# Strategic Development Packages

## Chapter 12

## CHAPTER TWELVE
## STRATEGIC DEVELOPMENT PACKAGES

### Introduction

1. Strategic development areas are essentially identified as potential growth areas with a core residential element. Additional elements such as offices, hotels, port facilities have been included in certain options. The environmental assessments of these strategic development packages focus upon the residential components as other issues are considered under individual strategies. The assessments initially centred on whether effluent collection, treatment and disposal arrangements are adequate or indeed in existence. Solid waste collection and disposal, potential interface problems, air quality and noise related issues have also been considered. Other related development issues are discussed in individual chapters on strategy developments.

Potential Strategic Growth Areas

A. Kai Tak Kowloon Bay Phases 2 and 3
B. Green Island
C. Hong Kong South
D. Tseung Kwan O Phase 3
E. Tung Chung Phases 2, 3 and 4
F. Tai Ho

Minor Growth Areas

G. Lok Ma Chau
H. Kam Tin
I. Yuen Long South
J. Fanling North

Low Density Residential Areas

K. Rural NWNT
L. Tuen Mun East
M. Whitehead

Possible Solution Spaces

N. North Lantau Extension
O. Border Area
P. Additional Redevelopment in Metro area
Q. Tuen Mun - Yuen Long Corridor

2. A series of summary evaluation sheets for individual strategic growth areas were prepared and included in Appendix J. The evaluation results are briefly described below. The Possible Solution Spaces are however not evaluated due to the uncertain nature of development.

### Potential Strategic Growth Areas

#### A. Kai Tak Kowloon Bay Phases 2 and 3 : Metro area

3. Kai Tak Kowloon Bay Phases 2 and 3 are presently located on the existing International Airport and the typhoon shelter. Infilling of the typhoon shelter will have environmental implications in terms of dredging and disposal of contaminated mud (although the quantities cannot be determined at this stage, however this will be controlled under the provisions of existing legislation and guidelines. The Fill Management Committee (FMC) and EPD have set out procedures to be adopted before any marine mud can be removed from the seabed

which include the sampling and testing of materials, definition of the level of contamination and determination of the quantity of material to be dredged and disposed of. Once these details are provided to the FMC, they will determine the controls placed on the dredging and disposal of such material. Implementation of the Strategic Sewage Disposal Scheme (SSDS) Stage I which is scheduled to be commissioned in 1997 should be able to accommodate additional domestic and industrial flows from this development area.

4. Water Quality : Receiving waters are seriously polluted at present, but should improve with the implementation of the SSDS. Effluent flows and loads are assumed to be collected by the SSDS network and thus do not require separate assessment.

5. Air Quality : The site lies within the partially confined airshed of the Harbour Air Control Zone which suffers from poor air quality. Detailed assessments of air quality will need to be carried out to ensure that traffic or industrial related emissions do not create local air quality problems.

6. Noise : Transport links could create serious noise and interface problems unless treated properly, through effective detailed land use arrangement and buffer uses. The proposed East Kowloon Line predominantly cross the reclamation at grade. A further potentially significant noise source is the railway depot and sidings situated to the northwestern extremity of the existing runway. The Public Cargo Working Area at the southeast of the site could also cause elevated noise levels due to operational methods. It should also be noted that the development strategy of this area has been examined under the South East Kowloon Study.

7. Solid Waste : Disposal of solid waste should not create a problem as the Kowloon Bay Refuse Transfer Station is located within one kilometre of the site. On the basis of the population forecasts the additional domestic solid wastes arising from the Phases 2 & 3 developments (170,000 population for Scenario B) amount to 280 tonne or 140 vehicles required to dispose of per day. However as the Kowloon Bay Refuse Transfer Station is very close to this site there should be minimal impact in terms of congestion of local roads (disposal can be staggered to minimise congestion).

8. There are no existing or planned PHIs associated with this development option nor are there any ecological issues to be considered.

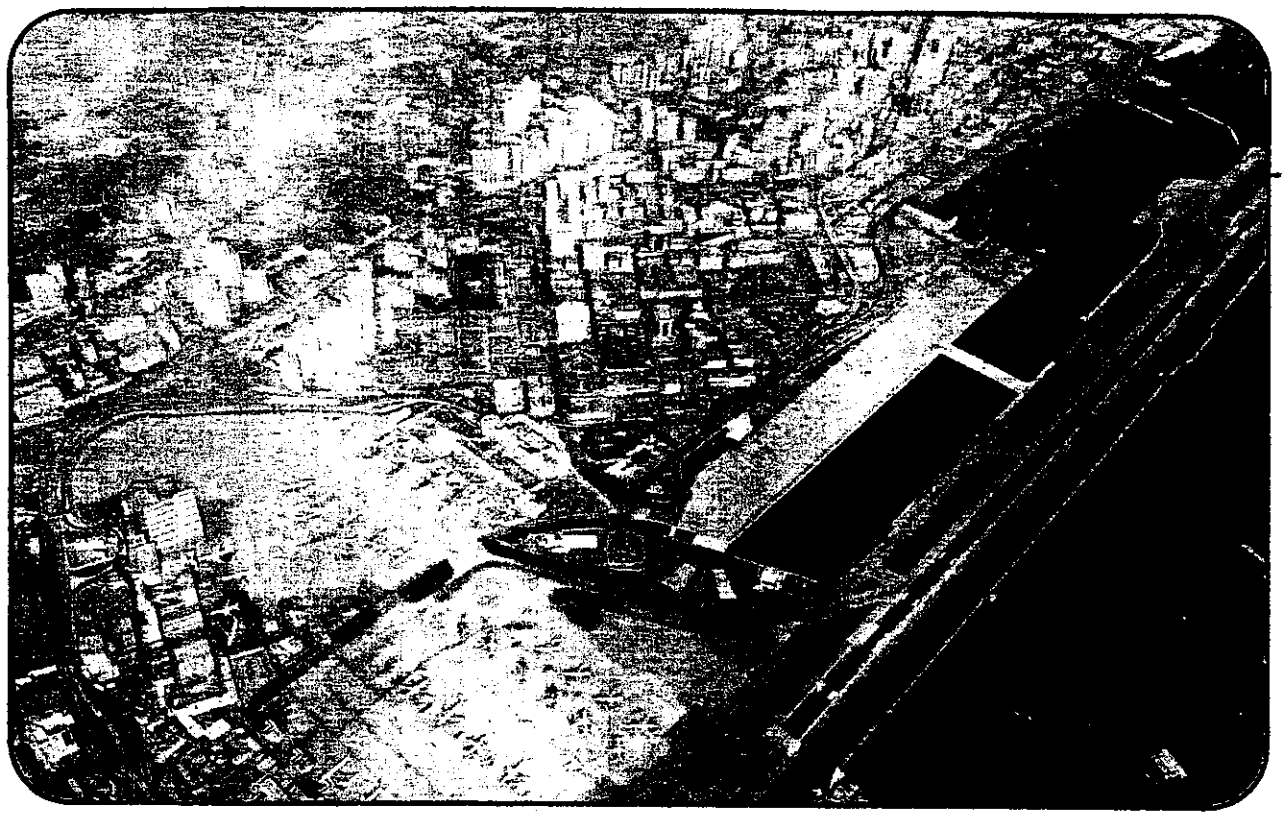
9. Visual Impacts : As the site is highly visible from many aspects, serious consideration needs to be given to developing this area along the lines of the West Kowloon Reclamation where features such as parks and promenades are incorporated into the overall development concept.

10. General Comments : It is not expected that the Kai Tak Kowloon Bay Phases 2 & 3 would be required under Scenario A but the increased population in Scenario B would require this Major Growth Area to be included in the development scenario. Any further additional increments of population and industrial development would need to be considered carefully in the context of the capacity of the SSDS Stage I collection system. Additional transport linkages which may need to be provided to accommodate any additional developments would also need careful consideration in terms of noise and air quality.

