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By Email and Fax

Public Accounts Committee  
Legislative Council Secretariat  
Legislative Council Complex  
1 Legislative Council Road  
Central, Hong Kong  
(Attn: Mr. Anthony CHU)

11 June 2018

Dear Sir,

**Public Accounts Committee**  
**Consideration of Chapter 1 of the Director of Audit's Report No.70**  
**Management of Restored Landfills**

Thank you for your letter dated 30 May 2018. Please find in the enclosed appendix the information requested. If you need any further information, please contact the undersigned.

Yours faithfully,

(FONG Kin-wa)

for Director of Environmental Protection

Encl.

c.c. Secretary for Environment (fax no. 2537 7278)  
Secretary for Home Affairs (fax no. 2591 5536)  
Director of Leisure and Cultural Services (fax no. 2691 4661)  
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Director of Audit (fax no. 2583 9063)

w/o encl.

## Appendix - EPD's response to PAC's request for information

Q(a)	<p>according to Note 39 of paragraph 3.2 (all paragraph numbers mentioned hereinafter refer to the paragraph number of the Audit Report), details regarding the "sub-allocation" arrangement between EPD and LCSD, including the role, division of work and responsibilities between the two departments in each of the design, construction and operation periods of the recreational facilities at restored landfills. Given the special nature of restored landfills which warrants special attention in developing the sites, whether EPD would provide technical advice to LCSD and other departments which acted as the works agent. If yes, details and records of the advice given regarding the seven sites in Table 4 of paragraph 3.2</p>
	<p>Regarding the land in restored landfills, the Lands Department (LandsD) allocated them to the Environmental Protection Department (EPD) via temporary government land allocations (TGLAs) to facilitate the EPD to carry out restoration works and aftercare works. According to relevant conditions in the TGLAs, the EPD may, subject to LandsD's approval, sub-allocate portions of the sites to other government departments, including the Leisure and Cultural Services Department (LCSD) for the purpose of development of recreational facilities. Throughout the design, construction and operation periods of the recreational facilities, the EPD would continue to carry out, at the restored landfills (including the portions of the sites which have been sub-allocated to the LCSD), aftercare works such as management and maintenance of all restoration facilities installed at restored landfills and environmental monitoring, until the completion of aftercare works. Furthermore, since restored landfills are no ordinary pieces of land, developing afteruse at restored landfills has to overcome various constraints and technical difficulties. The EPD has provided LCSD and other works agent departments with relevant information of restored landfills and professional advice such as loading limits, settlement changes, potential challenges on project coordination and interface and also vetting the landfill gas hazard assessments submitted by client departments, etc. Throughout the entire project development process, the EPD would continue to provide technical advice and support to the LCSD and other works agent departments.</p> <p>The EPD had in the past provided relevant departments with information of restored landfills and technical advice on planning, design and construction of the recreational facilities listed in Table 4. As a large number of documents are involved, representative ones are extracted and enclosed in <b>Annex</b> for reference.</p>
Q(b)	with reference to Table 4, please explain and provide information on:
(i)	differences in role, division of work and responsibilities between EPD, LCSD and other departments which acted as the works agents in developing the seven recreational projects;
(ii)	factors and criteria when assigning which department as works agents for individual projects;
	The development of the seven recreational projects mentioned in Table 4 were led by the relevant policy bureaux and with their respective departments acting as client departments responsible for the planning and development of the recreational projects, including

**\*Note by Clerk, PAC: Annex not attached.**

consultation with District Councils and other stakeholders, funding application and facilities operation. The works agent departments were responsible for the design and construction of the recreational facilities projects. The client departments and works agent departments for the seven recreational facilities are as follows:

Recreational Facilities Project		Client Department	Works Agent Department
1	Kwai Chung Park	LCSD	ArchSD
2	Wan Po Road Pet Garden	LCSD	HAD
3	Jordan Valley Park	LCSD	ArchSD
4	Sai Tso Wan Recreation Ground	HAB	EPD
5	Ma Yau Tong West Sitting-out Area	LCSD	HAD
6	Ma Yau Tong Central Sitting-out Area	LCSD	HAD
7	Ngau Chi Wan Park	LCSD	ArchSD

Among the seven recreational facilities, Sai Tso Wan Recreation Ground (item 4 in Table 4 of the Report) is the first recreational facility developed in a restored landfill in Hong Kong. The client department was the Home Affairs Bureau (HAB) who chaired the Landfill Afteruse Working Group while the EPD acted as the works agent department to develop the project through a design-build-operate contract arrangement. Regarding the roles and division of work of the EPD in the other projects, please refer to our reply to Q(a).

