vibration limit (a vibration limit at 7.5mm/s and 15mm/s could be adopted for graded historic buildings and historic buildings respectively) and to evaluate if construction vibration monitoring and structural strengthening measures are required during construction phase to ensure the construction performance meets with the vibration standard stated in the EIA report. Cartographic and photographic records are also recommended to mitigate the impacts as far as possible.

3.9.13 Meanwhile, since the construction works and development activities may induce change in the watertable. It is recommended the contractor should ensure that the change of watertable induced by the construction works and development activities will not result in settlement of built heritage.

3.9.14 For the retained built heritage items in developable area, drainage system and access route would be designed to prevent the persevered flooding and maintain the accessibility to the built heritage.

3.10 Landscape and Visual

3.10.1 The Schedule 2 DPs have been grouped into four packages according to their location, nature and likely landscape and visual impacts. Landscape and visual impact assessment for the Project was undertaken for each NDA and four packages of Schedule 2 DPs, for both construction and operational phases of the Project and key findings are outlined below.

3.10.2 There have been many considerations when developing the RODPs for the NDAs, including the landscape and visual aspects of the Project; in all the NDAs care has been taken to establish a network of linked open spaces, accommodating a number of parks, plazas, squares, green amenity strips and landscape corridors, to create 'green' new towns and partly compensate for any loss of such existing open spaces or other relevant landscape resources, such as ponds, due to the developments. Given the generally rural nature of the North East New Territories (NENT), however, development of the NDAs will lead to some land use changes which will fundamentally change the landscape and visual characters of these areas.

3.10.3 For the VIA in particular, it is relevant to note that detailed architectural designs of all built elements in the NDAs have not been finalised at this stage of the development programme. Therefore the built structure forms and masses (including for buildings, reservoirs etc) shown in all the photomontages and drawings are illustrating maximum building heights and currently suggested reservoir designs, which are likely to reflect the worst case scenario. These photomontages and drawings have helped to assess the magnitude of visual impact for various VSRs and the actual visual impacts may reduce when the design of building and reservoir forms, finishes and colours have been refined at the detailed design stage.

3.10.4 Despite the careful initial design of the NDAs, some impact from the Project is inevitable and the potential landscape and visual impacts from the construction phases of the various components of the NDAs generally result from: site clearance including demolition of structures and tree removal/transplantation; site formation works including cutting (e.g. slope formation for reservoir formation) and filling e.g. of streams and agricultural land; stockpiling of construction and demolition materials; construction of at-grade and above ground built structures including residential blocks, government/ institutional facilities, bridges, viaducts, interchanges, roads, slip roads and noise barriers; temporary structures within the Project Site including site offices and parking areas; and re-alignment of roads, streams and watercourses. During operation, potential impacts are likely to result from the existence and operation of these new built structures, including buildings, new roads, intersections, viaducts and any associated noise barriers. There will be some residual impacts that occurred during construction, such as the loss of trees and vegetation that will continue to cause impact at operation. Equally, planting carried out during construction for general landscaping works will have a positive impact during operation, as will the implementation of the careful design measures, such as provision of open spaces, green belt areas, etc..

LANDSCAPE

3.10.5 A broad brush tree survey has been carried out within the study area which estimates that there are approximately 17,000 trees which may be affected by the proposed development. This preliminary survey suggests that more than 30% of

the affected trees can be retained or transplanted and that the remaining would be felled. A detailed Tree Felling Application process will be carried out at a later detailed design stage, to finalise tree treatment and allocate compensatory planting areas including available open space, parks and streetscape. Five Old and Valuable Trees along Castle Peak Road are proposed to be retained in situ and protected based on the revised RODP. There are no rare species or endangered species of trees but only common species within the NDAs. All the trees with high amenity value that are unavoidably affected by the works would be transplanted where possible. Detailed tree preservation, transplanting and felling including compensatory planting proposals will be submitted to relevant government departments for approval in accordance with ETWB TCW No. 3/2006 and ETWB TCW No. 29/2004.

3.10.6 In KTN NDA, channelized water course, water courses, ponds, marsh/wetland, woodlands, shrubland/grassland mosaic and agricultural land have been identified as major LRs. Due to the nature of the Project, some LRs are inevitably affected, some of which (i.e. water ponds at Fung Kong Shan, hillside woodland in Ma Tso Lung, Tit Hang and Fung Kong, lowland woodland in Pak Shek Au and Tong Kok, shrubland/grassland mosaic in Tai Shek Mo and the Western Range Foothills) would experience substantial impact prior to mitigation. Seven LCAs have been identified at which Natural Hillside Landscape would experience substantial impacts prior to mitigation because of high sensitive of the LCA.

3.10.7 In FLN NDA, channelized water course, water courses, ponds, marsh/wetland, woodlands, shrubland/grassland mosaic and agricultural land have been identified as major LRs. Due to the nature of the Project, some LRs are inevitably affected, some of which (i.e. Ma Wat River, mitigation wetland along Ng Tung River, hillside woodland in Cham Shan and Wa Shan, shrubland/grassland mosaic in Lung Shan) would experience substantial impact prior to mitigation. Seven LCAs have been identified and no LCA would experience substantial impact.

3.10.8 For Package A (DPs 1, 2, 3 and 4) which includes major roads in KTN NDA, no LR and LCA would experience substantial impact as the magnitude of change on each LR and LCA is relatively small due to the linear nature of roads.

3.10.9 For Package B (DP 5) which includes 2 new sewage pumping stations in KTN NDA, in view of the small scale of development, no significant landscape impacts on LRs and LCAs is anticipated.

3.10.10 For Package C (DPs 7, 11 and 13) which includes utilization of treated sewage effluent, further expansion of Shek Wu Hui Sewage Treatment Works and 4 new sewage pumping stations, shrubland/grassland mosaic at Lung Shan and Tai Shek Mo would experience moderate impact since the construction of flushing water service reservoirs (one of the components of DP7) at Tong Hang and Tai Shek Mo involve significant slope cutting.

3.10.11 For Package D (DPs 8, 9, 10 and 12) which includes major roads related to FLN NDA and a temporary wholesale market, similar to Package A, no LR and LCA would experience substantial impact as the magnitude of change on each LR and LCA is relatively small due to the linear nature of roads.

3.10.12 To mitigate the adverse landscape impacts, a number of mitigation measures have been proposed. Tree protection & preservation, tree transplantation, compensatory planting, woodland compensatory planting, road greening are commonly applied in the Project. Mitigation measures including minimizing topographical change, slope landscaping, vertical greening, green roof and compensatory planting have been proposed to mitigate the topographic change and loss of shrubland/grassland mosaic due to the construction of the water service reservoirs. For watercourse mitigation, four mitigation measures, namely,

diversion of natural steams, stream buffer planting, enhancement planting on embankments and avoidance of watercourses have been proposed.

3.10.13 It is considered that through applying the abovementioned mitigation measures, residual impacts of LRs and LCAs would be moderate or lower, although loss of some LRs and LCAs e.g. agricultural land and pond cannot be directly mitigated. On the other hand, the industrial LRs and LCAs are predicted to experience slight to moderate beneficial residual impacts.

VISUAL

3.10.14 From a visual perspective, the scale and the extent of high-rise development is likely to significantly alter the visual context of area, particular partially or fully loss of open view or riverside view. With all the planning mitigation measures incorporated into the revised RODPs (e.g. view corridors, green network, stepped building heights, building setbacks, buffer zones, etc), as well as construction and operation mitigation measures such as light control and general soft landscaping including slope landscaping, green roofs, road greening, screen planting, vertical greening as well as tree protection, transplantation and compensation, it is considered that the overall residual visual impacts are acceptable with mitigation measures.

3.10.15 For KTN NDA, there will unavoidably be substantial or moderate/ substantial residual impact on the VSRs at cottage area at Western Range and Fung Kong Shan which the latter is recreational type VSR with less visual sensitivity. For FLN NDA, visual impacts would be more significant. There will unavoidably be substantial or moderate/ substantial residual impact on the residential VSRs at Kan Lung Tsuen area, Ma Wat Tsuen Area, Shung Him Tong, which are low rise village type development, Belair Monte & Regentville, Wing Fai Centre & Wing Fok Centre, Noble Hill and high rise residential buildings around Tin Ping Estate which are high rise residential development along Ma Sik Road and Ting Ping Road. However, the impacts will reduce to moderate in year 10 operation when the soft landscape measures have matured and convey their full mitigation effect.

3.10.16 For Schedule 2 DPs, visual impact is less significant. In Packages A and B, there is no substantial visual impacts on VSRs. For Package C, there will be moderate/substantial residual impacts on the VSR groups at southern knoll of Fung Kong Shan and Wah Sum Estate due to the construction of two flushing water service reservoirs at Tai Shek Mo and Tong Hang. However, the impacts will reduce to slight in year 10 operation when the soft landscape measures have matured and convey their full mitigation. For Package D, there will be moderate/substantial residual impacts on the VSR group near Cyber Domaine residential estate due to the Fanling Bypass Eastern section. It is considered through road greening and screen planting, the impact can be further reduced to slight/moderate level by year 10 of operation where these planting works will have fully established and helped to assimilate the works into the landscape.

