SPECIALIST ASSESSMENT – NATURAL ENVIRONMENT CRITERION

PALMERSTON NORTH REGIONAL FREIGHT HUB MULTI CRITERIA ANALYSIS AND DECISION CONFERENCING PROCESS

PREPARED FOR KIWIRAIL

June 2020

Assessment – Natural Environment

1 Introduction

Date: 18 September 2019
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The following is a comparative assessment of long list site options to inform the MCA workshop for KiwiRail's future Palmerston North Rail and Freight Hub.

This assessment has relied on the following information:

Department of Conservation:
- Manawatu Plains Ecological District. Survey Report for the Protected Natural Areas Programme.
- DOC Maps (*maps.doc.govt.nz›mapviewer›viewer=docmaps*)

Horizons Regional Council, One Plan:
- Part B.1: Surface Water Management Values
- Schedule F: Indigenous Biological Diversity

Palmerston North City Council District Plan:
- Appendix 17C Schedule of Notable Trees, Groups of Notable Trees, and Habitats of Local Significance
- City Planning Maps (*geosite.pncc.govt.nz*)

Manawatu District Council District Plan:
- Appendix 1A – Wetlands, Lakes, River and Their Margins & Supplementary List
- Appendix 1B – Significant Area of Indigenous Forest/Vegetation (Excluding Reserves)
- Appendix 1D – Trees with Heritage Value
- Zone Maps (*District_Plan_Maps_November_2018.pdf*)

Land Cover Database, Version 4.1
Potential Vegetation of New Zealand (*Iris.scinfo.org.nz)*
Google Earth Pro
Our Environment Maps (*Iris.scinfo.org.nz*)
Stantec Maps (*stns.maps.arcgis.com*)
New Zealand Topographic Map (*topomap.co.nz*)

2 Constraints

Area for Investigation	Constraints - what they are and where they are in the area
Option 1	**Taonui Stream** The upper reach of Taonui Stream flows across the Option 1 area near its northern boundary over a lineal length of approximately 2.9 km. **Whiskey Creek and tributaries** The upper reach of Whiskey Creek and tributaries flow diagonally across the Option 1 area over a lineal length of approximately 5.7 km.
Option 2	**Taonui Stream** The upper reach of Taonui Stream flows across the northern part of Option 2 area over a lineal length of approximately 2.5 km. **Unnamed tributary of Taonui Stream** A channelised waterway flows across part of the Option 2 area towards its northern boundary over a lineal length of approximately 800 metres. **Mangaone Stream** Mangaone Stream flows across the southern end of the Option 2 area in the vicinity of Bunnythorpe over a lineal length of approximately 2.8 km.
Option 3	**Mangaone Stream** Mangaone stream bisects the Option 3 area and flows in the south west direction towards Palmerston North over a lineal length of approximately 4.3 km. **Mangaone Stream tributaries** One tributary to the stream located to the west of Bunnythorpe flows in a south east direction over a lineal length of approximately 3.8 km. The other tributary flows from under Railway Road to the south of Bunnythorpe over a lineal length of approximately 1.3 km.
Option 4	**Unnamed tributaries of Mangaone Stream** At least five small streams cross the Option 4 area which collectively have a lineal length of approximately 3.0 km.
Option 5	**Indigenous Forest Remnant** The Option 5 area contains a remnant area of indigenous forest which appears from Google Earth Pro to be a forest of mature podocarp trees. It has an area of approximately 5 hectares. The forest is located immediately north of the railway line and adjacent to an orchard abutting Cloverlea Road. Podocarp forest or treeland is a habitat type classified as threatened in Schedule F of the One Plan.

