

Listed Land Use Register

Site categories and definitions

When Environment Canterbury identifies a Hazardous Activities and Industries List (HAIL) land use, we review the available information and assign the site a category on the Listed Land Use Register. The category is intended to best describe what we know about the land use.

If a site is categorised as **Unverified** it means it has been reported or identified as one that appears on the HAIL, but the land use has not been confirmed with the property owner.

If the land use has been confirmed but analytical information from the collection of samples is not available, and the presence or absence of contamination has therefore not been determined, the site is registered as:

Not investigated:

- A site whose past or present use has been reported and verified as one that appears on the HAIL.
- The site has not been investigated, which might typically include sampling and analysis of site soil, water and/or ambient air, and assessment of the associated analytical data.
- There is insufficient information to characterise any risks to human health or the environment from those activities undertaken on the site. Contamination may have occurred, but should not be assumed to have occurred.

If analytical information from the collection of samples is available, the site can be registered in one of six ways:

At or below background concentrations:

The site has been investigated or remediated. The investigation or post remediation validation results confirm there are no hazardous substances above local background concentrations other than those that occur naturally in the area. The investigation or validation sampling has been sufficiently detailed to characterise the site.

Below guideline values for:

The site has been investigated. Results show that there are hazardous substances present at the site but indicate that any adverse effects or risks to people and/or the environment are considered to be so low as to be acceptable. The site may have been remediated to reduce contamination to this level, and samples taken after remediation confirm this.

Managed for:

The site has been investigated. Results show that there are hazardous substances present at the site in concentrations that have the potential to cause adverse effects or risks to people and/or the environment. However, those risks are considered managed because:

- the nature of the use of the site prevents human and/or ecological exposure to the risks; and/or
- the land has been altered in some way and/or restrictions have been placed on the way it is used which prevent human and/or ecological exposure to the risks.

Partially investigated:

The site has been partially investigated. Results:

- demonstrate there are hazardous substances present at the site; however, there is insufficient information to quantify any adverse effects or risks to people or the environment; or
- do not adequately verify the presence or absence of contamination associated with all HAIL activities that are and/or have been undertaken on the site.

Significant adverse environmental effects:

The site has been investigated. Results show that sediment, groundwater or surface water contains hazardous substances that:

- have significant adverse effects on the environment; or
- are reasonably likely to have significant adverse effects on the environment.

Contaminated:

The site has been investigated. Results show that the land has a hazardous substance in or on it that:

- has significant adverse effects on human health and/or the environment; and/or
- is reasonably likely to have significant adverse effects on human health and/or the environment.

If a site has been included incorrectly on the Listed Land Use Register as having a HAIL, it will not be removed but will be registered as:

Verified non-HAIL:

Information shows that this site has never been associated with any of the specific activities or industries on the HAIL.

Please contact Environment
Canterbury for further information:

(03) 353 9007 or toll free
on 0800 EC INFO (32 4636)
email ecinfo@ecan.govt.nz



APPENDIX B: HISTORICAL AERIAL PHOTOGRAPHS



Canterbury Maps-1940-44

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Scale: 1:6,000 @A3

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Canterbury Maps-1955-59

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Scale: 1:6,000 @A3

Map Created by Canterbury Maps on 11/05/2021 at 1:25 PM





Canterbury Maps-1960-64

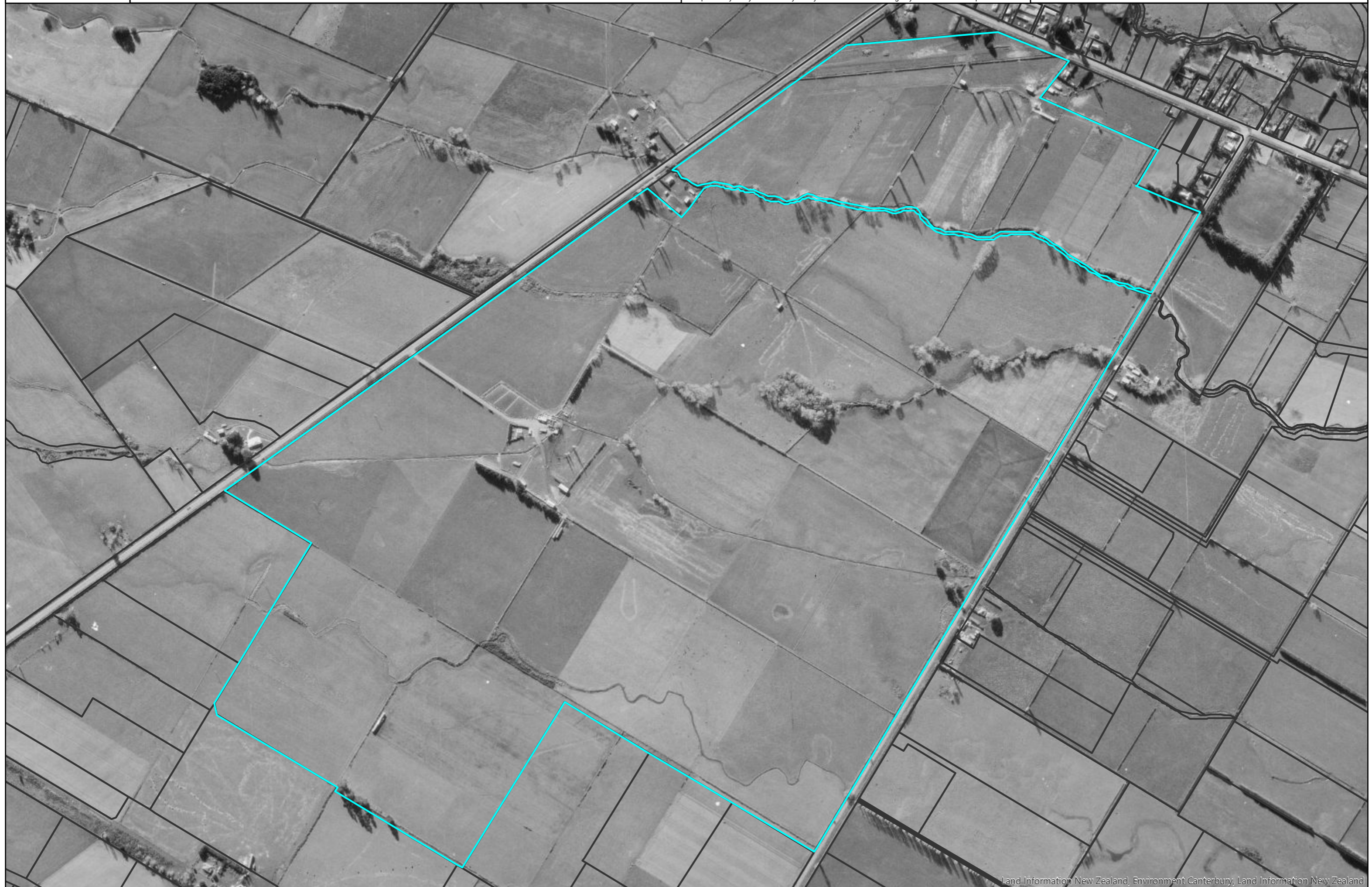
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Canterbury Maps-1980-84

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0 0.09 0.17 0.26 0.34 Kilometres

Scale: 1:6,000 @A3

Map Created by Canterbury Maps on 11/05/2021 at 1:27 PM







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Scale: 1:6,000 @A3

Map Created by Canterbury Maps on 11/05/2021 at 1:29 PM



APPENDIX C: SELECT SITE PHOTOGRAPHS

Photograph 1: Existing structures within the central section of the site.



Photograph 2: General grass cover and example of die off.



scale	drawn	AB		client:	Rolleston Industrial Development Limited			
	approved	RM		project:	535 Mill Road, Ohoka			
	date	May-21		title:	Site Photographs			
	scale	NTS		project no:	773-CHCGE288040	figure no:	1 of 3	rev:
	original size	A4						

Photograph 3: Metal equipment left rusting within the site.



Photograph 4: Storage and above ground fuel tank within the central section of the site.



scale	drawn	AB		client:	Rolleston Industrial Development Limited			
	approved	RM		project:	535 Mill Road, Ohoka			
	date	May-21		title:	Site Photographs			
	scale	NTS		project no:	773-CHCGE288040	figure no:	2 of 3	rev:
	original size	A4						

Photograph 5: Chemical storage area. Inset: Storage shed within the site.



scale	drawn	AB		client:	Rolleston Industrial Development Limited			
	approved	RM		project:	535 Mill Road, Ohoka			
	date	May-21		title:	Site Photographs			
	scale	NTS		project no:	773-CHCGE288040	figure no:	3 of 3	rev:
	original size	A4						



Appendix D

Ecology Assessment

Land Use Change, 535 Mill Road, Ohoka; Aquatic Ecology Report

Prepared for:
Rolleston Industrial Developments Ltd

AEL Report No. 192

Mark Taylor
Riley Payne

Final

November 2021



A juvenile brown trout from the Ohoka Tributary

 **Aquatic Ecology**

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1 Executive Summary

A rural land parcel (approximately 156 ha) is proposed for a District Plan change to mixed-density residential and commercial. Aquatic Ecology Limited was commissioned to evaluate the aquatic ecology of the waterways and water bodies in the land parcel and recommend realignments and waterway setbacks on the basis of maintaining, and possibly enhancing ecological values.

Four fish species were identified, the native longfin eel, shortfin eel, upland bully, and the introduced brown trout. Of these, the longfin eel has a conservation status of declining. The other species do not have a conservation status. Notably, we did not identify the Canterbury mudfish, and we are confident that this endangered species does not reside in the land parcel, partly due to the widespread distribution of other predatory and competitive fish species.

