何民傑議員辦事處

西貢區議會(彩健區)獨立區議員(2004-)

Written Submission to the Legislative Council's Subcommittee on Country Parks (Designation) (Consolidation) (Amendment) Order 2010

1. I object to the Country Parks (Designation) (Consolidation) (Amendment) Order 2010 ("the Order").

2. The proposal to excise about 5 hectares of Clear Water Bay Country Park for the proposed South East New Territories ("SENT") Landfill Extension ("the Proposal") has many problems.

3. I attach hereto an attachment to the written representation which I shall lodge with the Town Planning Board ("TPB") tomorrow opposing three amendments by TPB to the approved Tseung Kwan O Outline Zoning Plan No. S/TKO/17 ("the Amendments"). I shall adopt the arguments in the said attachment insofar as they apply, by parity of reasoning, to the Proposal.

4. I also intend to attend the meeting of the Subcommittee at 4:30 p.m. on Tuesday 13 July 2010 and make oral presentation before the Subcommittee.

Dated the 5th day of July 2010.

Ho Man Kit, Raymond

Elected DC Member

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Attachment to Form No. S6

3. Details of the Representation

Draft plan to which the Representation relates	Draft Tseung Kwan O Outline Zoning Plan No. S/TKO/18

NATURE OF AND REASONS FOR THE REPRESENTATION

Nature of the Representation

1. By this Representation we oppose three amendments by the Town Planning Board ("TPB") to the approved Tseung Kwan O Outline Zoning Plan No. S/TKO/17 ("the Amendments"). The Amendments can be found in the Draft Tseung Kwan O Outline Zoning Plan No. S/TKO/18 ("the Draft OZP"):

   (a) Amendments to Matters Shown on the Plan:

   Item A1 – Rezoning of a piece of land in Area 137, Fat Tong O from "Other Specified Uses" annotated "Deep Waterfront Industry" to "Open Space (2)" ("O(2)").

   Item A2 – Extending the planning scheme boundary to incorporate a site adjoining Area 137 to be excised from the Clear Water Bay Country Park into the Tseung Kwan O Outline Zoning Plan and zoning the site to "O(2)".

   (b) Amendments to the Notes of the Plan: Incorporation of Landfill as a Column 1 use in the set of Notes for the "O(2)" sub-area.

Reasons for the Representation

   (a) Amendments to Matters Shown on the Plan: Items A1 and A2

2. The Government has provided three main justifications for its proposal to construct an extension to the existing South East New Territories ("SENT") Landfill ("the Proposed Extension"):

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(1) It is predicted that the capacity of the SENT Landfill be exhausted by around 2012[1].

(2) On a territory-wide basis, as mentioned in the waste policy document published by the Government in December 2005, "A Policy Framework for the Management of Municipal Solid Waste (2005-2014)" ("Policy Framework")[2], even assuming that the integrated waste management facilities ("IWMF") are indeed commissioned in the mid-2010s, landfills will still be required as the final repositories for non-recyclable waste, inert waste and waste residues after treatment. It has been estimated that the demand for landfill space from 2006 to 2025 is around 200 million tonnes, while the remaining landfill capacity, at the end of 2004 was 90 million tonnes.[3]

(3) On a region-wide basis[4]:

(a) If the SENT Landfill is closed, waste will have to be diverted to the North East New Territories ("NENT") and West New Territories ("WENT") Landfills. This will require vehicles collecting waste from the catchments of the SENT Landfill to travel an additional hundred thousand kilometres per day in total through the built-up areas to the remotely located NENT and WENT Landfills, thus resulting in additional environmental impacts such as increased traffic movements, vehicular emissions and noise impacts on many more sensitive receivers en-route. To reduce these impacts, Hong Kong would need a succession plan by developing new waste transfer and/or handling facilities in the south-east region of the territory, such as new handling facility for construction waste (ie the Construction Waste Handling Facility ("CWHF")) and new refuse transfer station for MSW (ie the South East Kowloon Transfer Station ("SEKTS")).

(b) Projecting the time at which these new facilities will be available is very uncertain as the site for the CWHF will unlikely be available in the early 2010s and the site selection for the SEKTS has not yet started. It will be a long planning and public consultation process to secure suitable waterfront sites at the Tseung Kwan O and South East Kowloon areas which are acceptable to the public for the development of these waste transfer/handling facilities, but without compromising the overall planning and development of these two areas. In addition, the funding for developing these facilities has not been secured.

(c) Under an optimistic set of conditions to form a target programme at the present stage, these new waste handling facilities could **possibly** be in place by 2017. With SENT Landfill expected to be full by 2012, at least six years of additional void space is necessary. It is important to extend the lifespan of the SENT Landfill so that the Government can have time to plan and develop these new waste handling facilities. [*emphasis added*]

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[1] Environmental Resources Management, *South East New Territories (SENT) Landfill Extension – Feasibility Study: EIA Report Vol. 1*, Dec 2007 ("EIA Report") (relevant extracts at Annex 1 hereof), §1.1

[2] Relevant extracts at Annex 2 hereof, pp.1 & 3

[3] Annex 1, §2.2

[4] Annex 1, §2.2

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Are there really no alternatives to extending the 3 existing landfills in Hong Kong?

3. The Government's assertion that Hong Kong's landfills will soon be full is based on its prediction that the demand for landfill space from 2006 to 2025 is around 200 million tonnes, while the remaining landfill capacity at the end of 2004 was 90 million tonnes[5]. In our view, whilst the figure of 90 million tonnes should be a historical fact, the figure of 200 million tonnes is quite problematic.

4. The Government's figures of the solid waste[6] disposed of at our landfills from 2001 to 2008[7] are as follows:

[MSW = municipal solid waste C&D = construction and demolition waste
SW = special waste tpd = tonnes per day]

Year	Waste type	Quantity (tpd)	Change from previous year: Quantity (tpd)	Percentage
2001	MSW	9,300	-35	-0.4%
	C&D	6,408	-1,067	-14.3%
	SW	1,109	+15	+1.4%
	Total	**16,817**	**-1,087**	**-6.1%**
2002	MSW	9,422	+122	+1.3%
	C&D	10,202	+3,794	+59.2%
	SW	1,534	+426	+38.4%
	Total	**21,158**	**+4,341**	**+25.8%**
2003	MSW	9,441	+19	+0.2%
	C&D	6,728	-3,474	-34.1%
	SW	1,588	+54	+3.5%
	Total	**17,757**	**-3,401**	**-16.1%**
2004	MSW	9,288	-154	-1.6%
	C&D	6,590	-133	-2.0%
	SW	1,620	+32	+2.0%
	Total	**17,502**	**-256**	**-1.4%**
2005	MSW	9,377	+89	+1.0%
	C&D	6,556	-38	-0.6%

[5] Annex 1, §2.2
[6] i.e. the sum total of MSW + C&D + SW
[7] These figures are taken from EPD's annual publication "*Monitoring of Solid Waste in Hong Kong: Waste Statistics for 2008*" (relevant extracts at Annex 3 hereof). The figures for 2009 are not yet published yet.

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	SW	1,746	+126	+7.8%
	Total	**17,679**	**+177**	**+1.0%**

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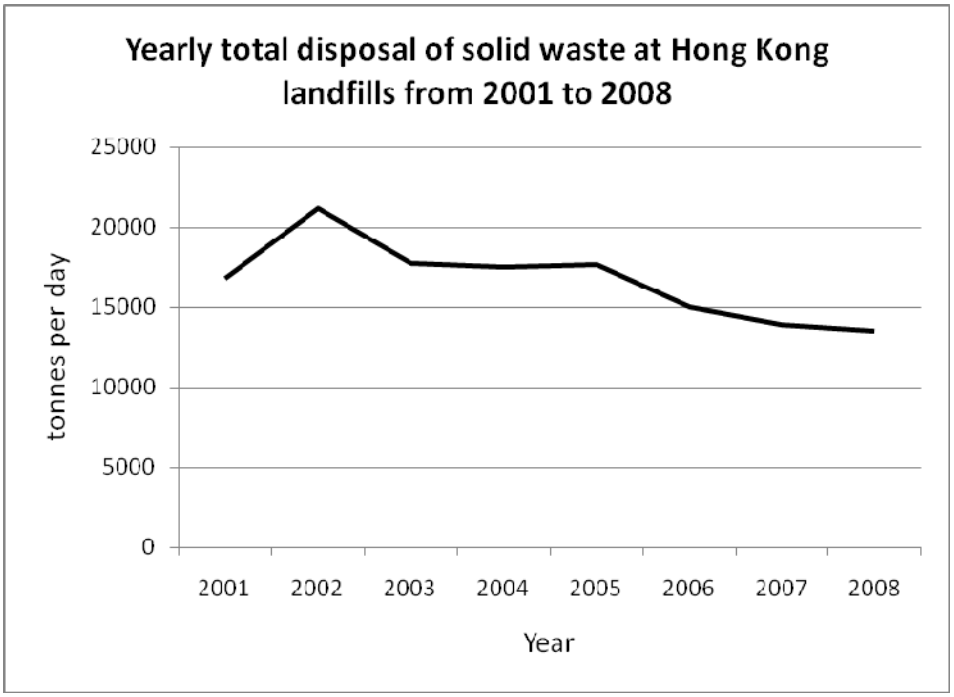
2006	MSW	9,279	+98	-1.0%
	C&D	4,125	-2,431	-37.1%
	SW	1,635	-111	-6.4%
	Total	**15,039**	**-2,640**	**-14.9%**
2007	MSW	9,428	+148	+1.6%
	C&D	2,914	-1,211	-29.4%
	SW	1,559	-75	-4.6%
	Total	**13,901**	**-1,138**	**-7.6%**
2008	MSW	9,453	+25	+0.3%
	C&D	2,659	-225	-8.7%
	SW	1,391	-168	+10.8%
	Total	**13,503**	**-389**	**-2.9%**



5. It is clear from the above figures and graph that the amount of solid waste which need to be disposed of at our landfills has been decreasing steadily since 2006. No doubt this is (i) largely due to the introduction of a charging scheme for C&D in 2006, and (ii) also due to, probably to a lesser extent,

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the increase in our domestic waste recovery rate from 14% in 2004[8] to 35% in 2009[9].

[8] Annex 2, §88
[9] EPD's Paper for LegCo's Panel on Environmental Affairs discussion on 29 march 2010, §3 (at Annex 4 hereof).

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6. The figure of 200 million tonnes for 2006 to 2025 mentioned in §3 above is quite problematic in that it has assumed an average of 10 million tonnes per year or **27,397 tpd**. This is **203%** of the figure of **13,503 tpd** (or 4.93 million tonnes for the whole year) solid waste actually disposed of at our landfills in 2008**.**

7. In fact, if one uses the actual 2008 figure of **13,503 tpd** as the baseline, and assuming that there is neither an increase nor decrease for 2006 to 2025, then the total solid waste which needs to be disposed of at our landfills will be 4.928 million tonnes per year or **98.6 million tonnes** in the period 2006 to 2025. Discounting the figure of 6.5 million tonnes (17,679 tpd) for 2005, that should still leave a figure of **92.1 million tonnes** of total solid waste which need to be disposed of at our landfills in the said period.

8. What we can get from the above figures is that:

   (a) assuming that there is no increase or decrease in the solid waste generated in Hong Kong in the years ahead, **the present capacity of our landfills will not be exhausted by 2015 as had been predicted in the Policy Framework**[10];

   (b) based on the figures in §4 above, the remaining landfill capacity at the end of 2008 was 68.05 million tonnes[11] [90 million tones – (17,679 + 15,039 + 13,901 + 13,503) tpd x 365 days].

   (c) **at the beginning of 2015**, the remaining landfill capacity is expected to be **38.48 million tones** [68.05 million tones – 29.57 million tones (13,503 tpd x 365 days x 6 years)].

   (d) after the commissioning of the IWMF in the mid 2010's[12], which has a capacity to treat 3,000 tonnes of solid waste per day[13] (or 1.08 million tonnes per year), the amount of solid waste which needs to be disposed of at our landfills will be **3.83 million tonnes per year**[14] [(13,503 tpd – 3,000 tpd) x 365 days];

   (e) assuming that the IWMF will be commissioned at the beginning of 2015, our landfills will only be full 10 years thereafter (i.e. **2025**) [38.48 million tones / 3.83 million tonnes per year].

   (f) even if we do not take into account the daily waste reduction brought by the IWMF, our landfills will not be exhausted until 7 year after 2015 (i.e. **2022**) [38.48 million tones / 4.928 million tonnes per year].

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[10] Annex 2, §16

[11] This has not taken into account the impact of the proposed extensions to the West New Territories (WENT) Landfill and Northeast New Territories (NENT) Landfill .

[12] Annex 4, §18

[13] EPD's Paper "Integrated Waste Management Facilities - Project Profile" on March 2008, §2.2.4 (at Annex 5 hereof)

[14] This has not taken into account the amount of residual ash after thermal treatment of the solid waste. This is because we have no expertise on that.

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9. Of course, we should not be complacent. Whilst the Government has succeeded in significantly reducing the amount of C&D from 2006 onwards as a result of the introduction of the charging scheme for C&D, no progress has been achieved in reducing the amount of MSW, which has throughout remained at a level of 9,300 tpd to 9,400 tpd for the period 2001 to 2008.

10. In a paper entitled "Site Selection for the Development of the Integrated Waste Management Facilities" submitted by the Environmental Protection Department ("EPD") to the Legislative Council Panel on Environmental Affairs for information on 28 January 2008[15], it is stated that,

> "2. Hong Kong currently relies solely on landfilling to dispose of our municipal solid waste (MSW). At the time of commissioning the three strategic landfills in Hong Kong, they were expected to be able to meet the waste disposal needs until 2020 or beyond. However, the amount of MSW generated has been on an increasing trend over the past years. For instance, **some 17 000 tonnes of MSW were generated each day in 2006, which are more than 30% when compared with 10 years ago.** Since the actual MSW disposal at the landfills has been much higher than projected, the three existing landfills would start to approach capacity in the next few years. Apart from extending the existing landfills, we need to adopt a comprehensive set of waste management initiatives to tackle the MSW problem.
>
> 3. To minimize waste generation and disposal, the Government announced a Policy Framework for the Management of Municipal Solid Waste (2005-2014) (the Policy Framework) to set out a series of waste management measures. We have implemented a territory-wide source separation programme of domestic waste which as at end of 2007, some 800 housing estates covering 2.8 million people have joined. To promote the development of a circular economy, we have set up an EcoPark to provide long-term land for the environmental and recycling industries. In January this year, we have introduced to the Legislative Council the Product Eco-responsibility Bill to provide a legal framework for implementing producer responsibility schemes. **We are also studying the feasibility of MSW charging as a direct economic incentive to induce behavioural change so as to avoid or reduce waste**. Our waste avoidance and reduction efforts have achieved progress and this has enhanced the public awareness on the need to reduce waste as exemplified by the increase of the overall recovery of MSW from 33% in 1997 to 45% in 2006. Notwithstanding the progress made, there remains pressing need for the adoption of advanced technologies to reduce the volume of waste so as to deal with the MSW generated in Hong Kong." [*emphases added*]

11. As at today, we have heard nothing about the progress of the Government's study on the feasibility of MSW charging as a direct economic incentive to induce behavioural change so as to avoid or reduce waste. It is our belief that the introduction of such charging will go a long way towards our efforts to reduce MSW, and that the Government should grasp the nettle and introduce such charging as a matter of urgency.

[15] Annex 6, §§2 and 3

12. We notice the following passage in the minutes of the meeting of the Advisory Council on the Environment ("ACE") held on 14 December 2009[16], when the subject of the technology review and associated facilities of the Integrated Waste Management Facilities was considered by the ACE:

> "28. A Member enquired about the benefits of having thermal treatment to operate with cement production, such as eco-co-combustion. Dr Lee Potts [Technical Specialist of Government's consultant] explained that the cement production process used limestone which could help remove acidic gases like hydrogen chloride. Moreover, the system utilized the bottom ash as raw material for cement production and it would reduce ash disposal to landfill."

13. We have made enquiries and found out that there is only one cement producer in Hong Kong, namely Green Island Cement Co. Ltd ("GI"). We also learnt from our enquiries that GI has proposed to the Government that an Eco-Co-Combustion System be provided at GI's present site at Tap Shek Kok, Tuen Mun for the thermal treatment of MSW and sewage sludge. It is said that such system, which can treat 4,800 tonnes of MSW per day, will have synergy with GI's present cement plant and will hence yield lower costs, higher productivity and a net improvement in air quality[17]. However, we understand that GI's proposal was turned down by the Government in 2008.

14. We do not know why GI's proposal was turned down. From our point of view, if GI's proposal can indeed substantially help solve Hong Kong's MSW problem, then the Government should not turn it down without cogent reasons. More importantly, the proposed IWMF of the Government can only treat 3,000 tonnes of MSW per day, which is only about 1/3 of the 9,000 tonnes or so of MSW per day Hong Kong is producing. In view of this shortfall, we do not understand why the Government turned down GI's proposal, which would go a long way in solving Hong Kong's MSW problem.

Are there really no alternatives to extending the SENT Landfill?

15. Tseung Kwan O is the seventh new town in Hong Kong. In 1982 the Executive Council approved the development of Tseung Kwan O into a new town . It is located at the southern part of Sai Kung District in the South East New Territories. It is however very close to the Metro Area. The New Town has a total land area of about 1,790 ha. It includes the districts of Tsui Lam, Po Lam, Hang Hau, Town Centre, Tiu Keng Leng, Pak Shing Kok, Siu Chik Sha, Tai Chik Sha and Fat Tong O.[18]

16. In 1983, development of Phase I of the New Town to an initial population of about 175,000 was formally endorsed. In 1986, the Government decided to proceed with the construction of the two

[16] Annex 7 , §28
[17] See GI's Fact Sheet at Annex 8
[18] Planning Department, Hong Kong. " Tseung Kwan O > Geographical Location" Pamphlets on Planning for New Territories. January 2003 (Retrieved on 2nd July 2010) <http://www.pland.gov.hk/pland_en/press/publication/nt_pamphlet02/tko_html/geo.html> (at Annex 9)

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tubes of Tseung Kwan O Tunnel, which provided scope for further increasing the population of the New Town. To maximize the utilization of the road infrastructure and to meet the demand for land for public housing, in 1987 the Government decided that the New Town should include a Phase II development and be planned to an increased population of 325,000.[19]

17. To cater for redevelopment of the Tiu Keng Leng Cottage Area and to provide land for development of Tseung Kwan O Industrial Estate and deep waterfront industries, in 1988 the Government further decided to proceed with Phase III development of the New Town for about 450,000 subject to detailed feasibility study. [20]

18. A feasibility study on the further development in Tseung Kwan O started in mid 2002 and was completed in 2005. According to the study, under the recommended option, the ultimate population in TKO would be around 450,000 as compared to around 480,000 as outlined in the current OZP[21].

19. In fact, Tseung Kwan O has been fast expanding since its first population intake in 1988 in the public housing estates in Po Lam and Tsui Lam, turning a small fishing village and ship building industrial area in the 1960s to a major new community[22]. By March 2008, it has a population of about 353,300 which is expected to increase by about 18% to 417,000 by 2016[23].

20. With the steady growth of population in Tseung Kwan O in recent years, the complaints on odour have increased correspondingly. Sources of odour affecting residents of Tseung Kwan O include the SENT Landfill itself and local mobile sources (refuse collection vehicles)[24]. We enclose herewith for the TPB's information copies of the following:

    (a) a recent newspaper clipping from the Hong Kong Economic Journal on the subject[25];

    (b) question by the Hon. Lau Kong-wah and a reply by the Secretary for the Environment, Transport and Works at LegCo on 25 April 2007[26];

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[19] Planning Department, Hong Kong. " Tseung Kwan O > Historical Background" Pamphlets on Planning for New Territories. January 2003 (Retrieved on 2nd July 2010) <http://www.pland.gov.hk/pland_en/press/publication/nt_pamphlet02/tko_html/hist.html> (at Annex 10)

[20] Ibid.

[21] Legislative Council Panel On Planning, Lands and Works "Feasibility Study for Further Development of Tseung Kwan O – Study Findings" June 2005 CB(1)1840/04-05(01) (Annex 11, §7)

[22] Civil Engineering and Development Department. "Achievements > Regional Development Services > Tseung Kwan O New Town " About Us. 2 July 2008 (Retrieved on 2nd July 2010) <http://www.cedd.gov.hk/eng/about/achievements/regional/regi_tko.htm> (at Annex 12)

[23] Legislative Council Panel on Home Affairs "District Open Space in Area 37, Tseung Kwan O" May 2009 CB(2)1453/08-09(01) (Annex 13, §5)

[24] EPD's Paper "Proposed Extension of the South East New Territories Landfill" on 14 June 2007, p.1 CB(1) 1979/06-07(01) (at Annex 14 hereof)

[25] Annex 15

[26] Annex 16

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(c) question by the Hon. Miriam Lau Kin Yee and a reply by the Acting Secretary for the Environment at LegCo on 23 June 2010[27]

21. We also wish to draw to Members' attention that in the site search for the IWMF, the Government's Advisory Group on Waste Management Facilities has recommended that certain areas should be excluded from consideration for the development of the IWMF. Such areas include, *inter alia*, all areas for Residential and Commercial Use and all 23 existing and potential Country Parks. We submit that by parity of reasoning, since the Proposed Extension is so near, albeit not within, areas zoned for residential development in Tseung Kwan O, it should be excluded from consideration.

Conclusion

22. We respectfully submit that the TPB should withdraw the Amendments in order to allow time for the following measures in the Policy Framework to become fully operational and effective:

(a) the further improvement in our waste recovery rate;

(b) the further decrease in the amount of our MSW upon the introduction of MSW charging.

23. Alternatively, we respectfully submit that what the TPB can do, and should at least do, is to ask the Government to re-consider the option of having thermal treatment to operate with cement production, such as eco-co-combustion.

24. Further alternatively, in the lamentable event that the TPB is not minded to so withdraw the Amendments, we respectfully submit that what the TPB can do, and should at least do, is to incorporate Landfill as a Column 2 use instead of a Column 1 use in the set of Notes for the "O(2)" sub-area. This will enable the TPB, if it sees fit to do so, to impose conditions, in relation to the Proposed Extension. Such conditions can, for instance, take the form of (i) requiring the odour generated by the Proposed Extension not to exceed a certain level for on the nearest sensitive receiver (ii) prohibiting the refuse collection vehicles going to and from the Proposed Extension after certain hours and requiring the adoption of other mitigation measures to the satisfaction of the TPB.

Date the 6th day of July 2010.

[27] Annex 17

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List of location plans, sites plans, other relevant plans, drawings and other documents submitted with the representation

Annex 1 Environmental Resources Management, *South East New Territories (SENT) Landfill Extension – Feasibility Study: EIA Report Vol. 1*, December 2007

Annex 2 Environmental Protection Department, *"A Policy Framework for the Management of Municipal Solid Waste (2005-2014)"*

Annex 3 Environmental Protection Department's annual publication "*Monitoring of Solid Waste in Hong Kong: Waste Statistics*" (from 2001 to 2008)

Annex 4 Environmental Protection Department, *"Update on the Progress of the Key Initiatives in the 'Policy Framework for the Management of Municipal Solid Waste (2005-2014)'"* submitted to the Legislative Council Panel on Environmental Affairs for information, 29 March 2010

Annex 5 Environmental Protection Department's Paper, *"Integrated Waste Management Facilities - Project Profile"* March 2008

Annex 6 Environmental Protection Department's paper, *"Site Selection for the Development of the Integrated Waste Management Facilities"* submitted to the Legislative Council Panel on Environmental Affairs for information, 29 January 2008

Annex 7 ACE Secretariat, *"Confirmed Minutes of the 166th Meeting of the Advisory Council on the Environment held on 14 December 2009 at 2:30 pm"* December 2009, Advisory Council on the Environment

Annex 8 Green Island Cement Co. Ltd, *"Green Island's Eco-Co-Combustion System – Fact Sheet"*

Annex 9 Planning Department, *"Tseung Kwan O > Geographical Location"* Pamphlets on Planning for New Territories. January 2003 (Retrieved on 2nd July 2010) <http://www.pland.gov.hk/pland_en/press/publication/nt_pamphlet02/tko_html/geo.html>

Annex 10 Planning Department, *"Tseung Kwan O > Historical Background"* Pamphlets on Planning for New Territories. January 2003 (Retrieved on 2nd July 2010) <http://www.pland.gov.hk/pland_en/press/publication/nt_pamphlet02/tko_html/hist.html>

Annex 11 Legislative Council Panel On Planning, Lands and Works *"Feasibility Study for Further Development of Tseung Kwan O – Study Findings"* June 2005 CB(1)1840/04-05(01)

Annex 12 Civil Engineering and Development Department, *"Achievements > Regional Development Services > Tseung Kwan O New Town"* About Us, 2 July 2008 (Retrieved on 2nd July 2010) <http://www.cedd.gov.hk/eng/about/achievements/regional/regi_tko.htm>

Annex 13 Legislative Council Panel on Home Affairs, *"District Open Space in Area 37, Tseung Kwan O"*, May 2009 CB(2)1453/08-09(01)

Annex 14 Environmental Protection Department's Paper *"Proposed Extension of the South East New Territories Landfill"*, 14 June 2007, p.1 CB(1) 1979/06-07(01)

Annex 15 "填區建圍牆冀擋臭氣" 信報 (Hong Kong) 24 June 2010

Annex 16 HKSAR, *"LCQ18: Malodour complaints from the Tseung Kwan O town south area"* Press Release dated 25 April, 2007 (Question by the Hon. Lau Kong-wah and a reply by the Secretary for the Environment, Transport and Works at Legislative Council on 25 April 2007)

Annex 17 HKSAR, *"LCQ20: South East New Territories Landfill"* Press Release dated 23 June, 2010 (Question by the Hon. Miriam Lau Kin Yee and a reply by the Acting Secretary for the Environment at Legislative Council on 23 June 2010)

Annex 18 List of signatures of Tseung Kwan O residents collected on 3, 4 and 5 July 2010 supporting this representation

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EIA REPORT - VOLUME I

Environmental Protection Department

Agreement No. CE 10/2005 (EP) *South East New Territories (SENT) Landfill Extension - Feasibility Study:* Environmental Impact Assessment Report - *Volume I*

December 2007

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1 INTRODUCTION

1.1 BACKGROUND

The existing SENT Landfill is strategically located in the south-east New Territories and currently receives about 6,200 tonnes of a wide variety of waste (1) per day. Based on the current waste input rate, it is predicted that its capacity will be exhausted by around 2012. As the planning, tendering and contract arrangement, detailed design, construction and commissioning of the landfill extension will take several years, it is essential to establish the environmental acceptability and the engineering feasibility of the proposed SENT Landfill Extension (hereafter referred to as the Extension) now.

ERM-Hong Kong, Ltd (ERM) has been commissioned by the Environmental Protection Department (EPD) to undertake the *South East New Territories (SENT) Landfill Extension Feasibility Study* (hereafter referred to as the Assignment) under the *Agreement No. CE 10/2005*. As part of the Assignment, an Environmental Impact Assessment (EIA) Study has been undertaken in accordance with the *EIA Study Brief* (No. ESB-119/2004) issued under the *Environmental Impact Assessment Ordinance (EIAO)*.

This EIA Report addresses the nature and extent of the potential environmental impacts associated with the construction, operation, restoration and aftercare of the Extension (hereafter referred to as the Project).

1.2 OBJECTIVES OF THE EIA STUDY

The Extension is classified as a Designated Project under Schedule 2, Category G.1 and Q.1 of the EIAO and therefore the construction, operation, restoration and aftercare of the Extension will require an Environmental Permit. The overall objectives of the EIA Study are to provide information on the nature and extent of environmental impacts arising from the Extension; to recommend appropriate mitigation measures to control the potential environmental impacts so that it complies with the requirements of the *Technical Memorandum on Environmental Impact Assessment Process of Environmental Impact Assessment Ordinance* (EIAO-TM), and to confirm the environmental acceptability of the Extension.

The specific objectives of the EIA Study described in the *EIA Study Brief* are listed below.

