

# MAINTAINING SEWERAGE SYSTEMS IN NORTH AMERICA



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## **ABSTRACT**

Hunter Water Australia, the commercial subsidiary of Hunter Water Corporation was created to provide technical and operational services to its parent company and make available its services to Councils and water authorities, both within and outside of Australia. In doing so, the aim was to enhance the skills and knowledge of employees.

Hunter Water Australia provides its expertise to a considerable number of authorities within Australia providing engineering, surveying, water testing and environmental services and is particularly strong in setting up, up-grading and managing treatment works, both water and sewage. In North America, Hunter Water has established a strong reputation as an international leader in the field of asset management.

Hunter Water Corporation has utilized many of Hunter Water Australia's enhanced skills and knowledge in maintaining our local systems. This ensures that we keep pace with what is considered best practice both here and abroad.

Hunter Water did its first job in the United States in 1995 for the US EPA. Jobs have been done for about 20 different authorities since then.

This paper covers a job done for County Sanitation District No.1 (CSD-1) at Sacramento in California. The job involved a review of the maintenance and operations practices of field staff over a two week period. This lead on to a discussion with them about areas they could improve their work practices and save dollars.

The paper focuses not only discusses the work done at CSD-1 but also comments generally on work practices in North America and the differences we have found through working with them on many jobs. There are lessons to be learnt by both sides.

## **1.0 INTRODUCTION**

Hunter Water Australia has opened up many opportunities for Hunter Water Corporation employees to provide specific knowledge and expertise for many of their projects, using experience built over many years in the water and sewage industry.

I come from a field background initially operating plant and laying and repairing pipes, then working as a Field Supervisor, moving onto a role as an operations and maintenance trainer and finally as a Field Manager. During this time I was heavily involved in introducing and managing change within our industry.

I was given the opportunity in 2005 to visit Sacramento in California and lend my field experience to one of Hunter Water Australia's projects. It was too good an opportunity to pass up. My job was to work with field staff, look at what they do and how they do it, talk to field personnel and their Supervisors, and work with their managers. The idea was to identify areas of concern and provide alternative approaches for them to consider.

Working with their employees and managers gave me the opportunity to look at what Hunter Water has done and is still doing, and benchmark it against what was currently happening in similar utilities in North America. I took the view that they could benefit from our experiences and we from theirs. Most of my time was spent in Sacramento. However, I could draw on the experience of other Hunter Water Australia employees who had worked in other areas of North America. The message I received from talking to others was that what I had seen in Sacramento was mostly a mirror image of what was happening elsewhere (with a few exceptions). A comparison of the situation at Hunter Water Corporation and CSD-1 is provided below.

**Table 1:** *Comparison of the situation at Hunter Water Corporation and CSD-1*

<b>Hunter Water Corporation (HWC)</b>	<b>Sacramento County Sanitation District (CSD-1)</b>
Covers both sewage and water distribution and treatment including some large storm water channels.	Covers sewage collection and maintenance only.
Is a State Government owned utility run locally by an expert Board of Directors.	District set up under Californian law and Board appointed from local municipality politicians
Maintains and operates treatment works	Treatment works run and managed independent of CSD-1.
Supplies sewage collection and Treatment services to approx 500,000 customers. In addition, supplies water treatment and distribution services to approx 520,000 customers.	Supplies wastewater collection services to about 850,000 people in the urban areas of Sacramento County and some other city's within the County.
Operates and maintains a waste water collection system consisting of 4,500km of pipeline, 380 pump stations and 17 treatment plants. In addition, there are 5 water treatment plants and a distribution system consisting of 4,548KL of pipeline, 76 reservoirs and 84 water pump stations.	Operates and maintains a wastewater collection system consisting of about 2800 miles (4500km) of pipeline and over 90 pump stations
Has approximately 560 staff of which 120 are field workers.	Has approx 320 staff, of which about 150 are field workers.

## 2.0 DISCUSSION

A lot of thoughts cross your mind the first time you enter a situation like this. A foreigner entering an alien environment at a time when it was obvious to the locals change was coming. How will you be received? Will they resent a foreigner meddling in their affairs? You hear so much media hype about brash Americans. Is that what they are really like? Is the way they work and function different to us? It didn't take long to find out; once you are there you are thrown straight into the thick of it.

Thankfully and pleasantly once you get past the up front media portrayal of Americans, they are no different to you and me. They have concerns about their future, raising a family, the cost of living.

Americans have similar recreational outlets and histories to relate to. They were genuinely interested in Australia and how we lived. It was interesting to note that Americans in general seemed to know very little of anything outside their country that did not involve them.

The workers discussed freely their work processes and were very proud of what they had achieved to date. There was an underlying feeling that they knew significant change is required. However, like most people they were reluctant to give up their comfortable way of life. So, how do they “Maintain Sewerage Systems in North America”? What is it that they are so comfortable with?

## **2.1 Resources in General**

As we are all aware, America is a resource rich nation (people, money, technology, cheap petrol and Mexican labour). This becomes obvious when talking to and witnessing how they approach their every day activities. Complacency over easy access to resources is normal. In general where there is a problem to solve or task to perform, the emphasis is on the task or problem. The amount of resources used is mainly seen as necessary to reach a positive conclusion. In a lot of cases the cost is recoverable. It is simply passed on to the customer.