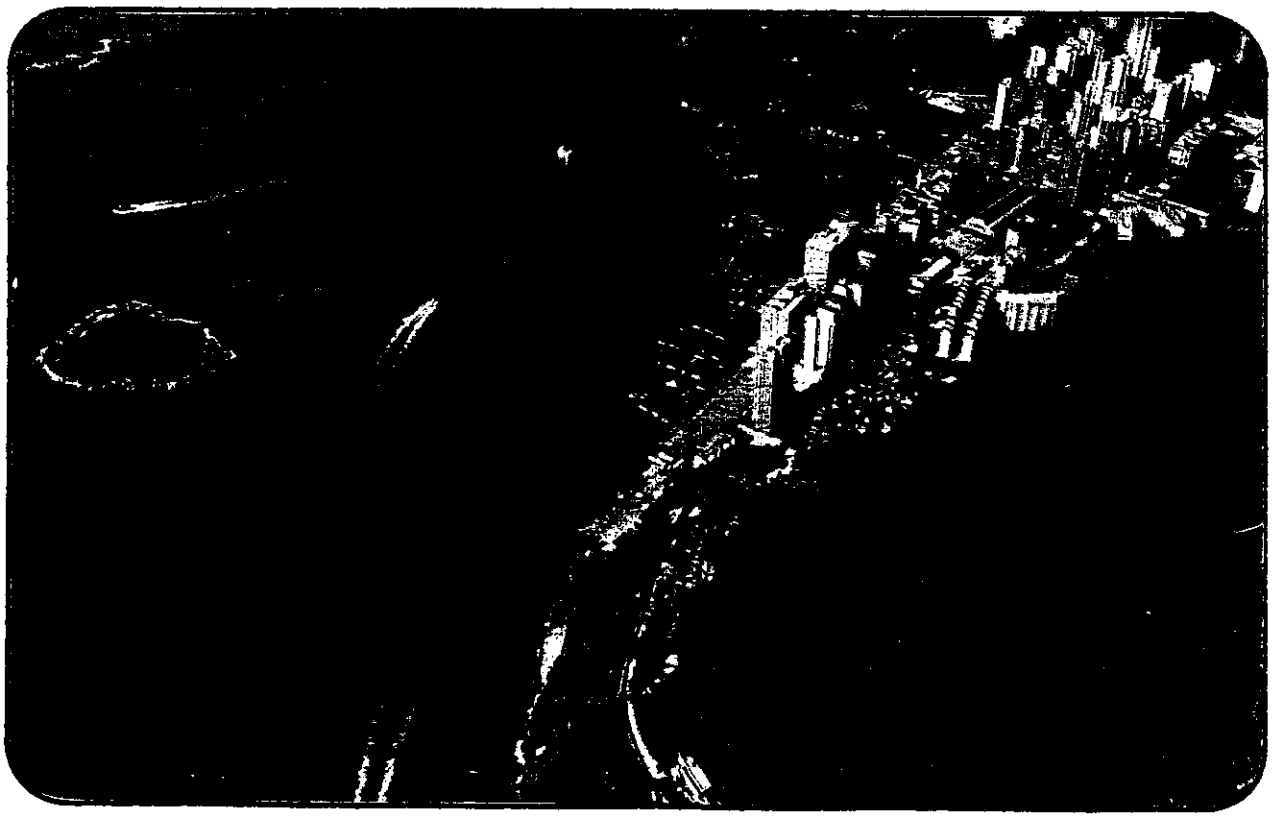
11. Mitigation Measures :

(a) primarily relate to noise and air quality impacts and prevention of interface problems. As this is a new and large site, there should be little difficulty in accommodating the noise mitigation requirements by planning buffer uses between noise sources and potentially sensitive receptors.

(b) contaminated marine mud will be disposed of according to the requirements of the



Kai Tak Kowloon Bay reclamation



Green Island reclamation

FMC and EPD.

(c) protection of existing utilities (gas pipelines etc.) when forming the site.

**B. Green Island** : Metro area

12. This area has been identified as another strategic growth area linking the new port facilities on Lantau Island with the established business districts. This area is identified as a prime site to house white collar workers associated with an expansion of the Central Business District (CBD) with the intention of alleviating cross harbour traffic congestion. In addition to residential developments, offices and hotel rooms are also proposed. Public dumping works are required to form an additional 50 hectares of land at this site. Environmental constraints associated with the development of this site include the uncertainty of the second stage of the SSDS, the early provision of a refuse transfer station and the sensitive designs required to permit transport linkages to be developed alongside the predominantly high density residential developments.

13. A total of 4.4 ha of godown (I(C)) and port related industry is planned for this area in addition to 58 ha of residential development (population of 110,000 and 125,000 assumed for Scenarios A and B respectively).

14. Water Quality : The recently gazetted Western Buffer Zone is the immediate receiving water body. From the data obtained, the existing water quality is judged to be poor. Disposal of effluent will be via a later stage of the SSDS but interim measures may be required if the timing of these two developments do not coincide.

15. Air Quality : Although existing air quality is judged to be good, local variations in air quality may be expected due to different land uses and frequent vehicle trips to this site, and around the portals of any road tunnels which may be constructed between the Lantau Port and Green Island.

16. Noise : Noise levels will also vary at different locations on the reclamation, which needs to be considered at the implementation stage. Although the MTRC station is below ground the vibration could affect above ground uses.

17. Waste Disposal : An estimated 181 tonnes of domestic wastes will be generated by the residential population in Scenario A and 206 tonnes in Scenario B. An estimated 90 to 103 vehicles (Scenarios A and B respectively) would be required to convey this waste to the Island West Refuse Transfer Station situated less than 1km away from the site on Hong Kong Island.

18. General Comments: It is expected that this growth area could be developed in the medium term due to the engineering constraints of forming the land. It is assumed that this component will be included in both Scenarios A and B from an early stage in the development.

19. Mitigation Measures :

(a) primarily relate to shielding noise sensitive receptors from the impacts of traffic related noise, by non-sensitive receptors. The distribution of traffic in the CBD by developing this area many be of benefit to other parts of the territory.

(b) air quality implications relating to vehicular traffic will also need further consideration to ensure adequate dispersion of pollutants within this area. As this development area is at a preliminary design stage the inclusion of such considerations in the master planning should not present any difficulties.

**C. Hong Kong South** : Metro area

20. With the lack of sites in Central Hong Kong, the southern part of Hong Kong Island appears to offer opportunities for comprehensive residential development. Development of 25 - 30 ha of residential development is proposed along the catchment of the proposed rail link to Central providing a total new population of 60,000 (18,000 in Telegraph Bay, 2,000 in Tin Wan, 38,000 in Ap Lei Chau, 2,000 in Ocean Park) under Scenario B and 40,000 under Scenario A. Local retail centres at the transport termini may provide a total of 1,500 jobs associated with this development.

21. Water Quality : Ultimate receiving waters are the Southern Waters Water Control Zone where water quality is judged to be acceptable. As this area will, in the long term, be connected to the SSDS there will be no direct impact on receiving water quality.

22. Air Quality : The development area is located within the Hong Kong South Air Control Zone where air quality is presently good. At a local level there could be traffic related air pollution problems due to the adjacent uses although this is likely to be a minor issue.

23. Noise : The proposed Light Rail Transit (LRT) could impact on the noise levels at the residential developments on Hong Kong Island South (especially in Telegraph Bay and around Ap Lei Chau. The exact alignment as well as buffer uses between the LRT and residential developments need to be considered. Noise from Route 7 also needs to be addressed.

24. Waste Disposal : With the Island West Refuse Transfer Station close by the site (about 2km) and the comparatively small quantities of domestic wastes generated (66-99 tonnes/day) by the residential developments, only minimal impacts are expected to arise with the collection and disposal (33-50 vehicles) of these wastes except at a district level.

25. Mitigation Measures :

(a) provision of adequate setback distances from the road to the residential dwellings will need to be included to reduce local traffic related noise and air quality impacts arising.

