33/F, Revenue Tower, 5 Gloucester Road, Wan Chai, Hong Kong
香港灣仔告士打道 5 號稅務大樓 33 樓

ACE-EIA Paper 5/2013
For advice on 19 August 2013

Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment Report
North East New Territories New Development Areas

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report for the Kwu Tung North (KTN) and Fanling North New Development Areas (NDAs) (hereafter known as "the Project") of the North East New Territories NDAs (NENT NDAs) submitted under section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-213/2013). The Civil Engineering and Development Department (CEDD) (the applicant) and their consultants will present the EIA report at the meeting of EIA Subcommittee, if necessary.

ADVICE SOUGHT

2. Members' views are sought on the findings and recommendations of the EIA report. The Director of Environmental Protection (DEP) will take into account comments from the public and the Advisory Council on the Environment (ACE) in deciding whether or not to approve the EIA report under section 8(3) of the EIAO.

BACKGROUND

3. The Study on Hong Kong 2030: Planning Vision and Strategy (the

HK2030 Study) carried out by the Planning Department (PlanD) was completed in 2007 and recommended proceeding with the NENT NDAs including KTN NDA, FLN NDA and Ping Che/Ta Kwu Ling (PC/TKL) NDA to address long-term housing demand and to provide job opportunities. The NENT NDAs were included as one of the ten major infrastructure projects in the Chief Executive's 2007-08 Policy Address.

4. The "North East New Territories New Development Areas Planning and Engineering Study" (the Study) was commissioned jointly by CEDD and PlanD in June 2008. The Study has adopted a three-stage public engagement programme since November 2008 to foster consensus building. After careful and comprehensive consideration of comments received during the public engagement exercises and taking into account all relevant consideration of the findings of various technical assessments, it is recommended to proceed with the developments in KTN and FLN NDAs to accommodate about 174,900 population, whereas the PC/TKL NDA will be critically reviewed and re-planned. Therefore, the PC/TKL NDA is not included in the current EIA report.

5. The applicant has submitted the EIA report for the Project and DEP, in conjunction with the relevant authorities, considers that the EIA report meets the requirement of the EIA Study Brief and the Technical Memorandum on EIA Process (TM).

NEED FOR THE PROJECT

6. The applicant has advised that in light of the population growth and the long-term demand for housing and employment, the HK2030 Study, completed in 2007 by PlanD, had recommended proceeding with the development of the NDAs. Despite the population growth in the latest projection is slower than that adopted by the HK2030 Study, there will still be an increase of about 1.4 million people in the coming 30 years. Due to the decrease in household size, the increase in the number of households is even more substantial. Development of the NDAs has a long lead time of at least 10 years and it is necessary to plan and to develop additional land now to ease pressure on developed areas and to meet the demand for land arising from population growth in Hong Kong. The NDAs would provide lands 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.

Environmental Benefits

7. The EIA report stated that the major environmental benefits with the Project in place include:

- Formation of Fanling/Sheung Shui/Kwu Tung (FL/SS/KT) New Town to serve a wider community and increase housing supply and employment opportunities. A holistic approach in the new town planning will ensure compliance with the relevant environmental quality and standards. The existing haphazard developments in the areas could be improved and new infrastructure, including roads, drains and sewerage system, could be provided, as well as more Government, Institution or Community facilities could be provided, not only to serve the NDAs but also the adjacent Fanling/Sheung Shui New Town;
- Designation of the Long Valley as Nature Park, hence safeguarding this area in the long term and actively managing it to further enhance its ecological value as a major ecological benefit of the Project at a Hong Kong level; and
- Provision of opportunities to promote a low carbon and green community such as the reuse of treated sewage effluent, low emission transport system, adoption of district cooling system (subject to further studies), built form and design, etc.

DESCRIPTION OF THE PROJECT

8. The overall objective of the Study is to establish a planning and development framework for KTN and FLN NDAs to meet long-term housing, social, economic and environmental needs, and to formulate an implementation programme for the NDAs.

9. KTN and FLN NDAs would become the extension of Fanling/Sheung Shui New Town to form the FL/SS/KT New Town. The FL/SS/KT New Town will be an integrated community providing a wide range of employment opportunities, as well as commercial, community, recreational and cultural facilities supporting a larger population.

10. The KTN NDA has an area of about 450 ha and is proposed to accommodate a population of 101,600. The FLN NDA has an area of 164 ha and is proposed to accommodate a population of 73,300. **Figures 1 to 3** illustrate the proposed general layout of the Project and the individual Designated Projects (DPs). **Figures 4 and 5** shows the Recommended Outline Development Plans of KTN and FLN NDAs.

