26. Lake Albert Catchment

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26.1 Background

Lake Albert provides for a variety of recreational activities including water based activities and passive recreation on the foreshore area. It is an important recreational and aesthetic feature of Wagga Wagga and is under threat due to water quality problems. Testing indicates that the water quality of the lake does not appear to be sufficiently high to support water based activities. The water quality of the lake is likely to continue to deteriorate if rural land is subdivided for residential and rural residential purposes and intensive agriculture activities continue without provision for appropriate erosion and pollution control measures. Recent studies have indicated that Lake Albert has been polluted with nutrients, bacteria and silt.

26.2 Aim

The aim of the controls contained within this section is to encourage the implementation of soil and pollution control measures for new developments in the catchment of Lake Albert as defined in Figure 26.1. This action is in accordance with the recommendations of the Draft Catchment Management Plan for Lake Albert and the Wagga Wagga Draft Natural Resources Management Plan.

26.3 Development Guidelines

The following concepts have evolved as a result of investigations into the most effective way to protect Lake Albert while still allowing suitable development. The investigations and conclusions of the Lake Albert Catchment Management Study (Willing & Partners) and recommendations from the Lake Albert Catchment Management Study Sub-Committee are the primary source of input into these development standards and guidelines. In addition, recommendations from the Draft Natural Resources Management Plan have been included in this DCP where appropriate.

Any development proposal within the Lake Albert Catchment, whether private or public, which will involve the following actions shall be subject to the provisions of this section:

- the disturbance of the existing surface of land within the catchment (such as cut & fill, road construction in association with subdivisions, dams, dwelling construction etc.) or placement of fill thereon; or
• changes in the rate, volume and/or quality of runoff entering directly or indirectly a watercourse in the catchment, or flowing overland.
26.3.1 General Development Standard

Development within the catchment will be required to achieve a zero pollution discharge from both surface and sub-surface sources, i.e. a discharge to reflect the “state of the land in nature”. This is defined by the following target average annual pollutant export rate:

- TP (Total Phosphorus) 0.06 kg/ha/yr
  (Bio-available P 0.012 kg/ha/yr)
- BOD (Direct & Indirect) 1.5 kg/ha/yr
- SS (Suspended Solids) 60 kg/ha/yr
- TN (Total Nitrogen) 1 kg/ha/yr

26.3.2 Masterplan

All rural residential development within the Lake Albert Catchment is to be in accordance with the adopted masterplans as shown in Figures 26.2 and 26.3.

26.3.3 Dwelling Density

The following dwelling density provisions shall apply for Lake Albert rural smallholding areas as defined in Figures 26.2 and 26.3:

- **Lloyd Road Area** - development density of 1 dwelling per 2 hectares with an absolute minimum lot size of 0.4 hectares;

- **Gelston Park/Gregado Hills Area** - 1 dwelling per 40 hectares with an absolute minimum lot size of 10 hectares.

Development in both the above-designated areas will be expected to achieve maximum lot yield utilising a variety of lot sizes in accordance with the stated development standard.

26.3.4 Land and Water Management Plan

It will be the developer's responsibility to prepare a Land and Water Management Plan to achieve the standards and objectives of these guidelines. A specification for preparing a Land & Water Management Plan is contained in Appendix 28.

All proposed development activity within the catchment, other than minor alterations or additions to existing development, is to be supported by a Land and Water Management Plan. The standard of
the Plan will vary depending on the complexity and potential impact of the proposal on the water quality of
FIGURE 26.2: Lloyd Road Area - 2ha Masterplan
(Amendment adopted 25/10/99)
FIGURE 26.3: Gelston Park/Gregadoo Hills Area - 40ha Masterplan
Lake Albert. Minor alterations or additions are those works that in the
opinion of Council do not detrimentally affect the quality of Lake Albert.

The plan shall have regard to and incorporate proposals from current
catchment management plans prepared by the local landcare group.

No site works shall be permitted to commence prior to approval by

Council may require erosion or sediment control works to be carried
out in addition to or instead of those works specified in the approved
plan should circumstances change during the construction work or the
activity.

26.3.5 Land and Water Management Design Guidelines

When designing a proposed development the following guidelines shall
be considered.

• all runoff from surrounding land is to be diverted away from the
area to be disturbed and the diversion works installed prior to the
clearing of site vegetation

• all polluted runoff is to be treated on site before release to the
catchment. The construction of erosion control mechanisms and
pollution control devices shall be installed prior to the area being
disturbed and maintained to ensure there is no increase in the
downstream levels of nutrients, litter, vegetative devices and other
water borne pollutants (see Appendices of the Willing's Study for
examples);

• disturbance of vegetation is to be minimised, 70% groundcover is
to be maintained;

• all disturbed areas are to be stabilised, preferably with vegetation
as soon as possible after earthworks completed;

• all works are to be staged to minimise the disturbed area;

• all pollution and erosion control structures are to be inspected by
Council and maintained to ensure that they are in good working
order. The inspection is to be carried out prior to the release of the
subdivision linen plan;

• all new developments should be designed taking into account
land and water management principles, as illustrated in Figures
26.4, 26.5, 26.6 & 26.7;
all permanent and non-permanent waterways shall be adequately protected. In this regard, the importance of maintaining a permanent stable vegetative zone along drainage lines shall be recognised and built into development plans.

