Water management on Kangaroo Island

1. Why do we manage water resources?

Water is a shared resource that provides economic, environmental, social and cultural benefits to Kangaroo Island. It is important to balance the competing needs of all individuals and enterprises that require access to water resources so as to achieve the greatest benefit for the Kangaroo Island community. It is equally important to ensure that extraction of water for development purposes poses an acceptable level of risk to water-dependent ecosystems (WDE) that are reliant on adequate water to function appropriately.

2. Who is responsible for managing water resources on KI?

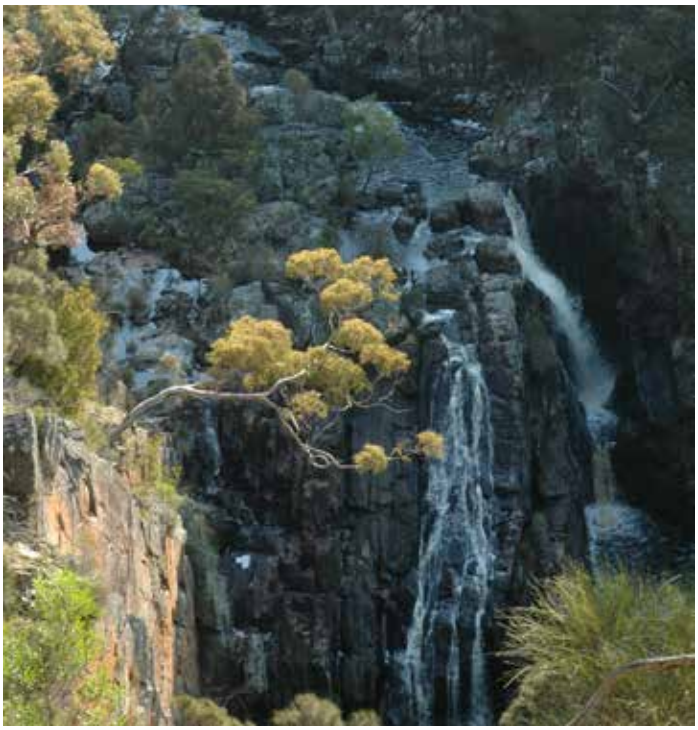
The Kangaroo Island Natural Resources Management Board is legislatively responsible under the *Natural Resources Management Act 2004* for developing and enforcing regulations to manage activities that affect surface or groundwater resources (termed 'water-affecting activities' or WAA). These regulations are set out in the Board's regional Natural Resources Management Plan, which is currently being revised to be 'climate-change ready'.

3. What are our objectives in managing water?

To support development and use of water resources in a sustainable and equitable manner so as to optimise productive use, as well as provide for the long-term needs of ecosystems and other water users. Collectively the principles in the Natural Resources Management Plan mitigate the risk of deterioration of water quality to a point that seasonal and longer term patterns of flow and condition are unacceptable to other water users, including water-dependent ecosystems.

4. How will climate change affect water resources?

The future climate of the KI region will be hotter and drier. Average annual maximum temperatures are predicted to increase by 1.2–2.1°C and average annual minimum temperatures are predicted to increase by 1.0–1.8°C by 2070.



Reductions in rainfall are projected for all seasons, with the greatest declines in spring, while rainfall events will become more sporadic and intense. Annual yields are predicted to decrease by between 26% (intermediate emissions) and 31% (high emissions) by 2070, relative to a 1990 baseline. To reflect the risk of lower annual yields, the calculation of water take limits uses the more recent annual rainfall period from 1990–2013, rather than the entire rainfall record.

5. What are 'Water Take Limits'

Water take limits (WTL) define the maximum volume of surface runoff that can be extracted by water users from a catchment, sub-catchment or property. They are a tool to help share a finite water resource among competing users (including water-dependent ecosystems) in a fair and impartial manner.

The total volume of runoff generated over an area of land is called the surface water yield and is controlled by local rainfall, land cover, terrain and soil properties. A percentage of the surface runoff in an area needs to flow downstream to other water users and water-dependent ecosystems, allowing the remainder to be captured by landholders for development purposes.