(i) to describe the Project and associated works together with the requirements for carrying out the Project;

(ii) to identify and describe elements of community and environment likely

(1) Including municipal solid waste, construction waste and special wastes.

2 CONSIDERATION OF ALTERNATIVES

2.1 INTRODUCTION

In accordance with the requirements of Section 3.3 of the *EIA Study Brief*, this Section describes the need for the Extension and the consideration of design options. The consideration of alternatives also includes alternative construction methods and work sequences.

2.2 JUSTIFICATION FOR THE NEED OF THE EXTENSION

Hong Kong is facing an imminent waste problem as the existing landfills will be filled up in the next decade. In December 2005, the Government published the waste policy document A Policy Framework for the Management of Municipal Solid Waste (2005-2014) (hereafter referred to as the Policy Framework). This document sets out a comprehensive strategy for the management of municipal solid waste (MSW) in Hong Kong with clear targets and a timetable for ten years, from 2005 to 2014. The strategy embraces the concepts of sustainable waste management and the 3-tiered waste hierarchy with avoidance and minimization as the top priorities, followed by reuse, recovery and recycling, and the bulk waste reduction and landfill disposal.

The Government is therefore actively promoting initiatives to reduce waste generation and promote waste recycling. When comparing the waste statistics for 2006 with those of previous years, the amount of MSW disposed of at the three strategic landfills (WENT, NENT and SENT) dropped by 1% against an economic growth of 6.8% in 2006. Equally encouraging is the increase in the recovery rate of domestic waste from 16% in 2005 to 20% in 2006. At the same time, the overall recovery of MSW has also increased from 43% in 2005 (2.59 million tonnes) to 45% in 2006 (2.84 million tonnes), three years ahead of the target stated in the Policy Framework. There are however areas of concern. Even though the amount of MSW landfilled was reduced by 1% in 2006, there is still a long way to go in achieving the Policy Framework s target of reducing the total MSW landfilled to less than 25%. In addition, despite EPD s efforts in waste reduction and recovery, the amount of MSW generated remains on an increasing trend. This is likely to be the result of growth in commercial, industrial and tourism-related activities in 2006 which has led to an increase of about 4% in commercial and industrial waste generation. Therefore, despite the progress achieved for source separation and waste recycling, it is important to press ahead with the other initiatives in the Policy Framework such as Producer Responsibility Schemes (PRSs), MSW charging, integrated waste management facilities (IWMF) and landfill extensions.

At the same time, the Government is also looking into building modern large scale integrated waste management facilities that would employ thermal

treatment as a core technology as it is clearly not sustainable to continue to rely on landfilling alone for the disposal of untreated MSW. The integrated waste management facilities are planned to be commissioned in the mid 2010s, assuming that good progress is made. As mentioned in the Policy Framework, landfills will still be required as the final repositories for non-recyclable waste, inert waste and waste residues after treatment. It has been estimated that the demand for landfill space from 2006 to 2025 is around 200 million tonnes, while the remaining landfill capacity, at the end of 2004 was 90 million tonnes. The provision of sufficient landfill space by extending the capacity of the three existing landfills is an important and integral part of the waste management strategy in Hong Kong and is necessary to meet the shortfall of landfill capacity. Indeed, the Policy Framework recommended that commissioning of these extensions will be required in the early 2010s to mid-2010s.

In addition to the need for landfill capacity on a territory-wide basis, there is a need to meet the regional demand for waste disposal outlets. The three landfills are at strategic locations in Hong Kong and the extension of all three is necessary to maintain the overall waste disposal plan which is based on bulk waste transfer to avoid excessive number of waste collection vehicles travelling in the urban areas (1). Due to its close proximity to the urban areas, the SENT Landfill is the most highly used waste disposal facility amongst the three landfills, particularly by private waste collectors for commercial, industrial as well as construction wastes. It receives about 6,200 tonnes of municipal, construction and special wastes every day. If the SENT Landfill is closed, waste will have to be diverted to the NENT and WENT Landfills. This will require vehicles collecting waste from the catchments of the SENT Landfill to travel an additional hundred thousand kilometres per day in total through the built-up areas to the remotely located NENT and WENT Landfills, thus resulting in additional environmental impacts such as increased traffic movements, vehicular emissions and noise impacts on many more sensitive receivers en-route. To reduce these impacts, we would need a succession plan by developing new waste transfer and/or handling facilities in the south-east region of the territory, such as new handling facility for construction waste (ie the Construction Waste Handling Facility (CWHF)) and refuse transfer station for MSW (ie the South East Kowloon Transfer Station

(1) According to the White Paper Pollution in Hong Kong A Time to Act issued on 5 June 1989 and the subsequent waste disposal strategy under the Waste Disposal Plan approved by the Governor in Council on 12 December 1989, there should be three new landfills in Hong Kong distributed on a regional basis for the following reasons:

- the daily quantity of MSW could not be handled by one or two landfills simply because of the strain that would be placed on the surrounding road network and on the landfill sites themselves;
- the increases in MSW were projected for the western and north-eastern New Territories and provision of disposal facility in each of these areas would help reduce transportation costs; and
- there would continue to be a need for a final disposal facility in reasonable proximity to Hong Kong Island in order to contain the transportation cost for waste arising from urban areas.

The existing 3 strategic landfills were therefore located at the western, north-eastern and south-eastern New Territories regions within the territory in the absence of other alternative site available in Kowloon and Hong Kong Island.

(SEKTS)). As the planning (including the site search), feasibility study, statutory environmental impact assessment process, tendering and contract arrangement, detailed design, construction and commissioning of these facilities would take equally long time as the landfill extension scheme, it further strengthens the importance of maximising the capacity of Extension where feasible in order to minimize those impacts as far as we could manage.

Projecting the time at which these new facilities will be available is very uncertain as the site for the CWHF will unlikely be available in the early 2010s and the site selection for the SEKTS has not yet been started. It will be a long planning and public consultation process to secure suitable waterfront sites at the Tseung Kwan O and South East Kowloon areas which are acceptable to the public for the development of these waste transfer/handlling facilities, but without compromising the overall planning and development of these two areas. In addition, the funding for developing these facilities has not been secured. Under an optimistic set of conditions to form a target programme at the present stage, they could possibly be in place by 2017. With SENT expected to be full by 2012, at least six years of additional void space is necessary. It is important to extend the lifespan of the SENT Landfill so that the Government can have time to plan and develop these new waste handling facilities.

2.2.1 Extension of the SENT Landfill

In 2000, the potential to extend the SENT Landfill was examined in a study entitled the Extension of Existing Landfills and Identification of Potential New Waste Disposal Sites . The recommendations of this study was presented to the Advisory Council on Environment (ACE) and supported by the ACE members. The possibility of locating extensions to the west, north and east of the existing SENT Landfill was investigated, but sites in these locations were ruled out for the following reasons:

- **Extension to the west**: this area is already occupied by the Tseung Kwan O Industrial Estate (TKOIE);
- **Extension to the north**: extensive excavation into the headland that separates the existing landfill from the TKO Stage II/III Landfill would be required and could significantly interfere with the completed and restored TKO Stage II/III Landfill and works yet to be carried out at the SENT Landfill; and
- **Extension to the east**: this will result in a major encroachment into the CWBCP, destroy the ridge line and sever the High Junk Peak Hiking Trail.

The only feasible option is to extend the landfill southward into TKO Area 137.

EPD identified 15 hectares of land in TKO Area 137 together with an adjoining narrow strip of land within the CWBCP as a potential site for the extension of the SENT Landfill (see *Figure 2.2a*).

Annex A

Environmental Protection Department

A Policy Framework for the Management of Municipal Solid Waste (2005-2014)

PREFACE

In an affluent and developed society such as Hong Kong, environmental issues are rightfully among the top concerns of the community. Since the air we breathe and water we drink directly affect our health, the concerns voiced on these areas are often louder than those on waste management, which is an equally important and perhaps even more imminent problem. Unless we change our consumption-led lifestyle, our landfills will be rapidly filled up in 6 to 10 years. It is clearly not sustainable to keep throwing all our waste to the landfills. A viable set of solutions is high on the agenda of the Government and the community as a whole.

It is therefore my pleasure to publish "A Policy Framework for the Management of Municipal Solid Waste (2005-2014)" at this opportune time. This Policy Framework advocates what we plan to do to tackle our waste problem head-on. Its core message is clear and simple: we must be responsible for what we consume and what we dispose of. We must all be responsible for avoiding, reducing, reusing, recycling and treating waste, and use our landfills as a final repository only for the unavoidable waste after waste treatment.

True to our belief in "big market, small government", the Policy Framework proposes simple, yet effective, economic tools based on the "polluter-pays" principle that would create incentives for us all to recycle more and throw less. They include measures tried and proven effective in other jurisdictions. We ask you to help make such waste reduction decisions that make sound economic and environmental sense.

We sincerely invite you all to thoroughly discuss and comment on the initiatives and milestones set out in the Policy Framework. Only with your full support can we turn this Policy Framework into reality. We must work together to tackle our waste problem now so that our future generations will not be burdened with cleaning up the mess we leave behind.

Dr Sarah Liao, JP
Secretary for the Environment, Transport and Works

EXECUTIVE SUMMARY

Why Now

Hong Kong has an imminent waste problem. At present, we rely solely on our landfills to dispose of our waste. Although we are recovering 40% of our waste for recycling, our landfills will be full in 6 to 10 years if we do not substantially reduce the generation of waste and cut down the amount of waste we send to the landfills.

The Government Acts

We must address the waste problem in a holistic manner. This Policy Framework sets out a comprehensive strategy consisting of a series of tried and proven policy tools and measures to tackle our waste problem head on and achieve the following targets:

Target 1: To reduce the amount of municipal solid waste (MSW) generated in Hong Kong by 1% per annum up to the year 2014.

Target 2: To increase the overall recovery rate of MSW to 45% by 2009 and 50% by 2014.

Target 3: To reduce the total MSW disposed of in landfills to less than 25% by 2014.

Tackling the Problem at Source

Waste avoidance and minimization are our top priorities. We introduced a territory-wide waste recovery programme in January 2005 to facilitate waste separation at the household level. We aim to expand the scheme to cover **80%** of the population by **2010**, and significantly increase the recovery of our domestic waste. To make proper use of the recyclables recovered, we must have a robust recycling industry locally. In addition to the existing policy of providing land on short-term tenancies, we are setting up the EcoPark for the recycling industry. The EcoPark will come into operation in

late **2006**. Additionally, we will continue to encourage the development of recycling technology through the Environment and Conservation Fund and the Innovation and Technology Fund. In doing so, we will not only reduce pressure on our waste facilities, but also conserve resources and jump-start a circular economy.

Throw less, Pay less

The core of our comprehensive strategy is the "polluter-pays" principle. We propose to introduce producer responsibility schemes (PRSs) that hold the manufacturers, importers, retailers and consumers responsible for what they produce and consume. We aim to introduce to the Legislative Council the Product Eco-responsibility Bill in **2006** to provide a legal framework for PRSs. With PRSs in place, we can consider introducing landfill disposal bans so as to make better use of our landfills as the final repository of unavoidable and properly treated wastes. We also propose introducing legislation on waste charging by **2007** as a direct economic incentive to avoid and reduce waste.

State-of-the-art Treatment

While our proposed policy measures would have substantial impact on waste reduction and recycling, we must face up to the reality that there will still be unavoidable waste that we must handle. We propose to develop state-of-the-art Integrated Waste Management Facilities with incineration as the core technology for final waste treatment. In developing the Facilities, we will adopt the most stringent emission standards to minimize their impact on the environment.

Community Participation

Our comprehensive strategy can only work in partnership with the public. We urge the community at large to fully support this Policy Framework.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2001

Environmental Protection Department

2. Waste Quantities and Characteristics

Table 2.1 Quantities of solid waste disposed of at landfills in 2001

Waste type	Quantity (tpd)			Change from 2000	
	Public[1]	Private[2]	Total	Quantity (tpd)	Percentage
a. Domestic waste [3]					
- waste from household, public cleansing	5,822	1,644	7,466		
- bulky waste [4]	28	57	85		
Sub-total	5,850[5]	1,701	7,551	+11	+0.1%
b. Commercial waste [6]					
- mixed waste from commercial activities	-	1,120	1,120		
- bulky waste [4]	-	68	68		
Sub-total		1,187	1,187	+36	+3.1%
c. Industrial waste					
- mixed waste from industrial activities	-	534	534		
- bulky waste [4]	-	28	28		
Sub-total		562	562	-82	-12.7%
d. Municipal solid waste received at disposal facilities (a+b+c)	**5,850**	**3,450**	**9,300**	**-35**	**-0.4%**
e. Construction & demolition waste (landfilled)	**-**	**6,408**	**6,408**	**-1,067**	**-14.3%**
f. Special waste [7] **(landfilled)**	**502**	**607**	**1,109**	**+15**	**+1.4%**
g. All waste received at landfills (d+e+f)	**6,352**	**10,465**	**16,817**	**-1,087**	**-6.1%**

Notes:

(1) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(2) Waste collected by private waste collectors.

(3) Domestic waste also includes waste collected from government markets.

(4) These are bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles and are usually collected separately. They may come from residential premises, commercial and industrial activities.

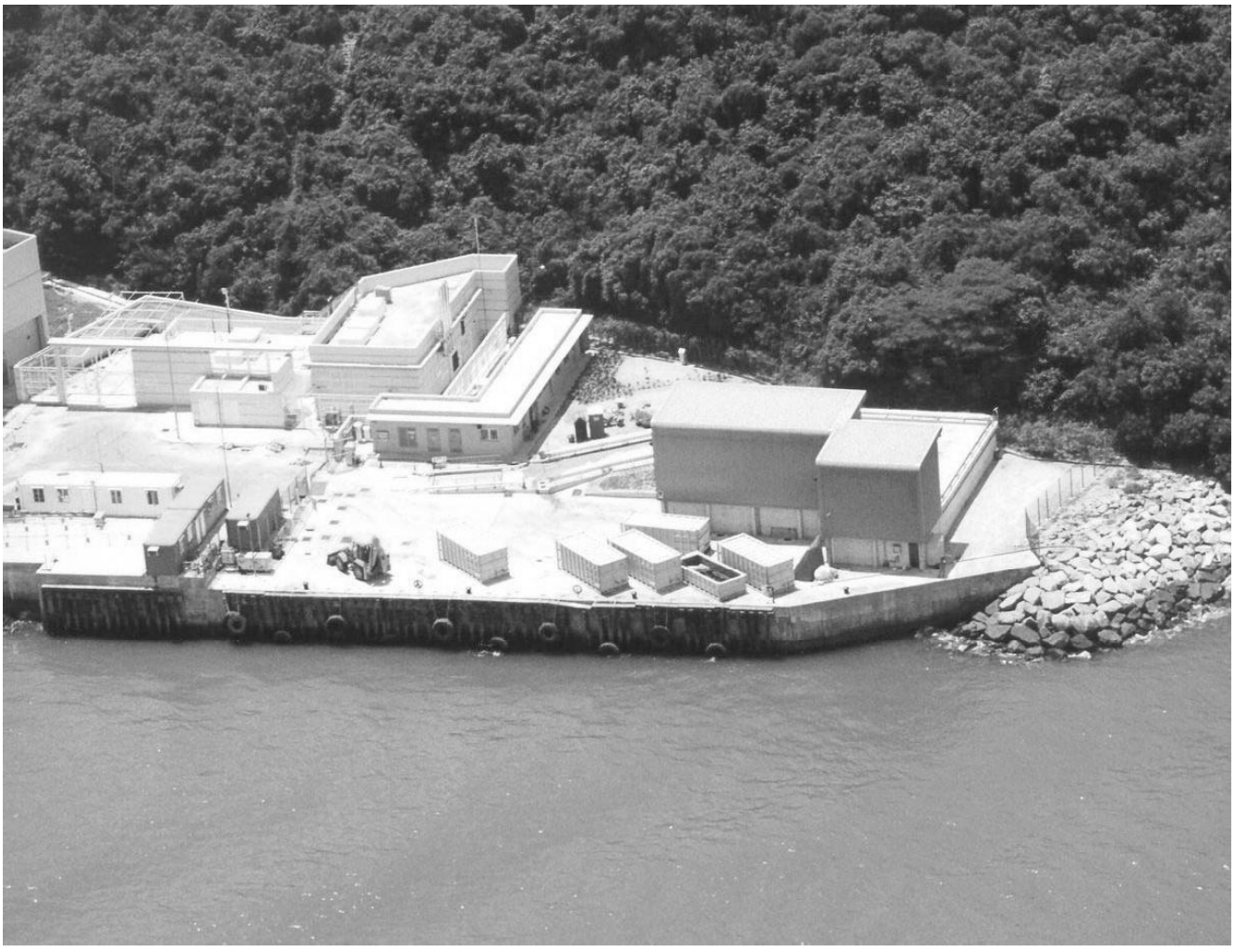
(5) Publicly collected domestic waste included some commercial and industrial waste.

(6) Commercial waste also includes waste collected from non-government markets.

(7) Special waste included abattoir waste, animal carcasses, asbestos, clinical waste, condemned goods, livestock waste, sewage treatment and waterworks treatment sludge, sewage works screenings and stabilized residues from Chemical Waste Treatment Centre.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2002



Environmental Protection Department

2. Waste Quantities and Characteristics

Plate 2.1 Solid waste disposal by category in 2002

Waste type [1]	Quantity (tpd)			Change from 2001	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste					
- waste from household, public cleansing	5,961	1,480	7,441		
- bulky waste [4]	28	50	78		
Sub-total	5,989	1,530	7,519	-32	-0.4%
b. Commercial waste					
- mixed waste from commercial activities	-	1,278	1,278		
- bulky waste [4]	-	64	64		
Sub-total		1,342	1,342	+155	+13.1%
c. Industrial waste					
- mixed waste from industrial activities	-	536	536		
- bulky waste [4]	-	25	25		
Sub-total		561	561	-1	-0.2%
d. Municipal solid waste received at disposal facilities (a+b+c)	**5,989**	**3,433**	**9,422**	**+122**	**+1.3%**
e. Construction & demolition waste	**-**	**10,202**	**10,202**	**+3,794**	**+59.2%**
f. Special waste	**883**	**651**	**1,534**	**+426**	**+38.4%**
g. All waste received at landfills (d+e+f)	**6,872**	**14,286**	**21,158**	**+4,341**	**+25.8%**

Remark: Figures may not add up to total due to rounding off.

Notes:

(1) Please refer to Appendix 1 for classification of solid waste.

(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(3) Waste collected by private waste collectors.

(4) These are bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles and are usually collected separately.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2003

Environmental Protection Department

2. Waste Quantities and Characteristics

Plate 2.1 Solid waste disposal by category in 2003

Waste type [1]	Quantity (tpd)			Change from 2002	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste					
- waste from household, public cleansing	5,892	1,422	7,314		
- bulky waste [4]	25	63	88		
Sub-total	5,917	1,485	7,402	-117	-1.6%
b. Commercial waste					
- mixed waste from commercial activities	-	1,337	1,337		
- bulky waste [4]	-	91	91		
Sub-total		1,428	1,428	+86	+6.4%
c. Industrial waste					
- mixed waste from industrial activities	-	581	581		
- bulky waste [4]	-	31	31		
Sub-total		612	612	+51	+9.0%
d. Municipal solid waste received at disposal facilities (a+b+c)	5,917	3,525	9,441	+19	+0.2%
e. Landfilled construction waste	-	6,728	6,728	-3,474	-34.1%
f. Special waste	939	649	1,588	+54	+3.5%
g. All waste received at landfills (d+e+f)	6,855	10,902	17,757	-3,401	-16.1%

Remark: Figures may not add up to total due to rounding off.

Notes:
(1) Please refer to Appendix 1 for classification of solid waste.
(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.
(3) Waste collected by private waste collectors.
(4) These are bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles and are usually collected separately.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2004

Environmental Protection Department

2. Waste Quantities and Characteristics

Plate 2.1 Solid waste disposal by category in 2004

Waste type [1]	Quantity (tpd)			Change from 2003	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste					
- waste from household, public cleansing	5,356	1,580	6,937		
- bulky waste [4]	22	56	77		
Sub-total	5,378	1,636	7,014	-388	-5.2%
b. Commercial waste					
- mixed waste from commercial activities	-	1,593	1,593		
- bulky waste [4]	-	80	80		
Sub-total		1,673	1,673	+245	+17.2%
c. Industrial waste					
- mixed waste from industrial activities	-	573	573		
- bulky waste [4]	-	28	28		
Sub-total		601	601	-11	-1.9%
d. Municipal solid waste received at disposal facilities (a+b+c)	5,378	3,909	9,288	-154	-1.6%
e. Landfilled construction waste	-	6,595	6,595	-133	-2.0%
f. Special waste	954	665	1,620	+32	+2.0%
g. All waste received at landfills (d+e+f)	6,333	11,169	17,502	-256	-1.4%

Remark: Figures may not add up to total due to rounding off.

Notes:

(1) Please refer to Appendix 1 for classification of solid waste.

(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(3) Waste collected by private waste collectors.

(4) These are bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles and are usually collected separately.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2005

Environmental Protection Department

2. Waste Quantities and Characteristics

Plate 2.1 Solid waste disposal by category in 2005

Waste type [1]	Quantity (tpd)			Change from 2004	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste					
- waste from household, public cleansing	**5,344**	**1,410**	**6,753**		
- bulky waste [4]	**22**	**52**	**74**		
Sub-total	**5,366**	**1,461**	**6,828**	**-186**	**-2.7%**
b. Commercial waste					
- mixed waste from commercial activities	**-**	**1,809**	**1,809**		
- bulky waste [4]	**-**	**86**	**86**		
Sub-total		**1,895**	**1,895**	**+222**	**+13.3%**
c. Industrial waste					
- mixed waste from industrial activities	**-**	**628**	**628**		
- bulky waste [4]	**-**	**26**	**26**		
Sub-total		**654**	**654**	**53**	**+8.8%**
d. Municipal solid waste received at disposal facilities (a+b+c)	**5,366**	**4,010**	**9,377**	**+89**	**+1.0%**
e. Landfilled construction waste	**-**	**6,556**	**6,556**	**-38**	**-0.6%**
f. Special waste	**1,059**	**687**	**1,746**	**+126**	**+7.8%**
g. All waste received at landfills (d+e+f)	**6,426**	**11,254**	**17,679**	**+177**	**+1.0%**

Remark: (1) Figures may not add up to total due to rounding off.

Notes:

(1) Please refer to Appendix 1 for classification of solid waste.

(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(3) Waste collected by private waste collectors.

(4) These are bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles and are usually collected separately.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2006

Environmental Protection Department

2. Waste Quantities and Characteristics

Plate 2.1 Solid waste disposal by category in 2006

Waste type [1]	Quantity (tpd)			Change from 2005	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste					
- waste from household, public cleansing	5,349	1,247	6,595		
- bulky waste [4]	3	36	39		
Sub-total	5,352	1,282	6,634	-194	-2.8%
b. Commercial waste					
- mixed waste from commercial activities	-	1,990	1,990		
- bulky waste [4]	-	71	71		
Sub-total		2,062	2,062	+167	+8.8%
c. Industrial waste					
- mixed waste from industrial activities	-	566	566		
- bulky waste [4]	-	18	18		
Sub-total		583	583	-71	-10.7%
d. Municipal solid waste received at disposal facilities (a+b+c)	5,352	3,927	9,279	-98	-1.0%
e. Landfilled construction waste	-	4,125	4,125	-2,431	-37.1%
f. Special waste	995	639	1,635	-111	-6.4%
g. All waste received at landfills (d+e+f)	6,347	8,692	15,039	-2,640	-14.9%

Remark: Figures may not add up to total due to rounding off.

Notes:

(1) Please refer to Appendix 1 for classification of solid waste.

(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(3) Waste collected by private waste collectors.

(4) These are bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles and are usually collected separately.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2007

Environmental Protection Department

2. Waste Quantities and Characteristics

Plate 2.1 Disposal of solid waste at landfills in 2007

Waste type[1]	Average daily quantity (tpd)			Change from 2006	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste					
– waste from household, public cleansing	5,237	1,093	6,331		
– bulky waste[4]	2	40	42		
Sub-total	5,239	1,133	6,372	-262	-3.9%
b. Commercial waste					
– mixed waste from commercial activities	-	2,117	2,117		
– bulky waste[4]	-	73	73		
Sub-total	-	2,190	2,190	128	6.2%
c. Industrial waste					
– mixed waste from industrial activities[5]	-	846	846		
– bulky waste[4]	-	20	20		
Sub-total	-	866	866	282	48.4%
d. Municipal solid waste[5] (a+b+c)	5,239	4,189	9,428	148	1.6%
e. Construction waste[6]	-	2,914	2,914	-1,211	-29.4%
f. Special waste[7]	966	594	1,559	-75	-4.6%
g. All waste received at landfills (d+e+f) Total	6,205	7,697	13,901	-1,138	-7.6%

Remark: Figures may not add up to total due to rounding off.

Notes:

(1) Refer to Appendix 1 for classification of solid waste.

(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(3) Waste collected by private waste collectors.

(4) Bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles are usually collected separately. The quantity reported here includes only the bulky waste delivered to landfills by waste collectors directly.

(5) The quantities include 244 tpd of waste concrete/plaster/mortar related to construction industry.

(6) The quantity does not include construction waste reused or disposed of at other outlets.

(7) The quantity does not include special waste retreated or disposed of at other outlets.

MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2008

Environmental Protection Department

2. Waste Quantities and Characteristics

Plate 2.1 Disposal of solid waste at landfills in 2008

Waste type[1]	Average daily quantity (tpd)			Change from 2007	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste	5,118	963	6,081	-291	-4.6%
b. Commercial waste	-	2,280	2,280	90	4.1%
c. Industrial waste[4]	-	1,092	1,092	226	26.2%
d. Municipal solid waste[4] (a+b+c)	5,118	4,335	9,453	25	0.3%
e. Construction waste[5]	-	2,659	2,659	-255	-8.7%
f. Special waste[6]	948	443	1,391	-168	-10.8%
g. All waste received at landfills (d+e+f) Total	6,066	7,438	13,503	-398	-2.9%

Remark: Figures may not add up to total due to rounding off.

Notes:

(1) Refer to Appendix 1 for classification of solid waste.

(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(3) Waste collected by private waste collectors.

(4) The quantities include 432 tpd of waste concrete/plaster/mortar related to construction industry.

(5) The quantity does not include construction waste reused or disposed of at other outlets.

(6) The quantity does not include special waste retreated or disposed of at other outlets.

CB(1) 1443/09-10(04)

For discussion
On 29 March 2010

Legislative Council Panel on Environmental Affairs

Update on the Progress of the Key Initiatives in the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)"

PURPOSE

This paper updates Members on the progress of key initiatives in the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)" (Policy Framework).

KEY INITIATIVES IN THE POLICY FRAMEWORK

2. To manage our municipal solid waste (MSW) (i.e. domestic and commercial and industrial[1] (C&I) waste) in a holistic manner, the Administration published the Policy Framework in December 2005, which sets out a comprehensive waste management strategy for the next ten years. With continuing effort, we have progressively achieved positive results in waste avoidance and reduction at source, waste recovery and recycling, as well as bulk reduction of waste.

3. The continuous expansion of the source separation of MSW and the introduction of the voluntary producer responsibility schemes (PRS's) help improve the waste recovery in Hong Kong. In 2009, the domestic waste recovery rate is 35% which has more than doubled the figure of 16% in 2005. As for C&I waste, the recovery rate has been maintained at a relatively high level of some 60% over the years. Overall, we achieved an MSW recovery rate of 49% in 2009. As compared with equivalent statistics[2] in some other jurisdictions, our MSW recovery rate is higher than United States (33%), United Kingdom (35%) and Singapore (43%), although there are some even better

[1] In consultation with Waste Management Subcommittee of the Advisory Council on the Environment, commercial and industrial waste is reviewed to exclude waste concrete generated from concrete batching plants and cement plaster / mortar production / manufacturing plants not set up inside construction sites, in order to truly reflect the pattern and trend of waste generated from commercial and industrial activities.

