



DEPARTMENT *of* PRIMARY
INDUSTRIES, WATER *and*
ENVIRONMENT

**ENVIRONMENTAL
MANAGEMENT
GOALS
for TASMANIAN
SURFACE WATERS**

**DERWENT ESTUARY
CATCHMENT**

December 2003



Environmental Management Goals

For Tasmanian Surface Waters:

Derwent Estuary Catchment

Between 2001 and 2003 Protected Environmental Values (PEVs) were set for the Derwent Estuary Catchment. A discussion paper was prepared to facilitate public participation in setting the PEVs. This discussion paper was intended as a basis for community and stakeholder participation in the process of developing environmental management goals for the waterways that are located within the Derwent Estuary Catchment.

This discussion paper was prepared by the Environment Division in association with the Land and Water Management Branch, and the Tasmanian Parks and Wildlife Service of the Department of Primary Industries, Water and Environment and Derwent Valley, Glenorchy City, Hobart City, Kingborough, Brighton and Clarence City Councils.

The Protected Environmental Values (PEVs) presented in this document refer only to the fresh waters not the estuarine waters.

Protected environmental values, where possible, are set on a catchment based approach. Due to the large size of the Derwent River Catchment, covering approximately one fifth of the State, carrying out the setting of Protected Environmental Values for the entire catchment would not have given equal emphasis on this catchment if this process was to be undertaken in one document. The catchment has therefore been broken down into three main components:

1. The Derwent Estuary Catchment – this area deals with all the surface waters that eventually drain to the Derwent Estuary but does not set Protected Environmental Values for the Estuarine Waters.
2. The Protected Environmental Values for the Derwent Estuary – this document was drafted in consultation with the Derwent Estuary Program stakeholders and deals with the Protected Environmental Values for the Estuarine Waters (see attached document).
3. The Derwent River Catchment – This area dealt with the remainder of the Derwent River catchment aside from the Great Lake Catchment area had PEVs set separately.

Words and expressions used in this document have, unless the contrary intention appears, the same meaning as defined in the *State Policy on Water Quality Management 1997* and the *Environmental Management and Pollution Control Act 1994*. Ecosystem refers to physical, chemical and biological aspects of the aquatic environment.

This document is divided into six main sections:

1. The first part discusses water reform in general.
2. The second part gives some general information relating to

the area covered in the discussion paper.

3. The third part discusses the *State Policy on Water Quality Management*.
4. The fourth part discusses the proposed Protected Environmental Values for the catchment.
5. The fifth section discusses water quality and water quantity values
6. The final part shows the Community Water Values collected during the PEV consultation process.

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1 INTRODUCTION

1.1 Why do we need water reform?

A good supply of fresh, clean water is an essential requirement for human life, a healthy environment and a productive economy.

We need water for drinking, for recreational activities like fishing, swimming and boating, to provide the food we eat and export, to generate clean electricity, and to support mining and other industries.

We also expect our rivers and lakes to look healthy, and provide a healthy environment for a wide range of aquatic plants and animals.

We sometimes take for granted that our use of water resources is sustainable; that our hard-working water will still be there in a healthy state to provide the same benefits for future generations. Our waterways are not immune from problems, however, and many of our river systems are showing signs of stress.

Tasmanian rivers range from relatively short, swiftly flowing rivers fed from mountain sources to slowly flowing rivers which may be reduced to a series of pools during dry periods.

River health, and the health of the economies that depend upon them, is clearly linked to the way we use the waters; the degree of regulation we impose; the quantity of water we take out; and the quality of water we return.

In response to a general recognition across the community of the importance of having clean water and appropriate river flows, the Tasmanian Government has recently introduced a range of reforms designed to ensure that these

values are protected for the future of the State.

1.2 What are these reforms?

Two major aspects of the water reforms are water quality management and water quantity management.

(a) water quality management

The *State Policy on Water Quality Management 1997* is designed to **maintain or enhance** the quality of Tasmanian surface waters. Principal objectives of the Policy include:

- Move on from reliance on ‘end of pipe’ controls to take into consideration the number of discharges into a given water body, or the sensitivity or current condition of the water body.
- Ensure that diffuse source and point source pollution does not endanger the achievement of water quality objectives, and that pollutants discharged to waterways are reduced as much as possible by the use of best practice environmental management;
- Facilitate and promote integrated catchment management.
- Focusing on overall water quality management strategies by identifying those water quality values and uses that are considered worthy of protection.

The first purpose of this discussion paper is to explain how the water quality values will be identified and used. Local communities have a key role in identifying these values in their catchments.

(b) water quantity management

The introduction of the *Water Management Act, 1999* to replace the *Water Act 1957* provides for:

- Major changes to the institutional arrangements for water management;
- The ready transfer of water rights between different users;
- Enhanced stakeholder and community input into water allocation and management; and
- A more transparent and equitable water allocation system, including formal allocation of flows to maintain a healthy river environment.
- The development of water management plans

The second purpose of this paper is to advise of what the public's views were and what was valued in the water resources from a water quantity perspective.

What did we want the public to do? (IM up to here)

Local communities have a valuable understanding of their regional waterways. What uses or values do you have for surface waters in this area that rely upon maintaining or enhancing water quality? Which of your activities rely upon maintaining or enhancing the flow of water into catchment waterways? Are there certain places on your rivers that you traditionally use for swimming or other recreational activities? Do you fish in them? Are there specific features of your rivers and streams that are recognized scenic attractions, such as rapids or waterfalls? Do you know of rare or endangered animals or plants in, or adjacent to, specific areas of your rivers or streams? Do you use water for livestock watering? Does your river supply the local town water supply? Do you draw

water from it to irrigate your farm? How often do you need to draw water from it, and when?

Your answers to these questions (and those of other catchment stakeholders) will help to develop the community water values for regional wetlands and waterways. People will have different views on these questions. What we all need to do is to try to think about the "big" picture, and how our own objectives may impact on the whole catchment and the wider community.

Planning to ensure sustainable use of these waters and protection of river health requires sound knowledge of local water quality and quantity issues. Your input to this process is important. We invite you to make a submission on the form at the back of this booklet.

1.3 How will your input be used?

Information from you on values particularly relating to water quality will assist in the setting of Water Quality Objectives for the regional waterways and will be used to assist in regional management planning. Further details of what this means is given in Section 4.

Information on water quantity values will be utilised along with advice from stakeholders, catchment groups and the public to better plan the water resources of your catchment. Water management planning will be closely linked with overall catchment management planning to put water resource management on a sustainable footing for the State. Water management planning will be undertaken on a priority basis, with stressed rivers in the State being targeted initially.

DERWENT ESTUARY CATCHMENT OVERVIEW

2.1 Catchment description

*Due to the general lack of information for the fresh water catchments that feed the estuary a lot of the information presented in this overview relates to the Derwent Estuary. The Protected Environmental Values presented in this document refer **only** to the fresh waters including intermittent streams commonly found on the eastern side of the Derwent not the estuarine waters. The Protected Environmental Values for the Derwent Estuary are presented in a separate document as attached.*

The Derwent River at 187 km in length to the head of the estuary at New Norfolk is Tasmania's second longest River after the South Esk. It flows in a north-south direction from its source at Lake St Clair.¹ The entire Derwent River catchment area covers 8,500 km². The Derwent Estuary catchment extends from New Norfolk to the Iron Pot and covers an area of 198.4 km². The Estuary spans 6 municipal areas: Derwent Valley, Brighton, Glenorchy City, Clarence City, Hobart City and Kingborough Councils. Around 190,000 people live around the margins of the Derwent Estuary with the majority of the population living in the Hobart, Glenorchy and Clarence municipal areas.

