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# Administrative and Legislative Measures Relating to the "Waste Diversion Plan" for the Southeast New Territories Landfill

## INTRODUCTION

This paper seeks to brief Members of the administrative and legislative measures relating to the "Waste Diversion Plan" for the Southeast New Territories ("SENT") Landfill which comprises the designation of the landfill to receive only construction waste and other complementary measures to facilitate diversion of waste through the waste collection system and minimize the consequential traffic and environmental impacts.

## BACKGROUND

2. There are complaints from the local community about the odour concern arising from the unsatisfactory hygienic conditions of some refuse collection vehicles ("RCVs"). In addition, the complaints against the odour concern from the SENT Landfill are strong. We aim to step up our efforts in addressing such concern as we seek to change the use of the SENT Landfill to receive construction waste only after the funding for its extension is approved and other necessary preparatory work is ready. In other words, municipal solid waste ("MSW") will have to be diverted away.

### Landfills, RTSs and MSW Collection in Hong Kong

3. The SENT Landfill, located in Tseung Kwan O ("TKO"), is one of the three strategic landfills in Hong Kong, with the other two being the Northeast New Territories ("NENT") Landfill and the West New Territories ("WENT") Landfill located in Ta Kwu Ling and Nim Wan respectively. All the three strategic landfills currently accept MSW, construction waste and other special

wastes including sewage sludge. In 2012, about 9,280 tpd of MSW was disposed of at the three landfills on a day-to-day basis, including about 6,290 tpd generated from domestic households and about 3,000 tpd from commercial and industrial ("C&I") establishments. At present, about 85% of domestic MSW in Hong Kong is collected by FEHD or its contractors for transfer to the three landfills without any charges. For the remaining 15% of domestic MSW and all MSW from C&I sources, the waste producers hire private waste collectors to provide the collection services at their own costs.

4. Out of all landfilled MSW, about 5,910 tpd (or 63.7%) went through a refuse transfer station ("RTS") which is a facility that compacts MSW for bulk transfer. There are currently seven RTSs, being West Kowloon Transfer Station ("WKTS"), Shatin Transfer Station ("STTS"), Island West Transfer Station ("IWTS"), Island East Transfer Station ("IETS"), North Lantau Transfer Station ("NLTS"), Northwest New Territories Refuse Transfer Station ("NWNTRTS") and Outlying Islands Transfer Facilities ("OITF"). They are located in different parts of the territory forming a network that helps to achieve a balanced distribution of waste to the landfills. By way of waste compaction and then bulk transfer, the RTSs may reduce the traffic burden and environmental problems caused by long haulage of RCVs. Such benefit is even more substantial for some 3,940 tpd of compacted MSW (about 42.4% of the total) which was sent to the WENT Landfill by vessels through RTSs with seafront access including IWTS, IETS, WKTS, NLTS and OITF. **Annex A** sets out the utilization level of individual RTSs in 2012.

## The SENT Landfill: Exhaustion and Extension

Projected Exhaustion and Proposed Extension

5. We have been closely assessing the remaining capacity of the existing SENT Landfill[1]. According to the latest projections, the existing SENT Landfill will almost be completely exhausted by the end of 2015. At present, Hong Kong relies on landfills heavily for waste disposal. Although we endeavour to reduce such reliance through the development of waste-to-energy facility in the long run, for the immediate future we cannot afford not to seek for extension of the three existing landfills. We therefore aim to re-submit the funding application of the three extension proposals to the LegCo within the first quarter of 2014.

[1] Apart from the overall effectiveness in waste reduction in Hong Kong and the specific usage of a facility (vis-à-vis the other two landfills), settlement of waste that has already been landfilled is a key determining factor particularly towards the end of the useful life of a landfill.

The Odour Concern

6. The three strategic landfills were built in the 1990s and are engineered to the international standard. As TKO develops, newly erected residential buildings have become increasingly close to the SENT Landfill with the closest local community (namely LOHAS Park) situating at about only one kilometre away. In recent years, more local complaints about the environmental nuisance caused by the operation of the SENT Landfill have been received, of which odour is a major subject of dissatisfaction[2]. In response to the complaints, Environmental Protection Department ("EPD") has based on international experience implemented a basket of odour management measures (see **Annex B**) and have employed independent third party to conduct impact assessments. Given the efforts, odour nuisance that may arise from the operation of the SENT Landfill has, in fact, been reduced. Despite that, the concern of the local community remains[3]. In view of the growth in residential buildings in the TKO area, we consider there is a case to change the use of the SENT Landfill to accept only construction waste so that the odour concern arising from MSW and other wastes could be removed at root.