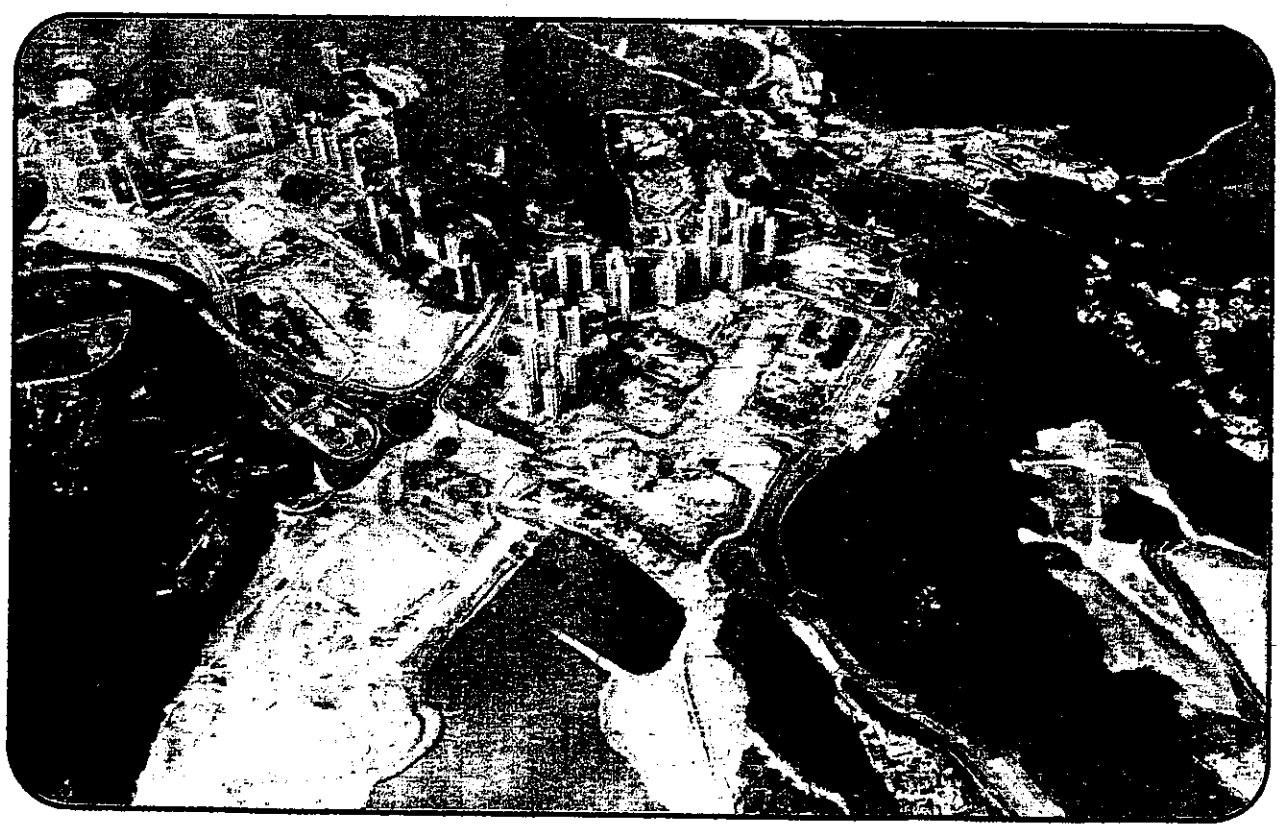
(b) provision of adequate attenuation distance between LRT and residential dwellings in Telegraph Bay and Ap Lei Chau. Elevated noise levels due to Route 7 similarly require consideration.

**D. Tseung Kwan O Phase 3** : SENT

26. Extension of facilities at Tseung Kwan O has been promulgated to optimise the planned infrastructure with the growth strategy characterised by high density residential developments, a possible Science Park and Special Industries. The population for TKO phase 3 is between 20,000 (Scenario A) and 50,000 (Scenario B).

27. Water Quality : Water quality within Junk Bay Water Control Zone is notoriously poor at present however this catchment area will be connected to the SSDS Stage I Scheme which is scheduled to be commissioned in 1997. Implementation of the SSDS Stage I Scheme will improve the quality of the receiving waters of the Junk Bay (and Port Shelter) Water Control Zones and reinstate the former recreational status of this area. Infilling of Junk Bay to provide additional land could have a possible adverse impact on local water quality (increased retention time for pollutants), although this would depend on the configuration of the reclamation and there are measures and designs which could be adopted to minimise this effect. These would need to be carefully considered and a full EIA should be carried out

Hong Kong South



Tseung Kwan O extension

before a decision can be made on whether to include the additional reclamation in the long term strategy. Another potential impact on water quality within Tseung Kwan O relates to the proposed Cross Bay Bridge Road. Careful consideration will be required at the design stage to ensure that the support structures of the bridge maintain existing water exchange rates between Junk Bay and the Eastern Buffer Zone to prevent a deterioration in overall water quality.

28. Air Quality : The Junk Bay Air Control Zone comprises a very confined airshed although air quality is presently defined as good. The location of industries and transport links needs careful assessment to ensure the dispersive capacity of the airshed is not exceeded by emissions from these sources. An estimated 554,000m$^2$ has been ascribed to special industry with 130,000m$^2$ for a possible Science Park in this area. Transport networks do not have spare capacity and any increases in road links will undoubtedly result in an increase in vehicles travelling on these roads with a reduction in local air quality within the ACZ.

29. Noise : The extension of the railway from East Kowloon to Tseung Kwan O could create severe noise impacts. The railway sidings could also have very significant increases in noise levels associated with their operation. All sites within this proposed development area have potential road residential interface problems. The extent of such impacts will depend upon various factors including the volume of traffic as well as the actual layout plans for the area.

30. Visual : Visual intrusion could be severe if the residential developments face Clearwater Bay. Extension of TKO also puts greater development pressure on rural SENT.

31. General Comments : Further studies are required in connection with the Cross Bay Bridge and the potential additional land requirements to accommodate further population growth. The relative distance from the Pearl River Delta and the strategic port development tend to suggest this area will not become a major growth pole.

32. Mitigation Measures :

(a) detailed design of the cross bay bridge support structures will need to ensure water exchange rates are maintained.

(b) fuel restrictions and the provision of clean industries would minimise industrial emission sources. Layout design of the residential dwellings will need to ensure that adequate setbacks are provided and potential local air quality problems are minimised.

(c) layout designs will need to avoid road residential interface problems and problems associated with elevated noise levels.

(d) development which could encroach on the Sai Kung Peninsula should be avoided to protect this area from becoming an urban conurbation.

**E. Tung Chung Phases 2, 3 and 4 : SWNT**

33. Further extension of the Tung Chung Developments beyond Phase 1 has been assumed for both in the Refined Preferred Options. Benefits to be accrued from developments include the road and rail links between the new airport at Chek Lap Kok and Central. Strategic growth assumes the population will increase by about 115,000 for Phases 2,3 & 4. A relatively small number of jobs in the retail sector (2,700) are associated with these developments. The major environmental constraint on further development is the very enclosed Tung Chung airshed. Even at the Development Study Stage, ventilation corridors and breezeways were considered to minimise this constraint as far as practical.

34. Water Quality : Receiving waters for this site are the North Western Water Control Zone. The adjacent sea channel will be designed into the development plan as a major environmental improvement scheme to maintain water quality within Tung Chung Wan.

35. It has been estimated that the design capacity of the sewage treatment works will be exceeded by 14% at 2011 (Scenario B), with only a relatively small proportion due to the development of Tung Chung Phases 3 & 4. Notwithstanding the foregoing, the need for upgrading and extending the treatment facilities to accommodate developments proposed for the North Lantau area will need to be reviewed in the context of the cumulative effects of pollution discharges to the North Western Water Control Zone and the assimilative capacity of local waters.

36. Air Quality : Good air quality experienced at present is due to the low levels of activity in the area. The second access road linking North Lantau with the Airport bounds the site, creating an interface between it and the residential developments. Any necessary setbacks or other mitigation measures will be incorporated in the detailed design. Offices could be included in this area to provide buffer uses between incompatible land uses. It should also be noted that the development plans for Tung Chung do not make provision for industrial land.

37. Noise : The road alignment and setback distances have been incorporated into the Development Plan for Tung Chung and taken full account of any constraints imposed by traffic generated noise. Barriers, buffer uses and set backs were all detailed in the environmental assessment of the North Lantau Development Study and were incorporated into the engineering design along with many other environmental protection measures.

38. Waste : Domestic solid wastes will be disposed of at the Siu Ho Wan Refuse Transfer Station some 8km from the development area. Vehicle trips, and unloading patterns have been taken into account in the detailed design of access roads for the RTS, thereby minimising potentially adverse impacts of queuing or congestion occurring.

39. Ecology : The SSSI adjacent to the residential developments may need to be considered when formulating recreation strategies.

