

# HYDRANT WATER FOR MOBILE TANKERS – A SOLUTION



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# HYDRANT WATER FOR MOBILE TANKERS – A SOLUTION

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## ABSTRACT

South East Water (SEW) has over 900 Hydrant Permit holders who take water from hydrants throughout the network for various purposes including road construction, dust suppression, street sweeping, cleaning drains and sewers, filling water tanks and tree watering.

The administration of Hydrant Permit Holders for SEW has previously been very complex and labour intensive. In addition, problems and issues associated with withdrawing water from hydrants, such as burst mains and water quality complaints were not being captured due to the inefficient approach.

A solution was needed for this growing problem. SEW engaged Australian manufacturer Aegis Pty Ltd to develop a simple, cost effective device using existing technology.

This presentation will outline the case study from issue identification and solution design, to the results of a pilot program conducted on mobile tankers with Hydrant Permit holders.

## KEY WORDS

Hydrant Permit Holders, Hydrotrak, Administration, Paper Logs, Water Quality, Solution

## 1.0 INTRODUCTION

South East Water has over 900 Hydrant Permit holders who take water from hydrants throughout the network for various purposes including road construction, dust suppression, street sweeping, cleaning drains and sewers, filling water tanks and tree watering.

The administration of Hydrant Permit Holders for South East Water has previously been very complex and labour intensive. There was also no doubt that many of the Permit holders were not complying with the permit conditions of notifying South East Water before they withdrew water from the hydrant and that they were not maintaining a paper log of the water withdrawn. The Permit Holders were also required to send the paper log to South East Water on a monthly basis for billing purposes. This approach had many draw-backs and inefficiencies, and it was difficult to control or audit the process of water being withdrawn. Paper logs were often 'lost' or 'misplaced', never completed or simply did not make it from the tanker / vehicle to SEW.

Problems and issues associated with withdrawing water from hydrants, such as burst mains and water quality complaints were not being captured. In addition the revenue from this water was unaccountable and many local residents were contacting South East Water to check if the water being taken was authorised.



An improved solution was needed for this growing problem, as SEW were uncertain how much was actually being taken, from where and by whom. SEW, through ‘us’ – Utility Services engaged an Australian manufacturer (Aegis Pty Ltd) to develop a simple and cost effective device using existing technology. The resulting HydroTrak solution also needed to be easy to install on a mobile tanker, provide SEW with real-time information when and where the water was being withdrawn, and finally eliminate all paperwork for the Hydrant Permit Holder. A web-based mapping interface was also developed to show the location of where the water was being withdrawn.

This paper outlines the SEW case study from issue identification and solution design to the results of the pilot program conducted on mobile tankers with Hydrant Permit holders.

## **2.0 DISCUSSION**

South East Water has installed Electronic Meter Stations (EMS) at outlying areas that require Hydrant Permit Holders to use an electronic swipe token to activate the device to withdraw water. It was not considered financially viable to increase the number of EMS’s for the number of hydrants scattered throughout the network.

The administration of dealing with 900 plus Hydrant Permit Holders was exhaustive and extremely labour intensive. Field audits established that Hydrant Permit Holders were not complying with the Terms and Conditions of the Permit. Manual logs recording the amount of water being withdrawn were not being recorded by the driver due to various reasons / excuses. Even when the manual logs were used by the driver, SEW was unsure if the paperwork was being submitted to the Permit Holders Office.

The audit process also established that many vehicles were being used as “dry hire” and there was a conflict between the hire company which should comply with the Permit Conditions and the person hiring the vehicle who was apparently unaware about the responsibility to record the loads being withdrawn and submit paperwork.

### **2.1 Customer Expectation**

During water restrictions and the summer period our customers expect the Water Company to manage our limited water supply appropriately.

This resulted in up to 50 weekly calls from frustrated customers enquiring why vehicles were connecting to the hydrants and what the water was being used for. Our field auditors were kept busy responding to our customers enquires. Water Companies have a responsibly to know where water is being taken from the network, if it is authorised and why the water is being withdrawn.



## 2.2 Non Revenue Water

South East Water was recording over 300,000 KL per year of water being withdrawn from hydrants. This amount is estimated to be substantially less than the actual being taken. This missing amount contributes to the amount of non revenue water that South East Water reports.

## 3.0 THE BUSINESS SOLUTION – HYDROTRAK FROM ‘us’ - UTILITY SERVICES

A solution was required to solve the problems associated with administering the Hydrant Tanker Permit Program. High-level business requirements were established for a possible solution, including:

- Automate the tanker filling recording process from the tanker to billing
- Easy to administer the overall program and manage permit terms and conditions
- Online, real-time, secure data access
- Easy to use for the Hydrant Permit Holders
- Easy to install on / in each Hydrant Permit Holder vehicle

Pre-existing technologies used in other comparable industries were assessed, however, no single device was capable of providing an effective and economical solution. The chosen device also needed to be simple, rugged and durable.

The final make-up of the HydroTrak project was a joint solution between Aegis (manufacturer of the DataCell GPRS device), ‘us’ - Utility Services (providing the IT interface for Hydrotrak) and South East Water (Web interface for Hydrant Permit Holders).

