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**(ACE Paper 12/96)**  
**for discussion**

## **Review of the Trade Effluent Surcharge Scheme**

### **Purpose**

This paper informs members of the Administration's intention to review the Trade Effluent Surcharge (TES) Scheme.

### **Background**

2. The sewage charging scheme comprises two components - a sewage charge (SC) and a TES. SC is a general charge payable by all water consumers discharging waste water into the public sewerage system. It is charged at a flat rate of \$1.2 per cu.m of water consumed. It reflects the costs for treating sewage at domestic strength. In line with water charges, domestic consumers enjoy an exemption of the first 12 cubic metres of water consumed in a 4-month billing period.

3. For certain trades and industries, they are discharging effluent at a strength higher than that of domestic sewage. As a result, a TES which reflects the additional cost in treating this type of sewage is payable by 30 trades and industries. As the strength of effluent of different types of commercial and industrial establishment varies, different TES rates are applicable to reflect the difference in treatment costs.

4. The strength of effluent is measured by the Chemical Oxygen Demand (COD) readings of waste water. The higher the COD value, the higher the treatment cost and hence the higher the TES rate.

5. The TES charging scheme was explained to, and accepted by, the ACE on 21 March 1994 (ACE Paper No. 16/94). At that time, the Administration undertook to review the TES scheme 12 months after the scheme has been implemented.

6. Subsequent to the enactment of the Sewage Services Ordinance in December 1994, two regulations detailing the scheme, viz the Sewage Services (Sewage Charge) Regulation and the Sewage Services (Trade Effluent Surcharge) Regulation, were also passed, with the discharge factor for SC for certain trades and industries being amended to 70%.

Problems encountered

7. Regarding the use of COD as the sole parameter in assessing the strength of effluent, a query has been received from hoteliers who argue that other parameters should be considered e.g. Biochemical Oxygen Demand (BOD), heavy metals, toxic and carcinogenic substances etc.

8. The Administration decided to use COD (in two forms, on the total sample and on the settled sample) as the sole parameter of effluent strength based on strong recommendations from the consultant who, using a team of international experts who advised on schemes elsewhere and who determined the most relevant parameters for Hong Kong, developed the TES scheme. The consultant was requested to develop a scheme that was technically and administratively simple to minimise operational costs.

9. The single most suitable parameter was determined to be COD as this measures well the strength of industrial and commercial sewage in Hong Kong. BOD is not suitable as the test takes 5 days with carefully controlled samples and results can be significantly affected by other chemical wastes in the sewage. Heavy metals, toxic materials and carcinogenic compounds are not permitted in discharges and those contravening are subject to prosecution. Charging for such substances would imply tolerance and would compromise enforcement.

10. Another concern centres around whether it is fair to have one generic COD value for a trade/industry. It has to be accepted that taking an average COD value is unlikely to reflect the effluent strength of individual dischargers within the same trade or industry, especially when the trade and industry concerned has more than one way to deal with the problem. However, it has to be noted that the scheme is designed to be administratively simple, thereby cutting the administrative costs which will eventually impact on the TES individual dischargers have to pay. This is in line with the LegCo Bills Committee's wish that the operating costs should be kept to a minimum.

11. The third problem we have encountered is the claim that the COD value of effluent actually discharged by a trade is lower than what is stipulated in the Sewage Charges (TES) Regulation. So far only the catering sector has made this claim and a group survey has been commissioned by the trade to ascertain this claim. Regrettably, the survey is beset by several problems from the start and as a result the validity of the data collected is in doubt. A full account of the shortcomings of the study is at Appendix A.

12. There have also been claims that certain industries/trades discharge less sewage than the water they consume. Under the regulation, discharge factors of 70% and 80% are applied to certain trades/industries in respect of SC and TES respectively. Similar to the pollution level of the effluent (measured by COD reading), the discharge factor can be revised if the Drainage Authority is satisfied with the evidence produced in individual appeals. Any consumer that has reason to believe that he has discharged substantially less than he consumes can file an appeal by producing evidence. After issuing about 2.8 million SC bills and 23,000 TES bills, about 20 individual appeals for revision of discharge factor have been received from trades including soft drink production company, ice making company, gas manufacturers, meat packing company, textile companies, chemical production company and concrete batching companies. As regards discharge factor for restaurants, no such appeal has been received so far although there have been claims that the discharge factor for catering business should be lower.