Waterways were in good order due to extensive fencing, and we expect stream health measures to be in the order of 'fair' to 'good' based on national protocols.

We would recommend a minimum of 10 m buffer strip setbacks (from the water's edge) on principal waterways (Ohoka Stream tributary, South Ohoka Branch, Northern and Southern spring fed channels, and the groundwater seep). A 5 m service strip on the Un-named Stream, with a re-alignment of the ephemeral Poned Drain into neighbouring perennial waterways. A minimum development offset of 20 m, but more if possible, should be applied from the point of wetland delineation (Ministry for the Environment 2020b) for the smaller of the two springheads (feeding Northern Spring Channel), but the larger spring feeding the Southern Spring Channel, requires a minimum of a 30 m setback.

The Northern Spring Channel could be diverted into, and benefit, the flow in the Southern Spring Channel. And the combined Southern and Northern Spring Channel would benefit from being combined and naturalised into a more meandering form. Likewise, the Poned Drain could also be diverted into the lower reach of the Southern Spring Channel. Diversions and decommissioning of waterways is subject to the recent NES-F 2020 regulations.

We recommend the decommissioning of Poned Drain (2), as it lacks aquatic values. We also identified 3 waterbodies with puddled water which we regard as not being wetlands and can be decommissioned.

2 Introduction and objectives

2.1 Proposal

A plan change is proposed for the property in the vicinity of 535 Mill Road, comprised of a large land parcel of 152.56 ha and other small parcels comprising of approximately 3.5 ha of rural zoned land. The proposed change will be from rural to the majority being residential 3 and residential 4a zones as defined in the Waimakariri District Plan. An outline development plan (ODP) was provided (Figure 1) which was overlaid with waterways mentioned later in the text. The ODP places stormwater treatment facilities across the development which will all flow toward the southeast of the plan change area, with green setback areas around waterbody areas of known environmental importance (App. I, Fig. a).

AEL was commissioned to assess the Plan Change area for ecological values in respect to waterways and waterbodies. This information will facilitate the finalisation of the Outline Development Plan in respect to the placement of setbacks and the ecological importance of aquatic habitats within the proposed plan change area (PPCA).

2.2 Methods

2.2.1 Background information

Some background information was available from previous studies, including previous trout spawning studies by AEL for the Waimakariri District Council (WDC), and AEL's district-wide studies underpinning

the WDC global consent for minor works on waterways. These studies did not include the proposed plan change area, but for context, provided ecological data in the general area, but also immediately downstream and to the north of the PPCA.

A low-scale fieldwork programme was followed as tabulated in Table 1.

Table 1. Field programme for the ecology assessment.

Date	Fieldwork
14/7/21	Initial reconnaissance
20/7/21	Trout spawning survey
21/7/21	Fish survey over PPCA-electric fishing
26-27/7/21	Fish survey over PPCA-netting and trapping

2.2.2 Electric fishing

Fishing locations and photos were recorded in the field using a high accuracy GPS receiver (Garmin GPSMap 64s). To assess the fish community, electric fishing was conducted, under AEL's electric fishing permits (MPI Permit 749, DOC 70754-FAU and under authority from NCFGFC). The fished reaches encompassed all hydrological habitats in the surveyed waterways, most of which were considered riffles. The total sample time (i.e. the total time that the machine was actively electrifying the water) for these reaches was 57 minutes. Captured fish were then anaesthetised, identified, measured, and upon recovery from anaesthesia, released back into their resident habitats.

All electric fishing locations (Fig. 1) were fished on 21/07/2021 using a conventional Kainga EFM300 electric fishing machine at an operating voltage of 200 V. D.C. This voltage provided a sufficient electrical field size to prevent escapement. Electric fishing serves to briefly (approx. 3 seconds) render fish unconscious to facilitate their capture in nets for identification. The machine incorporates a timer, allowing the effective fishing time to be recorded. Overall conditions for fish capture using electric fishing were adequate, with good water conductivity and excellent water clarity.

2.2.3 Netting and Trapping

Due to the depth and macrophyte growth of a number of waterways on the property, electric fishing was supplemented with set-netting and trapping. This is because netting and trapping fishing techniques are more effective where deep and slow-flowing water is present. Nets and traps were set in the Southern Spring Channel, Groundwater Seep, and Poned Drain, and deployed overnight on the 26th of July 2021 (Table 2, Figure 1). Nets used were mini and medium-sized baited fyke nets, with a 12 mm mesh. Traps used were Gee Minnow™ (GM) lines. Each line consisted of five baited Gee Minnow™ traps.

Table 2. Net and Trap setting on 26th July 2021.

Waterway (as in Fig. 1)	GM lines	Fyke nets (and size)
Groundwater Seep	2	2 mini
Southern Spring Channel	3	3 mediums, 1 mini
Poned Drain	1	0

All captured fish were anaesthetised, identified, measured, and after recovery, released back into their resident habitat.

2.3 Analytical methods and approach

During fieldwork, the provided ODP was accessed via a GPS-enabled ruggedised iPad, facilitating the correlation of core habitats to features in the field. Mapping was undertaken with Google Earth Pro and QGIS (v. 3.16.4). Isolated waterbodies were identified from Google Earth imagery of the PPCA with their hydrological sources evaluated using the sliding temporal scale with that software (2005-Dec 2020).

2.4 Description of waterways, fish fauna

Notably, all waterways and springheads we observed were effectively fenced from stock, either with a single electric hotwire, or multiple strands of barbed wire. We observed no apparent examples of stock intrusion into riparian zones. Fished habitats had a substrate composed of gravel with some silt, except for the Ohoka Stream tributary which had a gravel bed (Table 3).

Table 3. Substrate and depths of electric-fished sites in the PPCA.

Electric-fish location	Lower South Ohoka Branch	Lower South Ohoka Branch #2	Lower South Ohoka Branch #3	Upper South Ohoka Branch	Ohoka Tributary	Northern spring Channel
Substrate	gravel bed, ~30% embedded	90% fine + coarse sediment, 10% gravel (embedded)	gravel, 10% embedded	Soft sediment, wetland/m acrophyte growth in waterway	Loose gravel bed, riffle, high flow	Soft sediment, macrophytic growth present (e.g. milfoil)
Reach length (m)	25	23	30	25	35	40
Maximum depth (cm)	25	27	17	24	37	26
Average depth (cm)	17	25	14	18	29	20

Based on our fieldwork, the physical habitats of surveyed waterways are described here, in north to south order, along with the fish catch results (Table 3). Photographs of the waterways are provided in App. II (Figs. a-e).

2.5 Fish results synopsis

Following significant fishing effort using electric fishing, netting and trapping techniques, a total of four species were identified on the 535 Mill Road property (Table 4). These were, in order of catch abundance, the upland bully (*Gobiomorphus breviceps*), shortfin eel (*Anguilla australis*), longfin eel (*Anguilla dieffenbachii*) and brown trout (*Salmo trutta*).

The brown trout was only identified in the Ohoka tributary. Suitable habitat for this species was identified in the lower reaches of the South Ohoka Branch, however after a significant electric fishing effort no brown trout were identified in this reach. Upland bullies in all fished locations appeared gravid, and therefore will be breeding within the property boundaries.

Table 4. Fish catch within the 535 Mill Road PPCA.

Site	Ohoka Stream Tributary	South Ohoka Branch	Northern spring	Southern spring incl. channel	Groundwater seep	Ponded drain
Method	Electric fishing	Electric fishing	Electric fishing	Netting + Trapping	Netting + Trapping	Netting + Trapping
Fishing Pressure	14 minutes	33 minutes	10 minutes	4 GM lines, 4 Fyke nets	2 GM lines, 2 Fyke nets	1 GM line
Upland bully	20	23	6	7	10	0
Shortfin eel	1	22	2	7	0	0
Longfin eel	0	1	0	1	0	0
Brown trout (juvenile)	1	0	0	0	0	0
Unidentified bully	2	3	0	0	0	0
Total row	24	49	8	15	10	0

2.5.1 Ohoka Stream tributary

To the north, and the waterway with the most apparent flow volume, was a tributary of the Ohoka Stream (Fig. 1). This waterway had a significant baseflow during our winter survey, and possessed a gravel substrate. It was considered perennial and flow-stable, based on the growth of luxuriant marginal aquatic flora and fauna (App. II, Figs. a, b). For the electric-fished reach near the proposed stormwater treatment reserve, the average surface water depth of this channel (along its thalweg or mid-line), at time of survey, was c. 29 cm.

A fresh (i.e., recent) trout redd was identified in the middle of PPCA (Fig. 1), but older redds were found north and south of this location (Fig. 1). So trout spawning habitat suitability may be widespread. Two native fish species were identified, neither of which have conservation status: the upland bully, and the shortfin eel. A number of juvenile bullies could not be identified to species level, but these are likely to be upland bully as well.

The ODP indicates this waterway is expected to have a minimum 10m esplanade setback each side which is likely to protect instream values, including those of trout spawning and maintenance of native fish populations. To maintain trout spawning habitat, the waterway would require low TSS and flow stability during the winter months. Upland bully requires clean gravel for spawning, and associated with high bully abundance. The tributary provides rearing for small brown trout, and both habitat and flow stability is important for this species. The channel should remain free of instream structures to facilitate the movement of large spawning trout between the PPCA and the lower reaches downstream of Whites Road. Any stormwater treatment outlets in this channel should be situated away from suitable trout spawning locations. These can be mapped when a more detailed plan is required.

2.5.2 Groundwater Seep

A short (c. 170 m) distance to the south, an isolated groundwater-fed channel flows towards Whites Road, appeared during the site investigation to be fed by a groundwater seep (Fig. 1), especially so when the water table is high during winter months, and reaches of the Groundwater Seep contain an abundance of macrophytes particularly watercress (App. II, Fig. c, d). During winter there was a perceptible flow, over a fine-substrate base. During summer, we consider that the channel would lose a significant proportion of base flow. However, based on the aquatic fauna present, some water is always present in the channel.