OVERALL

3.10.17 Given the proposed development involves major land use changes for an urban development in an existing rural area, it is inevitable that landscape and visual impacts caused by such major development cannot be fully reduced and remain at a certain level at some locations even after implementation of all possible mitigation measures, including mimimizing topographical change, detailed design of the built structures to ensure compatibility of the proposed development with the existing surroundings, tree protection, preservation and transplantation as well as compensatory planting, woodland compensatory planting, screen planting to buffer structures from views, decorative hoarding to screen undesirable views of work sites, light control within construction sites and at operation to reduce light glare that could potentially cause visual disturbance to VSRs at night time, and

provision for green roofs and vertical greening to soften hard surfaces on built structures in sight. Additionally the NDAs have been carefully designed to avoid impact on natural watercourses, with the most sensitive streams being avoided or zoned in such a way to preserve them, and with buffer areas along key stretches. In view of the nature of the development, it is generally fair to accept that some of the impacts cannot be fully reduced and will only remain at a certain level for some areas. Nevertheless, such residual impacts are predicted to be acceptable with implementation of the proposed mitigation measures as the changes in land use gradually become adaptable to the existing rural context.

3.10.18 It is therefore anticipated that the overall residual landscape and visual impacts from the development of the NDAs are considered acceptable with mitigation measures.

3.11 Ecology

3.11.1 An ecological impact assessment has been conducted to address the potential ecological impacts arising from the development of the NDAs. Mitigation measures have been proposed where required to avoid, minimise or compensate for the significant impacts, such that all residual impacts are mitigated to an acceptable level

3.11.2 Alternatives to safeguard the conservation value of Long Valley were considered and measures to avoid potential impacts were adopted. These included the design of the Project such that a new road link through or to the north of Long Valley were not required and avoidance of development in Long Valley itself.

3.11.3 In order to safeguard the ecological value of Long Valley in the long term, it is proposed to designate the area of highest ecological value (~37ha), the largely wetland area south and east of the Sheung Yue River and south and west of the Shek Sheung River, as Other Uses (OU) Nature Park (area C1-9 in KTN).

3.11.4 It is proposed to retain the agricultural (AGR) zonings of the area west and north of the Ng Tung and Sheung Yue Rivers and east of Ho Sheung Heung (C2-2), and the area south and east of area C1-9 and east of Yin Kong (C1-6). To strengthen the planning control over the AGR zone to reflect the importance of this area being on the flight path of the birds and a buffer zone for the LVNP.

3.11.5 Impacts on secondary woodland and hillside woodlands are largely avoided at the first instance and when formulating the development footprint. Unavoidable loss of a very small area of secondary woodland and plantation woodland of ecological significance will be compensated by establishment of around 16ha of secondary woodland in two blocks in KTN;

3.11.6 Alternatives to avoid potential impacts to Man Kam To Road egretry were considered, but were found to be impractical due to engineering constraints and requirements; mitigation measures to compensate for this loss are therefore proposed; In view of the frequent change and the possible relocation of egretries, the possible need of additional measures would be reviewed and formulated before construction phase of the project.

3.11.7 Alternatives to avoid potential impacts to the Ma Tso Lung Stream and its riparian corridor and fauna of conservation significance were considered, and the sections of the stream to the south of where it is crossed by the LMC Loop Eastern Connection Road the stream and tributaries of ecological significance are included in a Green Belt zone where there is a presumption against development. Where the construction of the LMC Loop Eastern Connection Road will result in unavoidable impact to a downstream section of the stream in the north of the Project Area, alternatives to minimize impacts were considered. Avoidance of direct impacts by placing the road on a viaduct were evaluated as being greater than impacts of diverting a section of the stream and minimising and compensating for such impacts. Options to find an appropriate balance between

the width of buffer which could be provided post-diversion, and the length of stream to be diverted were then considered. It was resolved that the optimum solution, given the site constraints, is for a section of 130m of Ma Tso Lung Stream to be diverted and reinstated, with a minimum buffer width of 15m from the road to be maintained following diversion on the west side of the stream. On the east side a buffer width of 15 - 30m would be maintained from any development under the Project; the minimum buffer width in total will be 45m. The buffer zone in this section would be planted with riparian trees, shrubs and other vegetation in order to maintain and enhance ecological linkages along the stream.

3.11.8 Detailed arrangement of some of the proposed mitigation measures would be formulated further under the study, especially in relation to the creation and long-term management and monitoring of Long Valley Nature Park and the required detailed design to avoid or minimise ecological impacts to habitats including main river channels, certain streams of ecological significance and the loss of the Man Kam To Road egretry. For Long Valley Nature Park, a detailed Habitat Creation and Management Plan will be prepared and implemented as the next stage of the project. Similarly, detailed design and implementation of measures to create an egretry at FLN A1-7 to compensate for the loss of the existing Man Kam To Road egretry will be undertaken as an advance works element of the project.

3.11.9 Other mitigation measures required in order to avoid, minimise or compensate impacts of the project which have not been incorporated in the design of the project as detailed in the RODP, have been detailed in the EIA. With the implementation of the ecological mitigation measures described in this EIA, no significant residual ecological impacts are envisaged. It is considered that the implementation of NDAs project meets the ecological requirements of the EIAO.

3.12 Fisheries

3.12.1 The revised RODP would result in the loss of a fish fry farm at Fung Kong in KTN NDA. The loss of this pond would have a moderate impact on fish fry supply to pond fisheries in Hong Kong. It is proposed that appropriate notice should be given to the operator to permit the reinstatement of activities at an alternative location prior to the closure of the existing farm.

3.12.2 Other than the fish fry farm, fisheries in the two NDAs are of low importance in the overall productivity of Hong Kong fisheries. Impacts to the other fisheries are not considered to be significant in a Hong Kong context.

3.12.3 However, potential downstream impacts to fisheries in the Deep Bay ecosystem, and in the Ma Tso Lung area in particular, will require to be mitigated at source by preventing sediment or pollutants arising from the construction and operation of the Project entering watercourses.

3.13 Environmental Monitoring and Audit (EM&A)

3.13.1 An EM&A programme will be implemented throughout the entire construction period to regularly monitor the environmental impacts on the neighbouring sensitive receivers. Any action required during the construction phase is also recommended for implementation.

3.13.2 The EM&A programme would include site inspection / audit and monitoring for construction dust, construction airborne noise, operation airborne noise, water quality and updating changes as necessary. Details of the recommended mitigation measures, monitoring procedures and locations are presented in a standalone EM&A Manual.

4 Overall Conclusion

An EIA Report has been prepared to fulfil the requirements as specified in the EIA Study Brief No ESB-176/2008 and the TM-EIAO. All the latest design information has been incorporated into the EIA process. The aspects that have been considered in this EIA Report include:

- Description of land use planning;
- Description of construction and operation activities;
- Air quality impact;
- Noise impact;
- Water quality impact;
- Sewerage management implications;
- Waste management implications;
- Land contamination;
- Hazard to life;
- Landfill gas hazards;
- Cultural heritage;
- Landscape and visual impact;
- Ecological impact;
- Fisheris impact;
- EM&A requirements.

The impact summary of NDA is shown in **Appendix 1**. Overall, the EIA Report has predicted that the Project would be environmentally acceptable with the implementation of the proposed mitigation measures for construction and operation, phases. An environmental monitoring and audit manual has been recommended to ensure the effectiveness of recommended mitigation measures.

FIGURE

Shenzhen Shi

N

Ping Che / Ta Kwu Ling (PC/TKL) NDA

PC/TKL will be put aside and re-planned in the context of the policy initiative announced in the 2013-2014 Policy address to further explore the development potential in New Territories North.

Kong Nga Po

Ng Tung River

Lok Ma Chau

Kwu Tung North (KTN) NDA

Fanling North (FLN) NDA

East Rail

Sha Tau Kok Road

Fanling Highway

Fanling Bypass

Ki Lun Shan

Ngau Tei

Wo Hop Shek

0 1km

Legend

KTN and FLN NDA Project Boundary

PC/TKL NDA Boundary

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Filename : G:\env\project\25278\drawings\20130520_Stage 4 EIA_Option 2_revised_v1\Figure\Figure 1.1.dgn

土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	規劃署 PLANNING DEPARTMENT	ARUP

Job Title
Agreement No. CE 61/2007 (CE)
North East New Territories New Development Areas
Planning and Engineering Study - Investigation

Drawing Title
NENT NDA Study Areas

Rev	Description	Date
F	SEVENTH ISSUE	05/13
E	SIXTH ISSUE	04/13
D	FIFTH ISSUE	01/13
C	FOURTH ISSUE	12/12
B	THIRD ISSUE	06/12

Drawn GL | Date 05/13
Checked KL | Approved ST
Scale 1:30000 ON A3

Drawing No. Figure 1.1
Rev. F

Legend

- NDA Project Boundary
- Primary Distributor in KTN NDA (EIAO,Schedule 2, A.1)
- District Distributor in KTN NDA (EIAO, Schedule 2, A.1)
- Reuse Water Service Reservoir (Flushing) (EIAO, Schedule 2,F.4)
- Sewage Pumping Station (EIAO, Schedule 2, F.3(b))
- Proposed Railway Station and Associated Facilities (EIAO, Schedule 2, A.2)
- Express Way (EIAO, Schedule 2, A.1)