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The term 'Water Take Limits' replaces the term 'Sustainable Use Limits' used in the 2009 Kangaroo Island NRM Plan. The word 'take' is more appropriate as the KI NRM Board regulates activities that take water from the shared resource but has no authority over how that water is used.

6. What is 'the 25% rule' and why do we use it to set water take limits?

Where there is insufficient information about the environmental flows needed to support water-dependent ecosystems, 25% of long-term average catchment yield is assigned to development purposes. Based on hydrological studies, and community consultation completed elsewhere in South Australia and interstate, 25% is deemed an acceptable default value for the percentage of surface water extraction from catchments, sub-catchments or properties until such time as a risk assessment can be completed for alternative water-sharing scenarios.

7. What will replace the 25% rule?

The 25% rule will eventually be replaced by the long term average catchment yield minus an environmental water provision. An environmental water provision describes the average annual volume of water that must be allowed to flow downstream in order to deliver a flow regime[1] that is adequate to maintain water-dependent ecosystem function.

The determination of environmental water provisions requires information relating to hydrology, hydrogeology, aquatic ecology and the potential socio-economic benefits of developing a water resource. The process also requires an assessment of the level of risk to water-dependent ecosystem health that communities are willing to accept.

8. Can the Rocky River flow be used to define 'natural flows'?

The annual flow regime necessary to mitigate risks to the health of water-dependent ecosystems in largely cleared catchments may be substantially different to the Rocky River's 'natural flow regime'. In developed catchments, even if the annual volumes of flow are the same as those of undeveloped catchments, the modified flow regimes tend to have delayed onset of seasonal flows, longer no-flow periods, more extreme flow events and/or have poorer seasonal water quality.

The method previously used for determining water take limits in the western sub-catchments of Kangaroo Island ('Method A') used a combination of the Rocky River flow curve (to define 'natural flow') and a series of empirical factors and formulae to calculate the surplus water available for further development. Method A was not supported in an independent review by CSIRO because the assumptions used in the method have not been, or cannot be, substantiated with available data.

9. How have Kangaroo Island data been used to determine the latest water take limits?

Revised water take limits have been calculated from recent flow data obtained from gauging stations and field measurements in the Cygnet and Middle River catchments.

The flow records available in two other catchments with gauging stations (Timber Creek, Stun'sail Boom) are too short to calculate average annual yields, but these data will be incorporated into the next revision of water take limits.

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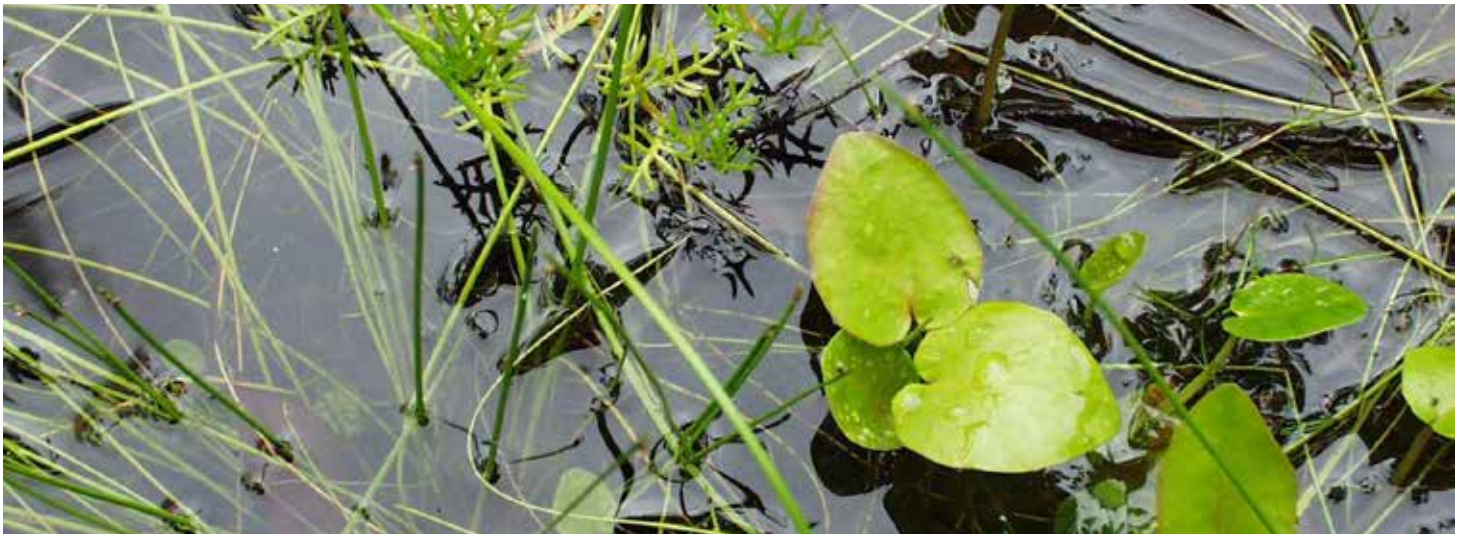
[1]A flow regime describes the timing, frequency and duration of flows. Water dependent ecosystems are commonly most sensitive to changes in low flow events within the flow regime.