## THE WASTE DIVERSION PLAN

### The SENT Landfill to Receive Construction Waste Only

7. In 2012, the SENT Landfill received solid waste of about 4,800 tpd, including about 2,080 tpd of MSW and about 340 tpd of sludge both of which are odour-producing. Such waste (2,080 tpd + 340 tpd) has to be diverted away from the SENT Landfill as the use of the facility changes. The Sludge Treatment Facility is under development in Tuen Mun and is expected to commence commissioning starting from the end of 2013. We envisage that sludge will start to be diverted away from the SENT Landfill by then. As for MSW, in 2012, about 270 tpd of MSW disposed of at the SENT Landfill was collected by FEHD. To reduce disposal of odour-producing wastes from the

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[2] In 2012, we received more than 1,900 complaints against the odour from the SENT Landfill, and some 1,100 complaints in 2011.

[3] Apart from the SENT Landfill, the TKO community has also expressed concerns about the operation of a temporary fill bank which is immediately adjacent to the SENT Landfill and is managed by Civil Engineering and Development Department ("CEDD"). Efforts have been made by CEDD with a view to minimizing the nuisance that may arise due to the fill bank operation. For instance, cleansing of Wan Po Road has been further enhanced and some truckloads reduced through re-balancing the use of TKO temporary fill bank and promoting the more use of marine delivery via existing barging facilities and additional temporary barging facilities which could be introduced at Kwai Chung and Kai Tak by mid 2014 the earliest. Besides, CEDD is also pursuing the closure of TKO fill bank on General Holidays from early 2014 onwards. As a start, the operating hours have already been shortened by 4 hours (from 8 am to 9 pm to 10 am to 7 pm) since April 2013.

SENT Landfill, FEHD is arranging to re-route the existing MSW collection services and divert such MSW away from the Landfill. However, the existing SENT Landfill users are mainly private waste collectors who collect about 1,800 tpd of MSW from a very wide catchment. Diverting such MSW away from the SENT Landfill must be implemented through legislative means. We therefore ***propose*** to designate the SENT Landfill to accept for disposal only construction waste[4] by amending Waste Disposal (Designated Waste Disposal Facility) Regulation (Cap 354L, the "DWDF Regulation") after the funding for its extension project is approved. In line with the existing Construction Waste Disposal Charging Scheme[5], such landfilled construction waste may only contain no more than 50% by weight of inert construction waste. Requisite preparatory work to achieve this is set out in the paragraphs to follow.

**RTSs to Accept More MSW**

8. If the SENT Landfill no longer accepts MSW, a considerable number of RCVs and other vehicles collecting MSW will have to find their ways to divert about 2,000 tpd of MSW to alternative designated waste disposal facilities. A significant portion was collected from the urban districts and would require very long haulage for direct transfer to the WENT and NENT Landfills. In mapping out the Waste Diversion Plan, we have to incorporate measures to maximize the utilization of the other RTSs with a view to minimizing the traffic and environmental impacts arising from the diversion.

Re-routing of FEHD's Collection Services

9. As shown in **Annex A**, in 2012, the RTS network attained an overall utilization rate of 71.5%; WKTS and STTS jointly had an unused capacity of some 370 tpd only. Most (about 4,870 tpd or 82.4%) of the MSW going through the RTS network was collected by FEHD. FEHD is arranging to deliver some MSW it collects to the NENT Landfill direct without going through an RTS. FEHD will also consider how to re-route its collection services in some other districts such that when the SENT Landfill ceases to accept MSW, more FEHD-collected MSW will go through NLTS, IETS and IWTS. By this, we aim to make available RTS capacity of up to 1,800 tpd (mainly at WKTS and some at STTS) to cope with the MSW diverted from the

[4] In general, construction waste means any substance, matter or thing that is generated from construction work and abandoned. Some construction waste is inert and may be reused as construction materials. Examples include rock, rubble, boulder, earth, soil, sand, concrete, asphalt, brick, tile, masonry and used bentonite. Unlike MSW (which contains food waste) and sludge, construction waste in general has a low organic content and is hence odourless.