DP5: New Sewage Pumping Station (SPS)

DP7: Utilization of Treated Sewage Effluent from SWHSTW

DP4: Road D1 to D5

DP3: Road P1, P2 and assocated new Kwu Tung Interchange & Pak Shek Au Interchange

DP6: Proposed Railway Station and Associated Facilities (Under Separate Study)

DP4: Road D1 to D5

DP4: Road D1 to D5

DP5: New Sewage Pumping Station (SPS)

DP3: Road P1, P2 and assocated new Kwu Tung Interchange & Pak Shek Au Interchange

DP2: Castle Peak Road Diversion

DP1: San Tin Highway and Fanling Highway Widening (between San Tin Interchange and Po Shek Wu Interchange)(Major Improvement)

羅湖分類靶場
Lo Wu Classification Range

N

0 250m

Printed by : 5/31/2013
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土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

規劃署 PLANNING DEPARTMENT

ARUP

Job Title
Agreement No. CE 61/2007 (CE)
North East New Territories New Development Areas
Planning and Engineering Study - Investigation

Drawing Title
Locations of Schedule 2 Designated Projects in KTN NDA

Rev	Description	Date
E	SIXTH ISSUE	05/13
D	FIFTH ISSUE	04/13
C	FOURTH ISSUE	01/13
B	THRID ISSUE	08/12
A	SECOND ISSUE	12/11

Drawn	Date
GL	05/13
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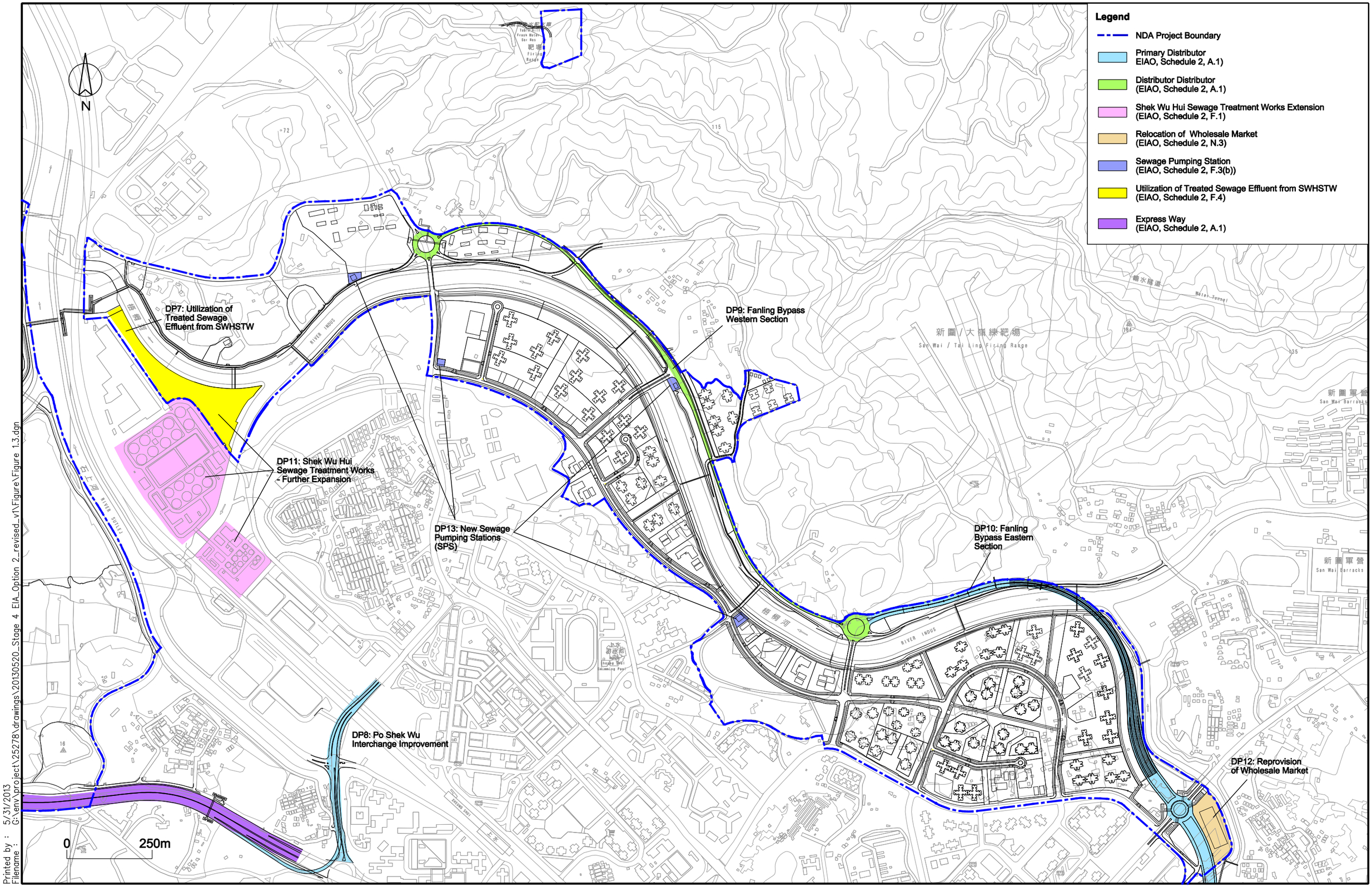
Drawing No.
Figure 1.2
Rev. E



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CEDD 土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	規劃署 PLANNING DEPARTMENT	ARUP	Job Title: Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation	Drawing Title: Locations of Schedule 2 Designated Projects in FLN NDA	E SIXTH ISSUE 05/13 D FIFTH ISSUE 04/13 C FOURTH ISSUE 01/13 B THIRD ISSUE 08/12 A SECOND ISSUE 12/11 Rev Description Date	Drawn GL / Date 05/13 Checked KL / Approved ST Scale 1:10000 on A3	Drawing No. Figure 1.3 Rev. E

Legend

- NDA Project Boundary
- Primary Distributor Fanling Bypass (EIAO, Schedule 2, A.1)
- Reuse Water Service Reservoir (Flushing) (EIAO, Schedule 2, F.4)

DP10: Fanling Bypass Eastern Section

DP7: Utilization of Treated Sewage Effluent from SWHSTW

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土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	規劃署 PLANNING DEPARTMENT
ARUP	
Job Title	Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation
Drawing Title	Location of Schedule 2 Designated Project along Fanling Bypass

Rev	Description	Date
E	SIXTH ISSUE	05/13
D	FIFTH ISSUE	04/13
C	FOURTH ISSUE	01/13
B	THIRD ISSUE	06/12
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Drawn	GL	Date	05/13
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Scale	1:10000 on A3		
Drawing No.	Figure 1.4		
Rev.	E		

Appendix

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Air Quality Impact					
Construction Phase					
Existing and Planned residential, premises, educational, industrial, clinic/ home for the aged, worship, government, institution and community (GIC) and Recreational/ Parks in the vicinity of KTN and FLN NDA 254 assessment points in KTN NDA and 176 assessment points in FLN NDA (refer to **Figures 3.2a – 3.4f**)	KTN NDA • 1-hour Average TSP Conc.: 430 - 12631 µg/m3 • 24-hour Average TSP Conc.: 102 - 3667 µg/m3 • Annual Average TSP Conc.: 73.1 – 122.0 µg/m3 FLN NDA • 1-hour Average TSP Conc.: 138 - 7494 µg/m3 • 24-hour Average TSP Conc.: 78 - 2321 µg/m3 • Annual Average TSP	• EIAO-TM and AQO • 1-hr Average TSP Conc: 500 µg/m3 • 24-hr Average TSP Conc: 260 µg/m3 • Annual Average TSP Conc: 80 µg/m3	KTN NDA • Exceed EIAO-TM (1-hr) criterion by up to 12131 µg/m3 • Exceed AQO (24-hr) criterion by up to 3407 µg/m3 • Exceed AQO (Annual) criterion by up to 42.0 µg/m3 FLN NDA • Exceed EIAO-TM (1-hr) criterion by up to 6994 µg/m3 • Exceed AQO (24-hr) criterion by up to 2061 µg/m3 Exceed AQO (Annual)	• Watering once per hour on the active works areas, exposed area; and paved haul roads to reduce dust emission • Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices would be carried out to further minimise construction dust impact.	• Adverse residual impacts not anticipated