Only upland bullies were identified from the Groundwater Seep, despite significant fishing effort.

2.5.3 Northern Spring Channel

The northern spring channel is a linear waterway traversing the PPCA, and originating from a spring near Bradleys Road (Fig. 1). Substrate in this channel consists of a mixture of fine sediment and embedded gravel. Flow is slow but perceptible, at least during the winter months. The average surface water depth of this channel, taken across the electric fishing reach (Fig. 1), was c. 20 cm. Plant zonation suggests that the flow is perennial.

A reach in the northern third of the channel was electric fished (App. II, Figs. e, f) with the shortfin eel and upland bullies identified. The flow may be too low, and the substrate too fine, to provide trout spawning habitat.

2.5.4 Southern Spring Channel

The Southern Spring Channel originates in two large deep ponds near the main homestead, one of which (more northern) appears recently man-made. The ponds are identified as a spring on Canterbury Maps. The southern pond has a small discharge channel which flows south towards Whites Road (App. II, Figs. g, h). The ponds are surrounded by mature oak trees, and contain large amounts of woody debris and leaf litter from the surrounding deciduous trees. The channel contains a fine sediment substrate and a significant abundance of introduced macrophytes, especially watercress. Both springs and their respective channels are considered perennial.

The headwater ponds and channel were subject to significant fishing pressure during this survey. Three fish species were identified: the upland bully, shortfin eel, and the longfin eel. The longfin eel is the only species in the PPCA with a conservation status of “declining” (Dunn *et al.* 2017). It has a higher dependence of bank cover and water depth than the non-endangered shortfin eel. The specimen in the spring head was large (c. 1100 T.L.), reflecting the depth and size of its resident habitat.

Large eels need to be able to access the sea so they can migrate to their tropical spawning grounds, therefore the ecological linkage between the springhead to Whites Road (i.e., Southern Spring Channel, Fig. 1) is important in this role.

2.5.5 Poned Drain

Poned Drain (Fig. 1) is considered ephemeral, as indicated by tall fescue and the facultative aquatic buttercup growing on the channel base. This channel is likely used to drain runoff during rainfall, and their base flow appears to be zero. A fishing attempt in the limited amount of ponded drain water did not identify any aquatic species (App. II, Figs. i, j).

2.5.6 South Ohoka Branch

During our winter baseflow visit, this waterway conveyed a clear-water flow, over a gravel base. Similar to all other waterways in the PPCA, the fenced banks and bed were stable. The upper section west of the farm buildings is ephemeral, and while it was watered during our visit (App. II, Fig. k, mean depth c. 18 cm), it was observed to dry during a recent visit (pers. obs. Peter McAuley, Inovo). No obligate aquatic macrophytes were observed between Bradleys Road and the farm buildings, nor were any fish identified during the fishing survey.

However, the downstream section, east of the farm buildings, was considered to contain perennial flow. The average mid-channel water depth in this reach was c. 19 cm. The substrate in the downstream section consisted of loose gravel, with short sections of fine sediment. Three fish species were identified in moderate numbers, the upland bully, shortfin eel, and the longfin eel, the latter possessing conservation status. A number of small bullies could not be identified to species level, but were, very likely, juvenile upland bullies. No brown trout were identified during the fish and brown trout survey, but trout redds were identified during the spawning survey, but only east of the farm dwellings. We also note that the waterway is not fenced immediately downstream of the PPCA (south-east of Whites Road), and is currently quite degraded by stock access. This results in bank erosion, channel widening and sediment increases. Based on Google Earth Street View imagery, this appears to be an ongoing issue. Therefore, we consider that the PPCA reach of this stream would represent an important refuge of high-quality habitat for rearing and spawning for trout and native fish.

Accordingly, we would recommend the protection and naturalisation of this channel, but preserving the hydraulics and gravel substrate which are particularly important for trout spawning. In particular, the preservation of the existing wetted channel width at winter baseflow.

2.5.7 Poned Drain 2 (dry)

This fenced waterway was choked with buttercup and pasture grass and was too shallow to fish (c. 2 cm, App. II, Figs. m, n). The channel appeared to be ephemeral, and shallowed down-gradient and southwards. It appeared to have no ecological value, and any water in the channel is likely to originate from rainfall or irrigation runoff.

2.5.8 Unnamed Stream (dry)

This waterway ran along the south boundary of the PPCA and lacked surface water for most of its course, with surface water limited to puddles (App. II, Figs. o, p). There was no vegetation at all in the channel, and we consider it likely the channel is dry for most of the year.

2.5.9 Isolated waterbodies

A number of waterbodies were located, and were assessed in respect to their status as a natural wetland as per the MFE National Policy Statement (Ministry for the Environment 2020a), the Land and Water Regional Plan (LWRP) and the RMA.

In this regard, in Ministry for the Environment (2020a), a natural wetland means a wetland (as defined in the Act) that is not:

- (a) a wetland constructed by artificial means (unless it was constructed to offset impacts on, or restore, an existing or former natural wetland); or
- (b) a geothermal wetland; or
- (c) any area of improved pasture that, at the commencement date, is dominated by (that is more than 50% of) exotic pasture species and is subject to temporary rain-derived water pooling

In the Land and Water Regional Plan (LWRP):.....”

Wetland includes:

1. wetlands which are part of river, stream and lake beds;
2. natural ponds, swamps, marshes, fens, bogs, seeps, brackish areas, mountain wetlands, and other naturally wet areas that support an indigenous ecosystem of plants and animals specifically adapted to living in wet conditions, and provide a habitat for wildlife;
3. coastal wetlands above mean high water springs;

but excludes:

- (a) wet pasture or where water temporarily ponds after rainfall
- (b) artificial wetlands used for wastewater or stormwater treatment except where they are listed in Sections 6 to 15 of this Plan;
- (c) artificial farm dams, drainage canals and detention dams; and
- (d) reservoirs for firefighting, domestic or community water supply.

Under the RMA 1991 the definition of a wetland is simple:

“wetland includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions”

Waterbody 1

This shallow disconnected puddle was situated in the middle of a paddock, and appeared to be a puddle which lacked wetland vegetation, and was not fished (App. II, Fig. q). It possessed no wetland vegetation and was surrounded by pasture grass. It was not regarded as a natural wetland under the NPS 2020 definition, nor a wetland under the LWRP and RMA definitions.

Waterbody 2

This is the remnant of an old fluvial channel, now appearing as a depression vegetated in dryland plants (App. II, Fig. r). There was no surface water, aquatic plants, nor signs of aquatic habitat. However, the fluvial channel depression was quite apparent in 2012 satellite imagery. It is possible the channel has been partially filled in the meantime. It was not regarded as a natural wetland under the NPS 2020 definition, nor a wetland under the LWRP and RMA definitions.

Waterbody 3

This site may also have been a segment of a historic fluvial channel, but appears to be waste ground used for land fill, surrounded by grazed, heavily pugged pasture. It was not regarded as a natural wetland under the NPS 2020 definition, nor a wetland under the LWRP and RMA definitions.

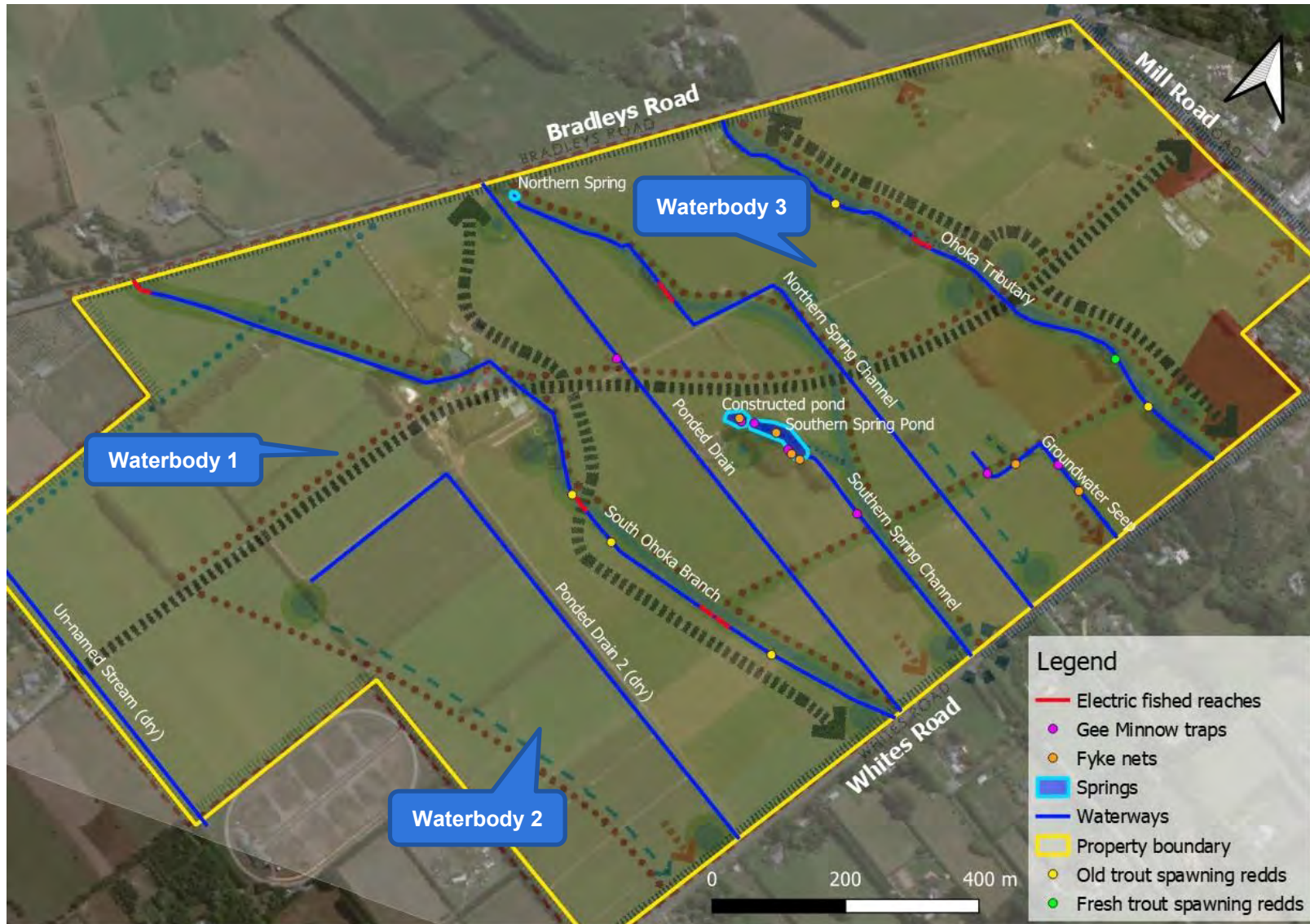


Figure 1. The outline development plan overlaid with waterways mentioned in the text.

