

INCEPTION AND IMPLEMENTATION OF TWO COURSES FOR ON-SITE SEWERAGE FACILITIES

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Abstract

The Domestic Wastewater Treatment Plant Course was first introduced into Queensland in 1997 to meet the requirements of industry and local & State Government. Since then those requirements have been embodied in the Interim Code of Practice For On-Site Sewerage Facilities. The Code requires that all service persons servicing treatment plants must be the holder of an approved license or restricted license as required under Section 16 of the Sewerage and Water Supply Act.

The course was designed by the treatment plant industry to reflect the essential elements in the training of personnel so that all aspects of plant maintenance were covered in accordance with industry standards and government legislation. The following subjects make up the 52-hour course: TIL006 Domestic Wastewater Industry – Codes /Acts, TIL007 Communication for the Domestic Wastewater Treatment Industry, TIL008 Workplace Health & Safety, TIL010 Basic Principles and TIL011 Field Sampling and Analysis of Domestic Wastewater.

The Site Assessment and Design Course for On-site Sewerage Facilities was first introduced in Queensland in 2000 to meet the requirements of Queensland legislation, which is embodied in the Interim Code of Practice for On-site Sewerage Facilities. The Code requires all site evaluators/ soil assessors to have completed the appropriate accredited training program. This course is the approved course and is made up of two major components, The Basic Principles Course, which is the necessary prerequisite to The Site Assessment and Design Course. The Basic Principles Course is a 24-hour course consisting of some of the components of The Domestic Wastewater – Treatment Plant Course that are essential to the understanding of effluent disposal for design purposes. The Site Assessment and Design Course is a 40-hour course consisting of site assessment, soil assessment, desk-top study, selection of on site sewerage facilities and designing and sizing of land application areas.

1 The Domestic Wastewater Treatment Plant Course

1.1 Course Inception

Major industry and government stakeholders recognised the need to educate service personnel in a statewide-accepted course. This need arose due to concerns regarding inadequate performance and maintenance of domestic on-site wastewater treatment plants and subsequent risks to community and the environment.

In 1997 a Course Advisory Committee was established to coordinate writing of a curriculum document and implementation of the course. The Course Advisory Committee comprised the following stakeholders to ensure representation across all areas of the industry:

- Local Government
- Manufacturers
- State Government (DNR)
- Plumbers and Drainers Licensing Board
- Independent Service Personnel
- Education

The Course Advisory Committee determined that the course should be accredited nationally and the course has now been placed on the TAFE National Register. The outcome level for students is AQF Level 2 (Australian Qualifications Framework).

1.2 The Five Key Areas Identified by the Course Advisory Committee

The Advisory Committee stakeholders held in-depth discussions as to the contents of the curriculum and to ascertain the required amount of course time to be devoted on each learning outcome. It was determined that the five major learning outcomes be:

TIL006	Domestic Wastewater Industry-Codes/Acts	12 hours
TIL007	Communication for the Domestic Wastewater Treatment Industry	6 hours
TIL008	Workplace Health and Safety	10 hours
TIL010	Basic Principles	16 hours
TIL011	Field Sampling and Analysis of Domestic Wastewater	8 hours

Although the Committee readily agreed upon the major learning outcomes, it is interesting to note that the allotment of hours to each learning outcome generated the most discussion. I believe that this illustrates each of the stakeholders' areas of expertise e.g. local authorities placed strong emphasis on industry-codes and acts, while manufacturers and service personnel placed emphasis on basic principles and field sampling and analysis.

One exception to this was the workplace health and safety learning outcome. All stakeholders recognised that students may be new entrants into the industry/workforce and therefore as per Queensland Workplace Health and Safety Act it is necessary that students undergo a site safety induction and have a sound understanding of the safety issues with which they could be confronted.