	Whiskey Creek and tributary drains The area contains part of Whiskey Creek and two drains feeding into the creek. Whiskey Creek flows in a south west direction along the axis of the option area near its northern boundary. The collective lineal length of Whiskey Creek and tributary drains within the option area is approximately 6.3 km.
Option 6	**Whiskey Creek and tributary drains** The area contains part of Whiskey Creek spanning a lineal length of approximately 2.2 km and a drain running along Tremain Avenue with tributary drains that have a collective lineal length of approximately 7.5 km.
Option 7	**Willow Island Oxbow Lake** The area contains an oxbow lake. This is a habitat type that has a threatened classification in Schedule F of the One Plan and is listed as Willow Island (W9) in Manawatu District Plan, Appendix 1A – Wetlands, Lakes, Rivers and their margins and is a category B place[1]. It encompasses an area of approximately 4.8 hectares. **Indigenous forest remnant** The area contains a small area of indigenous forest of unknown composition to the north of the oxbow lake[2] which encompasses an area of approximately 2.5 hectares. Owing to its riparian situation the forest is defined as a riparian margin habitat type in the One Plan. This habitat type has a classification of At-risk.[3] **Unnamed tributaries of Manawatu River** The area contains a meandering stream with a lineal length of approximately 4.0 km and a stream draining the oxbow lake with a lineal length of approximately 700 metres.
Option 8	**Unnamed tributary of Manawatu River** The area includes the upper and lower reaches to the meandering stream that also extends through Option area 7. The collective lineal length of these sections of the stream is approximately 1.8 km.
Option 9	This option concerns the existing rail and freight yard and presents no natural environment constraints.

[1] For Category B places, Council's consent is required before modification or demolition, and this consent may be granted or refused.

[2] Land Cover Database, Version 4.1.

[3] One Plan, Schedule F: Table F.1.

Assumptions

It is assumed that the streams including drains that occur in all of the option areas will support aquatic ecosystem values that are additional to the flood control and drainage values as specified in Schedule B to the One Plan.

It is further assumed that streams and drains occurring within the footprint of the proposed rail and freight hub would be culverted.

Summary of Constraints

Options	Streams (lineal length (m))	Wetlands (m^2)	Remnant indigenous forests (m^2)
Option 1	8600	-	-
Option 2	6100	-	-
Option 3	9400	-	-
Option 4	3000	-	-
Option 5	6300	-	5000
Option 6	7500	-	-
Option 7	4700	4800	2500
Option 8	1800	-	-
Option 9	-	-	-

Note: Google Earth Pro was used to calculate stream lengths and wetland and forest extents.

3 Natural Environment Criterion Assessment

Approach to the assessment

The assessment has relied on national, regional and local databases, schedules and supporting maps to identify areas of the natural environment including any significant natural features within each of the option areas.

The natural environment criterion for each option area was scored on the basis of a composite evaluation of the following three criteria:

- freshwater waterbodies such as streams and drains;
- wetlands; and

- remnant areas of indigenous forest.

The existence of wetlands and/or remnant areas of indigenous forest dictated the scoring of the option areas concerned based on their threatened classifications as stated in One Plan, Schedule F and in the Manawatu District Plan, Appendices 1A and 1B.

The likely composition of the remnant areas of indigenous forest in the Option 5 and Option 7 areas is based on analysis of Google Earth Pro imagery, the landcover database and the predicted potential vegetation maps, the latter showing indigenous forest composition likely to have existed in pre-human times.

The scoring of the level of constraint that waterbodies (streams and drains) may potentially impose on the proposed hub was based on the collective lineal lengths occurring in each of the option areas. Scores were allocated as follows:

- <1 km = 2/Medium Low
- 1-2 km = 3/Medium
- 3-4 km = 4/Medium High
- 4 km+ = 5/High

Avoidance of some reaches may be possible but it difficult to gauge at this stage of the assessment.

4 Comparative assessment

The overall scores provided in the table below are an average of the sub-scores ascribed to each element of the natural environment.

Area for Investigation	Option assessment	Sub-score			Overall Score
		Streams	Wetlands	Forest remnants	
Option 1	A score of 5 for this option reflects the lineal length of Taonui Stream, Whiskey Stream and tributaries affected by the hub which potentially could be approximately 8600 metres.	5			5
Option 2	A score of 5 for this option reflects the lineal length of Taonui Stream, Whiskey Stream and Mangaone Stream and tributaries affected by the hub which potentially could be approximately 6100 metres.	5			5
Option 3	A score of 5 for this option reflects the lineal length of Mangaone Stream and tributaries affected by the hub which	5			5

