

12.12 Hydro Generation Special Zone

12.12.1 Resources & Activities

i Lake Hawea

The majority of Lake Hawea adjoins rural environment except at the southern end where it adjoins Lake Hawea Township. While the majority of hydro generation activities are concentrated on the dam structures the management of Lake Hawea foreshore is integral to the efficient operation of the facility. Weed, sediment, erosion and flood control are an important part of hydro generation activities at Hawea.

Hawea Control Structure

This is a control facility at the outflow of Lake Hawea to the Hawea River. It consists of an earth embankment dam that averages 30 m in height and totals 390 m in length. The dam has a culvert gate structure that controls flows to the Hawea River. The structure regulates water availability and storage for the existing power stations of Clyde and Roxburgh downstream of the lake and possible future schemes on the Clutha River, both within and outside of the District. It also has the capability of being used for electricity generation.

Gladstone Gap Control Structure and Emergency Spill Way

This area incorporates a cofferdam or embankment structure and associated land which in an emergency situation would act as a spillway for Lake Hawea. Should the lake ever reach the Probable Maximum Flood level of 350.4 m (one metre below the crest of the Hawea dam) the embankment would be overtopped and breached. In such a hypothetical situation, which would arise only during the most extreme possible flood event, the spilled water would extend southward across low lying land in the Hawea Flat before joining the Hawea River.

ii Luggate Hydro Development

The area includes land that would be required for the proposed Luggate Dam and power station in addition to land for construction activities including borrow areas, roading and water supply. The area also incorporates land that would be inundated to form the reservoir Lake Luggate with associated lake margins. The maximum operating level of the lake permitted by existing Regional Council resource consents at the date of notification of this Plan is

271 m. This operating level reflects the requirement to preserve Lake Wanaka as established by the Lake Wanaka Preservation Act 1973.

iii Wye Creek Hydro Scheme

The Wye Creek Hydro scheme is located adjacent to State Highway 6, 13 km south of Frankton.

The scheme has no storage, being a run of the river type. Water is collected from small intakes on the north and south branches of Wye Creek which feed 1350m of pipeline varying from 450mm to 600mm in diameter, which in turn supply a small power house downstream of the State Highway 6 road bridge. The scheme was upgraded in 1991 with the addition of a generator, turbine, renewal of penstocks, and foundations and exterior cladding of the powerhouse.

The Wye Creek scheme has a peak generation output of approximately 1.5 megawatts and an average energy production 10 Gigawatt hours.

iv Oxburn Hydro Scheme

The Oxburn Hydro scheme is located on the true right bank of the Oxburn Creek upstream of the access to the Rees River Valley.

The scheme was established in 1969 as a local supply for the Glenorchy area. The scheme consists of a concrete gravity dam, 14m in height, with a 470 metre long, 700mm diameter steel pipeline to the powerhouse. As a result of flooding in 1994 a concrete wall was constructed around the powerhouse to help protect the building from flooding.

The Oxburn scheme has a generation output of approximately 500 kilowatts with an average annual energy production of 2 Gigawatt hours.

v Roaring Meg Hydro Scheme

The Roaring Meg Hydro scheme is located adjacent to the Roaring Meg Creek in the Kawarau Gorge.

The scheme was originally commissioned in 1936 and is made up of an upper and lower station. The intake dam is located 3.6km upstream of the confluence with the Kawarau River. The 10 metre high intake dam feeds a series of pipelines terminating at the stations, which each house two turbines.

The lower station discharges directly into the Kawarau River while the upper station discharges both into a pipeline feeding the lower station and the Roaring Meg Stream.

The peak output from the scheme is approximately 4 Megawatts with an average annual energy production of 33 Gigawatt hours.