10. How much water is available for development?

The total volume of water available for further development on Kangaroo Island at present is approximately 25 gigalitres (GL), although the distribution of available water varies by catchment, sub-catchment and property. Of the 245 sub-catchments on Kangaroo Island, 33 (13.5%) currently exceed their water take limits.

11. Does commercial forestry require a water affecting activity (WAA) permit?

Yes, undertaking commercial forestry requires a water affecting activity permit issued by the KI NRM Board. Commercial forestry excludes plantings solely for the purposes of amenity or biodiversity conservation but does include planting of vegetation for carbon credits.

12. Why doesn't revegetation with native species require a WAA permit?

The KI NRM Board does not have the authority under the *Natural Resources Management Act 2004* to regulate revegetation for purposes other than commercial exploitation as a water affecting activity.

13. How is water extraction by commercial forestry assessed?

A commercial forest is deemed to take 85% of the average annual runoff yielded by the net planted area. This is an average over the forestry rotation and across a landscape.

14. How much water becomes available when a forest is cleared?

When a forest is cleared, 85% of the typical yield from the plantation area is returned to the shared water resource for other landholders to access. However, where the catchment and/or sub-catchment water take limit is exceeded, despite the return of water from the forest, only 25% of the yield from the cleared area will become available to other users.

This provides an incentive to clear commercial forests while incrementally reducing the water deemed taken to below the water take limit.

15. What is included in the definition of a dam, wall or other structure that collects or diverts water?

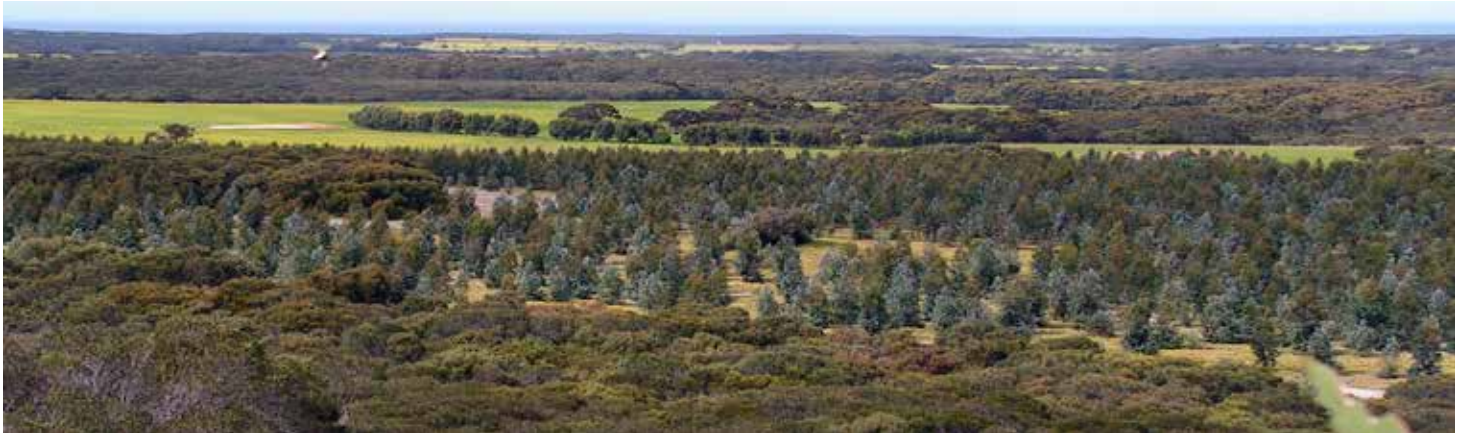
The water affecting activity policies do not exclusively regulate 'dams', they also regulate other structures that collect, store or divert water. In addition, any infrastructure that is 'hydraulically connected' and transports surface water into or out of a storage structure or a watercourse, or across a sub-catchment or property boundary, is considered part of the structure that collects or diverts water. It does not matter if it is a dam, weir, interception drain, retaining wall, clay pit, marron pond, spoon drain, pipe, roadside drain etc.

