
ON-SITE WASTEWATER ASSESSMENT FOR PROPOSED
RESIDENTIAL DWELLING ON 9-17 GARSWOOD ROAD,
GLENMORE PARK

FOLIO NO: LOT 4210 DP 1150762

LGA: PENRITH CITY COUNCIL

CLIENT: C/O- ECONOCYCLE (BOB DAY)

23 March 2015

Our ref: 1331ww



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1. ASSESSMENT CRITERIA


Harris Environmental Consulting was commissioned by Econocycle to prepare an onsite wastewater management plan for 9-17 Garswood Road, Glenmore Park, lot 4210 DP1150762. The owner plans to build a 4 bedroom residential dwelling on the 8558m² property located within Penrith City Council. Harris Environmental Consulting was appointed by Robert Day on behalf of Econocycle to undertake this Soil and Site Assessment for On Site Wastewater Management in accordance with:

- Penrith City Council's On- Site Sewage Management Policy (nominated irrigation areas for soil types);
- Environment and Health Protection Guidelines (1998) On-site Sewage Management for Single Households (Department of Local Government); and
- AS/NZ 1547:2012 On-site wastewater management (Standards Australia, 2012).

Figure 1 Location of proposed house site



2. SITE INFORMATION

Owner/postal address	9-17 Garswood Road, Glenmore Park					
Size of property	8558m ²					
Legal title	Lot 4210 DP 1150762					
Local Government	Penrith City Council's On- Site Sewage Management Policy (nominated irrigation areas for soil types);					
Proposed development:	Bedrooms	4	Potential b/rooms	2	Total	6
Water supply	Town water					
Wastewater load assumptions	150L/person/day for town water 120L/person/day for tank water					
Design wastewater load	1 master (2 persons/room) 3 bedrooms (1 person/room) 2 potential (1 person/room) = 7 potential persons = 1050L/day					
Surface and Subsurface Irrigation area	972m ² for 6 bedrooms and clayey soil (see appendix II)					
Proposed wastewater treatment	AWTS					
Proposed wastewater of disposal	Fixed spray irrigation					
Date site assessed:	20/03/2015					
Date report prepared:	23/03/2015					
Site assessor:	 Msc Env Science (UOW), Grad dip Nat Res (UNE), BscAppSc, Agriculture (HAC) Sean Harris					

3. SITE ASSESSMENT

Climate	Orchard Hills Treatment works (median annual 853.8mm) Badgerys Creek pan evaporation (median 1699mm). The climate provides no significant limitation to onsite effluent management as monthly pan evaporation exceeds rainfall throughout the year.
Flood potential	Treatment system above 1 in 100 year flood level; minor limitation; Land application system above 1 in 20 year flood contour, minor limitation
Exposure	Southern aspect, full sun and wind exposure
Slope	3-5% slope, minor limitation
Landform	Concave top slope, minor limitation
Run-on and seepage	No evidence of moisture tolerant grasses or wet areas; minor limitation
Erosion potential	Minor evidence of sheet erosion; minor limitation
Site drainage	No evidence of poor drainage; minor limitation
Fill	No evidence of fill; minor limitation
Domestic groundwater	No groundwater bores within 100m; minor limitation
Buffer distance from wastewater management system	Permanent waters : 100m+ Intermittent waters : 40m+ Boundary of premises: 3-6m+ Swimming pools: 3-6m+ Buildings: 15m+
Surface rock	No surface rock; minor limitation
Area available	Effluent management area is available

4. SOIL ASSESSMENT

Method	Shovel/crowbar			
Depth to bedrock (m)	1000+mm ; moderate limitation			
Depth to high soil watertable	No subsoil mottling; no free water, minor limitation			
Coarse (%)	No coarse fragments in subsoil, minor limitation			
pH (soil/water)	pH 5.5-6; minor limitation			
EAT	3 (2); minor limitation			
Electrical conductivity	0.04 dSm, minor limitation			
Salinity hazard	The Department of Infrastructure, Planning and Natural Resources map of salinity hazard throughout Western Sydney shows the proposed irrigation area as having a moderate salinity hazard .			
Domestic groundwater use	The Department of Primary Industries Office of Water search of groundwater bores found there are no known groundwater bores within 100m of the proposed irrigation area			
Soil Landscape /GSG Geological unit Great Soil Group	<i>Blacktown Soil Landscape</i> <i>Wianamatta Shale (Sandstone, Siltstone and shale)</i> <i>CSIRO defined Red Duplex (red clayed soils)</i>			
Surface rock	No surface rock in proposed irrigation area, minor limitation			
Bulk density	Permeable, well drained soil profile; moderate limitation			
Phosphorus balance assumptions	P sorption capacity - 600,000mg/m ² /week/depth for clay soil types or 400,000mg/m ² /week/depth for sandy soil types			
Nitrogen and Phosphorus output values	TN output value of 25mg/L and a critical loading rate of 27mg/m ² /day. TP output value of 12mg/L			
Soil profile:	Layer 1		DLR	DIR
	Texture	Clay loam	NA	15
	Colour	Black		
	Depth	0-300mm		
	Structure	Well structured		
	Coarse frag.	NA		
	Layer 2		DLR	DIR
	Texture	Medium clay	NA	NA
	Colour	Tan		
	Depth	300-1000		
	Structure	Moderately structured		
	Coarse frag.	NA		
	Layer 3			
	Texture		NA	NA
	Colour			
	Depth			
	Structure			
	Coarse frag.			

