



LAND CAPABILITY ASSESMENT WASTEWATER MANAGEMENT

Client: Ben Mudryk

Site: 840 Glen Martin Rd, Glen Martin, NSW

Report Prepared by Jasper Seymore 12/12/2024.

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**Land Capability Assessment for On-site Wastewater Management**

Assessment as per NSW Environmental and Health Protection Guidelines AS/NZS 1547 2012

Client	Mrs. Ben Mudryk
Site Address	840 Glen Martin Rd, Glen Martin, NSW
Property Size (m²)	>10,000m ²

1. Site Information

LGA (Council)	Dungog Shire Council
Existing Development	5 Bedroom Dwelling
Site Plan	Please see Fig 1.1
Intended Water Supply	Tank Water @ 120 Per person per day
Potential Hydraulic loading (L/pd)	1200 L/pd
Hydraulic Calculation (L/pd) <i>B = Bedrooms</i> <i>NP = Number of persons (2 per Bedroom) LPP</i> <i>= Liters Per Person (120L/pd Tank)</i>	$B \times NP \times LPP = 2 \times 5 \times 120 = 1200\text{L/pd}$

2. Site Assessment/ Restrictions

Low Temperature (<15°)	Possible	Groundwater	Not Encountered
Flood Potential (> 1 in 100)	NA	LAA Slope	2 - 5°
Exposure at LAA	Excellent	Run-on/ Seepage	Low with mitigation measures
Landform	Slight Slope (~5%)	Site Drainage	Very Good
Erosion Potential	Very Low	Fill	None

Buffer Distances from wastewater treatment system to (in meters):

Permanent Waters	>100m	Boundary	>6m
Other Waters (Dams)	>40m	Swimming Pool	>15m
Sensitive Environments	Above Minimum	Buildings/ Roads	Minimum required



Land Availability for Disposal Area (Land Application Area – LAA):

LAA (Disposal Area)	Yes
Reserve LAA (Reserve Disposal Area)	Not required under Dungog Shire Council DAF
Surface Rocks	None present is selected area for LAA

Geology and Soil landscape survey

Presence of discontinuities	None Present
Presence of fractures soils	None Present

3. Soil Assessment – as per AS/NZ 1547:2012

Depth to Hardpan	>700mm	Soil Category	Cat 5 Light Clay
Depth to Water Table	Above minimum req.	Soil Texture	Strongly Structured

(TP1) Test Pit 1	Loam 0mm – 100mm	Light Clay 100mm – 500mm	Medium Clay 500mm – 600mm
Soil Cat	5 Light Clay	TP1 (Pictures Page 5)	
DIR	3		
Permeability	0.12 – 0.5		

(TP2) Test Pit 2	Loam 0mm – 100mm	Light Clay 100mm – 500mm	Medium Clay 500mm – 600mm
Soil Cat	5 Light Clay	TP2 (Pictures Page 5)	
DIR	3		
Permeability	0.12 – 0.5		

Corse Fragments	< 2%	PH	~6.8	Phosphorous Absorption Index	N/A
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4. System and LAA Selection

Approximate distance to nearest feasible connection point: Not a consideration at this point due to absence of municipal services/ point of connection to sewer mains. Glem Martin falls outside of any major township and in turn does not have access to sewer or water mains systems.

Potential for future connection centralized sewerage: Very Low. It is highly unlikely this will change in the near/ long term future.

Exiting Onsite Disposal Methods: There is no on-site treatment facility or system in the area proposed for the new 5-Bedroom Dwelling. In turn it is proposed to install a new AWTS to service the proposed 5-bedroom dwelling.

Type of land application system considered best suited to site: Due to excellent exposure, nil shading, soil type (5 Light Clay), and lack of established vegetation (other than grass) this site is suitable for **Fixed Surface Spray irrigation**. This determination in disposal area design has been made based on the following factors.

- Ample clear and suitable land for full sized primary disposal area.
- Excellent exposure, low risk of run-on and suitable soil type/ depth (600mm).
- Capacity to construct run-on mitigation measures to further ensure that there is no risk of treated effluent leaving the nominated disposal area.
- Capacity of Isolation from livestock and pedestrian traffic and any future development.
- Minimum setbacks met on all accounts, including but not limited to structures, driveways, intermittent waterways, boundaries, dams, creeks and paddock access.

