ON-SITE WASTEWATER ASSESSMENT FOR PROPOSED DUAL OCCUPANCY DWELLING ON 2289-2293 THE NORTHERN ROAD, MULGOA

FOLIO NO: LOT 4 DP 29081

LGA: PENRITH CITY COUNCIL

OWNER: JEANETTE AND LEANNE SMITH

09 July 2015

Our ref: 1445ww

Harris environmental consulting

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TABLE OF CONTENTS

FIGURES

APPENDICES

1. ASSESSMENT CRITERIA

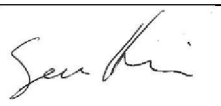
The owners of Lot 4 DP 29081, located 2289-2293 The Northern Road, Mulgoa, propose to construct a 4 bedroom dual occupancy dwelling on this 5 acre property. Harris Environmental Consulting was commissioned by the owner to undertake this Soil and Site Assessment for On Site Wastewater Management in accordance 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 2289-2293 The Northern Road, Mulgoa

Source: NSW SixMaps

2. SITE INFORMATION

Owner	**Jeanetta and Leanne Smith** E: jenny-smith@live.com.au M: 0433 953 392 M:0430 815 225
Project manager	**Linn Roberts**, Drafting coordinator at Masterton Homes PO BOX 323 Liverpool BC 1871 E: drafting.admin.casual@masterton.com.au T: (02) 9821 9755
Size of property	5 acres
Legal title	Lot 4 DP 29081
Local Government	Penrith City Council's On- Site Sewage Management Policy (nominated irrigation areas for soil types);
Proposed development:	Bedrooms 4 | Potential b/rooms 0 | Total 4
Water supply	Town water
Wastewater load assumptions	150L/person/day for town water
Design wastewater load	1 master (2 persons/room) 3 bedrooms (1 person/room) = 5 persons on 150L/person/day = 750L/day
Surface and Subsurface Irrigation area	1048m^2 for 5 bedrooms and clayey soil (see appendix II)
Proposed wastewater treatment	AWTS
Proposed wastewater of disposal	Fixed spray irrigation
Date site assessed:	3/07/2015
Date report prepared:	8/07/2015
Site assessor:	 Sean Harris Msc Env Science (UOW), Grad dip Nat Res (UNE), BscAppSc, Agriculture (HAC)

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	Western aspect, full sun and wind exposure
Slope	4-8% slope, minor limitation
Landform	Convex side slope, minor limitation
Run-on and seepage	No evidence of moisture tolerant grasses or wet areas; minor limitation
Erosion potential	No evidence of sheet erosion; fully managed lawn; 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)	1000mm; 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	Blacktown Soil Landscape Wianamatta Shale (Sandstone, Siltstone and shale) CSIRO defined Red Duplex (red clayed soils)			
Surface rock	No surface rock– see Photo 2; 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 Colour Depth Structure Coarse frag.	Silty clay loam Black/ 0-200mm Well structured NA	NA	15
	Layer 2		DLR	DIR
	Texture Colour Depth Structure Coarse frag.	Light clay Tan 200-400 Weakly structured NA	NA	NA
	Layer 3			
	Texture Colour Depth Structure Coarse frag.	Light/medium clay Brown to red 400-1000 Moderately structured NA	NA	NA

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

Photo 1 Proposed irrigation area

Photo 2 Looking upslope across o proposed irrigation from mid slope

Figure 2 **General Site Plan**

Description: Proposed residential dwelling 2289-2293 The Northern Road, Mulgoa	Owner: Jeanette and Leanne Smith	Date: 09 July 2015	Our Ref:1445ww

Slope/Runoff 4-8%
Proposed dwelling
Proposed 1048m² spray irrigation area
Proposed driveway
Existing dwellings septic tank
Existing dwellings soil absorption bed

Property boundary
2m contour lines
100mm pvc pipe
25mm pvc pipe
Proposed AWTS
Turf valves