3 Discussion

3.1 Ecology synopsis

No New Zealand Freshwater Fish Database (NZFFD) records have been recorded from the PPCA, although records exist in the surrounding area. Surveys completed by the Canterbury Regional Council (now Environment Canterbury) in 2001 record upland bullies (*Gobiomorphus breviceps*), common bullies (*Gobiomorphus cotidianus*) and shortfin eels (*Anguilla australis*) at Whites Road in the adjacent Ohoka Stream tributary, and the so-called “existing stream” at Whites Road (NZFFD cards 19680-19682, 19689-19690). A 2011 Department of Conservation (DOC) survey of the Ohoka Stream tributary downstream of Whites Road confirmed the presence of these three species. However, this survey also identified longfin eels (*Anguilla dieffenbachii*) and brown trout (*Salmo trutta*) in the waterway (NZFFD card 32080). The identified fish fauna in the Plan Change Area, in order of probable natural abundance, is the four species: upland bully, shortfin eel, longfin eel, and brown trout. It is probably that unidentified bullies are likely to be just upland bullies which are too difficult to identify in the field to species level. It is possible that some of these fish were common bullies. Of these, only the longfin eel has a significant conservation status of “declining”, the remaining native species have a status of “not threatened”, and the brown trout is introduced (Dunn *et al.* 2017).

In the PPCA, all of the waterways and waterbodies with ecological value were effectively fenced from stock, consequently bank structure, marginal plant growth, and substrate were stable. In particular, the fencing along the Ohoka Stream tributary, and the South Ohoka Branch maintains the coarse substrate and hydraulic characteristics essential for trout spawning.

A significant trout spawning survey was undertaken on the Ohoka Stream by AEL in 2018, as part of the Global Consent for the Waimakariri District Council & Environment Canterbury (Webb *et al.* 2018). Low numbers of trout redds (c. 5-25 redds/km) were identified from the Ohoka Stream tributary, downstream of Whites Road. The 2018 survey did not extend onto the PPCA.

The fish fauna within the PPCA was characteristic of steady flows, stable bank and habitat structure, with some gravel substrate. Of the four fish species identified, only the longfin eel had conservation status of nationally declining (Dunn *et al.* 2017). The remaining three species are listed as unthreatened (upland bully, shortfin eel), or introduced (brown trout)(Dunn *et al.* 2017).

The two eel species (i.e., shortfin eel, longfin eel) require sea access to complete their life cycles, being adept climbers as migratory juveniles, they can negotiate some instream structures like culverts and weirs. Adult spawning brown trout require access through Whites Road culverts along the courses of the Ohoka Stream tributary, and the South Ohoka Branch. Upland bullies spawn and rear locally, and benefit from gravel and cobbles for spawning and refuge (Jowett & Boustead 2001). The longfin eel grows to a large size, and is one of the largest freshwater eels species in the world. In the PPCA, a specimen of 1100 mm in length was obtained from the springhead at the Southern Spring Channel, and large individuals require significant water depth and stable bank structure.

The PPCA falls within the natural ecological range of the critically endangered Canterbury mudfish (*Galaxias burrowsius*). Accordingly, we were careful to ensure that the area was well-surveyed for isolated waterbodies where this species can survive, and that fishing methods were appropriate to catch these rare fish if they were present. However, given the results of this study, we are confident that the Canterbury mudfish does not survive in this PPCA. This is partly due to their absence in the fish catch, but also due to inability to survive predation and competition from the introduced brown trout and native eels, which are clearly widespread in the PPCA.

We did not survey freshwater invertebrates at the Plan Change level, as these assays can be undertaken at the consenting and AEE stage. Given the stable nature of the banks and flow, and the presence of some gravel reaches, we are confident that the invertebrate fauna would reflect at least fair stream health, and we consider it likely that koura (*Paranephrops zealandica*) are present in some locations.

3.2 Habitat requirements to preserve ecological values

Below are specific and general requirements to preserve fish values in the PPCA.

- Maintaining bank stability.
- Maintenance of spring base flows, and springhead depth (esp. at the Southern Spring Channel).
- Maintenance of suitable hydraulics, and unsilted trout spawning gravels in the Ohoka Stream Tributary and the South Ohoka Branch.
- Maintenance of fish passage for trout for the Ohoka Stream tributary and the South Ohoka Branch.

3.3 Notes on waterway alignment in respect to the November ODP

Following our ecological findings, some waterways are planned to be realigned to facilitate the development of an Outline Development Plan. All realignment proposals will be subject to accordance with the NES-F (National Environmental Standards) 2020 after the Plan Change stage. Waterways are presented in north-to-south order.

- There is no proposed change, in terms of alignment, in the Ohoka Tributary to the north of the PPCA, which will be left in its natural state.
- The Groundwater Seep may have a seasonal groundwater feed, and would benefit from being meandered and naturalised in some way.
- It is considered beneficial to combine the Northern Spring Channel baseflow into the Southern Spring Channel, possibly downstream of the spring-fed ponds. Both channels are perennial and are likely to be meandered and naturalised. The old linear channel of the Northern Spring Channel will then be decommissioned.
- The course of Poned Drain, which appears ephemeral, could be diverted into the perennial Southern Spring Channel. The preference would be to maintain the perennial course of the lower Southern Spring Channel. The old linear course of the Poned Drain will then be decommissioned.
- The course of the South Ohoka Branch will be retained in its present form.
- The course of Poned Drain 2, which appears highly ephemeral, could be realigned into the South Ohoka Branch, but as its dry and lacks aquatic values, it can be decommissioned
- The channel on the southern boundary of the PPCA (referred to as Un-named Stream) was largely dry, and could remain in this location and provide utilitarian function as a swale. A 5 m buffer could be used as a service lane.
- Waterbodies 1, 2, and 3 (see Fig. 1), upon inspection, were not considered to be wetlands under the Act, LWRP, or the NPS-FM. Since they lacked any ecological merit, they may be decommissioned.

3.4 Recommendations on development setbacks and buffer strips

- A minimum 10 m ecologically functional buffer strip on each side of the principal waterways as measured from the water's edge (i.e. Ohoka Stream tributary, Groundwater Seep, Northern Spring and Southern Spring Channels, and South Ohoka Branch.) A width of 10 m or more is required to provide nutrient uptake, erosion control, shading to control nuisance aquatic weed

growth (if canopy height exceeds wetted width). At a minimum width of 10 m, there will be some ecological function for stream invertebrates .

- The setback on the southern Boundary (un-named stream in Fig. 1), can be reduced to a service strip of 5 m.
- A minimum of a 20 m buffer setback for the northern spring
- A minimum of a 30 m setback for the large Southern spring as indicated in the November ODP.

4 Conclusions

Our recommendations on setbacks and buffer strips, released earlier to the Applicant, have been incorporated into the November 2021 ODP (Appendix I, Figure a).

If the habitat requirements in section 3.2, the realignment notes in section 3.3 (including being subject to accordance with the NES 2020) and the recommendations on setbacks and buffer strips in section 3.4 are implemented, then the change of land use from rural to residential and commercial will maintain and/or improve the current ecological status of the land within the plan change area.

5 Acknowledgements

We thank Peter Sheriff for his assistance with land access, orientation to waterways, and discussions about the waterways in the PPCA. We are grateful to Janine McIvor and Malcolm Main for fieldwork assistance. Laura Drummond and Bas Veendrick, of Pattle Delamore Partners, made comments on an earlier draft.

