

# SEWER RESPONSE UNIT (SRU)



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# SEWER RESPONSE UNIT (SRU)

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## ABSTRACT

With increasing volumes of blocked House Connection Branches (HCB's), Yarra Valley Water (YVW) invested two specially fitted out, light commercial vans with the latest high pressure pipe clearing equipment designed to clear blocked HCB's and remote camera equipment (close circuit television – CCTV) to record pre and post clearance results.

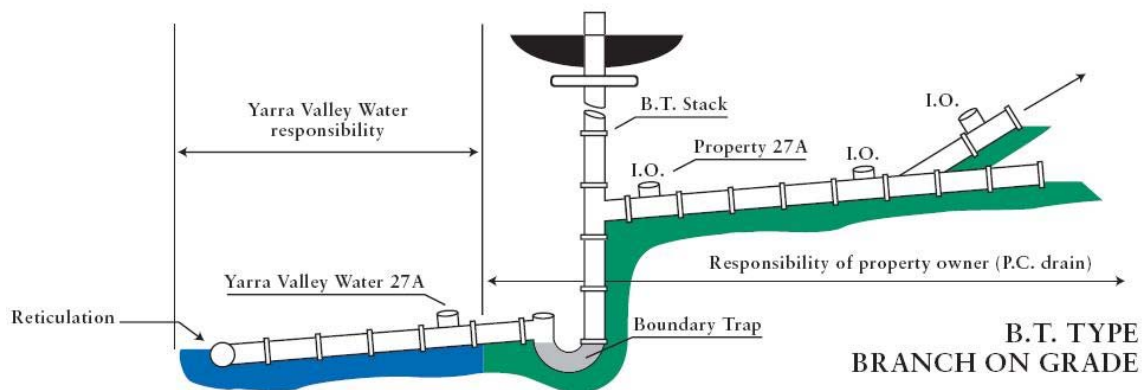
The purchase of the vans or Sewer Response Units (SRU's) followed a four week trial aimed to provide an alternative to the existing clearance methods used and reduce costs in emergency clearances and repeat blockages. The results of the trial indicated up to 85% of the emergency HCB rehabilitations (dig outs) could be avoided resulting in significant cost savings to YVW and customer service improvements.

Since their inception in September 2007, the SRU's have attended 231 jobs of which emergency rehabilitation of the HCB was able to be avoided in 72% of cases.

## 1.0 INTRODUCTION

### 1.1 What is an HCB?

Blockages can occur in the branch where the customer's sewer pipes connect to the reticulation main. This connection is known as the House Connection Branch (HCB). YVW's responsibility begins at the branch known as 27A. Everything upstream of the 27A into the customer's property becomes the customer's responsibility, known as the House Connection Drain (HCD).



**Figure 1:** *Example of a HCB and HCD*

### 1.2 HCB blockages

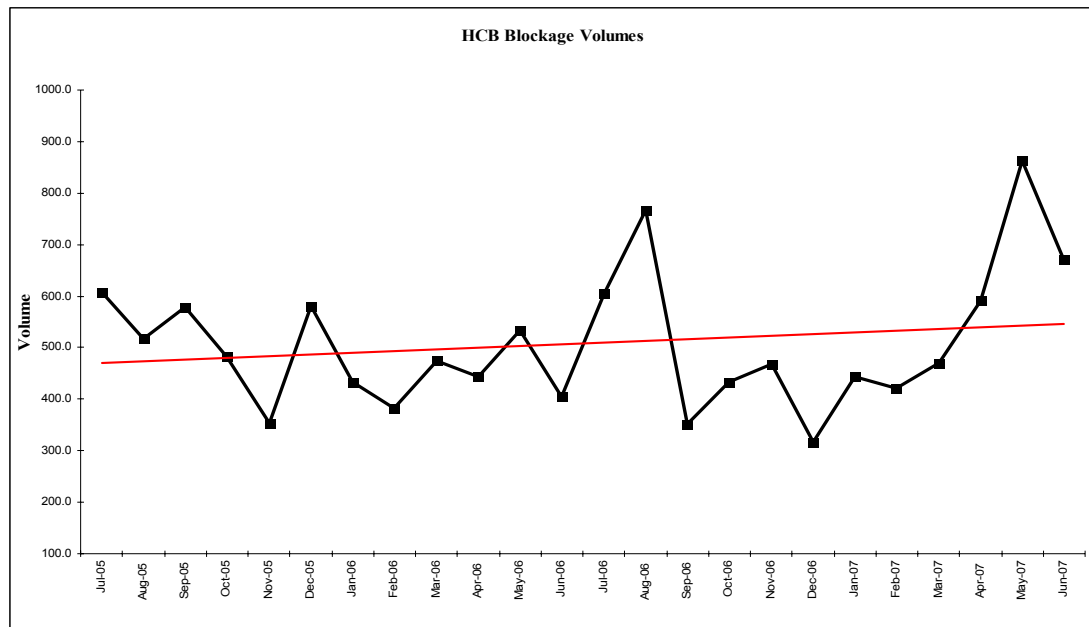
HCB blockages can be caused by a build up of silt, stones, fats, tree roots, broken or collapsed pipes and other foreign objects limiting the flow through the HCB and into the reticulation main.

