

24 February 2016

Wren Pty Ltd C-/Adam Smith  
Planit Consulting

Sent by email to: AdamS@planitconsulting.com.au

**ATTENTION: Adam Smith**

Dear Adam,

**Preliminary Assessment of Onsite Wastewater Disposal and Rainwater Harvesting  
for 225 Terranora Rd, Banora Point (PP10/0006)**

Harvest Water Management Consultants Pty Ltd (Harvest WMC) have undertaken a preliminary assessment of the onsite water and wastewater systems for the proposed development at 225 Terranora Road, Banora Point in relation to planning proposal PP10/0006).

**Background**

Tweed Shire Council (TSC) provided a response to the planning proposal to Planit Consulting on 10 September 2015. In this response TSC indicated there was insufficient capacity in the local water and sewerage networks for the proposed development to connect. It was suggested in this correspondence that independent onsite water and wastewater systems could be investigated as an alternative method of servicing the development.

This report provides an initial assessment of the onsite wastewater disposal and rainwater harvesting systems for the development.

This report has been written to initiate consultation with TSC to gain their general acceptance of and early input into the proposal. Following which detailed site design and water balance modelling would be undertaken for each allotment during finalisation of the development master plan.

The existing development master plan has lot sizes in the order of 4000 m<sup>2</sup>. There is potential to reduce this slightly provided that the onsite wastewater disposal systems can be located within each lot whilst still maintaining the required set back distances. This will be confirmed during detailed design.

**Onsite Wastewater Disposal**

Assessment of the effluent disposal systems required on each allotment has been undertaken based on AS1547 – *Onsite Domestic Wastewater Management* (2012) and *DLG Onsite sewage management for single households* (1998). This preliminary assessment was informed by a walk over site inspection as well as review of historic geotechnical data gathered for the site.

The most appropriate system for the proposed development is a surface spray irrigation system using advanced secondary treated and disinfected effluent. A minimum disposal area of 240 m<sup>2</sup> would be required.

A summary of the key findings and assumptions in undertaking this assessment are presented below in Table 1.

**Table 1: Summary of preliminary assessment of the onsite disposal system at 225 Terranora Rd.**

Parameter	Value	Comment
Single Lot Occupancy	6 EP/dwelling	Typical maximum occupancy. Could be reduced depending on the number of bedrooms in each house.
Wastewater Generation	80 L/EP/day, 480 L/dwelling/day	Based on water efficient fixtures and onsite rainwater harvesting water supply from AS1547.
Disposal Method	Surface spray irrigation	Surface irrigation to minimise percolation due to relatively shallow top soil and location on the side of a hill.
Effluent Quality	Advanced secondary treatment with disinfection	Required due to the use of spray irrigation
Design Irrigation Rate	2 mm/day	Lowest DIR value in AS1547 based on clay soils.
Irrigation Area	240 m <sup>2</sup>	A reserve area is not required due to the use of secondary treated effluent and spray irrigation.
Buffers	Dwellings – 15 m Rainwater Tanks – 15 m Property Boundaries – 6 m downgradient & 3 m upgradient Swimming pools – 6 m Walkways – 3 m Stormwater Drainage Channels – 15 m	Irrigation areas and lot layouts to be designed to comply with the setback distances. Provided setback distances can be achieved the overall lot size could potentially be reduced.
Slope	<10%, preferably <5 %.	Irrigation areas to be located on the flattest areas of each lot.
Catch drains	Diversion drain to be installed on the upslope side of all irrigation areas. Mounds to be installed on the down slope of all irrigation areas.	Catch drains required up and down stream of the irrigation areas to control runoff.
Soils	150 mm of loam topsoil to be provided on all irrigation areas	Loam topsoil required to facilitate vegetation growth and water uptake in the irrigation areas.
Wet weather storage	3.5 kL	Based on 7 days storage, to minimise irrigation during high rainfall periods.

The above onsite wastewater disposal system is considered feasible and sustainable for the site. Following general acceptance of the above strategy by TSC, it would be proposed to undertake detailed development master planning to ensure the lot layout is designed to achieve the required buffers and setback distances and requirements for onsite disposal.

### **Rainwater Harvesting**

Assessment of the onsite rainwater harvesting system was undertaken using annual rainfall data and yield calculations and conservative rainwater capture efficiencies, consistent with *Enhealth: Guidance on the use of rainwater tanks* (2011).

Given the high rainfall area, rainwater harvesting is a feasible water supply source for the development provided that adequate roof area and tank volume is provided. Preliminary assessment of the rainwater yield and tank sizing is provided below in Table 2.

**Table 2: Assessment of rainwater harvesting system at 225 Terranora Road.**

Parameter	Value	Comment
Rainwater Yield Target	248.2 kL/ET/year,	Based on 680 L/ET/day. 480 L/day indoor water use and 200 L/day outdoor water use.
Mean Annual Rainfall	1695 mm/year,	Tweed heads Golf Club BoM Site No. 58056
Rainwater Capture Efficiency	0.75	Effective rainfall is therefore 1271 mm/year (Capture Efficiency x Rainfall).
Roof Area Connected	200 m <sup>2</sup>	Calculated minimum roof area required to achieve the rainwater yield target.
Supply reliability	Target 99%	Final tank sizing and supply reliability will be confirmed based on water balance modelling.
Rainwater Storage Volume	50 kL, based on 100 days without rain	Nominal tank size, subject to detailed water balance modelling.
Fire Fighting Storage Volume	10 kL, at the base of the tank below the offtake for the domestic water supply	Typical fire storage allowance. Additional water storage should be considered for specific bushfire risks.
Total Rainwater Tank Volume	60 kL, nominally 2 x 30 kL rainwater tanks.	Total storage of 60 kL with domestic supply taken from a high level offtake 10 kL above the base of the tank.

Given the high rainfall in the area, rainwater harvesting is a viable water supply source for the development. Following consultation and general acceptance of the strategy by TSC detailed water balance modelling would be undertaken to finalise sizing of the rainwater tanks.

Please contact Brad Irwin from Harvest WMC should you wish to discuss or if you have any comments in relation to the above.

Kind Regards,



**Brad Irwin** MIEAust CPEng NPER RPEQ

Environmental Engineer | Managing Director