*Design Irrigation Rate for clayey soils, and 35mm/week for sandy soils. DIR in mm/week















Photo 1 Looking upslope towards the proposed irrigation area



Photo 2 Looking downslope towards proposed dwelling

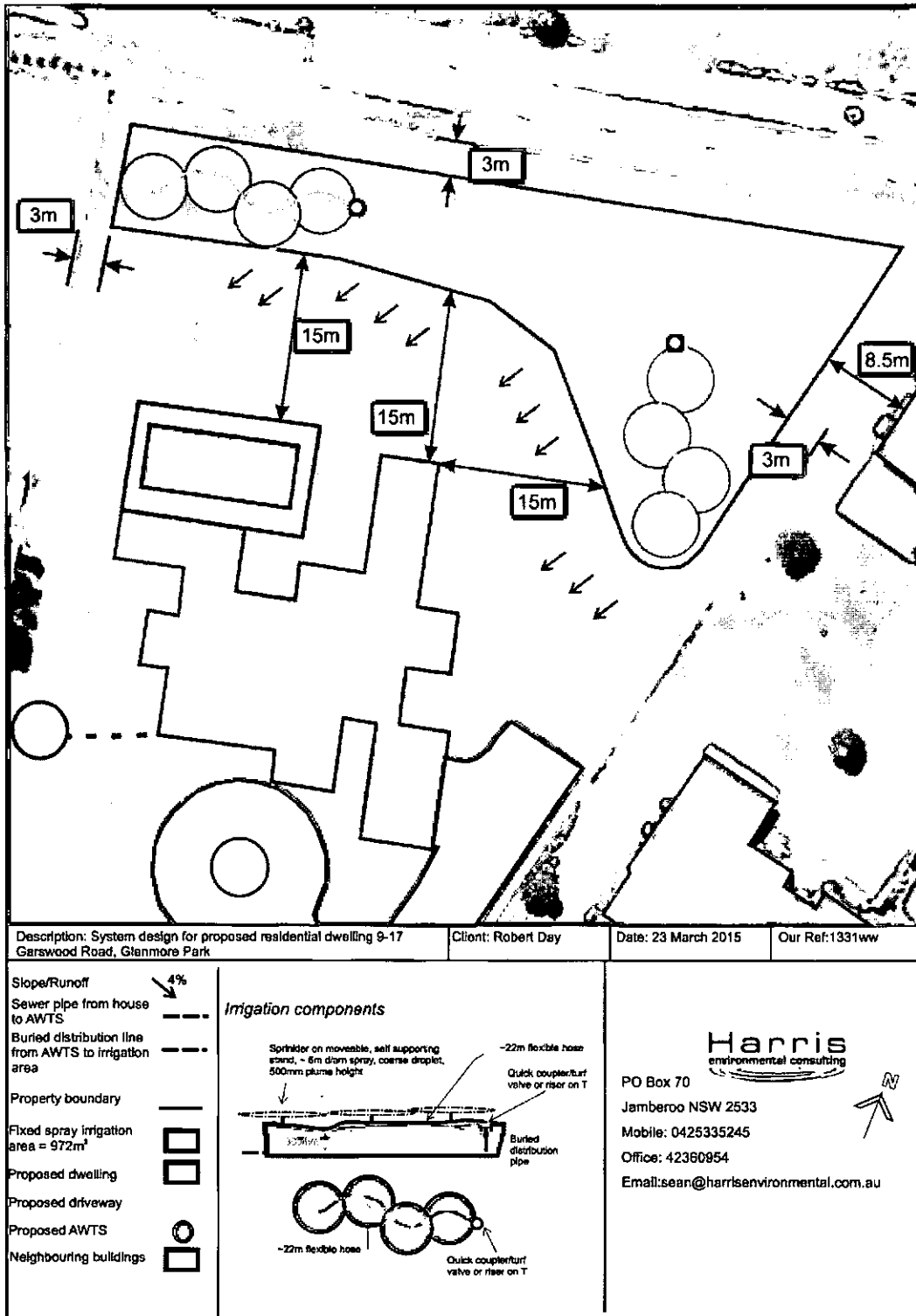


Figure 2 General Site Plan

Description: Proposed residential dwelling 9-17 Garswood Road, Glenmore Park		Client: Robert Day	Date: 23 March 2015	Our Ref:1331ww
<p>Slope/Runoff  4%</p> <p>Proposed dwelling </p> <p>Proposed driveway </p> <p>Proposed 972m² spray irrigation area </p> <p>Proposed AWTS </p> <p>Onsite dam </p> <p>Proposed pool </p> <p>Neighbouring buildings </p>		<p>Property boundary </p> <p>Contour lines (0.5m) </p> <p>Sewer pipe from house to AWTS </p> <p>Buried distribution line from AWTS to irrigation area </p>		
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Site and Soil Assessment for On-site Wastewater Management on 9-17 Garswood Road, Glenmore Park

Figure 3 Irrigation Site Plan



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Site and Soil Assessment for On-site Wastewater Management on 9-17 Garswood Road, Glenmore Park

5. PROPOSED METHOD OF WASTEWATER TREATMENT

- 5.1 A domestic AWTS has capacity for 10 persons, which would be sufficient for the proposed **4 bedroom house (7 person)**. The owner must provide Council with the AWTS manufacturer's specifications of the Sewage Management Facility. (Information on proposed AWTS can be obtained from the manufacturer or NSW Health Register of Accredited Sewage Management Systems at http://www.health.nsw.gov.au/publichealth/environment/water/waste_water.asp).
- 5.2 The AWTS manufacturer will provide the necessary plans and specifications including NSW Health Accreditation, tank dimensions and capacity, operation and maintenance details, plus Licensed Plumber's name, address, phone number and license number.
- 5.3 The AWTS will be installed and maintained in accordance with Section 5 of the guidelines 'On-site Sewage Management for Single Households' (Department of Local Government, 1998) and AS/NZS 1547-2012 'On-site Domestic Wastewater Management' (Standards Australia, 2012);
