BEFORE ENVIRONMENT CANTERBURY

AND

THE ASHBURTON DISTRICT COUNCIL

IN THE MATTER	of the Resource Management Act 1991 ("the Act")
AND	
IN THE MATTER	of an application by Ashburton Community Water Trust (ACWT)
FOR	resource consents necessary to construct, maintain and operate an intake, diversion race, sluice channel, fish bypass channel, associated earthworks, vegetation removal and powerhouse as part of the Rakaia Hydro Scheme.

STATEMENT OF EVIDENCE OF DAVID COMPTON-MOEN ON BEHALF OF ASHBURTON COMMUNITY WATER TRUST

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1. QUALIFICATIONS AND EXPERIENCE

1.1. My name is David John Compton-Moen. I am a registered associate member of the New Zealand Institute of Landscape Architects. I hold bachelor degrees in landscape architecture (honours) and resource studies (planning) and I have worked in the landscape architecture and planning fields for approximately 11 years, here in New Zealand and in Hong Kong. I currently work for MWH (NZ) Ltd, based in their Christchurch office.

1.2. This evidence is an assessment of the landscape and visual effects likely to result from Ashburton Community Water Trust (ACWT) proposal to establish, operate and maintain a hydro-electricity generation scheme on the Rakaia River. A full description of the proposal is provided in the application document, and in the evidence of Mr Steve Woods, Project Engineer for MWH.

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2. STUDY AREA AND METHODOLOGY

2.1. The regional location of the study area is illustrated in Figure 1.1. Within this locality, downstream of the Rakaia Gorge bridge, the Rakaia River forms the broad, braided river bed that flows eastwards across the Canterbury Plains to Pegasus Bay. Together with other major braided rivers of Canterbury, including the Waimakariri and Rangitata, the sediment load of the Rakaia has contributed to the build up of the expansive and flat Canterbury Plains. The braided pattern of the Rakaia River figures prominently in the public awareness, representing the dominant formative factor of the Plains landscape.

2.2. In the west of the Plains, including the proposed development site, the river flows within a broad channel contained within a series of stepped terraces. As soil quality, depth and the availability of irrigation water permits, these terraces have been developed for arable farming, dryland sheep pasture, and more recently, dairying. The deposition of silts, sands and gravels in times of flood has been variable, with heavier, coarsely textured and less fertile loads being deposited closer to the course of the river. On these soils plantation forestry has been developed.

2.3. Landuse patterns on the plains are strongly rectilinear as evidenced from the patterns of field subdivision and shelter planting apparent in Figure 1.2. Rural roads generally follow the rectilinear pattern of farm subdivision, although strong diagonal roading patterns are also characteristic of the Plains. Across this rigid geometry of landuse and transportation networks, the Rakaia River asserts an erratic, natural pattern of braided streams and open gravels which change

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dramatically as river flows vary according to precipitation in the upper catchment.

2.4. The local, or site context, of this assessment is illustrated in Figure 1.2. The site is generally north east of the town of Methven in western Central Canterbury, immediately upstream of the Highbank Power Station on the true right bank of the river. The landscape and visual impact assessment (LVIA) covers the Rakaia River in the broadest sense, including channels, riverbed, flats, terraces and plains land within the receiving environment of the proposed scheme. The extent of the landscape unit studied is illustrated in Figure 1.2.

2.5. In 2007, the applicant commissioned a Landscape and Visual Impact Assessment. My report was released in November 2007 and is included with the further information provided by the applicant. That document contains a fuller description of the study area and methodology.

2.6. This evidence has also been prepared on the basis that the Electricity Ashburton Limited (EAL) scheme did not exist. Although not yet built, many of the structures relating to the first part of the ACWT proposal overlap with that granted to EAL. This means that at least in part, my assessment is conservative. To an extent a slightly smaller intake, settling pond and lower terrace canal might as an alternative be properly considered as a part of the existing environment. This is particularly relevant when assessing the impacts near the existing Highbank powerstation where the two schemes are largely the same with the ACWT scheme having a slightly wider (5-10m on the right bank) canal.

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3. RELEVANT STATUTORY DOCUMENTS

3.1. Relevant statutory documents referred to include the Resource Management Act 1991 ('the Act'), the Canterbury Regional Policy Statement (CRPS), the National Water Conservation Order (Rakaia River) 1988 (WCO), and the Ashburton District Council District Plan (District Plan). A fuller description of the relevant sections of these documents is contained within the application document, and in the planning evidence submitted.

3.2. The proposed works, being within the bed of a nationally and regionally significant river, require an assessment of natural character in terms of section 6(a) of the RMA. As the landscape impacted upon by the proposed development has not been identified as an outstanding natural landscape, s.6(b) does not apply. However, for the sake of completeness, and to verify the non-outstanding status of the landscape in this locality I have undertaken an analysis of landscape values.

3.3. With regard to section 7(c) of the Act, a consideration of amenity values may give rise to a second tier of valued landscapes, beneath outstanding natural landscapes identified in accordance with s.6(b) of the Act. These are termed *visual amenity landscapes* (VAL). I consider in my evidence whether the site can be considered a visual amenity landscape.

3.4. The District Plan, Appendix 10, identifies outstanding natural landscapes of the Ashburton District. While the upper Rakaia River valley is among those areas scheduled as outstanding, this status applies to the landscape above the Gorge

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Bridge. The schedule of significant landscapes does not include the lower Rakaia River, below the gorge. The lower Rakaia River is identified in Appendix 2 (Site 67 - Schedule of areas of significant nature conservation value) of the District Plan as a Site of Special Wildlife Interest (SSWI) and as containing Wetlands of Ecological and Representative Interest (WERI).

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4. THE EXISTING LANDSCAPE: ASSESSMENT & EVALUATION

4.1. My assessment of the existing landscape of the Rakaia River in the locality of the proposed development incorporates a descriptive phase and an evaluative phase. The descriptive phase – or landscape character assessment – provides an objective description of landscape character. Landscape character assessment focuses upon the aspects of landscape that makes one landscape different from another, rather than better or worse. A particular aspect of landscape character identified by the RMA as a matter of national importance is the natural character of rivers and their margins

4.2. The evaluative phase seeks to ascribe values to the landscape. While the focus of much landscape evaluation has been on aesthetic values or scenic quality, RMA case law has widened the scope of landscape values to admit a range of other values to the process of landscape evaluation. These values are commonly referred to as the *revised Pigeon Bay criteria*.