The Derwent region experiences a cool temperate climate, with a moderate mean temperature range due to the maritime location. The mean daily maximums for the Hobart area show annual variations from 21.5°C in January to 11.6°C during July, with the minimum average temperatures varying

from 11.8°C in January to 4.5°C in July.² Precipitation within the catchment is variable, ranging from 500-600 mm/yr in the vicinity of the estuary, to about 1200 mm/yr in the mountainous areas.³ Rainfall characteristics are variable throughout the year with the driest month delivering 39.8mm of rainfall in February and the highest rainfall month being October with 62.8 mm of rain. Overall annual rainfall for the Hobart area is approximately 623 mm. These climate details only give an overview of the likely conditions in the area, there will be variations, such as a distinct western shore to eastern shore difference.

The oldest rocks in the area form the precambrian basement, exposed only in the headwaters of the Styx, Tyenna and Florentine rivers. In the Florentine Valley area these are overlain by folded Ordovician to Devonian sediments where limestone contains significant karst features susceptible to any degradation in water quality. However the geology of the catchment is dominated by a generally flat lying sequence of Permian to Triassic sedimentary rocks intruded by Jurassic dolerite. This has been significantly disrupted by the faulting which formed the broad Derwent valley graben and relatively minor basins of Tertiary sedimentation. Areal restricted Tertiary basalt has produced soils valued for agriculture but also occurs on the Central Plateau. Quaternary glacial

¹ Coughanowr, C. 1997. State of the Derwent Estuary: a review of environmental quality data to 1997. Supervising Scientist Report 129, Supervising Scientist, Canberra.

² Data from Bureau of Meteorology website: www.bom.gov.au/climate

³ Coughanowr, C. 1997. State of the Derwent Estuary a review of environmental quality data to 1997. Supervising Scientist Report 129, Supervising Scientist, Canberra.

and outwash deposits occur in the highlands whilst the lower reaches of the Derwent River above Bridgewater have developed quaternary alluvial and estuarine floodplains. Coastal processes and sedimentation have dominated formation of South Arm and Ralphs Bay.

The Derwent Estuary catchment has been largely modified since European settlement through the activities of agricultural development, industrial uses, forestry and urban development. Although the estuary catchment is largely modified due to the vast areas of urbanisation there are numerous areas that remain in public ownership and are managed for conservation purposes such as the Wellington Range Protected Area.

The estuary is deep, wide and long which has contributed to the existing land use patterns, particularly the linear urban development along the edges of the estuary. Urban development, which has significantly modified the original landscape, has been contained to a continuous strip from Granton to Blackmans Bay on the western side of the estuary and from Risdon to Tranmere on the eastern shore. Historically development on the eastern shore was slow due to the lack of access until the opening of the floating bridge in 1943. Much of the open space that remains in these heavily urbanised environments has been developed into formal urban parks aside from a few areas that have retained their natural character. Beyond the developed urban areas are vegetated mountains and hills. Some of the mountains and hills are reserved under the Skyline Reserve Program, the remainder of the landscape is of an urban character. The skyline reserve area has been achieved by the purchase of land to contribute to the skyline reserve system. As well as the development of the skyline reserve development controls over buildings,

and provisions over removing natural vegetation have been put in place.

The Derwent Estuary lies at the heart of the metropolitan area and is an asset of natural beauty and diversity. It is an environmental resource of high significance. A large component of the Derwent Estuary catchment contains concentrated urbanisation and at the same time is an important recreational and scenic resource for the municipal areas surrounding it. The piecemeal action of urban growth has led to permanent changes within the estuary and the catchments feeding the estuary. It is a complex and interlinking system that is under stress from both natural and human processes.

Despite the existing degradation, the estuary is an important and productive ecosystem which contains a range of valuable habitat types; these include wetlands, seagrass and seaweed beds, mudflats and rocky reefs. Many species of aquatic and marine flora and fauna live in or migrate through the Derwent and its subcatchments. The River and its foreshores are valuable to the understanding of the history of Tasmanian aboriginals and early European settlement in 1803. Not surprisingly the foreshore contains many sites and features of cultural heritage which need to be protected for future generations.

Many rivulets empty into the estuary from the surrounding hills and urban areas, which has implications on the water quality of the estuary. The estuary and these rivulets are what we call multiple use areas. They may be used for industry, recreation, aesthetics etc. Multiple use characteristics have implications for both the quality of the waterways and the management regimes.

The Derwent River is the estuary's main tributary, with a median annual

discharge of 120 cumecs⁴. Other tributaries include the Jordan River, with a mean discharge of less than 1 cumec and numerous smaller streams and creeks, contributing relatively small and often intermittent flows to the estuary. The Derwent and three of its nine tributaries have been dammed for hydro-electricity generation. Ten hydro-electric power plants are situated on the Derwent or its tributaries and the majority of the catchments flows are diverted through these plants⁵. The Clyde River is also controlled for the purposes of irrigation. Overall, the upper Derwent River is characterised by a modified flow regime, which has flow through effects on the Derwent Estuary. However note that no large storages exist and that seasonal discharges from the run-of-river power stations maintain something of their natural pattern.

The Derwent is Tasmania's third largest port and supports several large industries. The three largest industries operating on the Derwent are Pasminco Hobart Zinc Refinery, ANM Boyer Newsprint Mill and one smaller industry, Textile Industries Australia, located in Prince of Wales Bay. There are a number of other industries located on the Derwent or on rivulets that discharge to the Derwent. These are Cadbury Schweppes at Claremont, Self's Point Petroleum Tank Farm at New Town, Incat Tasmania at Derwent Park, National Foods on Newtown Rivulet, Cascade Brewery on Hobart Rivulet, Cuthbertsons Tannery also on Hobart Rivulet, Tasmanian Board Mills at Austins Ferry and Gunns Limited also at Austins Ferry⁶. In many cases

these industries discharge wastes to sewer for treatment; however there may be site runoff that will pass untreated into the Derwent or its feeder rivulets. There are other industries within the area not specifically mentioned in this paper which include quarries, concrete batching plants, brick and paver manufacturers, truck and railway depots, petrol stations, car washes, vineyards etc. The majority of these industries have impacts on water quality in some form by either a direct point source discharge to the waterway or via diffuse pollution input to the waterway via site runoff.

Urban stormwater runoff is increasingly being recognised as a major source of pollutants entering urban waterways and estuaries. There are at least 270 stormwater outlets flowing into the estuary as well as there being over 50 urbanised catchments emptying to the Derwent.

The major subcatchments located within the Derwent Estuary catchment are listed in Table 1.

In addition, there are many smaller waterways running directly into the estuary with catchments of less substantial size.

There are ten major conservation areas situated along the Derwent between New Norfolk and the mouth of the estuary. Eight of those are land based; the River Wildlife Sanctuary and the Tinderbox Marine Reserve are inter and sub tidal. The Derwent River Conservation Area, established in 1941, is the largest conservation area on the estuary (1568 ha) and occupies most of the wetlands and mudflats below the high water mark between New Norfolk and Dogshear Point.

