August 2016

1765-1785 River Road
Stream Ecology Assessment

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1.0 Introduction

1.1 Background

Ryman Healthcare Ltd is proposing to construct and operate a retirement village at 1765 – 1785 River Road in Hamilton. The proposal involves realigning and restoring a section of watercourse, filling a small artificial stock water pond and piping a section of highly modified watercourse within the property.

This report assesses the aquatic and riparian ecological values of the watercourse and assesses the effect of the proposed retirement village on those values. Section 1 describes the site and catchment, Section 2 describes the study methods, Section 3 describes the existing environment and Section 4 assesses the effects on the existing ecological values.

1.2 Site Description

The site is located within the headwaters of an unnamed, highly modified, first order watercourse that enters the Waikato River downstream of Featherstone Park. The watercourse catchment has been highly modified through residential land use north of River Road and agricultural land use between River Road and the boundary with Featherstone Park. North of River Road the watercourse has been fully piped as part of the residential development that has occurred in recent years.

The site is bounded by River Road to the north, residential housing to the east and west and the Waikato River to the South (Figure 1). The property slopes gently from River Road in a north – south direction. A shallow gully runs from the culvert at the River Road boundary in a south westerly direction exiting the site on the western boundary and entering Featherstone Park.

2.0 Methodology

2.1 Freshwater Ecological Values Assessment

The status of the watercourse within the property was assessed using the guidance and definitions within the Waikato Regional Plan. Watercourse sections were categorised as ephemeral or perennial in accordance with the Waikato Regional Plan:

*Ephemeral streams flow continuously for at least three months between March and September but do not flow all year.*

*Perennial streams are defined as a stream that flows all year round assuming average annual rainfall.*

The approach adopted for the in-stream and riparian habitat assessment was selected after a site walk over on 5 July 2016 that involved walking the full length of the watercourse within and downstream of the property. In-stream and riparian habitat was not assessed using the Stream Ecological Valuation (SEV) methodology advocated by some regional councils as the watercourse was classified as ephemeral and the SEV methodology is not able to be used on this type of watercourse.
Figure 1: Site location.
The benthic invertebrate community in the watercourse within the property and within Featherstone Park was sampled on 26 July 2016. Samples were collected using a kick-net (0.5 mm mesh) and following the soft-bottomed Protocol C2 in Stark et al. (2001). Samples were preserved and key taxonomic groups identified in order to get a general understanding of the type of benthic invertebrate community present.

3.0 The Environment

3.1 Rainfall Prior to the Assessment

There was less than 1 mm of rain recorded at Hamilton Airport in the week prior to the stream survey on 5 July 2016. A total of 136 mm of rain was recorded at Hamilton Airport in June 2016 which compares to 69 mm in June 2015 and 109 mm in June 2014.

3.2 In-stream and Riparian Habitat

The in-stream and riparian habitat of the watercourse within the property is in a highly modified state and reflects the historic agricultural land use and channelisation. The entire length of the watercourse within the property is characterised by poor quality riparian vegetation dominated by pasture grasses, deciduous exotic trees and blackberry that provides very little channel shading (Figure 2).

Water enters the property via a 525 mm stormwater pipe beneath River Road (Figure 3). The area immediately downstream of the River Road culvert is typical of a scour zone downstream of a stormwater outfall and is characterised by sandy substrate and moderately turbid water.

There is a 10 m long section of watercourse between the River Road culvert and the pond. Google Earth historical images show that the pond did not exist prior to May 2009. Prior to May 2009 the gully where the pond is now located appears in historical images as long grass with no discernible stream channel (Figure 4). It is likely that sometime after May 2009 the culvert beneath the farm track crossing became blocked resulting in water backing up until it reaches the crest of the dam (track crossing). Views of the pond are shown in Figure 2 (insets 1 – 3) and Figure 5.

Downstream of the pond the watercourse is a mixture of artificially created channel and overland flow path (Figure 2 insets 4 – 10) and Figures 6 and 7. Throughout this section there was no channel sorting processes evident and pasture grasses covered the channel.