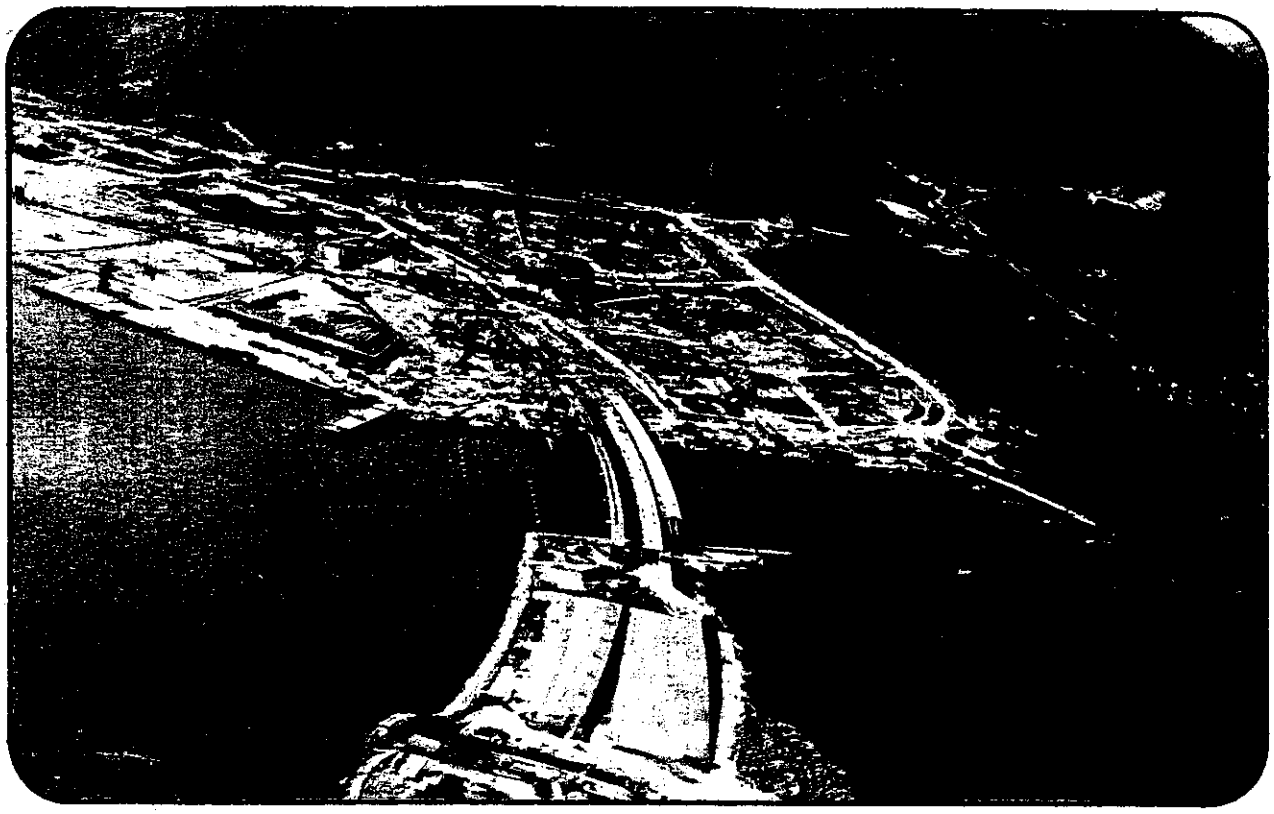
40. Mitigation Measures :

(a) consideration will need to be given to extending and upgrading sewage treatment facilities at Siu Ho Wan.

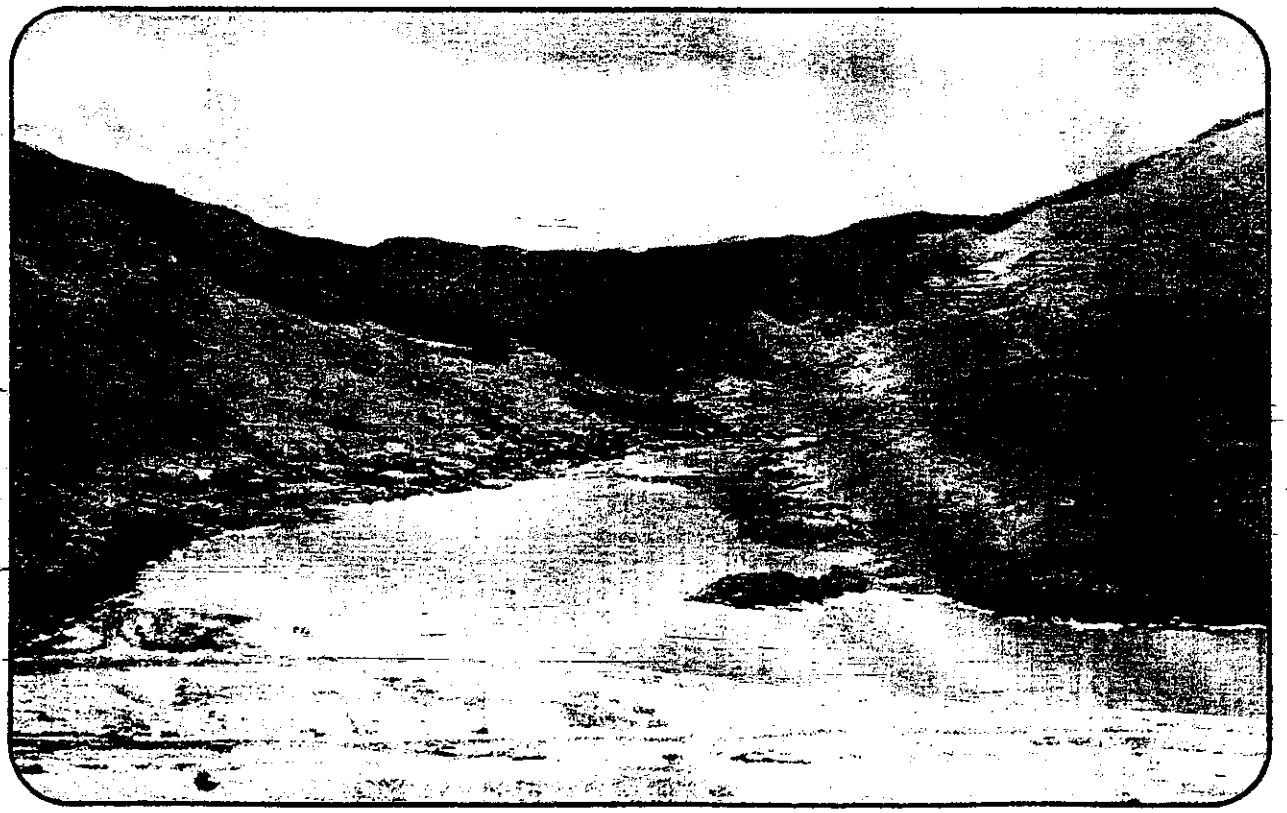
(b) account will need to be taken of local air quality. Mitigation measures such as incorporating breezeways and ventilation corridors into the layout plans may need further consideration as the development proceeds.

**F. Tai Ho : SWNT**

41. The planning intent for Tai Ho is to provide a self contained new town providing local employment enhancing the transport capacity of the North Lantau as well as serving the needs of the port and airport. A total development area of 350 hectares has been planned for this area with 120,000 population estimated for Tai Ho under Scenario B. In the North Lantau Development Study, the special industry facilities were defined as high tech "clean" industries. Any further reclamation to provide additional land would need detailed engineering and environmental assessments to be carried out. The North Lantau Development was aimed at maintaining water quality in East Tung Chung Bay, and the design of the outfall and the sea channel were undertaken in conjunction with this constraint. If



Tung Chung extension



Tai Ho

further reclamation is considered then the location and extent of such would need detailed study to ensure there would be negligible impact on the local tidal regime or the disposal mechanism for the effluent discharging from the Siu Ho Wan outfall.

42. Water Quality : With the exception of the sea channel, comments relating to Tung Chung similarly apply. The combined contribution of the Tung Chung and Tai Ho developments will require extension of the sewage treatment works as well as upgrading of treatment levels by 2011 under Scenario B. Similar comments with respect to cumulative assessment of pollution loads for Tung Chung similarly apply to Tai Ho.

43. Air Quality : Very good air quality prevails in this location. Industries are assumed to be clean and non-polluting in terms of air quality. Mechanisms to ensure the development principle relating to clean industries, may include restrictions on land uses and intensity, extent and nature of industrial developments, e.g. by licensing controls or by the establishment of a body such as the Industrial Estates Corporation.

44. Noise : Adverse impacts could arise from industrial activities and traffic generated noise. Setback distances and site layouts for residential developments, were also included in the North Lantau Development Study.

45. Waste : Siu Ho Wan Refuse Transfer Station is approximately 2km from the site. Comments for Tung Chung also apply here.

46. Mitigation Measures : Comments relating to mitigation measures for Tung Chung similarly apply.

**Minor Growth Areas**

**G. Lok Ma Chau/San Tin : NWNT**

47. Lok Ma Chau/San Tin is expected to develop as a border town with good connections by road and rail serving the PRD catchment. The development area is 160 ha comprising public and private housing, low density private residential developments, about 66 ha of container back-up area, and 4 ha of office, retail and hotel accommodation. An area of 20 hectares has been identified for possible rail connections and transport interchanges. It should be noted that further expansion of this development area to the north and west are not favoured on environmental grounds.

48. Water Quality : The implications of such developments on the receiving waters of Deep Bay via the Shenzhen River, could be significant especially as this is an unsewered area (population 10,000 and 2,450 jobs forecast under Scenario B). Rationalisation of the collection, treatment and wastewater systems will be required. Operations at the freight and storage areas have the potential to adversely affect Inner Deep Bay via discharges (runoff and spillages) to the Shenzhen River. Pollution prevention measures would need to be incorporated into the design of any freight yards or storage facilities provided at this location.

49. Air Quality : At present air quality in this area is generally good. The proposed road traffic network and the increases in throughput in this area could have an adverse effect on overall air quality and also at a local level as the preliminary proposed alignments traverse existing villages and the majority of the traffic will comprise goods vehicles.

