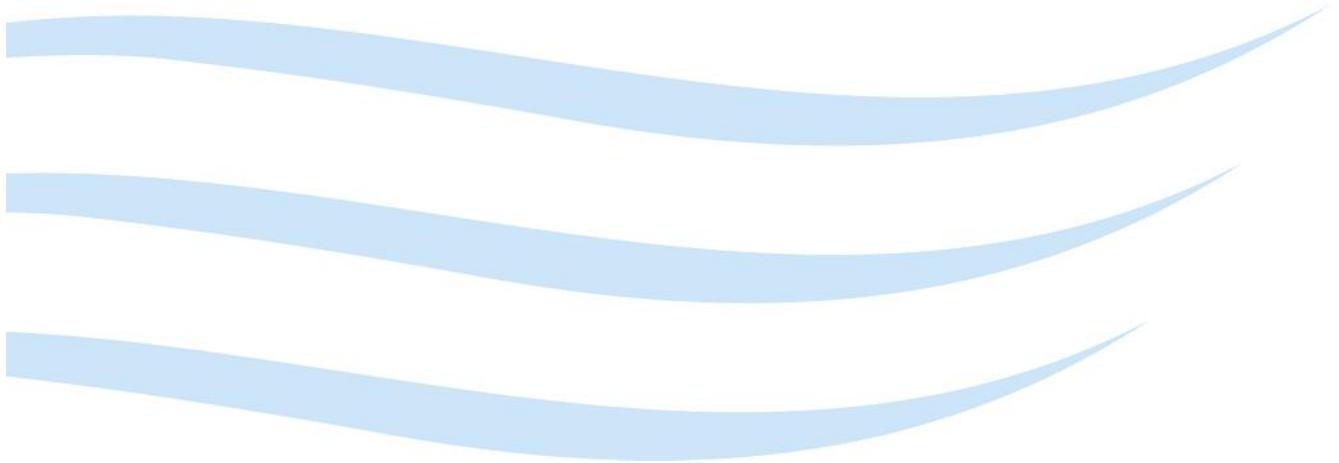


# Tomahawk River Catchment Water Management Plan



**April 2012**

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### **Preferred Citation**

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#### **The Department of Primary Industries, Parks, Water and Environment (DPIPWE)**

The Department of Primary Industries, Parks, Water and Environment provides leadership in the sustainable management and development of Tasmania's natural resources. The Mission of the Department is to support Tasmania's development by ensuring effective management of our natural resources.

The Water and Marine Resources Division provides a focus for water management and water development in Tasmania through a diverse range of functions, including implementing the *Water Management Act 1999* and the National Water Initiative; design of policy and regulatory frameworks to ensure sustainable use of surface water and groundwater resources; monitoring, assessment and reporting on the condition of the State's freshwater resources; and providing regulatory and policy support for water infrastructure development projects.

## CONTEXT

This Water Management Plan provides the management framework for the water resources of the Tomahawk River catchment, in accordance with the objectives of the *Water Management Act 1999* and the *State Policy on Water Quality Management 1997*. This Plan is a statutory plan prepared in accordance with Part 4 of the *Water Management Act 1999*. It provides management arrangements that apply to all fresh water resources within the catchment.

The Tomahawk River catchment is located southeast of Waterhouse Point in the northeast of Tasmania. The river system begins in the foot hills of Mount Horror which stands at an altitude of 676 m above sea level, and runs past the lower reaches of Whiterock Tier. It runs for approximately 29 km in a northerly direction before discharging into Ringarooma Bay.

Land use in the catchment is dominated by production forestry and dry land agriculture, with a significant area of undesignated crown land in the mid reaches. The northern reaches of the catchment are predominantly private holdings, the majority of which are used for sheep and cattle grazing, but small areas of commercial irrigation also occur.

At the time of this Plan's adoption, consumptive water extraction and use is relatively low based on current land usage.

The Tomahawk River is unregulated, with only a small number of instream dams affecting the natural flow. The average rainfall for the catchment is 894 mm, with the majority falling over the winter period which is reflected in the strong seasonal flow pattern. Although there is some consumptive water extraction and use, the flow regime remains in a relatively natural condition, providing for a healthy aquatic ecosystem.

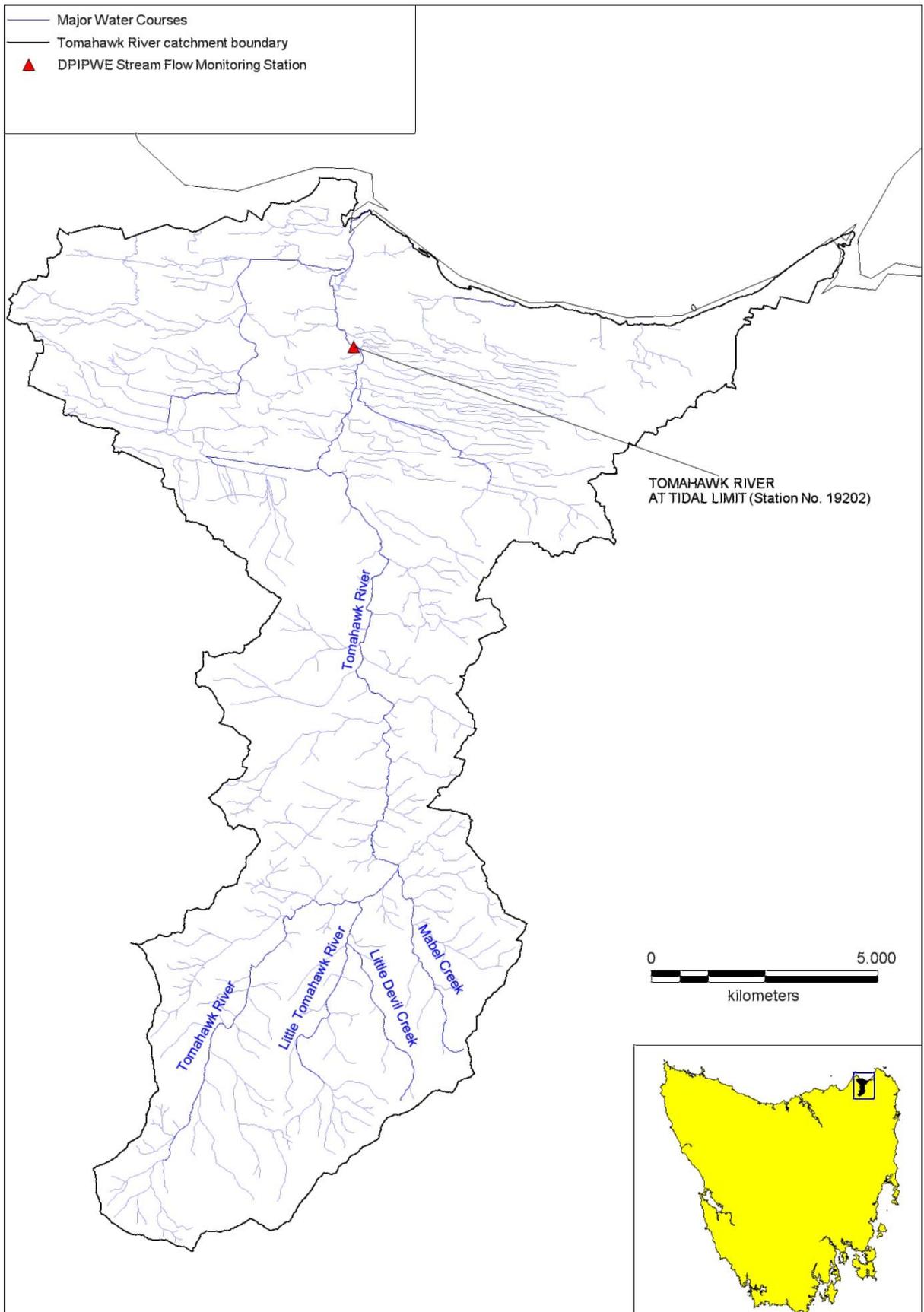
There are five groups of wetlands and lakes in the catchment. Special aquatic values in the catchment (as identified through the Conservation of Ecosystem Values Database) are listed threatened aquatic species the Australian grayling, dwarf galaxiid and giant freshwater crayfish; riparian vegetation including the listed threatened species jointed twig rush, and threatened amphibians such as the green and gold frog (DPIW 2009).