1.3 Major Course Objectives

- **TIL006** - Service Personnel understand the legislative framework and guidelines in which they work including: the standard sewerage law, AS/NZS1547:2000, Interim Code of Practice for On-site Sewerage Facilities and Local Government Policies for Wastewater Management.
- **TIL007**- Service personnel are able to communicate problems and solutions with homeowners and local authorities including effective upstream management strategies and service reports.
- **TIL008** – Ensure health and safety obligations to service personnel, homeowners and the community are met, including: a site safety induction, bites and stings, biological hazards, chemical hazards, electrical hazards, confined spaces, and environmental health and safety issues with regard to the impact of wastewater on the environment.
- **TIL010** - Service personnel possess a sound understanding of the effective operation and service requirements of domestic wastewater treatment plants, including:
 - Characteristics and components of domestic wastewater;
 - Conditions for growth of anaerobic and aerobic bacteria;
 - Conditions for suppression of growth of bacteria;
 - Water quality parameters:
 - Concentration
 - Suspended solids
 - pH
 - Pathogenic organisms
 - Organic matter
 - Clarity
 - Dissolved oxygen
 - Residual chlorine

- Treatment Processes
 - The different types of treatment processes including: septic tanks, aerated wastewater treatment plants, sand filters, bio-disks, and more recently wet composting systems
 - Understand control/correction concepts for each process
 - Advantages and disadvantages of each process
 - Occupational health and safety requirements
- Land Application – Piping Installation
 - Appropriate material to be used
 - Correct installation methods
 - Effluent disposal outlet methods
 - Vegetation of land application area
 - Safety
 - Soil classifications
- **TIL011** - Service Personnel gain an understanding of testing and sampling techniques required for ongoing monitoring of satisfactory performance of domestic wastewater treatment systems:
 - Commonly used tests – pH, dissolved oxygen, free residual chlorine, settleable matter, clarity
 - Operating and maintaining testing equipment
 - The importance of testing and water quality
 - Sampling procedures and labelling requirements

1.4 Course Eligibility

One of the key issues that the Course Advisory Committee discussed was course eligibility. This involved a range of issues including:

- should homeowners be permitted to service their own plants?
- how would local authorities enforce an ongoing standard of high workmanship?
- would restricting entry to the course infringe on competition policy?
- if service personnel fail to meet an acceptable standard of workmanship how would they be stopped or made to improve?

The Committee concluded that entry should be restricted to licensed drainers and those employed directly in the domestic wastewater treatment industry. Licensed drainers are required to complete the course and receive an endorsement on their licence. New entrants into the Industry are to keep a logbook for a period of six months to demonstrate their work experience. At the end of the six-month period and with the successful completion of the course, students can apply to the Queensland Plumbers and Drainers Licensing Board for a restricted drainer's licence. Under these licensing arrangements service personnel not fulfilling their role satisfactorily can be called before the Plumbers and Drainers Licensing Board to show cause as to why their license should not be revoked.

1.5 Course Review

Course Advisory Committee conducts course reviews every 12 months to ensure that new technologies and changes to legislation are included in the course. Subsequent course reviews have lead to learning outcomes such as workplace health and safety and communication being integrated into practical sessions and the inclusion of the wet composting treatment system.

1.6 The Challenges

Issues that need to be resolved in the future include restricted electrical licensing arrangements. Currently only holders of a recognised trade or calling AQF Level 3 are able to access the elective modules of the course.

NREL1	Electrical principles and safety	33 hours
NREL2	Disconnect/reconnect	21 hours
NREL3A	Fault find to 250 V motors	12 hours
NREL5	Cords and plugs	8 hours

This requirement disadvantages students who do not have a recognised trade qualification, as they cannot fully service all treatment plants that utilise electrical pumps, blowers and electrical equipment.

1.7 Conclusion

As an educational representative of the Course Advisory Committee, I was able to witness the many benefits of extensive across-industry consultation. The various representatives of the Course Advisory Committee brought with them a diverse range of industry expertise, which encouraged discussion and in turn allowed a comprehensive understanding of the whole of industry requirements for the maintenance of wastewater treatment plants. Without the consultation process any course developed would not be representative of the range of views of the groups within the industry. This consultation has resulted in industry having “ownership” over the content of the course and, therefore, creating an ongoing genuine interest in ensuring quality of content and delivery.