It was agreed to conduct a Pilot / Trial Project to thoroughly test and assess an initial batch of 20 DataCell GPRS units on Hydrant Permit Holder Vehicles before proceeding to a complete manufacture and rollout to the entire fleet of permit holders. In order to monitor and report on the success of the pilot and view the information in real-time, ‘us’ – Utility Services customised the existing internally developed technology called Locate ‘us’ (a GIS mapping and interface tool) to cater to data feeds from the units on the field vehicles.

This solution provided a seamless and automated solution from the push of a button on a

Tanker to the billing process for the actual Permit Holder.

#### **4.0 THE TECHNICAL SOLUTION – DATACELL GSM/GPRS (from AEGIS P/L)**

For the initial pilot project an Aegis DataCell GSM / GPRS enabled data logger was modified to request and retrieve GPS coordinates from a GPS receiver. The device is powered by its own lithium batteries (long-life) and all components are housed in a PVC container to protect it from vehicle vibration and other road hazards such as oil and grime. The PVC container was also favoured because it made the product look like it was a plumbing fitting for the truck and did not draw attention to the fact that there was an electronic device on board, it also provided installation benefits because standard, cost effective, plumbing fittings could be used to mount the device. (Refer Figure 1)



**Figure 1:** *Hydrotrak installed on Permit Holder Vehicle*

Once installed the DataCell GPS hibernates until its push button is activated by the vehicle driver. Upon activation, the device collects GPS coordinates and stores them in its memory with a time and date stamp. Immediately following receipt of the GPS coordinates the DataCell GPS sends the Hydrotrak system an email confirming that a tank fill event has occurred. A 15 minute lockout is provided to prevent duplication of filling events and systematic retry processes exist to allow for failure to confirm GPS coordinates and or the loss of communications network signal at the first attempt.

#### **5.0 THE PILOT TRIAL**

##### **5.1 Engagement of Hydrant Permit Holders**

At the commencement of the trial, it was critical to engage the support of the hydrant permit holders as the HydroTrak device was a completely different way of operating and the permit holders needed to have confidence in the system and appreciate the benefits.

The benefits were:

- Provides real time data when water is being withdrawn from hydrants
- Quick and Easy to Install on Vehicles in the Field – Minimal down time.
- There are no cables or wires than can break.
- Extremely simple to operate, Press the button before withdrawing water
- Provides a GIS map interface of vehicles withdrawing water
- Eliminates all paper work including manual log sheets
- Eliminates the need to record monthly totals of water used
- Eliminates the need to contact South East Water for an approved Hydrant Location.

- Provides electronic accounts of monthly total of water withdrawn from hydrants.

It was also important to convey that the HydroTrak device was not a GPS tracking device and would not be used to track the location of the vehicle unless the button was pushed. The device “wakes up” once the button is pressed and then goes “back to sleep” after it transmits the location of the hydrant. Some Hydrant Permit Holders were very apprehensive about the possibility of GPS tracking.

Hydrotrak doesn't record volume of the tank fill. Instead, the device is linked to the asset record management system that has all the details about the hydrant permit holder, the purpose of the permit and the volume capacity of the tanker. Every time the driver presses the Hydrotrak button, it records a complete fill of the tank. Example, A truck used for dust suppression has a 5,000 litre tank, if the Hydrotrak button is pushed, then the permit holder will be invoice for 5,000 litres of water.

The GIS map interface can also overlay the location of water quality complaints and burst water mains in real time. This has the great benefit of assessing if the withdrawal of the water from the hydrant has contributed to the operational issue. Remedial action can be taken to prevent this type of incident from occurring again. (Refer to Figure 2).



**Figure 2:** Web map showing location of vehicles and the tool tip with Vehicle details.

## 5.2 Installation of Hydrotrak

The installation of the 20 units proved to be challenging due to the large range of Permit Holder vehicles as depicted in Figure 3.



**Figure 3:** *Range of Permit Holder Vehicles and HydroTrak installation*

Vehicles' range from 18,000 litre tankers down to 1000 litre street sweepers, each requires a different bracket / fitting to install. Using the standard 90mm OD for the Hydrotrak device, various standard plumbing brackets were able to be used. This made the process of installing the units less time consuming and kept the cost to a minimum.

### 5.3 User Feedback

Hydrotrak users were surveyed at the end of the trial to gauge the success of the trial and to identify any improvements to the project. The response to the HydroTrak device was universally accepted and the elimination of all the paperwork and telephones calls to South East Water removed user frustration and was appreciated by all.

### 6.0 CONCLUSION

This trial of 20 HydroTrak devices demonstrates that a 'high tech' device that is inexpensive as well as easy to install and maintain can improve the management of water being withdrawn from hydrants. It also indicates that the amount of water being recorded is likely to increase due the simplified administration process of recording the water being withdrawn.

South East Water will be implementing the Hydrotrak system to the 900 Hydrant Permit holders over the 2009 / 2010 summer period based on the success of the trial, but will continue to monitor and report on the pilot units in the interim.

### 7.0 ACKNOWLEDGEMENTS

This project would not be made possible without the valuable contributions by the management and staff at 'us' – Utility Services and Aegis P/L. In particular, I would like to thank Brendan King of Aegis. Without his support and backing, this project would still be on the drawing board.

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