[5] Under the Construction Waste Disposal Charging Scheme, construction waste having a higher content of inert materials should be disposed of at the sorting facilities (no less than 50% of inert construction waste by weight) or the public fill reception facilities (100% inert) operated by the Civil Engineering and Development Department at $100 and $27 per tonne respectively. Landfills can only accept construction waste having not more than 50% by weight of inert materials and a disposal charge of $125 per tonne applies.

SENT Landfill.

10. Since each RCV will have to make multiple trips each day to collect MSW for disposal at RTSs or landfills, FEHD's preliminary assessment indicates that it may incur about 30 additional RCV routes to achieve the proposed diversion due to the substantial increase in traveling distance and time for each collection and disposal trip. Apart from the implied increases in the operating cost and contract price, changes to the existing collection schedules would be required. Similarly for the private waste collectors, they will have to make diversion plans which could affect their clients.

Opening Up STTS for Private Waste Collectors

11. A requisite for mobilizing the spare capacity of STTS is to open it up for use by private waste collectors. At present, STTS is the only RTS that is exclusively used by FEHD and its contractors, and the utilization rate is about 80%[6]. However, in view of the practical need to maximize the utilization of the RTS system under the Waste Diversion Plan, we plan to re-route FEHD's collection service (cf. paragraph 9) by which we may free up spare capacity in STTS. Therefore we ***propose*** to open up STTS for use by private waste collectors by amending the Waste Disposal (Refuse Transfer Station) Regulation (Cap. 354M; the "RTS Regulation"). This will supplement WKTS as an alternative waste disposal facility to the SENT Landfill and help address the demand for disposal facility in the eastern part of the territory, particularly Kowloon East.

Rate Reduction for RTSs

12. With the implementation of the aforesaid measures, we envisage that more MSW will be transferred to the landfills through the RTS network after compaction. We estimate some 7,710 tpd (or 83.1%, up from the current 63.7%) of MSW that requires disposal would go through an RTS including some 5,530 tpd (or 60.0%, up from the current 42.2%) being sent to the WENT Landfill through marine transport. This is in line with our intention to minimize the potential traffic burden and environmental problems by maximizing the utilization of RTSs, particularly those with seafront access.

13. At the same time, we estimate that the RTS network will be 93.3% full with all urban RTSs fully utilized upon the above waste diversion. The slim margin of RTS capacity suggests that in addition to the re-routing of FEHD-collected waste to the less utilized RTSs, private waste collectors should be encouraged to take up the RTS with more unused capacity. Yet the use of a particular RTS by private waste collectors is entirely voluntary and is mainly cost-driven. Under the established policy, the use of an RTS by private waste

[6] In 2012, the unused capacity at STTS was about 200 tpd (out of a design capacity of 1,200 tpd).

collectors is subject to a fee which is set at a level intended to be commercially viable to the trade and to enable the Government to recover at least the additional cost for handling the waste delivered by private waste collectors. The RTS fees have not been revised for over 10 years and have already resulted in under recovery of the costs under the established charging policy. On balance, however, we propose to optimize utilization by suitable fee reduction to create the necessary incentives.

14. WKTS and STTS are located within reasonable distance from the waste sources being affected when the SENT Landfill ceases to receive MSW. For operational reasons, private waste collectors would have stronger incentives to use the two RTSs. Some private waste collectors may also consider using IETS and IWTS if they operate on the Hong Kong side or serve South Kowloon. For these four RTSs which serve the most affected areas, we ***propose*** to charge a low fee at $30 per tonne which is the current fee level for WKTS and the lowest in the RTS system. In other words, there will be fee reduction for IETS and IWTS which are charging at $40 per tonne and the fee for STTS will be set at a level below the marginal cost at $60 per tonne[7]. For the other RTSs, we do not recommend any fee reduction for NLTS because the major change is to have more FEHD-collected MSW taking up its unused capacity. Regarding NWNTRTS and OITF, since they are unlikely to be affected by the Waste Diversion Plan and given their remote geographical location, similar fee reduction may not be effective. The new fees have to be implemented by amending the RTS Regulation.