[2] Due to differences in reporting methodology and timing, MSW recovery rates for United States, United Kingdom, Singapore and Germany are calculated from the relevant waste statistics in 2008 published by the respective governments.

examples such as Germany (62%). However, as the international economic situation remains challenging, the outlook of waste recovery in Hong Kong in the coming years is overshadowed by the uncertainty in the global demands for recyclable materials. We will continue to support the development of local recycling, including the facilitation for the recycling industry to move to higher-end and value-added operations, and to explore possible outlets for recovered materials and recycled products.

4. The efforts in waste recovery also reduce the quantity of waste which requires disposal at landfills. Since the launch of the Policy Framework, it is the fifth consecutive year recording reduction in landfill disposal of domestic waste with a cumulative decrease of about 14.5%. On a year-by-year comparison, the amount of domestic waste disposed of at landfills dropped by 1.4% in 2009, as compared to 2008, to about 2.20 million tonnes. On C&I waste, in 2009 the quantity of C&I waste disposed of at landfills remained at the 2008 level of around 1.08 million tonnes. The overall landfill disposal of MSW has decreased by 0.9% to about 3.27 million tonnes.

5. The implementation progress of major initiatives under the Policy Framework is set out below.

MSW Recovery and Recycling

6. Launched in January 2005, the territory-wide Source Separation of Domestic Waste Programme aims at providing suitable recycling facilities for domestic waste at locations as close as possible to its sources of generation, and at the same time broadening the types of recyclables to be recovered. It also encourages the community's participation in waste recovery and facilitates the provision of a reliable source of materials for the recycling industry.

7. As at end 2009, there were 1 256 (996 in 2008) housing estates participating in the programme, covering some 1.57 million (1.23 million in 2008) households or 67% (53% in 2008) of the population. Around 27% of them have implemented a floor-to-floor mode of waste separation, while the remaining set up waste separation facilities on the ground floor to collect different types of recyclable materials, including paper, plastics, metals, used clothes, small electrical and electronic appliances. We will continue to press ahead with the programme and, in particular, we are seeking to extend the coverage of the programme to some older districts as well as rural areas.

8. In 2009, we achieved a recovery rate of 65% for C&I waste. To press ahead with the recovery of C&I waste, a promotional programme targeting C&I buildings has been operative since October 2007. Some 554 buildings have

signed up to the programme, covering commercial and institutional buildings, industrial buildings, shopping arcades, warehouses and car parks. The programme recognizes and encourages the implementation of source separation practices in C&I buildings. We will continue to recruit new buildings. With funding support from the Environment and Conservation Fund (ECF), the Environmental Campaign Committee has been providing newly designed waste separation bins to housing estates, C&I buildings, schools, as well as recyclable collection points at public places.

Producer Responsibility Schemes

9. In the Policy Framework, we highlighted the "polluter-pays principle" to provide economic incentives for the public to reduce and recycle waste. In line with this principle, PRS's will enable manufacturers, importers, distributors, retailers and consumers to share the eco-responsibility of reducing, recovering and recycling, as well as contributing to the treatment and disposal of certain spent products so as to minimise the environmental impact. The Product Eco-responsibility Ordinance (Cap. 603) (PERO) was enacted in July 2008 to provide the legal basis for introducing mandatory PRS's in Hong Kong.

10. With general public support and consensus, the Environmental Levy Scheme on Plastic Shopping Bags (the Levy Scheme) was launched on 7 July 2009 as the first PRS introduced under the Ordinance. We have undertaken to review the effectiveness of the scheme one year after implementation taking into account related statistics and other relevant factors. In the meantime, we are closely monitoring the impact of the Levy Scheme through conducting disposal surveys and vetting returns by prescribed retailers, and encourage the relevant trades and the public to continue with reducing the indiscriminate use of plastic shopping bags.

11. Further to the Levy Scheme, we have identified waste electrical and electronic equipment (WEEE) as the next target product for mandatory PRS. WEEE contains hazardous components that could be harmful to the environment and human health if not properly treated or disposed of. Around 70 000 tonnes of WEEE is generated in Hong Kong annually and the volume has been on the rise in recent years. By introducing a mandatory PRS for the proper management of WEEE, we could on one hand avoid negative impact that WEEE might bring to the environment, and on the other hand promote the recycling of waste and the reuse and recovery of useful materials. At the same time, it would help to boost the development of the local environmental industry. We published a consultation document in January 2010 for the purpose of soliciting the public's views on the proposed PRS on WEEE. The public consultation period will end on 30 April 2010. We will take into account the views collected

when further developing the details of the scheme.

12. Besides pursuing PRS's under the PERO, we have been promoting and supporting the voluntary recycling programmes to recover and recycle certain products. The Computer Recycling Programme (CRP), the Fluorescent Lamp Recycling Programmes (FLRP) and the Glass Container Recycling Programme for the Hotel Sector (GCRP) were launched respectively in January, March and November of 2008. Together with the Rechargeable Battery Recycling Programme (RBRP) launched in 2005, all the four programmes were funded and administered by the respective trades. By the end of 2009, the CRP has recovered around 33 200 units of used computer equipment; the FLRP 488 000 pieces of fluorescent lamps; the RBRP 990 000 pieces of batteries; and the GCRP 460 tonnes of glass. In light of the experience gained, we will continue to encourage voluntary PRS's among the relevant trades.

EcoPark

13. Further to alleviating the pressure on our fast-depleting landfill space, the waste recovered could be turned into useful products and channeled back to the economic chain. To add further impetus to the development of the recycling industry, the EcoPark in Tuen Mun provides long term land at affordable costs for the local environmental and recycling industries. The 20-hectare EcoPark is developed in two phases. In Phase I, all six lots have been leased. The operation of three of the Phase I tenants for recycling of used cooking oil, scrap metals and used computer equipment are expected to commence in April/May 2010. The remaining infrastructure development works of EcoPark Phase II will soon be completed. We are reviewing the leasing arrangements of Phase II lots, with reference to the experience gained from Phase I, the feedback from stakeholders and recycling trades and other relevant factors. The first batch of Phase II lots is expected to be available later this year. With a main theme of solid waste management, a visitor centre of 10 000 square feet will also be open to the public in April 2010.

14. At the same time, the Government is setting up two waste recycling centres in EcoPark Phase II with a view to providing a secured outlet for waste plastics and WEEE which have relatively limited market demand and their processing in Hong Kong is currently not economically sustainable. The two centres are to be run by two non-profit organisations with subsidy from the ECF. The plastic processing centre started operating in March 2010 while the WEEE recycling centre is expected to commence operation in the second half of 2010.

Towards a More Sustainable Waste Management Approach

15. Among other initiatives, we are developing a proposal to introduce MSW charging in Hong Kong to promote waste reduction and recovery. On the domestic side, we conducted in 2007 a three-month trial scheme to examine the logistical requirements for waste recovery and disposal in different domestic housing settings. We are about to complete by March 2010 a Baseline Study to collect information on the waste generation and waste management practices of different C&I establishments. The information collected from the trial scheme and the baseline study would facilitate the development of possible MSW charging options, having regard to the policy objective of providing economic incentives for the public to avoid, reduce, reuse and recycle waste as stated in the Policy Framework.

16. Despite efforts and progress in waste reduction and recycling, there is unavoidable waste that needs to be disposed of properly. Our three strategic landfills are approaching their capacity and their extension would be necessary to provide the final repository for our waste. In this connection, the feasibility and environmental impact assessment studies on the extension of the North East New Territories Landfill, the South East New Territories and the West New Territories Landfill have been completed. Our target is to commission the landfill extensions by mid to late-2010s before the exhaustion of the existing landfills.

17. Pursuing waste reduction and recycling and extending the landfills alone will not resolve our waste problem. We need to adopt a more sustainable approach to reduce the volume of waste that requires disposal, and to conserve our landfill space as the final repository for residue waste or inert waste that cannot be further treated. As set out in the Policy Framework, we will develop the Integrated Waste Management Facilities (IWMF) with incineration as the core technology to substantially reduce the volume of unavoidable waste, thereby extending the life span of the existing landfills and their extension.

18. We will develop the IWMF in phases having regard to the size of overall waste problem. The first phase will have a treatment capacity of about 3 000 tonnes per day (tpd). It will also incorporate a small-scale sorting and recycling plant to recover recyclable materials from mixed MSW. The first phase of the IWMF will occupy an area of about 10 hectares. The result of our comprehensive site search exercise concludes that the sites at Shek Kwu Chau and Tsang Tsui Ash Lagoons are suitable for consideration as potential sites. We are conducting the detailed engineering and EIA studies for both sites to ascertain their suitability. Subject to the study findings to be available in the second half of 2010, we aim to make a decision on the choice of site and to commence construction with a view to commissioning the facilities by the mid-2010s.

19. Food waste constitutes some 33% of our C&I waste disposed of at our landfills in 2009. To gather experience and information on the collection and treatment of organic waste, we commissioned a pilot composting plant in mid-2008. The pilot composting plant is capable of receiving up to 4 tpd of source-separated food waste from C&I premises. It also provides us with useful information in developing the Organic Waste Treatment Facilities (OWTF). Biological treatment technology, like composting or anaerobic digestion, will be adopted. The first phase of the OWTF is planned to be built in Siu Ho Wan on Lantau Island and will handle about 200 tonnes of source-separated food waste from the C&I sector per day. The EIA study was completed in February 2010. We have consulted the Tsuen Wan and Islands District Councils which raised no objection to this project. We aim to submit funding application of the project to the Legislative Council in the latter half of this year.

Encouraging Reuse of waste C&D materials in works projects

20. While waste construction and demolition (C&D) materials are not regarded as MSW, their disposal at landfill will impose further pressure on the fast-depleting landfill space. Waste C&D materials could be recycled to produce works materials. Examples include recycled aggregates and paving blocks made with recycled contents. To this end, we are exploring with Development Bureau the feasibility to promote greater use of works materials made of waste C&D materials in public works contracts, whenever the performances of these products are satisfactory and the prices of which are economically rational.

Public Education and Partnership

21. The successful implementation of the initiatives under the Policy Framework hinges on public support and participation. We will continue to press ahead with public education programmes on waste reduction and recovery. For example, through the Hong Kong Green School Award and the Student Environmental Protection Ambassador Scheme, we organised training sessions, education programmes and topic specific seminars to encourage teachers, students and parents to adopt a greener lifestyle, such as the use of reusable or recyclable lunch boxes and the reduction of plastic shopping bags.

22. In particular, to encourage schools to stop using disposable lunch boxes and adopt on-site meal portioning where possible, the Environment Bureau and the Education Bureau have jointly invited all schools to sign a Green Lunch Charter. More than 270 secondary and primary schools signed the Green Lunch Charter at its launch on 26 February 2010 to demonstrate their support for the provision of green lunch at schools. The standardised facilities of all newly built

schools will meet the requirement of on-site meal portioning. As regards existing schools, the ECF Committee has recently allocated an additional $100 million, on top of the previously allocated $50 million, to support existing schools in installing basic facilities for on-site meal portioning. As at end February, more than 180 schools have indicated interest in the funding support and more than 20 ECF applications have been approved.

23. In end 2006, the ECF Committee agreed to reserve $10 million for a dedicated public education programme to promote environmental initiatives under the Policy Framework. So far, 19 applications with a total funding of about $8.03 million have been approved. These projects cover a wide range of topics, including reduction of plastic shopping bags, green procurement, green festive packaging, and the recovery and recycling of WEEE.

24. As part of the Government's commitment to promote and support public engagement, we injected $1 billion into the ECF to give new impetus to environmental education and research, including those on waste reduction and recovery. The Environmental Campaign Committee (ECC) will continue its partnership with District Councils and non-governmental organisations in promoting waste reduction and recycling initiatives, and low-carbon lifestyle.

25. We have also been promoting general awareness on waste reduction and recovery through local media. In addition to a series of TV and radio announcements of public interests (APIs) under the theme of "I love Hong Kong, I love Green", we have rolled out other APIs on source separation, simple packaging and reduction of plastic shopping bags. These help to enhance public awareness of the four R's: Reduce, Reuse, Recycling and Responsibility. The Hong Kong Awards for Environmental Excellence will continue to present "Wastewi$e Label" to companies/organizations for practising waste reduction and recycling.

ADVICE SOUGHT

26. Members are invited to note the progress of implementing the key initiatives under the Policy Framework.

Environmental Protection Department
March 2010

ENVIRONMENTAL PROTECTION DEPARTMENT

Integrated Waste Management Facilities

Project Profile

March 2008

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1. PURPOSE OF PROJECT PROFILE

This project profile sets out the scope of the environmental issues associated with the construction and operation of the proposed Phase 1 of Integrated Waste Management Facilities (IWMF) at either the Tsang Tsui Ash Lagoons site or the Shek Kwu Chau site for the application of an Environmental Impact Assessment (EIA) study brief.

2. BASIC INFORMATION

2.1. Project Title

2.1.1 Development of the Integrated Waste Management Facilities Phase 1 (hereinafter named as the Project).

2.2. Purpose and Nature of the Project

Background

2.2.1 Hong Kong is facing a serious and imminent waste problem. Despite our efforts and progress made in waste reduction and recycling, there remains substantial unavoidable waste that needs to be disposed of properly. Our three strategic landfills would approach their capacities one by one in the early to mid 2010s. To address the waste problem in a holistic manner, the Administration published *A Policy Framework for the Management of Municipal Solid Waste (2005-2014)* (the Policy Framework) in December 2005. The Policy Framework sets out a comprehensive waste management strategy that encompasses initiatives on waste avoidance at source, waste recovery and recycling and bulk reduction of waste.

2.2.2 As set out in the Policy Framework, the IWMF with incineration as the core technology would be developed to substantially reduce the volume of unavoidable waste, thereby extending the life span of the existing landfills and their extension. Having regard to the size of the overall waste problem, the IWMF is planned to be developed in phases.

2.2.3 A comprehensive site search exercise has been carried out to identify potential sites in Hong Kong suitable for the development of the Phase 1 of IWMF. The result of this exercise concluded that the sites at (i) Tsang Tsui Ash Lagoons and (ii) Shek Kwu Chau are suitable for consideration. The locations of these two potential sites are shown in **Figure 1.1**. It is intended that detailed engineering and EIA studies for both sites would be carried out to ascertain their ultimate suitability and to assist in the decision on the final choice of site.

Purpose and Nature

2.2.4 This Project comprises the construction and operation of the first phase of IWMF which would have a total treatment capacity for 3,000 tonnes per day (tpd) of mixed municipal solid waste (MSW). It would comprise (a) a thermal incineration plant of about 2,800 tpd capacity and (b) a sorting and recycling plant of a demonstration scale of about 200 tpd capacity. This Project would reduce the volume of MSW requiring landfill disposal substantially, recover energy for electricity generation and recover recyclable materials from the mixed MSW.

2.3. Name of Project Proponent

2.3.1 Environmental Protection Department (EPD).

2.4. Location and Scale of the Project

2.4.1 The Project will cover studies of two potential sites for the development of the Phase 1 of IWMF at one of the sites. The first site is located at the existing ash lagoon area in Tsang Tsui near Nim Wan, Tuen Mun, overlooking the Deep Bay. The site, comprising the East, Middle and West Lagoons, is granted to CLP Power Company Limited (CLP) in 1988 under two licences issued by the Lands Department mainly for the storage of pulverised fuel ash (PFA). The Project site will occupy an area of approximately 10 hectares (ha) in the Middle Lagoon which has been used as the 'water collection ad conservation system' of CLP's power plant since 1997. Other industrial facilities in the vicinity of the site area include the Black Point Power Station to the south-west, and the WENT Landfill and its associated waste reception facilities to the east. A location plan of this potential site is shown in **Figure 1.2.**

2.4.2 The second potential site is to be formed by reclamation at the south-western coast of Shek Kwu Chau, an island located to the southwest of Cheung Chau and to the south of Chi Ma Wan Peninsula, Lantau Island. The site will cover approximately 10 ha of reclaimed land. Shek Kwu Chau has been granted to the Society for the Aid and Rehabilitation of Drug Addicts (SARDA) for use as a rehabilitation centre, with a current residential population of about 200. There are no other residential, commercial or industrial facilities on the island. A location plan of the site is given in **Figure 1.3.**

2.5. Number and Types of Designated Projects Covered by the Project Profile

2.5.1 The following elements of the Project addressed in this Project Profile are classified as Designation Projects under the Environmental Impact Assessment Ordinance (EIAO) CAP. 499.

For both the Tsang Tsui Ash Lagoons and Shek Kwu Chau sites:

- An incinerator with an installed capacity of more than 50 tonnes per day (under Schedule 2, Part I, Item G.3 of the EIAO)
- A waste disposal facility for refuse (under Schedule 2, Part I, Item G.4 of the EIAO)
- A waste disposal facility for pulverised fuel ash or furnace bottom ash (under Schedule 2, Part I, Item G.6 of the EIAO)
- Public utility electricity power plant (under Schedule 2, Part I, Item D.1 of the EIAO).

For the Shek Kwu Chau site:

- Reclamation works (including associated dredging works) of more than 5 ha in size (under Schedule 2, Part I, Item C.1 of the EIAO)
- A dredging operation exceeding 500,000 m3 (under Schedule 2, Part I, Item C.12 of the EIAO).

2.6. Name and Telephone Number of Contact Person

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3. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

3.1. Project Planning and Implementation

3.1.1 The Project Proponent will employ consultancy firm to conduct the engineering and EIA studies for the proposed Project.

3.1.2 The Project is planned to be implemented through a Design, Build and Operate (DBO) contract. The Contractor will be selected through a competitive tendering exercise. Under the contract, the Contractor will be responsible for:

i) detailed design for the formation of the Project site
ii) detailed design of all facilities of the Project
iii) construction works for the forming of the Project site
iv) construction, provision and installation of all the facilities
v) testing and commissioning of all the facilities
vi) operation and maintenance of the facilities
vii) monitoring of operation

3.2. Project Programme

3.2.1 The Project implementation programme is shown in **Table 3.1** below.

Table 3. 1 – Project Implementation Programme

Activity Description	Indicative Milestones
Commencement of Engineering/EIA Studies	Dec. 2008
Completion of Engineering/ EIA Studies	Oct. 2010
Tendering for the DBO Contract	Dec. 2010
Award of Contract	Nov. 2011
Commencement of Operation	2014

3.3. Interfacing with Other Projects

Tsang Tsui Ash Lagoons

3.3.1 The Project will be located in part of the Ash Lagoons which is now occupied by CLP for uses relating to the operation of the Black Point and Castle Peak Power Stations. The Government would liaise with CLP on the land issue.

3.3.2 The planned Sludge Treatment Facilities (STF) would be located in the East Lagoon adjoining this Project site. The planned WENT Landfill Extension will be located also in the vicinity of the area Presently EIA studies for these two planned projects are being carried out and are not completed yet.

3.3.3 There were tentative proposals for regional roadworks and other infrastructures near the Project site (e.g. the Hong Kong-Zhuhai-Macao Bridge project). All these proposals are subject to review and have not obtained any firm commitment for their implementation.

Shek Kwu Chau

3.3.4 At present there is no proposed project that are planned to be constructed in proximity to the island, so no interfacing with other project is anticipated.

4. POSSIBLE IMPACTS ON THE ENVIRONMENT

4.1. General Description of the Project

4.1.1. The infrastructure for this Project would comprise (i) a thermal incineration plant, (ii) a sorting and recycling plant, and (iii) ancillary and supporting facilities. More details of these components are given below.

Thermal Incineration Plant

4.1.2 This plant would incinerate mixed MSW, recover energy and generate electricity for gainful uses. Advanced incineration based on "mass burn" design would be adopted. Typical schematic flow diagram of such incineration process is shown in **Figure 1.4.**

4.1.3 The plant would comprise the following elements the majority of which would be installed inside enclosed superstructures, odourous air would be fed into the high temperature incineration furnace for deodorization:

- Waste reception, storage and feeding system
- Mass burn incinerator (combustion chamber)
- Waste heat recovery (boiler), turbine generation and cooling systems
- Boiler feedwater treatment system
- Flue gas treatment system
- Flue gas discharge system with stack
- Fly ash storage and treatment system
- Residues and bottom ash storage and handling system
- Bulky waste storage and handling system
- Reagent reception and storage system
- Process control and monitoring system

Sorting and Recycling plant

4.1.4 The treatment capacity of this plant would be of a demonstration scale, which aims to investigate recovery of recyclables and resources from the mixed MSW and the stabilization of the residue for subsequent disposal.

4.1.5 The sorting and recycling plant typically would comprise the following components:

- Waste reception provisions
- Mechanical sorting and shredding systems for recyclables recovery
- Biological treatment systems based on anaerobic digestion and composting processes
- Biogas storage system
- Biogas electricity generation system

4.1.6 It is anticipated that all the above components, except the tanks for anaerobic digestion and the biogas storage systems, would be installed in enclosed superstructures with deodorisation provisions.

Ancillary and Supporting Facilities

4.1.7 These facilities would serve the operations of both the thermal incineration plant and the sorting and recycling plant. They would include the followings:

- Weighbridge
- Security system
- Administration building
- Visitor and education centre
- Vehicle and container washing facilities
- Maintenance workshop and utility yard
- Fuel storage tanks
- Drainage and sewerage system
- Water supply and waste water treatment systems
- Berthing for marine vessels that transport MSW to the site
- refuse container storage facilities

Project Construction Phase

4.1.8. The Project would require the forming of about 10 ha of land and the associated roads and drains, followed by foundation works, superstructures building and installation of plants and equipments for the various systems mentioned in paragraphs 4.1.3 to 4.1.7 above. It would also involve construction work outside the site for the installation and connection of utilities. Brief descriptions of these works for the two potential sites are given below.

Tsang Tsui Ash Lagoons

4.1.9 Currently land has been largely formed by PFA that was filled to this site in the previous years. It is anticipated that only relatively small scale of excavation, filling and levelling work is needed for the necessary site formation. As the existing berths of the WENT landfill is intended to be used for this Project, no construction of berth is anticipated.

4.1.10 Regarding utilities, the main requirement would be the connection of electricity cable for

which relatively minor trench excavation and filling on land would be carried out. As for construction of various facilities of the Project, the works would include foundation works, building of super-structures, installation of plants and equipments, building of access roads, utilities, sewer and drains.

Shek Kwu Chau

4.1.11 Reclamation is needed to form the 10 ha land as well as the berths for future marine vessel operations. This would likely involve dredging of soft marine mud, forming of sea wall and berth by concrete blocks, armour rock and sand filling, followed by filling of sand and suitable material to the designed ground level.

4.1.12 For electricity transmission, it is anticipated that submarine cable of a few kilometre length would need to be installed to connect the site to a receiving point at an nearby island. For this, marine dredging, cable laying and subsequent filling works would likely be required.

Project Operation Phase

4.1.13 It is planned that containers of mixed MSW from various existing Refuse Transfer Stations in Hong Kong would be delivered to the site by marine vessels. The containers would be unloaded at the berth and delivered to the waste reception halls of either the thermal incineration plant or the sorting and recycling plant.

4.1.14 At the waste reception hall of the thermal incineration plant, mixed MSW from the containers would be unloaded into a storage pit, where the bulky items will be sorted out and shredded. The waste is then transferred by overhead cranes into the combustion chamber for burning. The residue (ash) will be collected at the bottom of the combustion chamber and passes to the ash storage pit through a water-quenched ash extractor and magnetic separator for ferrous metal recovery. These ash, commonly know as bottom ash, would be delivered to the landfill for final disposal or reuse as appropriate.

4.1.15 The hot flue gases from the combustion chamber would flow through the boiler, releasing thermal energy which turns the water in the boiler tubes into steam. The steam produced would be used to drive the turbine to generate electricity. The cooled flue gases would be treated by gas cleaning equipments such as scrubbers, activated carbon powder injection and fabric filter systems. The cleaned flue gases would then be released to the atmosphere via the stack. A relatively smaller amount of ash would be collected from the boiler and gas cleaning equipments. The ash would be stabilized with cement or other suitable material before final disposal.

4.1.16 As regards the containers of waste delivered to the waste reception hall of the sorting and recycling plant, they would be unloaded into a storage pit where the bulky items will be sorted out and shredded. The waste would then be treated by further mechanical sorting systems such as magnetic separator and trommels for separation of recyclable metals, recyclable plastics, inert material and organic matters. The recyclables would be collected, stored for delivery to other recycling sites. The organic matters would be further treated by biological processes while the inert materials would be delivered to the landfill for disposal.

4.1.17 The separated organic fraction of the waste would be treated by biological processes for stabilization and possible recovery of resources. The biological processes would include

anaerobic digestion and composting. In the anaerobic digestion process, the organic materials would be degraded by microbial activity in the absence of oxygen to produce biogas. The biogas would be collected and used to generate heat and electricity. The anaerobic digestion process would also produce organic residues that could be further treated by dewatering and composting into soil conditioner.

4.1.18 In the composing process, the organic residue would be stabilized through bacterial activity in the presence of oxygen. Depending on the extent of contamination, the stabilised residue would be reused as soil conditioner or be disposed of at the landfill.

4.2. Key Environmental Issues at the Construction Phase

Air Quality

Tsang Tsui Ash Lagoons

4.2.1 The main potential air quality impacts during the construction phase would be elevated dust levels associated with the site formation and general construction activities. As the WENT Landfill site office, the nearest Air Sensitive Receivers (ASRs) is located at quite a distance of 500 m away, with the implementation of dust control and suppression measures as stipulated in the *Air Pollution Control (Construction Dust) Regulation,* adverse dust impact is not expected.

The operation of diesel-powered construction equipment may also emit gaseous pollutants. However due to the separation distances between the site and the ASRs and that only limited number of such equipment would be used, it is expected that the impacts would be minimal and well within the relevant standards.

Shek Kwu Chau

4.2.2 The main potential air quality impacts during the construction phase would be elevated dust levels associated with the site reclamation and general construction activities. The nearest ASR would be some residential structures of Shek Kwu Chau Treatment and Rehabilitation Centre at some 130 m away from the site boundary. With the implementation of dust control and suppression measures as stipulated in the *Air Pollution Control (Construction Dust) Regulation*, no adverse impact is expected.

The operation of diesel-powered construction equipment may also emit gaseous pollutants. However due to the separation distances between the site and the ASRs and that only limited number of such equipment would be used, it is expected that the impacts would be minimal and well within the relevant standards

Human Health

Tsang Tsui Ash Lagoons

4.2.3 It is anticipated that the PFA at the Ash Lagoons might need to be excavated during site formation, therefore the potential health risk induced by possible radon emissions from the PFA during the construction needs to be evaluated. Based on literature review, the radon health risk and radiological hazard from potential radon emissions from PFA to

members of the public and workers staying outdoor at the site are expected to be of insignificant level. Moreover, offsite radon impact through migration of any radon flux from the PFA lagoons to the ASRs should not be significant.

Shek Kwu Chau

4.2.4 The construction of the Project would unlikely give rise to major potential hazard to life or risk to human health.

Waste Management

Tsang Tsui Ash Lagoons

4.2.5 The construction activities of the Project would generate construction and demolition (C&D) material, general refuse by the workforce and chemical waste derived from the maintenance of construction plant and equipment. Provided that these wastes are handled, transported and disposed of using approved methods and that good site practices are strictly followed, adverse environmental impacts would not be expected.

Shek Kwu Chau

4.2.6 For the Shek Kwu Chau site, there would be impact associated with the handling and dumping of marine sediment arising from the dredging works described in paragraphs 4.1.11 and 4.1.12. The management and disposal of the dredged material would follow the procedures and requirements specified in ETWBTC 34/2002 and the Dumping at Sea Ordinance (Cap.466). No adverse environmental impact is expected.