- 5.4 Upon approval from **Penrith City Council**, the owner is to enter into a servicing contract with an approved servicing agent for the life of the system. Copies of the written service reports should be lodged with **Penrith City Council** following each quarterly service
- 5.5 The location of the AWTS is shown on the Site Plan previous. The location of the AWTS should be decided in conjunction by the licensed plumber in consultation with the property owner. The AWTS must be positioned on a stable, level base and be downslope of the building so there is sufficient fall from drainage outlets in the dwelling. The location of AWTS shown on the Site Plan was selected because:
- it is downslope of the buildings from where wastewater is generated;
 - at least 2.5m away from the building
 - at least 5m from the property boundary
 - at least 6m downslope from any in ground water storage tanks.
- 5.6 AWTS installation must comply with the manufacturer's recommendations, AS/NZS 3500.2:2003 Plumbing and Drainage Part 2 Sanitary Plumbing and Drainage' and Council requirements.
- 5.7 The sewer pipe between the house, AWTS and irrigation area must be buried at depth that provides protection against mechanical damage or deformation, in accordance with 'AS/NZS 3500(Set):2003 Plumbing and Drainage Set'. Table 1 shows the minimum pipe depth for trafficable areas.

Table 1 Minimum pipe depth for trafficable areas

Location	Minimum depth of cover (mm)
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Where subject to heavy vehicular traffic	500
Where subject to light vehicular traffic	450
Elsewhere	300
Source: 'AS/NZS 3500:2003 Table 3.4 Minimum Cover for Buried Piping'	

6. REQUIRED IRRIGATION AREA

In accordance with Table 3 of the Penrith City Council's On Site Sewage Management Policy, (appendix II) the required irrigation area for a dwelling on clay soil types with reticulated water supply:

- 6 potential bedroom occupancy will require a 972m² irrigation area.

7. METHOD OF IRRIGATION

- 7.1 Semi-fixed spray irrigation is proposed. This involves a 300mm deep buried, 25mm purple line polythene pipe (distribution line) from the AWTS to the irrigation area.
- 7.2 Two quick coupling turf valves are connected to the buried distribution line so fixed access points are available for the connection of a moveable hose and sprinkler. See Figure 2 & 3 and Appendix I for further information.