In considering the near naturalness of much of the catchment and low water extraction and usage, this Plan's objectives reflect the opportunity to preserve the existing freshwater ecosystem values while also enabling future sustainable use and development of the catchment's water resources.

To best give effect to its objectives, this Plan provides a water regime through the application of rules for water allocation and management. The taking of water for essential domestic and stock water supplies has the highest priority; environmental water requirements have the next highest priority; followed by the taking of water for commercial purposes (for example irrigation). Stream flow levels have been determined at which extraction of water for commercial use is restricted to protect water for stock and domestic use and the environment. These "cease to take" levels vary through the year to reflect monthly changes in hydrology and requirements of the ecosystem.

Monitoring of the implementation of this Plan will be undertaken primarily through monitoring of the stream flow regime and water management activities, with the measurement of other environmental, management and compliance parameters undertaken as considered necessary within available Departmental resources.

The Tomahawk River Catchment Water Management Plan strikes a balance in the management of the catchment's water resources, and in doing so ensures that the River's freshwater environmental values and its productive capacity to support a range of water uses, including stock and domestic supply and irrigation, are preserved into the future.



**Figure 1** Tomahawk River catchment.

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## **PART 1 INTRODUCTION**

### **1.1 Name of Plan**

This Water Management Plan is titled the Tomahawk River Catchment Water Management Plan, hereafter referred to as **this Plan**.

### **1.2 Nature and Status of this Plan**

This Plan is made under Part 4 of the *Water Management Act 1999* as amended, hereafter referred to as **the Act**, and is to be read as being subject to and consistent with the Act.

Nothing in this Plan absolves any person from the need to obtain any licence, permit, approval or other requirement under the Act or in any other applicable legislation.

### **1.3 Date of Commencement**

This Plan was adopted by the Minister, under section 28 of the Act, on 11 April 2012, and takes effect upon publication of a notice in the *Gazette*, under section 29 of the Act.

### **1.4 Review of this Plan**

A review of this Plan will take place after the end of the 10th year of its adoption, unless otherwise reviewed pursuant to section 34(1A) of the Act.

### **1.5 Area to which this Plan Applies**

This Plan applies to the Tomahawk River catchment as shown in Figure 1, hereafter referred to as **this catchment**.

### **1.6 Water Resources to which this Plan Applies**

The water resources managed under this Plan are the Tomahawk River and its tributaries, including (but not limited to) Little Devil Creek, Mabel Creek, Little Tomahawk River, Fern Creek and Price Creek, and the groundwater resources of this catchment.

### **1.7 Flow Measurement Reference Points**

For the purposes of this Plan, all surface water flow thresholds referred to relate to those as measured at the site of the Department's stream flow gauging station at the tidal limit (as shown in Figure 1). The stream flow gauging station located at this site was operational between 1968 and 1990.

### **1.8 Water Management Provisions**

The water management provisions of this Plan (set out in Parts 3, 4 and 5) provide a sound management system for the water resources of the Tomahawk River catchment, and a water regime that best gives effect to the objectives of the Plan.

The provisions are made in accordance with sections 14(3)(a), (b), (c), (d), (f) and (g) of the Act.

## **PART 2 VISION AND OBJECTIVES**

### **2.1 Vision**

The vision of this Plan is a sustainable, efficient and equitable management system for the water resources of the Tomahawk River catchment, which recognises and balances the water needs of the environment with the needs and aspirations of all water users and the general community.

### **2.2 Objectives**

As required under section 14(2) of the Act, this Plan includes a set of objectives. In addition to the objectives of the Resource Management and Planning System of Tasmania and the objectives of the Act (Appendix A), the specific objectives of this Plan are listed below.

This Plan's objectives guide how freshwater resources are to be managed and allocated for consumptive and other use, and how the water needs of freshwater ecosystems are to be provided for.

#### ***2.2.1 Environmental Objectives***

- a) Protect base flows to provide aquatic habitat during periods of low flow, and natural refuges for instream biotic communities during naturally dry periods.
- b) Maintain flow variability to support:
  - (i) instream, riparian and water-dependent floodplain ecosystems;
  - (ii) important ecological and geomorphic processes;
  - (iii) estuarine processes dependent on freshwater flow regimes;
  - (iv) replenishment of groundwater resources.

#### ***2.2.2 Water Usage and Development Objectives***

- a) Provide for the allocation of surface water at different levels of reliability and provide a clear hierarchy of access to water for commercial use.
- b) Provide certain access to water for stock and domestic and commercial use by clearly specifying the rules under which water can be taken.

## **PART 3 ADMINISTRATIVE PROVISIONS**

### **3.1 Plan Administration**

The Minister will be responsible for the administration and implementation of this Plan.

### **3.2 Water Access Entitlements, Dam and Well Works Permits**

For the purposes of this Plan, water licensing and allocation and the permitting of dam and well works will be undertaken in accordance with Parts 6, 7 and 8 of the Act, and will be consistent with this Plan and with the *State Policy on Water Quality Management 1997*, or its equivalent.

#### ***3.2.1 Rights Under Part 5 of the Water Management Act***

Surface water may be taken for stock and domestic purposes on riparian properties without a licence in accordance with Part 5 of the Act. The quantities of water which may be taken for stock and domestic purposes must be in accordance with the *Water Management Regulations 2009*, as amended from time to time.

An owner or occupier of land may take dispersed surface water from the land for any purpose without a licence under Part 5 of the Act, unless a water management plan provides that a licence is required.

An owner or occupier of land may also take groundwater from the land for any purpose without a licence under Part 5 of the Act, unless a water management plan provides that a licence is required, or an order has been made to appoint the area a groundwater area under section 124(A) of the Act, and the order also provides that groundwater may not be taken from that groundwater area without the authority of a licence.

#### ***3.2.2 Water Licences***

Holders of water licences in this catchment will be responsible for complying with the terms and conditions as specified on their licences. Where necessary, existing water licences will be varied to be consistent with this Plan in accordance with section 69(2)(d) of the Act.

#### ***3.2.3 Transfers of Water Licences and Allocations***

Water licences and allocations may be transferred either temporarily (limited period transfer) or permanently (absolute transfer).

For the purposes of sections 97(2)(b) and 98(1)(a) of the Act, transfers of water licences and allocations will be permitted, subject to meeting the requirements of Part 6 Division 4 of the Act. The Department will use the *Guiding Principles for Water Trading in Tasmania* (DPIWE 2004), as amended from time to time, when assessing applications for transfers of water licences and water allocations under the Act.

#### ***3.2.4 Conveyance of Water***

Water that has been taken in accordance with the Act may be conveyed via a watercourse for extraction downstream. Any conveyance of water via a watercourse will be subject to the granting of a Watercourse Authority under Part 6A of the Act, which may be subject to specific conditions.

#### ***3.2.5 Metering Requirements***

The taking of water under Part 5 of the Act is not required to be metered at present. However, an Authorised Officer may, at their discretion, direct individuals to install a water meter to measure water extraction.

Commercial water users including owners of all instream dams in this catchment with a licence allowing the taking of water into the dam will be required to install metering systems in accordance with relevant Departmental policies and standards.

Water meter installations and reporting of water meter data must be undertaken and managed in accordance with the requirements of the Department.

### ***3.2.6 Dam Works Permits***

Dam works are to be undertaken only where a permit authorising those works has been issued under Part 8, Division 4 of the Act. Any works undertaken must be in accordance with the permit's terms and conditions.

A permit to construct a dam is required for all dams except those described in section 137 of the Act which include:

- a) a dam that is not on a watercourse and that holds less than one megalitre of water; or
- b) a dam constructed for the primary purpose of storing waste as defined in the Act (note that the construction of such dams may require authorisations under other legislation);
- c) a levee or bank that is constructed during a flood and removed entirely within four weeks of its construction.

In addition to a barrier across a watercourse, a 'dam' includes an excavation in a water course and a permanent flood levee, both of which require a permit under the Act.