11. As the Study involves a study area greater than 20 ha, it constitutes a Schedule 3 (Item 1[1]) Designated Project. The Project also cover the following individual Schedule 2 DPs:

(i) San Tin Highway and Fanling Highway Kwu Tung Section Widening between San Tin Interchange and Po Shek Wu Interchange (Major Improvement) (i.e. Item A1[2] in Schedule 2 of the EIAO);
(ii) Castle Peak Road Diversion (Major Improvement) (i.e. Item A1 in Schedule 2 of the EIAO);
(iii) KTN NDA Road P1 and P2 (New Road) and associated new Kwu Tung Interchange (New Road) and Pak Shek Au Interchange Improvement (Major Improvement) (i.e. Item A1 in Schedule 2 of the EIAO);
(iv) KTN NDA Road D1 to D5 (New Road) (Item A1 in Schedule 2 of the EIAO);
(v) New Sewage Pumping Stations (SPSs) in KTN NDA (Item F3[3] in Schedule 2 of the EIAO);
(vi) Proposed railway station and associated facilities in KTN NDA (To be conducted under separate studies) (Item A2[4] in Schedule 2 of the EIAO);
(vii) Utilisation of Treated Sewage Effluent from SWHSTW (Item F4[5] in Schedule 2 of the EIAO);
(viii) Po Shek Wu Interchange Improvement (Major Improvement) (Item A1

1 Item 1 of Schedule 3 – "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".
2 Item A1 of Part I of Schedule 2 – "A road which is an expressway, trunk road, primary distributor road or district distributor road including new roads, and major extensions or improvements to existing roads".
3 Item F3 of Part I of Schedule 2 – "A sewage pumping station with an installed capacity of more than 2,000m3 per day and a boundary of which is less than 150m from an existing or planned – existing or planned residential area or educational institution".
4 Item A2 of Part I of Schedule 2 – "A railway and its associated stations".
5 Item F4 of Part I of Schedule 2 – "An activity for the reuse of treated sewage effluent from a treatment plant".

in Schedule 2 of the EIAO);

(ix) Fanling Bypass Western Section (New Road) (Item A1 in Schedule 2 of the EIAO);

(x) Fanling Bypass Eastern Section (New Road) (Item A1 in Schedule 2 of the EIAO);

(xi) Shek Wu Hui Sewage Treatment Works (SWHSTW) - Further Expansion at FLN NDA (Item F1[6] in Schedule 2 of the EIAO);

(xii) Reprovision of temporary wholesale market in FLN NDA. (Item N3[7] in Schedule 2 of the EIAO); and

(xiii) New Sewage Pumping Stations (SPSs) in FLN NDA (Item F3 in Schedule 2 of the EIAO).

CONSIDERATION OF ALTERNATIVE OPTIONS

12. The EIA report has considered various alternative options for the development of KTN and FLN NDAs, including the land uses, general layout, scale of development, building height, road alignments, designs, construction methods, sequence of works, etc. to avoid and minimise environmental impacts. The environmental benefits and dis-benefits of the options have been evaluated. The recommended options of various Project items have taken into account environmental considerations, site constraints, comments received from the public and Government departments, including those received during the public engagement exercises of the Study. The key consideration and outcomes are highlighted below.

Avoidance and Minimisation

13. The applicant has advised that avoidance and minimisation of environmental impacts have been the key considerations, among others, throughout the entire Project development and design. Some of the key approaches which have been adopted in the Project by the applicant to avoid and minimise the environmental impacts are summarised as follows:

(i) To avoid ecological impact by designating the area of highest ecological value (about 37 ha), the largely wetland area south and east of the

6 Item F1 of Part I of Schedule 2 – "Sewage treatment works with an installed capacity of more than 15,000m3 per day".

7 Item N3 of Part I of Schedule 2 – "A wholesale market".

Sheung Yue River and south and west of the Shek Sheung River in Long Valley, as "Other Specified Uses (Nature Park)";

(ii) To avoid potential impacts to the Ma Tso Lung Stream and its riparian corridor and fauna of conservation significance by including the sections of the stream and tributaries to the south of where it is crossed by the Lok Ma Chau (LMC) Loop Eastern Connection Road in a "Green Belt" zone where there is a presumption against development. Provision of a buffer zone of at least 15m at the western side and about 30m at the eastern side, planted with riparian trees, shrubs and other vegetation in order to maintain and enhance ecological linkages along the stream;

(iii) To minimise the odour impact from the proposed SWHSTW Expansion with the implementation of odour control measures, such as covering the major odour sources and provision of deodourising treatment;

(iv) To minimise landscape and visual impacts by reducing topographical/landform changes as well as reduce land take and interference with natural terrain changes; and

(v) To minimise visual impact through establishment of open space network, green corridors, view corridors, stepped building heights, setback and buffer zones etc.

SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

Ecological Impact

14. The area of highest ecological value in the Project is Long Valley which is a site of ecological significance in the Hong Kong context due to its being the largest remaining contiguous area managed for the production of wet agricultural crops. Ma Tso Lung Stream, its tributaries and the riparian zone of these streams are also of ecological importance. A number of species of conservation importance have been found in or near the stream, of these Three-banded Box Terrapin, which is listed as being Critically Endangered globally is of greatest significance. Direct impacts on the above were avoided as far as possible during the planning stage in formulating the Recommended Outline Development Plans (RODPs).