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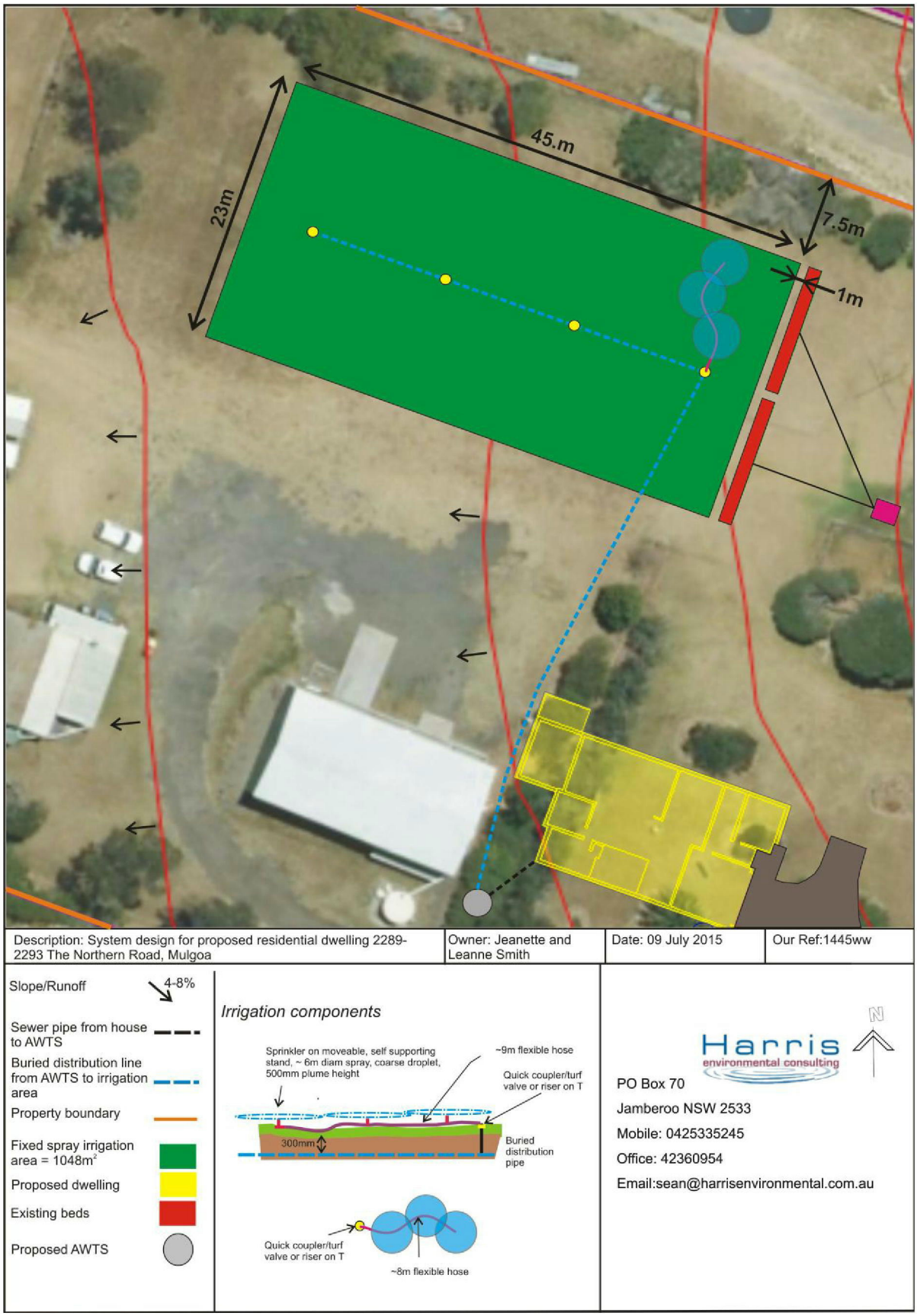
Figure 3 Irrigation Site Plan



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 (5 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 Heath 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 below the proposed duel occupancy dwelling. However please note 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 a 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)
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 is 1048m^2**.**

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 Four 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 1048m^2 for the proposed 4 bedroom residence; and
- Install spray irrigation, as described in the Appendix and shown on the Site Plan.

9. 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, 2 or 3 low plume wobbler / butterfly / rose sprinklers are to be mounted along the length of a ~9m 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 uses, 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 ***eg Agnes Banks - east of Castlereagh Road. Castlereagh - north of Devlin Road and east of Castlereagh Road.***	**4 or less**	873	700
	5	1048	838
	6	1223	978
Clay Soil Types ***Most other areas***	**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/m^2/day*
- *TP output value of 12 mg/L*
- *P sorption capacity - 600,000 mg/m^2/depth for clay soil types or 400,000 mg/m^2/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.

Appendix III Extract from PCC Draft Sewage and Greywater Policy

2.1.6 Dual Occupancies and Secondary Dwellings

Each dwelling within a dual occupancy is to be serviced by its own OSSM system. Secondary dwellings may be serviced by an existing OSSM system where it can be demonstrated to the satisfaction of Council that the system and the site have the capacity to manage effluent effectively.

If a dual occupancy or secondary dwelling is proposed, the OSSM system must comply with the requirements of Table 2 and Table 3 or a Wastewater Assessment Report is to be provided.

In addition, adequate provisions are to be made for any existing system on the site. The site must have sufficient land available for the replacement or alteration of the existing system if it were to fail in the future. Part 2 of this policy will be used to determine whether sufficient land is available.

If a site is unable to provide sufficient land for the future replacement or alterations of the existing system, a Wastewater Report is required to be submitted for the development. This Wastewater Report is to be prepared in accordance with the requirements of this policy and must also provide sufficient assessment and recommendations on the future replacement or alteration of the existing system, taking into account the proposed development.