In complex water reticulation systems, the Board simplifies the scope of the definition by considering infrastructure to be disconnected past a point at which there is a water meter, or there are no other storage structures in the direction of flow. Once the water is in a storage structure it is deemed taken, and the Board is not interested in any subsequent water transfers within the property.

16. How is water extraction by dams and diversions assessed?

A typical dam used to supply water for stock or irrigation purposes is deemed to take 50% of its capacity per year[2]. In the case of a watercourse diversion, the water diversion point will be hydraulically connected to a dam, therefore the capacity of the connected dam will be used to determine the deemed take.

[2]This is based on the assumption that on average a dam will collect 50% of its storage capacity per year, considering that not all dams fill completely every year, some dams are not used and some stored water is carried over to the following year.



17. How do graded catchments impact on water deemed taken by a dam?

If an applicant can demonstrate to the Board that the artificially enhanced runoff from a graded catchment results in less water being taken from the shared water resource than a typical dam, adjustments to deemed take will be made.

18. Will processing times and administration for WAA permits be reduced?

The water affecting activity policy has been modified to improve processing efficiency and reduce the number of situations where low risk activities require a permit. The policy introduces a mechanism to allow a person to follow publically available guidelines (named a Current Recommended Practice) and provide simple details about the activity, rather than applying for a permit.

19. How much does a WAA permit cost and what does is being done to minimise costs?

The current administration fee for a standard WAA permit is $53. The price is set by the State Government, not the KI NRM Board. Activities undertaken via the simpler Current Recommended Practice process are free as they do not require a WAA permit.

20. Do I need a WAA permit to construct a dam of any size?

Previously, construction of a dam with a capacity of less than five megalitres (ML) was exempt from requiring a WAA permit provided the water take limits at the catchment, sub-catchment and property scales were not exceeded.