⁴ 1 cumec = 1 cubic metre or 1000 litres/second

⁵ The Derwent and Central Highlands Catchment <http://www.hydro.com.au/recreation/derwenttour>

⁶ Coughanowr, C. 1997. State of the Derwent Estuary a review of environmental quality data to

1997. Supervising Scientist Report 129, Supervising Scientist, Canberra.

The Derwent Estuary contains three important wetlands; Goulds Lagoon, the Derwent River Marshes upstream of the Bridgewater Bridge and the South Arm Conservation Area. Goulds Lagoon is a 3 hectare wetland in the Glenorchy Municipality. This coastal marsh estuarine swamp is a severely disturbed system due to the pollution from nearby developments. The River Derwent wetland covers an area of 550 hectares and is in the New Norfolk Municipality. It is very important for the waterfowl habitat it provides. This wetland is slightly impacted by the invasion of some exotic species whilst geomorphic and hydrological processes have been disrupted by the construction of the Bridgewater bridge and causeway. The South Arm Conservation covers an area of 784 hectares and is reserved in particular for its wetland values particularly migratory waders. As well as containing important wetlands the Derwent Estuary also provides nursery and feeding grounds for many fish species caught off the Tasmanian Coast⁷.

The Derwent Estuary is widely used for recreation both on and off the water. Primary contact sports include swimming, waterskiing, windsurfing, scuba-diving and snorkelling, while secondary contact sports include large and small boat sailing, motor-boating, paddling, fishing and rowing. Land based recreation occurs in numerous parks, picnic areas and sports grounds. There are many notable picnic areas situated alongside many of the Rivulets that enter the Derwent. New Town and Hobart Rivulets in particular have developed linear parks along the edges of the rivulets. Many of the sandy beaches that are suitable for swimming

are located to the south of the Tasman Bridge. Nutgrove, Kingston and Blackmans Bay beaches are used most intensively on the Western shore while Howrah and Bellerive beaches are used on the eastern side of the estuary for both swimming and more frequently walking.⁸ Surfing at times is carried out on Taroona Beach and at Blackman's Bay. A number of beaches, particularly further up the river in the past have had elevated faecal indicator bacteria levels making them unsuitable for primary contact recreational activities however, the majority of beaches now continuously meet primary contact recreation requirements. Windsurfers frequent Ralphs Bay and diving is popular at the mouth of the estuary particularly near the Tinderbox Marine Reserve. Water skiing is also practiced in the river particularly near New Norfolk.

Recreational boating is popular in the Derwent. Nine yacht clubs and two private marinas provide anchorage for numerous boats. The Derwent is home to many large boating events, which attract national and international competitors to the Estuary.

There are 5-10 major urban rivulets feeding the Derwent Estuary. These major rivulets until recent years have been largely unstudied, however with recent changes on the value and importance of these waterways has come the recognition of their values and uses. This change in focus has brought about some studies on some of the catchments (Sandy Bay Rivulet, Humphrey's Rivulet, Hobart Rivulet and New Town Rivulet). From these studies it has been suggested that water quality problems can be significant at

⁷ Poynter, R, 1988. The Derwent River as an Educational Resource. University of Tasmania Report, Hobart.

⁸ Coughanowr, C. 1997. State of the Derwent Estuary: a review of environmental quality data to 1997. Supervising Scientist Report 129, Supervising Scientist, Canberra.

times and that serious attention needs to be given to urban runoff/stormwater management, particularly if environmental water quality objectives are to be met.

There are 4 active refuse disposal sites in the catchment located at New Norfolk (Peppermint Hill), Glenorchy (Jackson Street), Hobart (McRobies Gully) and Clarence (Lauderdale). In addition to the active tip sites there are numerous old tip sites that have the potential to contribute leachate to neighbouring rivulets and ultimately the Derwent.

Thirteen sewage treatment plants and two large industrial plants discharge effluent directly into the Estuary. As well as these discharges the estuary also receives urban runoff from 5 – 10 major urban rivulets and from about 270 stormwater direct outfall pipes.

2.2 Hobart Regional Water Authority Catchments

The Derwent River and its tributaries are an important source of municipal and industrial water supply. Hobart Water is involved in the collection, storage and treatment of surface water from the catchments within Mount Field National Park, Wellington Park and the River Derwent catchment. This water is held in nine in-ground bulk storages, including Risdon Brook Dam, Lime Kiln Dam, Tolosa St Reservoir, Upper Hobart Reservoir, Lower Hobart Reservoir, Ridgeway Dam and Flagstaff Gully Dam.

On average, Hobart Water supplies 36,000 megalitres (million litres) of water to the southern Tasmanian community every year. Most of this water (99%) is supplied to eight Councils who then have the responsibility to supply householders and industry. The remaining 1% of the

water is supplied to farmers on an off-peak basis.

Hobart Water is in a relatively unique situation of sourcing much of its raw water supply from highland catchments yielding high quality water. In these areas rainfall run-off and snow melt yield natural water resources that are relatively unaffected by human contact and largely free from the atmospheric and environmental pollutants that are common in developed and highly populated areas. The treatment process for this water is less complex only requiring chlorination due to the high quality.⁹

Although water taken for drinking water supply from the River Derwent is treated, poorer quality catchment water is more difficult to treat and may represent a higher risk in its final form than when more pure catchment water is treated.¹⁰ In-ground storages are susceptible to ground water infiltration, which means that special consideration must be taken in the areas surrounding these storages.

It is currently believed that periodic reduction in water quality from the Mount Field and Wellington Park catchments is largely related to the impact of infrastructure such as unsealed roads and, in some cases, recreational activities within the catchments. This reduction in water quality that has been noted is being monitored to ascertain the main sources of the sediment. Hence, catchment management planning is integral to Hobart Water's ability to continue supplying the community with quality

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<http://www.hobartwater.com.au/PAGES/CORPORAT/FRAMESET.HTML>

¹⁰

<http://www.hobartwater.com.au/PAGES/CORPORAT/FRAMESET.HTML>

drinking water at a relatively low cost without the need for additional treatment of water sourced from a number of its catchments.

2.3 Water Quality

The water quality of the Derwent Estuary and the land based surface waters feeding the estuary is a function of its physical setting, as well as historic and ongoing input of pollutants. The water quality of the Derwent Estuary can be affected by industrial wastewater, sewage, stormwater runoff, solid waste leachate and general land management practices.

Changes in water quality have the potential for major environmental impacts on the resource value of the estuary. Changes or reductions in water quality could affect current beneficial uses such as water supply, maintenance of aquatic ecosystems, estuary productivity, production of edible fish and crustaceans, recreational and aesthetic values.

Water quality can be affected by industrial wastewater discharge, water off takes, sewage, stormwater runoff, solid waste leachate, oil spills, agricultural practices and general land management practices.

These inputs can be broadly classified as point sources and diffuse sources. Inputs of diffuse types of pollutants to the Derwent Estuary are from sediment derived from the Derwent River itself, urban runoff, atmospheric fallout and leachate from some tip sites within the catchment.

Urban stormwater runoff is increasingly being recognised as a major diffuse source of pollutants entering urban waterways and estuaries. Urban stormwater may carry high concentrations of suspended solids with absorbed nutrients, heavy metals,

hydrocarbons, pesticides, bacteria, litter and other contaminants derived from human activity.

Each urban rivulet that flows to the Derwent will have its own quality characteristics. However, the more urbanised catchments can be typified by reduced water quality due to the following reasons:

- Raised faecal coliform levels due to illegal sewer connections or from dog or other animals faeces entering the system mainly during rain events.
- Excessive nutrients in waterways which can promote excessive growth of nuisance algae.
- Extensive paved surfaces cause increased flow peaks of decreased duration. This can increase in turbidity levels due to excessive stream bank erosion or from urban runoff. This can reduce the amount of light penetrating the water and cause sedimentation problems.
- Presence of heavy metals in waterways which can be toxic to human and aquatic life. The main source is from road runoff and accumulated vehicle emissions and historic industry emissions.
- Hydrocarbons from road runoff entering the water system particularly during rainfall events.
- Litter entering the waterways due to urban littering can cause a threat to aquatic life as well as being visually unsightly.
- Pesticides and herbicides from garden and roadside vegetation management practice can effect the aquatic biota.