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7 Appendix I. Land use change plan (November 2021)

OUTLINE DEVELOPMENT PLAN - MILL ROAD

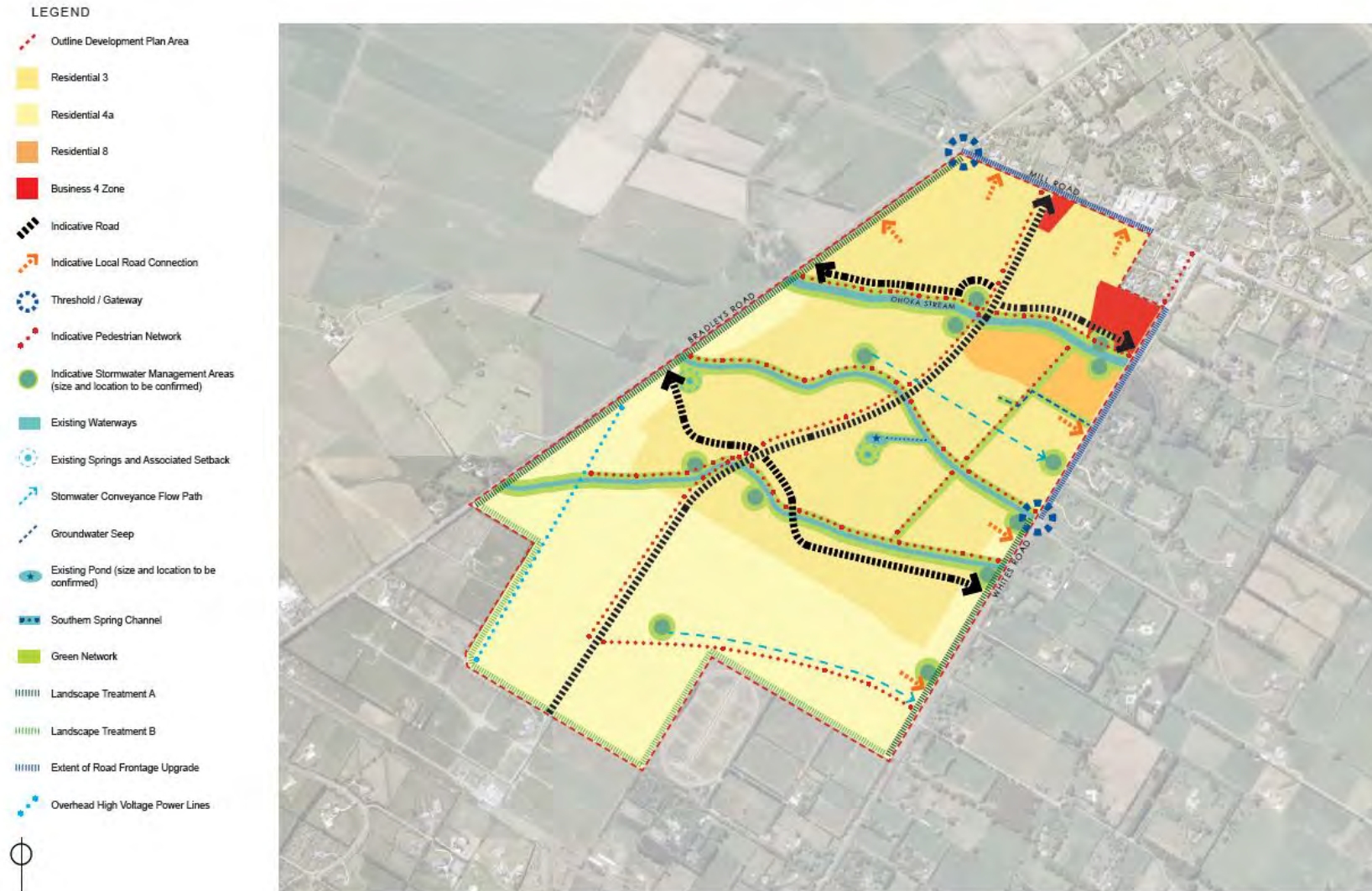


Figure a. Draft outline development plan for the land use change proposed at 535 Mill Road.

8 Appendix II. Photographs obtained during the field surveys



Figure a. Ohoka Stream tributary. Shortfin eels, upland bullies and brown trout were identified in this waterway. A fresh trout spawning redd was also located.



Figure b. Ohoka Stream tributary. Note the hotwire effectively protecting the fragile banks and marginal vegetation.



Figure c. Upstream section of the groundwater seep. Upland bullies were located in this section, caught in Gee Minnow traps (pictured).



Figure d. Downstream section of groundwater seep. Upland bullies were caught in this reach. Waterway fenced from stock by hotwire.



Figure e. The spring at the head of the Northern Spring Channel. It is protected by a hot-wire around its periphery.



Figure f. Northern spring channel. Upland bullies and shortfin eels were identified in this waterway.



Figure g. The south pond at the head of the Southern Spring Channel. Species located in these ponds were the longfin eel, shortfin eel and upland bully.



Figure h. Southern spring channel. The only species recorded in this channel was the upland bully. Turbidity in this photograph was from the setting of the GM traps line.



Figure i. GM traps set in the ponded drain. No flow is visible in this drain, and no fish species were recorded.



Figure j. Ponded drain, downstream of the GM set. Note the absence of aquatic flora.



Figure k. Upstream section of existing stream. No fish were identified at this location.



Figure l. Downstream section of existing stream. Longfin eels, shortfin eels, and upland bullies were present in this reach.



Figure m. Poned drain 2. This waterway contained minimal (c. 3 cm) surface water, insufficient to fish.



Figure n. showing the small amount of water and terrestrial plants in ponded drain 2.



Figure o. Showing a ponded section of the Un-named south boundary waterway.



Figure p. Un-named south boundary waterway, looking upstream. At the time of survey, this was a dry channel with two shallow ponded sections located. No aquatic flora was identified, and therefore the shallow ponds were deemed low value.



Figure q. Waterbody 1. This pond filled a small depression in the middle of a paddock. No aquatic value and stock-accessible.



Figure r. Waterbody 2. The remains of an old fluvial channel present before 2012.



Appendix E

Landscape Assessment

535 MILL ROAD PLAN CHANGE, OHOKA

ROLLESTON INDUSTRIAL DEVELOPMENTS LIMITED

Landscape and Visual Impact Assessment

Project No. 2021_097 | F

535 MILL ROAD PLAN CHANGE LVIA

Project no: 2021_097
Document title: Landscape and Visual Impact Assessment

Revision: F
Date: 21 February 2022
Client name: Rolleston Industrial Development Limited

Author: Dave Compton-Moen / Sophie Beaumont
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DOCUMENT HISTORY AND STATUS

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E	30/11/2021	Final for PC Application	DCM	TW	BVD
F	21/02/2022	RFI Response	DCM		

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1. INTRODUCTION AND PROPOSAL

DCM Urban has been commissioned by Rolleston Industrial Development Limited to prepare a Landscape and Visual Impact Assessment for a proposed Plan Change to provide a greater area and type of residential development in Ohoka. The proposal seeks to create a new area of residential living as an extension of the existing settlement in Ohoka. The proposal, covering an approximate area of 156ha, is currently zoned Rural under the Waimakariri District Plan. The proposal seeks to establish an Outline Development Plan (ODP) for the area and will include Residential Zone 3, Residential Zone 4a, Residential 8 and Business Zone 4 allowing for approximately 800 new households. The ODP is shown on page 3 and 4 of the attached figures.

2. METHODOLOGY

2.1 INTRODUCTION

The landscape and visual impact assessment considers the likely effects of the proposal in a holistic sense. There are three components to the assessment:

1. Identification of the receiving environment and a description of the existing landscape character, including natural character;
2. The landscape assessment is an assessment of the proposal against the existing landscape values;
3. The visual impact assessment is primarily concerned with the effects of the proposal on visual amenity and people, evaluated against the character and quality of the existing visual catchment.

The methodology is based on the [Aotearoa Landscape Assessment Guidelines \(Final Draft\) dated May 2021.](#)

2.2 LANDSCAPE DESCRIPTION AND CHARACTERISATION

Landscape attributes fall into 3 broad categories: biophysical features, patterns and processes; sensory qualities; and spiritual, cultural and social associations, including both activities and meanings.

- Biophysical features, patterns and processes may be natural and/or cultural in origin and range from the geology and landform that shape a landscape to the physical artefacts such as roads that mark human settlement and livelihood.
- Sensory qualities are landscape phenomena as directly perceived and experienced by humans, such as the view of a scenic landscape, or the distinctive smell and sound of the foreshore.
- Associated meanings are spiritual, cultural or social associations with particular landscape elements, features, or areas, such as tupuna awa and waahi tapu, and the tikanga appropriate to them, or sites of historic events or heritage. Associative activities are patterns of social activity that occur in particular parts of a landscape, for example, popular walking routes or fishing spots. Associative meanings and activities engender a sense of attachment and belonging.

Describing the landscape character is a process of interpreting the composite and cumulative character of a landscape, i.e. how attributes come together to create a landscape that can be distinguished from other landscapes. International best practice in characterisation has two dimensions of classification: the identification of distinctive types of landscape based on their distinctive patterns of natural and cultural features, processes and

influences; and their geographical delineation. The characterisation of a landscape is not to rank or rate a landscape, as all landscapes have character, but determine what landscape attributes combine to give an area its identity, and importantly to determine an area's sensitivity, resilience or capacity for change.

Table 1: Continuum of Natural Character

Natural	Near-natural	Semi-natural (including pastoral agriculture and exotic forests)	Agricultural (arable and intensive cropping)	Near-cultural	Cultural	
Very high- pristine	High	Moderate- High	Moderate	Moderate-low	Low	Very Low-nil

2.3 LANDSCAPE VALUES

Following the descriptive phase of landscape assessment, an evaluative phase is undertaken whereby values or significance is ascribed to the landscape.

Where Planning Documents have identified Outstanding Natural Features or Landscapes, the objectives, policies, and rules contained within the plan are used as the basis for landscape significance or value, and it is these values which the proposal is assessed against. Where there is some uncertainty of the landscape value, such as when the District Plan has a broad description of an Outstanding Natural Landscape (ONL), but it is not site specific, or the site neighbours an ONL, it is often necessary to complete an assessment against the values of the District Plan for completeness sake. Most district plans have policies or objectives which are relevant to Landscape and Natural Character if proposed in a rural or sensitive environment.

An accepted approach, where the landscape value of the site is not identified in the District Plan under Section 6(b) of the RMA, is to use criteria identified in *Wakatipu Environmental Society Inc. & Ors v QLDC* [2000] NZRMA 59 (generally referred to as the Amended Pigeon Bay criteria). The assessment criteria have been grouped into 3 broad categories or 'landscape attributes' which are to be considered:

1. Biophysical elements, patterns and processes;
2. Associative meaning and values including spiritual, cultural or social associations; and
3. Sensory or perceptual qualities.