### ***3.2.7 Well Works Permits***

Well works are to be undertaken only where a permit authorising those works has been issued under Part 7, Division 3 of the Act. Any works undertaken must be in accordance with the permit's terms and conditions.

## **3.3 Groundwater Management**

This Plan recognises the connectivity between surface water and groundwater. Accordingly any extraction of groundwater within this catchment must comply with relevant statutory instruments and the Department's regulations and policies pertaining to groundwater extraction, licensing and management.

## PART 4 SURFACE WATER ALLOCATION

This Plan enables the allocation of water from the relevant surface water resources within specified limits, which have been set to best give effect to the objectives of the Act and the objectives of the Plan.

Allocation of surface water under this Plan takes into account the likely effects on rights under Part 5 of the Act and the relevant water access entitlements of existing users, freshwater ecosystem values identified through the Conservation of Freshwater Ecosystem Values Database, and Water Quality Objectives (where established), as determined under the *State Policy on Water Quality Management 1997* or its equivalent.

To ensure the achievement of this Plan's environmental objectives and maintain the reliability of existing water allocations, no further direct take allocations will be granted in this catchment. There is, however, considerable scope for granting further storage allocations.

The granting of new storage allocations will be undertaken in accordance with Part 6 of the Act, and any relevant policies and guidelines in place at the relevant time. In granting a new storage allocation, the Minister may determine that it is used only in accordance with conditions for the avoidance, minimisation or management of associated environmental risks (section 58 of the Act).

Any application for a water licence, new storage allocation or transfer will be assessed by the Department on a case by case basis, taking into consideration factors such as local hydrology and water availability, impacts on existing water users and freshwater ecosystem values as they relate to the proposed extraction point. The approval of new storage allocations or transfers must also be consistent with this Plan's allocation limits.

### 4.1 Surety of Allocations

Where the Minister considers it to be appropriate, a water licence may specify the surety with which a water allocation attached to that licence can be expected to be available for taking (section 56(1)(c) of the Act).

Surety levels indicate the relative priority of an entitlement to take water when supply of water is limited. Surety levels are also used to indicate the reliability of different allocation types, and are listed in descending order of priority below.

- |                       |   |
|-----------------------|---|
| <i>Surety Level 1</i> | Rights under Part 5 of the Act for the taking of water for domestic purposes, public health purposes and consumption by livestock or firefighting. Owners and occupiers of land may take dispersed surface water and groundwater from the land for any purpose. The taking of water under Part 5 of the Act does not require a water licence. In some areas, allocations have been granted under Part 6 of the Act for essential town water supplies at Surety Level 1. There are no Surety Level 1 entitlements in this catchment. |
| <i>Surety Level 2</i> | Water required to sustain ecosystems dependent on the water resource.   |
| <i>Surety Level 3</i> | Water access entitlements replacing Prescriptive Rights granted under previous Acts. There are no Surety Level 3 entitlements in this catchment.  |
| <i>Surety Level 4</i> | Water access entitlements of special licensees such as Hydro Tasmania (under Part 6, Division 6 of the Act). There are no Surety Level 4 entitlements in this catchment.  |
| <i>Surety Level 5</i> | Water access entitlements under Part 6 of the Act for the taking of water for commercial purposes and non-essential town water supplies, by either direct abstraction or into storage.  |

**Surety Level 6** Water access entitlements under Part 6 of the Act for the taking of water for commercial purposes at a lower level of reliability than Surety Level 5.

## 4.2 Take Period of Allocations

Under this Plan the take period for all direct take allocations is 1 December to 30 April inclusive. The take period for all storage allocations is 1 May to 30 November inclusive.

Where necessary, water licences will be varied under section 69(2)(d) of the Act if the take period specified with respect to water allocations endorsed on those licences is inconsistent with the periods specified above.

## 4.3 Water to Meet Rights Under Part 5 of the Water Management Act

Volumes of water required to meet Part 5 Rights for stock and domestic use have been calculated using areas of relevant riparian land, likely stocking rates and likely household numbers. These volumes are set out in Table 1.

**Table 1** Potential annual volume of water required to meet Part 5 stock and domestic needs of riparian properties in the Tomahawk River catchment.

Part 5 Stock and Domestic Requirements	
<b>Surety Level</b>	1
<b>Reliability</b>	This water is available within natural flow variations and has the highest priority of access.
<b>Tomahawk River Catchment</b>	372 ML/year

## 4.4 Surface Water Allocation Limits

Limiting the volume of water available for allocation to a particular level is an effective measure in ensuring that the water regime provided under this Plan retains the broad hydrological characteristics necessary to give effect to the Plan's objectives.

### 4.4.1 Surface Water Yield

The surface water yield of this catchment for each of the direct take and storage periods has been determined using a hydrological model, which utilises rainfall, evaporation and estimated infiltration data. Yields at different levels of reliability have been determined at the catchment outlet over a 37 year period (1970 to 2007), and are set out in Table 2.

**Table 2** Surface water yield for the direct take and storage periods for the Tomahawk River catchment (at the catchment outlet).

Take Period	Yield (ML)	
	80% Reliability <sup>1</sup>	50% Reliability (Median Yield) <sup>2</sup>
<b>Direct Take</b>	1,146	1,792
<b>Storage</b>	9,970	17,147

<sup>1</sup> Yield at 80% reliability is the volume of water expected to occur 8 years in 10.

<sup>2</sup> Yield at 50% reliability is the volume of water expected to occur 5 years in 10.

#### **4.4.2 Method to Determine Water Allocation Limits**

Surface water allocation limits have been established to identify the volumes of water available for allocation in this catchment, consistent with giving effect to the objectives of this Plan. Generally, the approach used to determine the allocation limit for a river system is based on assessing the volume of water available at a certain level of reliability, taking into account environmental water needs.

This Plan adopts an approach to determining surface water allocation limits that provides a water regime that maintains key freshwater ecosystem values in this catchment at a low level of risk.

For this catchment, the limit for allocation of surface water in the relevant take period has been calculated using the following:

$$\text{Surety Level 5 allocation limit} = (A - B)$$

$$\text{Surety Level 6 allocation limit} = (C - A) \times 0.2^3$$

where:

A = yield at 80% reliability (based on historical flow and modelled data for the relevant take period between 1970 and 2007);

B = the volume of water deemed necessary for stock and domestic use and for the basic ecological functions of the freshwater environment;

C = yield at 50% reliability (based on historical flow and modelled data for the relevant take period between 1970 and 2007).

#### **4.4.3 Direct Take Allocations**

An allocation limit for the direct take period is set out in Table 3. In this catchment, the total volume of water available as direct take allocations, at a level of reliability of 80% is 305 ML<sup>4</sup>.

This limit has been set conservatively and represents a relatively small proportion of the median annual yield of this catchment. This conservative approach provides an appropriate buffer in the absence of specific scientific data on environmental water requirements and on the future impact of climate change on water availability.

The volume of existing direct take allocations in this catchment is 134 ML. Whilst the allocation limit provides scope for additional allocation of water during the direct take period, this Plan adopts a conservative approach to water allocation during the direct take period based on predicted impacts of climate change. Hence, no further direct take allocations will be granted under this Plan.

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<sup>3</sup> Limiting allocation to a 20% proportion of the yield is considered to provide a conservative “rule of thumb” approach.

<sup>4</sup> Reliability indicates the likelihood of the total volume of 305 ML being available during the direct take period. Whilst this *volume* is likely to be available at a level of 80% reliability over the take period, daily flow conditions and the application of daily access rules (cease to take and daily limits on extraction) may limit the extent to which water is accessible on a daily basis. Based on historical flow records (1968 – 1990) it is likely that water may only be accessible during the direct take period between 11 days per month and 22 days per month.

**Table 3** Allocation limit for the direct take period in the Tomahawk River catchment, indicating the volume of water available for allocation at the catchment outlet<sup>5</sup>.