A technical report published by the Tasmanian Aquaculture and Fisheries Institute on the conservation significance of the State's estuaries gives an indication of the health of the Derwent Estuary. Under this classification system the estuaries with the least human disturbance and greatest proportion of catchment area under statutory protection were considered to possess the highest conservation significance. Estuaries could also be assigned a high level of conservation significance if they possessed exceptional species diversity or included species with restricted distributions. Using these criteria, estuaries were assigned to one of five classes. The Derwent Estuary under this classification system rated as a Class C estuary¹¹.

Class C. Moderate conservation significance - Estuary and associated catchment area are affected by human habitation and land clearance, but have not been badly degraded. The technical report recommends that Class C estuaries should be made available for a variety of recreational and commercial purposes.

¹¹ G.J. Edgar, N.S. Barrett and D.J. Graddon. 1999. *A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land Use*. Tasmanian Aquaculture and Fisheries Institute

Table 1: Derwent Estuary Catchment Areas (estimates from Derwent Estuary Stormwater Catchment Map)

CATCHMENT	AREA (ha)
Brighton Council	
Ashburton	295
2_Bridgewater	317
1_Gagebrook*	1041
3_Quoin*	961
6_Blackstone	423
8_Cassids	216
11_Thistlv	233
7_Old Beach	102
Clarence City Council	
14_Otago#	269
90_Risdon#	1533
92_Bowen	347
13_Vale	227
10_Grasstree	522
16_Meehan	596
21_Bedlam	225
22_Gielston	685
30_Indisfarne	90
31_Gordons	149
35_Rose	66
38_Montagu	102
27_Rosny	688
28_Mornington	543
44_Bellerive	168
41_Howrah	267
43_Knoxwood	166
49_Skillion	133
53_Tranmere	159
36_Rumney	805
93_Rokeby	1037
54_Stansfield	176
56_Lauderdale	110
64_Droughty	251
61_Gibsons	231
69_Mather	632
78_Augustus	446
Mortimer	133
Rav	339
82_Onossum	1600
Derwent Valley Council	
89_Forest	122
97_Collins Hill	2096
98_Shenard Hill	1215
99_Penpermint Hill	2912
100_Penpermint Hill	5129
101_Lachlan River	9272
102_Dromedary	4285
Glenorchy City Council	
4_Black Snake#	527
5_Granton	384
9_Rusts#	793

12_Beedhams#	579
15_Faulkners	1210
91_Connewarre	229
17_Jaques	138
19_Islet	558
23_Littlejohn	135
24_Humphrey Rivulet	2016
18_Barossa Creek	593
20_Goodwood	122
26_Springfield	444
25_E7	180
Hobart City Council	
29_Newtown Rivulet#	1054
42_Brushy	267
39_Pottery	131
34_Maypole	416
33_Cornelian	90
37_Domain	162
45_Providence	158
46_Warwick	144
50_Goulburn	86
40_Hobart	1008
47_Sullivans	124
52_Sandy Bay	576
66_Browns River*	1407
70_Fern Tree*	388
52_Ridgeway	136
58_Proctors	116
55_University	150
57_Lambert	218
94_Waimea	45
60_Manning	120
62_Linscombe	81
63_Wayne	102
68_Folder	83
71_Cartwright*	182
Kinaborough Council	
67_Dunns Creek	801
65_Vincents	1410
95_Albian	74
73_Dixons	67
72_Taroona	80
74_Channel	119
76_Hinsby	51
77_Shot Tower	50
79_Taroona	101
80_Bonnet	74
75_Fawcett	436
81_Fisher	218
80_Lower Browns River	1407
83_Whitewater	1178
86_Kingston	109
87_Blackmans Bay	289
88_Tinderbox	661

* indicates that part of the catchment is in the next Council's boundary

indicates that part of the catchment is in the previous Council boundary.

3 WATER QUALITY : THE STATE POLICY ON WATER QUALITY MANAGEMENT

3.1 Setting Protected Environmental Values

The first step in the implementation of the *State Policy on Water Quality Management 1997* is the identification of **Protected Environmental Values (PEVs)** for the surface waters in your region. **PEVs are the current values and uses of a water body for which water quality should be protected.** These values and uses should be clearly in evidence at the time of the implementation of the Policy.

The Policy specifies a range of PEVs which may be applied to a given water body. More than one PEV may be applied to a water body. The PEVs are:

- A. Protection of Aquatic Ecosystems
- B. Recreational Water Quality and Aesthetics
- C. Raw Water for Drinking Water Supply
- D. Agricultural Water Use
- E. Industrial Water Supply

The Board of Environmental Management and Pollution Control will then specify a range of Water Quality Objectives. These will be designed to ensure the quality of water in that water body is maintained at a level which will allow the chosen PEVs to be protected.

The Policy also sets out a range of strategies which are aimed at ensuring that waste water discharges from point sources (such as industrial or sewage treatment plant discharges) and diffuse sources (such as runoff from highways, urban areas, farms, forest harvesting

etc.) will not endanger the achievement of the Water Quality Objectives.

The Board and local planning authorities will use these strategies in land use planning and approvals processes, and in ongoing regulation, to ensure that the PEVs for a given water body are maintained or enhanced over time.

3.2 Protected Environmental Values categories

The Policy lists a range of PEVs which are used to describe the identified values and uses of a given water body. These are:

- | |
|--|
| <p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none">(i) Pristine or nearly pristine ecosystems;(ii) Modified (not pristine) ecosystems:<ul style="list-style-type: none">(a) from which edible fish, crustacea and shellfish are harvested, or(b) from which edible fish, crustacea and shellfish are not harvested. |
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What does pristine mean?

"Pristine" means waters not subject to human interference through discharges or other activities within the catchment (Australian Water Quality Guidelines 1992).

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| <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none">(i) Primary contact water quality(ii) Secondary contact water quality |
|---|

(iii) Aesthetics water quality

‘Primary contact’ means recreation involving bodily immersion/submersion where there is direct contact with water, & includes swimming, diving, surfing, water skiing.

‘Secondary contact’ means activities where there is some direct water contact, but it is unlikely that water will be swallowed (e.g. paddling, boating, and fishing).

‘Aesthetics’ means visual appearance of the water, being free from oil, grease, floating debris, unnatural colour, algal blooms etc.

C: Raw Water for Drinking Supply

- (ii) Subject to coarse screening and disinfection.

Under the current *Policy* this PEV applies to water used as the intake source for **public use** (town water supply, in other words) and to registered private water supplies. It does not apply to the taking of water from surface waters by individuals for private use for the purposes of drinking etc.

The Director of Public Health recommends that raw water from any surface waterbody should be disinfected/boiled before use.

D: Agricultural Water Uses

- (i) Irrigation
- (ii) Stock watering

E: Industrial Water Supply

The actual industry type must be specified in order to identify appropriate guidelines.

3.3 Community Input

We ask the community to provide comment on some water quality PEVs which the Board of Environmental Management and Pollution Control (the Board) had suggested as a starting point as being suitable for surface waters of the region.

The community was asked if they agreed with the suggested PEVs for water quality, and why, or if they wished to propose other PEVs and why?