4.3. As noted above, a further category of values, defined in Section 7(c) of the RMA, are amenity values. They are those qualities or characteristics of a place that make it attractive to be in or to visit. In rural areas these may be understood as including:

- a sense of spaciousness (wide open spaces);
- privacy, quietness and absence of traffic and bustle;
- an environment relatively uncluttered by structures and artificial features;
- a clean environment, characterised by fresh air, clean water, etc.

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4.4. Where landscapes fall short of displaying exceptional or outstanding values in terms of the Pigeon Bay criteria, but are still held by the community and landscape professionals to be significant in terms of the provision of visual amenity, the classification *visual amenity landscape* may be used.

4.5. I will discuss the assessment and evaluation of the existing landscape from the following perspectives:

1. landscape character;
2. natural character;
3. landscape evaluation;
4. amenity values.

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5. LANDSCAPE CHARACTER ASSESSMENT

5.1. The landscape character assessment methodology draws upon the work of Tveit, Ode & Fry (2006)1. Tveit *et al* present a schema of nine, key visual concepts that are considered to represent the range of factors relevant to the assessment of visual landscape character, together with potential indicators. The definition of these concepts is contained in full detail in the Landscape and Visual Impact Assessment, in Appendix 4 of the Application Document.

5.2. While these concepts are applied to the descriptive assessment of landscape character, several of these factors are common to evaluations of visual quality, value and significance. Accordingly, they will be discussed further in my evidence.

Stewardship

5.3. The landscape exhibits varying degrees of stewardship, from the natural and unmanaged (river channels and riverbed) through to the rough, woody weed-dominant landscape of the river flat to the intensively managed landscape elements of the arable farmlands of the river terrace and primary terrace. Gravel beds within the river exposed for any length of time are colonised by weed species including broom, gorse, pine, willow and lupin, and a wide range of other exotic grasses and forbs. The result is a rough, disorderly landscape in the early stages of colonisation, and ever-changing according to the dynamics of the river. Above the river flat, on the river terrace, farm management has created an appealing landscape of pasture and arable fields separated by parallel shelterbelts of coniferous trees. Between the river terrace and primary terrace a

[1] Tveit, Ode & Fry (2006). Key Concepts in a Framework for Analysing Visual Landscape Character. *Landscape Research* Vol.31, No..3. pp 229-255

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steep escarpment of coarser pasture – and in places plantation forestry maintains a generally strong sense of stewardship within the landscape.

Coherence

5.4. The riverbed, adjacent terraces and their escarpments figure as a strongly patterned and highly coherent landscape, particularly when viewed from an elevated position. The active braids of the river channels are instantly recognisable and emblematic of the plains landscape, as are the rectilinear patterns of agricultural landuse on the intensively farmed terraces above the river flat.

Disturbance

5.5. Apart from the river channels and riverbed itself, the landscape has been transformed well beyond a natural landscape, but disturbances from a natural state are generally well managed and do not detract to any significant degree from the coherence of the overall river landscape. Localised structures, such as farm buildings, yards, fences, access tracks and the Highbank power station and its related infrastructure generally fit well within the landscape.

Historicity

5.6. Historic continuity and time layers are evident in the natural landscape features of river bed and adjacent river terraces, and stages in the transition of the river terraces from primary colonisation to agricultural development. Historical layers of cultural landscape elements such as landuse patterns and cultural artefacts associated with agriculture are largely absent. The Highbank power station is a significant industrial element of some historic significance, being constructed between 1939 and 1945.

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Visual Scale

5.7. The riverbed and terrace landscape is generally characterised by openness, grand scale and distant views. From within the riverbed, the main constraints to viewing are the farm shelterbelts of the river terrace, and the woody weeds on the river flat, and woody weeds such as willow growing on the escarpment between river flat and river terrace. The terrace escarpments and dense vegetation of willow and pine create strong containing elements, limiting views from the river channel and riverbed to the river terrace where the developments associated with the scheme are largely located. Views to the west include the foothills to the Southern Alps, including Mt Hutt. Views downstream are generally grand and extensive, as are views from the primary terrace across the river.

Imageability

5.8. The braided riverbed is widely recognised as an iconic or emblematic feature of the wider Canterbury landscape. Views of the wider river landscape from elevated positions are vivid and memorable for the scale of the landscape, the stepped terraces containing the riverbed, the patterns of braided channels and exposed gravel banks, and the seasonal drama of the river in flood.

Complexity

5.9. The riverbed and terrace landscape has sufficient diversity and richness to maintain viewer interest, yet not so much as to overwhelm the senses. Generally, elements in the landscape are readily perceived and resolve into coherent patterns. The natural, braided patterns of the riverbed contrast sharply with the strongly delineated terrace edges and rectilinear patterns of agricultural development on the terraces.

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Naturalness

5.10. The matter of the natural character of the river will be addressed in terms of principles accepted by the Environment Court in the following section. However, in terms of the factors and indicators referred to in Table 1, the naturalness of the locality derives largely from the wildness and dynamic character of the river itself, the related fluvial processes of erosion and deposition, and the fractal patterns of the river channels. The braided riverbed patterns are accentuated by contrasting the geometric, culturally-derived patterns of the agricultural landscape of the upper terraces. Built elements, such as farm buildings and structures are generally well screened by shelter plantings. The Highbank power station is a substantial structure but is not a conspicuous element given its location on the river terrace, and the scale of the landscape. A high voltage transmission line that traverses the terraces and spans the riverbed has a low order visual impact. Together, wild nature and cultural nature contribute to a moderate to high degree of naturalness.

Ephemera

5.11. Ephemeral or transient landscape characteristics derive from patterns of weather and atmospheric effects (e.g., dust storms emerging from the Rakaia Gorge), seasonal changes in river flow, and the presence of birdlife and fish in the river. Canterbury's infamous nor'-west winds brings the drama and beauty of north-west arch cloud patterns in the west, but such winds also sweep down braided riverbeds, whipping up dust storms and creating uncomfortable conditions for agricultural workers and river recreationists alike. North west storms and the spring snow melt also brings "freshes" and floods to the river, filling the channels and spilling out across exposed gravel banks to fill the bed in continuous floodwaters. The riverbed provides habitat to birdlife, including

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wrybill, black fronted tern, black billed gull and banded dotterel. From February to March, sea-run salmon migrating upstream to spawn in the headwaters of the river may be seen in the shallow, braided channels.

Natural Character

5.12. Section 6(a) of the Act requires that the **"***preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development*" be recognised and provided for as a matter of national importance. Natural character is a narrowly defined aspect of landscape character. It is generally understood to be determined by the extent to which the natural elements, patterns and processes occur in the landscape, and the extent to which they are modified by human interventions.

