

Problems with sewerage systems and effluent disposal in Wiluna, a remote Australian town

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Abstract

Remote and rural communities often have problems in obtaining adequate sewerage and effluent disposal systems. Wiluna, a small township in Western Australia, has inefficient, inadequate and illegal effluent disposal ponds that were designed or built to the required standards indicated by relevant legislation in Western Australian Health Act of 1911. This is an ongoing problem with it first being brought to the fore in 1999 and continuing to this present day. It is feared that further inaction will result in increased morbidity or even a mortality within this small community.

Key words: sanitation, effluent disposal, Indigenous, sewerage

Introduction

The Shire of Wiluna covers an area of some 184,000 km². The town is approximately 966 km northeast of Perth and is on the edge of the desert at the beginning of the Canning Stock Route and the Gunbarrel Highway. It is predominantly a mining and pastoral area (cattle and sheep). Weather conditions in the area are very harsh with an average rainfall of approximately 250 mm per year and extreme temperature variations with summer over 40°C and winter below freezing (SoW 2004).

At the peak of the mining boom in the 1930's the Wiluna Gold Mine was the largest in the southern hemisphere and the town had four hotels serving a population of 9000, by 1953 only 357 people remained in the area and by 1963 the population was about 90 people. In 1981, gold mining recommenced and continues today. The town of Wiluna is the main centre with a now stabilised population of about 300 including a large population of indigenous Australians. There are also a number of mining villages which takes the population to approximately 1644 (ABS 2001). Facilities in the town include a caravan park, hotel-motel, fuel, supermarket, police, hospital and post office.

The aim of this report is to highlight the problems that remote and rural areas have in getting adequate services with regards to sewerage systems and effective disposal of effluent, and to hopefully help correct this problem. The problem with Wiluna at present is that the effluent disposal ponds for the town are inefficient, inadequate, and illegal and are not designed or built to the required standards indicated by relevant legislation in Western Australian Health Act of 1911. This is an ongoing problem with it first being brought to the fore in 1999 and continuing to this present day which without fixing may in turn cause the chance of a mortality or morbidity within this small community. As Daube (2006) said, "More than 160 years after the first Western Australian legislation designed to protect the health of the community, some residents of the State still live in conditions that shame us all."

Investigation

Due to an increasing population in the township (Fig 1), the present system is unable to cope with increased effluent. Sustainability of the system was not taken into consideration when it was originally constructed. The present ponds are too close to the town which is growing and expanding. The age of the ponds and poor regulations about at this time has resulted in problems with ongoing control and maintenance of these areas. Inlet pipes are well below the surface of the ponds (40 cm) and are covered with sludge. This was observed when an acute blockage was investigated and old drawings were inspected and found to be inaccurate. When the ponds were drained so that the inlet openings were able to be inspected, a beer can was found to be blocking the opening causing great expense to the community for the works to drain and unblock this pipe (Fig 2). Risers were also inserted at the opening. This brought the cap nearer to the surface so that it would be able to be located quickly without further expense if further blockages occurred. These small things should have been done on installation.

Other solids have been found to be entering the system, which shows that the present septic tanks outlets may have been damaged. Further costs were incurred because all septic tank outlets required subsequent inspection. This sewerage concern is an acute on chronic problem which has been investigated since early 1999 and is still ongoing to this present day. Acute because of the very real problems it presents with the presence of enteric disease and intestinal worms and other health problems, increased buildings putting strain on the system. Due to the deficient walls there is a real possibility with effluent lying around and seeping through the granite soil may

present the cross contamination of waterways. Chronic because of the period that this has been ongoing for with no further upgrading or installation of new systems to provide a sustainable option for the community.