The community were asked to identify the following:

- Specific areas of the rivers that may need different or additional PEVs (traditional fishing areas, for example).

- Any rare or endangered species in specific locations which need to be acknowledged.
- Specific locations or stretches of river which need different PEVs (traditional swimming holes, for example)
- Any existing values and uses that are under threat from deteriorating water quality.

The Board and the regional planning authorities considered and took account of all submissions before coming to a decision on PEVs for these wetlands and waterways.

4 WATER QUALITY : PROTECTED ENVIRONMENTAL VALUES FOR THE DERWENT ESTUARY CATCHMENT

Between 2001 and 2003 the Board of Environmental Management and Pollution Control, in association with the Director of the Parks and Wildlife Service and Brighton, Derwent Valley, Glenorchy City, Hobart City, Clarence and Kingborough Councils set Protected Environmental Values (PEVs) for surface waters for the Derwent Estuary catchment as required by the *State Policy on Water Quality Management 1997* (the Policy).

A Discussion Paper – *Proposed Environmental Management Goals for Tasmanian Surface Waters: Derwent Estuary Catchment* – was developed by DPIWE in association with Councils. This paper explained the Policy and how the environmental values for water quality (PEVs) are identified and used.

The Discussion Paper was sent to 170 stakeholders who were invited to attend one of three workshops (held Feb-Mar 2001) to discuss proposed Protected Environmental Values for the estuary and catchment and to identify Community Water Values. Stakeholders invited included community groups such as Waterwatch, Landcare and catchment management groups, farmers, industries, Hobart Water and planning authorities.

Three public meetings were held three weeks after the stakeholder workshops.

These meetings were advertised in the Public Notices section of the Mercury on two consecutive Saturdays. To raise the profile of these meetings a media release was sent out which resulted in an article appearing in ‘The Mercury’, a radio interview on ABC “Drive Time”, a story on WIN TV news and an article in the Derwent Valley Gazette. Attendance at the public meetings was better than at the stakeholder workshops, but it was still low considering the population of the municipalities involved.

The main changes made to the PEVs for the Derwent Estuary catchment, resulting from the community consultation, were as follows:

- inclusion of several additional habitats and species of conservation significance;
- addition of swimming as an existing recreational use in the middle section of the estuary.

These amendments to the PEVs and the compiled Community Water Values were sent to stakeholders and those who attended the meetings for feedback. Other issues raised throughout the consultation process have been incorporated into the document.

Community Water Values should be incorporated into the future development of water management and catchment management plans.

Derwent Estuary Catchment

The Derwent Estuary spans 6 Municipal areas: Brighton, Derwent Valley, Glenorchy City, Hobart City, Clarence and Kingborough Councils. Around 190,000 people live around the margins of the Derwent Estuary. The Derwent Estuary Catchment has been largely modified since European settlement through the activities of agricultural development, industrial uses, forestry and urban development. A large component of the Derwent Estuary catchment contains concentrated urbanisation but at the same time many of the streams and rivulets are an important recreational and scenic resource. These waters have many varied uses and values including recreational, irrigation, drinking water, industrial water supply and basic river health values.

The area of the Derwent Estuary Catchment is covered by six local government municipalities – Brighton, Derwent Valley, Glenorchy City, Hobart City, Clarence and Kingborough councils. The Tasmanian Parks and Wildlife Service also have planning authority in some areas. The catchments and municipal boundaries are shown on the attached map.

The PEVs for the surface waters of the Derwent Estuary Catchment are described in Table 1 and Table 2 under land use categories shown on the attached map.

The PEVs apply to all surface waters within each land tenure category, other than¹²:

- privately owned waters that are not accessible to the public and are not connected to, or flow directly into, waters that are accessible to the public; or
- waters in any tank, pipe or cistern.
“Privately owned waters” means any surface waters confined within the boundary of privately owned land and which do not flow into, or do not communicate with:
 - (a) the sea or arm or creek of the sea;
 - (b) a source of supply for a water district or irrigation water district;
 - (c) any river, stream, watercourse, lake, pond or marsh.

Management of all surface waters within the catchment shall focus on the achievement of water quality objectives.

The water quality objectives will be determined by the Board of Environmental Management and Pollution Control in accordance with the *State Policy on Water Quality Management 1997*.

Achievement of these water quality objectives will maintain or enhance the water quality of those surface waters to ensure the protection of all of the following values and uses applying to each land use category. These values and uses are derived from the formal PEVs listed in Clause 7 of the Policy.

¹² State Policy on Water Quality Management 1997

In general, diffuse source pollution can be managed to protect the PEVs by compliance with approved codes of practice, or by development and implementation of best practice environmental management guidelines where codes are not available.

In general, point source pollution should be managed to protect the PEVs by implementation of best practice environmental management, and by compliance with emission limits set by the regulatory authority. This may also require the setting of a mixing zone by the Board of Environmental Management and Pollution Control. For specific details refer to Part 4 of the *State Policy on Water Quality Management, 1997*.

Protected Environmental Values reflect current values and uses of a water body but do not necessarily imply that the existing water quality will support these values and uses.

Table 1: PEVs for the Derwent Estuary Catchment excluding Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 26)
<p>Surface Waters flowing through Urban Areas</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics ^(**see note on page 27)</p> <p>(i) Primary contact water quality (Humphrey’s Rivulet near Dominic College, Hobart Rivulet at Cascade Gardens, Browns River)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>E: Industrial Water Supply (Cascade Brewery, Cuthbertson Tannery)</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; which will allow people to safely engage in primary contact activities such as swimming at Humphrey’s Rivulet near Dominic College, Hobart Rivulet at Cascade Gardens, Browns River and secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters; and which is suitable for industrial use by Cuthbertson Tannery and Cascade Brewery.</p>
<p>Surface Waters flowing through Private Land</p> <p>(including forest on private land)</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics ^(**see note on page 27)</p> <p>(i) Primary contact water quality (New Town Rivulet above Lady Franklin Gallery and where Lenah Valley Road crosses the rivulet)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>D: Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>E: Industrial Water Supply (Cascade Brewery, Cuthbertson Tannery)</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; that is acceptable for irrigation and stock watering purposes; which will allow people to safely engage in primary contact recreation activities such as swimming at New Town Rivulet above Lady Franklin Gallery and where Lenah Valley Road crosses the rivulet and secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters; and which is suitable for industrial use by Cascade Brewery and Cuthbertson Tannery.</p>

Table 1: PEVs for the Derwent Estuary Catchment excluding Hobart Water Catchments

Land Tenure	Protected Environmental Values <small>(*see note on page 26)</small>
<p>Surface Waters flowing through Forest Reserves</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> a. from which edible fish are harvested <p>having regard for the management objectives for forest reserves outlined in Schedule 3 of the <i>Forestry Act, 1920</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface waters with their headwaters within Forest Reserves.</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of pristine or nearly pristine ecosystems <p>having regard for the management objectives for forest reserves outlined in Schedule 3 of the <i>Forestry Act, 1920</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem, which will allow people to safely engage in recreation activities such as swimming(where permitted), paddling or fishing in aesthetically pleasing waters.</p>