Natural elements of the receiving environment

5.13. The predominant natural elements within the receiving environment are the braided river bed and river, and the largely unmodified physical forms of the river terraces and terrace escarpments. The active riverbed appears unmodified by human interventions, and regular seasonal flooding and fluvial erosion and deposition processes maintain most of the bed in a highly natural state. The river itself has a sense of wildness about it. Agricultural patterns on the river flat and primary terrace detract from this wildness but contribute a degree of cultural nature. Above the primary escarpment, on the main plain, a high level of natural character is replaced by a strong rural character.

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5.14. Overall, the effects of agricultural development on the river flats and the industrial development of the Highbank power station are minor in relation to the scale of the river landscape.

Natural patterns of the receiving environment

5.15. Within the active area of the river bed, subject to normal river flows, natural braided patterns remain and are refreshed with each flood event. Natural patterns of colonising plant communities, albeit largely with exotic woody weeds, are apparent on the river flat and lower escarpment. Pockets of native vegetation exist, predominantly a Kowhai-shrubland mix, along parts of the primary escarpment between CH8500-11500 along with large areas of bracken, gorse and broom. In other areas on the primary escarpment and on the upper terraces and escarpments of the river, natural vegetation patterns have been replaced with managed pastures, arable fields and woodlots.

Natural processes of the receiving environment

5.16. Natural process of fluvial transport, including 'freshes' and floods are unimpeded within the main channels of the river and across the stony riverbed and river flat. Colonisation by exotic weeds has effectively suppressed and replaced native plants on the river flat. On the higher terraces above the river flat, agricultural production patterns dominate, with managed grasslands, shelterbelts and forestry woodlots replacing indigenous vegetation, and linear and rectilinear patterns predominate. Remnants of the original native vegetation exist on the river flat and primary escarpment between CH8500-11500 with a number of kowhai trees present. However, due to grazing their ability to regenerate is limited.

Summary of natural character

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5.17. The quality of natural character varies within the study area. A sense of wildness and a high degree of naturalness prevails within the area of the riverbed occupied by the main river channels where there are few human elements and natural elements, patterns and processes are highly visible. On this basis the natural character of the riverbed is assessed as being 'high'.

5.18. The river flat, areas of the riverbed which are vegetated immediately adjacent to the active river bed but with an elevation less than 2m above the active riverbed, still exhibit a large number of natural elements, patterns and processes. Plant communities present are predominantly exotic weed species with occasional native specimens. In most locations within the river flat, except at the edges, vegetation screens views of the water reducing its perceived naturalness. On this basis I have assessed the natural character of the riverflat as being 'moderate-high'.

5.19. In most locations the upper river terrace (CH0-3500m) is separated from the river flat by a well vegetated escarpment, predominantly covered with willows, pines or gorse as well as the occasional *Cordyline australis* or *Phormium tenax,* which contribute to a degree of naturalness. However, on the terrace wildness and naturalness diminish where agricultural development predominates, characterised by open, linear paddocks separated by pine shelter belts. Native plant communities have all but been replaced by exotic species. Human elements are much more prevalent on the terrace with a number of farm buildings and associated structures, linear shelter belts of exotic trees, farm tracks and fences as well as the Highbank power station and associated infrastructure which all influence the level of natural character which is

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experienced. On this basis I have assessed the natural character of the upper river terrace as being ‘moderate’.

5.20. The lower river terrace (CH5100-11000), the area is characterised by low-key agricultural development. The edge of the terrace is defined by an irregular edge which in places is immediately adjacent to the active river bed. The paddocks are generally larger, and less well defined than the paddocks on the upper terrace. Human elements are also less visible with few buildings with the exception of the area immediately adjacent to Lowe’s cutting. Ground cover is predominantly pasture grasses but large areas of exotic weeds such as gorse are present, notably on the edges of the paddocks. Remnant stands of heavily weathered *Sophora microphylla* are present, especially in the area between CH8000 to 11000, contributing to the natural character and highlighting what the original vegetation cover may have been like. On this basis I have assessed the natural character of the lower river terrace as being ‘moderate-high’.

5.21. The primary escarpment runs the entire length of the alignment, separating the river corridor with the primary terrace (Canterbury Plains). The escarpment is in its natural state with few modifications evident and signs of natural erosion processes clearly visible, notably at the top of the escarpment where is it most steep. Vegetation cover varies along the alignment with areas of pine plantation, wilding pines, gorse, broom as well as pockets of native Kowhai shrubland communities. Regeneration is occurring on the escarpment with successional processes evident. On this basis I have assessed the natural character of the lower river terrace as being ‘high’.

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5.22. On the primary terrace, the natural character of the river corridor is replaced by the rural character of agricultural development. Natural elements, patterns and processes are limited due agricultural landuse practices.

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6. LANDSCAPE EVALUATION

Significance of the Landscape

6.1. To determine the significance of a landscape or landscape feature, the accepted approach is to use the criteria identified in *Wakatipu Environmental Society Inc & Ors v QLDC* [2000] NZRMA 59).

Natural science factors (inc. 'expressiveness'):

6.2. A key natural science value is the river bed and adjacent terraces, being significant expressions of active fluvial processes. The braided channels of the active riverbed have particular value, providing a dynamic illustration of the erosion, transport and depositional processes in operation. A further physical value of the river is its role in recharging fresh water aquifers of the Canterbury Plains.

6.3. Biological values within the river mainly derive from bird habitat and the presence of certain species of threatened indigenous birds, including the wrybill plover, banded dotterel, black billed gull (tara puka) and South Island pied oystercatcher (torea), and black fronted tern. The introduced salmon fishery is of significant recreational value. Within the riverbed and on the lower terraces, indigenous ecosystems have largely been replaced by exotic pasture, coniferous plantations and adventive weed species with isolated remnants remaining. Overall, natural science factors are high.

6.4. Expressiveness as defined in the context of the Pigeon Bay criteria refers to the extent to which the landscape's formative processes are evident to the viewer. In the case of the Rakaia River, the formative processes can be seen in

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operation still, especially in times of flood. The river's actions in depositing sediments and eroding river bank margins are ongoing, and while for the most part the processes operate in a subtle manner, flood events can bring significant changes over a relatively short time frame. The results of fluvial processes over geological time are evident in the river terraces, the faces of which reveal the history of sedimentation, written in layers of silts, sand and gravels. The expressive value of the river landscape is high, but this is essentially an aspect of the high level of natural science values associated with the river.

Aesthetic values:

6.5. The very presence of water within the riverbed and the wildness of the river contribute to a high degree of aesthetic value. This is reinforced by the coherence of the landscape, and the emblematic and widely recognised braided patterns of the channels. Below the Rakaia Gorge Bridge the river lacks the drama, wildness and mountainous landscape setting that characterises the catchment above the bridge. However, I consider the aesthetic values of the river within the study area to be high.