4.2.7 The construction activities would also generate C&D material, general refuse by the workforce and chemical waste derived from the maintenance of construction plant and equipment. Provided that these wastes are handled, transported and disposed of using approved methods and that good site practices are strictly followed, adverse environmental impacts would not be expected

Water Quality

Tsang Tsui Ash Lagoons

4.2.8 The potential sources of water quality impact during the construction phase of the Project consists of site runoff and drainage; debris, refuse and liquid spillages from general construction activities; and sewage effluent from the construction workforce. The water quality impact could be minimized through proper planning and implementation of control measures to reduce site runoff and to provide appropriate on-site treatment prior to discharge. Proper site management and good housekeeping practices would also be required to ensure that construction waste and material would not enter the nearby stream and coastal waters. Sewage arising from the construction workforce would require appropriate treatment through provision of portable toilets. Through implementation of these control and mitigation measures, it is expected that the construction works for the Project would not result in unacceptable impacts on water quality.

Shek Kwu Chau

4.2.9 The configuration and design of reclamation for the Project might affect the patterns of current in the nearby marine area and consequently the water quality. During the construction phase, the dredging, reclamation and filling works for site formation and submarine cable laying would have the potential to cause considerable impact on the marine water quality and also the nearby water sensitive receivers. These impacts would need to be evaluated. Appropriate reclamation design and mitigation measures such as provision of silt curtains or control of dredging and filling operations would need to be identified. With the implemented of these measures, it is expected that the residual water quality impact would be acceptable.

4.2.10 Other potential sources of water quality impact during the construction phase of the Project include site runoff and drainage; debris, refuse and liquid spillages from general construction activities; and sewage effluent from the construction workforce. Similar to the case for the Ash Lagoons site as depicted in paragraph 4.2.8 above, with implementation of proper site runoff control and treatment; good housekeeping practices; provision of sewage treatment, it is expected that the construction works would not result in unacceptable water quality impact.

Ecology

Tsang Tsui Ash Lagoons

4.2.11 The Ash Lagoons provide nesting and breeding ground for a few identified bird species most of which are generally widespread within Hong Kong. There is no 'Protected Areas' within 500 m of the site. The nearest ones are the Sha Chau and Lung Kwu Chau Marine Park and a Site of Special Scientific Interest (SSSI) at Sheung Pak Nai, all at a few km away. Hence the major direct potential impact on terrestrial ecology due to the construction work would be the loss of the habitats and associated fauna falling within the footprint of the Project site at the Middle Lagoon. There could also be indirect impacts to habitats and associated fauna adjacent to the site due to increased noise levels and human activities. Mitigation measures would be required to minimize potential indirect impacts to the surrounding habitats and associated fauna.

4.2.12 As no marine or river related works would be carried out, the construction would not result in any loss of aquatic habitat. With the implementation of appropriate measures to mitigate impacts associated with wastewater and site runoffs as depicted in paragraph 4.2.8 above, minimal residual impacts to the marine ecology and fisheries are anticipated.

Shek Kwu Chau

4.2.13 There are some faunal species of ecology interest on the existing Shek Kwu Chau island, including the Bogadek's Burrowing lizard, two previous unknown species of snake, two uncommon dragonfly species *Cercioin clamorum dyeri* and *C. melanotum* and a considerable number of butterfly species. However, as the Project would be developed on reclaimed land without encroachment onto the existing island, with implementation of appropriate mitigation measures, the impact on the terrestrial ecological habitat on the existing island should be minimal and acceptable.

4.2.14 The marine area at and in the vicinity of the site is a fish spawning and nursery ground. Chinese White Dolphin and Finless Porpoise have been sighted, though the area is not

their core habitat. There are also soft and hard sub-tidal habitats that are commonly found in Hong Kong. The coastline that would be affected by the site reclamation mainly comprises rocky habitats of low to medium ecological value. Hence the major direct impact on marine ecology due to the construction work would be the loss of the habitats and associated fauna falling within the footprint of the Project site.

4.2.15 The dredging reclamation and construction works would have the potential to impact on the marine water quality considerably thereby affecting the nearby marine ecology and fisheries. As given in paragraph 4.2.9 above, impacts on the marine water quality as well as the marine ecology arising from the construction works would need to be evaluated with appropriate mitigation measures identified and implemented to reduce the impacts to acceptable levels.

Noise

Tsang Tsui Ash Lagoons

4.2.16 The Project site is an industrial setting with the WENT Landfill, Black Point Power Station and the planned STF in the neighbourhood. The nearest Noise Sensitive Receivers (NSRs) is the WENT Landfill site office at 500 m away. As such, with appropriate noise mitigation measures, construction activities noise and construction vehicle traffic noise levels are expected to be insignificant and would not cause adverse impact on the NSRs.

Shek Kwu Chau

4.2.17 The nearest NSR is some residential structures of the rehabilitation centre about 130 m away on a slope on the south side of the island. Construction activities including use of powered mechanical equipments have the potential to generate construction noise the impact of which need to be evaluated. Yet it is expected that with implementation of appropriate mitigation measures, the construction noise levels at the NSRs should be contained to acceptable levels.

Landscape and Visual

Tsang Tsui Ash Lagoons

4.2.18 The site being in an industrial setting with the existing WENT landfill and the Black Point Power Station nearby has a low landscape value. The Visual Sensitive Receivers (VSRs) are limited to a few distant villages like Ha Pak Nai and Lung Kwu Sheung Tan some 2 km away. It is expected that with the implementation of appropriate mitigation measures such as good site practices, the residual landscape and visual impacts during the construction phase would be acceptable.

Shek Kwu Chau

4.2.19 The existing landscape of the island has relatively high baseline value. The construction for the Project will cause permanent changes to the natural coastline and landscape. However as the site is located far from any major population clusters, the VSR is largely limited to the small population of 200 persons living in the rehabilitation centre. Yet most

of this population's views to the site area are partly blocked by the existing hill on the island. As such, with implementation of mitigation measures such as landscape planting and good site practices, any landscape and visual impacts during the construction phase will be of limited extent.

Cultural Heritage

Tsang Tsui Ash Lagoons

4.2.20 The Tsang Tsui Archaeological Site is located to the south of the ash lagoons at a distance of over 300 m from the Project site boundary. With the implementation of appropriate mitigation measures such as good site practices, any potential impacts caused by the Project to the archaeological site and any other built heritage in the vicinity would be acceptable.

Shek Kwu Chau

4.2.21 There are recorded sites of archaeological interest on the island: Shek Kwu Chau Archaeological Site and Shek Kwu Chau Gravestone. As the Project would be developed on reclaimed land without encroachment onto the existing island, with implementation of appropriate mitigation measures, the potential cultural heritage impact on the existing island should be minimal and acceptable.

4.3 Key Environmental Issues at the Operational Phase

Air Quality

Tsang Tsui Ash Lagoons

4.3.1 Flue gas emission from the thermal incineration plant of the Project would be the major source of potential air quality impact. The air pollutants in the flue gas emission would be controlled to within the concentration limits stipulated in the *Best Practicable Means Guidance Note for Incinerators* [1]. Detailed air quality impact assessment would be required to predict the concentrations of air pollutants at the ASRs and to assess compliance with the Air Quality Objectives (AQOs) and the relevant air quality criteria for non-AQO pollutants. The assessment would include cumulative impacts of the potential stack emissions from the Project and the existing and planned emission sources nearby, such as the CLP Black Point and Castle Peak Power Stations, the planned STF, and the WENT Landfill and its extension.

4.3.2 Fugitive emission and odour nuisance may arise from the refuse container vessels heading to and from the site, operation of the on-site wastewater treatment plant, the waste reception halls, the waste storage area, the ash handling and storage areas of the thermal incineration plant, and the mechanical and biological treatment processes of the sorting and recycling plant of the Project. Assessment of fugitive emission and odour impact would be required. Given that the above facilities would be fully enclosed, high temperature incineration would be used for deordorization, the wastewater treatment plant

1 Guidance Note on the Best Practicable Means for Incinerators (Municipal Waste Incineration), BPM 12/1 (08), EPD/APG, February 2008.

and the sorting and recycling plant would be equipped with deodorizing units or odour filtration system, and the waste reception halls would be operated under a negative pressure to prevent odour leaking to the outdoor environment, adverse impact on the ASRs would not be expected.

Shek Kwu Chau

4.3.3 Flue gas emission from the thermal incineration plant of the Project would be the major source of potential air quality impact. The air pollutants in the flue gas emission would be controlled to within the concentration limits stipulated in the *Best Practicable Means Guidance Note for Incinerators* [2]. Detailed air quality impact assessment would be required to predict the concentrations of air pollutants at the ASRs and to assess compliance with the AQOs and the relevant air quality criteria for non-AQO pollutants. Since no other emission sources exist nearby, cumulative air quality impact is not expected to be a concern.

4.3.4 Fugitive emission and odour nuisance may arise from the refuse container vessels heading to and from the site, operation of the on-site wastewater treatment plant, the waste reception halls, the waste storage area, the ash handling and storage areas of the thermal incineration plant, and the mechanical and biological treatment processes of the sorting and recycling plant of the Project. Assessment of fugitive emission and odour impact would be required. Given that the above facilities would be fully enclosed, high temperature incineration would be used for deordorization, the wastewater treatment plant and the sorting and recycling plant would be equipped with deodorizing units or odour filtration system, and the waste reception halls would be operated under a negative pressure to prevent odour leaking to the outdoor environment, adverse odour impact on the ASRs would not be expected.

Human Health

Tsang Tsui Ash Lagoons

4.3.5 Potential health impacts may arise from the following sources during the operation phase of the Project:

- Aerial emissions and dispersion from the Project's stack
- Fugitive emissions during transportation, storage and handling of the waste and ash
- Potential accidental events such as fire in the waste storage pit, explosion in the furnace, inadvertent receipt of hazardous or clinical wastes, and potential failure of the air pollution control system.

4.3.6 Apart from the above, biogas that might be continuously produced in the sorting and recycling plant could be another source of potential health impact. It is anticipated that a maximum of 1000 cum of biogas would be stored in gas holding tanks on the site. Under normal operation, the biogas would be converted into electricity in the generator and any surplus biogas would be burned via an emergency flare.

4.3.7 In addition, possible radon emissions associated with the PFA would be another source of potential health impact. While the staff at the Project site are not anticipated to be exposed to a significant level of radon health risk, as a precaution, measures to prevent

2 ibid.

radon influx from the PFA to the Project buildings would considered for incorporation in the Project.

4.3.8 A quantitative risk assessment would be carried out to evaluate the potential health impacts arising from the Project The potential hazard to human life associated with the biogas generation and storage would be assessed to meet with the requirements stipulated in the *Hong Kong Government Risk Guidelines (see Annex 4, Figure 1 of the EIAO-TM).* With proper implementation of safeguards and risk control measures, it is expected that the risk associated with potential accidential or emergency events should be acceptable.

Shek Kwu Chau

4.3.9 The sources of potential health impacts include aerial emissions, fugitive emissions, accidental events and biogas production, similar to those depicted in paragraphs 4.3.5 and 4.3.6 above.

4.3.10 A quantitative risk assessment would be carried out to evaluate the potential health impacts arising from the Project. The potential hazard to human life associated with the biogas generation and storage would be assessed to meet with the requirements stipulated in the *Hong Kong Government Risk Guidelines (see Annex 4, Figure 1 of the EIAO-TM).* With proper implementation of safeguards and risk control measures, it is expected that the risks associated with potential accidental or emergency events should be acceptable.

Waste Management

Tsang Tsui Ash Lagoons and Shek Kwu Chau

4.3.11 The major solid matters and waste arising from the Project would be the combustion ash (bottom ash and fly ash) and flue gas cleaning residue generated from the thermal incineration plant. Bottom ash could be safely disposed of in landfill or recycled into construction material. Fly ash and flue gas cleaning residue would be stabilised prior to final disposal in landfill. These incineration end products would be tested in accordance with the requirements of the proposed Incineration Residue Pollution Control Limits [3] prior to landfill disposal.

4.3.12 The Project would also sort out waste or inert material that is unsuitable for reuse or further treatment. The amount of such waste is expected to be small and they would be disposed of at the landfill.

4.3.13 A relative small amount of chemical waste such as lubricating oil would be generated during the operation of the Project. These would be properly collected and disposed of in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

Water Quality

Tsang Tsui Ash Lagoons and Shek Kwu Chau

3 The proposed *Incineration Residue Pollution Control Limits* are derived with reference to those adopted for the Chemical Waste Treatment Centre at Tsing Yi.

4.3.14 Water Quality impacts may arise from the discharge of effluents to the drainage and/or nearby water bodies. Such effluent would include that from the waste water treatment system, the cooling system and the water supply system. It is intended that all the wastewater generated from the Project would be treated at the on-site wastewater treatment plant for cleansing and landscape irrigation reuses without any effluent discharge. As regards the cooling system, either air-cooled power generation system would be adopted or the process cooling water would be properly treated and recycled. A small desalination facility would be used for water supply and this facility would discharge a small volume of concentrated saline effluent.

4.3.15 Apart from the effluent discharges given above, surface runoff from the site, particularly the first flush of rainstorm event would have the potential to impact on water quality. Such impact could be minimized through pollution control measures such as regular cleansing of open areas and roads. In view of the relative small amount of effluent discharge, it is envisaged that with the implementation of appropriate mitigation measures and surface water pollution control measures, the operational phase of the Project would not cause any adverse water quality impact.

Ecology

Tsang Tsui Ash Lagoons

4.3.16 The partial loss of habitat loss at part of the Middle Lagoon would only impact on relatively few individuals of a small number of bird species most of which are generally widespread within Hong Kong. No other direct impacts are anticipated, whereas indirect impacts to surrounding habitats and associated wildlife may arise as general disturbance levels would be increased, such as noise and visual disturbance from traffic entering and exiting the Project site. Overall there should be no insurmountable terrestrial ecological impacts.

4.3.17 Given that appropriate measures would be adopted to mitigate water quality impacts to acceptable levels, minimal residual impacts to the marine ecology and fisheries are anticipated.

Shek Kwu Chau

4.3.18 There are some faunal species of ecology interest on the existing Shek Kwu Chau island. However as the Project would be operated at the newly reclaimed site without encroachment onto the existing island, with implementation of appropriate mitigation measures, the impact on the terrestrial ecological habitat on the existing island should be acceptable.

4.3.19 The marine area in the vicinity of the site is a fish spawning and nursery ground. Chinese White Dolphin and Finless Porpoise have been sighted, though the area is not their core habitat. Given the limited amount of marine vessel traffic arising from the operation of the project, and that appropriate measures would be implemented to mitigate water quality impacts due to surface water and effluent discharges, the potential impacts on marine ecology and fishery are expected to be acceptable.

Noise

Tsang Tsui Ash Lagoons and Shek Kwu Chau

4.3.20 The Project intends to accept mixed MSW containerized and delivered to the site solely by marine transport from the refuse transfer stations (RTS). There would be little, if any additional waste collection vehicles traffic in Hong Kong or Tuen Mun. Any increase in traffic noise due to on-site and off-site vehicle movements arising from the operation of the Project is expected to be insignificant and would not cause an adverse impact on the NSRs. As regards marine traffic, it is anticipated to be one round trip of refuse container vessel per RTS per day, so noise impact arising from marine traffic should be minimal.

4.3.21 Although the Project will operate 24 hours a day, experiences from other operating facilities elsewhere indicate that fixed plant noise will not be significant as most of the process equipments will be located within enclosed buildings. As such, with the implementation of acoustic barriers at strategic locations and appropriate mitigation measures included in the design of the Project, the daytime and night time criteria within the *Noise Control Ordinance* should be met.

Landscape and Visual

Tsang Tsui Ash Lagoons

4.3.22 The site is in an industrial setting with the existing WENT landfill and the Black Point Power Station nearby. Therefore it has a low landscape value and the Visual Sensitive Receivers (VSRs) are limited to a few distant villages some 2 km away. It is expected that with the implementation of appropriate architectural designs and other measures such as landscape planting, the residual landscape and visual impacts would be acceptable.

Shek Kwu Chau

4.3.23 As the existing landscape of the island has relatively high baseline value and the Project would change the natural coastline and landscape permanently, careful landscape and architectural designs are needed to blend the Project with the existing natural landscape as much as possible. With these, and noting that the site is located far away from any major population clusters, it is considered that the residual landscape and visual impacts during the operational phase would be acceptable.

Cultural Heritage

Tsang Tsui Ash Lagoons

4.3.24 Tsang Tsui Archaeological Site is located 300 m from the Project site boundary, any potential impacts caused by the Project would be minimal. Potential cultural heritage impacts caused by the Project to the archaeological site and any other built heritage in the vicinity would be assessed.

Shek Kwu Chau

4.3.25 Any potential impacts caused by the Project on the Shek Kwu Chau Archaeological Site and Shek Kwu Chau Gravestone on the island would be minimal. Potential cultural

heritage impacts caused by the Project to the archaeological site and any other built heritage in the vicinity would be assessed.

5. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT AND SITE HISTORY

Tsang Tsui Ash Lagoons

5.1 The Tsang Tsui Ash Lagoons in Tuen Mun was formed on land reclaimed in mid 1980s near Nim Wan, and are divided by bunds into three roughly equal sized lagoons for the storage of PFA. The proposed site for the Project is located in the Middle Lagoon. Other industrial facilities in the area include the CLP Black Point Power Station to the south-west, the planned STF to be located on the East Lagoon, and the WENT Landfill and its planned extension to the further east and south side.

5.2 The site is situated at the mouth of Deep Bay within the Deep Bay Water Control Zone. A stream runs to the south of the Ash Lagoons and discharges into a tidal channel to the east of the Project site. The natural habitats in the vicinity of the site are mainly man made ash lagoons, wasteland, plantation, secondary woodland, grassland, shrub, stream courses and some mangrove, which are of moderate ecological importance. However, given the extensive disturbance already caused by the industrial developments in the area, further potential impacts on the landscape resources will be slight.

5.3 The nearest existing ASRs and NSRs in the vicinity of the proposed site is the site office at WENT Landfill at 500 m away.

Shek Kwu Chau

5.4 Shek Kwu Chau is an island south of the Lantau Island. The Project site is located on a proposed reclamation which would be an extension to the south-western side of the island. The island has been granted for use by the SARDA and is sparsely inhibited. The rehabilitation centre of SARDA is located at over 100 m away and is the closest ASR and NSR.

6. ENVIRONMENTAL PROTECTION MEASURES

Air Quality

Tsang Tsui Ash Lagoons and Shek Kwu Chau

6.1 During construction phase, good site practices, dust control and suppression measures would be implemented. Reference would be made to the dust control requirements under the *APC (Construction Dust) Regulation*.

6.2 The design of the combustion system and flue gas pollution control system would meet the requirements of the *Best Practical Measures Guidance Note for Incinerators*. Combustion process controls would be specified in the design requirements so as to achieve a furnace combustion zone operating at no less than 850˚C with a residence time of at least 2 seconds for effective destruction of organic pollutants. Detailed air quality impact assessment would be conducted to determine the acceptability of the impacts.

6.3 Assessment of fugitive emission and odour impacts during operation of the Project would be carried out. Facilities that have the potential to cause fugitive emission or odour nuisance, including the on-site wastewater treatment plant, the waste reception and storage areas, the ash handling and storage areas of the thermal incineration plant, and the mechanical and biological treatment processes of the sorting and recycling plant. These facilities would be fully enclosed and equipped with deodorizing units or odour filtration system. The waste reception areas would be operated under a negative pressure to prevent odour leaking to the outdoor environment.

Human Health

Tsang Tsui Ash Lagoons

6.4 A quantitative risk assessment would be carried out to evaluate the potential health impacts arising from the Project. Appropriate safeguards and risk control measures would be identified and implemented to ensure that the potential risks would meet with the requirements stipulated in the *Hong Kong Government Risk Guidelines.* Arrangement and facilities for the storage and flaring of biogas produced from the sorting and recycling plant of the Project would be in strict compliance with the relevant legislation and guidelines.

6.5 The potential health risk induced by radon emission from PFA during the construction and operation phases of the Project would be evaluated. Measures to prevent radon influx from the PFA to the Project buildings would be considered and implemented as appropriate. Sufficient ventilation would be provided and regular maintenance would be conducted to avoid accumulation of radon.

Shek Kwu Chau

6.6 A quantitative risk assessment would be carried out to evaluate the potential health impacts arising from the Project. Appropriate safeguards and risk control measures would be identified and implemented to ensure that the potential risks would meet with the requirements stipulated in the *Hong Kong Government Risk Guidelines.* Arrangement and facilities for the storage and flaring of biogas produced from the sorting and recycling plant of the Project would be in strict compliance with the relevant legislation and guidelines.

Waste Management

Tsang Tsui Ash Lagoons

6.7 In the construction phase, the Contractor would be required to develop a Waste Management Plan prior to the commencement of construction works. Apart from good site practice, waste reduction measures and provisions to reuse/recycle materials would have to be implemented. The various types of waste produced would be handled, transported and disposed of using approving methods in compliance with statutory requirements.

6.8 In the operation phase, the fly ash and flue gas cleaning residue generated from the thermal incineration plant would be stabilized. These stabilized material and also the incinerator bottom ash would be tested in accordance with the requirements of the proposed Incineration Residue Pollution Control Limits prior to disposal to landfill.

6.9 The chemical waste generated from the Project, such as lubricating oil would be properly collected and disposed of in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

Shek Kwu Chau

6.10 Construction works at the Shek Kwu Chau would give rise to dredged marine sediment that needs to be handled and dumped. The management and disposal of the dredged material would follow the procedures and requirements specified in ETWBTC 34/2002 and the Dumping at Sea Ordinance (Cap.466).

6.11 In the construction phase, the Contractor would be required to develop a Waste Management Plan prior to the commencement of construction works. Apart from good site practice, waste reduction measures and provisions to reuse/recycle materials would have to be implemented. The various types of waste produced would be handled, transported and disposed of using approving methods in compliance with statutory requirements.

6.12 In the operation phase, the fly ash and flue gas cleaning residue generated would be stabilised (usually by mixing with cement on site) prior to disposal to landfill and any chemical waste generated would be dealt with in accordance with the Waste Disposal (Chemical Waste) (General) Regulation, similar to those depicted in paragraphs 6.8 and 6.9 above.

Water Quality

Tsang Tsui Ash Lagoons

6.13 During construction, control measures would be planned and implemented to reduce site discharges and surface runoff; and to provide appropriate on-site treatment to the discharges. The Contractor would be required to adopt proper site management and good housekeeping practices to ensure that construction waste and material would not enter the nearby water bodies. Appropriate facilities such as portable toilets would be provided to treat sewage arising from the construction workforce.

6.14 During operation, all the wastewater generated from the Project would be treated at the on-site wastewater treatment plant for cleansing and landscape irrigation reuses without any effluent discharge. Either air-cooled power generation system would be adopted or the process cooling water would be properly treated and recycled. The small volume of concentrated saline effluent from the small desalination facility would be properly discharged.

Shek Kwu Chau

6.15 The water quality impacts due to the reclamation design and also that arising from the dredging, reclamation and filling works during construction would be evaluated. Appropriate design and mitigation measures such as provision of silt curtains or control of dredging and filling operations would be identified and implemented to ensure acceptable residual water quality impact.

6.16 Other environmental protection measures to be incorporated during the construction phase

would include and similar to those given in paragraph 6.13 above

6.17 During operation, the environmental protection measures to be incorporated would be similar to those depicted in paragraph 6.14.

Ecology

Tsang Tsui Ash Lagoons

6.18 To minimize potential indirect impacts on the surrounding habitats and associated fauna arising from noise or human disturbances during the construction phase, appropriate mitigation measures such as use of quieter mechanical machineries and good site practices would be adopted. Measures to treat sewage arising and to control site runoff would also be implemented to minimize impacts to the aquatic ecology.

6.19 For the operation phase, impact of the Project on the aquatic ecology would be minimized via appropriate measures that mitigate water quality impacts which are depicted in paragraphs 6.14 above.

Shek Kwu Chau

6.20 The impacts of the reclamation design and construction works on water quality and marine ecology would be evaluated. Appropriate mitigation measures such as provision of silt curtains or control of dredging or filling operations would be identified and implemented to reduce such impacts to acceptable levels.

6.21 In addition, measures depicted in paragraph 6.18 would be adopted to minimize potential indirect impacts to the surrounding habitats and associated fauna arising from noise or human disturbances; to treat sewage arising and to control site runoff during the construction phase.

6.22 For the operation phase, impact of the Project on the aquatic ecology would be minimized via appropriate measures that mitigate water quality impacts which are depicted in paragraphs 6.14 above.

Landscape and Visual

Tsang Tsui Ash Lagoons and Shek Kwu Chau

6.23 For the construction phase, appropriate mitigation measures such as landscape planting and good site practices to restrict construction activities would be identified and implemented so as to minimize the residual landscape and visual impacts. The natural environmental features of the area adjoining and in the vicinity of the Project site would be restored if disturbed during construction.

6.24 The landscape and visual impacts of the architectural and landscape designs of the Project would be assessed. Careful designs would be carried out such that the Project would blend in with the surrounding landscape as much as possible.

Cultural Heritage

Tsang Tsui Ash Lagoons

6.25 A Cultural Heritage Impact Assessment would be conducted for the Tsang Tsui Archaeological Site to assess the potential impacts caused by the Project to the archaeological site and any other built heritage in the vicinity.

Shek Kwu Chau

6.26 Shek Kwu Chau Archaeological Site and Shek Kwu Chau Gravestone are recorded sites of archaeological interest on the island. A Cultural Heritage Impact Assessment would be conducted to assess the potential impacts caused by the Project to these sites.

7. USE OF PREVIOUSLY APPROVED EIA REPORTS

There are no previously approved EIA reports directly applicable to this Project.