50. Noise : The existing noise climate in San Tin will be severely impacted through the increase in traffic volume and congestion of local roads. Developments in this area and particularly those of freight marshalling yards will have both on-site and off-site implications. Detailed

assessments will need to be carried out to address these issues. This will be particularly significant in the established villages which are very close to the aforementioned facility.

51. Waste Disposal : An estimated 17 tonnes of domestic wastes could be generated each day as a result of the additional residential population which would require 9 refuse collection vehicles to convey the wastes to the landfill site. The closest landfill site to this area is WENT some 20km away. While the relatively small number of vehicles required to dispose of refuse on a daily basis will not cause a serious impact in terms of local congestion, noise or air pollution, but the cumulative impact of all the other refuse disposal vehicles which will use the same waste disposal site should be considered.

52. Visual intrusion is likely to be severe as this area changes in character from a rural community to a flourishing border township.

53. Ecology : Potential impacts include the effects of infilling fishponds for development in this area.

54. Mitigation Measures :

(a) provision of appropriate sewage collection treatment and disposal facilities will be essential before this area can be developed. Careful consideration should be given to disposal of effluent for the whole of the NWNT (possibly develop a Strategic Sewage Disposal North System).

(b) adequate and appropriate provision of on-site drainage and collection facilities will be required to prevent any spillages arising from activities at the freight storage areas ingressing the Shenzhen or other local river systems which ultimately drain into Deep Bay.

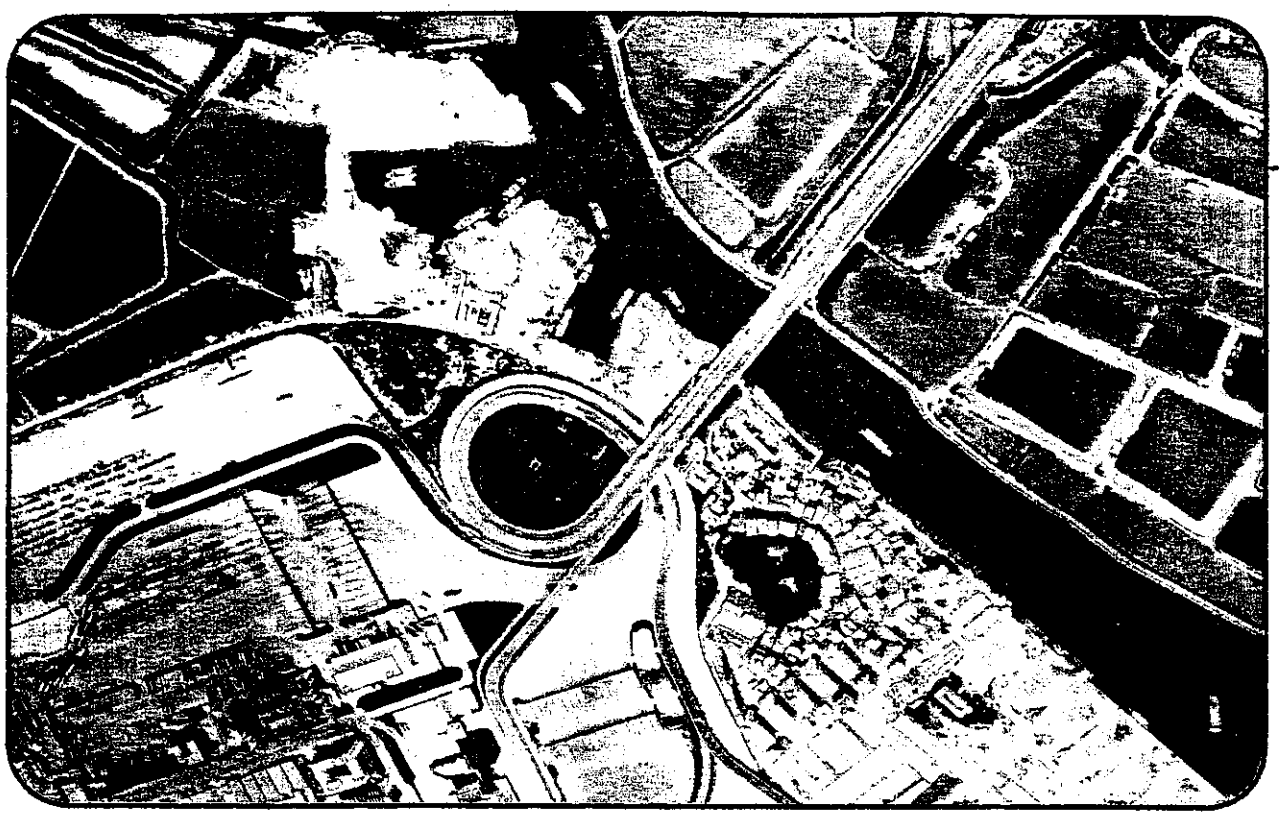
(c) careful consideration will need to be given to the alignment of the proposed road networks to minimise potential impacts on local air quality and the existing villages, to minimise impacts relating to noise and traffic congestion in terms of the residential developments proposed for this area.

(d) the proposed tunnelling of the railway is supported as this will reduce potential interface problems. The freight storage and marshalling areas may need to be covered to permit overhand development. These facilities will require detailed feasibility/environmental assessments to be undertaken to address the issues identified herein.

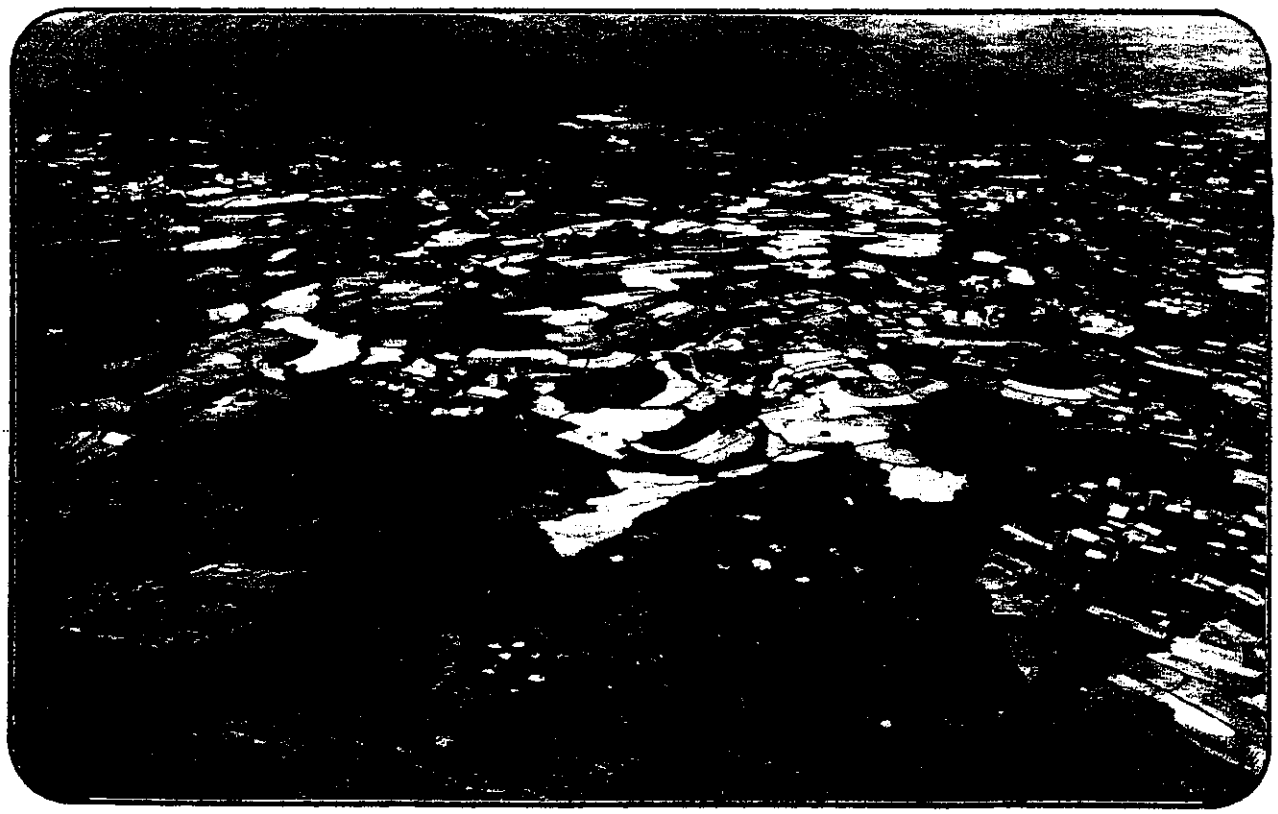
H. Kam Tin : NWNT

55. The planning intention is to develop Kam Tin from its current status as a market town to a medium to low density comprehensive development area (CDA) around the station and transport corridor. A total of 75 ha has been reserved for development which will comprise residential (population of 10,000 under Scenario A and 20,000 under Scenario B), office, retail and hotel accommodation. Hotel and office accommodation, primarily to serve China traders, will be strategically located along the transport corridors help to upgrading the existing environment by removing workshops, container storage and other land uses which have contributed to the overall environmental degradation in recent years.