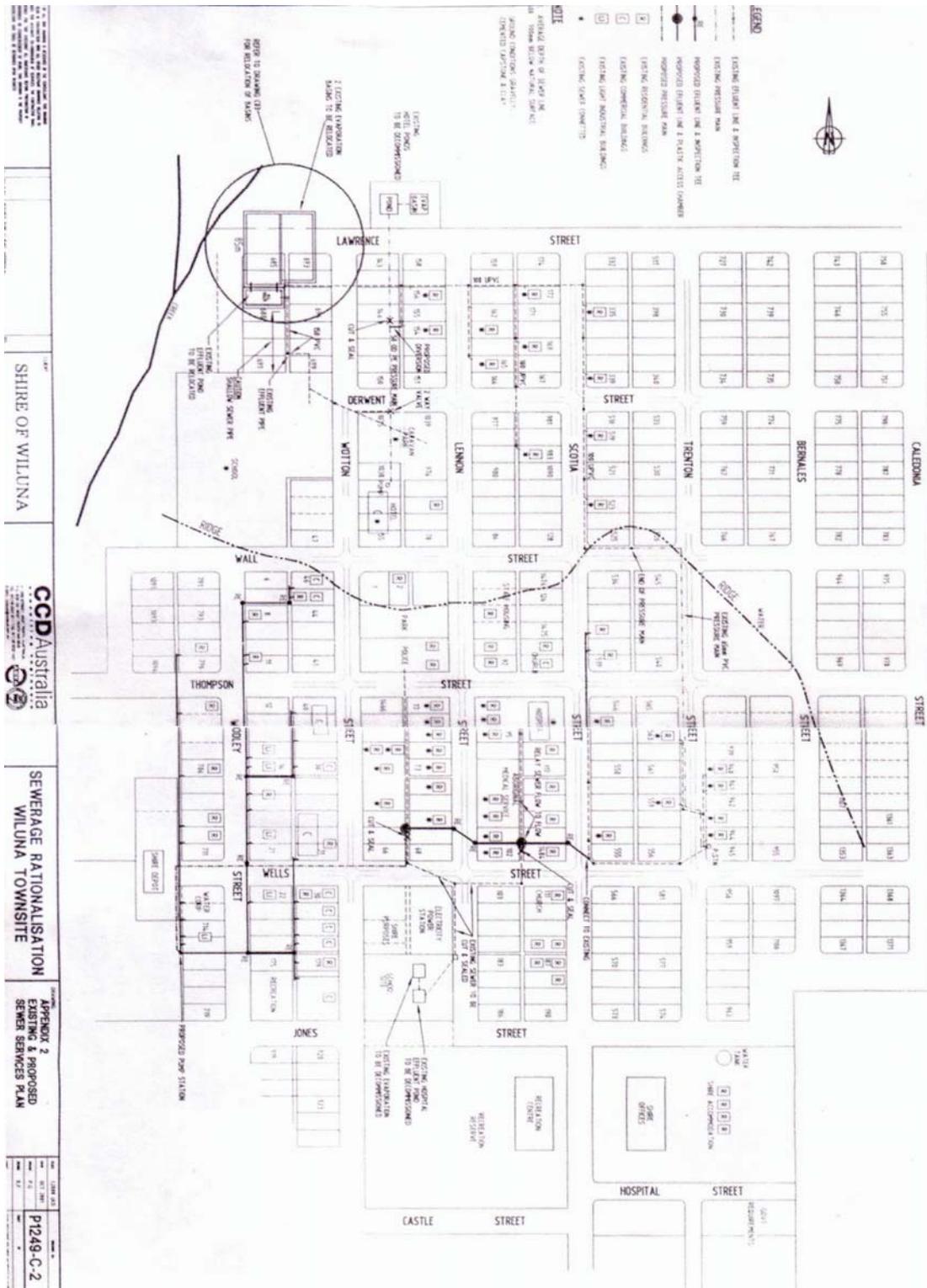


Figure 1: Map of Wiluna, showing present sewerage ponds

Wiluna has a 3 lagoon sewerage system (Fig 3):

- 1st pond (lagoon) which is adjacent to the school deals with Ministry of Housing 21 houses, caravan park 17 sites, school and Wiluna AMS Sobering Up Shelter.
- 2nd pond which is adjacent to the Main Street deals with Wiluna AMS Nursing Post/Clinic, Wiluna AMS 6 houses, GEHA 5 houses and Telstra office(1 toilet and hand basin)
- 3rd pond adjacent to residential housing in Lennon Street deals with hotel/motel



Figure 2: Inlet pipes and beer can from overflow sewerage treatment ponds (photo from Bill Atyeo, Environmental Health Officer, Wiluna).



Figure 3: Present day sewerage ponds (photos from Bill Atyeo, Environmental Health Officer, Wiluna).

There is proposed further development of:

- 15 bed aged care hostel with staff accommodation (using 1st pond)
- Duplex for medical students, HACC centre, dental clinic and 4 staff houses (using 2nd pond)

This system is too small to deal with the effluent wastes now therefore will prohibit this and any future growth. The deficient walls of the ponds have been causing the effluent to seep when overtaxed in turn causing a concern with leach drains given the soil/granite conditions of the area. Granite soils seep which in turn can cause another health problem with effluent going towards water systems especially in times of flooding which this area is prone to. All roads surrounding Wiluna usually have to be closed upon any rain due to flooding (pers. comm. (Wiluna Shire Council Office, May 2006). These issues are compounded by many factors which have their roll-on effects as enumerated below (Dyer 2000ab; Kucera 2002; SoW 1999, 2001ab, 2005; WAGov 2006).