15. In the long term, in order to further promote the use of RTSs for MSW collection and to better serve local waste collection needs, the provision of an RTS in the eastern region of the territory is required. A site search study is being conducted to identify suitable cavern site for locating this facility. In addition, we will review the Hong Kong Planning Standards and Guidelines to incorporate the provision of an RTS as basic environmental infrastructure at the early planning stage of new development areas. We also need to more fundamentally review the role of RTSs as part of our waste management infrastructure and accordingly update the charging policy taking into account also other developments on say MSW charging.

**RCVs to Meet Certain Equipment Standards**

16. Notwithstanding the increased use of RTSs, diverting MSW from the SENT Landfill will inevitably change the RCV traffic load in the neighbourhood of the other designated waste disposal facilities. We are committed to taking proactive measures to enhance the environmental

[7] Under the established policy, the use of an RTS by private waste collectors is subject to a fee which is set at a level intended to be commercially viable to the trade and to enable the Government to recover at least the marginal cost for handling the waste delivered by private waste collectors.

performance of RCVs and avoid nuisance arising from their operation. At present, many RCVs simply do not have the adequate device to avoid such nuisance as leachate dripping, waste spattering or dust. To tackle this problem, we ***propose*** to amend the DWDF Regulation so that when an RCV delivers waste to the landfills and RTSs, it has to be fully enclosed and properly equipped for more effective avoidance of nuisance. More specifically, a person who drives into a landfill or an RTS an RCV that does not meet the relevant equipment standards commits an offence and is liable to a fine at Level 6 (i.e. $100,000). Such equipment standards include –

(a) the RCV has been equipped with a metal tailgate cover and a waste water sump tank (collectively as "specified devices") which are in good working conditions; and

(b) the design and construction of the specified devices are in the opinion of the Director of Environmental Protection suitable for the purposes of (i) ensuring safety to the personnel present at the facility; (ii) avoiding nuisance or danger to health or the environment arising from the carrying on of activity in the facility; and (iii) preventing disruption to the operation of the facility or the carrying out of relevant activity in the facility.

We will keep in review the effectiveness of the proposed new equipment standard requirements and in parallel assess the need of further beefing up the existing control under the Waste Disposal Ordinance (Cap. 354).

17. At present, there are some 530 RCVs in Hong Kong of which 150 are Government vehicles operated by FEHD and the remaining 380 are private RCVs engaged in FEHD's refuse collection contracts or serving private clients. Whilst all of FEHD's RCVs and most of those operated by its contractors should have no problem in meeting the proposed equipment standards[8], most of the other private RCVs have yet to meet the proposed equipment standards. In June 2013, the Government announced the intention to assist private RCV operators to retrofit their serving RCVs so to comply with the new equipment standard requirements. As a first step, a pilot scheme was launched for about 10% of private RCVs which are yet to meet the proposed equipment standards to test out various technical aspects of the retrofitting process. The information and experience gathered in the pilot scheme have been used to devise the full-scale subsidy scheme. Under the scheme, a one-off subsidy will be paid to the retrofitting workshop to meet the actual cost of work, subject to a pre-set ceiling level.

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[8] FEHD has been updating the requirements on the RCVs used under its collection contracts to meet the proposed equipment requirements, when the contracts are due for re-tender. As at end-September 2013, only 3 collection contracts covering 19 RCVs have not yet been updated, though in practice all the RCVs deployed by the contractors already meet the required standards.

## LEGISLATIVE TIMETABLE

18. The new RCV equipment standards should be pursued as a matter of priority. In view of the limited working life of the existing part of the SENT Landfill that remains and the lead time required for diverting waste, designation of the facility to receive only construction waste may have an impact only if funding for its extension project is approved by the LegCo Finance Committee. Changes to the RTS system (including the opening up of STTS as well as the new RTS fees) may be implemented separately to facilitate the private waste collectors to get prepared for necessary MSW diversion at an early opportunity by say trying out new routes and make other necessary adjustments. We aim to introduce the relevant amendment regulations into the LegCo for negative vetting within 2013. Subject to their enactment, we will separately appoint the commencement date for individual components of the Waste Diversion Plan by notice in the Gazette taking into account progress.