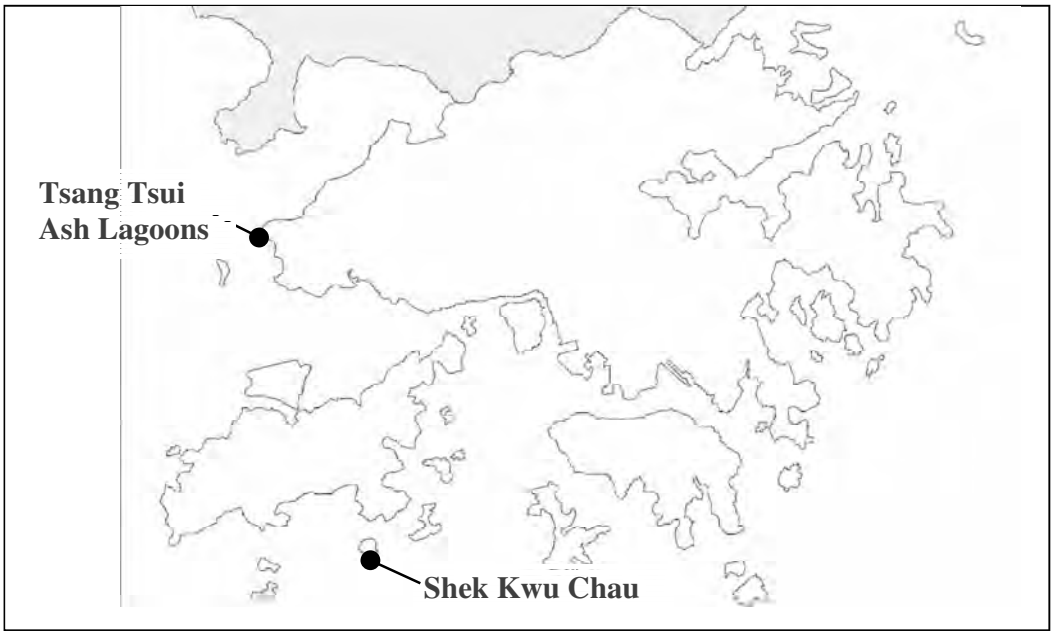

Figure 1.1 - **Locations of Two Potential Sites for Development of IWMF Phase 1**

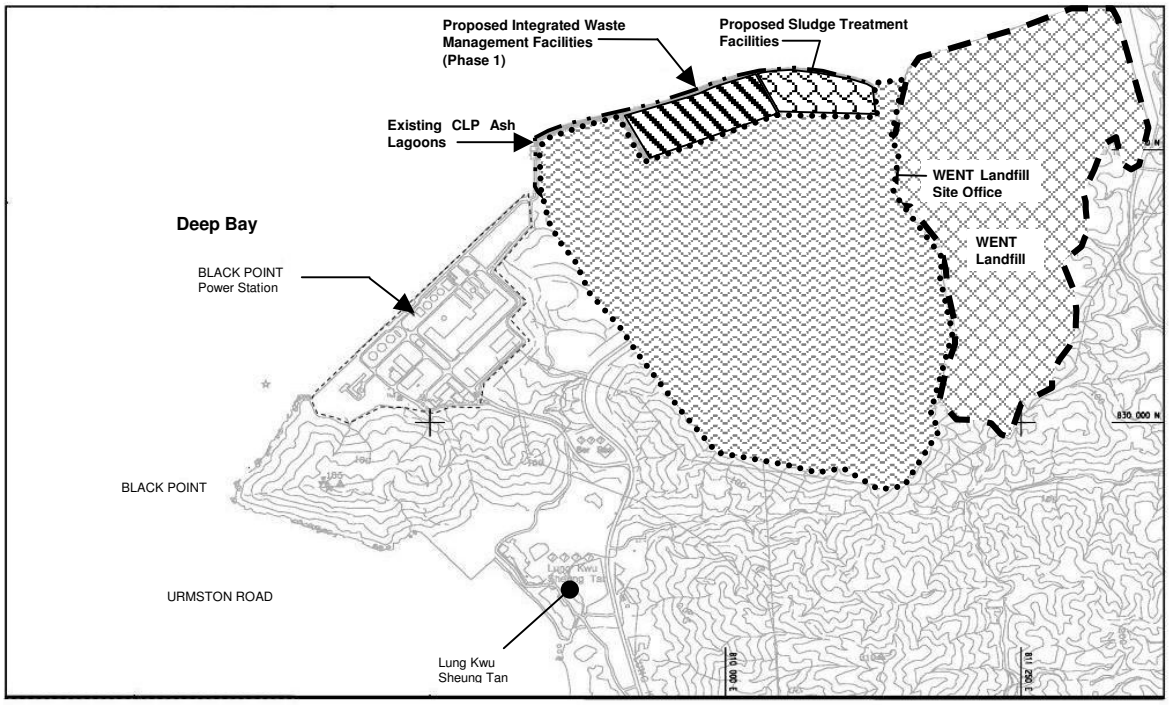

Figure 1.2 - **Location Plan of IWMF Phase 1 at Tsang Tsui Ash Lagoons Site**

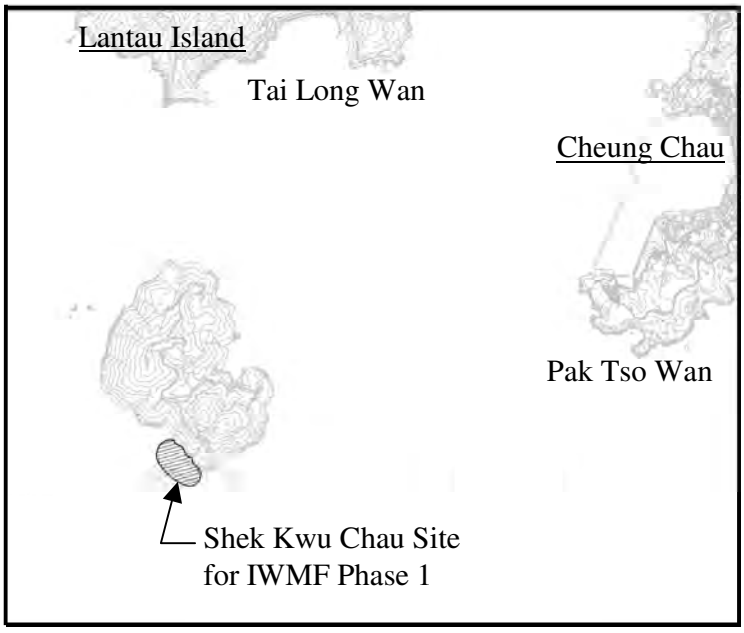

Figure 1.3 **- Location Plan of IWMF Phase 1 at Shek Kwu Chau Site**

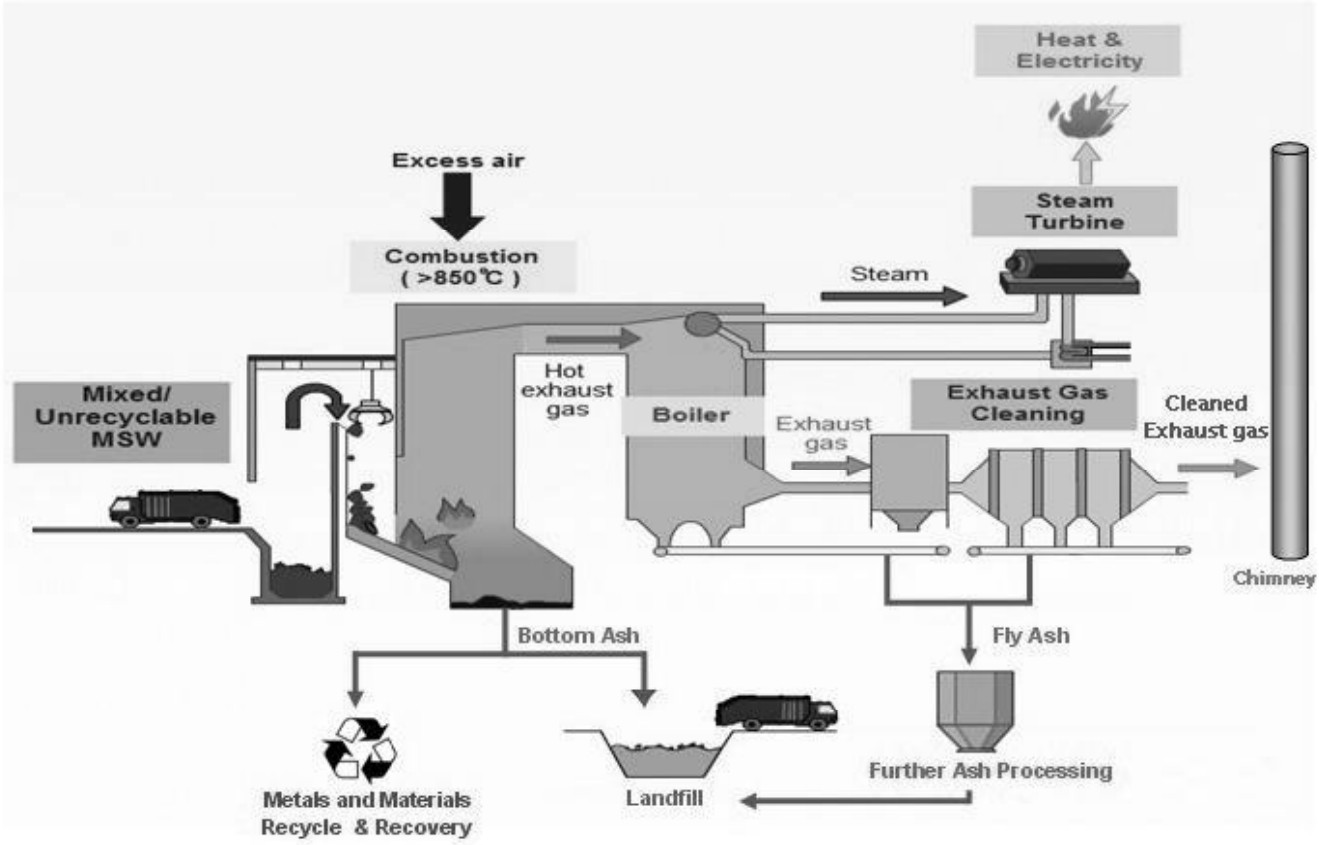

Figure 1.4 **- Process Flow Diagram of an Incineration System**

For information
29 January 2008

Legislative Council Panel on Environmental Affairs

Site Selection for the Development of the Integrated Waste Management Facilities

PURPOSE

This paper presents an update on the progress of the development of Integrated Waste Management Facilities (IWMF) in Hong Kong and the result of the site selection exercise for the IWMF.

BACKGROUND

2. Hong Kong currently relies solely on landfilling to dispose of our municipal solid waste (MSW). At the time of commissioning the three strategic landfills in Hong Kong, they were expected to be able to meet the waste disposal needs until 2020 or beyond. However, the amount of MSW generated has been on an increasing trend over the past years. For instance, some 17 000 tonnes of MSW were generated each day in 2006, which are more than 30% when compared with 10 years ago. Since the actual MSW disposal at the landfills has been much higher than projected, the three existing landfills would start to approach capacity in the next few years. Apart from extending the existing landfills, we need to adopt a comprehensive set of waste management initiatives to tackle the MSW problem.

3. To minimize waste generation and disposal, the Government announced a Policy Framework for the Management of Municipal Solid Waste (2005-2014) (the Polciy Framework) to set out a series of waste management measures. We have implemented a territory-wide source separation programme of domestic waste which as at end of 2007, some 800 housing estates covering 2.8 million people have joined. To promote the development of a circular economy, we have set up an EcoPark to provide long-term land for the environmental and recycling industries. In January this year, we have introduced to the Legislative Council the Product Eco-responsibility Bill to

provide a legal framework for implementing producer responsibility schemes. We are also studying the feasibility of MSW charging as a direct economic incentive to induce behavioural change so as to avoid or reduce waste. Our waste avoidance and reduction efforts have achieved progress and this has enhanced the public awareness on the need to reduce waste as exemplified by the increase of the overall recovery of MSW from 33% in 1997 to 45% in 2006. Notwithstanding the progress made, there remains pressing need for the adoption of advanced technologies to reduce the volume of waste so as to deal with the MSW generated in Hong Kong.

4. As one of the comprehensive measures set out in the Policy Framework and also mentioned in the Chief Executive's 2007-2008 Policy Address, we will develop the IWMF with incineration as the core technology to substantially reduce the volume of unavoidable waste and thereby extend the life span of the existing landfills and their extension. In addition, we will set up an Organic Waste Treatment Facility (OWTF) to treat biodegradable source-separated food waste.

5. As advised by the Advisory Council on Environment, we plan to develop the IWMF in phases. Having regard to the need to have the IWMF with a reasonable scale so as to achieve good economy of scale, we make reference to densely populated cities with similar demographic and geographic characteristics of Hong Kong and propose that the first phase will have a treatment capacity of about 3 000 tonnes per day (tpd). The IWMF will also incorporate a small scale sorting and recycling plant to recover recyclable materials from mixed MSW and will occupy a total area of about 10 hectares. The required treatment capacity for the remaining phase of the IWMF would be determined following our review of the implementation of the first phase of the IWMF, the progress of various waste management initiatives and the reduction as well as the recycling rates of the waste in Hong Kong.

6. As for the OWTF, instead of integrating it together with the IWMF, we consider that it is more practicable to develop it under a parallel but separate programme for the ensuing reasons. Currently, Hong Kong produces about 3 200 tpd of food waste of which 700 tpd are generated from the commercial and industrial sectors that can be more easily separated at source for collection. On the other hand, domestic MSW is now mixed with food waste, which cannot be easily separated. Unlike the mixed MSW, commercial food waste should not be compacted at the existing refuse transfer stations for transportation. It

should be transported directly to an OWTF developed under separate programme for specialized treatment. Our plan is to proceed with the development of OWTF in two different locations under two phases, with each phase to have a design capacity of 200 tpd[1].

Site Selection for the Development of the IWMF

7. As reported to the EAP at its meetings on 26 March 2007 and on 22 October 2007, we have conducted a comprehensive site selection exercise to identify potential sites in Hong Kong for developing the first phase of IWMF, having regard to environmental, technical/engineering and economic considerations, as well as social impact and implications to consumers/users.

Annex 8. The result of the site search exercise (full report at **Annex**) concludes that the sites at Shek Kwu Chau and Tsang Tsui Ash Lagoons satisfy our siting criteria as set out above and are suitable for consideration as potential sites for developing the first phase of IWMF. The Tsang Tsui Ash Lagoons are situated at the northwest New Territories adjacent to the WENT Landfill and the Black Point Power Station. The Shek Kwu Chau site is to be formed by reclamation at the south-western side of the island. The locations of the two potential sites are shown in Figure 1 below.

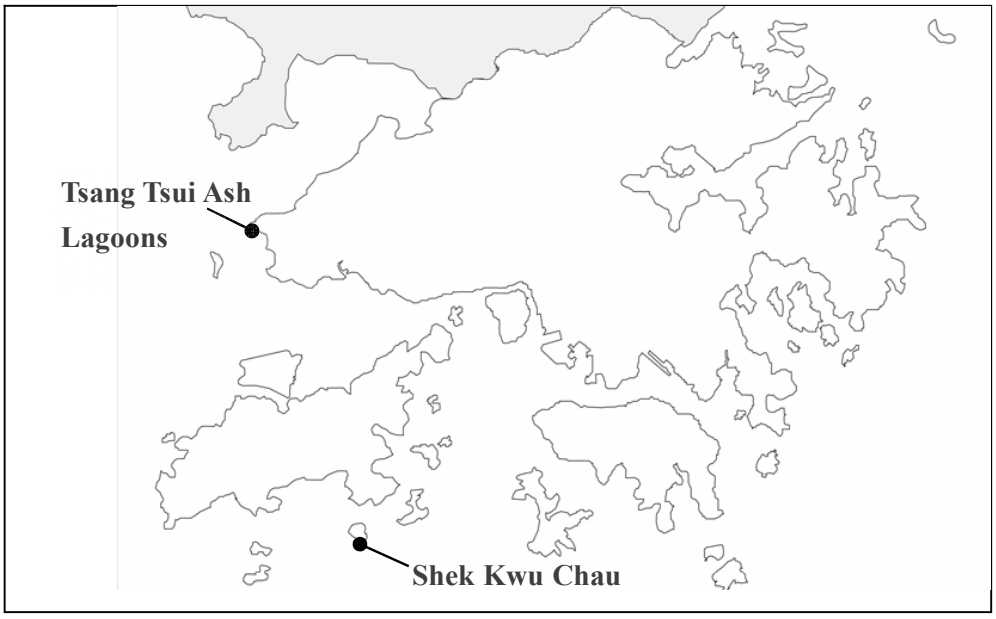

Figure 1 – Potential Sites for the Development of IWMF

[1] The total capacity of the OWTF will be about 400 tpd and this will leave room for the commercial and industrial sectors to develop their own treatment facilities.

The Way Forward

9. We will carry out the detailed engineering and EIA studies for both the Tsang Tsui Ash Lagoons site and the Shek Kwu Chau site to ascertain their ultimate suitability. While we pursue the technical aspects of the project, we will undertake a public engagement process and work and liaise closely with the relevant District Councils, local community and other stakeholders to deliberate matters of concern. All the while, we will continue our efforts to vigorously promote the 4Rs (Reduce, Reuse, Recycle and Responsibility) so as to keep our waste generation in check. The target timeframe is to complete the detailed engineering and EIA studies in 2010.

Environmental Protection Department
January 2008

Confirmed Minutes of the 166th Meeting of the Advisory Council on the Environment held on 14 December 2009 at 2:30 pm

Present:

Prof LAM Kin-che, SBS, JP (Chairman)
Prof Paul LAM, JP (Deputy Chairman)
Dr Dorothy CHAN, BBS
Prof CHAU Kwai-cheong
Mr Oscar CHOW
Mr Michael JEBSEN, BBS
Mr Edwin LAU, MH
Mr Michael LEE
Dr MAN Chi-sum, JP
Dr Alfred TAM
Mr TSANG Kam-lam
Prof WONG Ming-hung
Mr Simon WONG, JP
Prof Ignatius YU
Mr Carlson K S CHAN (Secretary)

Absent with Apologies:

Ms Teresa AU
Ms Betty HO
Prof Joseph LEE
Dr YAU Wing-kwong

In Attendance:

Ms Anissa WONG, JP	Permanent Secretary for the Environment
Mr C C LAY	Assistant Director (Conservation), Agriculture, Fisheries and Conservation Department (AFCD)
Mr P Y TAM	Assistant Director/Technical Services, Planning Department
Dr Tina MOK	Principal Medical and Health Officer, Department of Health (for agenda item 3)
Ms Eva WONG	Senior Information Officer, Environmental Protection Department (EPD)
Ms Josephine CHEUNG	Chief Executive Officer (CBD), EPD
Ms Loletta LAU	Executive Officer (CBD), EPD
Miss Kim KWAN	Executive Manager (CBD), EPD

In Attendance for Agenda Item 3:

Mr Elvis AU, JP	Assistant Director (Water Policy), EPD
Ms Greta TAM	Acting Senior Environmental Protection Officer (Water Policy & Science)2, EPD
Mr Louis LEUNG	Senior Administrative Officer (Water Policy Division), EPD
Dr Paul SHIN	Consultant, Hyder-CPS
Dr Jason YANG	Consultant, Hyder-CPS

In Attendance for Agenda Item 4:

Mr Albert LAM, JP	Deputy Director of Environmental Protection (2), EPD
Mr Vincent TANG	Assistant Director (Nature Conservation & Infrastructure Planning), EPD
Mr LUI Ping-hon	Principal Environmental Protection Officer (Infrastructure Planning), EPD
Dr Ken LUK	Regional Director, AECOM Asia Co. Ltd. (AECOM)
Ms Echo LEONG	Associate, AECOM
Dr Lee POTTS	Technical Specialist, AECOM

In Attendance for Agenda Items 5 & 6:

Mr C S LIU	Chief Engineer, Civil Engineering and Development Department (CEDD)
Mr Y P HUNG	Senior Engineer, CEDD
Ms Jacinta WOO	Acting Chief Town Planner, Planning Department
Mr Davis LEE	Project Manager, Ove Arup & Partners Hong Kong Ltd. (Arup)
Mr Joseph MA	Public Engagement Consultant, Arup
Mr Michael LEVEN	Ecologist, Arup
Mr Vincent CHENG	Carbon Appraisal Specialist, Arup
Mr Samuel CHAN	Environmental Specialist, Arup
Mr Geoff CAREY	Ecologist, Arup

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Action

Agenda Item 1 : Confirmation of the draft minutes of the 165th meeting held on 9 November 2009

The draft minutes were confirmed without amendment.

Agenda Item 2 : Matters arising from the minutes of the 165th meeting held on 9 November 2009

2. There were no matters arising from the minutes of the last meeting.

Agenda Item 3 : Review and development of marine water quality objectives – First stage public engagement exercise
(ACE Paper 21/2009)

3. Mr Elvis AU briefed Members on the background and proposed approaches and methodologies of the review and development of marine water quality objectives (WQOs). The current set of WQOs had been established according to the water conditions and scientific knowledge of the 1980s. The objective of the Review was to develop a revised set of WQOs that would provide an objective and scientific basis for planning environmental protection programmes and initiatives. This was the first stage of the two-stage public engagement exercise.

4. A Member said that the fisheries sector had been complaining about the declining fish stock in Hong Kong waters which probably had a correlation with pollution of marine water. Priority should be given to re-establishing and enhancing the fisheries resource. Mr Elvis Au explained that fisheries resource was one of the key issues identified in the consultation paper. Overseas experts indicated that water quality improvement would help enhance fisheries resources. Marine biological health, including fisheries resource, was a key area being monitored. The Environmental Protection Department (EPD) had formed a study management group with representatives of the Agricultural, Fisheries and Conservation Department (AFCD) advising on fisheries matters. AFCD commissioned a study on the fisheries resource survey in 1999 and the situation was being closely monitored since then. Upon the advice of City University of Hong Kong following a study from 2001 to 2003, EPD had been conducting marine biological monitoring, including fisheries aspects. The Review would look into the possibility of including some biological indicators in the new set of WQOs, such as indicators to reflect the health of marine ecosystem and fisheries.

5. A Member learnt that the fisheries sector was concerned about the silt being washed from construction sites close to coastal waters as the silt could affect the gills of the fish. He wondered whether there were other parameters

outside the list in Appendix A of Enclosure 1 of the paper which would affect the fish yield. Mr Elvis Au explained that silt and suspended solids were some of the many factors affecting water quality and fish yield. The standard of assessing suspended solids adopted by overseas countries was listed in the Technical Note. A range of standards, including *E. coli*, pH, turbidity and toxic substances, were used. Reference would be made to overseas practices and experience in considering the standards most suitable for Hong Kong.

6. In respect of the quality of fish tank water for seafood, a Member said that the Food and Health Bureau had rolled out a voluntary Quality Seawater Assurance Scheme in 2007 for seawater suppliers and seafood traders to encourage them to exercise better control of the quality of fish tank water for compliance with prescribed legal standards for protection of public health. The Hong Kong Productivity Council was appointed as an independent body to develop and implement the scheme.

7. A Member suggested taking into account the development of marine parks and marine reserve areas when considering the new set of WQOs. Mr Elvis Au said that the protection of marine parks was one of the key areas in the Review. The need of including tailor-made parameters for marine parks would be explored. Moreover, the Marine Parks Committee of the Country and Marine Parks Board was consulted on the Review.

8. A Member referred to pages 22 and 23 of the Technical Note at Enclosure 2 of the paper. He considered that while some compounds were of low concentration, it did not mean that they were of low level of concern. Some toxic chemicals, such as methylmercury, flame retardant, chlorinated hydrocarbon and dichloridiphenyltrichloroethane, were of concern to human health. For example, methylmercury was efficient in binding into aquatic organisms and could be biomagnified in the food chain which explained the reason for large fish having high concentration of methylmercury. It was necessary to have better protection in mariculture zones for protection of human health.

9. Mr Elvis Au explained that the study on toxic chemicals was one of the key issues identified in the Review. A total of 48 WQO parameters or indicators were listed out in Appendix A of Enclosure 1 of the paper and many of them were related to toxic chemicals. It was noted that toxic chemicals were

included in some overseas standards of mariculture for protection of public health. The applicability of these standards to Hong Kong would be explored. Since 2004, EPD had been monitoring the level of toxic substances in various marine zones and benthic community by using 33 parameters. The results indicated that the levels were comparable to or lower than other regions. Quantifying the toxic chemicals under the WQOs would help long-term monitoring and the Review would look into this area.

10. The Chairman noted that the World Health Organization (WHO) identified *intestinal enterococci* as the most suitable bacterial indicator for bathing waters whilst *E. coli* was adopted as a standard in Hong Kong. He enquired about studies conducted to facilitate consideration in reviewing the standard. Mr Elvis Au said that studies on *enterococci* had been conducted since early 1990s. Findings of local epidemiological studies showed that *E. coli* had a stronger correlation with bathing water diseases in Hong Kong and thus *E. coli* was adopted as a WQO for bathing waters. To provide more scientific data for the Review, the consultant would conduct an independent review having regard to the recommendations by the WHO and latest scientific findings while EPD would conduct surveys on some beaches. He pointed out that the recommendation of using *intestinal enterococci* in the WHO Guidelines issued in 2003 was based on an epidemiological study in the UK on the measurement of four beaches involving 1,100 participants in temperate climate. The WHO Guidelines indicated that the standard was based on temperate epidemiological study and application to tropical and sub-tropical regions would require more studies.

11. A Member enquired about the impact of *E. coli* discharged by the sewage of Pearl River Delta (PRD) on the Victoria Harbour. Mr Elvis Au explained that *E. coli* primarily came from untreated domestic sewage in Hong Kong and was not directly related to the discharge from PRD as *E. coli* would not survive over a long distance. The overall *E. coli* level in Hong Kong as a whole had decreased by 39% in the past 20 years. In the Victoria Harbour, the improvement was more significant due to the commissioning of the Habour Area Treatment Scheme (HATS) Stage 1 in 2001. Since 2001, the *E. coli* level had dropped by 50% on average for the whole harbour and by 90% in the eastern waters. It was expected that *E. coli* level would continue to drop with the operation of the advance disinfection facilities and commissioning of HATS Stage 2A.

12. A Member said that as water bodies in Hong Kong, particularly the western waters, were subject to the discharge of PRD, any proposed standard or mitigation scheme had to take into account the policies to be adopted by the Mainland. Mr Elvis Au said that there was close collaboration with the Mainland on water quality management. In early December, the Secretary for the Environment and the Director of Guangdong Environmental Protection Department (GDEPD) had reached an agreement to conduct a joint study on the water quality management plan for the whole PRD by using an advanced water quality model developed jointly with the GDEPD. The initial study, to be commissioned in 2010, would assess the water quality of the Pearl River Estuary and the environmental capacity of the estuary for meeting various WQOs. Regarding the Deep Bay, an action plan was put in place in 2001 and the first review was completed in 2007. With the cooperation of the Shenzhen side, the pollution loading was reduced by 38% in the past nine years. The second round of action plan aimed to reduce the pollution loading by further 40% in the next 10 years. The plan was endorsed by the Hong Kong-Guangdong Joint Working Group on Sustainable Development and Environmental Protection.

13. The Chairman asked the possibility of setting up a joint water quality monitoring programme with the Guangdong Authority for better understanding and monitoring of the Pearl River Estuary in the long run. Mr Elvis Au said that the joint study to be embarked in January 2010 would include not only water quality modelling, but also joint water quality monitoring. The study areas would cover two special administrative regions and nine PRD municipalities. Upon the completion of the study, a comprehensive set of water quality modelling as well as joint water quality monitoring programme would be worked out.

14. The Chairman noted that the Review would take into account the background concentration and enquired about the latest background concentration in the western waters. Mr Elvis Au explained that parameters which were not directly related to the PRD flow were on an improving trend. For example, unionized ammonia was on a decreasing trend over the past two decades. However, total inorganic nitrogen had increased by 35.6% from 1986 to 2008 which was related to the overall increase in pollution in the PRD. The sewage volume generated by the PRD region had increased by 50% over the last eight years, resulting an increase in pollution in the PRD region. For Hong Kong, over 70% of the nutrients in Hong Kong came from the PRD. Nonetheless, the

response of different water bodies to the increase in nutrient level was different. For example, the highest level of total inorganic nitrogen was recorded in Deep Bay but the incidences of red tide were very low which was probably due to high turbidity of the waters. The situation in the southern waters was very different. While the water bodies were quite stable and the nutrient level was much lower, the area was subject to higher incidences of red tides. Nonetheless, the number of red tides occurred in Hong Kong had significantly reduced from 88 times in 1988 to 15 times in 2008. The Review would study a comprehensive package of nutrient-related parameters, including total inorganic nitrogen, phosphate and silica as well as the hydrodynamic characteristics and stability of the water body.

15. A Member supported the proposed methodologies set out in the paper. He considered that public consultation was necessary for determining the beneficial use of each water body. Particular attention had to be paid to the beneficial use of the Victoria Harbour which was a unique resource for Hong Kong. Different people might have different expectations on its beneficial use. Mr Elvis Au explained that one of the objectives of the public engagement exercise was to gauge views on the beneficial use of different water bodies. Different stakeholders had been consulted and comments on the beneficial use of Victoria Harbour had been received, such as its leisure use and resumption of the cross-harbour swimming contest as well as the safety concern of busy marine traffic.

16. A Member was concerned about the problem of refuse in marine water and beaches and enquired about the responsible government departments and ways of tackling the problem. Mr Elvis Au said that similar concern had been raised by some Council Members and the concern had been referred to relevant departments, including the Marine Department, Food and Environmental Hygiene Department as well as Leisure and Cultural Services Department, which worked in collaboration to step up the collection of refuse. The Marine Department had an annual program on collection of marine refuse. In some areas such as Tsuen Wan Bay, an inter-departmental working group had also been set up to examine ways to tackle the problem, among other issues.

17. The Chairman summarized Members' views as follows –

(a) the Council noted that the current set of WQOs had been in force for over two decades and considered that it was opportune to

review the set of standards in light of the latest advancement in water science and technology as well as increasing community aspiration for better quality of life and changes in the beneficial use of the water bodies;

(b) the Council agreed with the proposed approaches and methodologies adopted in the Review and considered that the Review should be based on scientific and objective data and the WQOs had to take into account the specific water bodies in terms of its hydrodynamic characteristics, background trend in water quality and beneficial uses;

(c) the Council considered that it was essential to examine the health aspects of WQOs, including the need to include other biological indicators in addition to *E. coli* for bathing waters, toxic chemicals in mariculture and biological indicators on the marine ecosystem and fisheries resource;

(d) the Council considered that it was important to consult the public and specific stakeholders in considering the beneficial uses of water bodies, in particular the Victoria Harbour which was a valuable asset of Hong Kong; and

(e) the Council looked forward to receiving more concrete proposal regarding the new set of WQOs in the second stage of consultation.