2 Site Assessment and Design Course for On-site Sewerage Facilities

2.1 Background

Traditionally, under Queensland’s standard sewerage law, licensed plumbers and drainers were required to carry out a percolation test on which to base their trench sizes. However, in most local authorities this did not happen. Until recently councils tended to opt for standard designs that were to suit all sites and situations and, although this worked for many sites, there were significant numbers of failures.

2.2 Interim Code of Practice for On-Site Sewerage Facilities

The Interim Code of Practice was first introduced in 1999 and provided a departure from local authorities providing designs for on-site sewerage facilities and required designers to have come from suitable technical backgrounds to undergo an appropriate training course.

2.3 AS/NZS1547:2000

The AS/NZS1547:2000 reinforced this position and also provided the framework with which local authorities can assess applications. This is a very timely document for a majority of local authorities, as most are willing to devolve the design responsibility to private enterprise.

AS/NZS1547:2000 places accountability on the designer – most local authorities view this, in itself, very favourably. These actions by the AS/NZS 1547 Committee are most appropriate.

AS/NZS1547:2000 sets out educational requirements for people involved in on-site domestic wastewater management, including designers. These requirements are:

Level One	- Basic Principles Course	Including awareness of the provisions of AS/NZS1547.
Level Two	- Application Course	Specific to the person’s role.
Level Three	- Refresher Course	Provide updates on new technologies and practices, with local and regional experience in meeting the performance objectives.

These levels now form the basis of the Site Assessment and Design Course for on-site sewerage facilities.

2.4 Basic Principles Course

The 24 hours of the Basic Principles Course are a robust introduction to the components that make up successful domestic wastewater management. It is based on the 16 hour Basic Principles subject TIL010 from the Domestic Wastewater Treatment Plan Maintenance Course CNTIL011 (see TAFE National Register), Plus an additional eight hours to cover the requirements of AS/NZS1547:2000.

2.5 Site Assessment and Design Course

The Site Assessment and Design Course for on-site sewerage facilities is out Level Two role specific course for designers of on-site sewerage facilities with the Basic Principles Course as a pre-requisite.

The Course is 40 hours in duration and made up of five subject areas:

- Desktop study
- Site assessment
- Soil evaluation
- Selection of on-site sewerage facilities
- Design and sizing of on-site sewerage facilities.

The subjects have been arranged so that the student goes through the design process in a logical progression and whenever possible actual examples have been used.

2.6 Entry Requirements

At a meeting with the Local Government Department and the Department of Natural Resources a decision was made to limit course entry to the following groups:

- Civil engineers
- Environmental engineers
- Geotechnical personnel
- Plumbers and drainers
- Persons from other technical backgrounds who demonstrate their suitability for the design of on-site sewerage facilities.

This decision was not made lightly with the government departments always mindful of competition policy.

However, the Course assumes pre-existing knowledge in the following areas:

- Drainage skills
- Plan reading
- Reading technical documents
- Technical writing
- Basic levelling
- Basic hydraulics

Students without an appropriate technical background would be unable to successfully meet the performance criteria (assessment items).

2.7 Future Challenges

Yeronga TAFE has only been running the course since February 2000. Already the need exists for the Level 3 Refresher Course mentioned in AS/NZS1547:2000 as new technologies are coming on line, for example:

- In Queensland applications have been made for advanced secondary treatment plants;
- There is more information available on appropriate planting for land application areas (Jenny Cobbin Research Project); and
- New products and design practices for land application areas.

Without this continual updating of knowledge designers may find themselves in a similar position as the Local Authorities, as I mentioned at that start of this paper - providing designs that work for most sites but lacking the up-to-date knowledge to deal with those problems that only become evident with the passage of time.

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