## WAY FORWARD AND ADVICE SOUGHT

19. Members are invited to offer views and comments on the proposed measures for the Waste Diversion Plan. Subject to any other views from this Panel, we will proceed with further preparation of the legislative amendments required for the implementation of the Waste Diversion Plan for their early introduction into the LegCo within 2013.

**Environment Bureau / Environmental Protection Department**
**November 2013**

**Annex A**

## Utilization of RTSs in 2012

| Facility[9] | Collected by FEHD | Collected by Private Collectors | Total Utilization | Design Capacity | Remarks |
|---|---|---|---|---|---|
| IETS | 655 tpd | 142 tpd | 66.4% | 1,200 tpd | ♦ With seafront access |
| IWTS | 426 tpd | 105 tpd | 53.1% | 1,000 tpd | ♦ With seafront access |
| OITF | 75 tpd | 8 tpd | 13.4% | 611 tpd | ♦ With seafront access<br>♦ Only Ma Wan Transfer Station is open to private waste collectors |
| NLTS | 67 tpd | 111 tpd | 27.4% | 650 tpd | ♦ With seafront access |
| NWNTRTS | 843 tpd | 150 tpd | 90.3% | 1,100 tpd | |
| WKTS | 1,803 tpd | 527 tpd | 93.2% | 2,500 tpd | ♦ With seafront access |
| STTS | 998 tpd | -- | 83.2% | 1,200 tpd | |

[9] Abbreviations:
IETS: Island East Transfer Station;
IWTS: Island West Transfer Station;
OITF: Outlying Islands Transfer Facilities;
NLTS: North Lantau Transfer Station;
NWNTRTS: North West New Territories Refuse Transfer Station;
WKTS: West Kowloon Transfer Station;
STTS: Shatin Transfer Station

**Annex B**

## Odour Management Measures for the SENT Landfill

The SENT Landfill is operating in high international standards. To address the concerns from the TKO residents on odour nuisance, EPD has stepped up odour management and control measures over the past five years to further abate the potential odour impact of the landfill. These measures include:

(a) minimizing the size of the tipping area as far as practicable to minimize odour emitted from the disposed waste;

(b) compacting the waste and covering it by construction waste immediately and covering the tipping area with 300 mm thick layer of soil (increased from 150 mm), followed by a layer of cement-based material namely "Posi-Shell Cover" at the end of the daily waste reception process to minimize odour emitted from the disposed waste;

(c) covering the dewatered sludge from Stonecutters Island Sewage Treatment Works by soil immediately to minimize odour emitted from the disposed sludge;

(d) covering the non-active tipping areas with temporary impermeable liner, in addition to the 300 mm interim soil cover. For areas that are not suitable for installing the temporary impermeable liner, "Posi-Shell Cover" is applied in addition to the 300 mm interim soil cover to further prevent emission of landfill gas and odour from covered waste;

(e) putting a movable cover, fitted with activated carbon at the exhaust pipes, on the special waste trench to minimize odour emitted from the special waste trench during its operation;

(f) installing extra landfill gas extraction wells and mobile landfill gas flaring units, in addition to the existing landfill gas extraction system, to enhance the collection of landfill gas for treatment and to completely combust localized landfill gas to prevent potential landfill gas and odour emission;

(g) setting up fixed deodourisers at the site boundary along Wan Po Road, at the weighbridge area and at the entrance/exit of the landfill to neutralize odour from RCVs entering the landfill;

(h) providing mobile deodourisers at the tipping area to neutralize odour from waste deposited at the tipping area and rearranging the operation period of some mobile deodourisers for 24-hour operation to further control the emission from the landfill;

(i) restoring the landfill progressively to cap the completed waste disposal areas with a permanent liner system and restore the areas with suitable engineering structures such as drainage system and plantation to form a natural landscape;

(j) upgrading the existing wheel washing facility to a full-body vehicle washing facility to improve the hygienic conditions of RCVs before leaving the landfill;

(k) flushing and cleaning Wan Po Road (from Hang Hau Round-about to the SENT Landfill) to supplement the street cleaning work by FEHD to tackle the odour concern from the wastewater dripping from RCVs travelling along Wan Po Road and to improve the hygiene condition of Wan Po Road.

2. About $80 million of capital cost has been spent to implement the above measures.