

# **GREASE UNDER CONTROL AT SOUTH EAST WATER**



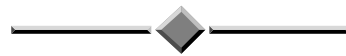
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# GREASE UNDER CONTROL AT SOUTH EAST WATER

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## ABSTRACT

South East Water Limited is a state-owned company providing water and sewerage services to 1.3 million customers in the south east region of Melbourne. One of the key management issues for South East Water was the control of blockages and spills due to build-up of fats and grease in the sewer system. In 1995 it was estimated that approximately 30% of sewer blockages were caused by fats and grease, and that 80% of these fats came from commercial businesses (that is, restaurants, fast food outlets, etc.).

In order to reduce sewer blockages, South East Water implemented a three phase Greasy Waste Program in late 1995. The first phase involved putting all commercial premises on Trade Waste Consents. Over 4,100 such consents were issued. The second phase was to ensure all commercial customers had an appropriately sized grease interceptor. Over 1,650 new grease interceptors were installed. The third and final phase was to ensure that all grease interceptors were pumped out regularly. South East Water developed and implemented its Wastelog system in consultation with the Victorian Waste Management Association to monitor and enforce pump-outs.

By 2001, the Greasy Waste Program had contributed to a 50% reduction in sewer blockages caused by fats.

## KEY WORDS

Fats, sewer blockages, commercial customers, Trade Waste Consents, grease interceptors, Wastelog.

## 1.0 INTRODUCTION

South East Water Limited is a state-owned company providing water and sewerage services to 1.3 million customers in the south east region of Melbourne. South East Water was one of three retail water companies formed by the disaggregation of Melbourne Water on 1 January 1995 (the other two companies being City West Water and Yarra Valley Water). Each of the retail companies operate in accord with a *Water and Sewerage Licence* issued by the State Government. One of the key performance standards in the *Licence* was the containment of at least 90% of sewer spills within five hours.

In order to achieve the sewer spill standard, South East Water looked at managing all potential causes of sewer spills. A major cause of spills were blockages in the sewer. Approximately 30% of sewer blockages were primarily due to solidified fats, with the remainder being due to tree roots.

Approximately 80% of the fats in the sewers came from commercial premises, such as restaurants, cafes, takeaways, etc. However, in 1995, the sewage discharges from these premises were largely unregulated. All three retail companies agreed that the risks posed by commercial premises – specifically in relation to contribution of fats – warranted a greater level of control.

## 1.1 The Greasy Waste Program

In 1995, with the aim of reducing the impact of grease in its sewer system, South East Water developed a Greasy Waste Program. The Program consisted of the following three phases, which were to be implemented sequentially:

**Phase 1** – Ensure that commercial premises can only discharge to sewer if they have a current Trade Waste Agreement.

**Phase 2** – Ensure that all commercial premises discharging greasy waste had an adequately sized grease interceptor, or equivalent.

**Phase 3** – Ensure that all commercial grease interceptors, or equivalent, are regularly cleaned out or maintained.

## 1.2 Phase 1

Between 1995 and 1997, South East Water put more than 4,100 commercial premises on Trade Waste Consents. A Consent was a simplified version of the existing Trade Waste Agreement: it specified the customer's key responsibility to have appropriate grease removal apparatus, and to adequately maintain that apparatus. Consents were issued after South East Water had reviewed the customer's application for discharging Trade Waste to sewer.

South East Water identified all potential commercial customers by a combination of checking Yellow Pages references and street-to-street surveys. Each potential customer was inspected, and if it met the criteria for a greasy waste discharge then it was provided with a Trade Waste Application. While on-site, South East Water's Trade Waste Officers would inspect and measure any existing grease removal apparatus. In over 99% of cases, if any grease removal apparatus was present it would be a grease interceptor.

Once customers had been issued with a Trade Waste Application, South East Water would follow up to ensure the Application was submitted. In accord with the *Water Industry Regulations 1995*, an occupier may only discharge trade waste if it has a trade waste agreement. Therefore, those customers who refused to lodge an application were treated as illegal dischargers, with the ultimate penalty being disconnection from the sewer system.