15. In addition to those major approaches and alternatives to avoid and minimise environmental impacts as mentioned in paragraphs 13 and 14 above, the applicant also proposes the following key ecological mitigation measures to

mitigate any unavoidable ecological impacts identified in the EIA study:

i) For Long Valley Nature Park, a detailed Habitat Creation and Management Plan will be prepared and implemented. Habitat enhancement measures will be implemented in Long Valley Nature Park to compensate for the unavoidable loss of 5.82 ha of wetland habitats including fishponds, mitigation wetlands, wet agricultural land and seasonally wet grassland identified under the Project and potential impacts on fauna species associated with these wetlands;

ii) A series of measures to mitigate for disturbance impacts on Long Valley, including planning control, provision of adequate buffer and screen plantings, installation of 2m high fences around works area, restrictions on works during breeding season on flight-lines;

iii) The proposed Fanling Bypass to cross Siu Hang San Tsuen Stream on viaduct to avoid direct ecological impact;

iv) Avoidance of works within channels and surface water catchments of Ma Wat River upstream of current Fanling Highway crossing point and Kau Lung Hang Watercourses;

v) Phasing of works along main river channels and near existing Egretries to avoid/minimise disturbance impacts;

vi) Provision of alternative egretry roosting and foraging sites for the unavoidable loss of the existing Man Kam To Road Egrerty;

vii) Preservation and provision of screen planting and optimise building setback along main river channels;

viii) Retaining the agricultural zonings of the area west and north of Ng Tung River and Sheung Yue River and east of Ho Sheung Heung, and the area east of Yin Kong. To strengthen the planning control over the agricultural zone to reflect the importance of this area being on the flight path of the birds and a buffer zone for the Long Valley Nature Park, stringent planning control will be exercised and will be stated in the Explanatory Statement of the relevant Outline Zoning Plan;

ix) A series of measures to protect the Ma Tso Lung Stream riparian corridor including designation of a no-building buffer zone, restoration of the stream to natural conditions following diversion, LMC Loop Eastern Connection Road to cross the stream on viaduct, provision of a permanent barrier on the at-grade section of the LMC Loop Eastern Connection Road to prevent terrestrial fauna mortality and a faunal underpass to mitigate for fragmentation impacts;

x) Establishment of around 16 ha of secondary woodland in KTN to compensate the loss of 0.23 ha secondary woodland and 8.65 ha hillside plantation arising from developments. Details of the above compensatory habitat would be formulated and provided in the Woodland Planting and Management Plan;

xi) Control of potential pollution and hydrological impacts in works areas of ecological significance, and in or adjacent to watercourses;

xii) Installation of 2m high fences around works areas adjacent to habitats/areas of ecological importance; and

xiii) Conducting pre-site clearance check on all construction sites and pre-works commencement check on any watercourses potentially affected for presence of species of conservation significance. Additional measures would be formulated and implemented as necessary.

16. The EIA concluded that after implementation of the proposed mitigation measures, the residual ecological impacts of the Project is considered acceptable.

Air Quality Impact

17. During the operation phase of the NENT NDAs development, vehicular emissions from open roads could be a concern. The key concerned air quality parameters would be nitrogen dioxide (NO_2) and respirable suspended particulates (RSP). The predicted worst cases of 1-hr NO_2 and Annual NO_2 would be 131µg/m^3 (criterion: 300µg/m^3) and 59µg/m^3 (criterion: 80µg/m3) respectively (with a background of 48.5µg/m^3). The predicted worst cases of 24-hr RSP and Annual RSP would be 56.3µg/m^3 (criterion: 180µg/m^3) and 54µg/m3 (criterion: 55µg/m^3) respectively (with a background of 50.5µg/m^3). All cumulative air quality impacts due to vehicular emissions are all within the prevailing Air Quality Objectives (AQOs).

18. For construction phase, with the implementation of dust control measures including those under the Air Pollution Control (Construction Dust) Regulation, the mitigated worst case dust levels at Air Sensitive Receivers of 1-hr total suspended particulates (TSP), 24-hr TSP and annual TSP are 498 µg/m^3 (criterion: 500µg/m^3); 212 µg/m^3 (criterion: 260µg/m^3) and 77.8 µg/m3 (criterion: 80µg/m^3) respectively. The assessment results show compliance with the respective criteria.

19. For operation phase, potential odour impact from the proposed SWHSTW Expansion has been assessed in the EIA report. With the implementation of odour control measures, such as covering of major odour sources and provision of deodourising treatment, odour impact due to the existing SWHSTW is expected to improve gradually with the expansion of the STW. The EIA concludes that the anticipated odour impact at the sensitive receivers in the NDAs will comply with the established criterion.

20. While the Legislative Council passed the Air Pollution Control (Amendment) Bill 2003 on 10 July 2013 to adopt the new AQOs with effect from 1 January 2014, for the purpose of assessing the air quality impacts under the EIAO, consideration of the assessment criteria would be based on the AQOs prevailing at the time of the decision.

Landscape and Visual Impact

21. The Project's planning layout and design has given consideration to landscape and visual aspects. However, the proposed KTN and FLN NDAs development including buildings, roads (comprising elevated & bridge structures, noise barriers), flushing and fresh water service reservoirs, etc. and the associated works will have potential landscape and visual impacts. Major landscape resources and landscape character areas that will be affected by the construction and operational phase of the Project include rural and urban peripheral villages, hillside landscapes and agriculture land.

22. The NDAs RODPs have been carefully designed to minimise potential impacts on natural watercourses by avoiding development at the most sensitive streams or designating protective zoning to preserve them, and designating buffer areas along key stretches. Particular care has also been taken to conserve the Long Valley area with its agricultural land and ponds.

23. There are about 17,000 no. of trees which may be affected by the proposed development. Of these, about 30% of the affected trees can be retained or transplanted and the remaining would be felled. A detailed Tree Felling Application process will be carried out at the design stage to finalise tree treatment and allocate compensatory planting areas. Five Old and Valuable Trees along Castle Peak Road are proposed to be retained in situ. Apart from this, no rare species or endangered species of trees but only common species

within the NDAs are found.