13. The hoteliers made representation to the Government because some of their accounts are the so-called "mixed accounts" (i.e. account with one water meter serving several water outlets for different uses, some of which e.g. restaurants, laundry and bakery, attract TES). In order to ascertain the amount of water used by TES chargeable business inside a hotel, the Drainage Authority has requested hotel owners to install separate water meters or private check meters, otherwise assessment will be made according to factors such as floor area and number of employees of each type of business inside the hotel, hotel owner's own assessment and kitchen floor area. If a hotel owner does not agree to this assessment, the hotel owner can submit evidence to substantiate an alternative assessment for the calculation of TES charges. Bills will only be issued to mixed account holders after the above process has been completed.

#### Way Forward

14. The Administration is aware that a complex scheme such as TES may need revisions from time to time. A Working Party comprising representatives of the Planning, Environment and Lands Branch, Works Branch, Drainage Services Department and Environmental Protection Department has therefore been set up to review the scheme.

#### Advice sought

15. Members are invited to comment on the scope and arrangements for reviewing the TES.

**Planning, Environment and Lands Branch  
April 1996**

An Account of the Shortcomings of the Survey Commissioned by the  
Restaurant Trade

Selection of Restaurants

1. It was originally agreed between the government and the Association of Restaurant Managers (ARM) that the latter should provide the names of 300 restaurants, from which 80 were to be selected at random. The intention was to sample about 1% of the total number of restaurants in Hong Kong.
2. But ARM was only able to provide the names of 179 restaurants. It was then agreed that government should provide its own list of restaurants, so that 40 would be chosen from each of ARM and government's lists.
3. ARM's list contained mainly Cantonese seafood restaurants, but it insisted that 40 must be chosen from its list.
4. Furthermore, a lot of restaurants on ARM's list could not be selected because of field constraints such as inaccessibility or inconvenient location of sampling points, some restaurants refused to take part in the survey for various reasons, some belonged to the same chain, some had closed down, etc. The number that could be selected from ARM's list turned out to be about 70 only.
5. Therefore the 80 restaurants that were finally selected may not be in accordance with the actual distribution of restaurant types in Hong Kong.
6. The results obtained have a heavy bias towards the Cantonese seafood restaurants, and may not be truly representative of the whole restaurant trade without consideration of further adjustment of the data.

Site Sampling

7. ARM commissioned a HOKLAS (Hong Kong Laboratory Accreditation Scheme) accredited laboratory to undertake the survey.
8. The sampling was carried out by workers provided by ARM and trained by the laboratory engaged by ARM. Staff from EPD and DSD were on site to ensure that sampling was carried out properly.

9. The laboratory was found to be deficient in many aspects, including:
- poor quality of pre-sampling inspection reports on sampling point and water meter location
  - more than half of the inspection reports were not available until half way through the survey
  - inadequate field experience
  - poor and inadequate supervision on site
  - under-provision of transportation, basic equipment (e.g. sampling pump, torch) and other materials (e.g. ice, gloves, tapes, marker pens) required for the survey
  - reluctance to sample from restaurants with dirty wastewater
10. The government staff had to make up for most of the above deficiencies so that the survey could continue.

#### Abnormal Practices of Restaurants

11. The following steps were taken by some restaurants when sampling was carried out in an attempt to influence the results:
- kept water taps running for no valid reasons
  - washed refrigerators and floors
  - discharged the dirtier wastewater during the time gap between sampling
  - discharged the dirtier wastewater into the storm drain instead of through the sampling point into the sewer
  - left their dishes unwashed (even overnight)
  - arranged for unscheduled cleaning of their grease traps
  - renewed the filter sponge at their drainage inlets of sinks

- asked the government staff (apparently unaware of their identity) to avoid taking samples when the wastewater were dirty, or avoid taking in the oily and solid particles
- put up notices in their kitchens asking their staff to adopt “clean” practices during the 5 weeks of survey

### Laboratory Work

12. The samples were not sufficiently homogenized before a portion was taken for sample compositing, preparation and analysis. Magnetic stirring was used instead of the agreed manual shaking. Magnetic stirring was not sufficient to homogenize the sample. Furthermore, when there was delay in taking the portion after stirring or shaking, the lighter oily layer would float to the top, and the larger heavy particles would sink to the bottom, and hence would not be included. The middle portion that was then taken would therefore be cleaner and not representative of the sample.
13. The laboratory also used narrow mouth pipette for taking sample portions, which tended to exclude larger particles. Again, the portions taken would be cleaner and not representative.
14. The laboratory was found not analyzing its samples promptly. For the delay in analysis, the laboratory preserved its samples at pH 7, instead of pH less than 2 as required by the internationally accepted standard method. Sample deterioration due to improper preservation would in general lead to a lowering of the COD results obtained.
15. The above defects were revealed during the survey, as a result of random spot checks on the laboratory by the government. These defects were finally all corrected and the results for the last 6 days of the survey were considered acceptable.