Transient values:

6.6. The most obvious transient value is associated with sometimes dramatic changes in flows originating from extreme weather events in the headwaters, or seasonal snow melt. Occasional rare birdlife, migrating salmon, and atmospheric effects associated with nor'-west winds are typical of other transient values. Recreational activities, such as kayaking and jet-boating also add interest to the landscape of the river.

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Value to tangata whenua:

6.7. No sites of significance to Tangata whenua have been identified.

Historical associations:

6.8. No significant historical associations have been identified within the landscape area.

Whether the values are shared and recognised:

6.9. The Rakaia River and the landscape through which it flows, as with other major braided Canterbury rivers such as the Waimakariri and Rangitata, are held in high regard by Canterbury communities.

Evaluation of the Rakaia River landscape, vicinity of the receiving environment

6.10. Where the aggregate of all values for a particular landscape or landscape feature is deemed to be significant relative to other regional landscapes, the landscape or landscape feature at issue may be regarded as an Outstanding Natural Landscape under Section 6(b) of the RMA. Past landscape assessments of the Canterbury Plains (including the lower Rakaia River) referenced in the Ashburton District plan have not identified the river east of the Rakaia Gorge as being an Outstanding Natural Landscape, nor does the District Plan identify it as a Significant Landscape. Be that as it may, the landscape of the locality of the receiving environment can still be regarded as being of very high value, perhaps even magnificent, without being Outstanding or Significant, as these terms are used in the context of the Ashburton District Plan.

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Landscape Amenity

6.11. In respect of landscape amenity (a sense of spaciousness (wide open spaces); privacy, quietness and absence of traffic and bustle; an environment relatively uncluttered by structures and artificial features; a clean environment, characterised by fresh air, clean water, etc), the site clearly has a very high degree of amenity value. The Ashburton District Plan refers to the recreational values of the river as being outstanding, and it is reasonable to include such values (associated with activities such as fishing, jet boating, and bird watching) as being aspects of the overall amenity value of the locality.

6.12. The waters of the river afford a high degree of amenity derived from the ever-changing dynamics, patterns and moods of the water's flow. Water as a landscape element is a consistent and reliable indicator of landscape amenity and landscape preference, and the particular characteristics of the river in this locality rate highly in amenity value for passive viewing and reflection, as well as more active recreational activities. Walking, fishing, kayaking and jet boating all draw upon the amenity values of the river landscape as a basis for recreational satisfaction.

6.13. Accordingly, while not identified in the District plan as either an Outstanding Natural Landscape or a Significant Landscape, in terms of the tripartite division of landscapes established by the Environment Court, in my opinion the Rakaia River landscape within this locality may be regarded as a visual amenity landscape of some value.

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7. EFFECTS OF THE PROPOSAL ON LANDSCAPE CHARACTER, NATURAL CHARACTER AND LANDSCAPE VALUES

Location of and nature of impacts

7.1. For the purpose of assessing effects on landscape character, natural character and landscape values, I have broken the project down into its component elements, and have identified the likely impacts on natural character and landscape values.

7.2. Again, I note that this has been completed on the basis that the EAL scheme did not exist. In reality some features of the ACWT scheme have already been consented to EAL – but by undertaking my analysis in the way I have, I have ensured that *all* landscape effects of the ACWT scheme have been assessed.

Intake structure

7.3. The intake structures are located at the western end of the proposal where the Rakaia River sharply turns to the north for a short distance as a result of the river terrace. The structures would be built into the embankment and would require the removal of some trees, mostly pines, with some indigenous species likely to be effected also. However, tree loss would be minimal with the intake structure only occupying a small section of the embankment. The structure would appear out of character during construction but with planting and due to its low profile being tucked in against the embankment the impact on the landscape character would be less than minor, especially given the scale of the structure when viewed as part of the overall landscape.

Intake Storage Pond

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7.4. The intake storage pond would be formed to allow sediment to settle out of the water before moving into the Highbank canal. The pond stretches across three gently undulating grazed paddocks and again would result in the loss of a considerable number of trees from shelter belts. However, *Macracarpa and Pinus radiata* are extremely common exotic speices and with care during construction the loss could be kept to a minimum with no noticeable impact on landscape or natural character. The large expanse of water would contrast with the adjoining agricultural land but would be close enough to the river corridor to be viewed as part of this system.

Sediment Disposal Area

7.5. The proposed sediment disposal area is located within the river bed, directly to the north of the intake storage area. Sediment would be removed from the intake storage pond on an annual basis and deposited on the river bed. The area proposed is approximately 75ha in size, but the useable area would be less due to vegetation which has since become established within the river bed. The project engineers have calculated that the average depth of sediment across the disposal area would be 330mm (with a maximum depth of approximately 700mm). This material would be distributed downstream by annual freshes and storm events and the riverbed naturally re-contouring as the river changes form, minimising any impact on landscape or natural character.

Fish bypass channel to active braid

7.6. The fish bypass channel would follow the line of the sluice channel across the river terrace then follow a dry river channel through the river flat to the river bed, to connect with an active river channel. While the schematic diagram shows the fish bypass following a naturalistic line of an abandoned river braid through the

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river flat, the line it would take across the riverbed to an active channel has not been determined. Nor has the form of the channel itself. It is assumed the fish bypass would need to function continuously. An indicative example of a fish bypass channel is shown in the attached photos, being the existing fish bypass channel at the end of the Highbank tailrace.

Canal on River Terrace (First Portion – CH0-2750) and Drop Structures

7.7. The main canal and drop structures would follow a line parallel to the edge of the river terrace, some 20 m in from the edge of the escarpment. The proposed canal is a combination of fill and cut embankments directing water down to the Highbank Power Station tailrace with the embankment rising to approximately 7.5m above the river terrace at its highest point. The outer slopes of the embankments would be grassed. There are two drop structures located along the alignment which would consist of two penstocks approximately 3m in diameter and associated buildings. The buildings would be similar to farm sheds in appearance with the exception of the buildings to house the turbines which would be approximately 10m in height. However, at these locations the canal embankments would be 7.5m in height, lessening the overall visual mass of the buildings. I recommend that colour schemes are proposed to assist with their assimilation into the landscape.

7.8. In terms of the impact on landscape character and natural character, the linear nature of the canal would not contrast with the linear patterns of agricultural practices and shelter belts. The canal would break the line of the shelter belts but to a small degree where the character of the managed agricultural landscape would not be dramatically changed. From most vantage points, the canal would be viewed in context with the braided river and therefore the canal

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water would appear to be a continuation of the natural braided river system. Dependant on materials and colour, proposed buildings would appear as farm buildings, consistent with the character of the river terrace.