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	Conc.: 73.1 – 95.1 µg/m3		criterion by up to 15.1 µg/m3		
Operational Phase					
Existing and Planned residential and primes, educational, industrial, clinic/ home for the aged, worship, GIC and Recreational/ Parks in the vicinity of KLN and FLN NDA 79 assessment points (refer to **Figures 4.6.1-4.6.3**)	KTN NDA NO_2 • 1-hour Average NO_2 Conc.: 55 – 133 µg/m3 • 24-hour Average NO_2 Conc.: 49 – 73 µg/m3 • Annual Average NO_2 Conc.: 48.7 – 59.2 µg/m3 RSP • 24-hour Average RSP Conc.: 51 – 56 µg/m3 Annual Average RSP Conc.: 50.7 – 53.2	• AQO • 1-hr Average NO_2 Conc: 300 µg/m3 • 24-hr Average NO_2 Conc: 150 µg/m3 • Annual Average NO_2 Conc: 80 µg/m3 • 24-hr Average RSP Conc: 180 µg/m3 • Annual Average RSP Conc: 55 µg/m3	• No exceedances are predicted at all ASRs.	• No mitigation measures are proposed as the predicted max. NO2 and RSP concentrations are all within the respective criteria.	• Adverse residual impacts not anticipated

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	µg/m3 <u>FLN NDA</u> NO_2 • 1-hour Average NO_2 Conc.: 59 – 106 µg/m3 • 24-hour Average NO_2 Conc.: 50 – 67 µg/m3 • Annual Average NO_2 Conc.: 49.0 – 67.3 µg/m3 RSP • 24-hour Average RSP Conc.: 51 – 56 µg/m3 • Annual Average RSP Conc.: 50.7 – 53.6 µg/m3				
Odour					
Existing and Planned residential and primes,	• Not Applicable.	• EIAO-TM	• Not Applicable.	• The detailed design of Shek Wu Hui	• Adverse residual impacts not

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
educational, industrial, clinic/ home for the aged, worship, GIC and Recreational/ Parks in the vicinity of KLN and FLN NDA 907 assessment points (refer to **Figures 3.1-3.4**)		• 5-second Average Odour Unit: 5 OU		Sewage Treatment Works - Further Expansion should incorporate the following odour impact mitigation measures. • All odour emission sources should be covered and the emission should be delivered to deodorization facility prior to discharge. • The odour removal efficiency of the deodorization facility is 90%. • Discharge point should be 10m above ground with 10m/s exit velocity.	anticipated.

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Cultural Heritage					
Construction Phase					
Archaeology	• Direct construction impact • Potential direct impact is anticipated due to various type of development.	• EIA recommendation; • AMO Guidelines for Archaeological Reports; • AMO Guidelines for Handling of Archaeological Finds and Archives; • Guidelines for Cultural Heritage Impact Assessment • EIAO-TM Annex 10 and Annex 19	• Preservation in-situ with further archaeological survey if necessary • Archaeological Impact Assessment	• Refinement of RODP to allow preservation in-situ • Undertaking Survey-cum-Rescue Excavation; • Undertaking Further Archaeological Survey; • Induction training should be provided to the construction contractor before the commencement of the excavation works • AMO should be informed immediately in case of discovery of antiquities or	• No adverse residual impacts anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				supposed antiquities during the construction.	
Built Heritage	• Potential construction vibration impact • Direct impact of removal • Settlement of built heritage caused by the change of watertable induced by the construction works and development activities	• Guidelines for Cultural Heritage Impact Assessment • EIAO-TM and • AMO Guidelines on Photographic Record and Cartographic Record	• Not Applicable	• Refinement of RODP to avoid direct impact • Undertaking baseline condition survey and baseline vibration impact assessment. A vibration limit at 7.5mm/s could be adopted for graded historical buildings • Undertaking baseline condition survey and baseline vibration impact assessment. A vibration limit at 15mm/s could be adopted for other historical buildings • Conducting Construction Vibration	• No adverse residual impacts anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				Monitoring and Structural Strengthening Measures • Conducting Photographic and Cartographic Records Prior to Removal/Relocation of Impacted Built Heritages • Relocation of Impacted Built Heritages • Watertable Monitoring • Drainage System and Access Route Design	
Operational Phase					
Archaeology	• No direct or indirect operational impact is identified at this stage	• EIA recommendation; • AMO Guidelines for Archaeological	• Not Applicable	• No mitigation required	• No adverse residual impacts anticipated

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Reports; • AMO Guidelines for Handling of Archaeological Finds and Archives; • Guidelines for Cultural Heritage Impact Assessment • EIAO-TM Annex 10 and Annex 19			
Built Heritage	• No direct or indirect operational impact is identified at this stage	• Guidelines for Cultural Heritage Impact Assessment • EIAO-TM and • AMO Guidelines on Photographic Record and Cartographic Record	• Not Applicable	• No mitigation required	• No adverse residual impacts anticipated

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Ecological Impact					
Pre-construction /Detailed Design Phase					
Long Valley, wet and dry agricultural land and pond	• Not applicable	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Long Valley Nature Park (LVNP) designation, design, implementation, management and maintenance (planning stage).	• Not Applicable
Major Channelised Watercourse (Sheung Yue, Shek Sheung and Ng Tung Rivers)	• Not applicable	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Provision of alternative foraging ground at Long Valley and along river channels.	• Not applicable
Ma Tso Lung Stream and tributaries and marsh	• Not applicable	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Detailed design of development along lower reaches of Ma Tso Lung Stream and Ma Tso Lung San Tsuen Stream and detailed	• Not Applicable

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				design of LMC Loop Eastern Connection Road with restoration of diverted stream and riparian corridor, permanent barrier and underpass on the at-grade section • Pre-works commencement check on areas to be physically or hydrologically impacted by construction activities. • Compensation for the loss of seasonally wet grassland at Ma Tso Lung by habitat restoration and enhancement along diverted section of Ma Tso Lung Stream	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Man Kam To Road egretry	Not applicable	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Compensatory habitat provision in area FLN A1-7 and measures to attract egrets to compensation sites. • The condition of egretries before commencement and during works would be monitored. Additional mitigation measures would be formulated and implemented if necessary.	Not Applicable
Shrubland at Crest Hill	Not applicable	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Pre-works site check for presence of Eurasian Hobby and other species of conservation concern	• Not applicable
Hillside Plantation Woodland and *fung shui* woodland	Not applicable	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Pre-works site check for presence of species of conservation concern	• Not applicable