## 1.3 Grease Interceptors

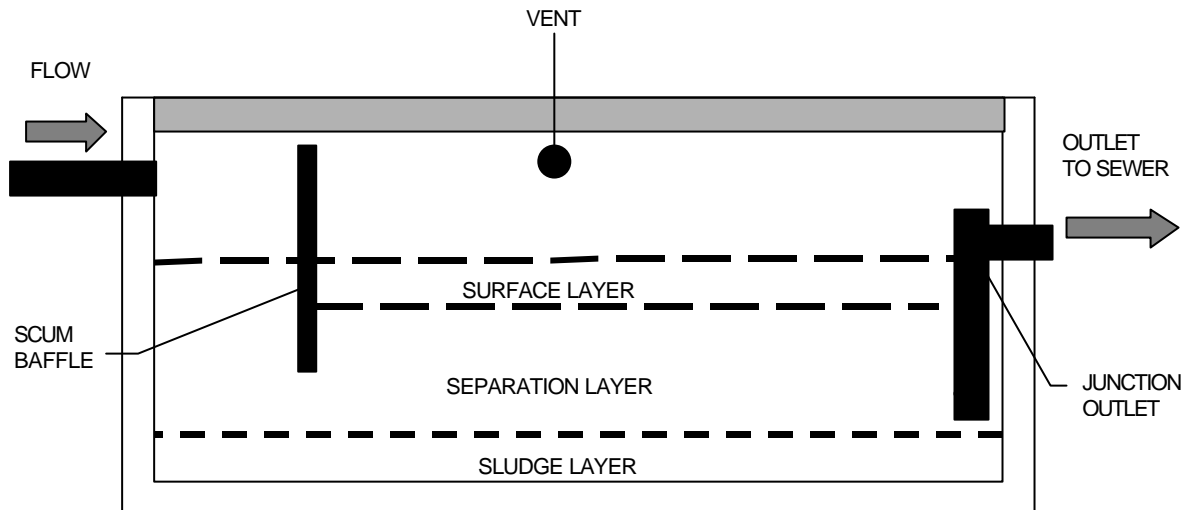
Grease interceptors are designed to cool the wastewater, reduce the inlet flow rate and allow contaminants to either settle or float out of the wastewater stream. This results in the formation of layers within the grease interceptor (surface, separation and sludge layers, Figure 1). The depth of each layer influences the ability of the grease trap to effectively retain oil, grease and sludge.

Surface layer depth is determined by the maximum horizontal velocity of water in the separation layer ( $0.03\text{m}^3/\text{min}$ ) of the grease trap (Catalano C. A., 2000). This velocity is known as the scour velocity, and is the point at which scouring of the oil and grease layer begins to occur. Modelling the performance of grease interceptors on this basis has shown that the maximum allowable surface layer depth varies according to the capacity of the grease interceptor (Figure 2).