8. SUMMARY

This assessment recommends the following:

- Install domestic Aerated Wastewater Treatment System to treat wastewater from proposed residential dwelling;
- Install 972m² for the proposed 4 bedroom residence; and
- Install spray irrigation, as described in the Appendix and shown on the Site Plan.

9. SITE LIMITATIONS

The proposed upslope spray irrigation site should be 3m of property boundaries and 15m from the planned dwelling, swimming pool and neighboring residential properties. Any underground water tank(s) should not be placed downslope of the proposed irrigation area, although an above ground water tank is acceptable provided that a 6m buffer from the spray irrigation area is achieved. The two flexible hoses (~22m) shall be

only irrigate within the designated spray irrigation area as highlighted in figure 3 – irrigation site plan.

10. REFERENCES

Department of Local Government (1998) *On-site Sewage Management for Single Households*. NSW Government.

Standards Australia (2012) Australian/New Zealand Standard 1547:2012 *On-site domestic wastewater management*. Standards Australia.

NSW Health Septic Tank Accreditation Guidelines (2001).

Hazelton, P.A and Murphy, B.W ed. (1992) *What Do All the Numbers Mean? A Guide for the Interpretation of Soil Test Results*. Department of Conservation and Land Management (incorporating the Soil Conservation Service of NSW), Sydney.

Penrith City Council's On- Site Sewage Management Policy

Appendix I Semi Fixed Spray Irrigation

Irrigation set up

- a) The irrigation area is to be split into three using turf valves;
- b) Within each zone, 4 low plume wobbler / butterfly / rose sprinklers are to be mounted along the length of a ~22m length of 19mm purple wastewater irrigation pipe;
- c) The low plume sprinklers should not be capable of producing aerosols;
- d) All distribution lines shall be buried to a minimum depth of 300mm below finished surface level or, where this is not possible, covered with 150mm of concrete;
- e) The throw on the sprinklers shall not exceed beyond the designated disposal area.

Management of irrigation area

- f) The grass within the irrigation should be mown on a regular basis to ensure sprinklers can be seen through grass and any breakage or leaks can be seen and repaired;
- g) The effluent disposal area shall be clearly identified within the property by post or some other means.
- h) All stormwater and seepage from higher levels shall be diverted away from the effluent disposal area using a dish drain or similar.
- i) Fruit or salad vegetables should not be irrigated with effluent from the wastewater treatment system.
- j) The irrigation area should not be used for recreational purposes or used for parking a car.
- k) Horse and cattle should not be kept within the effluent disposal area.
- l) Buffer distances are 6m if area up gradient and 3m if area down gradient of swimming pools, property boundaries and driveways; 15m buffer to buildings.

- m) A warning sign complying with AS1319:1994 – Safety signs for the occupational environment should be located at the boundary of the designated area in one or two places, clearly visible to property users, with wording such as, RECYCLED WATER, AVOID CONTACT, DO NOT DRINK'.

Example of turf valve, flexible 19mm poly pipe and 'wobbler' sprinklers.



Appendix II Penrith City Council, Table 3

Table 3 Sizing of domestic Aerated Wastewater Treatment Systems (AWTS) Effluent Disposal Areas

Sizing of AWTS Effluent Disposal Areas			
Unsewered Penrith Suburbs	No. of Bedrooms	Surface and Sub-Surface Irrigation Areas (m ²)	
		Reticulated Water	Tank Water
Sandy Soil Types <i>eg Agnes Banks - east of Castlereagh Road. Castlereagh - north of Devlin Road and east of Castlereagh Road.</i>	4 or less	873	700
	5	1048	838
	6	1223	978
Clay Soil Types <i>Most other areas</i>	4 or less	695	556
	5	833	667
	6	972	778

Notes: (1) The Effluent Disposal Area (EDA) is based on nutrient balances as they are considered to be the most limiting factors in these areas.

(2) Figures are based on:

- 150 litres per person/day or 120 litres per person/day for tank water supply
- One person per bedroom and two for a master bedroom
- TN output value of 25 mg/L and a Critical Loading Rate of 27 mg/m²/day
- TP output value of 12 mg/L
- P sorption capacity - 600,000 mg/m²/depth for clay soil types or 400,000 mg/m²/depth for sandy soil types
- Design irrigation rate of 15 mm/week for clay soil types or 35 mm/week for sandy soil types.

(3) A Wastewater Assessment is required for applications with more than 6 bedrooms.