Type of treatment system best suited to site application: The proposed 5-bedroom dwelling has a combined hydraulic loading of **1200L/pd**. It is recommended that a new NSW accredited treatment system (AWTS) is installed. With a potential hydraulic load of **1200L/pd**, the AWTS installed must hold an NSW accreditation with the treatment capacity of at least **1200L/pd**. Envirocycle proposes the installation of an Envirocycle ECO-PRO AWTS with the capacity to treat up to 1,500L/pd. This system can be offered in either concrete or poly.

Disposal Area Sizing Calculations

Soil Type	Cat 5 (Light Clay) = DIR 3	
Hydraulic Loading (m ²)	$Q \times W/W \times DIR = 1200 \times 7/7 \times 3$	~400m ² (Minimum)
Nitrogen Uptake (m ²)	$C \times Q/L_N = 25 \times 1200/68$	~441m ² (Minimum)
Disposal Area Type	Fixed Surface Spray Irrigation (Site alterations required)	

Total Minimum area required for disposal area (Based on limiting factor of nitrogen uptake) = 441m²

L_N – critical TN Loading Rate (mg/m²/day)

C – Concentration of total nitrogen (TN) (25mg/L) less 25% for loss to soil processes

Q – Treated Wastewater flow rate (P/d)

W – Week (7 days)

Required Disposal Area size = 441m²



Conclusions and Recommendations

Envirocycle Recommends the following.

It is recommended that a new AWTS is installed to service the proposed 5-bedroom dwelling, with no municipal services or potential future connection, this is the best proposed solution. With a potential hydraulic load of **1200L/pd**, the AWTS installed must hold an NSW Health accreditation with the treatment capacity of at least **1200L/pd**.

The system must be fitted with a high-water alarm to provide notification in the event of a pump failure, and a low air alarm in the case of a blower failure. This alarm must be located within the main structure or in a place whereby it won't go unnoticed. Once the waste line and power are connected all fittings and connections are to be tested to ensure proper function prior to commissioning.

As per calculations above, the treated effluent is best disposed of via **fixed surface spray irrigation**, covering a minimum area of **441m²**. This determination has been made based on the following.

- *Ample clear and suitable land for full sized primary disposal area.*
- *Excellent exposure, low risk of run-on and suitable soil type/ depth (600mm).*
- *Capacity to construct run-on mitigation measures to further ensure that there is no risk of treated effluent leaving the nominated disposal area.*
- *Capacity of Isolation from livestock and pedestrian traffic and any future development.*
- *Minimum setbacks met on all accounts, including but not limited to structures, driveways, intermittent waterways, boundaries, dams, creeks and paddock access.*

An area for the primary LAA has been identified on the accompanying site plan in Fig 1.1 highlighted in the lilac box, covering an area of **~550m²**. The nominated primary application area can be located within the highlighted open area and must remain as managed lawns once disposal area has been installed.

The primary disposal area will consist of a main line running from the AWTS to the primary LAA. This line will feed a main manifold to evenly distribute the treated effluent through mini wobblers mounted on 500mm risers.

The irrigation line from the AWTS must be installed at a depth of no less than **150mm**. The primary disposal area will consist of one **441m²** zone, to be installed as per AS/NZS 1547/2012.

Prior to the use of the disposal area the following site modifications are recommended to aid in the mitigation of any possible run-on during heavy rain events. (These modifications are illustrated on the accompanying site plan)

- *Extension of exiting diversion drain running along the top side of the proposed LAA. This will divert all stormwater from passing across the nominated LAA, mitigating the risk of stormwater leading to run-on of treated effluent.*
- *Construction of a downhill bund along the lower side of the proposed LAA. This will stop stormwater produced across the LAA passing to areas directly below the proposed LAA.*
- *Any shallows or "dished" areas within the nominated LAA are to be filled or graded to a uniform state. This will remove the risk of pooling and allow for more even distribution of treated effluent. Grading and filling can be sourced from site as to not alter soil characteristics. If material is imported, quality sandy loam is recommended.*

Continued over page



Warning signs must also be erected to indicate the active discharge of treated effluent. These signs are best located in the immediate surrounds of the nominated LAA.

A detailed design is outlined on Fig 1.2, location of disposal area is outlined in Fig 1.1 (Site plan). The disposal area identified covers an area of ~550m² and in turn presents enough area for the primary disposal area.