12.12.2 Resource Management Issues

Discussion of additional relevant issues is found in the following Parts of the District Plan:

District wide issues	Part 4
Rural Areas	Part 5

i Physical Resources that are to be Sustainably Managed

The above hydro generation activities have involved significant capital expenditure to develop and have a life expectancy spanning several decades. The developments also have associated roading, power lines and ancillary structures that are all required to be sustainably managed. These activities represent significant physical resources within the District, which provide essential contributions to the social and economic well-being of the District and nation. Rivers, lakes, canals and wetlands associated with or adjoining power generation activities provide important recreation and wildlife resources.

ii Recognition of Existing Activities

In order to ensure the continued use and development of these valuable resources, the Plan needs to recognise their existence and provide opportunities for their continued operation, refurbishment, enhancement and upgrading. The continued use of existing facilities is not considered to give rise to any significant resource management issues.

iii Management of Adverse Environmental Effects

Increase in scale of existing facilities and new developments have the potential for adverse effects on the environment. The localities of Hawea and Luggate have high landscape values and development has the potential to impact on those values. The effects of hydro generation activities tend to be concentrated on the dam structures. These include visual effects of dam

structures and buildings and the impact of noise, lighting and vehicle activity on amenity values. Health and safety considerations are also important within some instances the need to restrict public access. In addition to the effects associated with the actual dam associated land inundation can impact on flora, fauna and wildlife values. The construction phase of hydro development is also acknowledged as having potential for significant effects, however, due to the temporary nature of these effects they can be addressed by requirements to mitigate and undertake remedial work.

iv Unavoidable Effects

Some hydro developments generate effects that are unavoidable and may not be adequately remedied or mitigated in physical terms. Such effects can be offset or compensated for through the use of financial contributions as outlined below.

12.12.3 Objectives & Policies

Objective 1 – Efficient Use of Established Facilities

The efficient operation, maintenance, refurbishment, and enhancement of established hydro generation facilities.

Policies

- 1.1 *To provide for the integrated operation of Hawea hydro activities, including Hawea dam, Gladstone Gap control structure and emergency spill way and the foreshore of Lake Hawea.*
- 1.2 *To recognise the importance of activities such as weed, sediment, erosion and flood control on the day to day operations of hydro generation facilities.*
- 1.3 *To provide for activities associated with existing small river based schemes by recognising that these schemes consist of a number of components including river weirs, intakes, pipelines and power houses.*

Implementation Methods

The objectives and associated policies will be implemented through:

- (i) **District Plan**

- (a) Rules to ensure adverse effects of activities are avoided, remedied or mitigated.

(ii) Other Methods

- (a) Lake Hawea Crown operating easement agreement.

Explanation & Principal Reasons for Adoption

Established hydro generation facilities within the District provide valuable benefits to the community, have involved high capital cost to establish, and have a long life expectancy. These facilities were provided for through the designation process under previous planning legislation. However, with the introduction of the Resource Management Act 1991, the designation process is no longer available to hydro generation operators and existing and future facilities are subject to Plan provisions.

Provision for the continued operation and maintenance, refurbishment, enhancement of existing facilities is integral to their ongoing viability. At Hawea day to day operations include the management of the Lake foreshore. The Plan seeks to provide for the integrated operation of activities by including the foreshore within the zone. This is consistent with the operating easement agreement that Contract Energy has with the Crown.

Objective 2 – Adverse Environmental Effects

To provide for the upgrade of existing hydro generation facilities and the establishment of new hydro generation activities within the Hydro Generation Special Zone where the actual and potential effects on the environment can be avoided, remedied or mitigated.

Policies

- 2.1 *To assess the impact of land inundation on flora, fauna, wildlife and landscape values.*
- 2.2 *To minimise the visual effects of physical works in particular dam structures, buildings and earthworks, on landscape values and the amenity of surrounding sites.*
- 2.3 *To ensure noise, glare and vehicle activity associated with hydro generation facilities does not adversely impact on amenity values.*

- 2.4 *To promote awareness of health and safety issues, and restrict public access in and around dam facilities where people’s safety is at risk.*
- 2.5 *To require construction related effects including noise, traffic and earthworks to be managed and where appropriate remedial works to be undertaken.*

Implementation Methods

The objectives and associated policies will be implemented through:

(i) District Plan

- (a) Rules to ensure adverse effects of activities are avoided, remedied or mitigated.