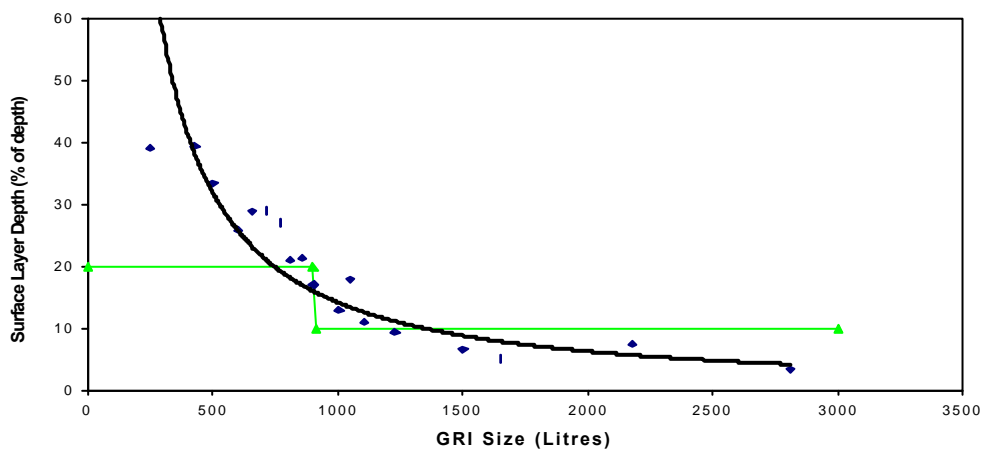
## 1.4 Definitions

- Surface Layer** - The surface layer is where grease, oil and other floatable particulates are retained.
- Separation Layer** - Is the most important layer that affects the performance of a grease trap. Grease interceptors are designed to reduce inlet flow and allow enough time for optimum separation and containment of oil/grease and solids, without any scouring.
- Sludge Layer** - The sludge layer is the solid accumulation at the bottom of the grease interceptor.

**Figure 1:** *Layers within a grease interceptor*



**Figure 2:** *Grease interceptor capacity and allowable grease accumulation*

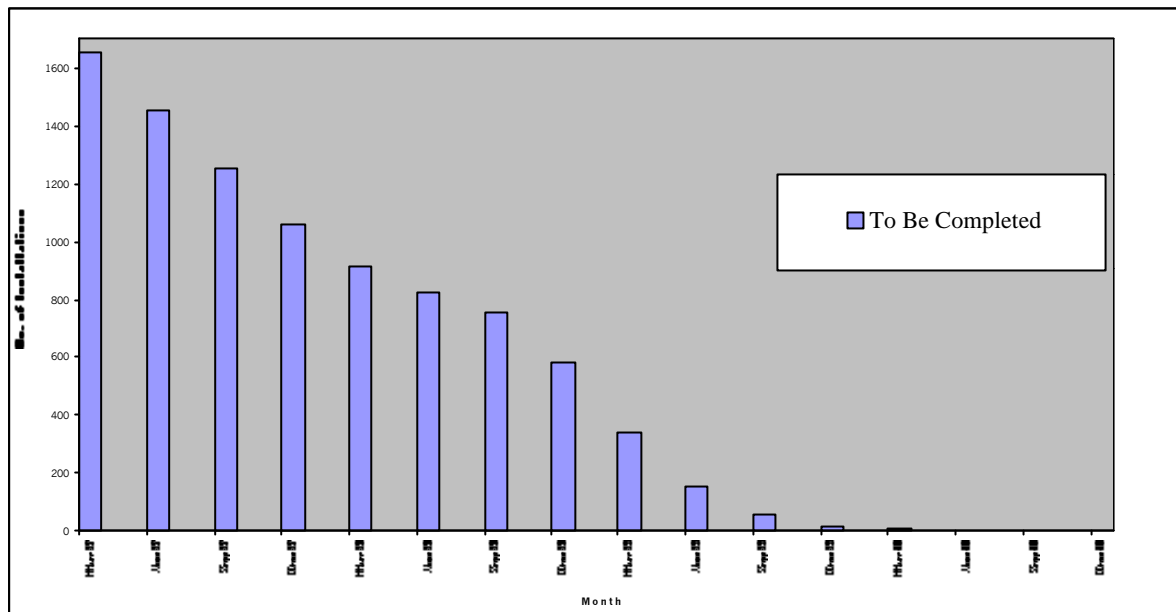


## 1.5 Phase 2

South East Water developed a grease interceptor sizing criteria based on the fixtures contributing greasy waste, and the seating capacity of the commercial business. The minimum size grease interceptor that South East Water was prepared to accept was 250 litres.

In 1997, South East Water began ensuring that all commercial customers had an appropriately sized grease interceptor. Over 1,650 premises were identified as requiring installation of a new or upgraded grease interceptor. By 2000, all these installations had been achieved.

