



Developing and Applying an Audit Protocol

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Introduction

- Risk assessment principles can be used to establish a systematic and consistent audit protocol.
- Provides justification and transparency - important for effective management and decision making.
- Can then be linked to broader risk management programs with more confidence.

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Standards for Assessment

- Performance objectives set out in legislation and state government guidelines.
- *AS/NZS 1547:2012 and AS/NZS 1546:2008/2017.*
- *USEPA Onsite Wastewater Treatment Systems Manual* and other publications.
- Guidance based on stakeholder experience in the installation, operation and maintenance of onsite systems.

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Standards for Assessment

- Beneficial to develop the protocol within a group of Councils for consistency.
- Where possible input should be provided by other stakeholders (e.g. installers, designers, private assessors).
- Agreement on the structure and weightings used in the risk assessment will be essential to successful implementation.

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Developing the Audit Instrument

- Key Questions:
 - What information do we want to collect?
 - What level of detail can be applied?
 - What are the assessment criteria for the different components?
 - What is the consequence of a system failing to meet each individual criteria?
 - What constitutes a failing system?

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Onsite Wastewater Management Systems Audit

SUMMARY SHEET (fill in or circle the appropriate answer)

Inspection Date:	Inspector:	Property File:
Property Address:		
Property Type:	Residential	Commercial
Name of Owner:	Cleaner/Onsite present? Yes/No	

Wastewater Management System (refer to the bottom of page 2 for a key to system type codes)

Type of Treatment System: ST AWTS CT SF PD Other

Type of Land Application Area: AT ETA SI SII MD Other

Number of Bedrooms: _____ Number of People: _____

Report on Treatment System

Action Required by Owner

CODES _____ SITE SPECIFIC ACTION _____

Report on Land Application Area / System (LAA)

Action Required by Owner

CODES _____ SITE SPECIFIC ACTION _____

RISK ASSESSMENT (Total score must be calculated and converted into a percentage)

Low Risk (25% of total)	Medium Risk (50-50%)	High Risk (50% of total/50%)
Required:	Immediate Minor Works	Major Works
Justification:	Minor Works	No Works
Follow up Required:	Yes/No	Follow up Date:

AWTS = Automatically 'Not Required' as a high risk system
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Land Capability

SITE INFORMATION (Site details should be gathered at level of detail appropriate to site)

Limiting Soil Texture: Clay Clay Loam Loam Sandy Loam Sand

Limiting Soil Structure: Massive Weak Moderate Strong

Slope: _____% Erosion Potential: High Moderate Low

Water Supply: Reticulated Tank Bore Block Size: _____ m²

Approx. Depth to Bedrock/Groundwater: _____ m Approx. Systems/km² _____

Based on AS1547:2012 and the *Environment & Health Protection Guidelines* what would be the general site capability for the on-site sewage management system operating on site?

No Significant Limitations (0) Significant Limitations (40)

Comments: _____

Mud Map

SITE DIAGRAM – Include treatment system, land application area(s), dwellings, boundaries, fences, drains, watercourses, dams etc.

Septic Tank / Tank Condition

TANK(S) / HOLDING WELL(S) – To be completed for all system types

Number of tanks: _____ Pump to LAAs? Yes No Separate Greywater? Yes No

Tank Dimensions and Treatment Efficiency (all measurements in millimetres)

Tank No	Diameter	Total Depth	Effluent Depth	Outlet Depth	Sludge Depth	Crust Condition
1						
2						
3						

Are the tanks and tank lids structurally sound? Yes (0) No (10)

Are there suitable inspection caps fitted? Yes (0) No (5)

Is the tank adequately sealed to prevent insect/vermin access? Yes (0) No (10)

Is the air vent in a functional state? Yes (0) No (5)

Are both T-pieces attached and operational? Yes (0) No (10)

Is the area flood prone or is there any evidence of stormwater inundation? Yes (15) No (0)

Are the tanks accessible for maintenance purposes? Yes (0) No (5)