Table 1: PEVs for the Derwent Estuary Catchment excluding Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 26)
<p>Surface Waters flowing through National Parks, State reserves, Nature reserves or historic sites from Private Land, State Forest or Unallocated Crown Land</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of a modified (not pristine) ecosystems <ul style="list-style-type: none"> a. from which edible fish are harvested <p>having regard for the management objectives for national parks outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish may be harvested, and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface Waters with their headwaters within National Parks, State reserves, Nature reserves or historic sites.</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of pristine or nearly pristine ecosystems <p>having regard for the management objectives for national parks outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or nearly pristine ecosystem; and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface Waters flowing through Nature Recreation Areas, Conservation Areas or Regional Reserves from Private Land, State Forest or Unallocated Crown Land</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of a modified (not pristine) ecosystem <ul style="list-style-type: none"> a. from which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish maybe harvested, and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>

Table 1: PEVs for the Derwent Estuary Catchment excluding Hobart Water Catchments

Land Tenure	Protected Environmental Values <small>(*see note on page 26)</small>
<p>Surface Waters with their headwaters within Nature Recreation Areas, Conservation Areas or Regional Reserves</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of Pristine or nearly pristine ecosystems having regard for the management objectives for conservation areas outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i>. <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem; and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface Waters with their headwaters within Wellington Park</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of Pristine or nearly pristine ecosystems having regard for the management objectives of the Wellington Park Act 1993 and the Wellington Park Management Plan 1997). <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (where permitted) (iii) Aesthetic water quality <p>C: Raw Water for Drinking Water Supply</p> <ul style="list-style-type: none"> (ii) Subject to coarse screening plus disinfection <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>

Table 1: PEVs for the Derwent Estuary Catchment excluding Hobart Water Catchments

Land Tenure	Protected Environmental Values <small>(*see note on page 26)</small>
<p>Surface waters flowing through Public Reserves under the <i>Crown Lands Act 1976</i></p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> a. from which edible fish are harvested <p>having regard for the management objectives for public reserves outlined in Schedule 4 of the <i>Regional Forest Agreement (Land Classification) Act, 1998</i></p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface waters with their headwaters within Public Reserves under the <i>Crown Lands Act 1976</i></p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of a modified (not pristine) ecosystem <ul style="list-style-type: none"> a. from which edible fish are harvested <p>having regard for the management objectives for public reserves outlined in Schedule 4 of the <i>Regional Forest Agreement (Land Classification) Act, 1998</i></p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified, but healthy ecosystems from which edible fish are harvested and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters</p>

Table 1: PEVs for the Derwent Estuary Catchment excluding Hobart Water Catchments

Land Tenure	Protected Environmental Values <small>(*see note on page 26)</small>
Surface waters flowing through Un-allocated Crown Land	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems</p> <p>a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified, but healthy aquatic ecosystems from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling and fishing in aesthetically pleasing waters.</p>
Surface waters flowing through Commonwealth Land	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems</p> <p>a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified, but healthy aquatic ecosystems from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling and fishing in aesthetically pleasing waters.</p>
Surface Waters flowing through Hydro Electric Corporation Land	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems</p> <p>a. From which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>E: Industrial Water Supply – Hydro Electric Power Generation</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested: which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (where such activities are permitted) in aesthetically pleasing waters; and which is also suitable for hydro-electric power generation.</p>

* In general, diffuse source pollution can be managed to protect the PEVs by compliance with approved codes of practice, or by development and implementation of best practice environmental management guidelines where codes are not available. In general, point source pollution should be managed to protect the PEVs by implementation of best practice environmental management, and by compliance with emission limits set by the regulatory authority. This may also require the setting of a mixing zone by the Board of Environmental Management and Pollution Control.

For specific details refer to Part 4 of the State Policy on Water Quality Management, 1997.

**** Unless otherwise indicated local government does not endorse the use of surface waters flowing through urban areas or private land for primary and secondary contact.**

Table 2: PEVs for the Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 33)
<p>Surface Waters with their headwaters within the following catchments within Wellington Park</p> <p>Hobart Water Supply:</p> <p>Knights Creek and Humphrey Rivulet water supply catchment above the junction of Knights Creek and Humphrey Rivulet</p> <p>Or</p> <p>Lime Kiln Gully water supply catchment</p> <p>Or</p> <p>Wellington South water supply catchment</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(i) Protection of pristine or nearly pristine ecosystems</p> <p>a. from which edible fish are harvested</p> <p>having regard for the management objectives of the Wellington Park Act 1993 and the Wellington Park Management Plan 1997).</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (for activities permitted under the Wellington Park Management Plan, 1997)</p> <p>(ii) Secondary contact water quality (for activities permitted under the Wellington Park Management Plan)</p> <p>(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (for activities permitted under the Wellington Park Management Plan) in aesthetically pleasing waters and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>

Table 2: PEVs for the Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 33)
<p>Surface Waters flowing through Private Land which are in the following catchments</p> <p>(including forest on private land)</p> <p>Hobart Water Supply:</p> <p>Risdon Brook water supply catchment above the Reservoir</p> <p>Or</p> <p>Sandy Bay Rivulet water supply catchment above the base of the Lower Reservoir</p> <p>Or</p> <p>Flagstaff Gully water supply catchment above the base of the Reservoir.</p> <p>Or</p> <p>Tolosa Reservoir water supply catchment above the base of the Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems</p> <p>a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (specify sites)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>E: Industrial Water Supply (check if any industry on private land)</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy but modified aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming (specify sites), paddling or fishing in aesthetically pleasing waters; which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection) and suitable for industrial water supply.</p>

Table 2: PEVs for the Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 33)
<p>Surface Waters with their headwaters within Private Land which are in the following catchments</p> <p>(including forest on private land)</p> <p>Hobart Water Supply:</p> <p>Risdon Brook water supply catchment above the Reservoir</p> <p>Or</p> <p>Sandy Bay Rivulet water supply catchment above the base of the Lower Reservoir</p> <p>Or</p> <p>Flagstaff Gully water supply catchment above the base of the Reservoir.</p> <p>Or</p> <p>Tolosa Reservoir water supply catchment above the base of the Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems</p> <p>a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (specify sites)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>E: Industrial Water Supply (check if any industry on private land)</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy but modified aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming (specify sites), paddling or fishing in aesthetically pleasing waters; which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection) and which is suitable for industrial water supply.</p>

Table 2: PEVs for the Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 33)
<p>Surface Waters flowing through Un-allocated Crown Land which are in the following catchments</p> <p>Hobart Water Supply:</p> <p>Knights Creek and Humphrey Rivulet water supply catchment above the junction of Knights Creek and Humphrey Rivulet</p> <p>Or</p> <p>Tolosa Reservoir water supply catchment above the base of the Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems</p> <p>a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy but modified aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (where permitted) in aesthetically pleasing waters; and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>
<p>Surface waters with their headwaters within Un-allocated Crown Land for the following catchments</p> <p>Hobart Water Supply:</p> <p>Knights Creek and Humphrey Rivulet water supply catchment above the junction of Knights Creek and Humphrey Rivulet</p> <p>Or</p> <p>Tolosa Reservoir water supply catchment above the base of the Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems</p> <p>a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy but modified aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (where permitted) in aesthetically pleasing waters; and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>