Tailrace and Gated Flow Control Structure

7.9. The tailrace for the scheme would combine with the Highbank Power Station formed tailrace. This tailrace runs within a straight, formed canal for a distance of some 200m before assuming an unformed character prior to re-entering a braid of the Rakaia River. The tailrace for the proposed scheme would feed into the existing tailrace a short distance below the Highbank Power Station. To accommodate the extra volume of water the channel would be widened on the true right bank, by up to 30m of the tailrace. A section of the existing tailrace would be infilled and the existing fish screen used as an overflow channel. A new gated flow control structure approximately 30m would be created. Some trees that are part of a managed pine plantation would need to be removed to accommodate the changes to the canal but I consider the impact on landscape character, natural character and landscape values to be insignificant, as this section of the tailrace and adjacent landscape has already been subject to a degree of cultural modification.

Canal on River Flat (Second portion CH3500m – 11500m)

7.10. The canal would generally follow the toe of the escarpment for this section, rising to a maximum fill embankment height of 35m before it crosses the top edge of the escarpment and becomes a cutting. Between CH4250 to 5250m, slope cutting is required to avoid the canal being on the active river bed. Minimal riparian vegetation would be lost as the flat is generally used for grazing with exotic pine plantations located on the escarpment slopes. There would be a

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loss of native vegetation, including species such as *Sophora microphylla*, *Kunzea ericoides 'Canterbury Plains'* (3 specimens approximately 4-5m in height) and *Melicytis flexiuous* (a full list is contained within the Ecologist's report) along the escarpment, especially as the canal moves up the escarpment. I consider this loss to be moderate and unavoidable in most instances but could be mitigated with suitable planting.

7.11. In terms of landscape character, the scale of the project is in keeping with the character of the surrounding landscape with open expansive views and large scale elements. However, the linear nature of canal would contrast with the slightly irregular and natural form of the primary escarpment and therefore have a significant impact on the natural character of the river corridor by placing human elements in a largely natural environment. This is particularly so where the canal transitions from a fill embankment to a cutting at CH11500m. This would change the unbroken terrace edge by imposing a break in the existing ridge, thereby reducing the visual containment of the river corridor in this location. However, with extensive native plantings along the canal embankment, it would be possible over time reduce the impact on landscape and natural character to give the appearance of a natural gully when viewed from a distance. The reintroduction of native species proposed in the mitigation measures which were removed as a result of the construction works would more than offset the loss of the vegetation. Overall, I consider with the implementation and management of the mitigation measures, the residual effect on landscape and natural character would be minor.

Slope Cutting (CH4250m – 5250m)

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7.12. To avoid the canal entering an area of active river bed it is necessary for a 1km stretch of escarpment to be cut back, with the fill material used to form the canal embankments between CH5000 and 11500. The height of the cuttings would be approximately 60-80m and a number of plantation pine trees would be lost. A drainage channel would be constructed along the top edge of the slope with mid slope berms every 10-15 metres.

7.13. In terms of landscape and natural character, the slope unmitigated would contrast with the adjoining natural escarpment due to its loss of vegetation and its regular, uniform profile. The potential construction of intermediate berms on the slope would add to this contrast. I consider that with allowing vegetation, including weed species, to establish on the slope, as detailed below in the Mitigation Measures, it would be possible reduce this impact over time to minor in effect.

Canal and Headpond Storage above Primary Escarpment (CH11500m – 14000m)

7.14. At CH11500m the canal would cross the top edge of the escarpment, changing from a fill embankment to a 25m deep cutting into the primary terrace. The depth of the canal would gradually reduce as it flows down to the headpond. This portion of the canal would cross agricultural land and would require the removal of sections of shelter belts. However, I consider this loss to be negligible and the linear nature of the canal would not contrast with the character of the rectilinear agricultural fields. Any effects on landscape or natural character for this portion would be minor.

Penstocks in Trench and Spillway

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7.15. At CH14000m two 3.2m diameter pipes would descend the primary escarpment, connecting the headpond to the proposed Barrhill Powerhouse located approximately 30m below the top of the primary terrace. A 10m wide concrete spillway would run parallel to the penstocks. Their construction would require the removal of some plantation trees, however I consider their loss to be negligible.

7.16. In terms of landscape and natural character, the linear forms of the penstocks and spillway would have a significant, albeit localised, impact. The structures would modify the character by providing substantial human elements which break the containment of the river corridor currently provided by the primary escarpment. With retention of the existing pine trees around the penstocks and spillway it would be possible to further localise their impact on natural character. Also, painting of the penstocks and colouring of concrete used on the spillway would reduce the residual effect on landscape and natural character such that it would be minor.

Barrhill Powerhouse and Associated Structures

7.17. A building up to 20m high is proposed to house the power generators and turbines. At present there are no built structures of any significance in this location and it is largely free of any human intervention with the exception of plantation plantings and fences. For this reason, the proposed structure would have a significant effect on landscape and natural character when it is initially constructed. However, with implementation of the mitigation measures outlined in below, it would be possible to reduce the residual impact over time, i.e. 10 years or longer. The existing powerhouse and penstock at Highbank provides an example that this is possible. However it would require tight controls on the

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appearance of the powerhouse and the implementation and maintenance of planting.

Tailrace to River Braid and Fish Barrier

7.18. A tailrace with a fish barrier is proposed, facilitating the return of the water back into the river. The location shown on the engineer's drawings is indicative only and it is recommended that the location of the fish barrier be at the edge of the river flat, reducing the length of permanent channel required. It would then be possible for the tailrace to be a non-permanent element formed by excavation and reformed after each flood event. As a consequence, some continued disturbance of natural riverbed patterns is likely for the life of the project, and these would be apparent to river users. It may also result in periodic disturbance to wildlife. However, in terms of the overall scale of the riverbed, I consider that these effects would be minor.

Potential effects on landscape values

7.19. I have identified the Rakaia River landscape in the vicinity of the receiving environment downstream of the Gorge as a visual amenity landscape of some value, while the Ashburton District Plan refers to the wildlife and recreational values of the river as being outstanding. The location and limited impact of the proposal on the riverbed and recreational attributes of the river has lead me to conclude that it would have minor effects on existing landscape values.

7.20. The first portion of the proposal (intake storage pond, canal (CH0 – 3500m) and associated structures) is all located on agricultural land which has limited value for recreational purposes, and is currently being used for agriculture or as

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part of the Highbank scheme. The same applies to the section of canal from CH11500 to 14000m and the headpond.