	potentially could be approximately 8100 metres.				
Option 4	A score of 4 for this option reflects a lineal length of streams and drains of approximately 3000 metres that could potentially be affected by the hub.	4			4
Option 5	A score of 5 reflects the existence of a remnant area of indigenous forest that is classified as a threatened habitat type and a lineal length of stream potentially affected by the hub of approximately 6300 metres. The forest remnant is considered to be regionally significant based on the threat classification and its very fragmented distribution on the Manawatu Plains. The forest remnant represents a high impact constraint. Avoidance of this feature would be difficult due to its location.	5		5	5
Option 6	A score of 5 for this option reflects the lineal length of Whiskey Stream and tributary drains of approximately 7500 metres that could be potentially be affected by the hub.	5			5
Option 7	A score of 5 is attributed to the occurrence of an Oxbow Lake and associated wetland that is classified as threatened, the occurrence of a remnant area of indigenous forest to the north of the Oxbow Lake is classified as At-risk and a lineal length of stream potentially affected by the hub of approximately 4700 metres. The presence of an oxbow lake and wetland, remnant forest and a meandering stream collectively represents a high impact constraint. Avoidance of these features could be difficult.	5	5	5	5

Option 8	A score of 3 for this option reflects a lineal length of stream of approximately 1800 metres that could potentially be affected by the hub.	3			3
Option 9	No score is provided due to the absence of any natural environment feature within the existing rail and freight hub.				N/A.

5 Conclusions

The high overall scores provided in the comparative assessment table reflect the significant lengths of local streams affected by the site options. In addition Option 5 and Option 7 would affect areas of indigenous vegetation and wetland (in the case of Option 7) that are classified as threatened habitats in the One Plan, Schedule F. The scoring system does not allow for higher scores to be given to Options 5 and 7 and instead represent an average score for the natural environment elements.

Addendum to the Workshop 2 – Natural Environment Assessment

Reasons for the addendum

The reason for this addendum is to provide a:

- record of the reasons why area option 5 was fatally flawed at workshop 2; and
- further assessment of the area options with the masterplan layout applied.

Fatal flaw of area option 5 based on the initial footprint

At Workshop 2 as part of the presentation of the natural environment assessment, I recommended to the workshop participants that area option 5 should be fatally flawed. The reason for this recommendation was that the area affected by option 5 contains a large remnant of mature lowland indigenous forest which is classified as a threatened habitat type in Schedule F of the One Plan. It would be not be possible to avoid this feature if the freight hub was developed in this location and because of its threatened status in the One Plan, any development that encroached on this feature would have significant adverse effects.

The workshop participants agreed with the recommendation, the reason for the recommendation and confirmed that area option 5 should be fatally flawed.

Further assessment

During Workshop 2, participants acknowledged that having a specific site to assess within the areas identified could potentially result in changes to the scores presented at Workshop 2.

As a result, after Workshop 2, the masterplan was applied to the area options assessed in Workshop 2, and sites within those areas identified. The rail connection was included on the refined options, and the implications for connecting to the North Island Main Trunk line were identified.

There are two layout options for areas 1 and 2 (Options 1a, 1b, 2a, 2b). Three layouts were originally developed for area 3, however only one layout was taken forward for assessment because the others did not meet the project objectives. Area 4 could only accommodate one layout option. There were significant constraints at the ends of areas 5 and 6, therefore the parts of these two areas without the constraints were combined to create site 5.

Sites in areas 7, 8 and 9 were not identified as these areas were fatally flawed at Workshop 2.

The following table sets out the Natural Environment assessment and scoring for each of the site options

Site Option	Score	Assessment (Lineal length of stream affected)	Streams affected
Option 1a	3	1500 metres	Mangaone Stream tributaries
Option 1b	3	1100 metres	Mangaone Stream tributaries
Option 2a	2	600 metres	Taonui Stream (270 metres) Mangaone Stream tributary (640 metres)
Option 2b	3	1150 metres	Mangaone Stream (800 metres) Mangaone Stream tributary (350 metres)
Option 3	3	1950 metres	Mangaone Stream tributaries
Option 4	3	1100 metres	Mangaone Stream tributaries
Option 5	4	2200 metres	Whiskey Creek tributaries

Conclusion

The scores provided in the table for the options are lower than the scores provided in the initial assessment dated 18 September 2019. These scores reflects shorter lineal lengths of the affected streams based on more refined hub layouts.

KiwiRail: Palmerston North Rail and Freight Hub Assessment – Natural Environment

1. Introduction

Date: 18 November 2019
Author(s): Simon Beale, Senior Ecologist, BSc (Zoology), BForestry Science
Adam Forbes, Senior Ecologist, BApplSc, MSc, PhD

The following is a comparative assessment of three shortlisted sites to inform the MCA workshop for KiwiRail's future Palmerston North Rail and Freight Hub.