(iii) relevant works agent for items 3, 4 and 7 sought funding approval from FC of LegCo after detailed design stage, which was different from projects under District Minor Works Programme (i.e. items 2, 5 and 6) in which funding was sought after feasibility study stage (Note 1 to the Table refers); the procedure and approval required for the change/increase in the project cost;

For the Sai Tso Wan Recreation Ground (item 4 in Table 4 of the Report), the client department was the HAB while the EPD acted as the works agent department to develop the project through a design-build-operate contract arrangement. Upon open tendering, the successful bidder immediately commenced detailed design and relevant construction works as required by the contract.

Since the EPD was only involved in item 4 of Table 4 (i.e. Sai Tso Wan Recreation Ground) and acted as a works agent for the project, we are able to provide information relevant to this project only. The chronology of funding application for the Sai Tso Wan Recreation Ground is set out as follows:

(1) On 13 December 2000, the HAB submitted a paper on the Sai Tso Wan Recreation

	<p>Ground to the Public Works Subcommittee (PWSC) of the Finance Committee (FC) of LegCo, applying to upgrade the proposed project to Category A.</p> <p>(2) On 12 January 2001, the application was approved by the FC.</p> <p>(3) In June 2002, the tender prices of all tenders received by the EPD were higher than the original approved project estimate (APE).</p> <p>(4) On 5 September 2002, the Central Tender Board approved the EPD to, after obtaining additional funding, award the design-build-operate contract of the Sai Tso Wan Recreation Ground.</p> <p>(5) In January 2003, as the APE was not sufficient to cover the cost of the recommended tender, the HAB sought the FSTB's approval for increasing the APE from \$39.9M to \$46.5M.</p> <p>(6) On 11 February 2003, the FSTB approved the increase of APE.</p> <p>(7) On 12 February 2003, the design-build-operate contract was awarded by EPD. The works commenced in March 2003 and the Sai Tso Wan Recreation Ground was opened to the public in April 2004.</p> <p>.</p> <p>In addition, we would like to take the opportunity to reiterate that the actual expenditure of the construction works for the project was \$46.4M, which had not exceeded the revised APE (i.e. \$46.5M).</p>
Q(c)	<p>using Kwai Chung Park as an illustration, involvement of relevant government bureaux/departments, relevant DCs and local communities in each of the design, construction and operation stages of developing restored landfills and procedures on seeking funding approval for the project;</p>
	<p>The planned Kwai Chung Park development is located in the restored Gin Drinkers Bay Landfill (GDBL). Similar to other landfills that had completed restoration works, the EPD is responsible for the aftercare works at the restored GDBL, so as to minimize the potential adverse impacts on the environment and to render the landfill safe for beneficial use.</p> <p>As mentioned in our response to Q(a) above, the EPD would continue to carry out, at the restored landfills (including the portions of the sites which have been sub-allocated to the LCSD), aftercare works such as management and maintenance of all restoration facilities installed at restored landfills and environmental monitoring, until the completion of aftercare works. Furthermore, the EPD has provided LCSD and other works agent departments with relevant information of restored landfills and professional advice such as loading limits, settlement changes, potential challenges on project coordination and interface and also vetting the landfill gas hazard assessments submitted by client departments, etc. Throughout the entire project development process, the EPD would continue to provide technical advice and support to the LCSD and other works agent departments. EPD staff also attended meetings of the Working Group on Development of Kwai Chung Park under the Kwai Tsing District Council; briefed members on the aftercare works and the environmental monitoring conducted in the restored landfill; and arranged on-site inspection at GDBL by the members,</p>