56. Water Quality : The Yuen Long Creek and Kam Tin Rivers eventually drain into Deep Bay where the waters are grossly polluted by livestock wastes combined with residential and industrial effluents. Measures to improve the water quality include the livestock wastes



Border area - Lok Ma Chau / San Tin



Kam Tin

controls and sewerage master plan schemes. The potential development area is at present unsewered and effluents generated by the residential population would require at least secondary treatment with nutrient removal prior to disposal, provided that effluents are diverted to the Yuen Long Sewage Treatment Works or the Kam Tin Works. However, the former STW will exceed its design capacity. If the development proposals are implemented and the zero discharge policy objective for Deep Bay is to be maintained, alternative disposal mechanisms will be required.

57. Air Quality : Although existing air quality is considered to be good, extensive development is not recommended in this area. While no direct interface exists between the proposed residential area and the strategic roads, a proposed new road will bisect the site which may accommodate offices associated with this development area. There should be no conflict between the development of offices adjacent to roads.

58. Noise : The distances between the proposed residential area and the strategic rail link and new roads are such that elevations in background noise levels from this source could be easily overcome.

59. Waste : An estimated 17-33 tonnes of domestic wastes could be generated on a daily basis from this site. This would involve the use of 17 refuse collection vehicles to collect and dispose of the wastes at the WENT landfill site located some 15km from the site. Potential noise nuisance, congestion on local roads and air pollution problems are possible due to the local conditions and a system for rationalising the wastes collection and disposal may need to be considered at a detailed design stage to minimise these impacts. As the intention is to reduce the planning blight and environmental degradation in this area by land use restructuring, it would be appropriate to consider in detail the local effects of these proposals both on the immediate environmental as well as off-site.

60. Visual : Visually intrusive elements in this area have changed the rural nature of the Kam Tin valley into open storage yards. The proposals aim to improve the visual aspect of this area through rationalisation of land use and by development control.

61. General Comments : The Kam Tin development seeks to provide a comprehensive improvement package with improved sewage collection, treatment and disposal facilities, improved road access in conjunction with the preservation of agricultural land, Fung Shui hills, wooded area and traditional villages. The proximity to the water treatment works needs to be considered carefully and no new development should be planned within the PHI CZ.

62. Mitigation Measures :

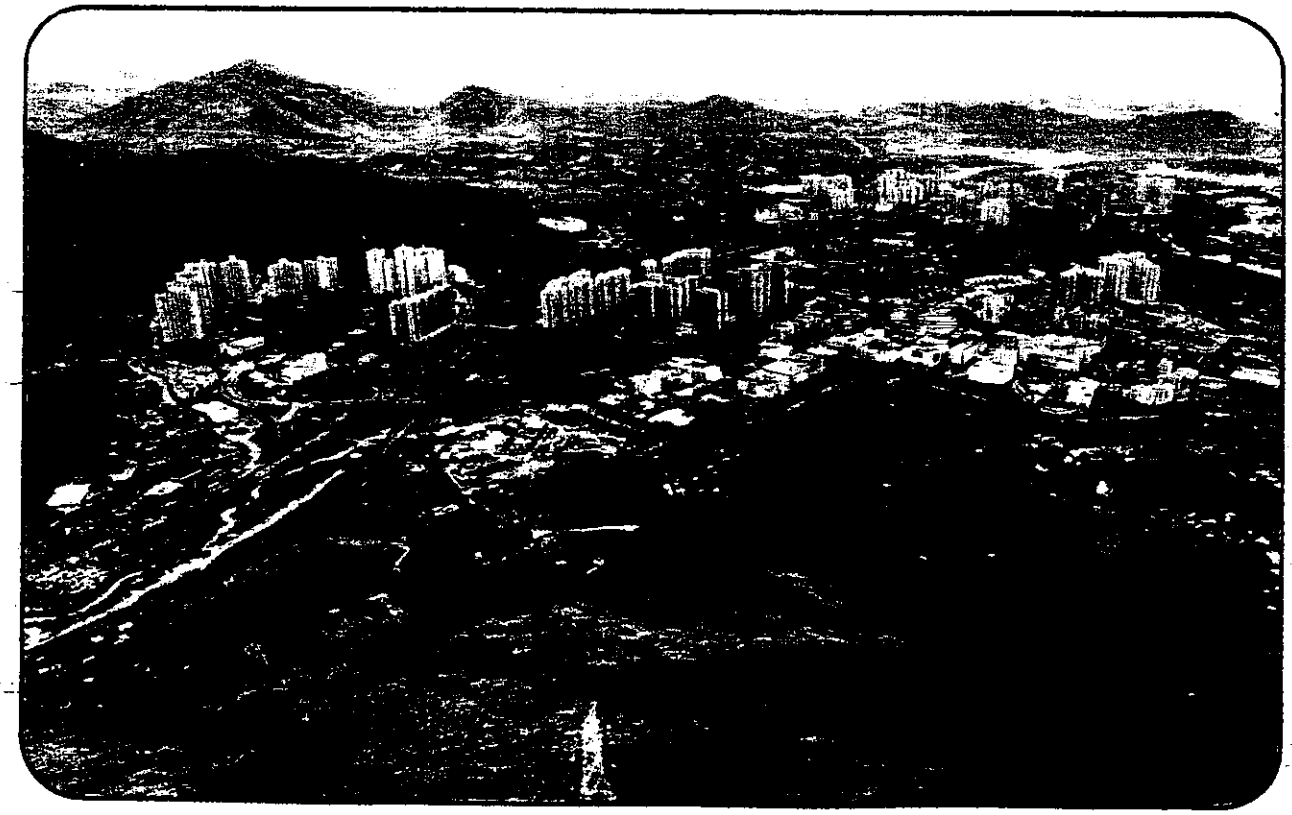
(a) enforcement of the zero discharge policy for Deep Bay, means the option for collecting effluent from this site and diverting them to Kam Tin Sewage Treatment Works would not be feasible. A practical solution would be to collect and treat all effluent arising in the NWNT, and ultimately dispose of it via the Urmston Road outfall. This would require a second outfall to be constructed and preliminary treatment presently provided at San Wai upgraded to at least secondary standard.

(b) visual intrusion can be minimised through detailed and local design process.

**I. Yuen Long South : NWNT**

63. Yuen Long is a well established rural township in the NWNT with the potential for expansion once the strategic road and rail networks are established. A total of 36 ha has been allocated for development in this area for an additional population of 20,000 (public and private) with

Yuen Long South



Fanling North

1600 - 2400 office jobs and 700 - 900 retailing jobs.

64. Water Quality : Ultimately the receiving waters are Deep Bay where conditions are grossly polluted. A potential development area is identified to the east of Yuen Long town in land designated as agricultural lands rehabilitation scheme and may not be covered by the sewerage master plan schemes. The effluent flows and pollutant loads have been calculated on the basis of the population forecasts. Disposal of effluent is likely to be a problem as the design capacity of the Yuen Long treatment works will be severely constrained as a result of the development proposals. In the SMP of Yuen Long it was identified that the eastern section of the existing Yuen Long sewerage system is severely constrained and in extremely poor condition. The Yuen Long Creek running adjacent to the north east of the site is presently heavily polluted and, in accordance with the long term policy restricting discharges to Deep Bay, no additional discharges will be permitted to the river course. Early implementation of the Stage 3 proposals under the Yuen Long - Kam Tin Master Plan is vital. Flooding in this area is a serious problem although various schemes are being considered at present to minimise flooding.

65. Air Quality : The Yuen Long airshed is partly confined in the developed area. Air quality in the low lying potential development area may be better. Consideration will need to be given to providing breezeways and maintaining air corridors in this development area to prevent local air quality problems especially as the proposed strategic road bisects the site. Planning should ensure no new residential road interfaces occur. The number of refuse disposal vehicles required for collection and conveyance of solid waste are not likely to create local problems relating to air pollution or traffic congestion.

66. Noise : Potential noise sources include the strategic new road (high percentage of Goods Vehicles on this road) and railway lines, both traversing the site which is earmarked for residential developments. The railway line is at grade through this section where peak headways of less than 4 minute intervals are forecast. Off peak headways are just under 11 minutes. While no noise estimates have been made for this section of the track it can be assumed that the velocity (48-50km/h) and frequency of rail movements could have a significant impact on ambient noise levels. As identified for other rural areas of the NWNT, elevated noise levels above existing background levels could have a significant impact.