7.21. While the intake structure, sediment disposal area, fish bypass, the canal from CH3500-11500 and the powerhouse and associated tailrace are within or adjacent to the riverbed, their location immediately adjacent to the primary escarpment and ability for their effects to be mitigated are unlikely to greatly impact upon recreational values. I therefore consider that the proposal would not have more than a minor effect on landscape values. The effects of the water take on the instream values of the braided river between the intake and tailrace structures are unlikely to be distinguishable from the effects of the natural dynamics of river flow.

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8. VISUAL ASSESSMENT: EFFECTS AND IMPACTS OF THE PROPOSAL

Existing Visual Character

8.1. The existing visual character is characterised by wide open views across the Canterbury Plains with the braided Rakaia River corridor breaking the formal grid pattern formed by current farming practices. While the visual character of this area of the Canterbury Plains is open and expansive, views of the river bed are actually very limited. Viewing locations are limited to along the edges of the primary terraces, river crossing points and elevated locations as the river bed is substantially lower than the surrounding plains.

8.2. Further obstructing views into the area and from the river corridor are existing plantings as part of farm shelter belts (*Macrocarpa*), large blocks of plantation forestry (*Pinus radiata*) and wilding Willow. In many cases, tree plantings are well established with heights over 20m common.

Potential Sources of Visual Impacts

8.3. The potential sources of visual impact from this project are as follows:

- Construction and operation of intake structure;
- Sediment disposal area;
- Canal (CH0 – 2750m) with embankments up to 7.5m in height, fish bypass channel, intake storage pond, two drop structures and associated buildings up to 10m in height, widening and realignment of existing tailrace, gated flow control structure;
- Canal (fill embankment) (3500m – 11500m) gradually ascending up the primary escarpment;
- Slope cutting (CH4250-5250m) up to 80m in height;

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- Canal (cutting) (11500-14000m) and headpond;
- Penstocks and spillway, Barrhill powerhouse up to 20m in height and associated structures;
- and tailrace with fish barrier.

Zone of Visual Influence

8.4. The Zone of Visual Influence (ZVI) or viewshed attached in the appendix shows views of the proposal are largely contained by the primary terraces located on either side of the river corridor with limited vantage points from outside of this area. It should be noted that the viewshed is conservative as it does not take account of existing vegetation or buildings as it only relates to topography. The topography is based on 20m contour lines so there would be some minor discrepancy with on-site conditions. In reality views would be further contained by existing vegetation as part of farm shelter belts and pine plantations.

Key Views

8.5. The following locations are the key views from where the proposal can be viewed:

- A layby area on Rakaia Gorge Road;
- Rakaia river bed;
- The access road from Barkers Road to the Highbank Power Station;
- The anglers access point at the end of Barhill - Methven Road;
- The anglers access point at the end of Steeler's Road.

8.6. I have prepared a series of photomontages to show the likely impact of the proposal on the visual amenity of the area.

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Visually Sensitive Receivers (VSRs) and Visual Sensitivity, and Potential Impacts

8.7. I have identified visually Sensitive Receivers (VSR's) within the ZVI and grouped into types and location. These are the people who live, work, play or travel through the area (ZVI) potentially affected by the project. Factors affecting their sensitivity for evaluation of visual impacts include the value and quality of existing views, the type of receiver, duration or frequency of view, distance from the proposal and the degree of visibility.

Residential VSRs

8.8. Most residents in properties located on the true right bank of the Rakaia River (along Rakaia River Road) would not be able to view the proposal from the existing dwellings due to the steep escarpment along this side of the river and existing vegetation. Where the proposed canal comes onto the primary plain (CH11500-14000m), the canal is in cut and would therefore only be visible during construction. The distance between residential dwellings and the proposal varies between 150m to 3km. While residential receivers by their nature tend to have a high sensitivity to visual impacts, the majority of residents of properties along Rakaia River Road would experience negligible adverse visual impacts as they are not able to view the proposal from their dwellings. The exception to this is the dwellings at the Clemens residence (2068 Rakaia River Road) where, due to their close proximity, would experience moderate adverse visual impacts.

8.9. Residents in properties located on the true left bank of the Rakaia River (along Rakaia Gorge Road) would experience limited, mid to far distance views of the entire proposal, generally being 2km or greater. Also as a mitigating factor, in

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most cases, views would be blocked by either existing vegetation or the steep escarpment blocking views into the river corridor. For these reasons and the limited number of vantage points, combined with the fact that the proposal would be viewed against the primary terrace and not on the ridgeline, the residential receivers along the Rakaia gorge Road, Rakaia terrace Road and Steeler's Road would experience limited adverse visual impacts from the proposal. With the implementation of the proposed mitigation measures, Planting Types A, C F and H, I consider the overall residual visual impact to be minor.

Recreational VSRs

8.10. Recreation receivers using the river corridor would have open views of the intake structure, sediment storage pond and fish bypass channel, canal (CH3500 – 11500m), penstocks, Barrhill powerhouse and tailrace with fish barrier, but at no time would they be able to view the proposal in its entirety. For the first portion between CH0-2750m the majority of the canal, drop structures and associated buildings would be screened by existing vegetation along the river bank. Intermittent, partial views would be possible of the proposed embankments and drop structures from the river bed where there are gaps in the existing vegetation cover. However the embankments would be viewed as a continuation of the adjoining open pasture and the scale of the drop structures is not out of scale with typical farm buildings.

8.11. As recreational users move down the river corridor, they would have open and full views of the second portion of the canal (CH3500-11500m), slope cutting (CH4250-5250m), the transition from fill embankment to cutting at CH11500m, penstocks and spillway, the Barrhill Powerhouse and the tailrace with fish barrier at CH14000m.

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8.12. Recreation receivers using the river corridor have a high visual sensitivity to the proposal given their close proximity and the fact that they are using the river corridor to enjoy its natural environment. The magnitude of the impact they receive would be offset to a degree by the fact that the entire proposal would not be visible at any one time. However, without mitigation, recreational receivers would experience a large degree of change that would result in more than minor adverse visual effects. The canal, buildings and associated slope works would all contrast with the high natural character of the primary escarpment. The potential impact of proposed buildings associated is lessen by the number of residential dwelling which are visible on the true left of the Rakaia river which lessen the 'wilderness' experience of the receiver.

8.13. Recreational receivers will also have open and full views of the scheme when crossing the canal at Highbank (over Trustpower land) and at Lowe's Cutting to gain access to the river corridor. In both cases, it will not be possible to screen the canal if access is to be maintained. In this instance, continuing public access to the river is considered more important and given the duration of the view experienced, I consider the effects to be moderate, reducing to minor following the establishment of planting. It should be noted that at Highbank, the proposal would be viewed as an extension of the existing infrastructure.