	Allocation Limit (ML) at 80% Reliability	Existing Allocations (ML) <sup>6</sup>	Volume Available for Allocation (ML) <sup>6</sup>
<b>Surety Level 5</b>	305	134	0 <sup>7</sup>

#### 4.4.4 Storage Allocations

Allocation limits for the storage period are set out in Table 4. In this catchment, the total volume of water available as storage allocations, at a level of reliability of 50% to 80% is 4,999 ML (3,564 ML at Surety Level 5 and 1,435 ML at Surety Level 6)<sup>8</sup>.

These limits have been set conservatively and represent a relatively small proportion of the median annual yield of this catchment. This conservative approach provides an appropriate buffer in the absence of specific scientific data on environmental water requirements and on the future impact of climate change on water availability.

The volume of existing storage allocations in this catchment is 1,670 ML (all at Surety Level 5 as at the date of this Plan's adoption). On this basis, there is considerable scope for the granting of new storage allocations.

**Table 4** Allocation limits for the storage period in the Tomahawk River catchment, indicating the volume of water available for allocation at the catchment outlet<sup>5</sup>.

	Allocation Limit (ML) at 80% Reliability	Allocation Limit (ML) at 50% Reliability	Existing Allocations (ML) <sup>9</sup>	Volume Available for Allocation (ML) <sup>9</sup>
<b>Surety Level 5</b>	3,564	-	1,670	1,894
<b>Surety Level 6</b>	-	1,435	0	1,435

If and when these allocation limits are approached in the future, further assessment work will be undertaken to review the limits in light of knowledge of climate change impacts, more specific environmental requirements and any other relevant factors at that time.

<sup>5</sup> Water availability at a local scale will be dependent on location in the catchment.

<sup>6</sup> As at the date of this Plan's adoption.

<sup>7</sup> No further direct take allocations will be granted under this Plan due to the predicted impacts of climate change.

<sup>8</sup> Reliability indicates the likelihood of the total volume specified being available during the storage period. Whilst the specified *volume* is likely to be available at a level of reliability of 50% to 80% over the take period, daily flow conditions and the application of access rules (cease to take and licence conditions) may limit the extent to which water is accessible on a daily basis.

<sup>9</sup> As at the date of this Plan's adoption.

## PART 5 SURFACE WATER ACCESS RULES

### 5.1 Restriction Management

In accordance with Part 6, Division 3 of the Act, the taking of water from a watercourse in this catchment will be restricted or prohibited in the event of there being inadequate water. In such instances, the restriction or prohibition of the taking of water will be undertaken in observance of the surety level of water allocations, in accordance with section 94 of the Act.

In this catchment, the restriction or prohibition of the taking of water from a watercourse will be undertaken through the administration of a cease to take provision, and an associated staged restriction protocol where necessary.

The cease to take provision ensures the preservation of base flows up to a minimum level for environmental purposes and the provision of domestic and stock watering supplies. This is achieved by setting a flow threshold, such that when river flow drops to this threshold, the taking of water from a watercourse by licence holders, for commercial purposes, is prohibited. It should be noted that during extended dry periods, stream flows may naturally fall below the cease to take threshold.

#### 5.1.1 Cease to Take Provision

In this catchment, the taking of water from a watercourse, other than for stock and domestic purposes through rights under Part 5 of the Act, will not be permitted when the measured flow drops to the thresholds set out in Table 5.

**Table 5** Monthly cease to take thresholds for the Tomahawk River catchment (measured at the site of the Department's stream flow gauging station on the Tomahawk River at the tidal limit)<sup>10</sup>.

	January	February	March	April	May	June
Cease to Take Threshold (ML/day)	6	3	3	6	8	21
	July	August	September	October	November	December
Cease to Take Threshold (ML/day)	64	56	33	16	11	9

The cease to take thresholds are based on the monthly 20<sup>th</sup> and 30<sup>th</sup> percentile yield for the storage and direct take periods respectively; that is, the yield that is exceeded 80% or 70% of the time for each month, which is considered sufficient to maintain environmental values at a low level of risk and provide sufficient water to meet potential stock and domestic needs.

Whenever the cease to take provision is in effect during the storage period (1 May to 30 November inclusive), owners of an instream dam are required to ensure that the dam outlet is operated to pass all inflow entering the storage. If the outlet is unable to pass all

<sup>10</sup> The Department's stream flow gauging station has been non-operational since 1990. Notwithstanding this, the site of the gauging station will be used as the reference point for restriction management.

flows entering the storage then it must be operated at maximum capacity until such time as inflows and outflows are equal, or the cease to take provision no longer applies.

Notwithstanding the cease to take provision, an Authorised Officer may, in accordance with Part 6, Division 3 of the Act, apply restrictions on, or prohibit the taking of water from, any watercourse in this catchment at any time, if the rate at which water is taken is such that: the quantity of water available can no longer meet demand; is adversely affecting, or is likely to adversely affect, the quality of the water in the watercourse; or is having a serious effect on another watercourse that depends on water from the first-mentioned watercourse.

Restrictions on the taking of water may also be applied if the rate at which, or the manner in which, water is taken from a water resource is causing, or is likely to cause, damage to ecosystems that depend on water from the water resource.

## **5.2 Management of Inflows and Outflows from Dams**

Notwithstanding the other provisions of this Plan, owners of instream dams must comply with any specific licence conditions in regard to the passing of inflows to their dam.

## **5.3 Variation to Period for Taking Direct Allocations**

Notwithstanding Part 4.2 of this Plan, an Authorised Officer may, upon a request from a licence holder with a direct take allocation, notify that licensee that they are permitted to take water prior to 1 December. This decision will be based upon whether there have been sufficient flows in the relevant catchment to enable licensees with storage allocations to take their full allocations.

## **5.4 Opportunistic Access to Water**

Opportunistic access to take flood water may be provided under this Plan should water allocations approach the limits set under Part 4. Any opportunistic access will be provided by notice under section 90 of the Act and managed in accordance with rules established by the Department.

## **PART 6 MONITORING AND REPORTING**

Information relating to the effectiveness of this Plan's water management provisions in achieving its environmental, and water usage and development objectives, will be collected and reported.

The basis of measuring this Plan's effectiveness in achieving its objectives will be to analyse stream flow gauging and water extraction and management information to determine whether this Plan's provisions were properly implemented in a reporting period, and if as a result of implementing those provisions, the intended water regime and specific river flow conditions were achieved with respect to environmental and water access outcomes.

### **6.1 Monitoring**

#### ***6.1.1 Stream Flow Monitoring***

River height and stream flow may be recorded periodically by Departmental staff at various locations in this catchment. Restriction management will be undertaken using measurements of stream flow taken at the site of the Department's stream flow gauging station at the tidal limit.

#### ***6.1.2 Surface Water Allocations***

Changes to the number and total volume of licensed surface water allocations will be recorded. This information will be used to ensure that the total volume of water allocated in this catchment is not in excess of the limits in Part 4 of this Plan.

#### ***6.1.3 Installation of Water Meters***

Records of water meters installed in this catchment will be maintained.

#### ***6.1.4 Water Extraction***

Licensees will be required to record and report water meter data in accordance with the requirements of the Department.

#### ***6.1.5 Transfers of Water Licences and Allocations***

Transfers of water licences and allocations in this catchment and any water conveyed under a Watercourse Authority will be recorded.

#### ***6.1.6 Restriction Management***

The Department will maintain records of, and monitor compliance with, any water restrictions within this catchment.

#### ***6.1.7 River Health and Water Quality Monitoring***

Additional surveillance monitoring information relating to the environment may be drawn upon where appropriate, to determine the effectiveness of the provisions of this Plan in achieving its objectives. It should be noted that the collection and reporting of this type of information will be dependent on Departmental resources and programs as they are implemented from time to time.

Where available, this type of information will provide an overall appraisal of the condition of this catchment's water resources and freshwater ecosystems. Any trends in this information will provide an indication of the sum total of all management actions in this catchment, and hence the information is limited in the extent to which it can be used to directly assess the performance of this Plan.

Under various programs, information may be collected relating to biological health, water quality and in stream habitat condition at selected sites in this catchment.

## **6.2 Reporting**

The Department will report annually on the effectiveness of this Plan's water management provisions in achieving its environmental and water usage and development objectives.