Does the primary tank/chamber require desludging? Yes (15) No (0)

Do any tanks require urgent repair or replacement? Yes (HR) No (0)

Total Score for Sub-group: _____

Comments: _____

Plumbing, Pumps, Grease traps

PIPEWORK / PUMP & FLOAT SWITCH / GREASETRAP

Are all pipes associated with the system structurally sound and functioning correctly? (this includes drawoff lines for pumpout systems) Yes (0) No (20)

Are there any pipes that allow the inappropriate discharge of sewage? (this could include greywater discharge or hidden overflow pipes) Yes (HR) No (0)

Does the greasetraps require cleaning? N/A Yes (10) No (0)

Are the baffles in the greasetraps adequate? N/A Yes (0) No (10)

Is the pump in satisfactory condition? N/A Yes (0) No (10)

Is the float switch operational and set correctly? N/A Yes (0) No (10)

Is the holding/pumpwell of adequate capacity? N/A Yes (0) No (10)

Total Score for Sub-group: _____

Comments: _____

Package Treatment Plants

AERATED WASTEWATER TREATMENT SYSTEM

N/A

Model: _____ Service Agent: _____

Service Agent reports should be consulted before inspection if available

Are all air blowers operating at an adequate rate? Yes (0) No (15)

Is the sludge return line working correctly? Yes (0) No (10)

Does the system have a high odour? Yes (15) No (0)

Is there adequate biological media present for treatment? Yes (0) No (15)

Are both 'high water' and 'no aeration' alarms operational? Yes (0) No (10)

Is there chlorine present in the disinfection chamber? Yes (0) No (HR)

Are any system components in need of urgent replacement/repair? Yes (HR) No (0)

Clarity of effluent _____ Total Score for Sub-group: _____

Comments: _____

Sand Filters

SAND FILTER

N/A

Type of Sand Filter: Single Pass Recirculating

Is the sand filter structurally sound and free from obstruction? Yes (0) No (10)

Are any associated pumps/siphons in a satisfactory condition? Yes (0) No (15)

Is effluent clarity satisfactory? Yes (0) No (10)

Is the sand filter in urgent need of repair? Yes (HR) No (0)

Is the sand filter area trafficked? Yes (20) No (0)

Total Score for Sub-group: _____


Comments: _____

Composting Toilets

COMPOSTING TOILET	N/A	
Type of Composting Toilet: Waterless CT Wet CT Model: _____		
Does logbook indicate that humus management is being undertaken in accordance with manufacturers/NSW Health requirements?	Yes (0)	No (15)
Is grey/wastewater managed in accordance with Council guidelines?	Yes (0)	No (20)
Is the exhaust fan operational?	N/A Yes (0)	No (15)
Does the owner / occupier have adequate access for humus removal and an instruction notice in place near the toilet?	Yes (0)	No (10)
Total Score for Sub-group: _____		
Comments: _____		


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LAND APPLICATION AREA (LAA)	AT	ETA	SI	SSI	MD	Other: _____
Dimensions of LAA: _____	Approx Area (m ²): _____					
Minimum Required Area (m ²): _____	Based on: Water Balance / Nutrient Balance					
Is there a suitable level and type of vegetation cover over the LAA?	Yes (0)	No (10)				
Is there adequate exposure over the LAA?	Yes (0)	No (5)				
Evidence of stormwater inundation, no diversion drain in place?	Yes (15)	No (0)				
Is there evidence of / access for vehicle or animal traffic?	Yes (10)	No (0)				
Are there any damaged or collapsed sections of the LAA?	Yes (15)	No (0)				
Is there evidence of soggy ground on the surface of the LAA? (Where appropriate, LAAs should be load tested prior to answering)	Yes (20)	No (0)				
Is the LAA prone to poor drainage, flooding or groundwater inundation? (To be taken to a depth of 600mm below base of LAA)	Yes (20)	No (0)				
Is the LAA constructed in line with the contours?	Yes (0)	No (10)				
Is there evidence of effluent runoff or discharge from the LAA?	Yes (HR)	No (0)				
Is the LAA adequately sized to manage the current wastewater load?	Yes (0)	No (15)				
Are there appropriate buffer distances between the LAA and: (NSW guideline distances are provided in <i>italics</i>)						
Permanent watercourses (100m)	Yes (0)	No (10)				
Intermittent watercourses, dams and drainage channels (40m)	Yes (0)	No (10)				
Groundwater bores used for potable water supply (250m)	Yes (0)	No (5)				
Dwellings (15m – irrigation, 12m – trench/bed)	Yes (0)	No (5)				
Boundaries, driveways, paths (3m – downslope, 6m – upslope)	Yes (0)	No (5)				
Swimming pools (6m)	Yes (0)	No (5)				
Total Score for Sub-group: _____						
Comments: _____						