Agenda Item 4 : Integrated Waste Management Facilities – Technology review and associated facilities
(ACE Paper 22/2009)

18. Mr Albert Lam briefed Members on the background of the Integrated Waste Management Facilities (IWMF). The EPD planned to develop the first phase of the IWMF with a treatment capacity of about 3,000 tonnes per day (tpd) for municipal solid waste (MSW). Incineration with energy recovery would be adopted as the core technology and a demonstration scale sorting and recycling plant would be incorporated to recover resources from the MSW. Shek Kwu Chau and Tuen Mun Tsang Tsui Ash Lagoon were considered potential sites. Dr Lee Potts briefed Members on the results of the technology review carried out

under the Engineering Investigation and Environmental Impact Assessment Studies for the proposed development of the IWMF. For the thermal technologies, incineration by using moving grate technology was recommended. For the sorting and recycling technologies, mechanical and biological treatment (MBT) was proposed. Dr Ken Luk briefed Members on the initial views on the associated facilities that might be incorporated in the IWMF.

19. A Member enquired about information on health impacts of incineration facilities in overseas countries, such as Singapore, Taiwan and Japan, including information on whether there were higher incidences of diseases, including respiratory disease and cancer, for people living in the vicinity of the incineration facilities. The information would be useful for the general public in understanding the minimal health impacts brought about by advanced technology in incineration design and operation. Dr Lee Potts explained that according to the experience in UK, the incinerators were usually built in industrial areas and it was difficult to assess their health impacts in view of the siting of other facilities nearby, such as power stations and chemical plants. There was no evidence of adverse health impacts caused by emissions from incineration facilities. Among the industrial facilities, incineration was the most highly regulated combustion process and the design allowed flue gas treatment to achieve extremely low level of dioxin emission. For example, the incinerator in Köln of Germany operated with extremely low level of emissions because the flue gas treatment system was one of the best in the world.

20. A Member enquired about the types and levels of pollutants generated by different types of thermal treatment technology, such as in terms of per tonne of waste. Dr Lee Potts explained that it was difficult to establish which technology had a higher level of performance in terms of pollutant emissions as the plants operated according to the regulatory standards in the particular country. In general, fluidized bed technology normally generated less nitrogen oxide (NO_x) than a moving grate incinerator as the former operated at a more turbulent condition. Gasification and pyrolysis technologies sometimes also had the benefit of generating less NO_x as they operated at an oxygen deficient condition. As different types of technology applied different waste treatment processes, making direct comparison between them would be difficult. Upon the Chairman's request, the presentation team undertook to provide additional information in relation to the enquiries raised by the two Members.

(Post-meeting note: An Information Note providing the information requested was circulated to Members after the meeting.)

21. A Member gathered from the discussion that the amount of pollutants emitted from the incineration process was closely related to the effort made in treating the flue gas. He considered that extra effort should be made to the treatment of flue gas in order to ensure the protection of public health. Dr Lee Potts explained that the combustion process and the flue gas treatment system had to be optimized to minimize the formation and emission of pollutants.

22. The Chairman enquired about the emission standard to be adopted for dioxin related to thermal treatment and whether the adoption of the proposed moving grate incineration technology could comply with the standard. Dr Lee Potts said that the emission standard for dioxin would be 0.1 ng I-TEQ/m^3 which was based on the European Union (EU) waste incineration standard. The moving grate was a proven technology around the world. It could achieve the stringent standard with a safe margin through various measures, including combustion control, design of the incinerator in terms of temperature and gas residence time, addition of activated carbon and utilization of filter to control dioxin.

23. A Member enquired about the waste to energy conversion ratio of incineration. Dr Lee Potts said that the modern technology could convert about 24% to 26% of the energy from the thermal treatment process to electricity. For one tonne of waste with a calorific value (CV) of around 10 megajoule/kg, 24% to 26% of the energy from the thermal treatment process could be converted to electricity. If the steam generated from the incineration process could also be utilized in addition to electricity generation, the overall energy efficiency could be as high as 75% to 80%. It was a common practice for European countries, such as Sweden, to locate the incineration facility at the centre of the city and utilize the heat generated for household or commercial uses.

24. A Member asked whether the moisture content of the waste feedstock would affect the incineration process by requiring more fuel to dry up the waste. Dr Lee Potts explained that to cater for variation in the composition and moisture content of waste feedstock, the facilities could be designed to operate within a firing diagram for a range of CV without the need for constant

addition of fuels. In the worst-case scenario, if the CV dropped to a very low level, fuel oil could be added to sustain the temperature as the furnaces needed to work at a high temperature to minimize formation of dioxin. However, this would not occur if proper assessment was conducted on the composition of waste and the facilities were designed according to the variation in composition of waste.

25. A Member enquired about the technologies adopted and experience learnt from the old type incinerators in Hong Kong. Mr P H Lui said that Hong Kong used to have three old type of incinerators in Lai Chi Kok, Kennedy Town and Kwai Chung in 1960s to 1970s and all of them had been demolished. The three incineration plants employed old thermal treatment technologies and could not meet the current emission standards and generate electricity for use off-site. For example, rotary kiln plus combustion chamber were used for the Kwai Chung incinerator.

26. A Member referred to the Figure in paragraph 8 of the paper regarding "Trend of Thermal Treatment of MSW of selected countries" and asked the ways South Korea, EU and Germany managed the waste load while keeping a low percentage of treatment by incineration. Dr Lee Potts explained that these countries managed the waste by maintaining a high level of recycling, such as about 60% in Germany. Other countries, such as the Netherlands, Singapore and Japan, were increasing efforts in recycling. Nonetheless, thermal treatment was still the backbone technology for treating residual waste in countries with high recycling rate. Another Member added that recycling was a mandatory waste treatment process in Germany. The Member requested the presentation team to provide the exact percentages of MSW treated by incineration from 2000 to 2007 by the selected countries in the Figure, if available.

(Post-meeting note: The information requested was included in the Information Note circulated to Members after the meeting.)

27. Regarding the eco-co-combustion system proposed by a local cement production company, a Member asked whether the technology was technically feasible, environmentally friendly and cost-effective for treating MSW, while putting aside the issue on demand of cement. Dr Lee Potts explained that the eco-co-combustion system had to be designed to allow total

waste management even in the event of no cement production. In the proposed eco-co-combustion model, some of the operation processes had to be bypassed if there was no cement production and this might result in exceedances of emission standards. More importantly, the proposed technology was different from the co-combustion process adopted worldwide and there had not been any similar operation at a commercial scale in Hong Kong or any other parts of the world.

28. A Member enquired about the benefits of having thermal treatment to operate with cement production, such as eco-co-combustion. Dr Lee Potts explained that the cement production process used limestone which could help remove acidic gases like hydrogen chloride. Moreover, the system utilized the bottom ash as raw material for cement production and it would reduce ash disposal to landfill.

29. A Member enquired about comparison of the emission level of eco-co-combustion system and moving grate incineration technology. Ms Echo Leong explained that the pilot plant trial run showed that emissions from the eco-co-combustion system could meet the emission standards. Nonetheless, direct comparison could not be made as eco-co-combustion system included a flue gas treatment process after the thermal treatment process. Dr Lee Potts added that it was difficult to assess the data as it was based on a two-month trial run and no full scale eco-co-combustion plant was in operation in other countries.

30. A Member asked whether the eco-cement plant in Japan was similar to the proposed eco-co-combustion system. Ms Echo Leong explained that they were totally different. The eco-cement plant in Japan made use of fly ash and bottom ash as raw materials and mixed them with other raw materials in the rotary kiln for cement production and it was similar to a normal cement production process.

31. Regarding the sorting and recycling technologies, the Chairman asked the reasons for developing only a demonstration scale plant given MBT was a well proven technology. Mr Vincent Tang explained that the plan was to develop the first phase of the IWMF with a treatment capacity of 3,000 tpd with incineration as the core technology. An incineration facility with a treatment capacity of about 2,800 tonnes plus a demonstration scale sorting and recycling facility by using MBT for treating about 200 tpd were proposed to maximize the capacity. Consideration of adopting MBT would be given to the second phase of

the IWMF should it prove to be effective. Dr Ken Luk added that one of the key considerations was the requirement of land space for MBT plant. With the provision of 10 hectare of land for the IWMF, it was more suitable to have a thermal treatment plant as the core process plus a MBT plant at demonstration scale.

32. Dr Lee Potts explained that MBT could serve as a pre-treatment process of thermal treatment when more recycling was required. A thermal treatment process was necessary to manage the residual waste. During the MBT sorting and recycling process, different types of wastes, such as paper cardboards, plastics, metal cans and organic food waste were sorted out. In UK, metal cans were normally recycled. However, the residual wastes, including dirty plastics, paper cardboards and compost, were normally treated by other means, such as thermal treatment or disposal at landfills.

33. The Chairman considered that the public would expect the IWMF to include technologies other than thermal technology to make it a truly integrated one. He considered that there was scope for further expanding the scale and scope of sorting and recycling. Dr Lee Potts explained that the expansion could be made possible if outlets of the waste from the MBT plant could be expanded. For example, the combustible rich fraction of waste could be further refined by chopping up plastics and papers to produce refuse-derived fuel. The end products could then be fed into a cement plant or power station as an alternative fuel. The digested residue from a MBT plant could be used for landfill restoration.

34. A Member said that his understanding of the IWMF included an organic waste treatment plant plus a thermal treatment plant or a MBT plant. A delegation of the Council paid a study visit to the Netherlands and Germany in 2006 to acquire information on management of MSW. In view of the unsatisfactory operation of the MBT plant which the delegation visited in Germany, the delegation recommended that the MBT method for un-sorted and mixed MSW should not be used. Mr Albert Lam clarified that a separate organic waste treatment facility to be located at Siu Ho Wan was proposed for treating organic waste.

35. In reply to a Member's enquiry about the purpose of setting up a demonstration scale of sorting and recycling MBT plant, Mr P H Lui explained that the proposal of the IWMF with incineration as the core technology plus a sorting and recycling plant as a component of the IWMF was based on the advice of the Advisory Group on Waste Management Facilities (AG). For the current technology review, the main purpose was to identify the most appropriate thermal treatment technology as well as sorting and recycling technology. The review recommended that moving grate incineration technology be adopted as the core technology while MBT was proposed for the sorting and recycling plant as a component of the IWMF. MBT was a popular technology in Europe in recent years. It should be noted that if no thermal or biological treatment was conducted on the mixed MSW, the organic residual would not be stabilized and when disposed of at landfills it would generate leachate with high pollutant levels as well as methane which was a strong greenhouse gas.

36. A Member considered that while incineration technology was necessary in view of the land problem in Hong Kong, the resources devoted to the MBT plant could be deployed to strengthening public education on household recycling. He recalled that the MBT technology was not included in the recommendation of the AG. Mr Vincent Tang said that the AG recommended that the IWMF should adopt a multi-technology approach with incineration as the major component of the IWMF strategy. Application of MBT technologies could be considered at suitable scale under particular circumstances and as a component of the overall IWMF strategy. Based on the recommendations of the AG, moving grate incineration technology was proposed as the core technology and MBT was proposed to be tested out in small scale to explore how far it could be applied in the future phases of the IWMF.

37. The Chairman considered that the intention of having an integrated waste management approach comprising different technologies was to allow maximum opportunity for recycling before the waste was treated by combustion. Thus, a sorting and recycling facility as well as an organic waste treatment plant were recommended.

38. A Member enquired about operation of the MBT plant as a sorting and recycling facility. Dr Lee Potts explained that the process employed mechanical treatment to pre-treat the waste by reducing the size of waste and removing contaminants before the waste entered into the later biological treatment

stage for generation of biogas by anaerobic digestion and/or treatment by composting. For example, magnetic separator was used to sort out metal cans, current separator to sort out non-ferrous metals like aluminum and infra-red separator to sort out plastic bottles. MBT could help maximize the amount of recyclables to be captured from the MSW. In Europe, MBT served as a half-way house and allowed recovery of more waste for recycling and digestion of the organic part.

39. A Member asked whether the MBT would enable the increase in the amount of recyclable waste and hence reduce the amount of waste for incineration. Dr Lee Potts explained that MBT could reduce the amount of waste for incineration if the recyclables, such as dirty plastics, paper cardboards and organic waste could be sorted out and consumed by the market, thus reducing the mass of waste for incineration.

40. The Chairman drew Members' attention to the recommendations of the delegation after the study visit to the Netherlands and Germany in 2006 as recorded in ACE Paper 11/2006. One of the recommendations was that for the treatment of waste, mechanical sorting and recycling plants could be used for source-separated mixed recyclable waste. Based on the German experience, the MBT method for un-sorted and mixed MSW should not be used. Given the importance of the IWMF and the need to consider the issue in context and from a holistic point of view, the Chairman suggested that the Council would not make a recommendation regarding the sorting and recycling facilities at this stage and the issue be further examined by the Waste Management Subcommittee by taking into account previous discussions and recommendations of the Council and further information provided by the Administration. The Subcommittee would then report its findings and recommendations to the full Council for consideration. The meeting agreed to the approach.

41. On the associated facilities of the IWMF, the Chairman enquired about the funding arrangement and long-term management of the facilities. Mr Albert Lam explained that it would depend very much on the type of facilities to be built. The construction cost would be included as part of the project cost and the facilities would probably be run by the contractor of the IWMF. Ms Anissa Wong said that the purpose of the associated facilities was to make good use of the energy generated from the incinerator for the benefit of the community. The facilities set out in the paper were only preliminary options

proposed by the consultants having regard to the amount of energy level and overseas experience. Whether the associated facilities should be operated as part of the overall project of the incinerator or operated separately was yet to be determined in light of the facilities selected. The District Councils and public concerned would be consulted on the facilities and design.

42. A Member considered that the Government should cooperate with local universities in training the required expertise in developing waste treatment technologies and establishing research centres and laboratories for the purpose. Another Member considered that more options for associated facilities should be explored for consideration by the stakeholders and public. Based on the few proposed preliminary options, it might give an impression that the location of the IWMF had been pre-determined.

43. A Member suggested making use of the creativity of the private sector to come up with good ideas of utilizing the energy generated and meeting the needs of the community in developing the associated community facilities. It would be a waste for providing some community facilities which were not used. A Member made some suggestions on the associated community facilities, such as setting up barbeque sites with free electric stoves to attract visitors similar to those in Australia, allowing social enterprises in the district to utilize the hot water for laundry service to create job opportunities, and utilizing the excessive carbon dioxide (CO_2) generated from the incinerator for community farms as increase in CO_2 concentration in green houses could increase crop yield. Another Member suggested providing free electricity to the nearby households. Dr Ken Luk thanked for the suggestions and would explore the feasibility of the ideas under the project.

44. The Chairman summarized Members' views as follows –

(a) on the basis of the information provided, the Council had no objection to employing moving grate incineration technology as the thermal treatment technology for further consideration;

(b) given the importance of the IWMF and the need to consider the issue in context and from a holistic point of view, the Waste Management Subcommittee would examine the proposal on the sorting and recycling facilities in greater detail taking into account

previous discussions and recommendations of the Council, and report the findings and recommendations to the full Council for consideration;

(c) the Council welcomed the proposal of setting up associated community facilities to make good use of the energy generated from the incineration facility. More creative ideas would be necessary on the type of facilities to be selected as the facilities should be meaningful and welcome by the community. Views of the community and stakeholders concerned should be seriously considered on the proposal and detailed design; and

(d) the Council considered that it was essential to put the IWMF in the context of an integrated waste management framework set out in the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)". For the IWMF, the public would expect a host of "integrated" technologies other than the thermal technology in order to maximize the recycling rate.

Agenda Item 5 : Study on land use planning for the Closed Area – Draft Development Plan
(ACE Paper 23/2009)

Agenda Item 6 : North East New Territories New Development Areas – Planning and Engineering Study – Stage Two Public Engagement
(ACE Paper 24/2009)

45. The Chairman informed Members that the Planning Department (PlanD) would seek Members' views on the land use planning for the Closed Area (FCA Study) under agenda item 5. The PlanD consulted the Council on the Draft Concept Plan under Stage 1 Community Engagement in June 2008. This was the second stage of the two-stage community engagement. For the North East New Territories (NENT) New Development Areas (NDAs) planning and engineering study (NDA Study) under agenda item 6, the PlanD and Civil Engineering and Development Department consulted the Council on the planning and development framework for the NDAs in January 2009. This was the second stage of the three-stage Public Engagement. As the two agenda items were closely related and would be presented by the same consultancy team, the

meeting agreed to combine the presentation and discussion of the two items for a more efficient and fruitful discussion. The Chairman also informed Members that the Council received a written submission from the Hong Kong Bird Watching Society expressing objection to the development zoning for Long Valley, Hoo Hok Wai and San Tin. The submission had been circulated to Members before the meeting for information.

46. Mr C S Liu briefed Members on the background of the two Studies. The purpose of the paper on FCA Study was to seek Members' views on the Draft Development Plan which would guide the conservation and development of the land to be released from the Frontier Closed Area. The plan focused on conservation with sustainable development. The purpose of the paper on NDA Study was to seek Members' views on the Preliminary Outline Development Plans formulated for the proposed Kwu Tung North, Fanling North and Ping Che/Ta Kwu Ling NDAs which focused on sustainable development with conservation element. Mr Joseph Ma briefed Members on the details of the two Studies.

47. A Member supported the approach of conserving the Closed Area with some minor development and developing the NDAs with conservation element. He was pleased to note the Government's commitment to preserve the area along the Closed Area despite the rapid development in Shenzhen. He suggested combining the design of the Closed Area and NDAs by avoiding large structures or supporting infrastructures in the Closed Area and moved them to the NDAs. He also suggested making efforts to revitalizing Fanling old town and Luen Wo Hui instead of only developing Fanling North which would help developing Fanling as a whole and boost the local economy.

48. A Member considered that the Closed Area was a unique and extremely sensitive area with wetland conservation area, ecological corridor and Lok Ma Chau Loop. Caution should be exercised in planning any development in the area in different aspects. Firstly, there was uncertainty on the behaviour of the natural environment in facing development in view of the lack of sufficient baseline information. Secondly, the term "eco" was often used, such as eco-lodge and eco-tourism, but they were not well-defined. It was necessary to have a clear specification as it would mean different footprints and different degrees of development. Thirdly, care should be exercised and feasibility studies should be conducted for the implementation of public-private partnership (PPP) conservation scheme. Fourthly, there were serious problems of illegal dumping

and landfilling in the New Territories in the past years, causing degradation of the environment. This problem might deteriorate with the opening up of land for development. Policing was important to guard against the change of land use. Finally, given the large scale of the two projects, more time had to be taken for careful planning and implementation of details to avoid the problems brought about by the rapid development of new towns in the 1970s and 1980s. Aesthetic design was important to blend the structures into the natural scenery.

49. The Chairman shared the view that the areas affected were ecologically important and Government should be very cautious on the instruments to be used to achieve the planning intentions. Alternative instruments should be considered in the event that PPP could not work.

50. A Member enquired about the proportion of the Closed Area being developed. Mr Joseph Ma said that over 70% of the area in the Closed Area would be for conservation purpose. The proposed development, mainly for recreational and very low density residential uses in the central portion with villages and flat land, accounted for about 30% of the area. Mr Davis Lee added that development in the Closed Area was mainly very small scale type for enhancing conservation and recreational purpose while residential development was very limited.

51. A Member did not agree to opening up the Closed Area until there was effective mechanism to deal with problems of illegal dumping and development, especially on agricultural land. He did not support designating the Hoo Hok Wai wetland as "Other Specified Uses (Comprehensive Development and Wetland Enhancement Area" ("OU(CDWEA)") as it meant that a certain degree of development would be allowed in the area. He asked whether Hoo Hok Wai was within the Wetland Buffer Area (WBA) as small-scale development outside WBA would not be covered by the Environmental Impact Assessment Ordinance (EIAO). Another Member asked whether San Tin would also be zoned as "OU(CDWEA)" as Hoo Hok Wai and San Tin should be preserved. He also asked whether housing development would be allowed in areas zoned as "OU(CDWEA)" as it would bring about disastrous impacts.

52. Ms Jacinta Woo explained that Hoo Hok Wai was not within the WBA of Deep Bay. The proposed designation of Hoo Hok Wai as "OU(CDWEA)" was similar to the existing zoning of the fish ponds in the San

Tin Outline Zoning Plan. The intention of the proposal was to preserve the wetland area and at the same time to provide some incentives to the landowners to come forward with a long-term management plan for the area. Under the "OU(CDWEA)" zoning, small-scale development might be permitted upon planning application. Through the planning application system, the project proponents would be required to carry out impact assessments, including an ecological impact assessment, for consideration by the Town Planning Board. The project proponents would also be required to submit a long-term management scheme including the long-term maintenance and management plan as well as monitoring and implementation mechanism.

53. A Member was concerned about the proposed zoning as small-scale development outside the WBA would not fall under the scope of EIAO and thus there was no means for the Council to scrutinize the environmental impacts of the development. He suggested including Hoo Hok Wai wetland into the WBA so that any development in the area would be subject to the EIAO.

54. The Chairman noted that there was a proposal of preserving the Long Valley as a Nature Park in the previous NENT NDA Study. Ms Jacinta Woo explained that a separate ecological survey for the Long Valley had been conducted during the current NDA Study. The current proposal in the Preliminary Outline Development Plans was to designate it as "Other Specified Uses (Comprehensive Development and Nature Conservation Enhancement Area)" ("OU(CDNCEA)") which was slightly different from the proposal of Nature Park and with a similar planning intention as the proposal for Hoo Hok Wai. The intention was to preserve the area while allowing some small-scale development in order to provide some incentives to the land owners to come forward with a long-term management plans for the wetland area. A majority of the area was under private ownership.

55. A Member expressed grave concern over the development zoning for the Long Valley. In view of the heated debate over the development in the Long Valley in 2000, the Government committed to zone the area as a nature reserve for preservation and conservation purpose. By changing the zoning of the Long Valley, it would open up opportunities and expectations for private sectors to develop the areas. He queried why the Government would need to depend on private sectors to preserve the unique and highly ecologically important areas. It was worthwhile for the Government to preserve the nature reserve with

public financial resources in the interest of the public. He raised objection to changing the zoning of the Long Valley, Hoo Hok Wai and San Tin by mixing the element of development into nature conservation. The proposed zoning would also cause confusion to the public and developers. Another Member agreed that the proposed zoning would create hurdles for preserving the area. With the bitter experience of the Spur Line case in the Long Valley, the definition of the zoning should be clear and well-defined.

56. A Member made a comparison between the proposed plan and a map of the AFCD in 2004 and noted a substantial change on the demarcating line between the Long Valley and Ho Sheung Heung. He agreed with another Member that the natural treasure of the Long Valley, Hoo Hok Wai and San Tin would be endangered with the proposed change in zoning. He did not support the proposed rezoning.

57. A Member was disappointed that the Government dropped the idea of preserving the Long Valley as a Nature Park. Given that a majority of the area involved private ownership, the Government would be the only party which could have the resources to preserve the area as a Nature Park. He suggested designating the Long Valley as a Nature Reserve and land owners in the area could be allowed to have some small-scale development outside the Long Valley. Otherwise, batches of development would be found within the Long Valley.

58. Ms Jacinta Woo explained that the high ecological value of the Long Valley was fully recognized and the planning intention was still to preserve it. The current proposal was to strike a balance between conservation and development to ensure a long-term management of the area. The resumption of the whole area by the Government would have far-reaching legal and financial resource implications. The proposed "OU(CDNCEA)" zoning would ensure that a comprehensive rather than fragmented plan for development and management of the whole area would be put in place.

59. The Chairman considered that the proposed zoning was not clearly specified and it would be difficult to achieve the intention. Ms Jacinta Woo explained that there was existing mechanism under the Town Planning Ordinance in that the project proponent would be required to submit a planning application for any development, including a comprehensive plan for the whole area.

60. A Member considered that the non-in-situ land exchange approach which had been successfully implemented in many other countries was not sufficiently explored in the planning study. Given the multiple ownership of the area, it would be difficult for the private owners to propose a comprehensive management plan for the whole area. It would not be meaningful to have only piece-meal conservation. It would set a bad precedent to give up the proposed Nature Park. There were regrets in the community in the past for not making use of the non-in-situ land exchange approach to preserve ecologically important areas.

61. The Chairman considered that it was important not only to maintain the ecological integrity of the area but also the hydrological regime as the loss of water would affect the wetland. Construction works, including sewage and drainage channel works, would disrupt the hydrological regime of the region.

62. A Member was pleased to note that farming was covered under the plans but it seemed to be restricted to leisure farming. He suggested promoting urban agriculture to produce safe and quality fish and crops which would also help create employment opportunities.

63. A Member was pleased to note the design of cycling tracks in the NDAs. However, the cycling tracks should not be limited to recreational purpose and promotion of tourism but also for the use of residents in the areas. There were complaints in other new towns such as Tseung Kwan O that the design of cycling tracks did not facilitate the use by residents.

64. The Chairman summarized Members' views as follows –

(a) the Council supported the principles of sustainable development and conservation in the plans and considered that it was of paramount importance that the ecological function and integrity of the affected areas should be maintained and enhanced;

(b) given the strategic location and uniqueness of the Closed Area in terms of its ecological value and landscape, the Council considered that the right instruments and mechanisms should be identified and adopted for implementation of the conservation and development initiatives to achieve the planning intentions;

(c) the Council was disappointed that the concept of preserving the Long Valley as a Nature Park was dropped and the Council did not support the proposed rezoning of the Long Valley as "Other Specified Uses". The Council also had reservation on designating Hoo Hok Wai as "Other Specified Uses". Without clearly specifying the uses in the areas, it would be difficult to achieve the intention of preservation and would give rise to development pressure. There was also insufficient information on the instruments to be used for achieving the goal of comprehensive conservation and long-term management in the areas; and

(d) the Council urged the Administration to take into account the comments of the Council for designing and building a sustainable environment for the Closed Area and a sustainable community for the NDAs, including minimizing impact to the hydrological regime, promoting urban agriculture, building cycling tracks for residents, putting in place enforceable mechanism to deal with illegal dumping and landfilling, with a view to minimizing adverse environmental impacts and striking a balance between conservation and development.

Agenda Item 7 : Any other business

Site visit to the Lions Nature Education Centre and Geopark

65. The Chairman informed Members that the site visit to the Geopark had been re-scheduled to 18 December 2009 pm. In addition to the High Island Geo-Area, the opportunity was also taken to visit the Rock Gallery and Geopark Visitor Centre of the Lions Nature Education Centre which were newly opened. Members were encouraged to join the visit.

Vote of thanks

66. As the meeting was the last one of the year, Ms Anissa Wong took the opportunity to extend, on behalf of the Secretary for the Environment and colleagues of the bureau/department, her heartfelt gratitude to the support and

invaluable advice of the Members, particularly to the Chairman whose terms of office would expire following his kind agreement last year to extend his service for one more year. Under the Chairman's remarkable leadership, the Council had dealt with many difficult and controversial issues, especially in upholding environmental considerations in the pursuit of sustainable development.

67. The Chairman expressed his thanks to the support and contribution of Members and the trust of the Administration. He was confident that the ACE would continue to "Advance with Concerted Efforts" and be the "Agent of Change for the Environment".

Tentative items for discussion at the next meeting

68. The agenda was being compiled. Members would be informed in due course.

Agenda Item 8 : Date of next meeting

69. The next meeting was scheduled for 12 January 2010.

ACE Secretariat
December 2009

Green Island's Eco-Co-Combustion System – Fact Sheet

Green Island's Eco-Co-Combustion System presents an environmentally-friendly and cost-effective technology for waste management to Hong Kong. It benefits from sharing the cement manufacturing facilities of Green Island. These synergies yield **lower cost, higher productivity** and a **net improvement in air quality.**

The technology aims to treat Hong Kong's municipal solid waste through a thermal treatment process that is environmentally-friendly. The waste will be used as fuel for the cement plant; the processed waste residue can be used as clinker in the cement manufacturing operations; and surplus power generated can be sent to the electricity grid.