## **PART 7 STATUTORY REQUIREMENTS UNDER SECTIONS 14 AND 15 OF THE *WATER MANAGEMENT ACT 1999***

Part 7 of this Plan provides details of the statutory requirements, as set out under Part 4 of the Act, that need to be addressed during the development of this Plan.

### **7.1 A Statement of the Objectives of the Plan, Including the Environmental Objectives (Section 14(2)(a))**

#### ***7.1.1 Environmental Objectives***

- a) Protect base flows to provide aquatic habitat during periods of low flow, and natural refuges for instream biotic communities during naturally dry periods.
- b) Maintain flow variability to support:
  - (i) instream, riparian and water-dependent floodplain ecosystems;
  - (ii) important ecological and geomorphic processes;
  - (iii) estuarine processes dependent on freshwater flow regimes;
  - (iv) replenishment of groundwater resources.

#### ***7.1.2 Water Usage and Development Objectives***

- a) Provide for the allocation of surface water at different levels of reliability and provide a clear hierarchy of access to water for commercial use.
- b) Provide certain access to water for stock and domestic and commercial use by clearly specifying the rules under which water can be taken.

## **7.2 A Description of the Water Regime that Best Gives Effect to the Environmental Objectives and Other Relevant Objectives of the Plan (Section 14(2)(b))**

The water regime that best gives effect to the environmental and other relevant objectives of this Plan is one that results in an appropriate balance in providing water to maintain environmental values and providing water for commercial purposes.

Broadly, for the Tomahawk River catchment this regime retains the key characteristics of the natural flow regime, with some modification of natural flows reflecting the consumptive extraction of water. As a result, this regime provides the overall water needed to give effect to the environmental objectives of this Plan, while also providing secure and certain access to water for commercial purposes, generally at a relatively high level of reliability.

Based on the premise that the natural flow regime provides the best guide to the flow requirements of the entire aquatic ecosystem, the water regime that best gives effect to the environmental objectives is one in which the key components of the natural flow regime are maintained. For the Tomahawk River, the key components of the natural flow regime that are relevant to identified freshwater ecosystem values, and the ecosystem more broadly include:

- a) base flows that sustain ecosystem health and populations of aquatic biota, and provide refuge during periods of low flow;
- b) moderate flows (freshes) and high flows that provide reproductive cues and dispersal mechanisms for some biota, and are important for transporting material (organic matter, sediments and nutrients) downstream as well as maintaining geomorphic processes;
- c) flood flows that support riparian zones, floodplains and wetlands, and maintain connectivity and exchange of resources between the river and its floodplain;
- d) the natural pattern of flow variability, including seasonal distribution, frequency and duration of flows, and rates of rise and fall;
- e) groundwater flows and levels critical to surface water flow;
- f) freshwater inputs to support estuarine processes and habitats.

As a key objective of this Plan is to provide reliable access to water for commercial purposes, the Plan's water regime, whilst retaining much of the natural pattern of flow variability, is one in which there is some modification of natural flows. However, given the minimal departure from the natural flow regime, water access is provided at a low level of risk to freshwater ecosystem values. The greatest risk of departure from the natural flow regime is posed by the extraction of water during the direct take period. Hence, the cease to take thresholds for this period are set to maintain the risk at a low level. Furthermore, limiting the volume of water extracted on a daily basis also reduces the impact on the flow regime during the direct take period.

This Plan ensures that water allocation and management gives precedence to rights under Part 5 of the Act, taking into account any monthly, seasonal or annual variation in water flows and availability.

It is worth highlighting that the water regime under this Plan provides significant opportunity for further development through additional storage allocation. These allocations are at high levels of reliability – a point that should not be under emphasised given the risks posed to the reliability of direct take allocations due to the effects of drought and climate change.

Under this Plan, the water regime is managed through a combination of:

- a) the provision of water allocation limits which also indicate the potential amount of water available for allocation;
- b) the application of seasonal and daily limits on surface water abstraction, based on the location of the resource and individual allocations;
- c) the application of a cease to take provision which prohibits the taking of water below a certain threshold flow;
- d) where necessary, the application of staged restriction management to ensure that water users with lower surety allocations are not impacting upon those with higher surety allocations;
- e) licence conditions requiring the passage of flows through instream storages.

### **7.3 An Assessment of the Ability of that Water Regime to Achieve the Environmental Objectives and Other Relevant Objectives of the Plan (Section 14(2)(c))**

Under this Plan, the management of water resources in the Tomahawk River catchment provides:

- a) secure access to water for stock and domestic purposes;
- b) a flow regime that meets the needs of aquatic ecosystems and maintains identified freshwater ecosystem values;
- c) secure and certain access to water for irrigation and other commercial purposes.

This Plan includes management provisions that ensure a water regime that best gives effect to its objectives. The main provisions of this Plan are linked to either the allocation of water, or the access rules that govern the taking of allocated water on a daily basis.

#### **7.3.1 Environmental Objectives**

- a) *Protect base flows to provide aquatic habitat during periods of low flow, and natural refuges for instream biotic communities during naturally dry periods.*
- b) *Maintain flow variability to support:*
  - (i) *instream, riparian and water-dependent floodplain ecosystems;*
  - (ii) *important ecological and geomorphic processes;*
  - (iii) *estuarine processes dependent on freshwater flow regimes;*
  - (iv) *replenishment of groundwater resources.*

A key consideration in managing the water resources of the Tomahawk River catchment is the provision of a water regime that meets the needs of its freshwater ecosystems.

In general, Tasmanian unregulated rivers and streams are managed to provide a water regime that meets the needs of the entire aquatic ecosystem, rather than discrete elements of the ecosystem such as a particular fish species. The natural flow regime is taken as the best guide to the flow requirements of the entire aquatic ecosystem, and hence the management of flow is based on maintaining or mimicking key components of the natural flow regime.

Whilst broadly aiming to meet the flow requirements of the entire ecosystem, flow management and assessment of environmental water requirements is also undertaken utilising information on specific freshwater ecosystem values, and integrating the flow requirements of these values within the broader ecosystem context.

The priority freshwater ecosystem values in the Tomahawk River catchment, as identified through the Conservation of Freshwater Ecosystems Values Database, consist of fish assemblages, riparian tree assemblages, and/or vulnerable, rare or endangered species including the Australian grayling, a new species of pygmy perch, estuary perch, and the southern toadlet (DPIW 2009). There are also a number of threatened bird species found in Ringarooma Bay for which freshwater flows from the Tomahawk River contribute to the provision of habitat and food supply.

Currently, the flow regime in the Tomahawk River catchment is close to natural as there is relatively little water extraction. The focus of this Plan in maintaining freshwater ecosystem values is therefore on maintaining the key characteristics of the natural flow regime into the future. As the flow regime provided under this Plan exhibits a minimal departure from the natural flow regime, the overall natural character of the seasonal distribution, duration, magnitude, and frequency of different flows will be retained. By retaining this variability, the flow regime will continue to play its role in regulating the physical and biological processes in

the Tomahawk River, and hence meet the water needs of the freshwater ecosystem values at a low level of risk.

The management provisions in this Plan have been formulated on the basis of identifying which particular flow components are likely to be at risk, in terms of their capacity to support particular hydrological or ecological functions, through consumptive water extraction, and providing measures to ensure that these key components of the natural flow regime are maintained into the future within the scope of water development possible under this Plan.

Surface water allocation limits and access rules are the key measures utilised by this Plan to provide a water regime that gives effect to its environmental objectives.

### **Allocation Limits**

Limiting the volume of water available for allocation to a particular level is an effective measure in maintaining the overall hydrological character of a river system. Generally, the approach used to determine the water allocation limit for a river system is based on assessing the volume of water available at particular levels of reliability, taking into account environmental water needs.

This Plan adopts an approach to determining surface water allocation limits that provides a water regime that maintains key freshwater ecosystem values in this catchment at a low level of risk.

The approach to determining allocation limits is one in which water for the environment and stock and domestic use is “quarantined” from allocation. For this catchment, the allocation limit for surface water has been calculated using the following:

$$\text{Surety Level 5 allocation limit} = (A - B)$$

$$\text{Surety Level 6 allocation limit} = (C - A) \times 0.2$$

where:

A = yield at 80% reliability (based on historical flow and modelled data for the relevant take period between 1970 and 2007);

B = the volume of water deemed necessary for stock and domestic use and for the basic ecological functions of the freshwater environment;

C = yield at 50% reliability (based on historical flow and modelled data for the relevant take period between 1970 and 2007).