**FIGURE 26.4: Erosion/Sedimentation Control Plan - House Construction Example**

**FIGURE 26.5: Erosion/Sedimentation Control Plan - Subdivision Example**
FIGURE 26.6: Erosion/Sedimentation Control Plan - Cut & Fill Works Example

FIGURE 26.7: Erosion/Sedimentation Control Plan - Rural Land Clearing Example
26.4 Alternatives

Council will consider alternative development concepts which can be demonstrated to have the same, or higher beneficial effects, in reducing the risk of water quality problems in the catchment.

26.5 Environmental Bond

No signed plans or approval to occupy until all environmental works completed, however, if a developer wishes to proceed at a faster rate than allowed by this, and in the case of subsequent non-residential developments, a bond shall apply. This bond shall be calculated using the following formula:

\[
Bond = \text{bond rate} \times \text{zone factor} \times \text{risk factor} \times \text{area} \times \text{value factor}
\]

**Bond rate** - shall be as set by Council from time to time but expect to be $20,000 adjusted for CPI movement.

**Zone factor** - The catchment shall be divided into 8 zones based on land class (as per DLWC maps), soil erodibility, distance from the lake and development potential (zoning).

Range 0.3 - 1.0
0.3 being stable, low gradient land more than 10 km from the lake.
1.0 being land adjacent to the lake.

**Risk factor** - Based on an assessment of the relative risk.

Range 0 - 1
0 being for environmental works
0.3 - 1 being for development works
1 being for major excavations, close to a water way and on a site within 1 km of the lake.

Note: the risk factor can be discounted by 0.05 for each of the following, provided they are constructed to approved standards:-

- upstream diversion drains
- provision of silt fences
- provision of silt traps
- provision of rumble strips for exiting trucks
- each 100 m of well grassed land between the site and closest downstream boundary.

**Area** - Area of disturbed land in hectares.
**Value factor** - A factor designed to ensure that the bonds are relative to the value of the work being undertaken.

Range 0.33 - 1.0
0.33 being for works of a value of less than $10,000
0.66 being for works of a value between $10,000 & $50,000
1.0 being for works of a value above $50,000.

**Example 1:** A farm shed 3 km from lake

Zone 0.5
Risk 0.5
Area 0.1 ha
Value ($30,000) 0.66

Bond $330

**Example 2:** A house site, including excavation of garage close to lake.

Zone 1.0
Risk 1.0
Area 0.05
Value ($150,000) 1.0

Bond $1,000

** Note: if diversion banks and silt trap provided and 200 m grassed buffer available on site, risk would have been reduced to 0.8 and the bond to $800.

### 26.6 Wetland Areas, Buffer Zones and Pollution Traps

The Lake Albert Catchment Management Study has recommended pollution and sediment control measures to be constructed around the perimeter of the Lake and elsewhere in the catchment. Works will include wetland areas, water quality ponds, farm dams, erosion control measures, pollution traps and riparian buffer zones to main waterways.

#### 26.6.1 Lake Foreshore Area

The works proposed in Figure 26.8 are to be implemented by Council. These will include wetland areas and a combination of pollution traps and
ponds. The wetland areas are to be located at the southern end of the lake around the discharge points of Stringybark and Crooked Creeks.

The pollution traps and ponds are to be located at the discharge points of existing stormwater lines.
FIGURE 26.8: Water Pollution Control Pond (WPCP), Wetland and Minor Pollution Traps on Lake Edge

KEY

- WPCP and Wetlands.
- Minor Pollution Traps.
26.6.2 Catchment Area

A series of water quality ponds (WQP’s) are to be developed within the catchment at locations indicated on Figure 26.9. These water quality ponds are to incorporate wetland areas.

Both water quality ponds and wetlands are to be designed to give some detention capacity (ie. a 1 metre level difference between trickle flow outlet and spillway). Trickle flow size to be limited to relate to normal minimal flows.

A series of farm dams as suggested by the Department of Land and Water Conservation (DLWC) are to be built by the land holder to assist in flow mitigation, collection of gross pollutants and silt control.

Riparian buffer zones along waterways as indicated in Figure 26.9 are to be established by the landholder. Buffer zones are to be 30 metres in width unless site circumstances require a variation to this standard. Figure 26.10 illustrates a typical example of the establishment of such buffer zones along waterways.

Ownership of buffer zones and water quality ponds is to remain with the landholder. A Project Agreement is be used during the construction period of water quality ponds and buffers strips. In addition, a Restriction as to User is to be taken out over the Title of the land to protect these structures and allow for maintenance to be done.