8.14. Even with implementation of the mitigation measures outlined later in this report, the visual impacts experienced by this group would be more than minor until planting can become established on the canal embankments, cut slopes and around the Barrhill Powerhouse. The existing Highbank Power Station highlights how this has been achieved, with the existing building being largely visually contained. In my opinion, once plantings have become established over

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a 10 year period, residual adverse visual impacts experienced by recreational receivers would be minor.

Travelling VSRs

8.15. The majority of the proposal is not visible from Rakaia River Road, and the section of canal between CH11500 and 14000m is in cut. Temporary effects would be experienced during construction but given the nature of the receiver, distance and the nature of the works, the visual effects would be negligible.

8.16. Travelling VSRs using Rakaia Gorge Road would have full and open views of the proposal only when viewed from the layby area. In most other locations only intermittent, partial views would be possible to travellers along this road. The viewing distance for this VSR would vary between 2km and greater. Due to the distance from which the proposal would be viewed, the back drop of the primary escarpment and the transient nature of travelling receivers, I consider that their visual sensitivity to this proposal would be low. With the implementation of the proposed mitigation measures, the visual impacts on the receiver are likely to be low and therefore I consider the overall residual visual impact to this receiver would be minor.

Working VSRs

8.17. The workers at Highbank power station would have full and open views of the proposal. However, the few people who work there have a low sensitivity to the proposal as they are there to work as opposed for scenic/recreational qualities. I consider the effect on these workers to be minor.

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9. MITIGATION MEASURES

Objectives

9.1. Mitigation measures have been developed to achieve the following objectives:

- To reinstate vegetation cover on previously vegetated areas disturbed by construction activities, where those areas do not contain components of scheme infrastructure or permanent accessways;
- To visually integrate finished structures, landforms and vegetation into the surrounding landscape so that as far as possible they appear to be naturally occurring features which are already present in the immediate area.
- To ensure short and long term stability of disturbed land area and their surrounding areas particularly on the terrace edges.
- Minimise the loss of existing vegetation where possible, most notably riparian vegetation located on the edge of the river terrace and on the river flat. This is particularly important to ensure views of the proposal by recreational users are limited when using the river.
- Compensate for the loss of any native vegetation which is removed during construction.

Mitigation Measures

9.2. The following mitigation measures are proposed as a minimum. They have been prepared jointly with MWH's ecologist, Adam Forbes, and reflect a desire to meet the landscape and ecological requirements of this project. However, the description of the proposed mitigation measures does differ in some places where more emphasis is given to landscape and visual matters. Application of

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these measures would assist in ensuring the effects of the proposal would be minor:

9.2.1. Sowing with pasture grass species of all outer embankment slopes of the canal between CH0 - 2750m and CH11500 - 14000.

9.2.2. For the section of canal between CH3500 – 11500m, the area around the penstocks and Barrhill powerhouse at CH14000m and the proposed slope cutting between CH4250 and 5250m, which are all located on the river flat or escarpment, a recommended planting plan and schedule have been prepared and are attached to this report. The planting plan proposes to mitigate the loss of existing native vegetation with the establishment of 4.5ha of rehabilitation areas along the alignment. Rehabilitation areas would comprise native, locally sourced plant species, and would benefit from the spreading of existing topsoil, humus and woody materials. As well as mitigating the loss of native plants, the planting plan seeks to minimise the visual impact of the proposal by blending it within the existing vegetation cover and providing screening to structures where necessary. These drawings would form part of a Landscape Management Plan which shall be prepared by a Registered Landscape Architect and submitted to the Ashburton District Council for certification prior to the commencement of construction.

9.2.3. The landscape treatments included in the planting plan have been developed for the following reasons:

9.2.3.1. Type A (4.0ha) – Kowhai-shrubland mix

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The aim of Type A is to create a simple composition with good 'structural' potential to mitigate the loss of existing areas of native vegetation affected by the proposal. Species selection is based on existing native vegetation in the area, consultation with Motukarara Conservation Nursery and the desire to create the right conditions to improve biodiversity in the future balanced with immediate results. Previous experience with large scale planting methods such as proposed in this project have shown that having a simplier, less complex, composition of plant species has a higher success rate with biodiversity being gradually obtained naturally over time as a result of having the correct 'nursery' conditions in place. Totara has been added to the mix to provide a species with a strong vertical element but planting of this species may not occur until the second year, once conditions become more suitable.

9.2.3.2. Type B (0.5ha)

To create a monospecific composition of Kunuka, using propagation material sourced from the three individual specimens of Kunzea ericoides 'Canterbury Plains' found on the alignment and from other locally sourced Kunzea ericoides specimens.

9.2.3.3. Type C – Riparian Planting

For areas located immediately adjacent to the river or within the river corridor (i.e. river flat and the adjacent terrace) a riparian native plant mix is to be established. These areas are around the

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Intake structure and along the disturbed outer edges of the sluice and fish bypass channels.

9.2.3.4. Type D – On-site Nursery

An on-site nursery is proposed, being a 20x20m fenced area located adjacent to the works area at Lowe's cutting. The area would be used as a permanent location for native specimens (based on the likelihood of survival) transplanted from areas affected by the project works.

9.2.3.5. Type E – Pasture Grasses

For those areas between CH0 - 2750 and CH11500 - 14000, located on either the upper river terrace or on the primary terrace, sowing of pasture grass is proposed for all outer embankment slopes of the canal and any disturbed area which are to be reinstated following construction works.

9.2.3.6. Type F – Planting around the Powerhouse

The principle purpose of the planting at CH14000, around the powerhouse, penstocks, spillway and associated structures is reduce its potential visual impact when viewed from the main river canal. For this reason, a mix of native and exotic species are purposed to screen the structures in a short period of time.

9.2.3.7. Type G – Slash and Humus

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For the remaining areas of the canal not covered by the above methods, it is proposed that existing topsoil, humus and woody material sourced from the site shall be spread out to a depth of 200mm on the outer embankment and sown with pasture grasses. It is expected that for the first years, up until year 10, that these areas will be dominated by competitive exotic grasses and common woody weed species as well as wilding pines, until native seed dispersal can occur from the nearby rehabilitation areas. The fast growth of exotic species will assist with integrating the proposed canal into the existing landscape as these species are common throughout the study area.

9.2.3.8. Type H – Slope treatment (CH4200-5200 and CH11500)

A 100mm deep layer of topsoil and humus is to be spread over the slopes and allowed to regenerate naturally. Seed dispersal of Kunzea ericoides 'Canterbury Plains' will also occur but no weed management will be undertaken on the slope. It is realised that weed growth will be an issue on these slopes but the principle reason of this method is for visual mitigation rather than ecological. The seed dispersal of Kanuka is an attempt to promote native plant growth but the primary areas for ecological planting are Areas A, B, C and D.