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Irrigation Systems

IRRIGATION SYSTEM	N/A	
No. of Sprinklers: _____ No. Operating: _____ Sprinkler Type(s): _____		
Are there any unauthorised fittings used in the system?	Yes (10)	No (0)
Are all fittings operational and free from damage?	Yes (0)	No (15)
Is sprinkler throw and plume height acceptable?	Yes (0)	No (10)
Are there two warning signs displayed in the LAA?	Yes (0)	No (5)
Is there adequate distribution of effluent over the LAA?	Yes (0)	No (15)
Can the system be moved to inappropriate locations?	Yes (15)	No (0)
Total Score for Sub-group: _____		
Comments: _____		

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Assigning a Risk Category

RISK ASSESSMENT Total score must be calculated and converted into a percentage			
Low Risk (29% or less)	Medium Risk (30-59%)	High Risk (60% or more/HR*)	
Required: Immediate Major Works	Major Works	Minor Works	No Works
Justification: _____			
Follow up Required: Yes No		Follow up Date: _____	

HR* = Automatically 'red flagged' as a high risk system

- Total score for the system is added and converted to a percentage.
- Assigned a risk category based on this percentage.

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Recording Data in the Field

- If paper reports are used it is essential that at least the key outcomes of the audit are recorded in some form of electronic database.
- There are numerous hand held computer devices available capable of recording data of this kind.
- An Excel spreadsheet can be created to record data on a palm pilot in the field.
- GPS can allow this data to be uploaded to GIS.

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Recording Data in the Field

- Numerous detailed checklists for each of the different types of treatment and land application systems are presented in *Designing and Installing On-Site Wastewater Systems* A Sydney Catchment Authority Current Recommended Practice (SCA 2012)
- http://www.watarnsw.com.au/__data/assets/pdf_file/0003/58251/Designing-and-Installing-On-Site-Wastewater-Systems-complete-document.pdf
- Checklists for both installation and operating systems
- Designed for Council Inspectors

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Council Information Systems

- If paper reports are used an Excel spreadsheet can easily be developed to enter details in the office.
- Need to be able to rapidly access and use the data collected to make it worthwhile (e.g. a database that can be queried).
- Assessment process can be streamlined by creating reporting shortcuts for standard required works.

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Web-based Systems

- iauditor offers web based inspection and audit templates and management
- <https://safetyculture.com/iauditor/>
- e.g. Tasman Council <https://public-library-cf-origin.safetyculture.io/products/final-owms-inspection>
- e.g. The Hills Shire <https://public-library-cf-origin.safetyculture.io/products/on-site-sewage-management-inspectionZ8pC1>

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Council Information Systems

- Standard spreadsheets can also be used to carry out basic land capability assessments.
- Major benefits in linking data collected to a GIS interface.
- Can integrate the results of inspection programs into broader risk management.
- Can rapidly gain an understanding of wastewater management issues specific to a particular area.

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Conclusions

- Recommend that any onsite system inspector have an audit protocol that:
 - is consistent
 - has been endorsed by relevant stakeholders
 - produces results that can be compared to audit results from other areas
 - can be used to justify management decisions

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