Over 100 technical studies have been carried out since year 2000 to support the Eco-Co-Combustion System, while the operation of a pilot plant has demonstrated process feasibility.

The main advantages of Green Island's Eco-Co-Combustion System are:

Lower Cost

- Upfront cost for Green Island's facility is HK$2 billion, with annual tipping fees of HK$200 million vs. EPD's proposal (for a government-owned integrated waste management facility (IWMF)) of HK$4 billion and HK$250 million respectively.
- Capital costs are lower primarily because Green Island's Eco-Co-Combustion System will use an existing platform with existing infrastructure.
- Running costs are lower primarily due to the heat energy synergy and the use of primary air scrubbing material which is a component of cement manufacture.

Lower Emissions; Net Improvement in Air Quality

- As waste is used as fuel, there will be a reduction of about 40% of the black coal burnt at the cement plant, resulting in a net improvement in air quality.
- Pilot Plant and air quality modeling of the full-size Eco-Co-Combustion System revealed no discernable impact (including dioxins) from the emissions of the Eco-Co-Combustion System.

Processes More Waste

- Green Island's Eco-Co-Combustion System aims to treat 4,800 tonnes of municipal solid waste per day, 60% more than EPD's proposed 3,000 tonnes for its IWMF.

Uses Existing Industrial Land

- Tap Shek Kok is an existing industrial site – no additional land is required to be zoned for IWMF use.
- The Eco-Co-Combustion System complies with the Outline Zoning Plan (Column 1 activity).

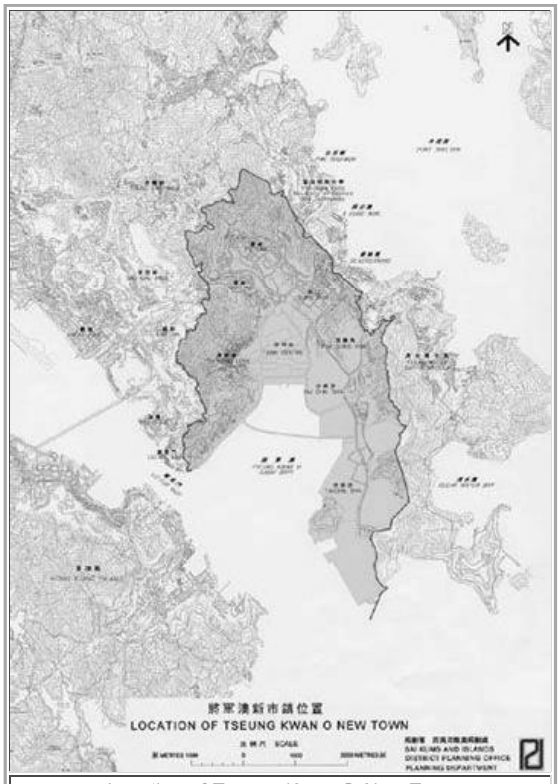
Tseung Kwan O 將軍澳

Geographical Location

Tseung Kwan O New Town is located in a long narrow inlet at the southern part of Sai Kung District in the South East New Territories (SENT). It is bounded by Clear Water Bay Peninsula to the east, Tseung Kwan O Bay to the south, East Kowloon to the west, and Tseng Lan Shue to the north. Being surrounded by steep hills on three sides, the New Town is physically segregated from East Kowloon and Clear Water Bay Peninsula. It is however very close to the Metro Area. The New Town has a total land area of about 1,790 ha. It includes the districts of Tsui Lam, Po Lam, Hang Hau, Town Centre, Tiu Keng Leng, Pak Shing Kok, Siu Chik Sha, Tai Chik Sha and Fat Tong O.

The New Town is covered by the Tseung Kwan O Outline Zoning Plan and a series of departmental plans.

The existing population is about 270,000. The population will be in the region of 490,000 upon full development.



Location of Tseung Kwan O New Town

Historical Background [back to content]

 Last revision date : January 2003

Tseung Kwan O 將軍澳

Historical Background

Settlements in the area began as early as in the 13th Century. Major settlements, however, did not occur until the late 16th Century when small fishing villages were founded. Hang Hau, which emerged into a market town, was once the most populated and prosperous place in the whole of Clear Water Bay Peninsula. The area continued to be dominated by rural uses in the next few centuries.

Former industrial activities in Tseung Kwan O

In the 1960s, industrial activities flourished in Tseung Kwan O. Ship building, ship repairing, ship breaking and steel rolling were the main industries. Other industries included manufacturing of non-ferrous metal products and production of industrial gases. Many of these industries relied on marine access. They have been gradually phased out or relocated since 1982 when the Government approved the development of Tseung Kwan O as a new town.

In 1983, development of Phase I of the New Town to an initial population of about 175,000 was formally endorsed. In 1986, the Government decided to proceed with the construction of the two tubes of Tseung Kwan O Tunnel, which provided scope for further increasing the population of the New Town. To maximise the utilisation of the road infrastructure and to meet the demand for land for public housing, in 1987, the Government decided that the New Town should include a Phase II development and be planned to an increased population of 325,000. To cater for redevelopment of the Tiu Keng Leng Cottage Area and to provide land for development of Tseung Kwan O Industrial Estate and deep waterfront industries, in 1988, the Government further decided to proceed with Phase III development of the New Town for about 450,000 subject to detailed feasibility study. The current Outline Zoning Plan and Outline Development Plan of Tseung Kwan O provide for a total planned population of 490,000. Population intake into the New Town started in 1988.

Tseung Kwan O in the 1970s prior to new town development

Tseung Kwan O New Town at present

Planning Principles and Concepts [back to content]

 Last revision date : January 2003

For Information

LEGISLATIVE COUNCIL
PANEL ON PLANNING, LANDS AND WORKS

Feasibility Study for Further Development of Tseung Kwan O – Study Findings

Purpose

This paper informs Members of the findings of the Feasibility Study for Further Development of Tseung Kwan O ("the Study").

Background

2. At present, the Tseung Kwan O ("TKO") New Town provides home to about 330,000 people. According to the current TKO town plans, the total planned population is about 480,000. In July 2002, we commissioned the Study to formulate a comprehensive plan for further development of TKO and improvement of its overall design with the vision to build TKO into a new town that can boast of its convenience, vibrancy, distinctive urban design and quality living environment.

3. We have undertaken three stages of extensive consultation to solicit public views throughout the study process. At the Stage 3 consultation conducted in early 2004, we received general public support to the Concept Plan, which had largely responded to public views such as no further reclamation in TKO for housing development, reduced development density in Town Centre South and Tiu Keng Leng, and provision of more open space and recreational facilities. On the basis of the Concept Plan and public views collected at the Stage 3 consultation, we have formulated detailed layout plans for the new development areas (i.e. Town Centre South, Tiu Keng Leng and Pak Shing Kok) and a Recommended Outline Development Plan ("RODP") for the TKO New Town. We have also carried out various impact assessments and engineering studies which indicate that the land use proposals and supporting infrastructures are both technically feasible and environmentally sustainable.

4. On 2 May 2003, we consulted this Panel and sought Members' views on the various development themes proposed for TKO Town Centre South and Pak Shing Kok. On 27 January 2004, we briefed this Panel again on the same subject, informing Members of the findings of the Stage 2 public consultation and

presenting the Concept Plan for the further development areas in TKO (mainly covering Town Centre South, Tiu Keng Leng and Pak Shing Kok).

The Study Findings

5. The Study has produced a RODP to guide the future land use planning as well as identified infrastructure facilities to support the development. An extract of the RODP at **Annex A** shows the consolidation of various land use proposals and major infrastructures in the new development areas. The key land use and infrastructure proposals are highlighted in the ensuing paragraphs.

Land Use Proposals

6. Land use proposals for the uncommitted sites in Town Centre South, Tiu Keng Leng, TKO Stage 1 Landfill and Pak Shing Kok include:

Town Centre South

(a) A commercial and entertainment node – the area over the MTR TKO Station in Area 56, with its central location and enhanced accessibility brought about by the MTR, is proposed to be developed predominantly for high quality retail, hotel and entertainment uses, possibly with some residential development, serving as a focal point of the TKO New Town.

(b) Medium density commercial/residential developments (with plot ratios in the range of 2 to 5) – high quality residential developments are proposed in the central part and along the waterfront and riverine parks. A mix of retail, restaurant, leisure and entertainment activities will be provided at the lower levels of these developments to enhance activity and create an interesting and vibrant waterfront for the enjoyment of local residents and visitors.

(c) A 'Central Avenue' – a richly landscaped pedestrian corridor at grade with a retail edge (e.g. outdoor cafes, retail shops, etc.) providing physical and visual connectivity from the commercial and entertainment centre at the MTR TKO Station to the new waterfront.

(d) Waterfront Park – contains high quality soft and hard landscape treatments, integrating with the waterfront promenade and Town Plaza to become a new venue for major community events.

(e) Riverine Park – provides direct access to potential water activities in the eastern channel (e.g. rowing, kayaking, water pedaling and possibly dragon boat racing).

(f) A Civic Node – comprises a new government complex with a town hall, government offices, library, heritage centre, etc. located at the western gateway of TKO.

Tiu Keng Leng

(g) Tiu Keng Leng Park and other open spaces – a total of about 9 hectares ("ha") of district open spaces for passive and active recreation uses are proposed in Areas 72, 74 and 128 to provide additional 'breathing space' for the existing high-density built-up environment. Two landscaped decks across a depressed Road P2 will provide direct pedestrian linkages from Tiu Keng Leng Park to the Waterfront Park.

(h) Civic Cluster – an extension of the proposed Civic Node in Town Centre South to Area 72 along the western side of Road P2, which will include a fire station cum ambulance depot, police station, clinic, magistracy and lorry park.

(i) Land formation for Tseung Kwan O – Lam Tin Tunnel ("TKO-LT Tunnel") – about 12 ha of land will be formed southwards along the western shoreline of Junk Bay to facilitate the construction of TKO-LT Tunnel and its interchange with Cross Bay Link ("CBL").

TKO Stage 1 Landfill

(j) The toe of the TKO Stage 1 Landfill is planned for active recreation (e.g. soccer pitches) whilst the remaining areas will provide a park environment for passive recreation (e.g. kite flying area, walking and cycling trails). Furthermore, water sports facilities (e.g. water sports centre and boating facilities) will be located along the western shoreline of the Landfill site.

Pak Shing Kok

(k) High quality low to medium density housing development (with plot ratios ranging from 1 to 2) is proposed on the existing three platforms of Pak Shing Kok to protect the ridgeline as viewed from Clear Water Bay.

7. In summary, we strive to maximize the utilization of the waterfront and its leisure/recreation potential; to reduce development density and building height; to increase open space provision and to improve linkages between the old and new districts. With the proposed reduction of development density in Town Centre South and Tiu Keng Leng, the estimated total population of TKO under the RODP will be reduced from the current planning of 480,000 to 450,000.

Urban Design and Landscape Framework

8. An urban design and landscape framework has been formulated under the Study. The key urban design concepts for the new development areas are illustrated on the Master Urban Design Plan at **Annex B** which include –

(a) Landmark/gateway buildings – in addition to creating the Civic Node as a western gateway to TKO, feature buildings at waterfront development sites and a landmark footbridge across the mouth of the eastern channel are proposed to create visual interest to the waterfront area and to promote a distinctive identity for TKO.

(b) Interesting building profile – a stepped height building profile with height descending from 100mPD to 50mPD towards the waterfront will be adopted in the Town Centre South area to optimize visual permeability to the waterfront. There will also be variation of building heights from east to west to create a more interesting building profile when viewed from the Junk Bay.

(c) Breezeways – a system of breezeways to facilitate improved air circulation is maintained within the area which allows the penetration of sea winds and off-slope breezes to the inland areas of the New Town.

(d) View corridors – principal views are maximized through the creation of green open space corridors (e.g. Central Avenue, etc.) and along the major breezeways as well as through maintaining low to medium rise developments on the waterfront.

(e) Traffic-free pedestrian environment in the waterfront area – with the deletion of waterfront roads, the waterfront area will largely be a traffic-free zone that provides a safe and attractive environment for pedestrians. By segregating pedestrian and vehicular traffic, lively streetscapes and activities will be promoted.

(f) Integration of existing and new development areas – the provision of comprehensive networks of open spaces, footpaths and cycle tracks will improve spatial connectivity and functional integration between the new and existing development areas, and enhance the cohesiveness of the New Town.

<u>Infrastructure</u>

9. To facilitate the further development of TKO, we plan to provide infrastructure (comprising roads, drains, sewers, water supply etc.) needed to serve the proposed development sites in Town Centre South, Tiu Keng Leng and Pak Shing Kok and recreational development in TKO Stage 1 Landfill by 2011. Moreover, to meet anticipated traffic generated from further population intake and

industrial development in TKO, we propose a new external road network comprising TKO-LT Tunnel, CBL and extension of Road P2 (from Town Centre). The general layout of the proposed infrastructure is shown on **Annex C.** In view of the adoption of tunnel alignment, the former Western Coast Road has been renamed as TKO-LT Tunnel.

10. The recommended alignment of TKO-LT Tunnel was developed based on the alignment of Trunk Road T2 proposed in the previous South East Kowloon Development Study. As Trunk Road T2 is now being reviewed under the Kai Tak Planning Review, the alignment of TKO-LT Tunnel is subject to change to tie in with the revised alignment of Trunk Road T2.

11. According to the traffic impact assessment of the Study, the new TKO external road network should be completed in around 2016/17. TKO-LT Tunnel is the eastern section of Route 6, a strategic link from TKO to West Kowloon, and its implementation programme should synchronize with the other two sections of Route 6 (i.e. Trunk Road T2 and Central Kowloon Route) in order to avoid adverse traffic impact to East Kowloon and to optimize the utilization of Route 6. We will review the implementation programme of the new TKO external road network taking account of the latest traffic conditions (which depends on the future development pace of TKO) as well as the programme of Trunk Road T2 and Central Kowloon Route.

12. CBL will be designed as a feature bridge across the Junk Bay to minimize the visual impact to the surrounding environment. With completion of CBL and TKO-LT Tunnel, external heavy traffic to and from the south-east industrial area of TKO will be able to by-pass the town centre, thus minimizing adverse traffic and environmental impacts on the residential areas. It will also provide relief to existing road links, particularly TKO Tunnel and Wan Po Road.

Presentation of Study Findings

13. We are informing the public of the findings of the Study through various channels, including presentations to the Sai Kung District Council and Town Planning Board; distribution of newsletters (**Annex D**) to TKO residents; and posting the Executive Summary of the Study on the web site of Civil Engineering and Development Department ("CEDD"). At its meeting on 6 June 2005, the Sai Kung District Council supported the Study proposals and urged for an early implementation.

The Next Step

14. CEDD will submit the Environmental Impact Assessment ("EIA") Report to the Director of Environmental Protection in accordance with the EIA Ordinance and exhibit the report for public inspection. To ensure implementation of the

proposed urban design concepts, appropriate land use zoning mechanism and development restrictions will be imposed on the relevant statutory town plan to put in place proper and effective planning control by the Town Planning Board.

Housing, Planning and Lands Bureau
Civil Engineering & Development Department
Planning Department
June 2005

About Us

Tseung Kwan O New Town

1977

1988

2004

Tseung Kwan O is the seventh new town in Hong Kong. The Executive Council approved the development of Tseung Kwan O into a new town in 1982.

Tseung Kwan O is located at the southern part of Sai Kung District in the South East New Territories (SENT). The new town is built mainly by reclaiming Tseung Kwan O Bay and formation of platforms on both sides of a long narrow inlet. Tseung Kwan O has been fast expanding since its first population intake in 1988 in the public housing estates in Po Lam and Tsui Lam, turning a small fishing village and ship building industrial area in the 1960s to a major new community of about 350 000 people today. The total development area of Tseung Kwan O is about 1738 hectares for a planned population of 450 000.

Currently, transport need of the new town is well served by road transport via Tseung Kwan O Tunnel, Po Lam Road and Clear Water Bay Road, and the MTR Tseung Kwan O Extension commissioned in August 2002. The grade-separated interchange at the junction of Tseung Kwan O Tunnel Road/ Po Shun Road/ Wan Po Road substantially completed in December 2005 provides significant improvement to traffic using Tseung Kwan O Tunnel. Further external road link under planning is the Tseung Kwan O ¡V Lam Tin Tunnel.

The Tseung Kwan O Industrial Estate, covering about 86 hectares of land and enjoying marine frontage, is located in the northern part of Tai Chik Sha in the southeastern part of the new town. Reclamation and servicing work were completed in 1997. About 104 hectares of land has been formed in Tai Chik Sha south of Fat Tong Chau and is currently planned for industrial use including potentially hazardous industries.

A feasibility study on the further development in Tseung Kwan O started in mid 2002 and was completed in 2005. The study proposals were presented to the public and received general support of the public. Planning for implementing the supporting infrastructure is under way.

Kai Tak Development

香港地質 HONG KONG GEOLOGY

落马洲 河套地区 发展规划及

跨湾連接路 大橋設計方案

Tseung Kwan O - Lam Tin Tunnel and Cross Bay Link

Special Issue

Last Review Date: 2 J Top 3


Photo Competition


Roving
Exhibition


Hong Kong
Slope Safety


North East
New Territories
New
Development
Areas
Planning &
Engineering Study


Wan Chai Development
Phase II -
Latest Development


5
天工作周
day week

LC Paper No. CB(2)1453/08-09(01)

For Information

Legislative Council Panel on Home Affairs
District Open Space in Area 37, Tseung Kwan O

Purpose

This paper informs Members of a proposed capital works project (the Project) to develop the District Open Space in Area 37, Tseung Kwan O that we plan to submit to the Public Works Subcommittee (PWSC) for consideration at its meeting on 20 May 2009. If Members of the Panel on Home Affairs would like to discuss the Project, we would make arrangement with the Secretariat for it to be discussed at a meeting of the Panel on Home Affairs before it is submitted to the PWSC.

Background

2. The Project is an ex-Municipal Council project identified as one of the 21 Leisure and Cultural Services projects committed for further planning and has the support of the Home Affairs Bureau.

Location of the Project Site

3. The Project covers a site of about 1.9 hectares in Area 37, Tseung Kwan O which is zoned "Open Space" under the Outline Zoning Plan No. S/TKO/16. The site has been temporarily landscaped pending permanent development. A conceptual layout of the project site together with the location plan is at **Enclosure**.

Project Scope

4. The proposed scope of the project comprises:

(a) a Chinese-style garden;
(b) an entrance corridor with sculptures, display banners/panels;
(c) a covered piazza;
(d) an elderly fitness corner;
(e) an artificial turf bowling green; and
(f) ancillary facilities, including toilets, changing rooms, management office, etc.

Justifications

5. Tseung Kwan O is a densely populated and fast developing new town with high-rise residential buildings. It has a current population of 353,300 which is expected to increase by about 18% to 417,000 by 2016. As a reference, the Hong Kong Planning Standards and Guidelines suggests a provision of 70.66 hectares of public open space for the current population. At present, there are about 60.09 hectares of public open space (including 19.39 and 40.70 hectares of public open space managed by the Leisure and Cultural Services Department and the Housing Department respectively) provided in Tseung Kwan O. Some 11.56 hectares of public open space are also under construction and active planning. In view of the continuous increase in population, there is a need to provide more public open space to cope with increasing demand for leisure facilities in Tseung Kwan O.

6. The proposed public open space is located in a densely populated residential area surrounded by high-rise public and private residential developments such as Nan Fung Plaza, La Cite Noble, Maritime Bay, Residence Oasis, East Point City, Wo Ming Court and Yuk Ming Court. In addition, there are some 50 secondary and primary schools in Tseung Kwan O. It is expected that the proposed provision of bowling green, passive soft landscaping and sitting out facilities will be highly welcomed and will become a popular leisure venue for the local residents.

Project stimate and mplementation Plan

7. The estimated cost of the Project is about $130 million in September 2008 prices.

8. Subject to funding approval by the Finance Committee, construction is expected to commence in January 2010 for completion in January 2012.

Public Consultation

9. We consulted the District Facilities Management Committee of the Sai Kung District Council on the scope of the Project on 18 January 2007, 1 February 2007 and 12 February 2008 and the conceptual layout of the Project on 20 January 2009 and 24 March 2009. Members supported the Project and urged for its early implementation.

10. We consulted the Incorporated Owners and Owners' Committees in the vicinity, including Nan Fung Plaza, La Cite Noble, Maritime Bay, Residence Oasis, East Point City and On Ning Garden on 31 January 2007 and 27 February 2009 respectively on the proposed development of the Project. They welcomed the Project and looked forward to its early implementation.

Way Forward

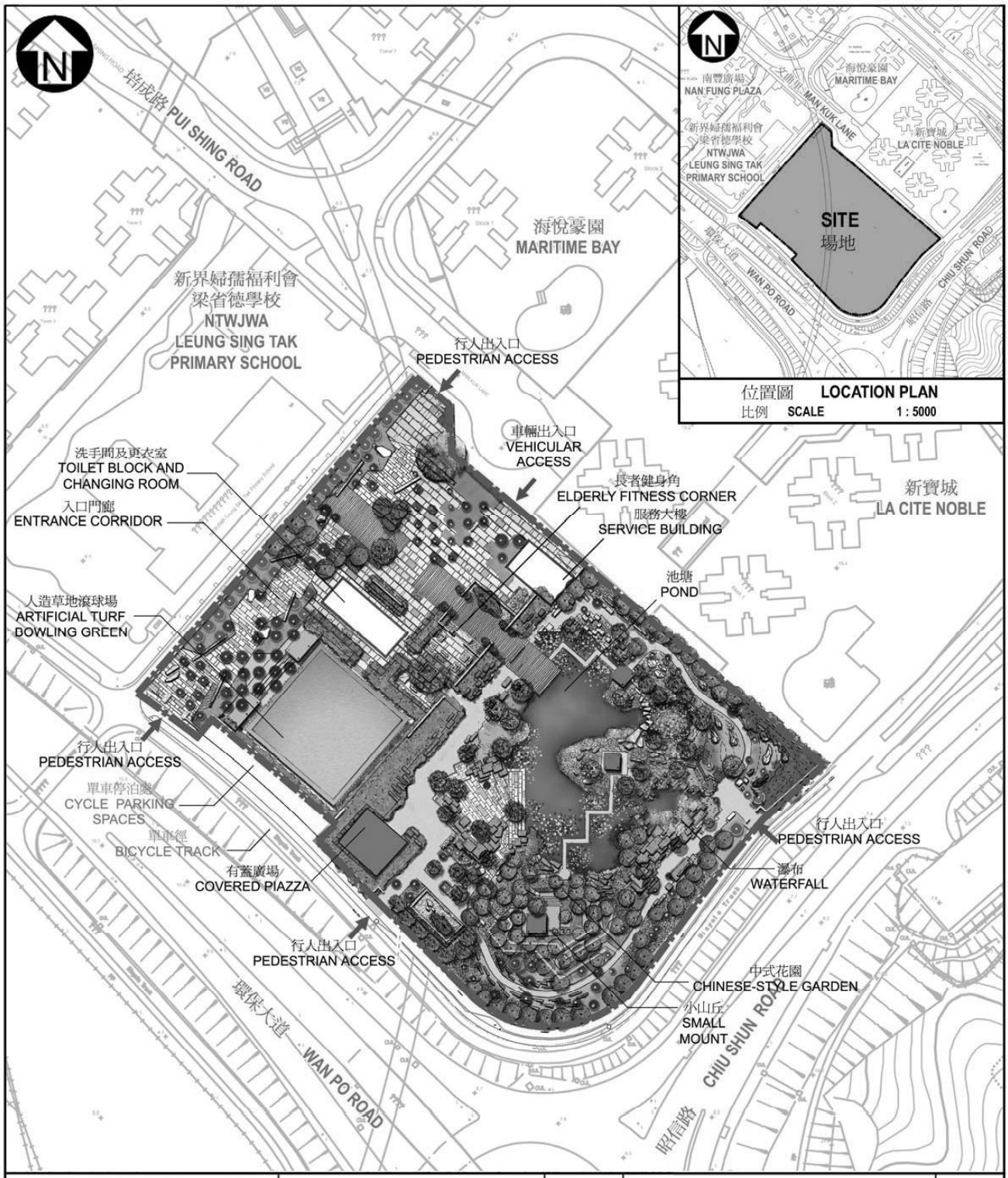
11. We intend to submit the Project to PWSC of the Finance Committee for consideration of upgrading to Category A at its meeting on 20 May 2009.

