

URBAN WATER MANAGEMENT PLAN

FOR GREENLAND PEMBERTON PTY LTD

Lots 1, 200, 201 and 801 Golf Links Road Pemberton

For Stage 1 comprising 27 1ha lots on Golf Links Road

February 2014

Introduction

The Greenland Pemberton Estate (the development) is located at Lots 1, 200, 201 and 801 Golf Links Road, Pemberton, in the Shire of Manjimup. The approximately 28 ha site is located on the Southern side of Golf Links Road Road, east of the town centre. It is proposed to develop Lots 1, 200, 201 and 801 into 27 1Ha lots for residential housing, adjacent to and abutting the existing Golf Links Road (see plan at attachment A).

The purpose of this Urban Water Management Plan (UWMP) is to establish a planned approach to provide retention of the environmental values, integrity and functions of the existing waterways in the area, whilst balancing the need to provide sufficient suitable residential land.

This UWMP for the proposed development has been prepared for Greenland Pemberton Pty Ltd in accordance with *Better Urban Water Management* (WAPC, 2008) and *Guidelines for preparing plans and for complying with subdivision conditions* (DoW 2008) to satisfy Condition 9 specified in WAPC Approval No 148347.

Previous studies and relevant literature

Some information used in the preparation of this UWMP has been sourced from the ATA Environmental Report No 2006/264 Version 4 October 2007 "Effluent Disposal Investigation and Drainage Assessment Lots 1, 200, 201 Location 7256 Golf Links Road, Pemberton". In the interest of brevity this report should be read in conjunction with the ATA report.

Geotechnical

The study area is relatively flat with elevations typically ranging between 158m AHD and 166m AHD, Grades are typically less 1 in 20 with some limited areas with grades up to 1 in 10.

A review of the relative bore holes TP7, TP8, TP10 and TP13, as shown on Figure 2 of the ATA report, noted that below the sandy loam topsoil, the near surface soils encountered were generally sandy clay loam and some lateritic gravel.

The acid sulphate risk map published by WAPC in 2005, indicates that the soils in the study area generally exhibit no known acid sulphate soils (ASS) disturbance risk of actual and potential ASS occurring generally at greater than 3 m depth.

Surface Water

The proposed development is generally located on a ridge. As the site is located at the top of the catchment, surface water tends to drain as sheet flow to the existing Golf Links Road swale drains and the south to the existing dams and water courses as shown by the drainage catchments C1, C3, C8, C9, C10 and C11 in Figure 2 in the ATA report which is attached as Attachment 2. There are no obvious water courses across the site of these works.

As the proposed 27 lots are generally located on the watershed – ie on the highest local topography, it is considered unnecessary to calculate flow volumes and flood levels.

Depth of Groundwater

The 2006 investigation into groundwater at the site, as detailed in the ATA report showed that for the extent of this development the Groundwater Level (AAMGL) is at a depth greater than 2.5m from the ground level. The topography of the site suggests that groundwater levels are directly related to rainfall falling on the site, and not external inflows.

Groundwater Quality

Predevelopment land use of the site and surrounding area included farming and in Section 5.6 of the ATA report it concludes that the use of WSUD guiding principles will manage the surface and ground water quality and quantity issues, and in fact is likely to improve the quality of water leaving the site.

Declared rare flora and Threatened ecological communities

There are no environmental assets within the development area's boundary.

Managing stormwater quantity

The proposed development of 1Ha lots does not necessitate bulk earthworks and will retain the natural existing contours, hence post development water flows will remain as pre development water flows with the exception of that captured as roof drainage for potable water usage.

The proposed stormwater management strategy employs the following principles for the following events:

1 year ARI event

- Roofs will be connected to rainwater tanks;
- Road runoff will drain the existing Golf Links Road swale system or to the south as the existing contours dictate.

5 year ARI event

- Roof runoff exceeding the capacity of rainwater tanks will overflow to the road swale system, or to the south, as the existing contours dictate.

Greater than 5 year ARI event

- Road and lot runoff exceeding the capacity of the swales to be conveyed by overland flow down roads and to the south into the existing stormwater system;

Managing groundwater quantity

As the predevelopment flow patterns are not proposed to be altered other than the collection of roof drainage, the existing ground water regime shall largely be unaffected by the development.

