

ACCREDITATION OF ON-SITE WASTEWATER TREATMENT SYSTEMS - INSTALLATION & MAINTENANCE PERSONNEL

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Abstract

Currently in Australia there is a variety of competency requirements for installation and maintenance personnel of on-site wastewater treatment systems. These range from no formal requirements to legally required successful completion of set study programs with formal assessment requirements. A review of the various state regulatory authorities' requirements has been undertaken. This shows that a nationally recognised accreditation course for on-site wastewater installation and maintenance personnel is something to aim for.

A nationally consistent approach with mutually acceptable educational programs that cover all forms of on-site treatment would have benefits for the on-site wastewater treatment industry, the regulatory authorities, and the final owner of the wastewater treatment system. Uniform expectations would assist in ensuring environmentally safe treatment and disposal / reuse of the treated wastewater.

Keywords

accreditation, installation, maintenance, mutual recognition, on-site treatment systems, regulations

1 Introduction

1.1 High Failure Rates Concern Local Government

On-site / decentralised household wastewater treatment systems provide a high level of public health and environmental protection when properly designed, sited, installed, operated and maintained. Unfortunately there is strong evidence that a large proportion of the systems currently in use do not adequately protect surface and groundwater quality, often due to poor management of systems after their installation. Unless there is sewage backup into the building or surfacing of effluent on the ground surface, it is generally assumed that the system is working properly (Linahan, 2001).

1.2 Regulation in U.S.A.

In United States of America, approximately 25 percent of the population rely on on-site wastewater treatment systems and almost 40 per cent of new developments are fitted with on-site wastewater treatment systems (USA, 1997). There are legally required accreditation standards for a wide range of personnel involved in the USA on-site wastewater industry. In various states these include certification for inspectors, designers, environmental scientists, engineers, installers, constructors, soil evaluators, geologists, mechanical on-site wastewater treatment system maintainers, pumpers (desludgers), and operators. This is regulated and managed at a state level across the USA. It has been reported to USA Congress that, where properly managed, on-site and decentralised wastewater treatment systems do provide adequate protection of public health and environmental quality (USEPA, 1997). Conversely, areas that do not have appropriate regulatory and management controls have high incidents of septic tank systems failure

1.3 Competency Requirements in Australia

Snapshot surveys carried out in various parts of Australia have found similar results to those performed in the USA. One survey indicated that at least fifty percent of on-site wastewater treatment systems were malfunctioning to some degree. The main contributing factor of these results was believed to be that the on-site treatment systems were not correctly installed or maintained and serviced.

A recent survey by EPA (EPA Victoria, 2001) showed that municipal environmental health officers are concerned that effluent originating from domestic on-site systems maybe contaminating waterways, stormwater drains, water storage dams and groundwater. These concerns were prevalent throughout Victoria. Other concerns included an increase in the population of insects and odour from the inappropriate management of on-site wastewater treatment systems.

The survey also showed that a large proportion of on-site systems had not been installed or maintained correctly by plumbers and other personnel. There were no quality control systems or accreditation standards in place to encourage a high level of reliability in the results of service technician reports. The lack of an accreditation standard for installation and maintenance personnel was a major obstacle hampering the correct operation of on-site systems.

Currently in Australia a variety of competency requirements for installation and maintenance personnel of on-site wastewater treatment systems exist. These range from no formal requirements to legally required successful completion of set study programs with formal assessment. A review of the various state regulatory authorities' requirements has been undertaken and the results are shown in table No.1.

The number of septic tank systems in Australia has been steadily increasing over the past few decades. In 1986 it was reported (Patterson, 1994) that there were 835,000 people in Australia who relied on septic tanks, while a further 65,000 used other direct methods such as deep pit latrines (Patterson, 1994). This gives an overall population of 900,000 relying on non-reticulated wastewater treatment systems. The 1986 Australian Census (Australian Bureau of Statistics, 2000) lists a total Australian population of 15,602,156 who occupied 5,187,422 private dwellings (Australian Bureau of Statistics, 1986), an average of three persons per private occupied residence. This correlates approximately to 5.77% of the population utilising on-site wastewater treatment systems in 1986.

Table No.1 shows that in 2001 there are an estimated 1 017 964 on-site treatment systems in Australia. This correlates to an estimated 3 155 688 million people in Australia relying on on-site wastewater treatment systems (3.1 people per residence – ABS June 2000).

The estimated numbers of on-site treatment systems in the table No.1 does include, in some jurisdictions, both commercial and domestic premises. The proportion of commercial systems in all jurisdictions is minor, compared with the number of domestic systems. The statistics have been gathered from the responsible government departments as estimates, as the Australian Bureau of Statistics advised that they do not have statistics on the number of unsewered premises or on-site treatment systems for non indigenous people in Australia.

Homeowners often have no idea their on-site system needs maintenance until there is a major failure. Having a formalised accreditation program and a regular inspection and maintenance regime for systems would greatly increase the effectiveness of treatment and longevity of the whole on-site system. Regular maintenance reports could also be expected to increase the knowledge and interest level by the owner of how the treatment system should be managed by the occupants of the site. It is well documented that a properly installed and maintained system prolongs the life of the absorption trenches and / or irrigation area (EPA 1996).

