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Sludge accumulation in septic tank chambers should be inspected regularly as part of the maintenance schedule and the sludge depth measured with an appropriate device (Figure 4.6). Guidance on the frequency of sludge removal is provided in AS/NZS 1547:2012. Sludge removal should be undertaken by an experienced and licensed contractor.

When sludge is removed from a septic tank chamber approximately 10% of the original contents should be retained in the tank to help regenerate an appropriate bacterial population for ongoing treatment. Once pumped out, the septic tank chamber should be refilled with water to its normal operating level to ensure that the tank is not subject to undue upward pressure from high groundwater. If the groundwater level in the vicinity of the tank is high, the tank should be pumped and simultaneously partially refilled with clean water. Once pumped out, replace all inspection openings and seal the tank lid with flexible sealant.



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The system owner needs to complete a number of general maintenance and operational tasks, including:

- addressing maintenance issues identified by the service provider
- engaging a contractor to desludge the system when its recommended by the service provider or council
- ensuring all products used in the household are safe for an AWTS (bleaches, many household cleaning products, and certain medications are not safe as they can adversely affect the biological activity)
- managing the vegetation around the tank and effluent irrigation areas (including mowing and trimming back bushes for maximum exposure)

- ensuring a continuous power supply is provided to the system – power to the system should not be turned off when the house is unoccupied
- ensuring that the service provider is contacted as soon as practicable if an alarm activates.

Checklist 4.2 outlines items that should be checked at a three monthly maintenance inspection for an operational AWTS. Qualified service providers and council inspectors can use this checklist for compliance inspections of an AWTS. The land application section of the checklist can be used for the various effluent irrigation methods referred to in Sections 12 and 13.

4.6 Common technical issues

A number of common technical problems with AWTS installations have been observed by plumbers, property owners and regulatory authorities. These include:

- the sludge return line was not installed or not installed correctly
- tanks are not secured into the ground, which causes them to pop out or float and break/crack the pipes
- the pump size is too small for the hydraulic gradient of the effluent irrigation system, resulting in overloading and pump burn out
- the effluent management area is too small
- intermittent or low wastewater loads are resulting in a lower level of treatment
- pumps have burned out and the system has failed from disruption to the power supply
- stormwater in the tank because the location is too low and/or there is no runoff diversion (Figures 4.7 and 4.8)
- no valid service agreement with an appropriately qualified service provider for regular inspections
- a subsurface irrigation area flushing or return line was not installed.



Figure 4.7



Figure 4.8

Both figures – Low installation locations, no stormwater diversion berm / drain and inadequate sealing of lid to tank leading to stormwater inflows

Checklist 4.2 Operational AWTS inspection report for use by service providers and Council inspectors			
Owner's name:			
Address:		Council area:	
System brand and model:		<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial
Date of service:	Date of last service:	Next service due:	
General Comments			
General condition of tank		<input type="checkbox"/> Good	<input type="checkbox"/> Fair <input type="checkbox"/> Poor
Comments:			
Septic tank / chamber			
Crust <input type="checkbox"/> Yes <input type="checkbox"/> No		Odour <input type="checkbox"/> Yes <input type="checkbox"/> No	
		Sludge depth _____ m	
Desludge needed <input type="checkbox"/> Yes <input type="checkbox"/> No		Inlet/outlet junctions clear <input type="checkbox"/> Yes <input type="checkbox"/> No	
Good biological activity <input type="checkbox"/> Yes <input type="checkbox"/> No		Sludge return lines clear <input type="checkbox"/> Yes <input type="checkbox"/> No	
Treatment tank / chamber			
Aeration zone			
Odour <input type="checkbox"/> Yes <input type="checkbox"/> No		pH _____	Dissolved oxygen _____ mg/L
Activated sludge			
Activated sludge system <input type="checkbox"/> Yes <input type="checkbox"/> No		Diffusers operating <input type="checkbox"/> Yes <input type="checkbox"/> No	
Air blower working <input type="checkbox"/> Yes <input type="checkbox"/> No		Sufficient air supply <input type="checkbox"/> Yes <input type="checkbox"/> No	
Air blower noise <input type="checkbox"/> Yes <input type="checkbox"/> No		Biofilm build up <input type="checkbox"/> High <input type="checkbox"/> Normal	
Air blower pressure OK <input type="checkbox"/> Yes <input type="checkbox"/> No		Aeration timer / diffusers adjusted <input type="checkbox"/> Yes <input type="checkbox"/> No	
Air blower filter cleaned <input type="checkbox"/> Yes <input type="checkbox"/> No		Air blower filter replaced <input type="checkbox"/> Yes <input type="checkbox"/> No	
Colour of Effluent (tick one only)			
<input type="checkbox"/> Dark brown (good)		<input type="checkbox"/> Light brown (insufficient aeration times)	
<input type="checkbox"/> Dark grey (insufficient oxygen delivery)			
Suspended growth system		<input type="checkbox"/> Yes (conduct settleability test) <input type="checkbox"/> No	