Explanation & Principal Reasons for Adoption

The Council recognises that changing technology and markets may mean there is a demand to upgrade or establish new hydro generation activities in the future within the special zone at Hawea and Luggate. The potential for small, river based hydro schemes to be upgraded as new technologies become available is also recognised. Development will need to be carefully assessed to determine the environmental effects. To achieve this, Council will require a discretionary activity resource consent to assess all of the adverse effects that may be associated with any new facility or activity.

Objective 3 – Effects not able to be adequately avoided or remedied

Where hydro development generates adverse environmental effects and other effects (such as demand on infrastructure) which cannot be adequately avoided, remedied or mitigated, to require financial contributions to attempt to offset these effects.

Policies

- 3.1 To ensure financial contributions on hydro developments are fair and reasonable by considering whether they are:
 - (a) Justifiable in that they directly relate to avoiding, remedying or mitigating adverse effects on the environment and/or contribute to a positive effect which provides some compensation or mitigation of an adverse effect on the environment caused by or likely to be caused by hydro generation activity, and shall be

- (b) Of a proportion that is fair and reasonable and takes into account:
- The significance of the adverse effect to be generated;
 - The extent to which the design of the hydro development (or associated subdivision) avoids, remedies or mitigates or compensates for the adverse effect;
 - Any negotiated private arrangements between the hydro developer and affected parties;
 - The extent to which another hydro developments (or associated subdivision) contributes to an adverse effect; and
 - The extent to which, on completion, the hydro development (or associated subdivision) provides amenities for the community.

Implementation Methods

The objective and associated policies will be implemented through:

(i) District Plan

- (a) Rules to ensure adverse effects of hydro development activities are avoided, remedied or mitigated.

Explanation and Principal Reason for Adoption

In considering a hydro development or activity there may be effects that are not possible to be physically avoided, remedied or mitigated, and/or offset in physical terms through project design and/or private agreement. In these circumstances, mitigation can sometimes be achieved by using a financial contribution that provides a positive effect in compensation for a negative effect on the environment and/or the community.

Financial contributions charged on any resource consent for hydro development (or associated subdivision) must be fair and reasonable. This is fundamental to any charge levied under this plan. This policy sets out matters that must be taken into account when assessing what a fair and reasonable contribution may be. It however is not exclusive.

The effects of some large-scale hydro development (or associated subdivision) are not easily quantifiable in dollar terms. Council would prefer that such effects are dealt with through the consultation phase of any large

scale development (or associated subdivision) with a view to achieving improved project design or other measures that can be taken to compensate for significant adverse effects. If this cannot be achieved, then a financial contribution may be charged as a condition of consent.

12.12.4 Extent of Hydro Generation Zone

The extent of the Hydro Generation Zone is shown on the planning maps. Legal descriptions of the Contact Energy land covered by the zone are included in an Appendix to the zone. The zone covers all of Contact Energy's existing activities meaning:

- (i) all of the land which is subject to the operating easement granted by the Crown; and
- (ii) land covered by Contact's core sites, which are the Hawea control structure and the Gladstone Gap control structure and emergency spill way; and
- (iii) land originally designated for the Luggate power project.

The zone also covers Pioneer Generation Limited's core sites which are located at Wye Creek, Oxburn and Roaring Meg.

12.12.5 Environmental Results Anticipated

- (a) The safe and efficient operation of existing facilities.
- (b) Foreshore management of Lake Hawea including weed, sediment, erosion and flood control.
- (c) The establishment and maintenance of jetties, wharves, landing places and slipways.
- (d) Dams, buildings, structures and earthworks integrated with the surrounding environment.
- (e) Levels of noise, glare and vehicle activity that is compatible with the amenity of the surrounding environment.
- (f) Secure facilities with the public excluded from areas where their safety would be at risk.
- (g) Temporary construction effects with remedial works undertaken within reasonable timeframes.