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				•	
Siu Hang San Tsuen Stream and other watercourses impacted directly by the Project. Upland and lowland grassland, grassland-shrubland, shrubland directly impacted by the Project. Seasonally wet grassland impacted directly by the Project. Various fauna of conservation significance occupying the above habitats.	Not applicable	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Pre-works check for presence of any protected flora and fauna and flora of conservation significance or bat roosts in areas to be physically or hydrologically impacted by construction activities. Formulation and implementation of practicable and effective mitigation measures, if required, in consultation with AFCD.	• Not applicable
Construction Phase					
Long Valley, wet and dry agricultural land, pond, and Mitigation Wetland in FLN area	• No direct loss • Disturbance of Long Valley habitats (**Low**). • Hydrological disruption of Long	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Long Valley Nature Park (LVNP) implementation, management and	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
A1-7.	Valley habitats (**Low to High**) • Dust deposition and increased sediment and nutrient load **Low** during construction and operational stages • Pollution of Long Valley habitats (dependent upon type but most likely **Low to Moderate**). • Fragmentation impact on Long Valley **Low to Moderate)**. • Combined disturbance and fragmentation impacts **Low to Moderate** during construction, **Low** during operation. • Permanent loss of 0.58ha of wet agricultural land (**Low to Moderate**) and 9.33ha of dry agricultural land			maintenance. • Enhancement of wetland habitats in LVNP. • Provision of alternative foraging ground along river channels. • Phasing of works to avoid peak breeding season of waterbirds. • Erection of temporary noise/visual barriers; timing of construction works; control access and numbers of visitors to LVNP • Buffer planting at LVNP to minimise disturbance. • Building setback of 30m in area KT B3-12 from road DP3. • Stringent Planning	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	(**Low**). • Loss of 3.08ha of Pond (**Low** for small fragmented ponds (0.59ha), **Low to Moderate** (2.12ha) and **Moderate** (0.37ha)) • Fragmentation impacts on FLN A1-7 (**Low to Moderate**).			Control in areas C2-1 and C2-2 to protect these areas and maintain flight-lines from Ho Sheung Heung egretry. • Avoidance of hydrological disruption to LVNP. • Environmental control measures proposed under relevant chapters of the EIA and prevention of pollutants impacting LVNP (dust, sediments, nutrient load).	
Major Channelised Watercourse (Sheung Yue, Shek Sheung and Ng Tung Rivers)	• Direct impact : **Low** severity during both construction and operation phases as area is <0.02ha) • Disturbance of Sheung Yue River (**Moderate**).	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Design and erection of temporary noise visual/ barriers at any development sites adjacent to watercourses.	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	• Disturbance of tidal Ng Tung River (**Low**). • Disturbance of Shek Sheung River (**Low**). • Fragmentation impact between non-tidal Ng Tung and Long Valley (**Low to Moderate**); **Low** along tidal Ng Tung River; Run-off and pollution impacts on Ng Tung, Sheung Yue and Shek Sheung Rivers (**Low** in most circumstances but some construction phase could be of **Moderate** severity). • Combined impacts on Sheung Yue River **Moderate**. • Combined impacts on non-tidal section of Ng Tung River **Low to Moderate**. • Combined impacts on tidal section of Ng			• Maximise building setback, retaining and provision of buffer planting in open space zones along watercourses. • Phasing of works to avoid peak breeding season of waterbirds, and avoid overlap in construction timing of bridges. • Measures to avoid/minimize fragmentation and hydrological impacts to river channels • Establishment and long term maintenance of LVNP. • Review of design and construction methods for all bridges especially	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	Tung River **Low**.Combined impacts on Shek Sheung River **Low**.			those on the Sheung Yue and tidal Ng Tung Rivers and adoption of methods which will minimise impacts on rivers and disturbance and fragmentation impacts on fauna. • Provision of alternative foraging site for waterbirds by establishment of LVNP and stocking of fish at suitable ponds on government land along river channels and in LVNP during the advanced works stage.	
Ho Sheung Heung *Fung Shui* Woodland & Secondary Woodland	• Loss of 0.23ha secondary woodland (**Low**). • Disturbance of *fung shui* and secondary woodland (**Low to**	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Woodland compensatory planting. • Avoid and minimize direct encroachment	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	Moderate). • Dust deposition on vegetation during construction (**Low**). • Fragmentation impact on woodland (**Low to Moderate**). • Combined impacts **Low to Moderate** during construction.			during detailed design and reinstate any temporary works area upon completion of works • Design and install Noise/visual barrier at boundary of areas KTN D1-7 and D1-11. • Adopt environmental control measures and avoidance of dust on vegetation. • Temporary fauna barriers at Ho Sheung Heung works areas 30m from Ho Sheung Heung secondary and *fung shui* woodlands or works area whichever is greater.	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Shrubland at Crest Hill	• Loss of habitat (most likely **Low** but **Low to Moderate** in the unlikely event that Eurasian Hobby nest site is in the project area). • Disturbance of shrubland at Crest Hill (Most likely **Low** but **Low to Moderate** in the unlikely event that Eurasian Hobby nest site is in the project area).	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Design and install noise/visual barrier at boundary of areas KTN D1-11, D1-12 and G1-5. • Avoid and minimize direct encroachment during detailed design and reinstate any temporary works area upon completion of works • Measures to control dust, construction run-off and pollution	• Adverse residual impacts not anticipated.
Man Kam To Road egretry	• Direct loss is **Low to Moderate.**	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Early implementation of compensatory habitat provision in area FLN A1-7 and measures to attract egrets to compensation site. • Formulation and provision of additional	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				mitigation measure in view of the condition and location of the Egretry before commencement of works. • Phasing of works away from peak foraging hours and breeding season • Provision of alternative foraging ground at suitable sites along river channels • Maintenance of existing ecological linkages between assessment area and Deep Bay. • Design and erection of temporary noise/visual barriers adjacent to works areas along rivers.	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				• Measures to avoid/minimize fragmentation impacts on existing Egretry (before removal) and on new egretry site and their flight-paths	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Ho Sheung Heung Egretry	• Disturbance to Ho Sheung Heung egretry: **Low**. • Fragmentation impact on flight-lines between Ho Sheung Heung egretry and foraging areas: **Low to Moderate**. Combined impact: **Low to Moderate**.	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Maintenance of existing ecological linkages between assessment area and Deep Bay. • Erection of temporary noise/visual barriers adjacent to works areas along rivers. • Prohibition of works during ardeid breeding season. • Provision of alternative foraging ground at suitable sites along river channels	• Adverse residual impacts not anticipated.
Ma Tso Lung Stream and tributaries and marsh	• Diversion of 130m of Ma Tso Lung Stream in its lower reaches (**Moderate**) and 120m of tributaries in their upper reaches (**Low**). • Disturbance to Ma Tso Lung Stream and	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Permanent buffer zone of 15-30m as appropriate on (not less than 45m total width) along each bank of stream and tributaries except for LMC Loop Eastern Connection	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	Marsh (**Low**). • Run-off and hydrological impacts to Ma Tso Lung Stream (**Moderate**) and Marsh (**Low**) • Fragmentation impact on Ma Tso Lung Stream riparian corridor (**Moderate**). • Combined impacts **Moderate.** • Cumulative disturbance impacts with LMC Loop Project **Low**. • Cumulative run-off impacts with LMC Loop Project **Moderate** during construction. • Cumulative hydrological disruption impacts with LMC Loop Project **Moderate.** • Cumulative fragmentation impacts with LMC			Road crossing. • Measures to control hydrological disruption, construction run-off and pollution • Road crossing to be on viaduct, no construction works within watercourse. • Areas of stream diversion minimized in relation to buffer requirements. • Creation of permanent vegetated 15m minimum buffer between road and diverted watercourse, and 30m. minimum buffer between watercourse and project area operation in any area where works are required within 30m. of	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	Loop Project **Moderate**.			Ma Tso Lung stream and tributaries. • Implementation of permanent terrestrial fauna barrier on at-grade section of LMC Loop Eastern Connection Road at Ma Tso Lung. • Implementation of permanent fauna underpass. • Temporary fauna barriers at Ma Tso Lung works areas KTN F1-1, F1-3, F1-4, F1-7, G1-1, G1-2 and G1-4 and SPS, 30m. from Ma Tso Lung stream or works area whichever is greater. • Temporary solid barrier 30m from watercourse	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				or edge of works area to protect riparian vegetation in any works area 30m or less from watercourse.	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Siu Hang San Tsuen Watercourse	• Re-channelization of approx. 180m length of lowest reaches (**Low**). • Disturbance impacts (**Low**). • Run-off and hydrological impacts (**Low**). • Combined impacts **Low to Moderate** during construction)	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Provision and designation of buffer zone and maintenance of hydrological linkages during construction under and adjacent to Fanling Bypass. Provision and maintenance of shade-tolerant plantings along the buffer; • Adoption of viaduct for road section encroach on the watercourse; • Permanent buffer zone for natural section of stream (not in project area).	• Adverse residual impacts not anticipated.
Kau Lung Hang Watercourses	• No direct impact. • Disturbance of approx. 50m during construction of	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• None required. • Avoidance of construction works in	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	Fanling Bypass (**Low**)			streambeds, prevention of pollutants entering watercourses.	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Hillside Plantation	• Disturbance (**Low to Moderate**). • Dust deposition and fragmentation impacts on vegetation (**Low**). • Combined impacts **Low to Moderate**.	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Establishment of about 16ha of Woodland compensatory planting. • Avoid and minimize direct encroachment during detailed design and reinstate any temporary works area upon completion of works • Erection of 2m high solid green site barrier fence between active works and adjacent natural habitats. • Measures to control dust, construction run-off and pollution.	• Adverse residual impacts not anticipated.
Egretries and egretry flight lines	Direct loss of Man Kam To Road Egretry: **Low to Moderate**. Disturbance to Ho Sheung Heung Egretry:	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Egretry Habitat Creation & Management Plan (EHCMP) and compensatory egretry habitat provision.	• Adverse residual impacts not predicted.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	Low. Fragmentation impact on flight-lines between Ho Sheung Heung Egretry and foraging areas: **Low to Moderate**. Fragmentation impact on flight-lines between Man Kam To egrety and foraging areas: **Low to Moderate** during construction prior to clearance of egretry site. Combined impact: **Moderate** during construction.			• Stringent planning control requirements in Long Valley north and west of Sheung Yue River, including Ho Sheung Heung Egretry (**5.9.2**). • Planning for creation of Green Corridors along larger watercourses and detailed design of Open Space areas and development areas along river corridors (**5.9.3**). • No construction during ardeid breeding season (1st March to 31st July) along Sheung Yue River north or east of KTN D1-5 and east of D1-9 and C2-3 and restriction of working hours on new pedestrian bridges over the Sheung Yue River and tidal Ng Tung River to 09.00 to 17.30 during the ardeid breeding	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				season. • Unavoidable clearance of Man Kam To Road Egretry scheduled outside breeding season. • Review of bridge design and construction methods during detailed design phase to ensure that disturbance impacts from these sources are minimised. Creation and operation of of Long Valley Nature Park and creation and enhancement of wetland within LVNP including redistribution of wetland habitats in LVNP to concentrate closed wetland habitats (marsh and reedmarsh) in more disturbed areas and to undertake supplementary stocking of fish to mitigate for any loss of foraging habitat	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				for large waterbirds in disturbed areas including the Sheung Yue River, especially during the construction phase. • Erection of 2m high solid dull green site barrier fence between river channel and any active works area along or adjacent to Ng Tung, Sheung Yue and Shek Sheung Rivers. • Avoidance of removal and interference with screen planting undertaken under the Construction of Cycle Tracks and Associated Supporting Facilities from Sha Po Tsuen to Shek Sheung.	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Other wetland-dependent bird species	Direct loss of wetland habitats: **Low**. Indirect loss of wetland habitats: **Low to Moderate** on birds using the Sheung Yue River and non-tidal Ng Tung River, but **Low** elsewhere, during the construction phase. **Low** on birds using the Sheung Yue River; Low to Moderate on non-tidal Ng Tung Rivers, but not significant elsewhere, during operational phase. Fragmentation impact: **Low to Moderate** severity during construction on the linkage between Long Valley and the long non-tidal Ng Tung River; **Low** severity on the linkage between Long Valley and the Deep Bay wetland	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• As per details for Long Valley Nature Park (LVNP) implementation, management and maintenance. • Maintenance of existing ecological linkages between assessment area and Deep Bay. • Stringent planning control in Long Valley north and west of Sheung Yue River, including Ho Sheung Heung Egretry. • Planning for creation of Green Corridors along larger watercourses, detailed design of Open Space areas and development areas along river corridors to provide screening of rivers. • Building setback from	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	ecosystem along the tidal Ng Tung River during construction but not significant during operation; no other significant fragmentation impacts. Combined impacts of habitat loss, disturbance and fragmentation: **Low** overall but **Low to Moderate** for freshwater wetland/wet agricultural land habitat-specialist species and species using the Sheung Yue River and non-tidal section of Ng Tung River in significant numbers (especially breeding Little Egrets and Chinese Pond Herons).			Long Valley. • Erection of 2m high solid dull green site barrier fence between river channel and any active works area along or adjacent to Ng Tung, Sheung Yue and Shek Sheung Rivers, and areas and all areas/habitats of ecological importance on edge of development areas, including along any roads adjacent to or penetrating into areas/habitats of ecological importance. • Review of bridge design and construction methods during detailed design phase to ensure that disturbance impacts from these sources are minimised. • Avoidance of removal and interference with screen planting	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				undertaken under the Construction of Cycle Tracks and Associated Supporting Facilities from Sha Po Tsuen to Shek Sheung. • Some phasing of construction such that bridges over watercourses are not constructed simultaneously.	
Other species of conservation importance	• Direct loss of habitats: **Low - Moderate**. • Indirect loss of wetland habitats: **Low-Moderate.** • Fragmentation impact: **Low**. • Mortality Impacts during site clearance: **Low-Moderate**. • Cumulative impact of habitat loss, disturbance and fragmentation: **Low** overall but **Moderate**	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• As per details for Long Valley Nature Park (LVNP) implementation, management and maintenance. • Minimise mortality to bats and disturbance to bat roosts. • Minimise impacts on species of conservation significance in development areas by translocation from works	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	for freshwater wetland/wet agricultural land habitat-specialist species. • Combined impacts: **Moderate** overall but **Moderate to High** for freshwater wetland/wet agricultural land habitat-specialist species).			area.	
Operational Phase					
Long Valley	• Disturbance of Long Valley habitats (**Low**). • Hydrological disruption of Long Valley habitats (**Low**) • Pollution of Long Valley habitats (dependent upon type but most likely **Low**). • Fragmentation impact on Long Valley **Low**. • Combined disturbance and	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Long Valley Nature Park (LVNP) management and maintenance. • Enhancement of wetland habitats in LVNP. • Buffer planting at LVNP to minimise disturbance. • Building setback of 20m in area KT B3-12 from	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	fragmentation impacts **Low**. • Cumulative disturbance and fragmentation with Sha Po Tsuen to Shek Sheung River Cycle Track project **Low**.			road DP3. • Stringent Planning Control in areas C2-1and C2-2 to protect these areas and maintain flight-lines from Ho Sheung Heung egretry. • Avoidance of hydrological disruption to LVNP.	
Major Channelised Watercourse (Sheung Yue, Shek Sheung and Ng Tung Rivers)	• Disturbance of Sheung Yue River (**Low**). • Disturbance of Ng Tung River (**Low**). • Disturbance of Shek Sheung River (**Low**). • Fragmentation impact on non-tidal Ng Tung River (**Low to Moderate**) • Fragmentation impact on tidal Ng Tung	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Erection of temporary noise visual/ barriers at any development sites adjacent to watercourses. • Planting buffers in open space zones along watercourses.	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	River (**Low**) • Fragmentation impact on Sheung Yue and Shek Sheung Rivers (**Low**). • Run-off and pollution impacts on Ng Tung, Sheung Yue and Shek Sheung Rivers (**Low**). • Combined operational impacts on all rivers **Low**.				
Ho Sheung Heung *Fung Shui* Woodland & Secondary Woodland	• Disturbance of *fung shui* and secondary woodland (**Low**). • Fragmentation impact on woodland (**Low**). • Combined impacts **Low**.	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• None required.	• Adverse residual impacts not anticipated.
Shrubland at Crest Hill	Disturbance of shrubland at Crest Hill (**Low** during operation)	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Ho Sheung Heung Egretry	• Disturbance to Ho Sheung Heung egretry: **Low**. • Fragmentation impact	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Long Valley Nature Park (LVNP) implementation, management and	• Adverse residual impacts not