67. Waste Disposal : Although the quantities of solid waste requiring disposal may not be significant in strategic terms (33 tonne/day), the cumulative impacts of conveying the wastes to WENT (some 14km from the site) could be reflected by congestion and noise and air pollution especially on local roads around the disposal site.

68. Visual : The vistas offered by this low lying flood plain will be greatly diminished by the inclusion of a major highway and rail network.

69. Mitigation Measures :

(a) expansion and upgrading of the sewage treatment works at Yuen Long may be possible although this depends on many factors including the availability of land and the ultimate disposal mechanisms.

(b) noise from local roads can be minimised by design and orientation of the buildings.

(c) air quality impacts can be minimised through inclusion of breezeways in the overall layout plans.

(d) visual intrusion and compatibility of residential and other commercial and industrial

uses will need to be treated properly to ensure the opportunities provided for a high quality living and working environment are not diminished.

(e) sections for the traffic systems should be covered in particularly sensitive areas.

**J. Fanling North : NENT**

70. Fanling North is expected to be developed in response to the increased capacity of the border crossing at Sha Tau Kok. The development of Yantian Port at present will enhance this development site. The development concept is essentially to provide a border service area with port back up facilities, office accommodation for China trading firms and to take advantage of the informal open storage/industrial developments at Ping Che. Development of this site is considered for Scenario B, and it is envisaged that there will be a merging of the border zones.

71. Water Quality : Collection and treatment of effluent will be a key issue to be resolved for this development site. The proposal, contained herein, to provide centralised sewage treatment and disposal facilities for the northern New Territories is further supported by the anticipated expansion of facilities in areas close to sensitive water bodies (Shenzhen River to Deep Bay, Mirs Bay, Tolo Harbour).

72. Air Quality : Impacts on ambient air quality could arise from the increases in vehicular traffic which will be generated by reorientation of growth in this area. The topography around Fanling may affect dispersion of air pollutants. Local air quality impacts would need to be considered in connection with other developments proposed for the area (Slaughterhouse etc.). The distance between the existing Shek Wu Hui Sewage Treatment Works and the development site should be sufficient to minimise any interface problem (mainly odours) but would need to be reconsidered in connection with proposals for upgrading or extension of the works.

73. Noise : The distance between the proposed development and the NT Circular Road will attenuate noise from that source. Local traffic management, such as the prohibition of the use of local roads at certain times of the day or by having set routes which vehicles have to use to minimise creation of interface problems, is required.

74. Waste : An estimated 33 tonnes of solid wastes per day will be generated by the residential population proposed under Scenario B, and will involve 17 vehicles per day for its disposal.

75. Visual : Apart from the aspect of the site with the sewage treatment works, there are no other sources of visual intrusion associated with this site.

76. Mitigation Measures:

(a) given the Shek Wu Hui treatment works in close proximity, rationalisation of the sewerage should not be a key issue (assuming disposal mechanisms are clearly defined).

(ii) consider single aspect buildings, set back distances, buffer uses and any reduction in line of sight to minimise noise impacts on residential dwellings.

**Low Density Residential Areas**

**K. Rural NWNT : NWNT**

77. A site area of 112 ha has been reserved for this development comprising 27 ha in Ngau Tam Mei (residential and retail), 70 ha in Cheung Chun San Tsuen (low density residential) and a further 15 ha in Au Tau North (medium density mixed developments). A total additional population of 10,000 is forecast for this area where the predominant land uses at present consist of rural settlements, suburban development and open storage. Some fallow land still exists in this area although it is relatively minor compared to other uses.

78. Water Quality : As this is an unsewered area the implications on receiving water quality relate to effluent disposal. The proposal for a centralised sewage treatment facility is supported although it should be noted that treatment levels required would be no less than full secondary treatment with additional nutrient removal. As the zero discharge policy objective for Deep Bay states that no new treated or untreated effluent can be discharged into Deep Bay, it must be assumed that this objective will be realised before 2011. Connections would therefore need to be made to treatment facilities which do not ultimately discharge to Deep Bay or Mirs Bay. Detailed review of the SMP for this area and the entire NWNT needs to be undertaken to ensure that the effluent collection, treatment and disposal schemes are economic from an environmental and engineering standpoint.

79. Air Quality : Although the proposed site lies within a confined airshed, air quality is considered to be good although the forecast increases in traffic could have a local impact on air quality. The sites are located along the roadside and consequently the local planning will need to consider set backs to avoid local air quality impacts.

80. Noise : Ambient noise levels are likely to be significantly elevated as a consequence of the proximity of this proposed development in relation to the extensive increases in road and rail links in addition to border crossing facilities. There would be need to provide covered sections, buffer uses as well as local noise mitigation measures to reduce the impacts of these developments on sensitive uses. These will need to be prescribed at the district planning level.

81. Waste Disposal : Disposal of domestic solid wastes could have an impact on the traffic on local roads, and thus contribute to overall air pollution and congestion problems. The distance from the site to Western New Territories landfill (WENT) is approximately 20km. The estimated wastes arising (17 tonnes/day) and associated number of refuse collection vehicles (8/day) required for disposal of such wastes, could contribute to the overall noise levels, congestion on local roads and could create general nuisance.

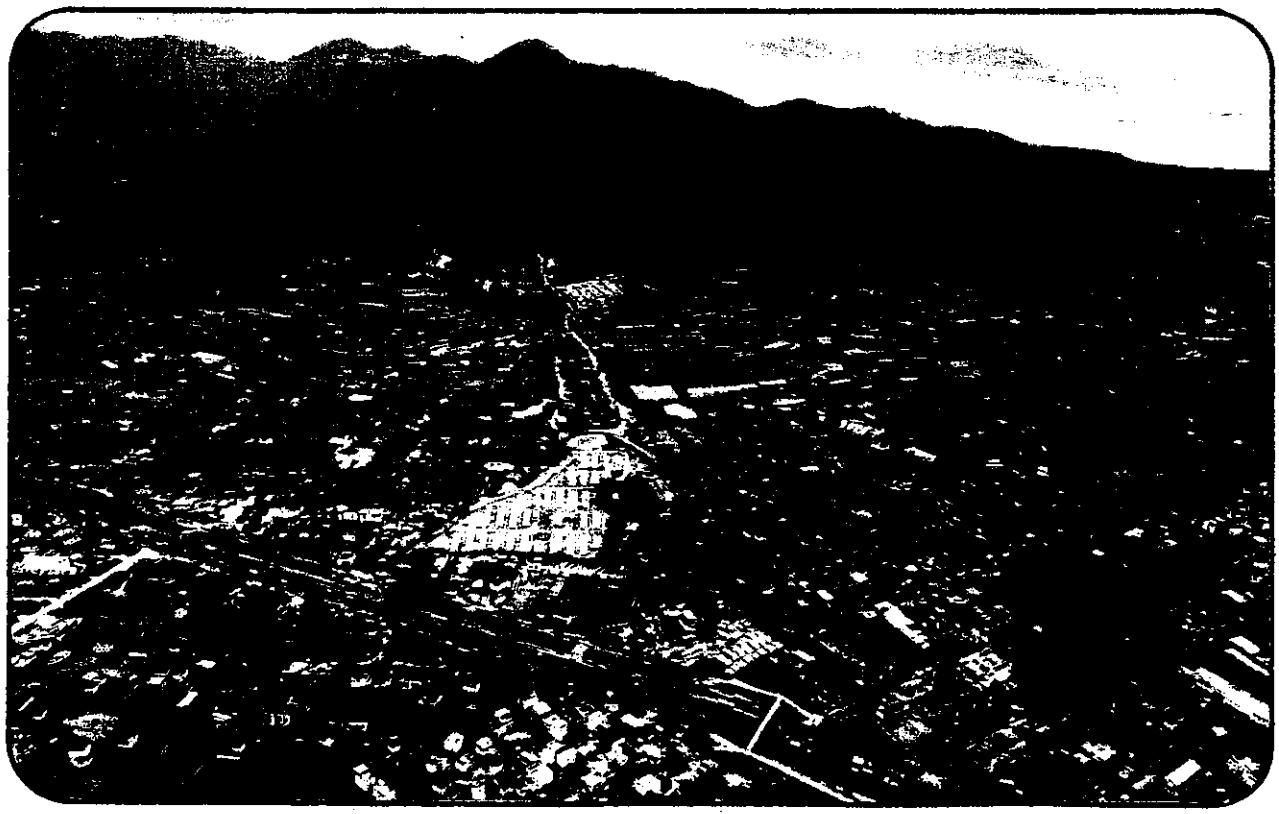
82. Ecology : As in the Lok Ma Chau/San Tin area, the possible infilling of fishponds could have a serious impact on the unique wetland ecology of this area.