	<p>LCSD and other relevant government departments.</p> <p>As for the other items, LCSD, as the client department of the Kwai Chung Park, would provide detailed responses.</p>
Q(d)	<p>whether the Administration would consider that, for future development of restored landfills, it would be beneficial to hire a consultant to conduct a comprehensive feasibility study, recommend mitigation measures and propose a list of development options for consideration by EPD/LCSD, DCs and local communities so as to speed up the development process;</p>
	<p>Over the years, the ENB and EPD have been developing restored landfills into recreational facilities such as recreational ground, sports facility, park etc. The EPD had in the past allocated those lands that were relatively easier to develop into recreational facilities to relevant government departments and sporting associations. From 2015, the remaining lands that could possibly be developed for beneficial uses have been included in the “Restored Landfill Revitalization Funding Scheme” (RLRFS), providing subsidies for the development of recreational facilities or other innovative uses by non-profit-making organizations and sporting associations. The land use conditions and constraints (such as loading limits, settlement, potential difficulties of project interfacing and coordination matters, landfill gas hazard assessment, etc.) are listed out in the technical information kit for reference by the RLRFS applicants. (Technical information kits for RLRFS (Batch 1) can be found at this weblink:  <a href="https://www.epd.gov.hk/epd/tc_chi/environmentinhk/waste/prob_solutions/landfill/application_batch1_arrangements.html">https://www.epd.gov.hk/epd/tc_chi/environmentinhk/waste/prob_solutions/landfill/application_batch1_arrangements.html</a>)</p> <p>Based on their expertise and interests, interested parties can develop innovative afteruse projects and formulate suitable designs based on the actual site conditions.</p> <p>The remaining lands in the restored landfills are mostly slopes with varying gradients. The slopes in various restored landfills differ individually and pose significant limitations and challenges for developing into beneficial uses. In future, if there are any departments or organizations that are interested in developing the sloping areas into recreational facilities or other beneficial uses, the EPD will provide them with the relevant information for studying and devising suitable uses.</p>
Q(e)	<p>whether EPD has informed LCSD of the technical difficulties and obstacles (existence of slopes and location of restoration facilities) when sub-allocating the site to the latter for development, if yes, details of the information provided to LCSD and if no, reasons why not;</p>
	<p>As the Kwai Chung Park is still in its planning and design stage, EPD will sub-allocate the concerned areas to LCSD before the construction works commence. Nonetheless, the EPD has provided relevant information and comments to LCSD on Kwai Chung Park development. The details are as follow:</p> <p>(1) In June 2001, the EPD provided technical advice to the LCSD on the proposed</p>

	<p>development of the Football Training Centre in the Kwai Chung Park;</p> <p>(2) In August 2002, the EPD provided technical advice to LCSD on the proposed development of the grass skiing ground in the Kwai Chung Park, including the possible impacts to restoration facilities during site formation works;</p> <p>(3) Between June and October 2013, the EPD provided technical advice on the proposed Kwai Chung Park, including that LCSD and ArchSD needed to (a) consider the maximum loading capacity and differential ground settlement at the Gin Drinkers' Bay landfill (GDBL); (b) carry out Landfill Gas Hazard Assessment and adopt mitigation and safety precaution measures in accordance with the assessment finding; and (c) consider the large sloping areas and large numbers of monitoring wells within GDBL.</p> <p>The LCSD and ArchSD are now compiling the Technical Feasibility Statement for the Kwai Chung Park development. The EPD will continue to provide the two departments with technical advice.</p>
Q(f)	<p>ArchSD informed HAB/LCSD in May 2014 and May 2017 that a landfill gas hazard assessment should be conducted before proceeding with the Technical Feasibility Statement to confirm the technical feasibility of the proposed project (paragraphs 3.7 and 3.10 refer), and expressed concern in May 2017 on whether the project could be launched before 2022; reasons for EPD/ArchSD to have "no objection" for HAB/LCSD to carry out the landfill gas hazard assessment at detailed planning stage despite that the findings of the assessment might affect the completion time and cost of the project;</p>
	<p>According to the "Landfill Gas Hazard Assessment Guidance Note" (LFGHAGN) and the "Professional Persons Environmental Consultative Committee Practice Note PN 3/96" (ProPECC PN 3/96), when developing any piece of land within a landfill site or within a 250m zone around any landfill site, the project proponent and/or the works agent should adopt suitable precautionary measures in order to minimize the risk due to the lateral migration of landfill gas. Departments should refer to the requirements as stated in the LFGHAGN and the ProPECC PN 3/96 when undertaking the landfill gas hazard assessment for the proposed development, in order to evaluate the risk and design suitable precautionary or protective measures, so as to ensure the proposed development can be utilized in a safe manner.</p> <p>As per the LFGHAGN, the assessment process often comprises two stages. The first stage, or 'preliminary qualitative assessment', is carried out at the planning stage of a development project. While its assessment scope will be constrained by the level of available detail about the proposed development, the assessment result may be used to determine the in-principle acceptability of a proposed development and to identify the scope of any further investigations which may be required to complete the assessment.</p> <p>In the responses to LCSD in January 2015 and June 2017, the EPD expressed no objection to</p>

LCSD to make reference to the practices adopted in previous relevant examples such as the Ngau Chi Wan Recreation Ground and the Jordan Valley Park, i.e. to carry out preliminary qualitative assessment for the Kwai Chung Park project in accordance with the LFGHAGN and to review and reassess in detail during the project's detailed design stage. Based on past experience in developing similar projects, the EPD opines that such arrangements in general would not affect the project's completion date and cost.