TABLE 1: On-Site Wastewater Treatment Systems in Australia (June 2001)

Area	Estimated Number of On-Site Systems	Max Generic Design Approval	Influent Source	Regulatory Body Approving On-Site Systems	Population of Jurisdiction June 2000	% Popul. Served by On-Site Systems
Victoria	250,000	5000 L/day hydraulic design	Domestic & commercial(200 L/day /person EP)	EPA	4,765,856	16.3%
NSW	300,000	2000 L/day	Domestic only 200 (L/day / person EP)	NSW Health	6,463,455	14.4%
South Australia	75,000 incl. offsite effluent treatment	5000 L/day 900 L/day/ residence	Domestic & commercial 150 (L/day/person EP)	South Australian Health Commission	1,497,634	15.5%
Queensland	200,000	4000 L/day up to 20 EP	Domestic & commercial 200 (L/day/person EP)	Dept of Natural Resources	3,566,357	17.4%
Western Australia	125,000	Single dwelling (8 persons) or other development up to 540 L/d	Domestic & commercial 2 bedrm or less 141 L/p 3 bedrm 127 L/p 4 bedrm 103 L/p	Health Department	1,883,860	20.6%
Tasmania	57,764	100,000 L/day All on-site disposal systems	Domestic & commercial	Department of Infrastructure energy and Resources	470,376	38%
Northern Territory	10,000	1500 L/day 600L/day/bed Remote indigenous	Domestic & commercial up to 5 bedrm 300L/day/ bedroom – Non indigenous	Territory Health Services	195,463	15.9%
ACT	200	All on-site treatment systems	Domestic & commercial	ACT Health	310,839	0.2%
TOTAL	1,017,964				19,153,840	16.5%
					÷3.1 = 6,178,658 households	

2 Accreditation Requirements

The on-site wastewater industry in Australia has a range of different requirements to meet, depending on the state or territory the on-site system is to be installed in. The development of the Australian and New Zealand Standards in this subject area has highlighted the different level of acceptability and requirements in Australia. A summary is presented in Table 2.

The two most common reasons why these systems fail to meet the necessary level of treatment and achieve stated performance goals are improper system selection/siting and the lack of necessary maintenance and servicing. In a majority of cases, the homeowner is not aware of the malfunctioning of the system or major failure until it becomes catastrophic. In many areas, the local authority cannot identify all systems within the service area. (Rubin Hudson et al 2001)

Table 2: Australian Agencies Accreditation Requirements (May 2001)

Area	Installation	Service	Pumpout Desludging	Auditing	Land Capability Assessment	Design	Site Selection
Victoria	No Plumber to connect	No	No	No	Recognised Professional	No	No
NSW	No	No In development process	No Owner issued licence to operate system	No In development process	No In development process	No	No
WA	No	No	No	No	No	No	No
Tas							
Qland	Registered plumber	Yes Plumbers & Drainers Board	No Prescribed waste	No	Yes*	No	Yes
SA	Registered plumber	No	No Prescribed waste	Yes Independent expert status may be removed	Engineer Recognised professional	No	DHS & Local Govt
ACT	Plumber	No	No	No	No	No	No
NT	Rural areas around major towns – licensed plumber, Remote communities – no requirements	No	No	No	No	No	No

* This accreditation requirement is not yet formally accredited by Queensland Department of Natural Resources, but is often required by local government councils before site suitability can be determined.

3 Proposed Accreditation in Victoria

The Victorian Environment Protection Authority is developing an accreditation course for personnel involved in the installation, maintenance and servicing of all on-site wastewater treatment systems of 5000 L or less daily design hydraulic capacity. This course has been in response to local governments' environmental health officers and the industry's concerns over the large number of systems incorrectly installed and irregularly or not correctly maintained.

The course is proposed to provide training in the installation and servicing of all systems including waterless composting systems, aerated wastewater treatment systems, traditional septic tanks, sand filters, vermiculture systems, reed beds and electro-flocculation. It is proposed that the course will cover all the competencies required by the Queensland Accreditation course and gain National competencies under the TAFE system. A committee consisting of representatives from key industry manufacturers, the Plumbing Industry Commission, TAFE, the Australian Institute of Environmental Health and EPA has been formed to ensure the course covers all possible aspects within its time constraints.

Once the development of the course is finalised, approved by the EPA and is offered for delivery, it will be a requirement of approval of systems, that they can only be installed and maintained by accredited persons.

Enforcement of this accreditation will be a requirement on every Certificate of Approval of an on-site wastewater treatment system approved by the EPA for use in Victoria. Local government officers will ensure this requirement is met via conditions on a permit to install and operate the on-site system.

4 Conclusion

Approximately 16.5% of the Australian population rely on on-site wastewater treatment systems. The increasing number and density of these systems, and their high reported failure rate, indicate they will pose greater public health and environmental risks, unless action is taken to improve their performance. Improved installation and maintenance procedures would significantly reduce these risks.

A nationally consistent approach with mutually acceptable educational programs that cover all forms of on-site treatment would minimise these risks, and have benefits for the on-site wastewater treatment industry, the regulatory authorities, and the final owner of the wastewater treatment system. Uniform expectations would assist in ensuring environmentally safe treatment and disposal / reuse of the treated wastewater. Thus, a nationally recognised accreditation course for on-site wastewater treatment system installation and maintenance personnel is something to aim for.

A number of surveys and general reporting by environmental health officers in Victoria and other parts of Australia, demonstrate that on-site wastewater treatment systems do not currently deliver good environmental outcomes in a high proportion of circumstances. Other surveys have shown that septic tank effluent contributes to environmental pollution, and potential risks to public health (Sinclair Knight Merz, 1996). On-site systems, no matter how simple, need routine inspections to provide sustainable long-term service. The inadequate, piecemeal current approach to the installation, maintenance, servicing and operation of on-site wastewater treatment systems has undoubtedly contributed to unacceptable performance levels. Surveys have demonstrated that a major reason why systems fail is lack of correct management by the occupier of the premises, lack of correct maintenance and servicing and faulty installation.

Nationally recognised accreditation for the installation and maintenance of on-site wastewater treatment systems is recommended, to improve their performance and hence achieve the sustainable protection of public health and the environment that we are all striving for.

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