Settleability test			
<input type="checkbox"/> Clear (good)	<input type="checkbox"/> Bulky (excess sludge accumulation)	<input type="checkbox"/> Turbid (short residence time and carry over)	
Trickling filter			
Recirculation pump operational	<input type="checkbox"/> Yes <input type="checkbox"/> No	Distribution plate biofilm good	<input type="checkbox"/> Yes <input type="checkbox"/> No
Rotating arm / sprayer operational	<input type="checkbox"/> Yes <input type="checkbox"/> No	Timer working correctly	<input type="checkbox"/> Yes <input type="checkbox"/> No
Clarification zone			
Sludge return operating	<input type="checkbox"/> Yes <input type="checkbox"/> No	Clarity	<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy
Scum return operating	<input type="checkbox"/> Yes <input type="checkbox"/> No	Sludge depth	<input type="checkbox"/> High <input type="checkbox"/> Med
Disinfection			
Chlorine	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Turbidity	NTU		
Chlorinator intact & operating	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
No. tablets consumed:	No. tablets replaced:		
Free chlorine	mg/L		
Ultraviolet (UV)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Turbidity	NTU		
Lamp cleaned	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Lamp replaced	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Irrigation Chamber			
Irrigation pump operational	<input type="checkbox"/> Yes <input type="checkbox"/> No	Float switches operational	<input type="checkbox"/> Yes <input type="checkbox"/> No
Presence of sludge	<input type="checkbox"/> Yes <input type="checkbox"/> No	Alarm operational	<input type="checkbox"/> Yes <input type="checkbox"/> No
Electrical components			
Alarms tested			
Water	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Air	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
General condition	<input type="checkbox"/> Good	<input type="checkbox"/> Fair	<input type="checkbox"/> Poor
Land Application Area			
Evidence of physical damage	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments:

Presence of surface ponding / runoff from the effluent irrigation area		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Excess weed growth in the area		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Effluent running into dam, stormwater drain or watercourse		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Subsurface Irrigation		Trench / Bed / Mound	
Operating pressure <input type="checkbox"/> Good <input type="checkbox"/> Poor		Check surface ponding / toe leaching <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Lines back flushed <input type="checkbox"/> Yes <input type="checkbox"/> No		Comments:	
Filter checked and cleaned <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sprinklers spraying in high risk area <input type="checkbox"/> Yes <input type="checkbox"/> No	Auto sequencing valves working <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Manual valves working <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sprinklers moved / manual valves switched to a different effluent irrigation / trench / mound area		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Comments, action or repairs needed: (Where a response in the above Checklist needs extra information or action, specify the action plan and/or the process to fix the problem, or specify an alternative that is being offered)			
Service provider:			
Contact number:			
Name / title of inspector:			
Signature:		Date:	

4.7 Case study

A builder engaged a contractor to supply and install an AWTS for a new dwelling in the Sydney drinking water catchment. The builder also obtained all approvals needed by council and installed the system before handing the new home over to the owner to occupy. Upon inspection council officers saw that the system had not been installed according to the approval. The owner did not have a copy of the approval and did not know the system was not ready to use.

Problem

The tanks were positioned in the correct location on-site but the lids were not sealed to prevent stormwater entering and the lid was level with the ground surface on the upslope side of the tank. A black poly hose was coiled over the top of the tank with two butterfly sprinklers left in the pump box on the top of the tank (Figure 4.9). The approved plans for the system indicated that there would be 400 square metres of surface spray irrigation installed according to buffer distances from the dwelling and a nearby intermittent drainage line.



Figure 4.9 New AWTS with irrigation hose coiled on top, no sprinklers and potential for stormwater inundation

Solution

- Install the AWTS and irrigation system as needed by the council approval (the installer of the wastewater and effluent disposal system must be provided with the relevant conditions of consent)
- install a surface water diversion drain around the top of the tank to divert all upslope surface water runoff away from the tank
- seal around the lid of the tank to ensure stormwater water cannot enter the system
- system installers should liaise with builders and property owners about outstanding work needed for the system to comply with council approvals.