Q(g) records of continuous topographical survey conducted by EPD on the site between 2007 and 2011, number of survey points being monitored and whether unusual ground settlement problem was revealed during the period; when were the results of topographical surveys conducted by Consultant A and Contractor C (which recorded a difference in site levels of 0.7 metre and 1.59 metres respectively) made known to EPD and whether it had provided advice on the remedy or mitigation measures to HAB (paragraphs 3.26(b) and 3.27(e) refer); if yes, of the details and if no, reasons why not. Has EPD studied the reasons for the unusual ground settlement problem? If yes, the findings and if no, reasons why not;

According to the Tseung Kwan O landfills restoration contract, the contractor had installed settlement markers at the Tseung Kwan O Stage I Landfill (TKOL-I) at a maximum spacing of 100m, such that the settlement monitoring would cover the entire restored landfill. Currently, there are about 40 settlement markers at the TKOL-I. The contractor has been carrying out settlement monitoring at a frequency of not less than twice a year, and has been recording the settlement readings for each marker. There are 3 settlement markers in the vicinity of the Pet Garden (i.e. SM3, SM6, and SM9). From 2007 to 2011, the records of these settlement markers are tabulated as follow:



Year	Metres above Principal Datum for settlement markers (m)		
	SM3 (Outside Pet Garden)	SM6 (Inside Pet Garden)	SM9 (Outside Pet Garden)
Late 2007	20.886	27.582	17.002
Late 2008	20.885	27.573	17.000

		Late 2009	20.876	27.564	16.997
		Late 2010	20.864	27.553	16.987
		Late 2011	20.850	27.542	16.977
		Settlement (m)	0.036 (i.e. 36 mm)	0.04 (i.e. 40 mm)	0.025 (i.e. 25 mm)
		Average settlement rate (m/year)	0.009 (i.e. 9 mm/year)	0.01 (i.e. 10 mm/year)	0.00625 (i.e. 6.25 mm/year)
	<p>According to the records above and the EPD's on-site observations, we have not noticed any unusual settlement in the Pet Garden vicinity and the rest of the TKOL-I during the restoration and aftercare period.</p> <p>According to our records, the EPD did not receive the topographical survey records from Consultant A, Contractor C, or the relevant departments that were conducted during the aforementioned period.</p>				
Q(h)	<p>according to note 56 in paragraph 3.30, \$15.1 million contract sum comprised \$1.7 million for construction of the adjacent car park, which was provided by EPD. Please advise the final contract sum of the car park;</p>				
	<p>The Pet Garden development project included the Pet Garden itself and an adjacent car park, which was developed by the LCSD and the HAD. According to the LCSD and the HAD, the works contract of the development project did not provide a breakdown on the final construction cost of the car park.</p>				
Q(i)	<p>referring to paragraph 3.37, lessons learnt and remedy to be taken to address the ground settlement problem in the development of restored landfills in future;</p>				
	<p>As mentioned in paragraph 3.42 of the D of Audit's Report, the EPD will consider conducting a review on the ground settlement at TKOL-I when a new afteruse project is to be implemented at this site, in order to enable the project proponent to grasp the topographic and settlement conditions of the site as early as possible for the planning and design of the project. With the successive completion of various afteruse facilities at restored landfills, the EPD will, in the form of experience sharing, share the key points of afteruse development (e.g. differential settlement at the site area, maximum allowable loading, etc.) with relevant bureaux / departments and non-Government organizations, in order to facilitate their future afteruse developments.</p>				
Q(j)	<p>progress of conducting a review on the ground settlement at Tseung Kwan O Stage I Landfill and whether any unusual ground settlement has been observed (paragraph 3.42 refers). Has unusual ground settlement problem been observed at the other 12 landfills? If yes, please provide details.</p>				
	<p>As mentioned in our response to Q(g) and Q(i) above, according to the TKOL-I contractor's settlement monitoring data and the EPD's on-site observations, there was no unusual</p>				



<p>settlement found at the TKOL-I. Nonetheless, the EPD will consider conducting a review on the ground settlement at TKOL-I when a new afteruse project is to be implemented at this site for reference by the project proponent when planning and designing the project. For the rest of the 12 restored landfills, we have not observed any unusual settlement. The EPD will continue to monitor the ground settlement and will take immediate follow-up actions should there be any unusual settlement.</p>
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**Environmental Protection Department  
June 2018**