YVW's service area includes significant treed areas and geology is characterised by reactive clay soils. In the continuing dry period tree roots become progressively more aggressive in finding water, increasing the number and severity of roots penetrating the sewers. At the same time the clays have contracted and shifted causing HCB's to become misaligned allowing further root intrusion and causing sewer blockages.

### 1.3 HCB clearances and dig outs

HCB clearances and dig outs generally involve crews attempting to clear the blockage using a "through the pipe" method which involves "rodding" the pipe with a sewer rodding machine. This machine performs the task of clearing the blockage but it may not completely cut and clear the pipe of all tree roots, fats and other objects. The effectiveness of the clearance is dependant on a number of variables such as the arrangement of the HCB and availability of fittings, the length of branch, the size, type and amount of roots and the size of cutting head that can be passed through the available fittings.

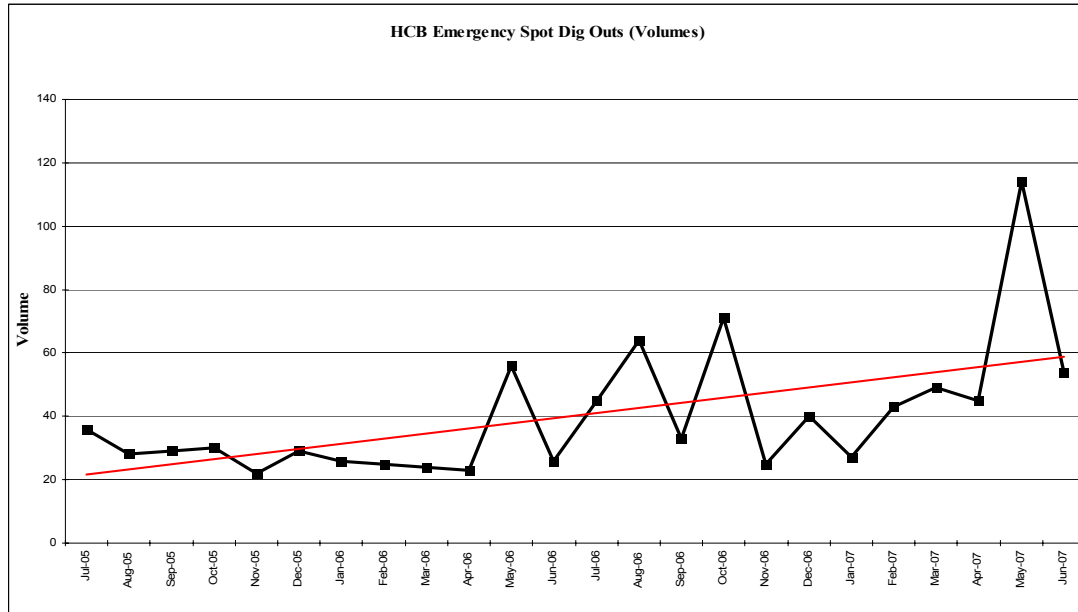
In cases where the blockage is difficult to clear or there is evidence of broken pipes, the contractor will proceed to issue a scheduled job to CCTV the HCB. This process will determine the cause of the blockage and allow YVW to assess the asset condition and arrange for any follow up rehabilitation. Where blockages are unable to be cleared using a "through the pipe" method, it must be cleared by digging it out. This decision is made with out the use of CCTV assistance and therefore may not accurately determine the best solution to rectify the HCB service.