2.4 VISUAL ASSESSMENT METHODOLOGY

In response to section 7(c) of the RMA, an evaluation is undertaken to define and describe visual amenity values. As with aesthetic values, with which amenity values share considerable overlap, this evaluation was professionally based using current and accepted good practice. Amenity values are defined in the Act as “*those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.*” The visual assessment looks at the sensitivity of receptors to changes in their visual amenity through the analysis of selected representative

viewpoints and wider visibility analysis. It identifies the potential sources for visual effect resulting from the Proposal and describes the existing character of the area in terms of openness, prominence, compatibility of the project with the existing visual context, viewing distances and the potential for obstruction of views.¹

The visual impact assessment involves the following procedures:

- Identification of key viewpoints: A selection of key viewpoints is identified and verified for selection during the site visit. The viewpoints are considered representative of the various viewing audiences within the receiving catchment, being taken from public locations where views of the proposal were possible, some of which would be very similar to views from nearby houses. The identification of the visual catchment is prepared as a desktop study in the first instance using Council GIS for aerials and contours. This information is then ground-truthed on site to determine the key viewpoints and potential audience. Depending on the complexity of the project a 'viewshed' may be prepared which highlights the 'Theoretical Zone of Visual Influence' (TZVI) from where a proposal will theoretically be visible from. It is theoretical as the mapping does not take into account existing structures or vegetation so is conservative in its results (given the scale and form of the proposal, the creation of a TZVI was not considered necessary).
- Assessment of the degree of sensitivity of receptors to changes in visual amenity resulting from the proposal: Factors affecting the sensitivity of receptors for evaluation of visual effects 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. For example, those who view the change from their homes may be considered highly sensitive. The attractiveness or otherwise of the outlook from their home will have a significant effect on their perception of the quality and acceptability of their home environment and their general quality of life. Those who view the change from their workplace may be considered to be only moderately sensitive as the attractiveness or otherwise of the outlook will have a less important, although still material, effect on their perception of their quality of life. The degree to which this applies also depends on factors such as whether the workplace is industrial, retail or commercial. Those who view the change whilst taking part in an outdoor leisure activity may display varying sensitivity depending on the type of leisure activity and a greater sensitivity to those commuting. For example, walkers or horse riders in open country on a long-distance trip may be considered to be highly sensitive to change while other walkers may not be so focused on the surrounding landscape. Those who view the change whilst travelling on a public thoroughfare will also display varying sensitivity depending on the speed and direction of travel and whether the view is continuous or occasionally glimpsed.
- Identification of potential mitigation measures: These may take the form of revisions/refinements to the engineering and architectural design to minimise potential effects, and/or the implementation of landscape design measures (e.g. screen tree planting, colour design of hard landscape features etc.) to alleviate adverse urban design or visual effects and generate potentially beneficial long-term effects.
- Prediction and identification of the effects during operation without mitigation and the residual effects after the implementation of the mitigation measures.

¹ Reference: NZILA Education Foundation - [Best Practice Guide – Landscape Assessment and Sustainable Management/ Best Practice Guide – Visual Simulations](#) (2.11.2010)

2.5 EFFECTS METHODOLOGY

Analysis of the existing landscape and visual environment is focused upon understanding the functioning of how an environment is likely to respond to external change (the proposal). The assessment assesses the resilience of the existing character, values or views and determines their capacity to absorb change. The proposal is assessed in its 'unmitigated' form and then in its mitigated form to determine the likely residual effects. The analysis identifies opportunities, risks, threats, costs and benefits arising from the potential change.

Assessing the magnitude of change (from the proposal) is based on the Aotearoa Landscape Assessment Guidelines (May 2021) with a seven-point scale, being:

VERY HIGH / HIGH / MODERATE-HIGH / MODERATE / MODERATE-LOW / LOW / VERY LOW

In determining the extent of adverse effects, taking into account the sensitivity of the landscape or receptor combined with the Magnitude of Change proposed, the level of effects is along a continuum to ensure that each effect has been considered consistently and in turn cumulatively. This continuum may include the following effects (based on the descriptions provided on the Quality Planning website):

- **Indiscernible Effects** No effects at all or are too small to register.
- **Less than Minor Adverse Effects** Adverse effects that are discernible day-to-day effects, but too small to adversely affect other persons.
- **Minor Adverse Effects** Adverse effects that are noticeable but will not cause any significant adverse impacts.
- **More than Minor Adverse Effects** Adverse effects that are noticeable that may cause an adverse impact but could be potentially mitigated or remedied.
- **Significant Adverse Effects that could be remedied or mitigated** An effect that is noticeable and will have a serious adverse impact on the environment but could potentially be mitigated or remedied.
- **Unacceptable Adverse Effects** Extensive adverse effects that cannot be avoided, remedied or mitigated.

The following table assists with providing consistency between NZILA and RMA terms to determine where effects lie.

NZILA Rating	Very High	High	Moderate-High	Moderate	Moderate-Low	Low	Very Low
RMA Effects Equivalent	Significant		More than Minor		Minor		Less than Minor

The NZILA rating of 'Moderate' has been divided into 3-levels as a 'Moderate' magnitude of change to always result in either 'More than Minor' or 'Minor' effects but maybe one or the other depending on site conditions, context, sensitivity or receiving character and its degree of change. Identification of potential mitigation or offsetting measures: These may take the form of revisions/refinements to the engineering and

architectural design to minimise potential effects, and/or the implementation of landscape design measures (e.g. screen tree planting, colour design of hard landscape features etc.) to alleviate adverse urban design or visual effects and/or generate potentially beneficial long-term effects.

Prediction and assessment identification of the residual adverse effects after the implementation of the mitigation measures. Residual effects are considered to be five years after the implementation of the proposed mitigation measures, allowing for planting to get established but not to a mature level.

2.6 PHOTOGRAPHY METHODOLOGY

All photos are taken using a SONY A6000 digital camera with a focal length of 50mm. No zoom was used. In the case of stitched photos used as the viewpoint images, a series of 4 portrait photos were taken from the same position to create a panorama. The photos were stitched together automatically in Adobe Photoshop to create the panorama presented in the figures.

2.7 STATUTORY DOCUMENTS

Relevant statutory documents in terms of Landscape Values and Visual Amenity are referred to below are the Resource Management Act 1991, and the Waimakariri District Plan.

2.7.1 Resource Management Act 1991

Section 6 of the RMA identifies matters of national importance:

“In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- s.6 (a) *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;*
- s.6 (b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development;*
- s.6 (c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.”*

Other matters are included under Section 7:

“In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to-

- (c) *The maintenance and enhancement of amenity values.”*

2.7.2 Waimakariri District Plan

Under the Waimakariri District Plan, the proposal site is zoned Rural.

The proposal is not located in either an Outstanding Natural Landscape (ONL) or Visual Amenity Landscape (VAL). There are several policies in the Rural Objectives and Policies of the Waimakariri District Plan which relate to Landscape Values and amenity which have been addressed in 3.3 below.

3. ASSESSMENT OF EFFECTS

3.1 EXISTING SITE CHARACTER

The receiving environment of the Lower Canterbury Plains is characterised by large open paddocks, with boundaries often delineated by well-established shelter belts of exotic species and rural dwellings surrounded by large trees. The relatively flat landforms flow from the base of the Southern Alps to the Port Hills in an assortment of agricultural fields, criss-crossed with roadways and shelterbelts. The existing site is bound by Mill Road to the north, Whites Road to the east and Bradleys Road to the west. The northeast of the site borders onto the edge of Ohoka village centre with a typical rural residential character with an increase in the number of dwellings, hard surfaces, and infrastructure present in the landscape. Two main existing waterways, being the Ohoka Stream and the Ohoka South Branch, run east-west across the site, feeding into the Kaiapoi River to the east of Kaiapoi. The proposal site has relatively flat topography and has typical rural characteristics found within the Canterbury Plains including shelterbelts, auxiliary structures, and rural residential dwellings. Overall, the topographical attributes of the receiving environment are relatively low with no other defining features to note.

The existing land type of the Lower Canterbury Plains was acknowledged by Boffa Miskell in the Canterbury Regional Landscape Study Review (2010) as forming part of the L2 – Lower Plains Land Type. A landscape formed from low angle coalescing outwash fans and associated low terraces of the major rivers that slice through the plains, comprising Pleistocene glacial outwash gravels and minor inland dune belts.

Vegetation types in the receiving environment are predominantly exotic species, with small amounts of native species located near some waterways and paddock boundaries. Vegetation is used predominantly for shelter belts running along the paddock boundaries and includes species such as *Pinus radiata*, *Cupressus macrocarpa*, and *Eucalyptus* varying in height between 7 – 15m. The shelter belts are orientated to block the prevailing winds and are primarily located to delineate property boundaries, and along small parts of the roads. The majority of the site is open grass fields, which is disrupted occasionally by clusters of vegetation, and the two main water ways running east-west across the site.

Indigenous vegetation has been identified in the Canterbury Regional Landscape Study as being reduced to small, isolated, and scattered remnants because of the large-scale land use changes seen throughout the plains. This has resulted in 0.5% of the plains supporting native vegetation. This is seen in the existing vegetation patterns found on site, comprising largely of exotic species, which have been used for their ability to fulfil a role as fast growing shelterbelts. This is typical of the rural setting surrounding the site. Overall, the vegetation cover in the area has a low sensitivity to change, given the high level of fast growing introduced exotic species. The section of the Ohoka Stream adjacent to the domain is heavily planted with native species having recently been regenerated in the last 20 years.