The method to calculate the volume of water deemed necessary for the environment and stock and domestic purposes (and hence that is not to be allocated) is twofold. Firstly, for each of the storage and direct take periods, the volume of water deemed necessary for the environment and stock and domestic purposes is derived by adding the 20<sup>th</sup> percentile yield (storage period) and 30<sup>th</sup> percentile yield (direct take period) for each of the months in the relevant take period (B in the equation set out above). Secondly, an 80% proportion of the volume of water derived by subtracting the yield at 80% reliability (A in the equation set out above) from the yield at 50% reliability (C in the equation set out above) is retained for the environment (hence, a 20% proportion of this volume is available for allocation). This is based on aiming to retain 80% of the median annual discharge, which is considered to be a reasonable “rule of thumb” that aims to meet the water needs of river ecosystems.

This Plan provides a Surety Level 5 water allocation limit for this catchment of 305 ML during the direct take period and 3,564 ML during the storage period. At Surety Level 6, this Plan provides a water allocation limit for this catchment of 1,435 ML during the storage period. The total catchment allocation limit of 5,304 ML is 27% of the median annual yield (which is 19,569 ML based on modelled data from 1970 to 2007). The direct take allocation limit of 305 ML is 17% of the median yield for the 1 December to 30 April period and the 4,999 ML storage allocation limit is 29% of the median yield for the 1 May to 30 November period.

As discussed in more detail below, whilst the direct take allocation limit provides scope for further allocation, under this Plan no new direct take allocations will be granted due to the potential impacts of climate change.

It should be noted that whilst the allocation limits provided in this Plan identify the volumes of water that are available at different levels of reliability, any application for a new water allocation will be assessed in the context of existing water development in this catchment, taking into consideration factors such as local hydrology and water availability, and impacts on existing water users and the environment.

### **Water Access Rules**

Whilst a water allocation limit is an effective measure in preserving the overall hydrological character of a river system, daily access rules ensure that the effect of water extraction on any particular aspect of the flow regime is not harmful to the environment. Together with allocation limits, these rules ensure that key components of the flow regime are maintained to provide environmental and other public benefit outcomes.

Additionally, these access rules also ensure that the rights of water users with higher surety water allocations are not impinged and that the taking of water is managed on an orderly and equitable basis.

The main impact of water extraction on Tasmanian river systems that are largely unregulated is on the low flow component of the flow regime, particularly during the direct take period as this is usually the time at which consumptive demands for water are highest. This impact can be a result of either direct extraction of water from a river for application to a crop, or the capture of stream flow in an instream dam.

Under this Plan, a cease to take provision is the main water access rule (refer Part 5.1 of this Plan). This provision ensures the preservation of natural base flows by setting a flow threshold, such that when stream flow drops to this threshold, direct extraction for commercial purposes is prohibited and instream dams are required to pass all inflows.

This measure ensures that there is sufficient base flow to sustain ecosystem health and populations of aquatic biota, and that the frequency and duration of low flow conditions are not artificially increased by commercial water extraction to a level detrimental to the river ecosystem. Furthermore, this measure also ensures that water is available for stock and domestic purposes (subject to natural flow conditions). It should be emphasised that under very dry conditions, stream flows may naturally fall below the cease to take threshold, and in some instances, streams may cease to flow altogether.

Given the relatively low level of development of the water resources in the Tomahawk River catchment, a comprehensive assessment of minimum environmental flow requirements has not been conducted. A desktop method, applicable to the Tomahawk River catchment, has been developed to provide a conservative estimate of minimum environmental flow requirements. This method is based on a low risk scenario developed for several streams using the Instream Flow Incremental Methodology (Graham *et. al.* 2000).

The desktop method provides a cease to take threshold based on the monthly 30<sup>th</sup> percentile yield (that is, the yield that is exceeded 70% of the time for each month) during the direct take period, and monthly 20<sup>th</sup> percentile yield (that is, the yield that is exceeded 80% of the time for each month) during the storage period. For each take period, the relevant monthly yield is divided by the number of days in the month to provide a daily threshold flow. This is considered to provide a low level of risk to the environment.

The water regime provided under this Plan retains natural base flows up to the cease to take levels set out in Part 5. These base flows are considered sufficient to maintain an appropriate degree of connection between pools and wetted habitat in riffle areas.

The management of inflows to and outflows from instream dams is also an important aspect in limiting the impact of water extraction on the hydrology of the river system. Passing flows

below the cease to take threshold, as well as passing flows outside the storage period are effective management mechanisms, and where appropriate, additional measures will be provided through conditions on water licences.

The water regime provided under this Plan retains much of the flow variability of the natural flow regime, and hence will support water dependent ecosystems. By specifying allocation limits that preserve a minimum of 73% of the median annual flow in the river system, and access rules that provide for the day to day management of water extractions, this Plan ensures that water extraction does not remove important parts of the flow regime.

As the overall allocation limits preserve the bulk of the river system's median annual discharge, the general pattern and distribution of flows will largely be unimpacted. Whilst there will be some modification to the flow regime due to water extraction, this should be limited to specific classes of flows, such as those immediately above the cease to take thresholds during the direct take period.

Freshes and flows up to bank full are important for an array of reasons, including their ability to distribute sediment, nutrients and organic material within the river channel, scour material built up during periods of low flow and maintain habitat, provide a dispersal mechanism for biota, and integrate material as food sources by inundating instream benches. These flows will largely be preserved into the future.

In respect of flood flows, there is unlikely to be any significant impact on the size and duration of floods, and rates of change of flow at these times due to water extraction. By preserving these features of the flow regime, all of the ecosystem processes they support (for example cues for fish migration, watering of riparian and floodplain flora, exchange of material between the river and its floodplain and geomorphological processes) should be maintained.

The water regime provided by this Plan is one in which the connectivity between surface water and groundwater is recognised. By retaining the key characteristics of the natural flow regime, groundwater flows and levels critical to surface water flows should be maintained within the natural bounds of variability.

Any extraction of groundwater within this catchment must comply with relevant statutory instruments and the Department's regulations and policies pertaining to groundwater abstraction, licensing and management. At the date of this Plan's adoption, groundwater extraction is not considered to be significant enough to warrant the implementation of licensing. However, this may be reviewed over time should there be significant growth in the extraction of groundwater in this catchment.

### ***7.3.2 Water Usage and Development Objectives***

- a) *Provide for the allocation of surface water at different levels of reliability and provide a clear hierarchy of access to water for commercial use.*

In establishing a water regime that best gives effect to its objectives, this Plan provides water allocation limits for this catchment of 305 ML during the direct take period and 4,999 ML during the storage period. As at the date of this Plan's adoption, the volume of existing allocations is 134 ML for the direct take period and 1,670 ML for the storage period.

By determining the volume of water available for allocation, this Plan provides water users with certainty as the reliability of their allocations will not be eroded by continuing allocation. Additionally, certainty is provided by identifying how much water may be available for further allocation, and the level of reliability of that water.

Whilst the allocation limit set for the direct take period indicates that there is scope for the granting of new allocations, no further allocations will be granted during the direct take period under this Plan. Results from the Tasmanian Sustainable Yields project for the Pipers-Ringarooma region (Ling *et. al.* 2009) indicate that catchment runoff is likely to be

reduced by an average of 11% under the dry extreme future climate scenario (through to 2030). The greatest impact in this regard is likely occur during the direct take period.

Given the potential decrease in water availability predicted under a future climate, and the small volume of water identified as available for allocation during the direct take period as a result of this reduced yield, it is considered prudent to determine that no further direct take allocations will be granted under this Plan.

The water available for allocation during the storage period is at a relatively high level of reliability, with 4,999 ML likely to be provided in full 5 years in 10, and 3,564 ML likely to be provided in 8 years in 10.