Factors

- At present no one body will accept ownership for the responsibility of operation and maintenance of this current system and funds for the present system are worked out on a percentage basis, except for the hotel which pays for its' own.
- As with non ownership cases, these funds have not been forthcoming so council which do not use these ponds are being left out of pocket and are not willing to carry on with the burden of the ongoing maintenance.
- Due to the inadequate funding from users maintenance work has not been carried out so therefore the probability of a real health problem within the town is rising.
- From this we see the problems of the ponds at present not complying with Department of Environmental (DoE), standards and are also not licensed with the DoE.
- Due to lack of ownership the drive to get capital to upgrade and monies for maintaining and monitoring has been lacking.
- The lack of maintenance has lead to pump station and lagoon overflows becoming commonplace leaving untreated effluent lying around bringing us towards various health and environmental concerns (Fig 4).



Figure 4: Overflow area top photo, sewerage treatment ponds (photos from Bill Atyeo, Environmental Health Officer, Wiluna).

- Non-reporting of major outbreaks of instances of diarrhoeal disease means that they are working with the risk or probability of this happening without any notable proof.
- Many of the fences surrounding the lagoons have been breached in several places and therefore creating access for children who have been swimming in them.
- Fence breeches have allowed access for dogs (which have been seen in the areas) and other animals (Fig 5).
- Ponds are in close proximity to residential properties, the school and to a food premises. Many complaints have been made to council with regards to this and the malodorous smells coming from the ponds.
- Due to the close proximity to these areas and the open lagoons there is also a real and increasing risk of mosquito and other insect vector borne disease transmission.



Figure 5: Fence Breeches sewerage treatment ponds (photos from Bill Atyeo, Environmental Health Officer, Wiluna).

- Also the inter government departmental shuffle of the problem involving so many of them without any actual problem solving
- The final concern is the again non ownership of the construction of ponds adjacent to the power house which are located on a designated recreational reserve.
- The increasing size of the population and the proposed further development along with the overtaxing of the present system, and lack of maintenance could cause a major outbreak of health problems as evidence by 101 reported cases of diarrhoeal disease from 2004-2006. (May 2006).
- This is a major growing concern as without a new system the town is a ticking time bomb and with non ownership the problem could widely spread with health problems coming to the fore.
- Periods of latency have not been noted, as this problem has been an ongoing concern for several years, however due to its handling between many different departments (both at local and state government levels) and decreasing drive it does seem to come to a halt for periods.
- At present growth of the town has been limited, as evidence by one of the local mines building its own staff village outside of the town so as not to become involved with the costly set up of the sewerage system.
- Businesses in the area are resorting to Activated Treatment Units (ATU) where upon they are less reliant on the present system also making them less likely to help support a push for this concern.
- The school has had to put on hold proposed before and after school care of children due to the proximity of the area to the sewerage ponds.
- Related circumstances behind all of these other developments seems to be due to the fact that this problem has been ongoing for so long with little if any return on the matter therefore dividing the community where they really need to group together with a common goal so as to prevent a quick fix to the sewerage and effluent disposal system.

Problem Identification

The problem was identified firstly by the Shire (SoW 1999, 2001a, 2001b):

- Not having any “as-constructed” drawings for the current system.
- Current system not being designed for an expected increase in house building.
- Location of the ponds not complying with requirements from the DoE.
- No pond licensed with the DoE.
- No organisation prepared to accept ownership or responsibility for the running and maintenance of the current system.
- No one knowing who paid for the construction of the ponds adjacent to the power-house which is located on recreational ground.

Secondly from the EHO of Shire Ateyo 2001, 2002):

- Current state of ponds poses a threat to the health and well being of the community.
- Children swim in the ponds.
- Dogs frequent the ponds.
- Fences have been breached.
- Deficient walls lead to seepage when overtaxed.
- Ponds too close to the school, residential housing and food premises.
- A problem with the efficiency of the leach drains with the soil/granite conditions.
- Current system prohibiting growth of the town.

The results of investigations show that the system is non-compliant with DoE, Department of Health (Western Australian Health Act of 1911), Water Authority and the Department of Housing.