This assessment has relied on the following information:
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New Zealand Topographic Map (*topomap.co.nz*)

2. Constraints identified in each site

Site for Investigation	Constraints - what they are, and where they are in the site and the significance of the constraint
Site 2	**Taonui Stream** The upper reach of Taonui Stream skirts the northern part of the site over a lineal length of approximately 270 metres. **Mangaone Stream tributary** A channelised stream flows across the site in a westerly direction over a lineal length of approximately 640 metres.

Site 3	**Mangaone Stream tributaries** A tributary stream flows in a south to south west direction across the site over a lineal length of approximately 1120 metres on the outskirts of Bunnythorpe. A secondary tributary flows under Railway Road and across the site in a westerly direction over a lineal length of approximately 200 metres. A tributary stream flows in a westerly direction across the site over a lineal length of 620 metres to the south of the Railway Road - Tutaki Road intersection.
Site 4	**Mangaone Stream tributaries** Three tributary streams flow across the site in a westerly direction. These collectively have a lineal length of approximately 1300 metres.

Summary of Constraints

Sites	Streams		Wetlands (m^2)	Remnant indigenous forests (m^2)
	(approximate lineal length (m))	One Plan, Schedule B Values		
Site 2	910	SOS-A, FC/D	0	0
Site 3	1950	FC/D	0	0
Site 4	1300	FC/D	0	0

Key: SOS-A = site of significance – aquatic
FC/D = flood control and drainage

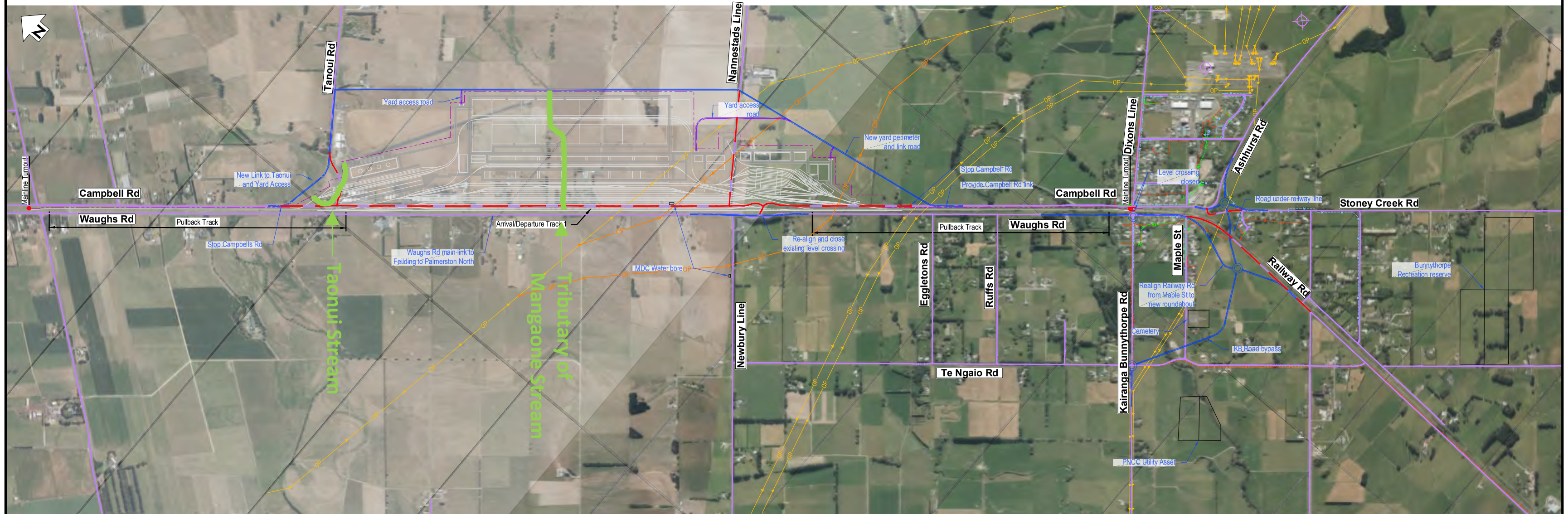
Note: Google Earth Pro was used to calculate stream lengths and wetland and forest extents.