Important Notes

- *Disposal area is to be fenced off from livestock, vehicle access and pedestrian traffic and strictly used for the disposal of treated effluent.*
- *AWTS location is only a proposed and final location may differ. The final position should be confirmed with Envirocycle by projects plumber (if applicable).*
- *****IMPORTANT** AWTS location must have natural fall from new dwelling. It is also critical to ensure that the drains are not set too deep as this will incur the additional cost of a riser if the tank needs to be set deeper into the ground. Inlet Height will be confirmed by Envirocycle on request.***

Site pictures over page.



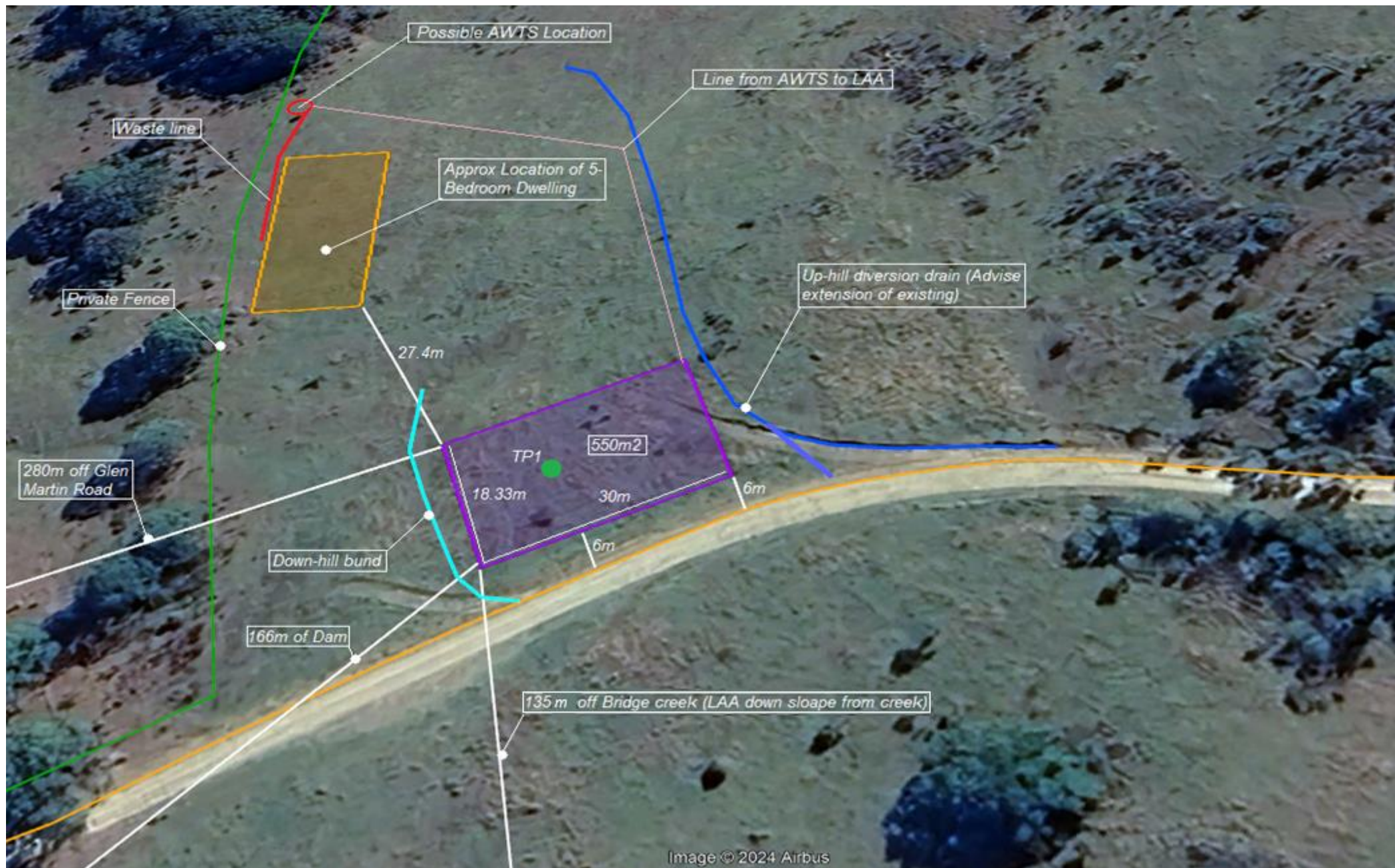
Test Pit Location Pictures

TP1



Site Profile





Envirocycle® is a product of
**AWTS MAINTENANCE SERVICES
 PTY LTD**
 ABN: 88 073 578 195
 P.O. Box 293
 Wallsend NSW 2287