24. Provision of visual permeability, buffer areas and stepped building height profile to address the potential visual impact of future developments have been considered in formulating the RODPs. With the implementation of mitigation measures including limited works area, preservation of existing trees and transplanting where possible, responsive design of built structures, infrastructure and utilities facilities, minimisation of topographical change, adoption of slope landscaping, appropriate façade treatment, vertical greening and screen planting and restoration of disturbed area with compensatory planting, the overall residual landscape and visual impacts of the Project would be reduced to acceptable level.

Noise Impact

25. Operational noise impacts include helicopter noise, industrial noise, fixed noise sources and road traffic noise. Provision of acoustic insulation with air conditioning is recommended for some of the land use which is affected by helicopter noise and shooting noise near Lo Wu Classification Range.

26. Operational road traffic noise impact on the sensitive uses outside and within NDA area would be mitigated by the provision of vertical noise barriers, vertical noise barriers with cantilevered arm, low noise surfacing, semi-enclosures/full enclosures and controlled to acceptable levels.

27. For the construction noise impact, with the implementation of practical mitigation measures including good site management, acoustic mat and full enclosures, use of “quiet” plant and working method, significant construction noise impacts at nearby sensitive uses are not anticipated.

Water Quality and Sewerage Impact

28. The potential water quality impact of the Project would be caused by the construction site runoff, alteration of natural streams, groundwater from contaminated area and sewage from workforce, etc. The potential impact would be minimised by the Project design and construction methods, e.g. by means of cofferdam, diaphragm wall, pre-cast bridge structures, etc. to separate and avoid the construction works from water courses. Besides, silt traps and oil

interceptors would be installed at the proposed roads with regular cleansing to cater for the operational phase impact.

29. The Project will generate sewage. With the expansion and upgrading of the existing SWHSTW, "No net increase in pollution load requirement in Deep Bay" will be fulfilled. The reuse of treated sewage effluent will be considered for non-potable uses, e.g. toilet flushing, irrigation and district cooling system.

30. The EIA concluded that the water quality impact and sewerage impact would be acceptable with the implementation of the recommended mitigation measures.

Waste Management

31. Whilst the principle of balanced cut and fill construction to minimise generation of inert materials has been adhered to in the determination of the site formation layout, about 4.1Mm^3 inert materials, including the treatment of 1,181,000m^3 of soil mentioned in paragraph 31, will be generated. About 90% of them (i.e. 3.7Mm^3) would be reused on site. The remaining would be sent to public fill reception facilities or landfills. Besides, 134,000m^3 non-inert materials and 186,000m^3 of top soil would be generated and 270,000 m^3 (134,000 non-inert materials and 136,000m^3 of top soil) will be disposal of at landfills.

Land Contamination

32. One of the key issues is the presence of soil with high concentration of Arsenic (As) in KTN NDA. Based on results of the ground investigation and the land use history, it is considered that the high level of As is naturally occurring. While the relevant departments have assessed that the health of the public would not be adversely affected by the presence of As in its existing state, for the proposed NDA development, a detailed Health Risk Assessment (HRA) on As has been conducted and included in the EIA. The HRA focused on two major exposure pathways, namely ingestion and inhalation of As, during construction and operational phases. For the construction phase, suitable mitigation measures, including temporary covering of excavated materials, regular watering and wheel washing facilities, as well as providing protective clothing to workers and prohibiting workers from eating on site, etc., will be implemented to safeguard the workers and the residents nearby. For the operational phase, the HRA results

indicate that the acceptable level of As in soil is 571mg/kg, above which the soil will have to be treated. Based on the findings, about 1,181,000m^3 of soil with high As concentration within the KTN NDA would require treatment. The EIA recommends treatment by solidification/stabilisation method and the treated soil would be reused on site. Re-appraisal of land contamination will be carried out prior to the construction phase to ascertain the actual extent of soil that requires treatment.

Other Environmental Impacts

33. Other environmental impacts including hazard to life, cultural heritage, fisheries and landfill gas hazard have also been addressed in the EIA report. With the implementation of recommended mitigation measures, the Project will comply with the relevant requirements under the TM.