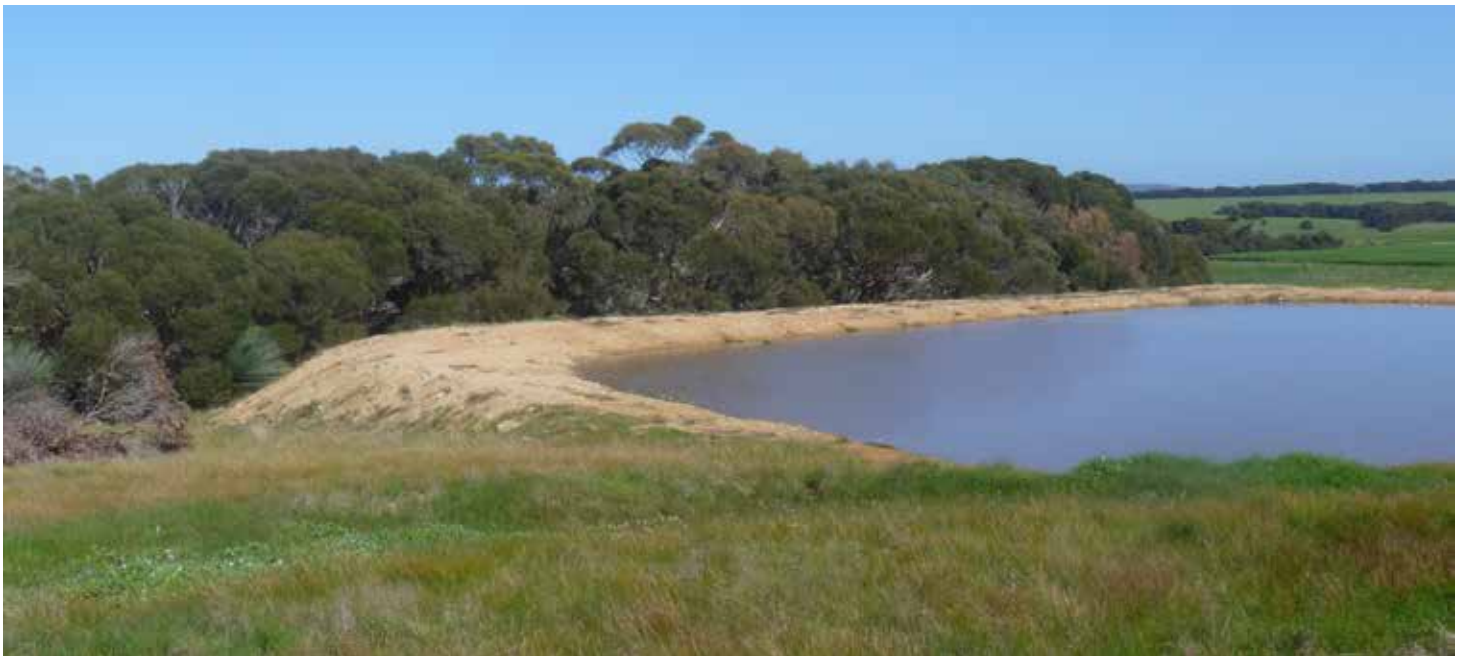
Without some form of assessment, however, landholders were unaware if this was the case and therefore unsure whether or not they required a permit. This situation also meant that the cumulative storage capacity of multiple small dams was not being captured in the calculation of catchment water budgets. Furthermore, landholders were incentivised to construct multiple 5 ML dams rather than one larger and more water-efficient dam in order to avoid bureaucracy.

In the revised NRM Plan, the water affecting activity policy has been modified as follows:

- To reduce red tape, the construction or modification of a dam with a capacity of less than 2 ML may be undertaken using the Current Recommended Practice process, as described in question 18.

- The construction or modification of a dam with a capacity of 2 ML — 5 ML, and a wall height of less than three metres, requires a WAA permit.

- The construction or modification of a dam with a capacity of greater than 5 ML, or a wall height of greater than three metres, requires development approval from the Kangaroo Island Council. In order to reduce the number of permits involved, the development assessment process incorporates an assessment under the WAA policy, and the notes and conditions that would otherwise be included on a WAA permit are included in the development approval.



21. Who can apply for a WAA permit?

Any person or corporation, including contractors, can apply for a WAA permit providing they have consent from the owner of the land or the lessee if the land tenure is crown lease.

22. Who is responsible for meeting the conditions associated with a WAA permit or a development approval?

If the development proposal is processed via a development assessment (as for all large dams and commercial forests) the conditions will be attached to the land. If the development is assessed via a WAA permit application, the conditions apply to the applicant. In either situation, the applicant, lessors or lessees will need to negotiate their own management conditions. If the land tenure is Crown Lease, the lessee may act as the owner of the land.

23. What restrictions apply to where a dam can be constructed?

A dam can generally be constructed anywhere on a property except in watercourses with a stream order of three or higher.