Table 2: PEVs for the Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 33)
<p>Surface waters flowing through Public Reserves which are in the following catchments</p> <p>Hobart Water Supply:</p> <p>Risdon Brook water supply catchment above the Reservoir</p> <p>Or</p> <p>Sandy Bay Rivulet water supply catchment above the base of the Lower Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p style="padding-left: 40px;">(ii) Protection of modified (not pristine) ecosystems</p> <p style="padding-left: 80px;">a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p style="padding-left: 40px;">(i) Primary contact water quality (where permitted)</p> <p style="padding-left: 40px;">(ii) Secondary contact water quality</p> <p style="padding-left: 40px;">(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p style="padding-left: 40px;">(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy but modified aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (where permitted) in aesthetically pleasing waters; and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>
<p>Surface Waters with their headwaters within Public Reserves which are in the following catchments</p> <p>Water Supply:</p> <p>Risdon Brook water supply catchment above the Reservoir</p> <p>Or</p> <p>Sandy Bay Rivulet water supply catchment above the base of the Lower Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p style="padding-left: 40px;">ii) Protection of modified (not pristine) ecosystems</p> <p style="padding-left: 80px;">a. from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p style="padding-left: 40px;">(i) Primary contact water quality (where permitted)</p> <p style="padding-left: 40px;">(ii) Secondary contact water quality</p> <p style="padding-left: 40px;">(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p style="padding-left: 40px;">(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy but modified aquatic ecosystem; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (where permitted) in aesthetically pleasing waters; and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>

Table 2: PEVs for the Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 33)
<p>Surface Waters flowing through Nature Recreation Areas, Conservation Areas or Regional Reserves which are in the following catchments</p> <p>Hobart Water Supply:</p> <p>Risdon Brook water supply catchment above the Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p style="padding-left: 40px;">(ii) Protection of modified (not pristine) ecosystem</p> <p style="padding-left: 80px;">a. from which edible fish maybe harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p style="padding-left: 40px;">(i) Primary contact water quality (where permitted)</p> <p style="padding-left: 40px;">(ii) Secondary contact water quality</p> <p style="padding-left: 40px;">(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p style="padding-left: 40px;">(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified, but healthy aquatic ecosystems; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (where permitted) in aesthetically pleasing waters and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>

Table 2: PEVs for the Hobart Water Catchments

Land Tenure	Protected Environmental Values ^(*see note on page 33)
<p>Surface Waters with their headwaters within Nature Recreation Areas, Conservation Areas or Regional Reserves which are in the following catchments</p> <p>Hobart Water Supply:</p> <p>Risdon Brook water supply catchment above the Reservoir</p>	<p>A: Protection of Aquatic Ecosystems</p> <p style="padding-left: 40px;">(ii) Protection of modified (not pristine) ecosystem</p> <p style="padding-left: 80px;">a. from which edible fish maybe harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p style="padding-left: 40px;">(i) Primary contact water quality (where permitted)</p> <p style="padding-left: 40px;">(ii) Secondary contact water quality</p> <p style="padding-left: 40px;">(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p style="padding-left: 40px;">(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified, but healthy aquatic ecosystems; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing (where permitted) in aesthetically pleasing waters and which is suitable as raw water for drinking water supply (subject to coarse screening plus disinfection).</p>

* **In general, diffuse source pollution can be managed to protect the PEVs by compliance with approved codes of practice, or by development and implementation of best practice environmental management guidelines where codes are not available.**

In general, point source pollution should be managed to protect the PEVs by implementation of best practice environmental management, and by compliance with emission limits set by the regulatory authority. This may also require the setting of a mixing zone by the Board of Environmental Management and Pollution Control.

For specific details refer to Part 4 of the State Policy on Water Quality Management, 1997.

5 WATER QUANTITY VALUES FOR THE DERWENT ESTUARY CATCHMENT

5.1 Overview

While water quality is a very important part of any water management regime, the issue of how much water a river or stream carries, and how that flow is managed, is of equal importance. Water quality and quantity are closely linked.

The State Government proposes to re-organise the way water flow in our rivers and streams is managed, and one of the key understandings is that there needs to be a specific allocation of water for the river or stream itself (Water Management Act 1999). This is necessary not only to protect the aquatic life of the river, but also to maintain basic "river health". If there is insufficient flow at crucial times of the year, the overall quality of the remaining water may be badly affected. This will very likely have a negative effect on human uses of the water, as well as on the environment.

In some instances there may be competing uses for the available resource, and there may need to be trade-offs needed to ensure a balanced sharing arrangement between human uses and the needs of the river environment.

The allocation of water for the environment must be based on scientific information, and also on legitimate community values and uses.

We want you to tell us of any water values and uses that occur in your rivers and streams.

5.2 Water quantity values

Five broad categories of water quantity values have been identified, and as with

the water quality PEVs, it is likely that most rivers will attract more than one value/use category. The categories are:

- Ecosystem values;
- Physical landscape values.
- Consumptive and non-consumptive use values;
- Recreation values;
- Aesthetic landscape values;

From your input, specific water management objectives can be developed for your catchment, and incorporated into a regional or catchment-based water management plan.

In most cases, the government will weigh up the identified objectives with any available scientific data. Additional data may need to be obtained, and economic analyses done to determine what impact attempting to protect all the identified values may have. It is possible that, in some cases, there may simply not be enough water to go around, and a trade-off in values may then be necessary.

An explanation of the water quantity value categories and examples of specific values are given below:

Ecosystem values: The term is used to identify those values which are to be protected and / or enhanced in the current state of aquatic and adjacent land ecosystems. Specific water values associated with the ecosystem value category may be:

- protection of an endangered species (plant or animal);

- protection or improvement in native fish populations;
- protection of riverine vegetation;
- provision of adequate water for stream habitat for flora and fauna;
- provision of water for wetland and/or estuary ecosystems.

Physical Landscape values: These values are closely related to the physical nature of the catchment. This includes the nature and constitution of channels, the frequency of floods and droughts, soil and rock types, and vegetation coverage. These values are also closely associated with ecosystem function, and may overlap with the protection of ecosystem values. Specific water values associated with physical landscape values may include:

- provision of variable flows;
- prevention of artificial erosion whilst maintaining where appropriate natural processes of erosion and deposition;
- protection or improvement of riparian zone.

Consumptive and non-consumptive use values: These are related to the current and potential human uses of water bodies. Consumptive use refers to the extraction of water from the water body, with no return of it to the waterbody. Examples may include:

- provision of water for irrigation;
- provision of water for town supply;
- provision of water for industry.

Non-consumptive use refers to extraction or use of water, where the water is eventually returned to the river. Examples may include:

- use of water for hydro-electricity generation;
- use of water for fish farming.

Recreational values: These include the range of direct human uses of water bodies for purposes such as kayaking, canoeing, sailing, swimming, fishing etc. This type of value is difficult to quantify, but is an essential part of our way of life in Tasmania. Water quality issues are also important, especially where primary contact occurs (swimming for example), or where the recreational activity relies on a base of good quality water, such as a recreational fishery. Examples may include:

- maintenance or improvement of the quantity (and quality) of water for recreational fishery (trout, blackfish etc);
- provision of sufficient water for whitewater rafting;
- provision of sufficient water (of adequate quality) for swimming.

Aesthetic Landscape values: These values relate to human appreciation of water and adjacent environments. It is often extremely difficult to address these types of values, or work out the flow requirements to ensure their protection. They are, however, legitimate values which must be acknowledged in any good management process. Examples may include:

- maintenance or improvement of flow through gorges or over waterfalls;
- protection of scenic features in a river.

6. Community Water Values for Derwent Estuary Surface Waters

The following Community Water Values for the Derwent Estuary Catchment were collected during the community consultation process [Derwent Stakeholder Workshops (26/2/2001, 28/2/2001, 1/3/2001) and public workshops (26/3/2001, 28/3/2001, 29/3/2001)]. These values will be valuable in future natural resource management planning, water management planning and in determining appropriate Water Quality Objectives for the region.