Quick fixes, often put in place, usually leave communities with a system that is adequate for the time being, but which costs a lot more upon breaking down. This results in a return to old, inadequate systems or continued use

of faulty existing systems. Remote locations, lack of ownership, and payment defaults issues make it hard to attract competent tradespeople who are required to fix or upgrade these systems. This is a very real problem within remote and rural communities with systems having been either put in place a long time ago with little or no thought to the sustainability in the future with the growth of population or trends being looked at. All too often these are the hard fix problems which go to the bottom of the pile of things to do.

Management History and Effects

This sewerage and effluent disposal problem seems to be shuffled continually through government departments with ownership seeming to be one of the difficulties encountered. Although the Shire Council has persisted in trying to push this through, a lack of capital funds appears to be hindering the process.

The community itself is trying to plan for the future with projects being looked at to extend public ownership but with continual waiting there is a feeling of being overlooked because of the rural area and just putting up with what they have got at the moment.

With projects being kept waiting public interest is dropping due to the long time frame that the getting of the new system is taking.

Timeline

- **Early 1999** – Sewerage problems were discussed with various organisations in the community and it was decided to investigate the issues.
- **September 1999** – Larger meeting was held with community groups and representatives from Water Corporation, Contract and Management Services (CAMS), Ministry of Housing and Ngangganawili AMS, (the Health Department and DoE did not attend) at which several issues were raised with regards to:
 - non-compliance of the system with the DoE
 - non ownership of the current system
 - health concerns with regards to present system (children swimming in ponds, dogs in the area and seeping of effluent)
 - efficiency of leach drains
 - no room for further community growth
 - deficiency of current system
 - the ponds vicinity to school, town, food premises

From these issues it was again decided to do more information and statistical gathering.

- **June 2000** – Lobbying of the Department of Health and DoE began.
- **August 2000** – Health Department sent an officer to investigate above claims.
- **January 2001** – Health Department report agrees and acknowledges with all the above problems.
- **March 2001** – Further meeting with the community to discuss the findings from the Department of Health report. Some ownership/responsibility was now gained:
 - Health Department offered to support the Shire.
 - School offered to assist with maintenance and running of the ponds but would not assist with capital. They are also running a health programme within the school.
 - Ministry of Housing would contribute towards maintenance but once again not capital.
 - The Shire Council would evaluate its' position with regards to maintenance and conduct a feasibility study with regards to a new full sewerage scheme or a more appropriate effluent disposal scheme. (Qualified and accredited engineering companies tenders were prepared, discussed and finalised and CCD were employed for this.) Unfortunately Ansett Airlines fell over and council had to pay out monies for the above and therefore no further progress was made.

- **July 2001** - A major meeting was held at Grace Vaughan House, Shenton Park with all Government Departments (pertaining to the problem) and Shire of Wiluna representatives present. The Department of Health presented all problems and 4 options were presented:
 1. Continue with the 3 existing ponds
 2. Consolidate 3 ponds into existing large pond system next to school
 3. Consolidate the systems into a new system further from the present town development
 4. Replace the pond systems with 3 below ground disposal methods or package plants

Several issues were discussed:

- Options 2 and 3 were supported with the main aim that the ponds needed to be combined and moved from town with option 2 providing the initial benefit whilst funding obtained for option 3
- Council would maintain the systems and premises using them would pay costs
- Need for decisions on who would manage the planned systems, needs assessment and design, land issues, ownership and funding.
- Concerns about the school with regards to the proximity and the schools home economics rooms, canteen and breakfast programme with proposed after school programme also in the pipeline.
- Capability of ponds to accept all the waste from the town.
- Department of Education and Housing and Works relinquishing the present infrastructure.
- Effluent reuses requiring further expense due to maintenance, disinfection and monitoring costs.
- Total option costs.
- Department of Health to prepare further briefing to be taken to Cabinet.

Conclusions were:

- Phased introduction of Option 2 moving towards Option 3
- Survey of the town and consider the use of the existing infrastructure
- Ove Arup will assist the shire with the revised survey and DoE, Department of Health and the Office of Water Regulation to view specifications
- Department of Education, Department of Health- Office of Aboriginal Health and the Shire have agreed to contribute towards survey
- Department of Health will take matter to cabinet
- Department of Education, Housing and Works to formalise advice about relinquishment of infrastructure
- Office of Water Regulation and DoE will write to the Shire with regards to the status of the current sewerage disposal arrangements
- **September 2001** – Results of meeting reported to Shire Council.
- **October 2001** – CCD Australia conducted survey and full report submitted (not accepted by the Water Authority).
- **May 2002** – Further meeting at Grace Vaughan House, Shenton Park and updates received with regards to any progress being made.
- **June 2002** – Wiluna Council updated.
- **September 2002** – Green light given for Water Authority to proceed and to take over the project and provide a new or revamped sewerage scheme for the town. Wiluna Council updated.