The materials and equipment required to do the job are purchased through a central “Mega Store” owned and run as a separate business unit by the County to service all its government offices and utilities (Police, Fire, Ambulance, Sewer/Water authorities) etc.

## **2.2 The Workers**

In many sewerage utilities employees work a roster system allowing the services to be covered 24 hours per day, seven days a week. They have work teams that perform every day maintenance tasks, and emergency teams who respond to customer complaints from a call centre.

The military influence is obvious as most Americans serve time in the armed forces. Managers are firm on discipline and usually quick to act in areas of insubordination. Many field operations managers come up through the ranks.

Their work day usually commences at a depot where they are briefed on the day’s activities and find out who their team members are. They attend a morning safety talk which usually consists of a safety video, which they know word for word, coffee and cream donuts. They do their set tasks or surveillance for the day, fill in reports on the day’s events, and report back to their supervisor in the afternoon. A lot of emphasis is put on safety and the well being of employees.

## **2.3 Depots**

Most large districts are broken up and supported by separate depots. The depots are large and are often total duplications of each other. They have fully equipped offices with their own technical, engineering, management and secretarial support. There is a depot store that is stocked via the “Mega Store” plus other miscellaneous services. The most striking aspect at each depot was the number of vehicles and other machinery. Row upon row, some used every day, others as required, and also some because they were nice to have

around just in case.

## **2.4 Vehicles/Machinery**

Most Maintenance Team vehicles are purpose built and large to cater for the excellent range of equipment kept on board. They carry equipment for just about any conceivable situation. The reason being most work is in urban areas and it reduces the delay in sending to the depot if they don't have what's required. Even temporary hired vehicles are required to be purpose built. They are often hired for a few days or weeks, remaining in the depots for months when not being used (just in case they are required) instead of off hiring them.

Some machinery also remains in depots waiting for a need. An example would be large generators waiting for a power failure to a sewer pump station (they have many large generators).

## **2.5 Maintenance Tasks**

The main maintenance tasks undertaken were:

- Sewer main cleaning
- Sewer main repairs ( classified into Road or Backyard repairs)
- Sewage Pump Station surveillance and maintenance

## **2.6 Sewer Main Cleaning**

As stated previously, Work Teams all specialized, and were totally equipped to perform the tasks within their specialist area. Sewer main cleaning was the field that interested me most and was certainly where there was room for improvement.

High pressure water jetting (Hydro Jetting) is in common use throughout North America and they are good at it. So they should be, they have been in the game far longer than Australians and have developed excellent technology and expertise. However, in Australia high pressure jetting has proven to be successful in 90% of tasks and where it is not successful you dig up and repair. We have phased out other methods and rarely see them in use to-day. Americans tend to retain their old methods and specialist crews and factor them into their maintenance schedules.

Ball cleaning, coaning, rigid rodding, eeling where all still commonly used. And people specialized in these disciplines. Cleaning sewer mains is a scheduled process in America as it is in Australia, however most American utilities keep poor records of surcharge incidents. Therefore scheduling usually related to doing it for the whole system whether required or not. There is some positive effect on problem areas by this practice but it is expensive. However they have excess work teams who when they had no scheduled work would be instructed by their immediate Supervisors to choose some mains they knew were potential problems and clean them.

An example of over-kill and throwing technology at a perceived problem was seen when Hunter Water Australia first began their association with CSD-1 in Sacramento. A request to purchase three semi-trailers with fully equipped Hydro jetting units at a cost of well over one million U.S dollars had been made by the local Operations Managers and was going through for approval. At Hunter Water's suggestion, these purchases were put

on-hold until they reviewed their cleaning methods and current equipment.

## **2.7 Sewer Main Repairs Road/Backyard.**

Once again the road crews had specialized units, truck and trailer combination rigs with compaction and road cutting equipment and they did the total task. Access to road base and hot-mix bitumen was gained on a 24/7 basis from the local suppliers depot which meant it was fresh and ready to use with no wastage.

Backyard crews often hand dug and laid down protective matting and fencing to limit their area of work and protect the customer's property. This was a quality procedure repeated by all Work Teams that I witnessed regardless of what function they were performing.

## **2.8 Sewage Pump Station Surveillance and Maintenance**

Pump Stations were similar to ours and performed the same functions. They were usually monitored 24/7 via telemetry back to a base location. The surveillance team mostly consisted of two persons with a fully equipped vehicle/truck. They would do everything from replacing pumps/reflux valves to sweeping up and removing rubbish from the sites. In addition they read and recorded meter readings.

## **3.0 CONCLUSIONS**

Australia over the last decade has made good progress in bringing out sewerage systems in line with best practice. We cannot assume we have done enough or know it all. The urge and commitment must be maintained. The opportunity to witness how other industries and systems function and benchmark your own industry against theirs is invaluable.

North American sewage utilities, with a few exceptions, could improve in the areas of asset management and record keeping. They seem to provide well for their employees. They place a high level on safety and training and the customer service is good. The skills level of employees is excellent. Local politics often has too much influence on local utilities, dictates directions and hence restricts their ability to manage efficiently.

The positive side of all this is whilst some areas in North America are still going it alone, others are starting to catch up and some good things are happening in utilities such as CSD-1 in Sacramento.

## **4.0 ACKNOWLEDGEMENTS**

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