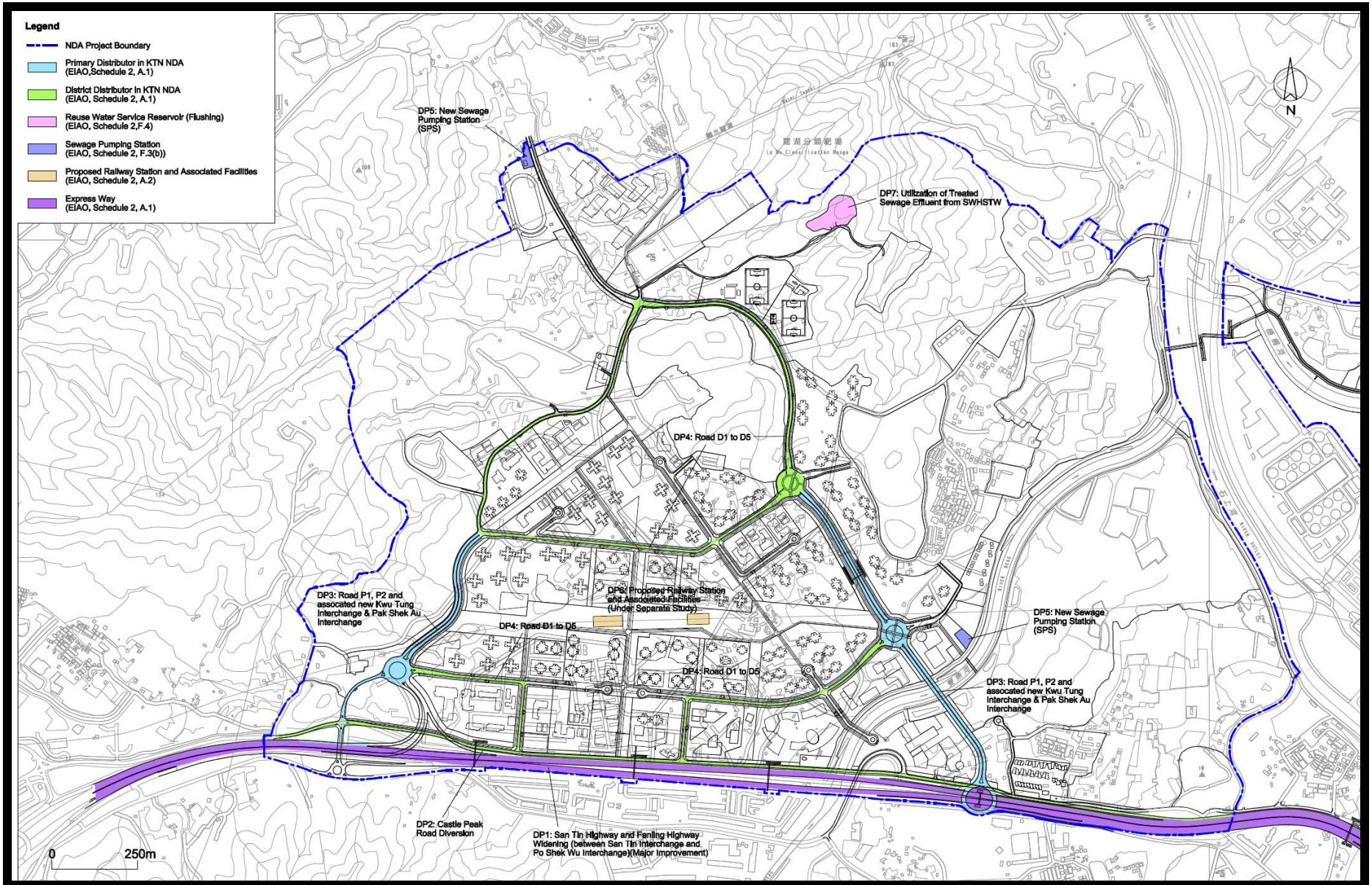
ENVIRONMENTAL MONITORING AND AUDIT (EM&A)

34. The EIA report includes an EM&A Manual which recommends an EM&A programme during the construction and operational phases of the Project. Key recommended EM&A requirements cover ecology, air quality, dust, noise and water quality.

PUBLIC CONSULTATION

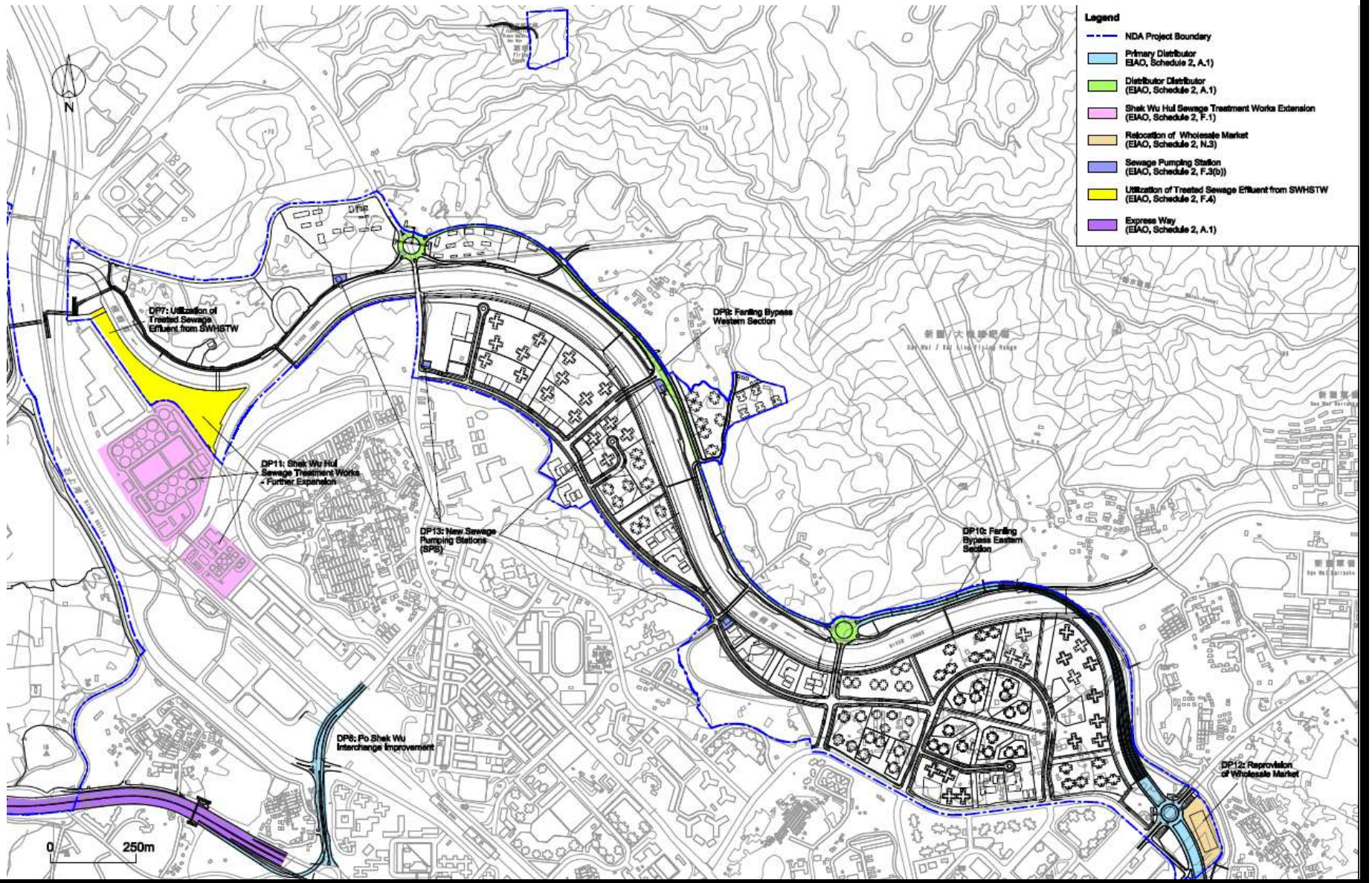
35. The applicant has made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 5 July 2013 to 3 August 2013. During this inspection period, a total of 931 public comments were received by the Environmental Protection Department. The main concerns raised by the public will be summarised in a gist to be provided separately.