In terms of sensory qualities, the flat open geometric fields are back dropped by the Southern Alps to the west. Views are possible intermittently, being screened by existing development and shelterbelts. The infrastructure and shelter belts, though disrupting the continual views, have become integral to the rural aesthetic and identity. The natural characteristic of the environment is considered to be modified, with a rural character as opposed to a natural character. The land surrounding the proposed site mirrors the overall character of the wider Canterbury region.

In terms of built form, dwellings and farm structures are common throughout the area. The scale, character, form, and materiality of these structures vary throughout the receiving environment. There are a number of existing dwellings adjacent to the proposal along Mill Road and Whites Road. Dwellings are of typical rural residential character, having irregular bulk and location which are often supported by additional infrastructure and are separated by large fields and exotic vegetation. The proposal site is directly adjacent to the existing Ohoka settlement including the Domain. It is approximately 4.5km to the west of Kaiapoi where development has a typical medium density suburban character, and 2km northeast to Mandeville Village where development has a typical rural suburban character and density.

Overall, the receiving environment has a rural, semi-open character on the outskirts of rural suburban development with some areas exhibiting a high level of compartmentalisation (eastern side of Whites Road). The existing environment has various structures including dwellings, auxiliary structures, power lines and exotic vegetation clustered throughout the landscape, typical of rural landscapes within Canterbury.

NATURAL CHARACTER

There are two main waterways which run through the proposal site being the Ohoka Stream and the Ohoka South Branch. Both streams are shown in the proposed ODP running in a west-east direction across the site to eventually feed into the Kaiapoi River. Within the site the waterways are predominantly bordered by either exotic species in the form of shelter belts or individual trees, notably poplars and willows. Large portions of the



Figure 1 - Waterways running through proposal site. No native species of note were identified waterways are open with no shade. The waterways have soil banks with a small degree of modification noted but in general the channels are somewhat naturalised with soft, as opposed, to hard edges visible. No timber or

concrete structures were noted. Some localised signs of erosion were visible, highlighting natural processes, but not to a degree where they influenced the character of the waterways.

No indigenous species of note were noted but to the southeast of the site, below Whites Road, the stream corridor has been planted extensively with native species although large numbers of weed species were also present. This shows the potential for the waterways to become native corridors through the block but presently the waterways are considered to have a low to moderate sensitivity to change.



Figure 2: Native riparian planting in Ohoka Bush as well as weed species

3.2 EFFECTS ON LANDSCAPE CHARACTER

Landscape character is the combination and composition of biophysical elements such as topography, vegetation, built form and sensory qualities perceived by humans. Landscape character is also spiritual, cultural, and social associations.

The character of the receiving environment is semi-open, to the west it is rural and is used principally for agricultural purposes. To the east and south the character undergoes subtle changes from a rural to a rural residential character with lifestyle blocks and associated dwellings and landscaping creating a smaller compartmentalized pattern leading to a reduction in open character when compared to the open paddocks to the west.

To the north and north-east the Ohoka North Stream and Ohoka Stream meander through the Ohoka settlement. The densely vegetated margins of these naturalized waterways create a landscaped foil for the village and provide it with a sense of enclosure. The landscape character within and immediately surrounding the village is

one of denser vegetation with a strong verticality created by mature specimen trees contrasting the flatness of the wider surrounding rural area.

The proposed development modifies the landscape of the Site from one that is semi-open and agricultural in character to one that is denser and more developed in nature, where infrastructure and amenities are more concentrated. Whilst the proposal does not physically modify the surrounding rural farmland and the surrounding lifestyle blocks, it changes the land use of the Site and brings with it changes to the visual amenity and rural outlook currently experienced by adjoining properties.

To integrate the proposed development the ODP introduces several measures to retain and introduce aspects of rural character through the mitigation of fencing types/position, protection of existing large trees where possible, additional landscape planting and bulk and location of development. The ODP also proposes design features and landscape detailing focused on the public environs such as the naturalisation of waterways, protection of springs and spring water flows, and street layouts of a rural typology. This approach will assist in retaining larger areas of open space and a generally rural character and amenity within the development assisting with its integration into a landscape character of Ohoka and the wider rural environment.

The character of existing housing is typically single storey detached dwellings, which the proposal intends to continue, albeit at a higher density and with the possibility of more two storey houses, a school or a retirement village.

EFFECTS ON NATURAL CHARACTER

The natural character of the Site is highly modified, having been cleared for agricultural use but retains some natural features being the two main waterways. The proposed ODP has incorporated these into the design and will ensure their protection and enhancement. Ten metre wide buffer strips have been proposed along the waterway corridors, which will be combined with the green network (native planting and weed management) to create ecological and movement corridors. No works are proposed to the stream banks except where crossing points are located. Where crossing points are proposed, care will be taken to ensure any earthworks within the riparian margin are minimised. The waterways current conditions reflect the existing agricultural practices with the lack of native riparian vegetation present, an aspect which will be improved with the proposed ODP. Existing amenity of the natural landscape is to be enhanced and retained through the planting, the restoration of blue networks and the development of green corridors through the proposal, especially along identified waterways as shown on the ODP.

In addition, the ODP identifies and protects local springs and introduces a spring channel, separated from other surface water flows. This creates a third naturalised waterway adding to the natural character of the site. In terms of natural character, positive effects are expected to result from the proposal.

OVERALL LANDSCAPE CHARACTER EFFECTS

Overall, the character and land use of the area will shift from semi-open and agriculturally focused to a more compartmentalised character, high amenity urban development. Through several mitigation measures, the village-like urban character will be retained and enhanced, where possible.

3.3 EFFECTS ON LANDSCAPE VALUES

WAIMAKARIRI DISTRICT PLAN – RURAL ZONES

The proposed plan change area is zoned Rural. The Waimakariri District Plan has identified Outstanding Natural Landscapes and Features. The ODP is not located within a Landscape of value. The Objectives and Policies which are considered relevant to this Plan Change from a Landscape perspective follow:

Objective 14.1.1

Maintain and enhance both rural production and the rural character of the Rural Zones, which is characterised by:

- *The dominant effect of paddocks, trees, natural features, and agricultural, pastoral, or horticultural activities*
- *Separation between dwellinghouses to maintain privacy and a sense of openness*
- *A dwellinghouse clustered with ancillary buildings and structures on the same site*
- *Farm buildings and structures close to lot boundaries including roads*
- *Generally quiet – but some significant intermittent and/or seasonal noise from farming activities*
- *Clean air - but with some significant short term and/or seasonal smells associated with farming activities*
- *Limited signage in the Rural Zone*

The proposed plan change has given careful consideration and application of design treatment to matters such as road hierarchy and streetscape, diversity of density, spatial layout, and existing and proposed blue and green networks to help the retention of the open and spacious rural character. While maintaining aspects of openness and rural character where possible, the development will not have any significant effects on aspects such as noise or smell of the wider environment. The proposal has located larger residential lots near regions of higher rural character to maintain rural amenity and allow the plan change to appear as a gradual extension of the existing Ohoka settlement. Aspects of rural character are to be maintained on the proposed Plan Change Site and through design and mitigation measures along the boundaries adjoining land will not be adversely effected by the proposal.

Policy 14.1.1.1

Avoid subdivision and/or dwelling house development that results in any loss of rural character or is likely to constrain lawfully established farming activities

As stated above, the Plan Change has carefully considered the importance of the existing rural character in the receiving environment. The proposal is bound on three sides by residential development of varying densities, and the Plan Change is likely to appear as a natural extension of this. The proposal is not likely to constrain established farming activities nearby due to the existing road reserves of Bradleys Road and Whites Road forming generous buffers. This will be further aided by the proposed Landscape Treatment along the site boundary to the east and west of the Site. To the south, existing boundary vegetation is to be retained to complement the new landscape treatment which will fully enclose the site along the boundary it shares with rural lifestyle blocks. This specific edge treatment will ensure that any effects on the existing rural environment to the south introduced by the overall change in land use and density is minimal.

Policy 14.1.1.2

- *Maintain the continued domination of the Rural Zones by intensive and extensive agricultural, pastoral and horticultural land use activities*

While the receiving environment is zoned Rural, there has been a significant shift from high amenity productive land to one that has a higher density of dwellings. The proposal is bound on three sides by residential development of varying densities, with more intensive, productive farming occurring to the north and northwest.

Policy 14.1.1.3

Maintain and enhance the environmental qualities such as natural features, air and noise levels, including limited signage and rural retail activities that contribute to the distinctive character of the Rural Zones, consistent with a rural working environment

The Plan Change proposes to enhance and maintain the natural waterways running east-west through the site. Commercial activity is proposed in two locations within the development, both near or adjacent to Ohoka features, such as Mill Road and the Domain. The Plan Change seeks to enhance the natural village centre of Ohoka while maintaining its local scale and rural character. Locating the business zone near existing development ensures possible effects including quantity of signage visible and noise levels are minimised and concentrated to an area with existing levels of noise and signage.

Policy 14.1.1.4

Maintain rural character as the setting for Residential 4A and 4B Zone.

The proposed Plan Change does not directly adjoin any existing Residential 4A or 4B Zones. The outlook for existing Residential 4A and 4B Zones will remain one that is more open and rural in character.