Client: **Ben Mudryk**
 Address: **840 Glen Martin Rd, Glen Martin, NSW**
 Council: **Dungog Shire**
 DP/SP: **NA**

Drawing: **FIG 1.1**
 Site Plan
08/12/2024



Maintaining Your System

DO

- ✓ Learn how your sewage management system works and its operational and maintenance requirements.
- ✓ Learn the location and layout of your sewage management system.
- ✓ Have your AWTS (if installed) inspected and serviced four times per year by an approved contractor. Other systems should be inspected at least once every year. Assessment should be applicable to the system design.
- ✓ Keep a record of desludgings, inspections, and other maintenance.
- ✓ Have your septic tank or AWTS desludged every three years to prevent sludge build up, which may 'clog' the pipes.
- ✓ Conserve water. Conservative water use around the house will reduce the amount of wastewater which is produced and needs to be treated.
- ✓ Discuss with your local council the adequacy of your existing sewage management system if you are considering house extensions for increased occupancy.

DON'T

- ✗ Don't let children or pets play on land application areas.
- ✗ Don't water fruit and vegetables with effluent.
- ✗ Don't extract untreated groundwater for cooking and drinking.
- ✗ Don't put large quantities of bleaches, disinfectants, whiteners, nappy soakers and spot removers into your system via the sink, washing machine or toilet.
- ✗ Don't allow any foreign materials such as nappies, sanitary napkins, condoms and other hygiene products to enter the system.
- ✗ Don't put fats and oils down the drain and keep food waste out of your system.
- ✗ Don't install or use a garbage grinder or spa bath if your system is not designed for it.

Reducing water usage

Reducing water usage will lessen the likelihood of problems such as overloading with your septic system. Overloading may result in wastewater backing up into your house, contamination of your yard with improperly treated effluent, and effluent from your system contaminating groundwater or a nearby waterway.

Your sewage management system is also unable to cope with large volumes of water such as several showers or loads of washing over a short period of time. You should try to avoid these 'shock loads' by ensuring water use is spread more evenly throughout the day and week.

HELP PROTECT YOUR HEALTH AND THE ENVIRONMENT

Poorly maintained sewage management systems are a serious source of water pollution and may present health risks, cause odours and attract vermin and insects.

By looking after your management system you can do your part in helping to protect the environment and the health of you and your community.

For more information please contact:

JASPER SEYMORE

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Aerated Wastewater Treatment Systems (AWTS)

In unsewered areas, the proper treatment and utilisation of household wastewater on-site is critical in preserving the health of the public and the environment. AWTS have been developed as a way of achieving this.

What is an AWTS?

An AWTS is a purpose built system used for the treatment of sewage and liquid wastes from a single household or multiple dwellings.

It consists of a series of treatment chambers combined with an irrigation system. An AWTS enables people living in unsewered areas to treat and utilise their wastewater.

How does an AWTS work?

Wastewater from a household is treated in stages in several separate chambers. The first chamber is similar to a conventional septic tank. The wastewater enters the chamber where the solids settle to the bottom and are retained in the tank forming a sludge layer. Scum collects at the top, and the partially clarified wastewater flows into a second chamber. Here the wastewater is mixed with air

to assist bacteria to further treat it. A third chamber allows additional clarification through the settling of solids, which are returned for further treatment to either the septic chamber (as shown) or to the aeration chamber. The clarified effluent is disinfected in another chamber (usually by chlorination) before irrigation can take place.

Bacteria in the first chamber break down the solid matter in the sludge and scum layers. Material that cannot be fully broken down gradually builds up in the chamber and must be pumped out periodically.

Regulations and recommendations

Local councils are primarily responsible for approving the smaller, domestic AWTSs in their area. The Environment Protection Authority (EPA) approves larger units, whilst the NSW Department of Health determines the design and structural requirements for all AWTSs.