August 2013
Environmental Assessment Division
Environmental Protection Department



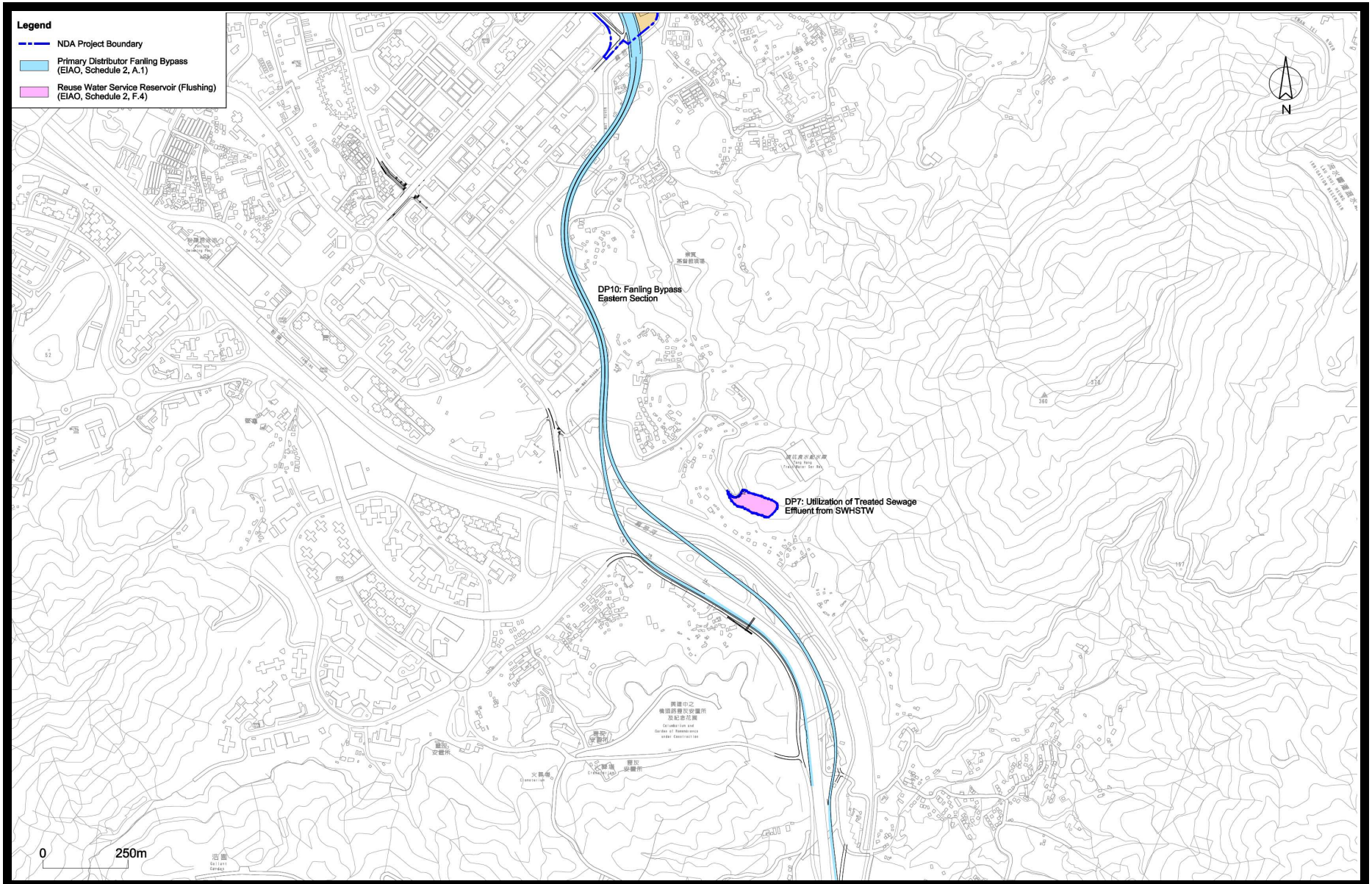
Project Title: North East New Territories New Development Areas
Figure 1: Project Layout Plan of Kwu Tung North New Development Area (based on Figure No. 1.2 of the EIA Report)