Managing water quality

Stormwater quality for the development will involve the adoption of Water Sensitive Urban Design (WSUD) features which promote retention and treatment of events up to the 1- year ARI events. The key WSUD measures in relation to nutrient and pollutant management are:

- Reduced demand for fertilisers through xeriscaping;
- Pollutants from the lots will be contained by the lot-scale rain gardens,
- It is expected that the predevelopment hydrological regime will not be significantly altered after development.

Water conservation and efficiency

The proposed development of 1ha lots does not require servicing by a reticulated potable water scheme, and all water for use in the development will be collected rainwater

Waste Water Management

In accordance with the recommendation of the ATA Report the lots developed are to be generally serviced by conventional septic system. However where portions of the lots are located within the drainage catchment C1 as shown in Figure 2 of the ATA report, and the disposal system is within that portion, it is noted that the developer has committed to the use of an aerobic treatment unit (ATU) to treat and dispose of all household sewage.

A minimum separation of 1.2 m between the waste water disposal system and the maximum groundwater level is required. As the groundwater level for the development is greater than 2.5 m from the ground surface, no fill is required to ensure adequate separation. Shire of Manjimup and Department of Health guidelines stipulate septic tank systems are to be assessed individually to determine site specific characteristics and requirements. Builders and owners of the property will then have to design the septic system to the council's recommendations based on the local conditions, at building approval stage.

Disease Vector Management

No permanent water bodies are being created as part of the development; therefore no specific Disease Vector Management Plan is required.

Managing Subdivisional Works

No bulk earthworks are proposed for the development with the only construction works being the upgrades required to Golf Links road. However current best practices for erosion and sediment control are to be implemented.

Future subdivisional stages

The balance of the Greenland Pemberton property will be developed with additional lots over a series of stages subject to market conditions. As it does now, pre-development, the vast majority of stormwater will drain south into the property and be directed, as appropriate, into a system of piped drains and compensating basins to be designed on a stage by stage basis. Currently, from an overall perspective, there are no foreseeable impediments to designing and implementing a comprehensive drainage system that meets all the required guidelines. It is envisaged that drainage systems will follow existing contours and drainage lines. Flow volumes and routes will be generally consistent with the existing, pre-development scenario.

Conclusion

From the review of the ATA report and general assessment of the existing ground and drainage characteristics, it can be seen that use of normal design and construction parameters based on the WSUD principles is sufficient to enable the development of the twenty seven one hectare lots to proceed with no bulk earthworks, roof drainage catchment for residential use on the lots, septic tank wastewater disposal systems on each lot, and upgrade of the existing Golf Links Road pavement and drainage swales as agreed with the Shire of Manjimup.

P J Eastlake BE, FIE Aust, CP Eng.

ATTACHMENT A – Plan of Stage 1 – 27 1ha lots

PROPOSED SUBDIVISION OF:
 LOT 1 ON DIAGRAM 46341 CT 1383/80 30.486ha,
 LOT 200 ON DP 36559 CT 2226/930 43.477ha,
 LOT 201 ON DP 41003 CT 2226/929 19.873ha and
 LOT 801 ON DP 69221 CT 2761/732 54.711ha.

SUBJECT TO SURVEY

L.A. SHIRE OF MANJIMUP
 LOCALITY PEMBERTON, GOLF LINKS ROAD
 CONTOUR INTERVAL - 2m
 ORIGINAL NUMBER OF LOTS - 4
 PROPOSED NUMBER OF LOTS - 32

ROD LARKLIN
 SURVEYORS & VALUERS
 17880/17882, 17884, 17886, 17888, 17890, 17892, 17894, 17896, 17898, 17900, 17902, 17904, 17906, 17908, 17910, 17912, 17914, 17916, 17918, 17920, 17922, 17924, 17926, 17928, 17930, 17932, 17934, 17936, 17938, 17940, 17942, 17944, 17946, 17948, 17950, 17952, 17954, 17956, 17958, 17960, 17962, 17964, 17966, 17968, 17970, 17972, 17974, 17976, 17978, 17980, 17982, 17984, 17986, 17988, 17990, 17992, 17994, 17996, 17998, 18000