Advice Sought

12. Members are invited to support the implementation of the Project.

Home Affairs Bureau
May 2009

附件 **ENCLOSURE**



將軍澳第37區 地區休憩用地 421RO DISTRICT OPEN SPACE IN AREA 37, TSEUNG KWAN O	drawn by 繪圖 Esther Li	date 日期 3/2009	drawing no. 圖號 AB / 421RO / XA001	scale 比例 1 : 1500
	approved 覆核 Alfred Lai	date 日期 3/2009	ARCHITECTURAL SERVICES DEPARTMENT 建築署	
	office PROJECT MANAGEMENT BRANCH 辦事處 工程策劃管理處			

CB(1) 1979/06-07(01)

將軍澳居民日忍薰天惡臭
堆填區入侵郊野公園 焚化爐伺機進攻

議員駕泥頭車示威反對將軍澳堆填區擴建

背景

環保署現擬在將軍澳 137 區一幅大約 15 公頃的土地，並連同清水灣郊野公園邊緣的 3 至 5 公頃土地，用作新界東南堆填區(將軍澳堆填區)的擴展計劃。環保署於 2007 年 5 月 22 日到郊野公園及海岸公園委員會諮詢委員對上述擴建計劃的意見，並獲委員通過佔用清水灣郊野公園土地，據悉環保署於會上透露佔用郊野公園土地，擴闊擴展區，同時可為未來興建垃圾焚化爐提供更多配套空間。

現況

自 2005 年始每到夏季將軍澳南及調景嶺區內居民均受到將軍澳堆填區的惡臭滋擾，雖然新界東南堆填區選址將軍澳，但將軍澳居民絕無必要年年受臭味滋擾，將軍澳居民的生活及健康已受臭味問題嚴重影響。環保署竟然在新界東南堆填區臭味問題正困擾區內居民時，仍罔顧居民利益計劃擴建新界東南堆填區，讓居民對環保署罔顧居民感受一意孤行的態度，深感不滿。

反對擴建堆填區原因：

一. 將軍澳第一期堆填區於 80 年代發展，其時將軍澳仍未發展為新市鎮，故垃圾堆填並未對居民構成嚴重影響。惟至今將軍澳區是一個高密度住宅區，人口達 34 萬。另外，鄰近堆填區(86 區)7 萬人口的住宅發展項目(夢幻之城)最快將於 08 年入伙，而且將軍澳的地勢呈窩狀，三面環山，臭面難以消散，堆填區對市民構成環境衛生問題將會更形嚴重；

二. 現時每日經將軍澳進出堆填區的垃圾車已多達 3600 架次，龐大的流量亦為將軍澳隧道帶來壓力，而且區內的交通意外亦有不少涉及進出堆填區的垃圾車。政府早於 1990 年便提出要於 2001 年落成連接堆填區的跨灣連接路，惟此路建築期一直押後，至今估計需待 2016 年才能完工。將軍澳區並無完善的交通配套同時應付高速人口增長及大型堆填區的需要；

三. 堆填區已為將軍澳帶來不少環境問題：90 年代中堆填區滋生大量蒼蠅滋擾民居，到近年困擾居民多時的臭味問題持續兩年，仍未見解決。堆填區若再擴建，很大可能再出現其他環境問題；

四. 相較於另外兩個正運作的新界西(屯門稔灣)及新界東北(打鼓嶺)堆填區，新界東北堆填區每日接收廢物量為 2794 公噸、新界西堆填區為 6356 公噸，而將軍澳堆填區每日接收廢物量則為 8202 公噸。另外，新界東北堆填區每日由早上 7 時運作至晚上 7 時、新界西堆填區每日由早上 8 時運作至晚上 8 時，但將軍澳堆填區則由早上 8 時運作至晚上 11

時及年中無休，致令大部份垃圾均集中於將軍澳堆填區處理。擴建將軍澳堆填區，令使用失衡問題更為嚴重。

建議

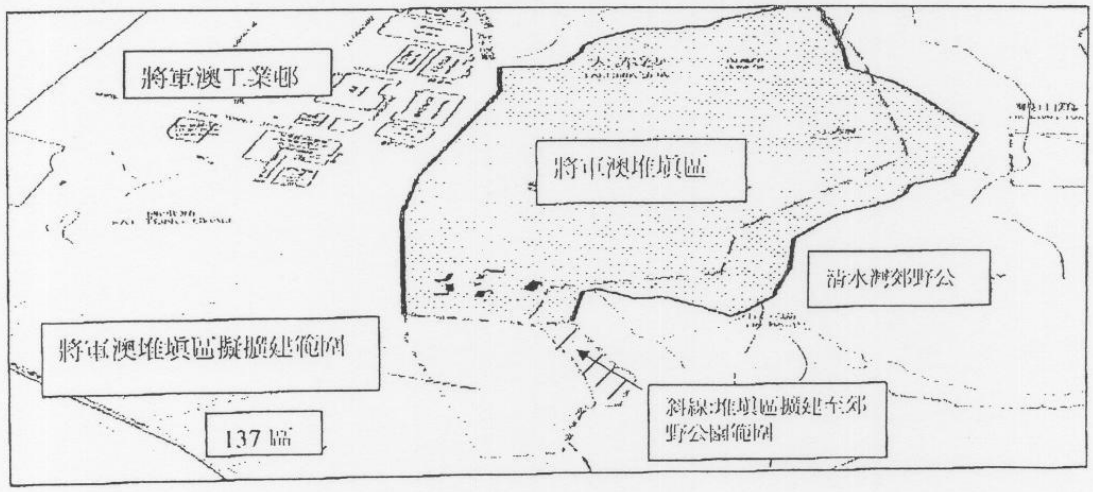
特區政府於 2005 年公布都市固體廢物管理政策大綱，提倡以減廢和分類回收作為處理固體廢物的先行方法。惟現時環保署卻提出擴建堆填區，實與上述政策背道而馳，而且亦對堆填區附近的居民造成影響。吾等認為政府應加強廢物分類回收的政策，甚至強制執行，配合政府計劃在零七年提交都市固體廢物收費的草案，實行雙管齊下。吾等認為處理固體廢物應以減廢及回收為主；而只是作最少限的焚化、最少限的堆填。以台北市為例，該市在 2000 年 7 月隨量徵收垃圾費後， 2005 年的回收率高達 34.5%；人均垃圾量也由 1999 年的大約 1 公斤下跌至 2005 年的約 0.5 公斤。由於政策成功，當地甚至有焚化爐無垃圾可燒的問題出現。(資料來源:長春社)

總結

環保署一直未能解決上述新界東南堆填區臭味問題，仍罔顧居民利益計劃擴建新界東南堆填區，甚至考慮於鄰近住宅區的地點興建焚化爐，完全漠視居民健康。環保署於未管理好堆填區運作時，仍計劃擴建將軍澳堆填區之舉根本不會得到市民的支持。吾等堅持反對環保署提出的上述新界東南堆填區擴建計劃，並要求儘快解決堆填區臭味問題!

西貢區議員　彭淑儀女士

新界東南堆填區擴建計劃示意圖



Proposed Extension of the South East New Territories Landfill

In its letter to the Secretary for the Environment, Transport and Works on 1 June 2007, the Secretariat of Legislative Council Panel on Environmental Affairs (the Panel) has attached the submission and proposal from Hon Emily LAU on the proposed extension of the South East New Territories (SENT) Landfill (the Extension), which was then referred to our Department. Below is our reply to relevant sections of the said submission:

Background

In our submission to the Country and Marine Parks Board (CMPB), the proposed option was "to temporarily occupy" a narrow strip of land of about 5 hectares on the boundary of the Clear Water Bay Country Park (CWBCP) adjacent to SENT Landfill for extension purpose, which was later agreed in principle by the CMPB on 22 May 2007. After the completion of the Extension, the occupied area will be fully restored and returned to CMPB and the Agriculture, Fisheries and Conservation Department to become part of the country park again.

Present Situation

SENT Landfill is one of the three strategic landfills in Hong Kong. It came into operation in 1994 for treating the solid waste generated by residents every day. The standards of environmental management in SENT Landfill, including odour emission, are comparable to those of the most advanced countries in the world, and have been incorporated into the operation contract of the SENT Landfill. Apart from the quality management of the contractor, EPD staff would also closely monitor the performance of the contractor to ensure compliance with the stringent standards of environmental management specified in the contract, and that the operation of the landfill meets the statutory requirements under pollution control ordinances. With the vast growth of population in Tseung Kwan O in recent years, the complaints on odour have increased correspondingly. However, since the malodour intermittently detected by residents was easily dispersed and lasted for only a short time, the investigation was very difficult.

In response to residents' concern on odour, a number of additional measures have been taken in the SENT Landfill in the past two years to further enhance management and control of the process of waste treatment to reduce the chance of

emission during landfilling. EPD would continue to review every operational procedure carried out by the contractor of SENT Landfill for possible improvement and to reduce objectionable odour emission. Regular inspections would also be conducted to check other potential emission sources in Tseung Kwan O.

Reasons for opposing landfill extension

(1) Sources of odour affecting residents of Tseung Kwan O south may include the SENT Landfill, local mobile sources (including refuse collection vehicles) and other unknown sources causing an odour nuisance for a short time. To further enhance the odour management performance of the SENT Landfill, additional enhanced measures have been put in place including limiting the delivery time of odorous waste to the landfill, installation of deodorizing equipment, reducing the size of the active tipping area, prompt covering up of waste deposited, provision of thicker cover to the waste, etc.

The design and operation of the SENT Landfill comply with the most stringent international environment standards. To ensure its compliance with our environmental legislations and contractual requirements and to reduce its impact on the environment and residents nearby, the contractor of the landfill has adopted advanced waste treatment technologies and sound management system for its operation. Moreover, pest control measures have been made in accordance with the guidelines issued by the Food and Environmental Hygiene Department under which regular inspection and pest control is conducted within the landfill. Weekly inspection is also conducted by an independent consultant engineer stationed in the landfill. In fact, fly infestation has never been found in the SENT Landfill since the commissioning of its operation in 1994. To enable local residents to have a better understanding of the operation of the landfill and its odour control measures, a number of site visits were arranged in the past two years for the members of the Sai Kung District Council and representatives of residents in Tseung Kwan O. During the visits, staff of EPD explained in detail the operation, environmental management, the landfill development plan, etc to the SKDC Members, district and estate representatives as well as the media

The feasibility study and environmental impact assessment (EIA) for the proposed SENT Landfill Extension are now being conducted. The EIA covers the potential environmental impacts of the proposal including its odour nuisance, appropriate mitigation measures and their effectiveness. Throughout the EIA, close liaison with key stakeholders has been maintained in the Continuous Public Involvement process. Upon the completion of the EIA, a report will be made available for public inspection, and

public consultation will be conducted in parallel. We would like to reiterate that no adverse impact on environmental hygiene and public health will arise from the operation of a well-designed landfill with sound management.

(2) To manage our ever increasing waste arising, it is necessary to formulate a well-planned and sustainable strategy. Disposing of wastes which are non-recyclable or need further treatment at landfills is one of the key elements in our overall waste management strategy. Waste reduction measures implemented by EPD over the past few years have started to take effect. In the past three years, the number of refuse collection vehicles using the SENT Landfill has decreased, from 1 700 vehicle loads per day in 2004 to 1 400 vehicle loads per day at present. (Please note that the figure is not 3 600 vehicle loads per day as stated in the Hon Emily LAU's submission.) It is expected that the number of refuse collection vehicles using the SENT landfill after its extension will not increase.

(3) Please refer to the reply in paragraph (1).

(4) The existing landfills in West New Territories (WENT) Landfill, North East New Territories (NENT) Landfill and South East New Territories (SENT) Landfill serve to cater for the disposal need of individual regions as well as the overall demand for landfill capacity in the territory. The SENT Landfill, which lies in close proximity to the urban area, has the highest utilization rate among the three landfills; in particular intake of the commercial and industrial waste as well as the construction waste collected by private refuse collectors. Domestic waste generated and collected in the urban areas and the New Territories are mostly delivered to the NENT Landfill or WENT Landfill for treatment and disposal via refuse transfer stations of the respective areas. Wastes will have to be diverted to these two landfills if the SENT Landfill is closed. Refuse collection vehicles collecting commercial and industrial waste and construction waste within the catchment of the SENT Landfill will have to run an extra journey stretching hundred thousand miles every single day for delivering waste to the other two remote landfills via the urban areas. Consequently, more sensitive receivers along the route will be subject to such environmental impact due to increase in traffic volume, vehicle emission and noise level.

Recommendations and Conclusion

The Government published a policy document "A Policy Framework for the Management of Municipal Solid Waste (2005-2014)" (Policy Framework) in December

2005 which clearly sets out the strategy to tackle our municipal solid waste (MSW) problem during this ten year period in a comprehensive and holistic manner. It continues to adopt the three-tiered waste management hierarchy with specific targets for each of the three approaches as follows:-

> Target 1 – Waste Avoidance and Minimisation: to reduce the amount of MSW generated in Hong Kong by 1% per annum up to the year 2014, based on the 2003 levels;
>
> Target 2 – Reuse, Recovery and Recycling: to increase the recovery rate of MSW to 45% by 2009 and 50% by 2014; and
>
> Target 3 – Bulk Reduction and Disposal of Unavoidable Waste: to reduce the total MSW disposed of in landfills to less than 25% by 2014.

The Policy Framework sets out the proposed way forward on MSW Management for the next decade. The emphasis is on community participation and the "polluter pays" principle together with the provision of adequate waste treatment and disposal facilities for a sustainable waste management strategy. The following major initiatives are proposed:

(a) expedite the roll-out of the territory-wide source separation of domestic waste programme to increase domestic waste recovery;
(b) introduce mandatory Producer Responsibility Schemes (PRSs) through new legislation;
(c) examine ways of introducing MSW charging;
(d) continue to encourage waste recycling through provision of short term tenancies of suitable sites for local waste recycling businesses;
(e) develop the EcoPark exclusively for the environmental industry;
(f) all Government departments to adopt a green procurement policy as far as practicable;
(g) continue to encourage the development of recycling technology projects through the Environmental and Conservation Fund (ECF), the Innovation and Technology Fund and funds for small and medium enterprises;
(h) introduce landfill disposal bans to complement the PRSs;
(i) develop Integrated Waste Management Facilities (IWMF) using thermal treatment as a core technology to effectively reduce the volume of waste requiring landfill disposal; and

(j) extend the 3 existing strategic landfills to serve as final repositories for our non-recyclable or residual waste after treatment.

We have already reported the progress of implementing the Policy Framework to the Advisory Council on the Environment and the LegCo Panel on Environmental Affairs in February 2007. The progress of implementing some major initiatives is as follows. When we compare the waste statistics for 2006 with those of the previous year, the amount of MSW disposed of at our landfills dropped by 1% against an economic growth of 6.8% in 2006. Equally encouraging is the increase in the recovery rate of domestic waste from 16% in 2005 to 20% in 2006. At the same time, the overall recovery of MSW has also increased from 43% in 2005 (2.59 million tonnes) to 45% in 2006 (2.84 million tonnes), three years ahead of the target listed above.

There are however areas of concern. Even though the amount of MSW landfilled was reduced by 1% in 2006, there is still a long way to go in achieving the Policy Framework's target of reducing the total amount of MSW landfilled to less than 25%. In addition, despite our efforts in waste reduction and recovery, the amount of MSW generated remains on an increasing trend. The increase in the amount of waste generated is likely to be the result of robust growth in commercial, industrial and tourism-related activities in 2006 which has led to an increase of about 4% in commercial and industrial waste. Therefore, despite the good results achieved for source separation and waste recycling, it is still important to press ahead in full speed the other policy initiatives in the Policy Framework such as PRSs, MSW charging, IWMF and landfill extensions.

We hope that the above information has fully addressed the concerns raised by Hon Emily Lau.

Environmental Protection Department
14 June 2007

信報 24/6/10

堆填區建圍牆冀擋臭氣

本港目前對廢物的處理，幾乎完全依賴堆填區，雖然政府近年致力推動源頭減廢以增加都市固體廢物的回收，然而，現時每日仍有高達九千公噸的垃圾要扔進堆填區去。

堆填區本就是巨型垃圾崗，鄰近民居的將軍澳堆填區更是「臭名遠播」，近年屢次被投訴發出難聞氣味，根據環保署數字，過去五年，署方分別接獲二千三百零二宗投訴，當中大部分投訴都是在炎熱多雨的月份收到。雖然環保署已實施多項措施，希望解決氣味滋擾問題，包括在廢物上加厚覆蓋泥土及在堆填區邊界設置固定除臭機等，但似乎成效不大。署方最新計劃，是在堆填區面向將軍澳工業邨之邊界，建造一道八百米圍牆，以減低對附近環境和視覺影響。

老紀曾多次隨朋友到訪將軍澳工業邨，在夏季時就算遠在一公里外，仍感到那股臭味中人欲嘔，故實在難以想像，區區一道八百米圍牆，可以隔走多少臭味？君不知氣味無眼，從來都會循任何空隙向外跑？故除非把堆填區密封起來，否則絕不能「困」住臭味。

其實，環保署接獲的投訴中，逾半來自過去兩年，原因之一，估計是位於將軍澳工業邨口（與堆填區距離約一公里）的新樓盤日出康城正式入伙有關。環保署過去就曾證實，有兩個沼氣排放設施，距離日出康城不足二百五十米，污水處理廠亦跟屋苑只有一街之隔，故才令屋苑被臭味圍攻。

翻查資料，整個日出康城的發展計劃共有十四期，至2019年時，將有逾二萬一千個住宅單位落成，老紀幾乎可以想像，將來居民每天與臭為鄰，屋苑隨時會出現人人戴上口罩的奇景。其實，香港地少人多，地皮都要物盡其用，例如葵涌、荃灣等，無不是住宅與工業邨為鄰，但將軍澳屬新市鎮，理應有更完善之城市規劃，就算要在恍如荒漠的工業邨口起樓，最少都不應在臭氣沖天尚未消散時。

將軍澳堆填區鄰近日出康城，當地居民可聞日日都可以遠聞播唱周杰倫的《七里香》。（資料圖片）

Press Releases

LCQ18: Malodour complaints from the Tseung Kwan O town south area
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Following is a question by the Hon Lau Kong-wah and a written reply by the Secretary for the Environment, Transport and Works, Dr Sarah Liao, at the Legislative Council meeting today (April 25) :

Question:

Many residents in Tseung Kwan O South have relayed to me that they often smell a foul odour from an unknown source in spring and summer. In this connection, will the Government inform this Council:

(a) of the number of such complaints received by the relevant government departments in the past 12 months, and the follow-up actions taken;

(b) whether it has investigated the source of the foul odour and its impact on human health; and

(c) whether it will consider installing a stationary gas monitoring device in the district to assist in tracing the source of the foul odour?

Reply:

Madam President,

(a) In the past 12 months, the Environmental Protection Department (EPD) received 161 malodour complaints from the Tseung Kwan O town south area. EPD had investigated each of these complaints thoroughly, in order to try to find out the odour source(s). In response to the complaints, EPD staff had conducted more than 600 inspections in 2006 during different time periods, at all the affected estates and all potential odour sources in the area. Moreover, pursuant to the request from residents of Tseung Kwan O town south, EPD has set up a designated malodour complaint hotline, and extended the service hours from 6 pm to 11 pm (including Sundays and public holidays). In addition, in order to conduct immediate investigation, starting from end-June 2006, EPD deployed extra resources to arrange investigation staff to handle malodour complaints immediately until 11 pm in evenings and Sundays. After receiving complaint call, EPD staff would contact the complainant immediately for investigation. EPD had informed all complainants about the investigation results, and reported the main results at different occasions to the Sai Kung District Council, etc. EPD will continue to monitor the situation closely.

(b) EPD inspection teams scented slight malodour intermittently during some inspections in the Tseung Kwan O town south area. Based on all the investigation results, it was found that the South East New Territories (SENT) Landfill might be one of the odour sources. On the other hand, it was also found that some of the cases might be caused by other sources, such as refuse trucks and foul sewers inside estates. In order to enhance the performance on odour management at the SENT Landfill and to prevent odour from the landfill affecting nearby residents, additional improvement measures have been implemented in the landfill, including provision of additional deodorising units on site, reduction of the size of the active tipping face, prompt covering up of the waste deposited, provision of thicker cover to

the waste, and covering up of the active tipping face by soil at the end of each working day. Moreover, special attention will be paid to the soil cover during the rainy season. EPD is also reviewing every details of the landfill operation, in order to further enhance the management of odour at the landfill. As malodour in the Tseung Kwan O town south area was intermittent and of light intensity, there is no evidence or indication that the odour will cause any ill health effect.

(c) Investigation of community odour complaints is mainly based on the smell and professional judgement of the investigators. This is similar to the method being used in other parts of the world. In fact, the human nose is more sensitive than most electronic equipment, and can also distinguish the intensity and type of odour, as well as whether the odour is irritant or offensive. Moreover, the odour scented by complainants could be that of rubbish, sewage, faeces or smell of rotten egg, etc. This reflects that the composition of the odour under complaint may be quite complex. It is therefore very difficult to use a single instrument for investigation. We believed that the above arrangement to conduct immediate malodour complaint investigations in Tseung Kwan O town south by EPD staff in the evenings may effectively handle the complaints.

Ends/Wednesday, April 25, 2007
Issued at HKT 11:36

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Press Releases

LCQ20: South East New Territories Landfill
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Following is a question by the Hon Miriam Lau Kin Yee and a written reply by the Acting Secretary for the Environment, Dr Kitty Poon, at the Legislative Council meeting today (June 23):

Question:

Quite a number of Tseung Kwan O residents have indicated to me that the environmental problems created by the South East New Territories ("SENT") Landfill since its commissioning have caused nuisances to them for a long time. Recently, the Planning Department submitted a paper to the Sai Kung District Council proposing to further extend the SENT Landfill area, including designating about five hectares of land in Clear Water Bay Country Park and about 15.6 hectares of land in Tseung Kwan O Area 137 for landfill extension purpose. In this connection, will the Government inform this Council :

(a) of the number of complaints received about the SENT Landfill since its commissioning, together with a breakdown of the complaints by category; how the authorities follow up such complaints;

(b) given that it has been recently reported that it is expected that the proposed extension of the SENT Landfill will aggravate the adverse impact on residents in the district, including the environment (in terms of odour and visual impact), traffic and the health of the residents nearby, and will also affect Chai Wan district, which is situated on the other side of the bank opposite to Tseung Kwan O, and the authorities had indicated in its paper to the Panel on Environmental Affairs of this Council in October 2008 that they would adopt a number of mitigation measures for the proposed extension of the SENT Landfill in accordance with the principle of avoidance, minimisation and compensation as set out in the Technical Memorandum of the Environmental Impact Assessment Ordinance (Cap. 499), whether they have assessed if such mitigation measures can resolve the aforesaid adverse impact on residents in the district; whether the authorities have other mitigation measures; if they have, of the details;

(c) of the daily average numbers of trips run by refuse collection vehicles and vehicles carrying construction waste which travel to and from the SENT Landfill through Tseung Kwan O at present, and the expected changes in the respective vehicular flows of the aforesaid two types of vehicles after the extension of the landfill; what measures the authorities have to mitigate the traffic impact and odour nuisance caused by such vehicles in the Tseung Kwan O district;

(d) whether the authorities will plan to require the use of compressed and enclosed type of refuse collection vehicles to travel to and from the SENT Landfill, so as to prevent wastes from spattering and emitting odour during transportation; if so, of the details; if not, the reasons for that;

(e) given that the proposed extension of the SENT Landfill will cover 15.6 hectares of industrial land in Tseung Kwan O Area 137, of the original planned use for the site; whether the proposed extension of the landfill will affect the development potential of other industrial land lots in Area 137, and as a result, reduce the employment opportunities within the area for residents

in the district;

(f) given that it has been reported that the authorities plan to supply the methane generated by the wastes in the SENT Landfill after its extension to the Hong Kong and China Gas Company Limited ("Towngas") for conversion into gas, whether the authorities will request Towngas to reduce the tariff for Tseung Kwan O residents, so as to compensate for their being plagued by the environmental problems caused by the landfill for a long time; and

(g) given that the life of the SENT Landfill will be extended to 2019 after the proposed extension, whether the authorities have planned to further expand the area of the landfill, with a view to extending the life of the landfill again?

Reply:

President,

(a) The development of the South East New Territories (SENT) Landfill started in the 1990s and was commissioned in 1994, and its operation has been assessed as meeting international standards.

Since 2005, the Environmental Protection Department (EPD) has received complaints about odour problem in the Tseung Kwan O town and the related figures are as follows:

Year	Figures
2005	106
2006	165
2007	459
2008	943
2009	629

Most of the complaints were received in hot and rainy months.

Apart from the SENT Landfill, there are potential sources of odour nuisance in Tseung Kwan O. In this connection, the District Officer of Sai Kung has established an inter-departmental working group comprising representatives from the Sai Kung District Office, EPD, Drainage Services Department, Food and Environmental Hygiene Department (FEHD), District Lands Office and Highways Department. It aims to investigate and follow up on potential sources of odour under the purview of various departments with a view to abating the local odour nuisance. The working group has held a number of meetings, conducted joint inspections in Tseung Kwan O, and stepped up cleaning of the sites where odour may be emitted. We will continue our work on this front.

The EPD looks into each complaint about odour nuisance independently to identify the odour source. The EPD also informs the complainant of the investigation results of each case.

The EPD understands that Tseung Kwan O residents are concerned about the odour nuisance. The Department has stepped up odour management and control measures to further abate the potential odour impact of the Landfill. Such measures implemented so far include for example covering the tipping face with a thicker layer of soil at the end of the daily waste reception process; covering the non-active tipping face with temporary impermeable liner; setting up fixed deodorisers at the Landfill boundary; providing additional mobile deodorisers at the tipping area; putting a mobile cover on the special waste trench; and installing additional landfill gas extraction pipes and mobile landfill gas flares. The EPD will continue to implement

the above measures. In addition, the Department is planning to construct an 800-metre wall along the boundary of the Landfill facing the industrial estate to abate environmental and visual impacts on the surrounding area. The EPD will also upgrade the existing facility for wheel washing to full-body vehicle washing facility to ensure that the entire body of every refuse collection vehicle is washed before leaving the Landfill.

(b) The Government has been working hard to promote waste reduction at source in recent years. Last year, the recovery rate of municipal solid waste has reached 49%. However, as we currently rely almost entirely on landfilling as our only means of waste disposal and the total municipal solid waste disposed of at landfill is about 9,000 tonnes per day, this has exerted pressure on our valuable landfill space. The proposed extension of the SENT Landfill (the proposed Extension) aims to continue an effective management of the municipal solid waste generated in Hong Kong every day when the existing SENT Landfill reaches its capacity. The EPD completed the environmental impact assessment (EIA) and traffic impact assessment on the proposed Extension in 2008. The EIA has studied in detail the potential environmental impacts of the proposed Extension, covering air quality (including odour), ecology, noise, waste management, water quality, landfill gas as well as landscape and visual impacts, and recommended effective mitigation measures. Apart from Tseung Kwan O, the study on air quality, noise and visual impacts also covered Siu Sai Wan area in northeast of Hong Kong Island. According to the EIA Report, with the implementation of the recommended mitigation measures, the anticipated environmental impacts are acceptable and will meet the relevant requirements under the Environmental Impact Assessment Ordinance (EIAO) and its Technical Memorandum. The EIA was approved by the Authority in May 2008. The traffic impact assessment points out that the Landfill Extension will not have any adverse impact on the traffic. The EPD will ensure that the recommended mitigation measures will be strictly implemented, the works under the proposed Extension will comply with the conditions set out in the environmental permit issued under the EIAO, and the operation of the Landfill will not create any adverse impact on the residents nearby.

(c)According to the statistics for 2009, on average the SENT Landfill received about 1,050 vehicle loads daily, including about 510 vehicle loads of municipal solid waste.

According to the traffic impact assessment on the proposed Extension, the number of vehicles travelling to and from the Landfill Extension will be similar to that of vehicles travelling to and from the SENT Landfill at present. Therefore, the vehicular flow will be approximately the same upon the exhaustion of the SENT Landfill and the commissioning of the Landfill Extension. As such, the Landfill Extension will not create any adverse impact on the traffic. However, to abate effectively the odour from refuse collection vehicles, the EPD will implement a number of odour mitigation measures under the proposed Extension. They include enclosing entirely the weighbridge area, providing a vehicle washing facility at the exit from the Landfill Extension, and reminding drivers of refuse collection vehicles to take heed of hygiene and keep their vehicles clean.

(d) Currently there are three strategically located landfills in the territory. Coupled with seven refuse transfer stations, they form a solid waste disposal network which handles the waste generated daily by the community. Bulk waste transfer is adopted to avoid large number of small refuse collection vehicles travelling in the urban areas. The SENT Landfill mainly receives commercial, industrial as well as construction wastes from Hong Kong Island, Kowloon and Sai Kung District and domestic waste from Tseung Kwan O and Sai Kung collected by private waste

collectors. It is the private waste collectors' own commercial decisions to choose the types of their refuse collection vehicles. To reduce the environmental impacts of refuse collection vehicles, the EPD regularly draws the attention of the trade to road safety as well as the cleanliness and hygiene of their refuse collection vehicles at landfill liaison meetings. At the meetings of the inter-departmental working group, the EPD also refers the complaints about refuse collection vehicles received to the relevant departments for follow-up. Moreover, the EPD distributes leaflets to drivers of refuse collection vehicles on a monthly basis through the landfill contractors to remind the drivers of the operation practice of refuse collection vehicles, so that they can keep their vehicles clean and tidy. Under the Public Health and Municipal Services Ordinance, the FEHD may, with sufficient evidence, institute prosecutions against people concerned in case of refuse collection vehicles dirtying public roads.

(e) The 15.6 hectares of land in Tseung Kwan O Area 137 rezoned for the extension of the SENT Landfill as shown on the draft Tseung Kwan O Outline Zoning Plan No. S/TKO/18 was previously zoned "Other Specified Uses" annotated "Deep Waterfront Industry" ("OU(DWI)") on the earlier version of the Tseung Kwan O Outline Zoning Plan No. S/TKO/17. According to the Notes of the Outline Zoning Plan, the "OU(DWI)" zone is intended primarily for special industries which require marine access, access to deep water berths or water frontage. The subject area for the extension of the SENT Landfill is located inland which does not have access to the sea. Although part of the area in Area 137 is proposed for the extension of the SENT Landfill, the remaining area is still zoned as "OU(DWI)", which has an area of about 86.9 hectares of land with marine frontage unaffected to meet the long term need of deep waterfront industries.

(f) To utilise the landfill gas generated from the SENT Landfill more effectively, the EPD has been exploring a large-scale landfill gas recovery and utilisation project with the contractor of the SENT Landfill and the town gas producer. The EPD is studying its feasibility and contractual arrangements.

(g) We estimate that the SENT Landfill will reach its capacity in mid-2010s. We hope to complete the planning in time so that the SENT Landfill Extension can be commissioned immediately after the exhaustion of the SENT Landfill. Our current projection is that the Landfill Extension will reach its capacity in about six years, and then we can proceed with restoration and aftercare of the Landfill Extension. Apart from the proposed Extension, the Government has no plan to further expand the area of the SENT Landfill.

Ends/Wednesday, June 23, 2010
Issued at HKT 12:03

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