9.2.4. As far as practicable, topsoil, humus and woody vegetation removed for the construction of the canal shall be used as part of the rehabilitation works. Priority is given to Area A then Areas B, D and G.

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9.2.5. Waste plant material generated from tree felling shall not be stored or stockpiled in the riparian zone or in such a way that it may cause damage to existing vegetation which is to be retained.

9.2.6. Prior to the commencement of construction works, details for the sourcing of plant material must be submitted to Council for certification. All plant material shall be grown from locally sourced (i.e. from the Rakaia River, or when suitable material is not available from the Rakaia River, material should be sourced from the Canterbury Plains) native plant material locally grown to meet the requirements of the attached planting schedule. This is to ensure the large numbers of plants required are available at the time of planting as requests for plant substitutions will not be entertained. NB. Discussions have already been undertaken by the applicant with local nurseries to ascertain their ability to provide sufficient plant material. All of which expressed positive feedback to the proposal and desire to be involved. Plant material can also be sourced from Motukarara Conversation Nursery which propagates over 120,000 plants a year (refer to the Ecologist evidence). Also during the site visit with Forest and Bird, they outlined their ability to supply plant material to the project, in particular *Kunzea ericoides* 'Canterbury Plains'.

9.2.7. Prior to any construction works commencing a full survey of native vegetation located within the proposed construction area (or associated transport routes) between CH3500 – 11500m must be undertaken to locate any threaten native plant species. Propagules (i.e. seed or cutting material)

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from such threatened plant species shall be collected and 'grown-on' to later be incorporated in rehabilitation works. After collection of propagule material, specimens of such threatened plant species found to be affected by construction works shall be transplanted to a permanent site shown on the planting plans. The site is to be fenced to prevent stock access.

9.2.8. Propagation material (i.e. seed/cutting material) shall be collected from the three individual specimens of *Kunzea ericoides* 'Canterbury Plains', identified at NZMS 260 E2412202, N5731737. This propagation material should be grown on and when a suitable maturity is reached, incorporated along with other locally sourced *Kunzra ericoides* material into the proposed rehabilitation planting. Other local sources include DoC's Motukarara Conversation Nursery, Forest and Bird and the Kanuka forests of Eyrewell and Bankside Reserves. The three specimens of *Kunzea ericoides* 'Canterbury Plains' shall than be transplanted to the site identified on the planting plans. Transplantation work shall be undertaken in accordance with recognised best horticultural practices by a fully qualified Arboriculturist.

9.2.9. All proposed rehabilitation planting on the outer canal embankments must be fenced at the toe of the slope to prevent stock access.

9.2.10. Areas affected by earthworks should be subject to the following site control measures:

- Defining the access and construction zone clearly on the ground;

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- Ensuring no vegetation is disturbed or removed beyond the defined access and construction zone;
- Ensuring slash material is temporarily stored at designated sites;
- Cleaning of potentially contaminated (i.e. containing plant pest material) machinery prior to entry onto the site to ensure no plant pest material is introduced to the area.

9.2.11. The contractor shall ensure that no vegetation located outside of the designated construction zone is damaged or felled during construction. No nails or other fixings shall be driven into vegetation located outside of the construction zone, and no materials or machinery shall be stored under the crown of trees which are to be retained.

9.2.12. Any proposed channels within the river bed are to be formed using river stones. During maintenance of the channels, materials removed are not to be stockpiled in the riverbed but either must be removed from site or evenly spread across a flat area within the riverbed.

9.2.13. Visible sections of penstock pipes at the drop structures and at the powerhouse at CH14000m are to be painted Resene French Grey or similar approved colour to ensure they are visually recessive. Concrete used for the construction of the spillway is to be coloured an earth-coloured tone to reduce potential visual impact and glare. The colours are to be submitted to Council for certification prior to construction works.

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9.2.14. Where the intake structure and fish bypass channel are located on the river flat, disturbed areas are to be planted with appropriate native species at a distance of 1500mm centres. Refer to the Plant schedule in the attached figures for further detail.

9.2.15. For buildings associated with the proposal, recessive, non-reflective colours should be applied to reduce potential visual impact. For the main powerhouse located at CH14000, the building design should also be subject to Ashburton District Council certification, limited to building colour and materials. The design should be such that the building is as close as possible to the toe of the escarpment. Proposed planting around the building is shown in the attached figures.

9.2.16. The establishment period for the landscape works shall be 24 months from the issuing of the Certificate of Practical Completion by the Engineer. This period is proposed for the landscape works to ensure that planting is successful. During this period, the contractor will ensure that weed growth is controlled, pest control measures are maintained, dead or diseased plants are replaced and adequate watering is undertaken as necessary to maintain plants in a healthy state during extended periods of dry weather.

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10. CONCLUSIONS

10.1. Based on the landscape and visual impact assessment above, and implementation of the mitigation measures, I consider that the proposal would have a less than minor impact on the landscape character, natural character, landscape values and visually sensitive receivers, with the exception of the Clemens who retain residual moderate adverse effects. This is on the basis of the following reasons:

- The mitigated proposal would over time appear to be in character, both in form and scale, with the receiving landscape. The area, while not identified as an Outstanding Natural Landscape or Significant Landscape may be regarded as having a visual amenity of some value. This is mainly due to the recreational opportunities that the river provides and the high degree of amenity derived from the ever-changing dynamics, patterns and moods of the river. Access across the scheme to the river bed will be maintained. The proposal would not impact upon these values with the majority of the works proposed on the river terrace, primary escarpment or river flat where the character is dominated by managed agricultural farmland or plantation forestry. Where impacts occur within the river bed, the proposal consists of loosely formed channels using river stone which is in keeping with the braided nature of the river.

- While the landscape and natural character of the primary escarpment will be moderately affected during and immediately following construction, I consider that the residual effects can be mitigated to minor over 10 years with the

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proposed planting assisting with blending the proposal into the surrounding landscape.

- While Recreational VSR's will experience moderate adverse effects during and immediately following construction, I consider that with the implementation of the proposed mitigation measures, their residual visual effect (i.e. after 10 years) will be reduced to minor as the proposal will mostly be screened or viewed against the primary escarpment. For the other vantage points, the limited number of vantage points from where the proposal can be viewed combined with viewing distance, frequency and the low number of visually sensitive receivers, I consider the effects to be less than minor.

Dated: 08 September 2008

Name: David Compton-Moen
Title: Landscape Architect

MWH New Zealand Limited

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