It appears that with every move forward towards a new system there seems to be two steps back.

The planning is all in place but now the community has been left to try and raise the capital needed for the project to continue forward with minimal financial assistance from the government departments that state that the system is not up to the regulatory standard that it should be.

From this date an anticipated works programme has been received, the ponds have been de-sludged and the infrastructure flushed and cleaned to assess current system to see if it was able to be used but nothing further has been started. It was anticipated that this problem would be fixed and the new system up and running in 2006.

Outcomes

The probable outcome will be that with the agreed phase of consolidating the ponds into the existing larger pond system next to the school, eventually Wiluna will receive a new compliant sewerage system and means of effluent disposal, even though for the time being it will remain unsatisfactory due to its proximity to the school.

It will require the persistence of all bodies involved along with gaining an injection of capital to obtain the best outcome of a new sustainable system that is further removed from present and future development.

The lasting damage is that it is now 2006 and the new systems have yet to be implemented, so Wiluna is coping with continual maintenance of the old system and all its associated problems. The way things stand it has been extremely lucky that no mortality or morbidity has arisen.

The Water Authority has taken some ownership of the problem but has yet to present the developments of this to the local shire council, yet again stalling the progress and with no information given to the people at ground level so that they are able to help take ownership of the outcome.

As the Water Authority has yet to present their case the Wiluna people are unable to take ownership, therefore will it provide all they need and are they able to commence their market garden, are people able to learn the skills needed to run and maintain the new system, is new development being catered for and overall is the project going to be a sustainable one.

There is a feeling in the community of some worthlessness due to the time and effort that these people have put towards getting a new system along with the feelings of frustration due to people not willing to take ownership so it seems that with each step forward there is some sort of hurdle to overcome.

This in turn reacts with social effects of not being able to adequately increase housing and further development in the community so effects all aspects of the community.

Can you really put a cost on these effects because this becomes the underlying problem which can lead to further health costs in the community so without this project going forwards things in Wiluna may become costly healthwise.

Resolution

- The community of Wiluna has been presenting this problem now for some years and slowly some ownership is taking place.
- The local council have agreed to maintain the present systems under an already presented user pays agreement which will be of some benefit.
- The new planned system needs to look towards growth of the area and sustainability for the future.
- Decisions need to be made as to who will manage the new system and whether people within the area can be taught this so as to promote further skills and education.
- Land issues need to be discussed with local owners and council as to whether the new system will be in a culturally correct area and culturally correct throughout the town.
- Education programmes and good hygiene practises need to continue in the school system so that children are aware of the dangers of handling or coming into contact with sewerage.
- The resolution of these problems depends on many things, firstly the working of this problem from the grass roots with community involvement right through to the big governmental departments.
- Ongoing open discussion between the Shire and all agencies involved in any decision making areas with regular open feed back to the town people.
- Local government needs to set out some regulatory requirements and issue work orders where necessary to have faults fixed or maintenance carried out when required.
- All avenues need to be investigated to force the present system to be closed so the implementation of a new system can be bought forward and installed.
- Mosquito/vector management processes need to be put in place at present time.
- Looking at effluent reuse within the community with costs of maintenance, disinfection and monitoring.

- Approaching all departments involved with regards to any funding that they are prepared to put forward, these departments include: Department of Health (Environmental Health Branch and the Office of Aboriginal Health), Office of Water Regulation, Water Corporation, Shire of Wiluna, Midwest Development Commission, Department of Indigenous Affairs, Department of Housing and Works, Department of Local Government and Regional Development, Aboriginal and Torres Strait Islanders Corporation, Department of Environmental Protection, Government Employees Housing Authority and Department of Land Administration.
- Relinquishing of any previous ownership to allow the project to take place.
- Checking whether the availability of waste water from the project with regards to supporting a market garden which will both give employment opportunities for employment along with the provision of fresh food.
- People of Wiluna have decided they wish to establish a garden with seed collection, revegetation, growing and harvesting desert timber, market gardening and redeveloping a citrus orchard property, plans which will be able to move forward on the commencement of this project.
- Plans for the manufacture of concrete drill hole plugs are also being discussed.
- Incorporating features into the works to provide more usage for wastewater.

Overall Wiluna appears to be heading in the right direction, but this needs to be sooner rather than later before a potential mortality or morbidity occurs.

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