**Figure 2:** *Volume of HCB clearances 2005/06 to 2006/07*

A dig out involves a 3 man crew, confined space conditions and an extended interruption to the customers' service. This is expensive and often involves removal of trees, replacement of fences, reinstatement of paved areas, gardens and property. The dig out will be either a spot repair or a complete replacement depending on the length and condition of the HCB pipe.

HCB blockage volumes and HCB emergency dig outs increased from 2005/06 to 2006/07 by 10.5% and 72% respectively as shown in Figure 2 & 3.



**Figure 3:** *Volume of HCB emergency dig outs 2005/06 to 2006/07*

#### 1.4 Sewer Response Unit (SRU) Trial

With the increasing HCB blockages, associated clearances and increasing dig outs an alternative HCB clearance method was trialled.

In August 2007 a four week trial commenced using a contractor’s specially fitted out light commercial van with high pressure pipe clearing and CCTV equipment called a Sewer Response Unit (SRU). The van operator was able to CCTV blocked HCB’s and get an accurate picture of what they were dealing with before attempting to clear the blockage. Once the clearance was performed, the second CCTV recording provided an accurate diagnosis of any faults including root intrusion, broken or misaligned pipes, other objects and general condition of the asset.

During the trial the van attended 20 emergency jobs where a blockage clearance was immediately required and 42 scheduled assessments, where previously cleared HCB’s suspected of having further problems required CCTV. Of the emergency jobs 85% would have normally resulted in an emergency dig out, however the attendance of the SRU prevented these. Of the scheduled assessments, 26% would have normally resulted in a dig out. It is estimated \$70K in dig out costs were saved and these results provided a strong business case for YVW to invest in two SRU’s vans of its own.

**Table 1:** *Jobs attended by the SRU during the August 2007 trial period*

| Job type | Jobs attended | Dig outs avoided | Percentage |
|----------|---------------|------------------|------------|
|          |               |                  |            |

|                      |    |    |     |
|----------------------|----|----|-----|
| Emergency clearance  | 20 | 17 | 85% |
| Scheduled assessment | 42 | 11 | 26% |

## 2.0 DISCUSSION

### 2.1 YVW's Sewer Response Unit



In September 2007 two SRU vans fitted out with specialist high pressure pipe cleaning and CCTV equipment were purchased by YVW for a cost of \$275K. Two new operators were employed and trained in the SRU's use.

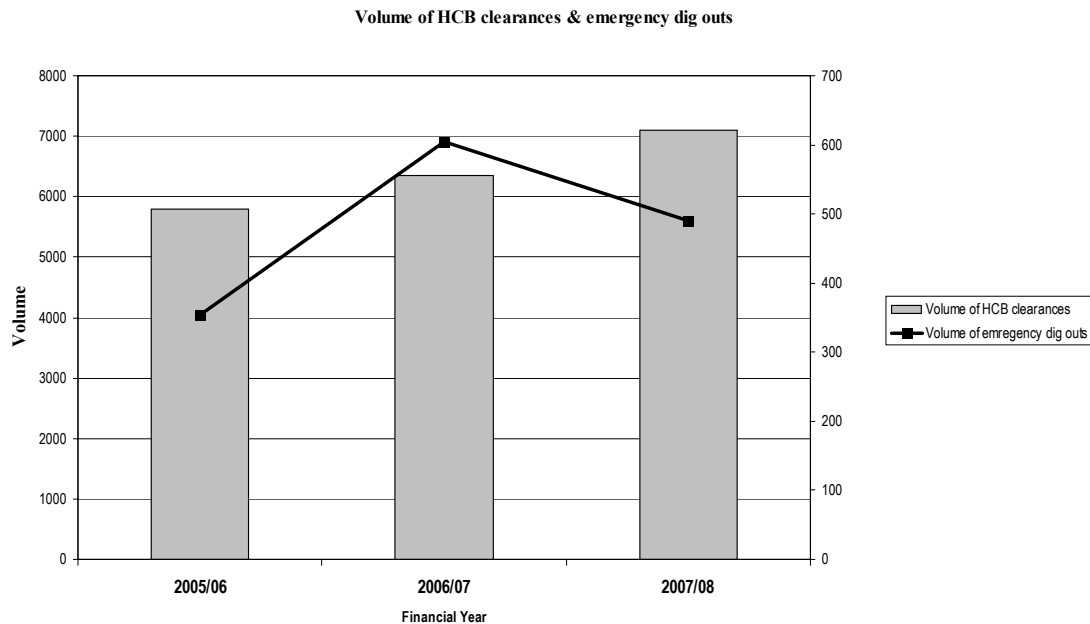
Specifications of the high pressure pipe cleaning and CCTV equipment fitted within the SRU vans were as follows:

**Table 2:** *SRU equipment specifications*

| Tank capacity | Pressure (PSI) | Water usage per minute | CCTV type            |
|---------------|----------------|------------------------|----------------------|
| 1,000 litres  | 3,500          | 45 litres              | RIDGID mini seasnake |

When the SRU attends jobs, the CCTV results are recorded on to a DVD and entered into YVW's Asset Management database. This information can be utilised when developing renewal strategies or targeting particular jobs by order of priority. The results of the CCTV also assist in future maintenance decisions, auditing, customer advice and negotiations over responsibility of the blockage. This last point is particularly important as customers and plumbers often dispute whether the pipe was cleared correctly in the first instance and whether the blockage was located in YVW's HCB or the customers HCD. With this pre and post clearance DVD recording, YVW can present the facts to the customer and plumber, therefore making it clear what has caused the blockage and where it was located. This also assists the reimbursement process for customers and plumbers when required.

The targeted jobs for attendance by the SRU's were HCB blockages which had an attempted clearance by the standard "through pipe method" that subsequently had a HCB emergency dig out recommended. Between September 2007 and June 2008 the SRU's attended 231 jobs, of which 166 dig outs (or 72%) were able to be avoided, saving approximately \$400K. The SRU program has therefore contributed to the overall reduction in the number of emergency dig outs by 19% from 2006/07 to 2007/08 as shown in Figure 4.



**Figure 4:** *Volume of HCB clearances & emergency dig outs since 2005/06*

In circumstances where a HCB is cleared with the standard “through pipe” method the current practice would involve waiting until customers experience their second blockage in the next 12 months before scheduling a planned job to CCTV the branch. This can take up to two weeks to get the recording and a further week to assess. If rehabilitation was then required, up to another three months may pass before rehabilitation is completed.

With the total time from the blockage to completion taking up to four months, there is significant benefit in time and cost savings and customer service by dispatching the SRU’s to the initial job and undertaking CCTV of the HCB pre and post clearance. The SRU’s in most cases provide an effective clearance and clean and provide an immediate accurate diagnosis of the most appropriate pipe rectification if it is required.

Of the 166 HCBs in the SRU program that would normally have resulted in an emergency dig out almost 50% were relined which avoided significant disruption to customers.

## 2.2 Future Opportunities

YVW will continue to investigate expansion and improvements to its SRU program including:

- Camera improvements in line with technological advancements providing the ability to download and store imagery digitally rather than have to rely on disk format.
- Consider CCTV of HCD’s to further assist to YVW and customers diagnose problems in the HCD.
- Target second blockages to ensure YVW pursues its strategic objective to ultimately have no customer experience more than one sewer service interruption within 12 months

### 3.0 CONCLUSION

YVW's SRU's were established to primarily reduce the number of emergency dig outs and repeat HCB blockages identifying the cause of the problem, undertaking the work and then providing CCTV footage pre and post clearance to ensure the problem does not reoccur. The SRU's provide an accurate diagnosis of the problem, avoiding the need for multiple attendances to pin point the cause of a blockage and recommend the most appropriate resolution. The SRU's provide a "one stop shop" which achieve an improved HCB clean on the "through the pipe / rodding" method and ensure there is no need to return to a job for CCTV, as it is all done during the initial site visit.

Between September 2007 and June 2008 YVW's SRU HCB clearance program has prevented 72% of cases where HCB's could have been recommended for emergency rehabilitation or dig out providing significant cost savings. Other intangible benefits include:

- Reduction in customer impact, inconvenience and site visits;
- Increase in customer service levels;
- Large reduction in scheduled jobs & backlog of scheduled jobs;
- Unnecessary confined space entries are avoided;
- Quicker response and turn around of dig out jobs;
- Efficiencies in dealing with reimbursements for plumbers; and
- Prompt and accurate electronic recording of asset condition.

Based on the performance of the SRU's thus far and the potential customer service and cost benefits, YVW will investigate the possibility of expanding its SRU fleet and improve its SRU HCB clearance program.