3.4 EFFECTS ON VISUAL AMENITY

The visual context of the receiving environment is considered to be a 1.5km offset from the edge of the proposed development. This distance has been used due to the receiving environment’s flat topography, resulting in views from further away either not being possible or being indiscernible at distance. A series of key viewpoints were selected to show a representative sample of the likely visual effects which could result from the proposal (refer to Appendix 1 for the relevant photos). Viewpoints are generally located on public land, and where possible located as close as possible to existing or proposed residential dwellings. In assessing the potential effect of a proposal, the quality and openness of the view is considered. These were as follows:

- 1) View south west from 318 Whites Road
- 2) View south west from 410 Whites Road
- 3) View south from 535 Mills Road
- 4) View south from 301 Bradleys Road
- 5) View south east from 231 Bradleys Road
- 6) View south east from 205 Bradleys Road

In assessing the potential effects on visually sensitive receptors, the key viewpoints outlined above have been used as a reference point where it is considered that the effects are likely to be similar to the viewpoint and for a group of viewers. The viewpoint is a representative view, as close as possible to the view likely to be experienced from a private residence or property but obtained from a public location.

The following table outlines the potential visual effects each Visually Sensitive Receptor might receive. The effects take into account the likely sensitivity of the receptor (based on type), combined with the likely magnitude

of effects (a combination of distance from the proposal and degree of change) to determine what the likely residual effects from the proposal will be.

Table 2: Assessment of Effects on Visually Sensitive Receptors

Viewpoint	Visually Sensitive Receptors (VSR)	Distance from Proposal (m)	Type of View (open, partial, screened)	Sensitivity of VSR	Magnitude of Change	Mitigation Measures	Effects after mitigation
1	Residents at properties at 241 and between 296 - 372 Whites Road	30	OPEN	High	Low	MM5, MM6, MM7, MM8	Minor
	Vehicle users along Whites Road	0	OPEN	Low	Very Low	MM5, MM6, MM7, MM8	Less than Minor
2	Residents at 401, 505, 507 Whites Road	0	OPEN	High	Low	MM1, MM5, MM6,	Minor
	Vehicle users along Whites Road	0	OPEN	Low	Very Low	MM1, MM5, MM6, MM7, MM8	Less than Minor
3	Residents at 540, 536 Mill Road	30	OPEN	High	Low	MM1, MM2, MM3, MM5, MM6	Minor
	Vehicle users along Mill Road	0	OPEN	Low	Very Low	MM1, MM2, MM3, MM6	Less than Minor
4	Vehicle users along Bradleys Road	0	OPEN	Low	Very Low	MM1, MM4, MM6, MM7	Less than Minor
5	Vehicle users along Bradleys Road	0	OPEN	Low	Very Low	MM1, MM4, MM6, MM7	Less than Minor
6	Residents at 205 Bradleys Road	30	OPEN	High	Low	MM1, MM4, MM6, MM7, MM8	Minor
	Vehicle users along Bradleys Road	0	OPEN	Low	Very Low	MM1, MM4, MM6, MM7, MM8	Less than Minor

3.5 SUMMARY OF EFFECTS ON VISUAL AMENITY.

In terms of visual effects, the proposed development is considered to have the following residual effects.

Effects on nearby residents

The bulk and density of the proposal is consistent with the character of the adjacent urban environment with the inclusion of the proposed mitigation measures ensuring a high level of amenity can be retained. The largest potential adverse effects are for residents at 241 and between 296 – 372, 401, 505 and 507 Whites Road and 536 and 540 Mill Road due to their semi-open and open views towards the Site, although in many cases views are already screened due to existing landscape planting on the VSR properties. Other residents adjacent to the proposal will have open views towards the lowest density proposed (Residential 4A), not likely to result in adverse effects of note although there will be a change. Given the scale, form and underlying design of the proposal, , most residents will, due to their separation from the proposed development by existing roads and by either existing or proposed landscape (Treatments A and B) planting, experience adverse effects which will be Minor overall with an acceptable level of change.

Changes experienced by residents living within the village centre on Mill Road will be acceptable and to some extent positive as the proposal provides a more cohesive village main street whilst retaining its rural characteristics. However, views into the Site from existing properties on the southern side of Mills Road will change due to the land use change. The effect of this change is considered Minor as there are alternative views available and residential activities and dwelling orientation are focused away from this southern view.

All Mill Road residents can reasonably expect development in such close proximity to the village centre to occur over time.

The landscaped Ohoka Stream, in particular the tall trees will provide a backdrop for the southern views further reducing the impact of denser development.

Effects on the streetscape and users

Views of the proposal are generally semi-open or open from the surrounding roads. Given the scale and character of the proposed development, when compared with the existing residential and rural character, and combined with the lower sensitivity to change, adverse effects for streetscape users are likely to be less than minor. For the sections along Whites Road and Bradleys Road, where potential adverse effects could result from the long stretch of development, vehicle access is limited, and density is proposed to be lower to maintain a more open character. In addition, on both roads the natural road sequences created by the slight narrowing and elevation of the waterway crossings have been accentuated through landscape treatment creating thresholds.

Along these approaches the development is also broken up by the waterways and new landscape stormwater management areas providing larger breaks in the built form and allowing views deeper into the Site.

For those viewing from public environments, the proposal would result in a change in character from one semi-open and rural to one that is denser and more developed in nature. Aspects of openness will to be maintained through the restoration and retention of blue and green networks, alongside the bulk and location of development.

Effects on Domain and users

The proposal locates a small commercial area and a special purpose zone directly west of the local Domain across Whites Road. This addition to the village centre will introduce a positive change to the area and has the potential to activate the Domain. The new commercial area will be seen as a part of the village centre activities in

proximity to the existing commercial area at the intersection. The provision of a local village square and greenspace within the commercial centre will allow for generous landscaping to provide scale and context.

The Ohoka Stream with its landscaped, tree-lined margins separates the commercial node from the special purpose area. This creates a landscaped foil for both zones to integrate into the village as the existing trees will partially screen buildings and in particular break roof line. The limit on GFA for the commercial premises also ensure that the build form will be broken up and be of a scale suitable for Ohoka.

4. MITIGATION MEASURES

The following mitigation measures are suggested to either avoid, remedy, or mitigate any potential effects on Urban Design, Landscape Character, Landscape Values and/or Visual Amenity from the proposed Plan Change:

MM1	Provide a diversity of house size and lot size to provide choice, with higher density development located close to existing residential areas, areas of high amenity and business areas.
MM2	Create streets which have a high level of amenity, provide for different modal allocation, and allow for an efficient use of land by having a street hierarchy with different road reserve widths depending on their classification. Indicative cross sections are shown on page 13, Appendix 1 to show how the street network can be developed to retain a low-key, residential village character.
MM3	Create a well-connected walking and cycling network which combines with the green / blue network and existing facilities connecting to key destinations (Domain, Ohoka Bush), prioritising walking and cycling with a mix of on-road, separate, and off-road facilities to promote active transport modes. Potential key connections are identified on the ODP and may be supplemented through additional connections provided for at the time of subdivision consent.
MM4	Minimise direct vehicle access onto Bradleys Road for individual properties where possible to allow for a high-quality landscape treatment along this corridor and minimize potential effects on this road. Where direct access is necessary, likely for large-lot residential properties, it is recommended that entrances are combined/consolidated for up to 6 properties.
MM5	Provide a quantity and quality of greenspace and facilities appropriate for the future population with green links extending through the plan change area and connecting with adjoining recreation areas and blue networks. This includes the protection of the existing waterways and their enhancement with future riparian plantings.
MM6	Solid fencing should preferably be restricted to rear and side yards to retain an open character along streets and existing roads or at a minimum front boundary fencing will have restrictions. Side fencing should not extend forward of the front wall closest to the street of a house or would need to be limited in height. Solid fencing is also not permitted on Whites or Bradley Road frontages (see MM7 below)

	<ul style="list-style-type: none"> This is a matter that would be incorporated into developer covenants that manage and implement specific design outcomes sought within the plan change areas.
MM7	<p>Landscape Treatment A is designed to retain a rural residential character along Whites and Bradley Roads as shown on the ODP. The landscape treatment is proposed as a 10m wide strip and is to consist of a post and rail fence or post and wire fence with the installation of solid fencing within this strip not permitted. A double row of landscape planting is proposed along the road boundary consisting of:</p> <ol style="list-style-type: none"> The outer row (adjacent to the road boundary fence) is a hedge species with a minimum maintained height of 1500mm consisting of one, or more, of the following species (planted at 1000mm centres): <ul style="list-style-type: none"> Griselinia littoralis Pittosporum tenuifolium or similar Korokia species Prunus lusitanica The inner row is to be planted 2m from the centre of the hedge row and is to consist of specimen tree species at a maximum distance of 3000mm centre. There is no specific species specified but tree species selected should be able to grow to a minimum height of 8m when mature.
MM8	<p>Landscape Treatment B is designed to provide a visual buffer between the ODP and adjacent rural land to the south. The treatment consists of a single row of shelter belt trees (maximum spacing of 2000mm centres), using one, or more, of the following species:</p> <ul style="list-style-type: none"> Popular Macrocarpa Pittosporum Totara Ribbonwood, or similar

5. CONCLUSIONS

In terms of landscape character (including natural character) and values of the area, subject to the mitigation measures proposed, the proposal will result in an acceptable magnitude of change on the existing rural landscape character and values. The existing character of the Plan Change area is already highly modified and with the proposed mitigation measures both protecting and enhancing existing waterways, the proposal will retain existing natural features. The semi-open character of the site will change to a character which is more dense and compartmentalised (similar to the properties on the eastern side of Whites Road) but can be partially mitigated through fencing controls and landscape planting to retain a high level of amenity.

In terms of visual amenity, the adjacent rural properties will experience a change in the openness of views across the space. Adjoining residential properties, current and future, overlooking the Plan Change area have a mix of open, partial, and screened views of future development. The changes in the landscape experienced by these residents are considered Low given the character of the existing environment, the existing high level of compartmentalisation and the ability to retain/create a high amenity environment along both Whites and Bradleys Roads.



Appendix F

Urban Design Assessment



OHOKA - MILL ROAD DEVELOPMENT

URBAN DESIGN STATEMENT

21/02/2022 | FINAL v2

report by

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