The Featherstone Park culvert invert level is set above the bed of the water course and at the time of the survey water was backed up behind the culvert (Figure 2 inset 11) and Figure 8. The riparian margins of the watercourse within Featherstone Park have recently (within the last 5 years) been planted (Figure 2 insets 12 – 16) and Figure 9. Some water was present in deeper parts of the channel and upstream of a culvert within Featherstone Park.

At approximately photo point 16 (see Figure 2) the channel gradient increased and the geology changed to sand. The watercourse channel between photo point 16 and its confluence with the Waikato River was dry (Figure 2 insets 17 – 19) and Figures 10 and 11.

The watercourse enters the Waikato River via a poorly defined channel amongst willows (Figure 2 inset 20 and Figure 12).
Figure 2: View of watercourse habitat within and downstream of the property.
3.3 Biological Communities

The benthic invertebrate community in the watercourse within the site was limited to water and habitat tolerant taxa that are able to exploit temporary habitat and poor water quality environments and included chironomids and worms and a single amphipod (Paracalloipe) that is most likely to have come from the farm pond immediately upstream and which provides permanent aquatic habitat. No EPT taxa, snails or other insect groups were recorded from the sample collected within the site.

The benthic invertebrate community in the watercourse within Featherstone Park was limited to water and habitat tolerant taxa included chironomids and worms, a single snail and numerous Paracalloipe. No EPT taxa or other insect groups were recorded from the sample collected within Featherstone Park.

The fish community in the watercourse within the property is highly likely to be limited to a small number of eels living in the artificial stock water pond and for this reason the fish were not sampled during the survey.

![View of watercourse immediately downstream of the River Road culvert.](image)

**Figure 3:** View of watercourse immediately downstream of the River Road culvert.
Figure 4: Aerial view of the site in May 2009.
Figure 5: View of artificial pond downstream of the River Road culvert.

Figure 6: View of watercourse between the pond and the Featherstone Park culvert.
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Figure 8: View of watercourse immediately upstream of the Featherstone Park culvert.
Figure 9: View of watercourse within Featherstone Park.

Figure 10: View of dry watercourse channel within Featherstone Park.
Figure 11: View of dry watercourse channel within Featherstone Park.

Figure 12: View of watercourse where it enters the Waikato River downstream of Featherstone Park.
4.0 Assessment of Effects

The proposed retirement village involves piping of a section of the highly modified watercourse (channel and pond) and realigning, restoring and enhancing sections of the watercourse upstream and downstream of the piped section (see BECA 2016). Based on observations during site visits in July (lack of evidence of channel sorting processes and pasture grass covering the ‘channel’) the watercourse was assessed as ephemeral.

Because of the ephemeral status of the watercourse and its low ecological status the proposed piping will have no adverse effects and as a consequence mitigation in the form of offsite stream habitat restoration is not recommended. The realigned watercourse will be restored and enhanced by planting the riparian margins using locally sourced native plants which will have a positive overall effect. With the ephemeral nature of the upstream habitat within the property and the piped catchment upstream of River Road there will be little attraction to upstream migrants such as eels. The proposed pipe within the property will not be a barrier to fish with good climbing ability such as elvers. If eels are currently present they are expected to be able to negotiate the new pipe and utilise the section of restored watercourse between the pipe and River Road. It is recommended that native fish be captured from within the artificial farm pond within the site using baited fyke and minnow traps and from the watercourse using an electric fishing machine and relocated to the Waikato River prior to works in the watercourse.

The earthworks associated with the development of the site has the potential to result in sediment runoff to the watercourse and the Waikato River. The Civil Design Report prepared by BECA (see BECA 2016) details the sediment controls associated with the proposal. With the site sediment control and management, adverse effects on downstream water quality will be avoided.

The discharge of treated stormwater from the proposed development has the potential to alter the hydrology and water quality of a watercourse (approximate length = 300 m) downstream of the site. BECA (2016) sets out the proposed stormwater treatment and management for the site. The northern stormwater catchment will discharge to the watercourse on the western boundary (immediately upstream of Featherstone Park) after retention on site and treatment via a Stormwater 360 device. The stormwater treatment target outlined in BECA (2016) is 75% removal of suspended solids. With the proposed level of stormwater treatment and detention no adverse effects on the watercourse within Featherstone Park are anticipated.

5.0 References


6.0 Report Signature Page

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