Value category	Community Water Values
Consumptive/ Non Consumptive	<ul style="list-style-type: none"> • Maintain drinking water storages and drinking water catchments for the good quality water they provide to the community (Mount Rumney Private Water Scheme- distributing drinking water from water supplied by Hobart Water via Clarence Council). • The Flagstaff Gully catchment is no longer used for water collection and therefore raw water for drinking water PEV may not be required. • Maintenance of Illa Brook (tributary of the Lachlan River) Water supply for 10% of New Norfolk Town Water. • Maintain quality of water to allow homestead use of water on Sorell Creek and Lachlan River and for the Chalet on and the Springs on Mount Wellington. • Water is taken from Lenah Valley Road on New Town Rivulet for drinking purposes. • Maintain water quality and flow at a level that is suitable for irrigation on New Town Rivulet. • Maintain water quality and flow in streams between Mornington and Rokeby for market garden watering. • Maintain flows to allow irrigation offtakes and stock watering from Lachlan River, Sorell Creek, Count Creek and Derwent River. • Maintain sufficient flows in Lachlan River and Sorell Creek to allow for fire fighting. • Maintain industry water offtakes -Cascade Brewery (from Hobart Rivulet); Tannery (water taken where Strickland Avenue crosses the Hobart Rivulet).
Recreational/ Aesthetic	<ul style="list-style-type: none"> • Recreational Value to local community of streams: • Children paddling in streams throughout the system (Waynes Rivulet) • Children full body immersion in water (Humphrey's Rivulet near Dominic College and Hobart Rivulet near Cascade Gardens). • Canoeing (Jordon River) • Maintenance of water quality that is suitable for swimming (New Town Rivulet – where Lenah Valley Road crosses the Rivulet and above Lady Franklin Gallery) • Maintain recreational fishing: New Town Bay, Hobart Rivulet (Trout), Lachlan River, Glen Dhu River, Sorell Creek, New Town Rivulet (Native Trout), Jordon River (Bream). • Maintain recreational value of bird watching throughout the catchment particularly for sea eagles. • Maintain recreational value of Risdon Brook dam maintained - Model boat sailing, fishing for disabled people, Picnic area. • Maintain the varied values of Sorell Creek for: Waterwatch education, environmental education for school students, children playing and paddling. • Maintain recreational values and aesthetic values of Waterworks

Value category	Community Water Values
	<p>Reserve and Tolosa Reserve maintained.</p> <ul style="list-style-type: none"> • Maintenance of native vegetation and ability to walk or cycle along stream edges (particularly Hobart Rivulet, Waterworks and the linear park alongside New Town Rivulet) as these areas are regarded more highly. • Maintain ability for dog walking alongside rivulets. • Maintenance of walking trails along Bedlams and Alums Cliffs. • Maintain aesthetic value of Kangaroo Rivulet maintained as a backdrop to the golf course, the newly formed wetland will improve the areas aesthetics. • Maintain aesthetic value of Gielston Creek. • Maintenance of aesthetic beauty of streams for artists. • Maintain value aesthetics of areas free of stormwater pipes as they degrade the aesthetics especially when pipes protrude from banks. • Maintain areas free of general litter and rubbish including shopping trolleys and car bodies. • Maintain areas free of turbidity particularly where excavation works occur for flood mitigation on Hobart Rivulet.
<p>Ecosystem / Basic River Health</p>	<ul style="list-style-type: none"> • Maintain areas of native vegetation for its value as shade, aesthetics and bank maintenance, particularly with respect to Clarence Plains. • Maintain catchment vegetation to prevent landslips which can have large impacts on streams. • Maintain areas of streams that are still in their natural state. • Maintain areas free of blackberries, cracked willows, cumbungi (bull rush), fennel and other weeds. • Maintain bank/riparian vegetation and areas where bank erosion is not evident. • Water Quality to support healthy riparian vegetation as vegetation provides organic debris, sediment trapping, shade and a buffering role. • Maintain wetlands for their value at purifying and cleaning water. • Maintain streams at a quality that will reduce the likelihood of algal blooms. • Maintain the value of Humphrey’s Rivulet by keeping it free of litter, blackberries and willows and maintaining areas of native vegetation as this will sustain tadpole, frog, duck, cockatoos, green and red parrots and heron populations. • Maintain natural debris in streams and prevent clean ups as decaying logs etc offer habitat values to smaller species. • Keep streams free of litter and choking vegetation to maintain the flood mitigation value of the streams. • Maintain low sediment loads in streams particularly in the upper reaches of the estuary. • Maintenance of environmental flows in streams as streams with flow are more highly regarded. • Maintain or increase environmental flows in streams and rivulets. • Releases of water from dams to create flow are highly valued. • Maintain healthy and self sustaining platypie populations in New Town Rivulet, near Cascade Brewery on Hobart Rivulet, Tynwall Park near New Norfolk, Lachlan River and the Jordon River and its tributaries. • Maintain healthy fish populations throughout the system. • Maintaining a healthy Bream ecosystem on the Jordon. • Maintenance of healthy salmon populations.

Value category	Community Water Values
	<ul style="list-style-type: none"> • Maintain healthy trout ecosystem at Granton, Old Beach, Windermere Bay. • Maintenance of healthy fish populations in New Town Bay. • Maintenance of oyster populations in Lindisfarne Bay and Cornelian Bay. • Maintenance of healthy stream habitat for the growth of tadpoles particularly in streams on the eastern side of the Derwent. • Maintain healthy streams to sustain frog populations. • Maintenance of an ecosystem that will support eels, particularly in Gielston Creek, New Town Rivulet and Rushy Lagoon however they occur throughout the entire system. • Maintain health and flow in lower reaches of waterways as they are areas of trout spawning. • Maintain a healthy and self sustaining macroinvertebrate community. • Maintenance of habitat for rare bird species. • Maintain all bird populations including white egret, merrametic and swans, ducks, pelicans and geese at New Norfolk. • Maintain trout populations in New Town and Hobart Rivulet's by maintaining good quality water and sufficient flow. • Maintain healthy galaxiid populations in New Town Rivulet, Sandy Bay Rivulet and Waynes Rivulet. • Maintain water quality at a level suitable for the maintenance of crayfish populations in New Town Rivulet, Sandy Bay Rivulet and Waynes Rivulet. • Maintain areas free of septic systems which could discharge to creeks or water storages. • Maintenance of rivers and streams to prevent illegal rubbish dumping. • Maintain high quality sewage discharges to maintain stream water quality and biodiversity.

Value category	Community Water Values
Other Issues	<ul style="list-style-type: none"> • Educational value of streams for the community. • Value the streams for what they are and their links with history. • Historic value of Hobart Rivulet flood walls should be maintained. • Maintain the historic value of items of cultural significance associated with waterways such as bridges, weirs, mills and the old sandstone walls in Hobart Rivulet. • Maintenance of historical value of penal settlements that occur around rivulets. • Maintain aboriginal middens associated with water bodies at Rokeby Beach, Bedlam Walls, Domain Foreshores and New Town Bay Foreshore. • Maintain the streams and rivers for their stormwater carrying capacity and for flood prevention. • Value areas where a higher quality of stormwater is discharged to streams. • Maintain boulder and trash racks in streams as they prevent property damage during floods. • Concern about the aesthetic impacts of the debris/trash racks used for flood prevention. • Maintain graffiti free areas in streams, particularly graffiti on rocks. • Protect the native vegetation and develop more linear parks. • Protect rivulets and streams from being built over or modified during the construction of new developments. • Value water courses being called Rivulets instead of creeks. • Maintain tips in order to reduce runoff impacts on water quality. • Maintain and improve stream banks and maintain skyline reserve areas within the catchment.