Application No.:EIA-213/2013



Project Title: North East New Territories New Development Areas
Figure 2: Project Layout Plan of Fanling North New Development Area (based on Figure No. 1.3 of the EIA Report)

Application No.:EIA-213/2013



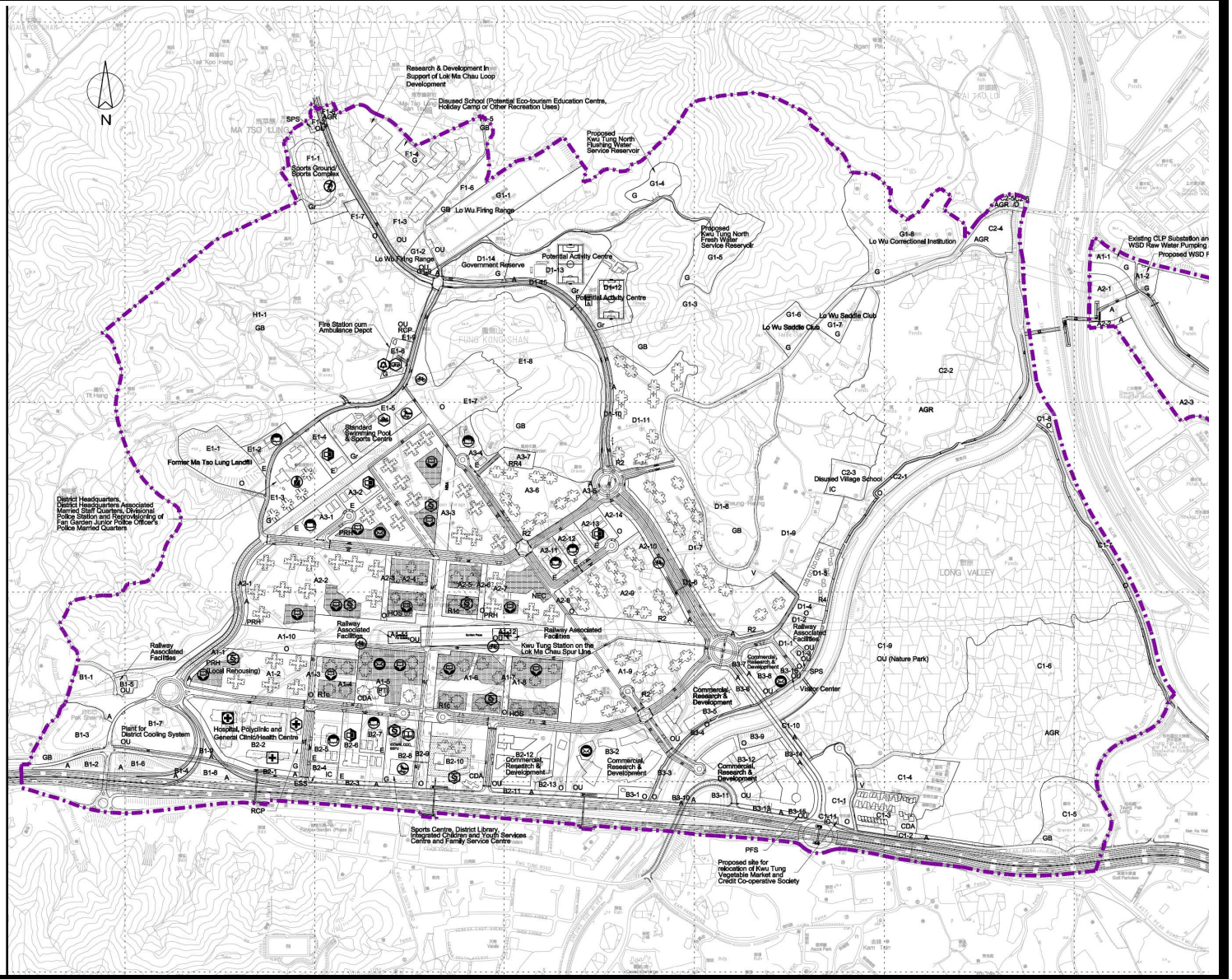
Project Title: North East New Territories New Development Areas
Figure 3: Project Layout Plan – Fanling Bypass
(based on Figure No. 1.4 of the EIA Report)

Application No.:EIA-213/2013

Legend:

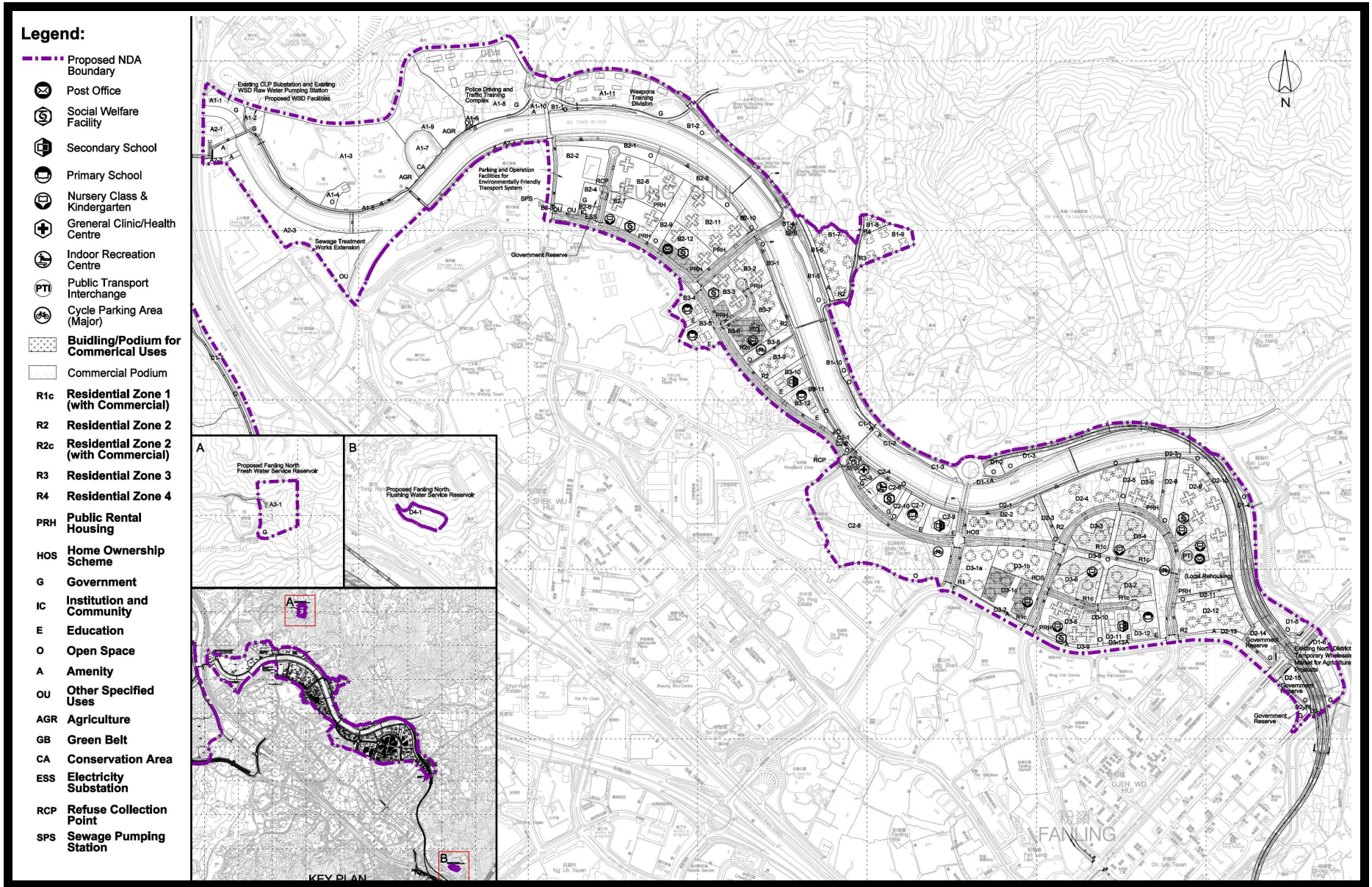
- Proposed NDA Boundary
- District Police Station
- Fire Station
- Ambulance Depot
- Post Office
- Library
- Social Welfare Facility
- Secondary School
- Primary School
- Nursery Class & Kindergarten
- Hospital
- Polyclinic / Specialist Clinic
- General Clinic / Health Centre
- Sports Ground / Sports Complex
- Indoor Recreation Centre
- Swimming Pool Complex
- Public Transport Interchange
- Cycle Parking Area (Major)
- Buidling/Podium for Commerical Uses
- Commercial Podium

CDA	Comprehensive Development Area
R1c	Residential Zone 1 (with Commercial)
R2	Residential Zone 2
R4	Residential Zone 4
RR4	Rural Residential Zone 4
PRH	Public Rental Housing
HOS	Home Ownership Scheme
V	Village Type Development
G	Government
Gr	Government (Recreation)
IC	Institution and Community
E	Education
O	Open Space
A	Amenity
OU	Other Specified Uses
AGR	Agriculture
GB	Green Belt
ESS	Electricity Substation
PFS	Petrol Filling Station
RCP	Refuse Collection Point
SPS	Sewage Pumping Station



Project Title: North East New Territories New Development Areas
Figure 4: Recommended Outline Development Plan (RODP) of KTN NDA (based on Figure No. 2.1 of the EIA Report)

Application No.:EIA-213/2013



Project Title: North East New Territories New Development Areas
Figure 5: Recommended Outline Development Plan (RODP) of FLN NDA (based on Figure No. 2.2 of the EIA Report)

Application No.:EIA-213/2013