24. Do I need a permit to de-silt a dam or a drain or other similar water infrastructure?

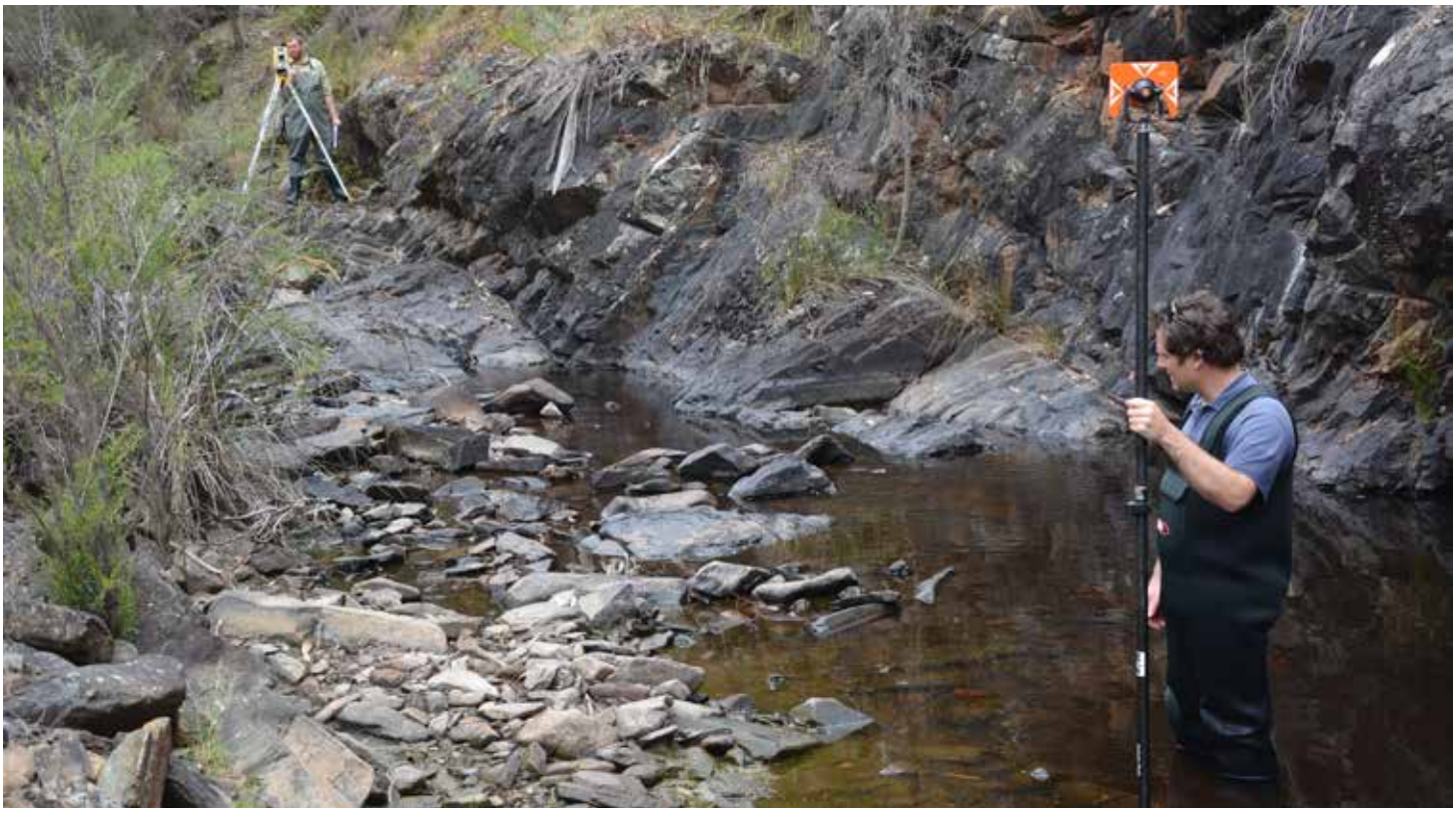
Generally no, unless the dam, drain or other similar water infrastructure is in a watercourse with a stream order of three or higher. However, there are restrictions on where the excavated material can be placed.

25. Do I need to fit a low flow bypass?

A low flow bypass or other design feature will generally be required if the low flow band at the site is calculated to be greater than one litre per second (equivalent to a 30 mm diameter low flow bypass pipe). A low flow bypass permits the lowest 10% of flows to travel downstream unimpeded thereby protecting water-dependent ecosystems. Other design features that may achieve the same outcome are the stage height of the pump intake or the configuration of the diversion weir.

26. How do I apply for a water affecting activity permit?

Contact Natural Resources Kangaroo Island (8553 4444) or visit the Natural Resources Kangaroo Island website http://www.naturalresources.sa.gov.au/kangarooisland/home



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