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	on flight-lines between Ho Sheung Heung egretry and foraging areas: **Low**.			maintenance. • Implementation of stringent planning controls to maintain ecological linkages between assessment area and Deep Bay, egretry and Long Valley	anticipated.
Compensatory egretry at FLN A1-7	• Disturbance (**Low**).	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• . None required.	• Adverse residual impacts not anticipated
Ma Tso Lung Stream and tributaries and Marsh	• Disturbance to Ma Tso Lung Stream (**Low**). • Run-off and hydrological impacts to Ma Tso Lung Stream (**Low**) • Fragmentation impact on Ma Tso Lung Stream riparian corridor (**Moderate**). • Combined impacts **Moderate**.	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Permanent buffer zone of 15-30m as appropriate on (not less than 45m total width) along each bank of stream and tributaries except for LMC Loop Eastern Connection Road crossing. • Measures to control hydrological disruption,	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	• Cumulative disturbance impacts with LMC Loop Project **Low**. • Cumulative run-off impacts with LMC Loop Project **Low to Moderate**. • Cumulative hydrological disruption impacts with LMC Loop Project **Moderate.** • Cumulative fragmentation impacts with LMC Loop Project **Moderate**.			run-off and pollution • Permanent terrestrial fauna barrier on at-grade section of LMC Loop Eastern Connection Road at Ma Tso Lung. • Permanent fauna underpass.	
Siu Hang San Tsuen and Kau Lung Hang Watercourses	• Disturbance impacts (**Low**). • Run-off and hydrological impacts (**Low**). • Combined operational phase impacts **Low**.	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Permanent buffer zone for natural section of stream (not in project area).	• Adverse residual impacts not anticipated
Hillside Plantation woodland	• Disturbance (**Low to Moderate**).	• EIAO-TM Annex 8	• Not applicable	• Establishment of about	• Adverse residual

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	• Dust deposition on vegetation (**Low**). • Combined impacts **Low**.	and Annex 16		16ha of Woodland compensatory planting.	impacts not anticipated
Other wetland-dependent bird species (excluding those associated with main river channels (see above))	• Combined fragmentation impact for freshwater wetland / wet agricultural land habitat specialists: **Low to Moderate**.	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Long Valley Nature Park (LVNP) implementation, management and maintenance. • Building setback from Long Valley • Use of 2m high dull green site barriers adjacent to habitats of ecological importance. • Maintenance of existing ecological linkages between assessment area and Deep Bay. • Green Corridors along larger watercourses provided and maintenance of river	• Adverse residual impacts not anticipated

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				screen planting.	
Other species of conservation importance	• Fragmentation impact: **Low-Moderate**. • Light and glare impacts: **Low** for most species but may be **Low to Moderate** for migrating birds • Mortality impacts arising from collision: **Low**, largely smaller birds • Cumulative impact of habitat loss, disturbance and fragmentation: **Low** overall but **Moderate** for freshwater wetland/wet agricultural land habitat-specialist species. • Combined impacts: **Moderate** overall but **Moderate to High** for freshwater wetland/wet	• EIAO-TM Annex 8 and Annex 16	• Not applicable	• Guidelines for building design measures to minimize light and glare impacts on mammals and birds applied. • Noise barriers designed to minimize avian collision mortality.	• Adverse residual impacts not anticipated

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	agricultural land habitat-specialist species).				

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Fisheries Impact					
Construction Phase					
Active Fish Ponds	• Direct loss: Low	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Inactive Fish Ponds	• No Fisheries Impacts.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Abandoned Fish Ponds	• Direct loss of these ponds: Very Low Fisheries Impact.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Fisheries resources/ production	• Loss of fish fry ponds: • Moderate.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• Early notification of operator of resumption programme to permit timely relocation of fish fry farm to an alternative location.	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Nursery and spawning grounds	• No Fisheries Impacts.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Impact on fishing activity	• No Fisheries Impacts	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Aquaculture activity.	• Loss of fish fry ponds: Moderate.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• Early notification of operator of resumption programme to permit timely relocation of fish fry farm to an alternative location.	• Adverse residual impacts not anticipated.
Pollution of watercourses resulting in downstream impacts to fisheries	• Low	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• Standard on-site measures to minimize impacts of run-off and pollution events. • Monitoring station to be established at Ma Tso Lung Stream.	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Operational Phase		• EIAO-TM Annex 9 and Annex 17			
Active Fish Ponds	• No Fisheries Impacts.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Inactive Fish Ponds	• No Fisheries Impacts.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Abandoned Fish Ponds	• No Fisheries Impacts.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Fisheries resources/ production	• No Fisheries Impacts	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Nursery and spawning grounds	• No Fisheries Impacts.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Impact on fishing activity	• No Fisheries Impacts	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Aquaculture activity.	• No Fisheries Impacts	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.
Pollution of watercourses resulting in downstream impacts to fisheries	• No Fisheries Impacts.	• EIAO-TM Annex 9 and Annex 17	• Not applicable	• None required	• Adverse residual impacts not anticipated.