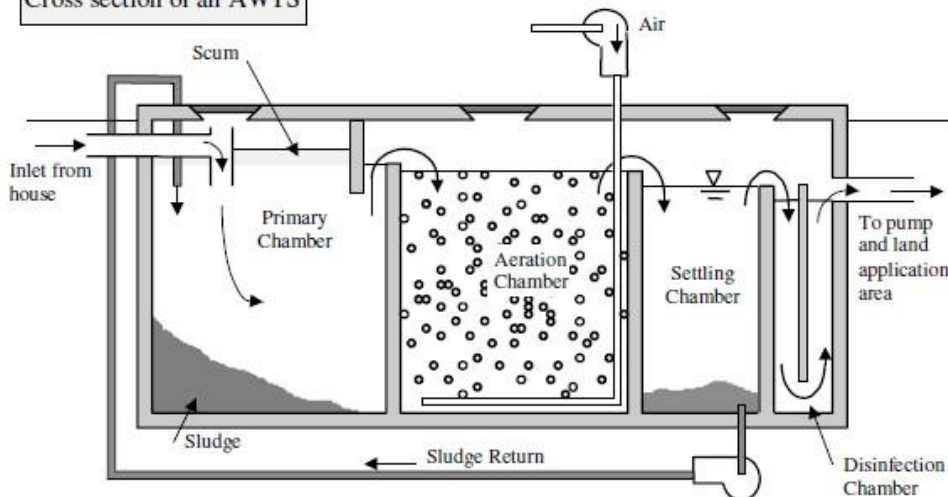
At present AWTSs need to be serviced quarterly by an approved contractor at a cost to the owner. Local councils should also maintain a register of the servicing of each system within their area.

AWTSs should be fitted with an alarm having visual and audible components to indicate mechanical and electrical equipment malfunctions. The alarm should provide a signal adjacent to the alarm and at a relevant position inside the house. The alarm should incorporate a warning lamp which may only be reset by the service agent.

Maintaining your AWTS

The effectiveness of the system will, in part, depend on how it is used and maintained. The following is a guide on good maintenance procedures that you should follow:

Cross section of an AWTS





Reducing water usage

Reducing water usage will lessen the likelihood of problems such as overloading with your AWTS. Overloading may result in wastewater backing up into your house, contamination of your yard with improperly treated effluent, and effluent from your system entering a nearby river, creek or dam.

Conservative water use around the house will reduce the amount of wastewater which is produced and needs to be treated.

Your AWTS is also unable to cope with large volumes of water such as several showers or loads of washing over a short period of time. You should try to avoid these 'shock loads' by ensuring water use is spread more evenly throughout the day and week.

Warning signs

You can look out for a few warning signs that signal to you that there are troubles with your AWTS. Ensure that these problems are attended to immediately to protect your health and the environment.

Look out for the following warning signs:

- 🔊 Water that drains too slowly.
- 🔊 Drain pipes that gurgle or make noises when air bubbles are forced back through the system.
- 🔊 Sewage smells, this indicates a serious problem.
- 🔊 Water backing up into your sink which may indicate that your system is already failing.
- 🔊 Wastewater pooling over the land application area.
- 🔊 Black coloured effluent in the aerated tank.
- 🔊 Excess noise from the blower or pumping equipment
- 🔊 Poor vegetation growth in irrigated area.

Odour problems from a vent on the AWTS can be a result of slow or inadequate breakdown of solids. Call a technician to service the system.

HELP PROTECT YOUR HEALTH AND THE ENVIRONMENT

Poorly maintained AWTSs are a serious source of water pollution and may present health risks, cause odours and attract vermin and insects.

By looking after your treatment system you can do your part in helping to protect the environment and the health of you and your family.

If you would like more information please contact:

DO

- ✓ Have your AWTS inspected and serviced four times per year by an approved contractor. Assessment should be applicable to the system design.
- ✓ Have your system service include assessment of sludge and scum levels in all tanks, and performance of irrigation areas.
- ✓ Have all your tanks desludged at least every three years.
- ✓ Have your disinfection chamber inspected and tested quarterly to ensure correct disinfectant levels.
- ✓ Have your grease trap (if installed) cleaned out at least every two months.
- ✓ Keep a record of pumping, inspections, and other maintenance.
- ✓ Learn the location and layout of your AWTS and land application area.
- ✓ Use biodegradable liquid detergents such as concentrates with low sodium and phosphorous levels.
- ✓ Conserve water.

DON'T

- ✗ Don't put bleaches, disinfectants, whiteners, nappy soakers and spot removers in large quantities into your AWTS via the sink, washing machine or toilet.
- ✗ Don't allow any foreign materials such as nappies, sanitary napkins, condoms and other hygiene products to enter the system.
- ✗ Don't use more than the recommended amounts of detergents.
- ✗ Don't put fats and oils down the drain and keep food waste out of your system.
- ✗ Don't switch off power to the AWTS, even if you are going on holidays