Under this Plan, a clear hierarchy of access is provided through different surety levels. Water allocations during the direct take period are all at Surety Level 5. During the storage period, this Plan provides a total limit of 3,564 ML of water at Surety Level 5 and 1,435 ML of water at Surety Level 6.

The water regime provided under this Plan is one in which there is significant scope for water development to proceed through the granting of new allocations during the storage period. In this regard, certainty is provided by identifying how much water may be available for further development, and the level of reliability of that water.

It should be noted that whilst the allocation limits provided in this Plan identify the volumes of water that are available at different levels of reliability, any application for a new water allocation will be assessed in the context of existing water development in this catchment, taking into consideration factors such as local hydrology and water availability, and impacts on existing water users and the environment.

In respect of flood flows, this Plan does not provide opportunistic access to extract water at the time of the Plan's adoption. This is based on a relatively large volume of reliable water remaining available for allocation in the storage period. Notwithstanding this, environmental flood flow requirements have been determined for the Tomahawk River (Davies and Warfe 2002), and hence this Plan makes provision for opportunistic access to be considered in the future.

*b) Provide certain access to water for stock and domestic and commercial use by clearly specifying the rules under which water can be taken.*

In establishing a water regime that best gives effect to its objectives, this Plan provides certain access to water for stock and domestic and commercial use by clearly specifying the rules under which water can be taken.

Together, the application of surface water allocation limits and the cease to take provision ensure that water required to meet stock and domestic needs is not allocated to other uses, and that natural base flows are maintained up to a sufficient level to meet these essential water needs.

It must be emphasised that in the event of extended dry periods, naturally occurring low flow and cease to flow events may limit the availability of surface water for stock and domestic purposes.

The allocation limits and access rules specified within this Plan provide certainty of access to water for irrigation and other commercial purposes. Within the water regime provided under this Plan, water available for extraction at different levels of reliability is clearly specified, and the flow thresholds at which restriction on the taking of water will be applied are set out.

#### **7.4 An Assessment of Likely Detrimental Effects of the Plan on the Quality of Water (Section 14(2)(d))**

Under the *State Policy on Water Quality Management 1997*, Protected Environmental Values (PEVs) for surface waters have been identified for the Tomahawk River catchment (DPIWE 2005). PEVs are values or uses of the environment for which it has been determined that a given area of the environment should be protected, and form the basis of water quality management.

Water Quality Objectives (WQOs) for a specific body of water are the most stringent set of water quality guidelines which should be met to achieve all of the protected environmental values nominated for that body of water. As yet, WQOs have not been set for the Tomahawk River catchment.

This Plan is consistent with the *State Policy on Water Quality Management 1997*, in that it is not likely to prevent the achievement of the PEVs nominated for the Tomahawk River catchment, and nor is it likely to prevent the achievement of any WQOs required for the protection of the PEVs once they are established.

In providing a water regime that retains the key characteristics of the natural flow regime, and which will maintain key ecological and geomorphological processes, this Plan broadly provides for the maintenance of physical and chemical processes currently operating within the river system. In this context, it is unlikely that this Plan will prejudice the achievement of future WQOs associated with the protection of identified PEVs for the Tomahawk River catchment.

It is considered that the flow conditions that are most likely to lead to a reduction in water quality, for example cease to flow or very low flow events, are not likely to occur with any greater frequency or duration as a result of the water regime provided by this Plan.

It is therefore concluded that this Plan is not likely to have any significant detrimental effects on water quality.

## **7.5 An Assessment of the Capacity of the Relevant Resources to Meet the Likely Demands for Water by Existing and Future Users (Section 15(a))**

Under this Plan, the demand for water for stock and domestic purposes should be met within the capacity of the resource, notwithstanding naturally dry periods potentially limiting this supply at certain times.

This Plan provides an annual catchment total of 5,304 ML of water for allocation at Surety Levels 5 and 6, of which 1,804 ML has been allocated as at the date of this Plan's adoption. This volume of water is at a relatively high level of reliability. However, it should be recognised that these levels of reliability are indicative only, and the potential for drought and climate change to reduce reliability should be considered.

Access to water during the direct take period is likely to be limited to between 11 and 22 days per month, and the lower level of reliability of direct take allocations should be carefully considered in relation to water supply needs.

An assessment<sup>11</sup> based on Land Capability Classes 1 to 5 indicates a potential water demand of 19,175 ML annually in this catchment. This is considerably more than the total volume of 5,304 ML available for allocation under this Plan, and reflects the relatively small yield of this catchment in comparison to the relatively large area of irrigable land. Should the full volume of 5,304 ML available under this Plan be allocated, more detailed assessments would need to be undertaken to determine whether additional water could be allocated sustainably.

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<sup>11</sup> The assessment calculated the total area of irrigable land in the Tomahawk River catchment which also has a Land Capability Class of 1 to 5 (based on Australian Bureau of Statistics data for 2006). Tasmanian water consumption was estimated to be 2.5 ML per hectare per annum for irrigable land.

## **7.6 Likely Effects of the Plan on Existing and Future Users, Including Any Effects on Businesses Carried on by those Users (Section 15(b))**

There are a relatively small number of existing licensed water users in this catchment, the bulk of whom have storage allocations. This Plan should have very little impact on these particular entitlement holders.

As this Plan introduces a cease to take provision, the small number of licensees with direct take allocations (two) may be affected by the imposition of restriction periods, however these effects are not considered to be large. Under current management arrangements, the taking of water during the direct take period is likely to be limited by low stream flows at certain times, and it is not expected that the introduction of a formal cease to take provision will dramatically change this situation.

This Plan does provide certainty for existing water users and for any future water development by identifying water available for further allocation and providing rules for accessing water under those allocations. This enables potential commercial water users to assess the availability and reliability of water supply within the scope of this Plan's provisions.

It should be emphasised that the cease to take provision and the application of staged restriction management applies only to commercial users of water and will have no impact upon the taking of water from surface water resources under Part 5 of the Act. That is, those taking water for stock and domestic purposes are recognised as having the highest priority in accessing water. However should the extraction of water for stock and domestic use under Part 5 of the Act ever reach a level which risks environmental harm, the taking of water for these purposes may be licensed.

## PART 8 INTERPRETATION AND DEFINITIONS

Words used in this Plan have their ordinary meanings as defined in the Macquarie Dictionary unless otherwise defined in the Plan or the *Water Management Act 1999*. A reference in this Plan to any legislation is to be taken as a reference to such legislation as it may be amended from time to time.

### 8.1 Statutory Definitions

**Authorised Officer** means an Authorised Officer appointed under section 237.

**dam** means a permanent or temporary barrier or structure that stores, holds back or impedes the flow of water and includes –

- a) any spillway or similar works for passing water around or over the barrier or structure; and
- b) a pipe or other works for passing water through or over the barrier or structure; and
- c) water stored or held back by the barrier or structure and the area covered by that water; and
- d) an artificial depression or hole excavated in a watercourse that holds water or impedes the flow of water; and
- e) an artificial levee or bank that holds back or diverts water in a watercourse –

but does not include –

- a) associated works and canals used in, or in relation to, the generation of electricity; or
- b) a tank or reservoir unless –
- c) the storage of water involves flooding natural ground; or
- d) the tank or reservoir is on a watercourse; or
- e) roads, buildings and other ancillary works that are not part of the dam.

**dam works** means any works for the construction, erection, enlargement, modification, repair or removal of a dam, or for the conversion of land to a dam, to which Part 8 or Part 8A applies or any work on any such dam which may significantly increase the dam's safety risk.

**dispersed surface water** means –

- a) water flowing over land otherwise than in a watercourse –
  - (i) after having fallen as rain or hail or having precipitated in any other manner; or
  - (ii) after rising to the surface naturally from underground; or
- b) water as mentioned in paragraph (a) that has been collected in a dam or reservoir.

**domestic purpose** means personal use for drinking, cooking and washing but does not include taking water to be used in carrying on a business unless it is for the personal use of persons employed in the business.

**environmental objectives** means the objectives of a water management plan proposed to further the provisions of section 6(1)(c).

**environment** means components of the earth, including –

- a) land, air and water; and
- b) any organic matter and inorganic matter and any living organism; and
- c) human-made or modified structures and areas –
- d) and includes interacting natural ecosystems that include components referred to in (a) and (b).