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Hazard to Life					
Construction Phase					
Future population in vicinity of transport, storage and use of chlorine associated with the operations at Sheung Shui Water Treatment Works	• The risk levels of transport, storage and use of chlorine associated with the operations at Sheung Shui Water Treatment Works during construction phase of the Project to the future are considered "acceptable" according to the risk guidelines and no adverse impact is expected.	• EIAO-TM Annex 4 and Annex 22	• Not Applicable	• Not Applicable	• No adverse residual impacts anticipated.
Operational Phase					
Future population in vicinity of transport, storage and use of	• The risk levels of transport, storage and use of chlorine	• EIAO-TM Annex 4 and Annex 22	• Not Applicable	• Not Applicable	• No adverse residual impacts anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
chlorine associated with the operations at Sheung Shui Water Treatment Works	associated with the operations at Sheung Shui Water Treatment Works during operation phase of the Project to the future population are considered "acceptable" according to the risk guidelines and no adverse impact is expected.				

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Land contamination					
Construction Phase					
Potential land contamination sites within the Project Area	• Anomalistic high arsenic was detected in 3 potentially contaminated sites in government land in KTN. • 47 potentially contaminated sites in KTN, 24 potentially contaminated sites in FLN and 4 potentially contaminated sites near FLB were not granted access for conducting site investigation (SI). • Re-appraisal of 158 surveyed sites in KTN, 25 surveyed sites in FLN and 13	• Section 3 (Potential Contaminated Land Issues) of Annex 19 "Guidelines for Assessment of Impact on Sites of Cultural Heritage and Other Impacts" of the EIAO-TM. • Guidance Note for Contaminated Land Assessment and Remediation. • Practice Guide for Investigation and Remediation of Contaminated Land • Guidance Manual for Use of Risk-based	• Not applicable	• A Health Risk Assessment has been conducted and results indicate that the health risk of arsenic through inhalation of arsenic-containing dust during construction stage of KTN development is non-significant for both Cancer Risk Level and Non-cancer Risk Level. • Project Proponent would carry out further site visit and prepare and submit the supplementary CAP to EPD prior to the commencement	• No adverse residual impacts would be anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	surveyed sites in FLB would be required to ensure any potential contamination activities from land use changes after the approval of this land contamination assessment study.	Remediation Goals for Contaminated Land Management		of SI works.	
Operational Phase					
Not Applicable	• Not Applicable	• Not Applicable	• Not Applicable	• Not Applicable	• Not Applicable

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Landfill Gas Impact					
Construction Phase					
MTLL and its 250m Consultation Zone	• The potential risk of MTLL during construction phase is "high"	• Section 1.1(f) in Annex 7 of the EIA Technical Memorandum (TM); • Section 3.3 in Annex 19 of the EIA TM; • Landfill Gas Hazard Assessment Guidance Note (1997) (EPD/TR8/97); and • Landfill Gas Hazard Assessment for Development Adjacent to Landfills (ProPECC PN 3/96).	• Not applicable.	• Precautionary measures stipulated in the landfill Gas Hazard Assessment Guidance Note.	• No residual impacts would be anticipated

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Operational Phase					
MTLL and its 250m Consultation Zone	• The potential risk of MTLL during operational phase is 'low' to 'high'	• Section 1.1(f) in Annex 7 of the EIA Technical Memorandum (TM); • Section 3.3 in Annex 19 of the EIA TM; • Landfill Gas Hazard Assessment Guidance Note (1997) (EPD/TR8/97); and • Landfill Gas Hazard Assessment for Development Adjacent to Landfills (ProPECC PN 3/96).	• Not applicable.	• Utility companies to take appropriate precautions at all times when entering enclosed spaces or plant rooms. • Building management • Monitoring requirement	• No residual impacts would be anticipated

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Landscape and Visual Impact Assessment					
Construction Phase					
• Landscape Resources (LRs) and Landscape Character Area (LCAs) within the Study Areas • Visually Sensitive Receivers (VSRs) within the Primary Zones of Visual Influence	• Substantial to insignificant adverse impacts on LRs within the KTN and FLN NDA Study Areas • Substantial to insignificant adverse impacts on LCAs within the KTN NDA Study Area • Substantial to slight adverse impacts on LCAs within the FLN NDA Study Area • Substantial to insignificant adverse	• EIAO (Cap. 499. S16) and the Technical Memorandum on EIA Process (EIAO-TM); • EIAO GN 8/2010 (Preparation of Landscape and Visual Impact Assessment under the Environmental Impact Assessment Ordinance); • Town Planning Ordinance (Cap131) and Town Planning (Amendment)	• Not Applicable	• Minimum Topographical Change • Detailed Design - Visual • Tree Protection & Preservation • Tree Transplantation • Slope Landscaping • Compensatory Planting • Woodland Compensatory Planting	• Moderate to insignificant adverse impacts on LRs within the KTN and FLN NDA Study Areas • Moderate to insignificant adverse impacts on LCAs within the KTN NDA Study Area • Moderate to insignificant adverse impacts on LCAs within the FLN NDA Study Area • Moderate to

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	impacts on VSRs due to KTN NDA	Ordinance; • Hong Kong Planning Standards and Guidelines (HKPSG); • Land Administration Office Instruction (LAOI) Section D-12 Tree Preservation; • DEVB TCW No. 2/2012 – Allocation of Space for Quality Greening on Roads; • DEVB TCW No. 3/2012 – Site Coverage of Greenery for Government Building Projects; • DEVB, Greening, Landscape and Tree Management Section (GLTM) April 2012 – Guidelines on		• Vertical Greening • Green Roof • Screen Planting • Road Greening • Marsh/Wetland Compensation • Watercourse Impact Mitigation - Reprovision of Natural Stream • Watercourse Impact Mitigation - Stream Buffer Planting • Watercourse Impact Mitigation- Enhancement Planting along Embankment • Watercourse Impact Mitigation – Avoid Affecting	insignificant adverse impacts on VSRs due to KTN NDA • Moderate to insignificant adverse impacts on VSRs due to FLN NDA

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Greening of Noise Barriers; • DEVB TCW No. 2/2013 – Greening on Footbridges and Flyovers; • DSD PN No.1/2005 – Guidelines on Environmental Considerations for River Channel Design; • ETWB TCW No. 2/2004 – Maintenance of Vegetation and Hard Landscape Features; • ETWB TCW No. 11/2004 – Cyber Manual for Greening; • ETWB TCW No. 29/2004 – Registration of Old		Watercouses • Pond Replacement • Screen Hoarding Light Control	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		and Valuable Trees, and Guidelines for their Preservation; • ETWB TCW No. 36/2004 – The Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS);' • ETWB TCW No. 5/2005 – Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works; • ETWB TCW No. 3/2006 – Tree Preservation; • HyD HQ/GN/13 Interim Guidelines for			

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit; • HQ/GN/15 - Guidelines for Greening Works along Highways; • Urban Design Guidelines for Hong Kong issued by the Planning Department (2003); • Study on Landscape Value Mapping of Hong Kong; • WBTC No. 25/92 – Allocation of Space for Urban Street Trees; • WBTC No. 7/2002 –			

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Tree Planting in Public Works; • GEO publication (1999) – Use of Vegetation as Surface Protection on Slopes; and GEO 1/2011 – Technical Guidelines on Landscaping Treatment for Slopes			
Operational Phase					
• Landscape Resources (LRs) and Landscape Character Area (LCAs) within the Study Area • Visually Sensitive Receivers (VSRs) within the Primary Zone of Visual	• Substantial to insignificant adverse impacts on LRs within the KTN and FLN NDA Study Areas • Substantial to insignificant adverse impacts on LCAs within the KTN NDA	• EIAO (Cap. 499. S16) and the Technical Memorandum on EIA Process (EIAO-TM); • EIAO GN 8/2010 (Preparation of Landscape and Visual Impact Assessment under	• Not Applicable	• Minimum Topographical Change • Detailed Design - Visual • Tree Protection & Preservation • Tree Transplantation	• Moderate to insignificant adverse impacts on LRs within the KTN and FLN NDA Study Areas • Moderate to insignificant adverse impacts on LCAs within the KTN NDA

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Influence	Study Area • Substantial to slight adverse impacts on LCAs within the FLN NDA Study Area • Substantial to insignificant adverse impacts on VSRs due to KTN NDA • Substantial to slight adverse impacts on VSRs due to FLN NDA	the Environmental Impact Assessment Ordinance); • Town Planning Ordinance (Cap131) and Town Planning (Amendment) Ordinance; • Hong Kong Planning Standards and Guidelines (HKPSG); • Land Administration Office Instruction (LAOI) Section D-12 Tree Preservation; • DEVB TCW No. 2/2012 – Allocation of Space for Quality Greening on Roads; • DEVB TCW No. 3/2012 – Site Coverage of Greenery for		• Slope Landscaping • Compensatory Planting • Woodland Compensatory Planting • Vertical Greening • Green Roof • Screen Planting • Road Greening • Marsh/Wetland Compensation • Watercourse Impact Mitigation - Reprovision of Natural Stream • Watercourse Impact Mitigation - Stream Buffer Planting • Watercourse Impact	Study Area • Moderate to insignificant adverse impacts on LCAs within the FLN NDA Study Area • Moderate to insignificant adverse impacts on VSRs due to KTN NDA • Moderate to insignificant adverse impacts on VSRs due to FLN NDA