83. General Comments : There are several environmental issues which need to be rationalised at the local district planning level. These include interface problems with open areas, noise nuisance from the increases in vehicular traffic, and the local traffic impacts.

84. Mitigation Measures :

(a) Centralised sewage treatment facilities, with a connection to the NWNT Trunk Sewer for discharge into Urmston Road, would be required. Treatment levels would need to be considered further, with options including central treatment at San Wai or individual collection and treatment before connection to the NWNT trunk sewer.

Rural NWNT



Tuen Mun East

(b) Alignments of the railway lines with respect to new residential developments would need to be further considered to minimise noise levels. Consideration may need to be given to routing at least part of the railway line in tunnel.

(c) There could be an impact on air quality and noise levels at the residential sites proposed along the route of the road and railway lines. Alignments of the roads, and adequate setback distances will be required when considering detailed design of this site.

(d) Covered sections of road/rail may be required to permit the noise levels prescribed in the NCO to be achieved. An EIA would be required to determine the feasibility of such schemes and would include, inter alia, dispersion modelling to address the potential air quality impacts from tunnel ventilation systems.

**L. Tuen Mun East : NWNT**

85. Proposals for low/medium residential developments in the NWNT include a site at the former borrow area at Tuen Mun East which is conceived as offering low density housing and recreational facilities similar to the developments at Hong Lok Yuen. A gross area of 50 ha has been identified for a population of about 10,000. Around 200 jobs are expected to be generated by local facilities. The development is heavily constrained by the traffic flows on the Castle Peak Road and additional commuter traffic will only exacerbate an already untenable situation. The potential development area is fringed by landscape priority area offering splendid views in both the seaward and landward directions making the site extremely attractive.

86. Water Quality : Receiving waters are the North Western Waters which are seasonally influenced by pollution loads conveyed by the Pearl River. Effluent flows and pollutant loads have been estimated on the basis of the population forecasts. Effluent disposal is assumed to be via Pillar Point Sewage Treatment Works. Although the actual site is presently unsewered, it is not anticipated this development would have an adverse impact in terms of water quality.

87. Air Quality : Although the Tuen Mun airshed is partly confined with generally poor air quality recorded, this strategic growth area is expected to enjoy better conditions than other parts of the ACZ.

88. Noise : Traffic related noise impacts may arise from the proximity of the road with the seaward facing residential areas. Engineering designs including single aspect design, buffer uses and set back distances should be considered and accommodated as appropriate in the overall layout plans to minimise this potential problem.

89. Waste : Projected solid wastes arising from this development area range from 17 tonnes per day. The contribution of refuse collection vehicles (9/day) to mainstream traffic flows will thus be negligible.

90. Visual : Both seaward and landward aspects will provide very appealing views for this residential development. The adjoining land uses are designated suburban uses and urban fringe which should not conflict with the development potential.

91. Mitigation Measures :

(a) provision of on-site sewerage and connection to the closest trunk mains which will convey the effluent to Pillar Point Treatment Works.

(b) setbacks from the roads and inclusion of breezeways and ventilation corridors may be required to meet air quality objective in view of the proximity of the road to the residential developments.

(c) the orientation of buildings, single aspect design, buffer uses and set back distances could all be integral components for minimising potential noise impacts from the road on the roadward facing residential dwellings.

**M. Whitehead : NENT**

92. It is expected that full development in Sha Tin and Ma On Shan will result in encroachment into rural areas by low density low rise dwellings. Whitehead has been identified as an area where such developments could take place with the incorporation of amenity and recreation facilities into the development complex occupying 50 ha. About 100 job places are forecast in the retail sector associated with this low density housing complex. Environmental constraints on the extent of development include the transport network and marine water quality consideration, as the site is close to the environmentally sensitive Three Fathoms Cove.

93. Water Quality : The receiving water body is the Tolo Harbour Water Control Zone. Creeping incrementalism of developments in this area with the subsequent encroachment into the rural NENT, coastal ecology and the level of pollutants discharging into Tolo Channel are primary concerns.

94. Air Quality : The Tolo Harbour Air Control Zone comprises a partly confined airshed, despite that air quality is presently defined as good. Although the Sai Sha Road bounds the site to the south, forecast traffic flows on this road suggest that road residential interface problems are not likely to be an issue given the opportunity to provide buffer zones.

95. Noise : Noise levels due to traffic using the Sai Sha Road are not likely to create a major interface problem with the residential developments. This consideration should be addressed when detailed planning layouts are developed.

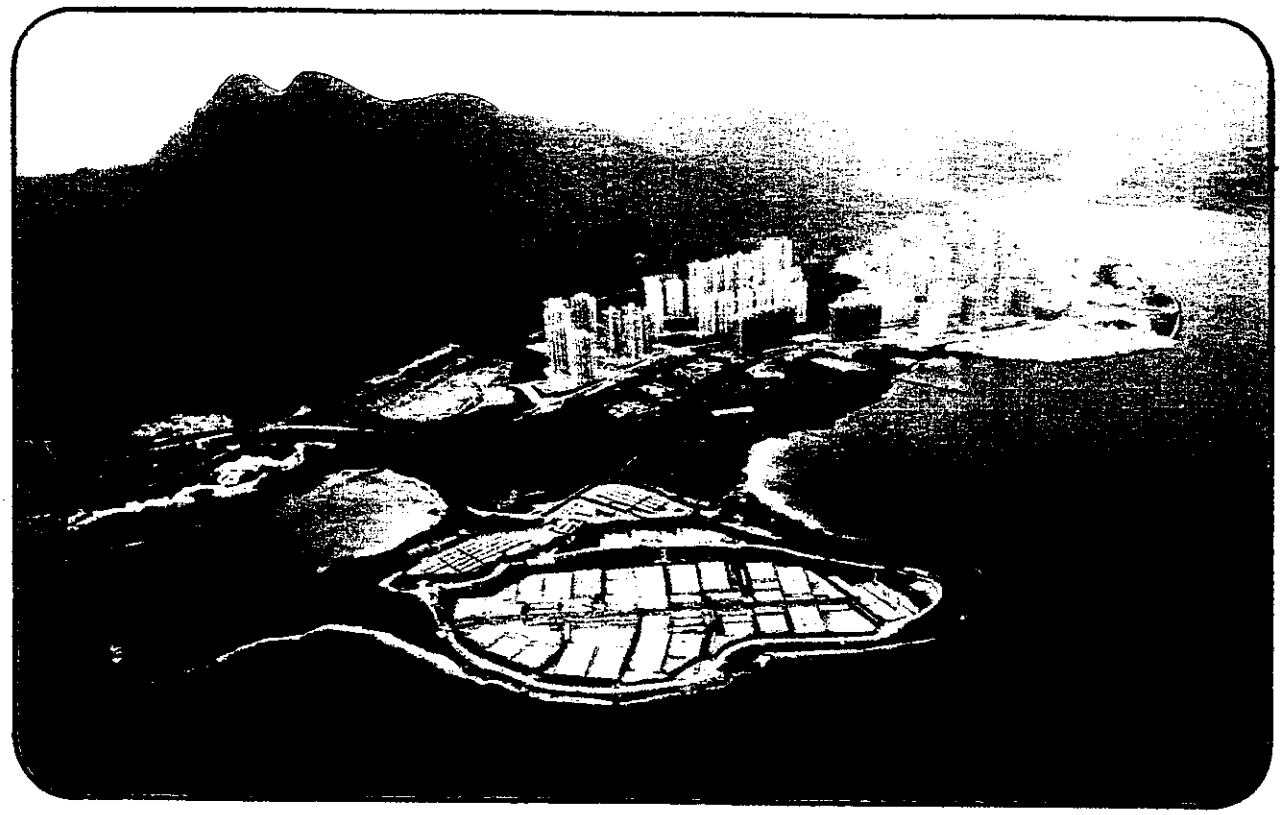
96. Solid Waste : The generation of solid waste arising is similar for all options. This is not an issue of any particular concern, for although the Sha Tin Refuse Transfer Station is about 9km from the site, the number of refuse collection vehicles required to dispose of the daily 8 tonnes of domestic wastes is only 4 per day.

97. General Comments : The Ma On Shan Water Treatment Works Consultation Zone needs to be re-examined in connection with this development concept.

98. Mitigation Measures :

(a) The efforts being made to divert pollution loads from Tolo Harbour by, inter alia the Effluent Export Scheme, imply that even if the effluent from the small head of population proposed for Whitehead were treated to secondary standard with additional nutrient removal, the resulting effluent would still not be acceptable for discharge to Tolo Harbour. Connection would therefore have to be made to an alternative treatment works.

(b) Layout plans and detailed designs for this site would need to take into account the location of the Sai Sha Road to avoid creating localised air quality or noise issues.



Whitehead