**groundwater** means –

- a) water occurring naturally below ground level; or
- b) water pumped, diverted or released into a well for storage underground.

**groundwater area** means an area of land that is appointed as a groundwater area by an order made by the Minister under section 124A.

**licence** means a licence granted and in force under Part 6.

**meter** means an instrument that measures and records a flow or level of water and includes any ancillary device attached to or incorporated in the instrument.

**permit** means a permit granted and in force under Division 4 of Part 8.

**regulations** means regulations made and in force under this Act.

**stock watering** means the provision of water for drinking by livestock and for normal husbandry practices associated with the keeping of livestock, but does not include the provision of water for livestock or animals subject to intensive farming.

**surety** means the actual or relative probability with which a water allocation is expected to be available in any year having regard to the natural variability of the supply of water.

**taking**, in the case of water from a water resource, includes –

- a) taking water by pumping or syphoning the water; and
- b) stopping, impeding or diverting the flow of water over land (whether in a watercourse or not) for the purpose of collecting or storing the water; and
- c) diverting the flow of water in a watercourse from the watercourse; and
- d) releasing water from a lake; and
- e) permitting water to flow under natural pressure from a well, unless the water is flowing from a natural opening in the ground that gives access to groundwater; and
- f) permitting stock to drink from a watercourse, a natural or artificial lake, a dam or reservoir.

**water allocation** means a quantity of water that a licensee is entitled to take and use under a licence.

**watercourse** means a river, creek or other natural stream of water (whether modified or not) flowing in a defined channel, or between banks, notwithstanding that the flow may be intermittent or seasonal or the banks not clearly or sharply defined, and includes –

- a) a dam that collects water flowing in any such stream; and
- b) a lake through which water flows; and
- c) a channel into which the water of any such stream has been diverted; and
- d) part of any such stream; and
- e) the floodplain of any such stream –

but does not include –

- a) a channel declared by the regulations to be excluded from this definition; or
- b) a drain or drainage depression in the contours on the land which only serves to relieve upper land of excess water in times of major precipitation.

**water management plan** means a water management plan in force under Part 4 and includes an interim water management plan under section 31.

**water regime** means –

- a) in respect of a watercourse, the pattern of flow in the watercourse, which is to be described in terms of the major features of its volumetric and temporal variation and which, in the case of a lake, is to include the fluctuation in the water level of the lake; or
- b) in respect of groundwater, the pattern of flow or fluctuation in the level of groundwater or pressure which is to be described in terms of the major features of its temporal variation.

**water resource** means –

- a) a watercourse, lake or any dispersed surface water or groundwater; or
- b) a tidal area that a declaration under section 5A relates to.

**well** means –

- a) an opening in the ground below the surface of the earth excavated or used for the taking of groundwater; or
- b) a natural opening in the ground that gives access to groundwater; or
- c) any other excavation as may be provided by the regulations;

**well works** means an excavation undertaken to give access to groundwater, any other works undertaken to repair or modify the structure of a well or any works undertaken to plug, backfill, seal or decommission a well.

## 8.2 General Definitions

**abstraction** means the taking of water from a water resource.

**Act** means the *Water Management Act 1999* as amended or, if that Act is repealed, any Act enacted in substitution for that Act.

**allocation limit** means the volume of water that can be allocated at a level of reliability taking into consideration environmental water requirements, rights under Part 5 of the Act and existing allocations.

**aquifer** means porous and fractured sediments and rocks that can store and yield groundwater.

**catchment** means the drainage area within which water will naturally flow towards a watercourse and includes the watercourse.

**Department** means the Department of Primary Industries, Parks, Water and Environment (DPIPWE).

**direct take allocation** means a quantity of water that a licensee is entitled to take from a watercourse under a licence, between 1 December and 30 April inclusive (in the Tomahawk River catchment). Direct take allocations are primarily used for (though not limited to) extraction and direct application during the irrigation season (summer).

**ML** means megalitre (one million litres).

**Protected Environmental Values** means the value or use for which it has been determined that a given area of the environment should be protected. There can, and often will be, more than one protected environmental value for a given area. A list of potential protected environmental values is given in clause 7.1 of the *State Policy on Water Quality Management 1997*.

**restriction management** means the process by which the taking of water, when in limited supply, is reduced in accordance with section 94 of the Act.

**reliability** means the likelihood of the total volume specified on a water allocation being available in the relevant take period (i.e. reliability of 80% indicates the total volume is likely to be available 8 years in 10).

**storage allocation** means a quantity of water that a licensee is entitled to take from a watercourse under a licence, between 1 May and 30 November inclusive (in the Tomahawk River catchment). Storage allocations are primarily used for (though not limited to) capturing and storing water in a dam in winter, for later use during the irrigation season.

**stream flow gauging station** means the Department's flow measuring device located at a particular reference point.

**surface water** means the surface water from all sources within the catchment, either as dispersed surface water or as occurs in a watercourse.

**take period** means the period between the start date and end date specified on a licence for the taking of a water allocation.

**water access entitlement** means an entitlement to take water, which has been established through a water licence and any water allocations endorsed on that licence.

**water user** means:

- a) any person who has a right or authorisation to take water under the Act; or
- b) any other person who uses the water resource for recreation or any other purpose.

## **PART 9 REFERENCES AND FURTHER INFORMATION**

Departmental reports and other supporting information can be found via the Department's website ([www.dpipwe.tas.gov.au](http://www.dpipwe.tas.gov.au)).

Davies, P.E. and Warfe, D. (2002) Waterhouse Community Irrigation Development: Aquatic Environmental Assessment. Freshwater Systems, Hobart, Tasmania.

DPIW (2009) Assessment of Freshwater Ecosystem Values in the Tomahawk River Catchment: Guidance for Water Management. Water Management Planning Report Series No. WMP 09/04. Water Resources Division, Department of Primary Industries and Water, Hobart, Tasmania.

DPIWE (2004) Guiding Principles for Water Trading in Tasmania. Policy 2003/2.

DPIWE (2005) Environmental Management Goals for Tasmanian Surface Waters. Dorset and Break O'Day Municipal Areas. Final Paper November 2005.

Graham, B., Nelson, M., Read, M. and Fuller, D. (2000) Desktop Method for Environmental Water Requirements in North East Tasmania. Technical Report No. WRA 00/06. Department of Primary Industry Water and Environment, Hobart, Tasmania.

Ling, F.L.N., Gupta, V., Willis, M., Bennett, J.C., Robinson, K.A., Paudel, K., Post, D.A. and Marvanek, S. (2009) River Modelling for Tasmania. Volume 3: the Pipers-Ringarooma Region. A report to the Australian Government from the CSIRO Tasmania Sustainable Yields Project, CSIRO Water for a Healthy Country Flagship, Australia.

## APPENDIX A

### Objectives of the Resource Planning and Management System of Tasmania and the *Water Management Act 1999*

#### *Resource Management and Planning System of Tasmania*

The objectives of the Resource Management and Planning System of Tasmania are:

- a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and
- b) to provide for the fair, orderly and sustainable use and development of air, land and water; and
- c) to encourage public involvement in resource management and planning; and
- d) to facilitate economic development in accordance with the objectives specified in paragraphs (a), (b) and (c); and
- e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in Tasmania.

#### *Water Management Act 1999*

The objectives of the *Water Management Act 1999* are to further the objectives of the resource management and planning system of Tasmania as specified in Schedule 1 and in particular to provide for the use and management of the freshwater resources of Tasmania having regard to the need to:

- a) promote sustainable use and facilitate economic development of water resources; and
- b) recognise and foster the significant social and economic benefits resulting from the sustainable use and development of water resources for the generation of hydro-electricity and for the supply of water for human consumption and commercial activities dependent on water; and
- c) maintain ecological processes and genetic diversity for aquatic and riparian ecosystems; and
- d) provide for the fair, orderly and efficient allocation of water resources to meet the community's needs; and
- e) increase the community's understanding of aquatic ecosystems and the need to use and manage water in a sustainable and cost-efficient manner; and
- f) encourage community involvement in water resource management.