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Government Building Projects; • DEVB, Greening, Landscape and Tree Management Section (GLTM) April 2012 – Guidelines on Greening of Noise Barriers; • DEVB TCW No. 2/2013 – Greening on Footbridges and Flyovers; • DSD PN No.1/2005 – Guidelines on Environmental Considerations for River Channel Design; • ETWB TCW No. 2/2004 – Maintenance of Vegetation and Hard		Mitigation- Enhancement Planting along Embankment • Watercourse Impact Mitigation – Avoid Affecting Watercouses • Pond Replacement • Light Control	

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Landscape Features; • ETWB TCW No. 11/2004 – Cyber Manual for Greening; • ETWB TCW No. 29/2004 – Registration of Old and Valuable Trees, and Guidelines for their Preservation; • ETWB TCW No. 36/2004 – The Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS);' • ETWB TCW No. 5/2005 – Protection of Natural Streams/Rivers from Adverse Impacts			

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Arising from Construction Works; • ETWB TCW No. 3/2006 – Tree Preservation; • HyD HQ/GN/13 Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit; • HQ/GN/15 - Guidelines for Greening Works along Highways; • Urban Design Guidelines for Hong Kong issued by the Planning Department (2003); • Study on Landscape			

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Value Mapping of Hong Kong; • WBTC No. 25/92 – Allocation of Space for Urban Street Trees; • WBTC No. 7/2002 – Tree Planting in Public Works; • GEO publication (1999) – Use of Vegetation as Surface Protection on Slopes; and • GEO 1/2011 – Technical Guidelines on Landscaping Treatment for Slopes			

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Noise Impact					
Construction Phase					
Existing and planned residential premises and schools in the vicinity of KTN and FLN NDA. Assessment points (refer to **Appendix 4.1a**)	• Without mitigation measures, the predicted cumulative noise levels would range from 66 to 93 dB(A). Most of the sensitive receivers will be higher than 80 dB(A). Around 6 sensitive receivers will greater than or equal to 90 dB(A).	• TM-EIAO Annex 5 for non-restricted hours for domestic premises: 75 dB(A), for educational institution is 70 dB(A) (65 dB(A) during examination period).	• Exceed the TM-EIAO noise criterion by up to 18 dB(A) for residential premises and 12 dB(A) for schools (17 dB(A) during examination period.)	• Adoption of good site practices, optimization of construction methodology, quieter plant, temporary movable noise barriers enclosure and acoustic mat to minimize construction noise impact	• The mitigated predicted cumulative noise levels would range from 56 to 77 dB(A). The exceedance of 1-2 dB(A) for 3-24 months for residential premises and 1-5 dB(A) for 2-5 months for school during examination period. Most of the sensitive receiver will comply the noise criteria, 5 sensitive receivers will greater than 75 dB(A). • It is considered that all practicable measures have been

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
					exhausted to minimize the adverse residual impact.
Operational Phase (Traffic Noise)					
Existing and Planned residential premises, schools, clinics, temple in the vicinity of KTN NDA and FLN NDA Assessment points (refer to **Appendix 4.1b**)	• Without noise mitigation measures, the predicted noise levels would be in the range of 24 to 84 dB(A); • The noise contribution from Project Roads would be up to 84 dB(A)	• TM-EIAO Annex 5	• Exceed the TM-EIAO noise criterion by up to 22 dB(A)	• Implementation of low noise road surfacing, vertical noise barrier, vertical noise barrier with cantilevered arm, semi-enclosure and full enclosure before the operational stage; • Provision of acoustic insulation with air conditioning system	• Some of the noise sensitive receivers will exceed the noise criteria, however, the noise contribution from Project Roads is less than 1.0 dB(A).

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Operational Phase (Fixed Noise)					
Existing and Planned residential premises, schools and temple in the vicinity of KTN NDA and FLN NDA Assessment points (refer to **Appendix 4.1c**)	• Without noise mitigation measures, the predicted noise levels would be in the range of 30 to 72 dB(A); • Maximum allowable sound power level of the proposed fixed plants such as district cooling system, sewage pumping station, pumping station, sewage treatment works were predicted to meet the relevant noise criteria	• TM-EIAO Annex 5: ANL-5dB(A) or prevailing noise level	• Exceed the noise criterion by up to 18 dB(A)	• Direct noise mitigation measures including silencers, noise barrier and acoustic enclosure should be allowed; • Provision of acoustic insulation with air conditioning system	• No adverse residual impacts would be anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Operational Phase (Helicopter Noise)					
Planned residential premises and schools in the vicinity of KTN NDA Assessment points (refer to **Appendix 4.1d**)	• Without noise mitigation measures, the predicted noise levels would be in the range of 69 to 118 dB(A)	• TM-EIAO Annex 5	• Exceed the TM-EIAO noise criterion by up to 33 dB(A) for KTN NDA	• Provision of acoustic insulation with air conditioning system	• No adverse residual impacts would be anticipated.

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Sewage Impact					
Construction Phase					
	• No applicable	• No applicable	• No applicable	• No applicable	• No applicable
Operational Phase					
Existing sewage system and sewage treatment	• Projected flow in year 2031 to Shek Wu Hui Sewage Treatment Works (SWHSTW) would be about 190,000m^3/day. • Contribution from KTN NDA and FLN NDA is projected to be 51,507 m^3/day	• Technical Memorandum - Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters, the Water Pollution Control Ordinance (Cap 358) • "No Net Increase in Pollutant Loading to Deep Bay Policy" • Treatment capacity of the existing SWHSTW is about	• Additional Pollutant loading violates the "No Net Increase Policy". • Projected flow from KTN NDA and FLN NDA together with natural growth and other committed and planned development within the sewage catchment, exceeds the current treatment capacity of SWHSTW by	• Upgrading and expansion of the SWHSTW	• No residual impacts would be anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		93,000m^3/day	97,000m^3/day		
TSE reuse	Not applicable. TSE if not reused will be discharged to Deep Bay.	Not applicable.	Not applicable	• Proper polishing of TSE for routine monitoring prior to distribution • Separate distribution system from that of potable water.	• No residual impacts would be anticipated.

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Waste					
Construction Phase					
Water quality, air and noise sensitive receivers at or near the Project Site, the waste transportation routes and the waste disposal site.	• Typical wastes include site clearance waste, excavated materials, construction and demolition (C&D) materials, asbestos containing materials, chemical wastes, general refuse and sewage will be generated.	• Waste Disposal Ordinance (Cap. 354); • EIAO-TM Annex 7 and Annex 15 • Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation; • Dumping at Sea Ordinance (Cap. 466). Land • (Miscellaneous Provisions) Ordinance (Cap. 28);	• Not applicable.	• The opportunity for on-site sorting, reusing excavated fill materials, etc., are devised in the construction methodology to minimise the surplus materials to be disposed. • Recommendations have been made for implementation by the Contractor to minimise waste generation and off-site disposal.	• No residual impacts would be anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Operational Phase					
Water quality, air and noise sensitive receivers at or near the Project Site, the waste transportation routes and the waste disposal site.	• 263 tpd of Municipal solid waste • chemical waste • sewage sludge	• Waste Disposal Ordinance (Cap. 354); and • Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C).	• Not applicable.	• Proper treatment and disposal of wastes.	• No residual impacts would be anticipated

Impact Summary

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Water Quality Impact					
Construction Phase					
Rivers, watercourses, agricultural land, marshland, ponds, wetlands KTN NDA: 24 assessment points; FLN NDA: 28 assessment points (refer to **Figures 5.3** & **5.4**)	• Potential deterioration in water quality	• TM-EIAO; • Water Pollution Control Ordinance (WPCO) (Cap. 358); • Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS); • Practice Note for Professional Persons (ProPECC) PN 1/94	• No exceedance was predicted.	• Appropriate mitigation measures has been proposed (see Section 5.7.1) to control the following: - Construction runoff and drainage - Alternation of natural streams - Groundwater from contaminated area - Sewage from workforce	• No unacceptable water quality impacts would be anticipated. • No residual impact would be anticipated.

Receivers/ Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/ Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Operational Phase					
Rivers, watercourses, agricultural land, marshland, ponds, wetlands KTN NDA: 24 assessment points; FLN NDA: 28 assessment points (refer to **Figures 5.3** & **5.4**)	Water quality would be deteriorated by: - Sewage and sewerage system - Discharge from District Cooling System - Runoff from roads/open areas - Drainage system	• Relevant standards/ criteria stipulated under the EIAO-TM, WPCO, TM-DDS and ProPECC 5/93	• No exceedance was predicted	• Appropriate and practicable mitigation measures have been proposed to control potential adverse water quality impact during operational phase (see Section 5.7.2)	• No unacceptable water quality impacts would be anticipated. • No residual impact would be anticipated.