**Figure 3:** *Installation of new grease interceptors*



### 1.6 Phase 3

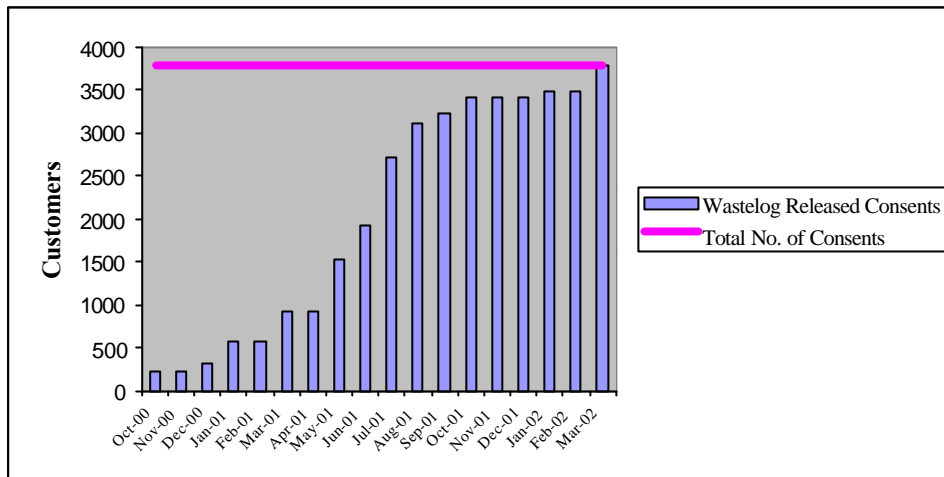
Phase 3 of the Greasy Waste Program was to ensure that all commercial grease interceptors were pumped out at an appropriate frequency. Generally, this frequency would be every four months (based on a review of national and international standards). However, some commercial customers were allowed to retain undersized grease interceptors on the condition that they were pumped out more frequently (say, every two months).

In order to keep track of the pump-outs of more than 4,000 commercial customers, South East Water developed a program called Wastelog. This was developed in consultation with the Victorian Waste Management Association, and operated as follows:

- Each grease interceptor is given a unique six digit identifier code;
- Each waste transporter also has a four digit identifier code;
- Each waste transporter was given the list of Wastelog codes for their customers;
- The waste transporters would ring an Interactive Voice Recognition system, enter their identifier code, then enter all the Wastelog codes for grease interceptors pumped out that day;
- South East Water's Trade Waste Information System (TWIS) would record a pump-out for each nominated Wastelog code, on the day the entry was recorded;
- TWIS reports, on a daily basis, all those grease interceptors that are overdue for a pump out; and
- TWIS automatically generates a series of reminder letters and actions designed to ensure the grease interceptors are pumped out.

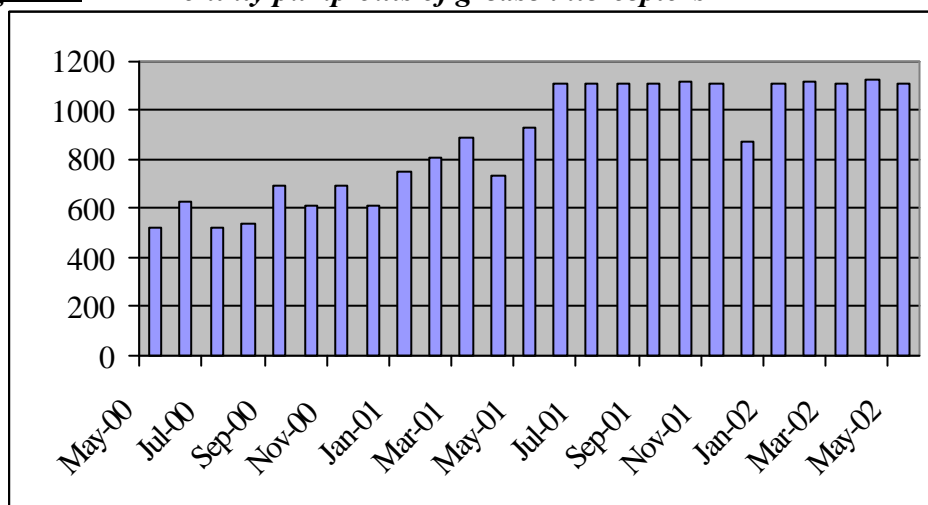
South East Water began collecting data on pump-outs in May 2000, then began enforcing pump-outs in November 2000. The enforcement component of Wastelog was progressively implemented across South East Water's area. This ensured that the work requirements of the waste transporters were evened out across the year. By March 2002, all South East Water's commercial customers were covered by Wastelog (see Figure 4).