The affected streams are superimposed on the site 2A, 3C and 4 site layout plans.

LEGEND

NEW SERVICES:
- POWER - O/H

EXISTING SERVICES:
- POWER - O/H
- SEWER - GRAVITY
- WATER
- STORMWATER - GRAVITY
- EXISTING ROADS
- PROPOSED ROAD
- INTERNAL ROAD
- STOPPED/CLOSED LINKS
- PROPOSED RAIL BOUNDARY



KiwiRail

Stantec

Job No: 310003007

KIWIRAIL HUB

SITE 2A

Drawn By: VK

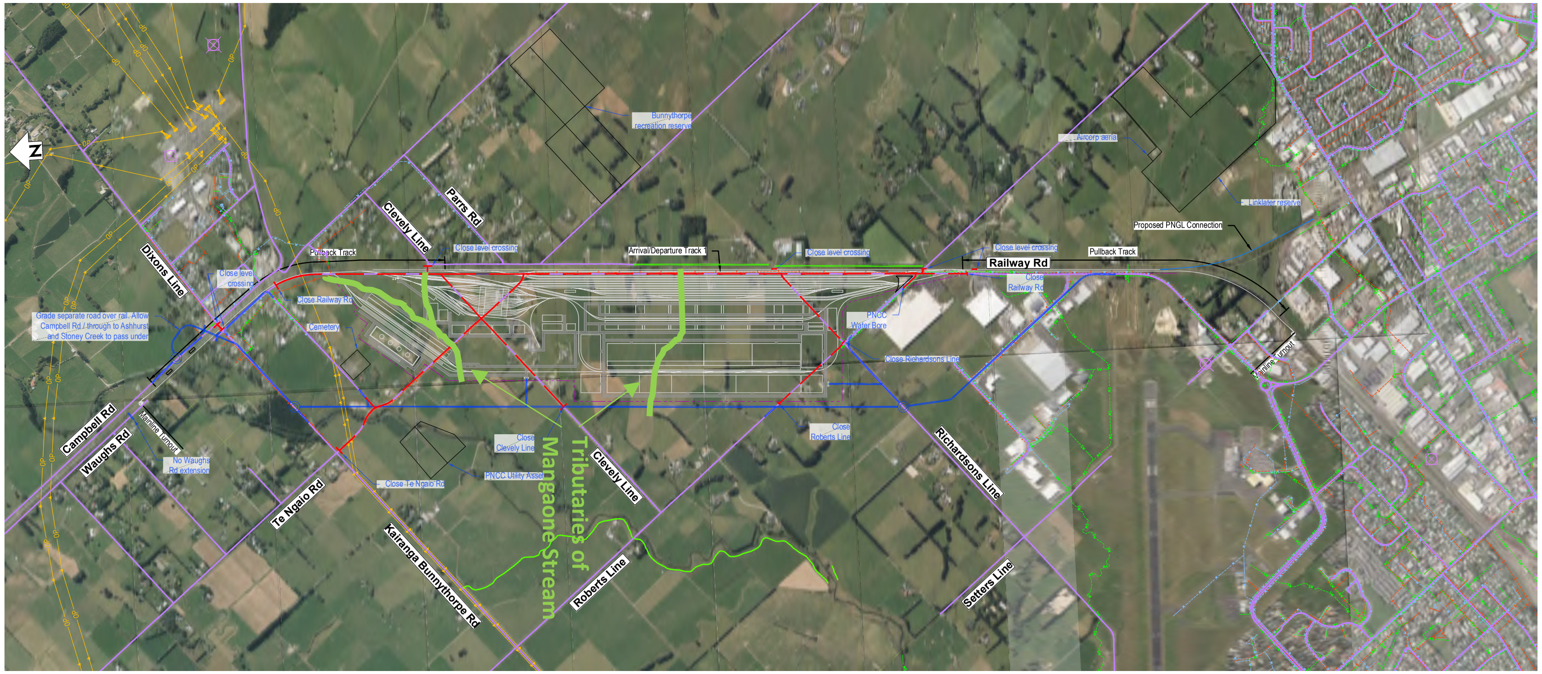
Scale: 1:10000

FIG: 01

LEGEND

EXISTING SERVICES:

- OP — POWER - O/H
- S — SEWER - GRAVITY
- W — WATER
- SW — STORMWATER - GRAVITY
- EXISTING ROAD
- PROPERTY ACCESS ROAD
- PROPOSED ROAD
- INTERNAL ROAD
- STOPPED/CLOSED LINKS
- PROPOSED RAIL BOUNDARY



KiwiRail

Stantec

Job No: 310003007

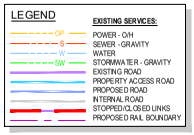
KIWIRAIL HUB

SITE 3C

Drawn By: VK

Scale: 1:10000

FIG: 02



KiwiRail Stantec

Job No: 310003007

KIWIRAIL HUB

SITE 4

Drawn By: VK
Scale: 1:10000

FIG: 03

3. Criteria being assessed

Approach to the assessment

The assessment has relied principally on the master plan layouts for Site 2, 3 and 4, Google Earth Pro imagery and One Plan, Schedule B.

In the absence of wetlands and areas of terrestrial ecological value including remnant areas of indigenous forest in the three shortlisted sites, the evaluation and hence scoring of the level of impact on the natural environment criterion is restricted to freshwater streams that flow across the proposed hub layouts.

The surface water management values set out in Schedule B, One Plan are key attributes of the assessment. Site/reach specific values ascribed to the affected streams within the Mangaone Stream catchment are flood control and drainage (FC/D). The site of significance - aquatic (SOS-A) value additionally applies to the Main Drain catchment which includes Taonui Stream.

However discussions with Mike Patterson, Senior Environmental Scientist from Horizons Regional Council on 4 October 2019 revealed that the affected streams exhibit no clear differences in ecological values. The ability to further differentiate the affected streams is therefore not possible in the absence of field work.

The scoring of the level of impact on streams is therefore based solely on lineal length affected as the differentiator and is consistent with the approach applied to the assessment of the initial nine options (Workshop 2). Scores are allocated as follows:

- <1 km = 2/Medium Low
- 1-2 km = 3/Medium
- 2-3 km = 4/Medium High
- >3 km = 5/High Impact

4. Fatal Flaws

The streams affected by the proposed site 2, 3 and 4 hub layout do not represent fatal flaws owing to the prevailing surface water management classifications of FC/D and expert opinion indicating a lack of clear difference in ecological values between the affected streams.

5. Comparative assessment

The comparative assessment of the natural environment criterion as noted previously is limited to streams that lie with the shortlisted hub layouts.

The summary table indicates that the preferred option is site 2 as the combined lineal length of streams affected is approximately 900 metres as opposed to approximately 1950 and 1300 metres for sites 3 and 4.

Further comparative assessment of the streams is not possible owing to the absence of clear differences in their ecological values.

Summary

Site for Investigation	Assessment of the option	Score
Site 2	A score of 2 allocated to this site reflects a combined lineal length of Taonui Stream and the Mangaone Stream tributary affected by the hub of approximately 900 metres.	2
Site 3	A score of 3 allocated to this site reflects a combined lineal length of the Mangaone Stream tributaries affected by the hub of approximately 1950 metres.	3
Site 4	A score of 3 allocated to this site reflects a combined lineal length of the Mangaone Stream tributaries affected by the hub of approximately 1300 metres.	3

6. Effects Management

It is our understanding that the affected streams would be permanently culverted where these lie within the footprint of the proposed hub.

The impact of the proposed railway hub on the affected stream reaches represents a residual adverse effect as there would be no scope to avoid, remedy or mitigate this effect.

A biodiversity offset would be required to address the residual adverse effect to achieve a net gain outcome in instream ecosystem or biodiversity values within the Taonui and Mangaone Stream catchments. This would entail quantification of the adverse effect and the required positive effects and implementation of an off-site enhancement of an adjacent like for like reach of stream, preferably an unaffected stream reach or reaches within the affected catchments.

7. Conclusions

The scores provided in the comparative assessment summary table for short listed options 2, 3 and 4 are lower than the scores provided in the initial assessment dated 18 September 2019. These scores correlate with smaller lineal lengths of the affected streams as determined from more precise hub layout plans.

Options 2, 3 and 4 do not represent fatal flaws owing to the prevailing surface water management classifications of FC/D and expert opinion indicating a lack of clear difference in ecological values between the affected streams.