Erosion control measures currently being established through the Lake Albert Soil Conservation Project with the assistance of DLWC are to be continued. The designs, however, are to be modified to encourage mitigation of other pollutants and to attenuate flows. The locations of existing and proposed works under this project are indicated on maps produced by DLWC titled “Lake Albert Property Plan (Sheets 1 to 4)”.

FIGURE 26.9: Waterways & Water Quality Ponds (WQP's)
EXAMPLE OF 30m BUFFER ZONE TO WATERWAYS
POLLUTION AND EROSION CONTROL

Gully Head
Deciduous trees such as willows and poplars planted in staggered rows across the drainage line at 1 to 1.5m spacing

Gully Sides
Eucalypts, Acacias, Casuarinas

Natural Surface
Eucalypts, Acacias, Callistemons and Melaleucas

Permanent wet sites
Deciduous trees such as willows and poplars

Silt Traps
Sods of grass placed in bars 0.5m wide every 10 to 20 metres along gully floor at right angles to stream flow

FIGURE 26.10: Buffer Zones along Waterways
26.7 Domestic Effluent Disposal Systems

Allotments of 8 hectares or smaller in the rural residential zone shall be sewered. Further information on the provision of sewer can be obtained by contacting Council’s Department of Engineering and Technical Services.

The following guidelines are applicable for 40ha rural residential areas. It is pointed out that Council is in no way seeking to be prescriptive and that the responsibility for developing and supporting the system lies with the developer.

26.7.1 Domestic Systems - Common Issues

Systems should:

- Be sized so as to be adequate for maximum normal dwelling occupancy and shock loadings.
- Be specifically designed around the actual site conditions and constraints; i.e. load, climate, topography, soil type and hydrogeology.
- Have a disposal area/method specifically designed for the system and site based on proper and documented site and climate analysis.
- Nutrient build up shall be controlled by ensuring that the plant cover is properly maintained, regularly harvested and removed.
- In the case of land parcels of less than 10 hectares the effluent disposal system shall be designed at subdivision stage with a "disposal site" envelope being marked on the title or otherwise covenanted on the title deeds. In the case of larger parcels of land, individual assessment should be carried out on the proposed house site and suitably protected by covenant. This is to ensure that the design parameters are met in operation and that the system is operated consistently as planned and meets the overall site objectives.
- The title constraints shall be such that they are passed onto all subsequent owners of the property.
- The effluent disposal envelope shall be a minimum of 10m from the proposed property boundary.
- The developer (at development application stage) shall submit a septic tank and effluent disposal system management plan covering such issues as:
  - maintenance and cleaning of the treatment system;
- maintenance of the transpiration/absorption/disposal area;
- contingency (emergency) plans covering tank and disposal system failures;
- the need to periodically replace or rejuvenate disposal areas; and
- the use of low water use fittings and appliances (eg. dual flush cisterns).

This plan can be incorporated into the Land and Water Management Plan and shall be provided to the land purchaser via a covenant attached to the title deeds of the property.

26.7.2 Conventional Septic Tank Systems - Specific Issues

Septic tanks should not be located within 400m from the lake, 200m from a major creek and 100m from any other waterway.

If septic tanks are proposed as part of a development they should:

- Be of a two chamber design to minimise sludge carry over into effluent disposal systems.
- Where provided, have transpiration systems designed to be adequately protected from the ingress of ground and surface waters; be protected from vehicle movements and other damaging activities; and be planted and maintained with suitable plants to ensure good transpiration and plant fixation of nutrients.
- Where septic installations are unable to comply with the distance from water way conditions and an argument for the use of an on-site disposal system can be substantiated by the developer, the transpiration area shall be lined with a impervious material so as to ensure that effluent can not migrate into the ground waters.
- Septic tanks shall be properly maintained by subsequent owners and the removal of sludge shall be carried out as soon as the sludge level reaches within 0.5m from the invert, but in any case at intervals of no longer than 4 years.

26.7.3 Aerated Systems - Specific Issues

If domestic aerated septic tank systems are proposed as part of a development they:
• May be considered where, by documented individual assessment of the land, they are deemed appropriate and where suitable conditions apply;
• Must be installed to the manufacturer’s specifications;
• Must be maintained in accordance with the manufacturer’s recommendations eg. guaranteed chlorine levels to be achieved and sludge draw-off procedures; and
• Must be located in a disposal area envelope to be indicated on the development application plans which defines a disposal area and also an envelope for summer disposal and transpiration/absorption area for winter conditions.

26.8 Monitoring

There is a need for on-going monitoring of the impact of development within the catchment. In this regard, Charles Sturt University, Department of Land and Water Conservation and Council are investigating the setting up of a monitoring programme. This programme will aim to monitor water quality in Lake Albert, major streams and groundwater, particularly in regard to salinity.

26.9 Other Matters

Other relevant development provisions are included in Sections 7.5.2 - Site Responsive Layout, 7.5.4 - Land Management Techniques and Appendix 11 - Guidelines for Sediment, Erosion Control and Drainage Management in Rural and Urban Subdivisions of the Development Control Plan 2005.