**Figure 4:** *Release of Wastelog to commercial customers*



From May 2000 when Wastelog first began to be released to May 2002 when it covered all commercial customers in South East Water’s area, the monthly number of pump-outs of grease interceptors has virtually doubled (see Figure 5). Assuming that on average 100 litres of fat is removed with each pump-out, this increase means an additional 600,000 litres of fat is kept out of the sewer system each year.

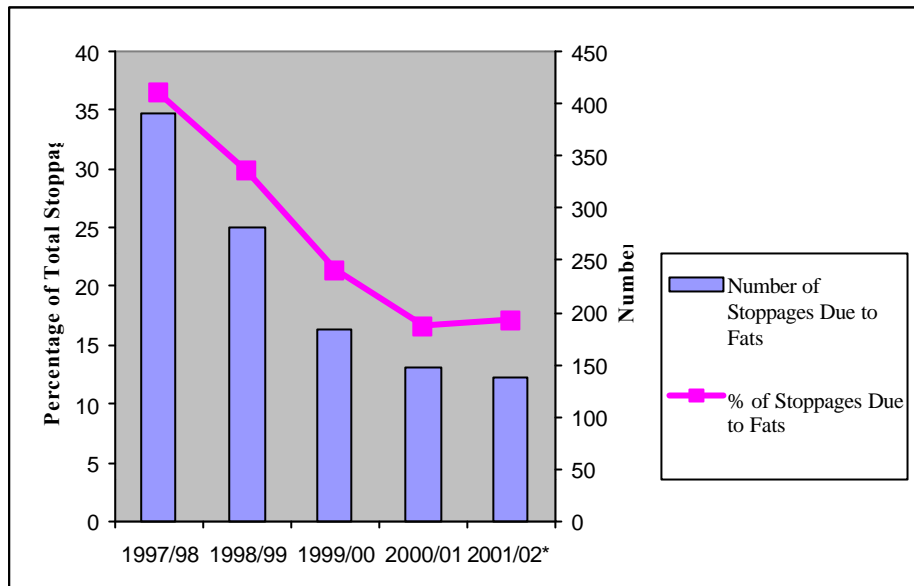
**Figure 5:** *Monthly pump-outs of grease interceptors*



## 2.0 RESULTS

Phases 1 and 2 of South East Water’s Greasy Waste Program have contributed to a virtual 50% decrease in both numbers of sewer blockages due to fats, and the percentage of sewer blockages due to fats (see Figure 6). In addition, Phase 3 – the implementation of Wastelog – has doubled the number of pump-outs of grease interceptors, removing an estimated extra 500 kilolitres of fats from the sewer system each year.

**Figure 6:** Sewer stoppages due to fats



\* Extrapolated result

### 3.0 CONCLUSION

The implementation of South East Water's Greasy Waste Program has been a success. It has contributed to the overall aim of reducing the number of sewer blockages caused by fats. There has been a 50% reduction from levels of sewer blockages due to fats, since the inception of Phases 1 and 2 of the Program. In addition, Phase 3 – Wastelog – is ensuring grease interceptors are being pumped out more regularly, leading to less fats getting into the sewer. Therefore, South East Water expects that there will be further reductions of sewer blockages due to fats.

### 4.0 REFERENCES

Catalano , C.A. *Design of Interceptor Grease/Oil Arrestor*. Trade Waste Training Manual, South Australian Water Corporation (2000).

Water Industry Regulations 1995