Report pursuant to s42A Resource Management Act 1991

In the matter of:	A Notice of Requirement to construct and operate a new intermodal rail and freight hub on land between Palmerston North and Bunnythorpe
And:	A hearing by Palmerston North City Council pursuant to s100A
Requiring Authority:	KiwiRail Holdings Ltd
Hearing date:	9 August 2021

S42A Technical Evidence: Ecology

By: Justine Louisa Quinn

1 Executive Summary

1. I have reviewed the application materials submitted with the notice of requirement ("**NoR**") application for the proposed Kiwirail Freight Hub. My evidence addresses the ecological elements of the NoR application and the natural character assessment as it relates to ecology matters.

2. The Assessment of Ecological Values and Effects ("**Ecology Report**") assesses the ecological values and the level of potential ecological effect of the NoR's proposed activities. Additional regional consents will be required in the future, and further detail is expected to be provided at that time. Due to constraints on Kiwirail's ecologist's access to land in the NoR site, there are some limitations in the on-site information 'informing Kiwirail's ecological values and effects assessment.

3. I consider that the quantum of information collected to date and, in particular, the way it has been presented is insufficient to provide confidence in the conclusions drawn regarding the ecological values of the NoR site. I recognise that the ecologists had limited access to the NoR area, and, consequently, I understand that there are some limitations to the information that can be presented at this stage of the project. That said, these information limitations should be built into Kiwirail's ecological assessment by applying a degree of conservatism, which in my view, Kiwirail has not. In my opinion, the ecological values are likely understated, and the ecological and natural character effects are likely underestimated.

4. Overall, the Ecology Report concludes that the potential ecological effects will be overall 'negligible' and considers that, in some instances, there will be positive effects. Based on the information available, I do not agree with the conclusions drawn and consider that the scale and significance of ecological effects are underestimated. One practical risk of underestimation is that the management of effects to be addressed at the regional consenting phase might not be achievable within the designation extent.

5. I agree that the designation site is degraded and typical of agricultural land use, and I do not consider that the site is fundamentally inappropriate for a large-scale development such as this. However, in the absence of a complete survey of the ecological values of the site I disagree with Kiwirail's conclusion that there will be overall negligible or positive effects – in my view, where there

is insufficient information, more conservative conclusions should be made. Because of the lack of information about the full extent of adverse effects on ecology, I have recommended conditions to provide Kiwirail an avenue to bridge the information gap. With this information available, better decisions can be made about how the Freight Hub's design can address or manage adverse ecological effects.

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2 Introduction

6. My full name is Justine Louisa Quinn. I hold the qualifications of Bachelor of Science (Biology, 2006), a Postgraduate Diploma of Science with Distinction (Environmental Science, 2010) and a Master of Legal Studies (Hons) (Environmental Law, 2016), all from the University of Auckland.

7. I hold the position of Technical Director – Freshwater Science & Ecology at Tonkin & Taylor Limited, Environmental and Engineering Consultants. I have fourteen years' experience in the field of freshwater science and have worked at Tonkin & Taylor since February 2017.

8. I have prepared this evidence on behalf of the determining authority, Palmerston North City Council, in relation to the Notice of Requirement for the KiwiRail Regional Freight Hub ("**the Freight Hub**" or "**Project**") lodged by KiwiRail Holdings Ltd ("**KiwiRail**"). I understand that my evidence will accompany the planning report being prepared by the determining authority (Palmerston North City Council) under section 42A of the Resource Management Act 1991 (the "**Act**").

9. I have the following certifications and experience relevant to this assessment. I have been a Certified Environmental Practitioner (#604) since 2014, and achieved the Ecology Specialisation (CEnvP (Ecology) E21042) in early 2021. I have completed the Ministry for the Environment Making Good Decisions Course. I am a member of the New Zealand Freshwater Sciences Society, the Environment Institute of Australia and New Zealand ("**EIANZ**") and the Resource Management Law Association. I have been active within EIANZ since joining in 2010, holding several roles on the Executive Committee and Auckland Branch, most recently as a mentor.

10. I specialise in water quality and aquatic ecology resource evaluation and management work in freshwater environments. In addition to my specialist areas, I project manage and oversee ecological project work for a range of local authority, industry and developer clients throughout New Zealand. My project work typically includes technical advice on ecology matters, undertaking small to large scale water quality and ecological evaluations, designing and implementing monitoring and field assessment programmes, and assessing the environmental effects for small and large projects. Examples of projects I have recently been involved in include:

a. Te Ahu a Turanga: Manawatū Tararua Highway. I led the freshwater effects assessment, developed a stream offset package and was the freshwater expert in expert conferencing for the resource consenting phase of the project. I was involved in ongoing discussions with mana whenua in the development of the effects management package and Ecological Management Plan. I was subject matter expert for freshwater ecology values in the project team assessing the pre- and post-development natural character assessment. Matters were resolved prior to the Environment Court hearing and no technical expert witnesses were called.

b. Northland Water Supply Reservoirs. I have been the lead ecologist providing ecological advice and developing assessments of effects for several new water supply reservoirs proposed in Northland, including one fast tracked through the COVID-19 Recovery (Fast-track Consenting) Act 2020 (Matawii Reservoir).

c. Drury Metropolitan Centre – Plan Change. I am the lead ecologist for a proposed private plan change in Drury East. The site will be zoned to enable a metropolitan town centre and involves impacts on small streams and on the Hingaia Stream. I am also the lead ecologist for the concurrent Fast Track Application for the Stage One Development of this metropolitan centre. The plan change hearing is taking place in July 2021.

d. Auckland Regional Landfill: I am the lead freshwater ecologist for the proposed Auckland Regional Landfill in North Auckland. I have seen this project through from its commencement to the Council hearing. I am now leading the development of the further ecological work required for the appeal to the Environment Court.

e. I am regularly called upon by Auckland Council's Earth, Stream and Trees Team to provide specialist input to resource consent applications seeking to modify streams in the Auckland region. I have been involved with this team since 2013 and have worked on over 40 applications. In this role I have appeared at Council hearings on behalf of Council several times. I have also provided training to this team and input to the development of guidance documents for the Auckland Council.

11. I am experienced in the development of mitigation, offset and compensation packages. I am experienced in applying the Stream Ecological Valuation ("**SEV**") method, having contributed to the 2011 revised version and co-authored the application of the method to intermittent streams. I regularly apply the SEV method, associated Environmental Compensation Ratio ("**ECR**") and principles of offsetting to developments where stream loss or modification is unavoidable. I am co-author of the recently published terrestrial biodiversity offsetting and compensation paper in the Resource Management Journal.[1]

2.1 Expert Witnesses – Code Of Conduct

12. I confirm that I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that except where I state I am relying on information provided by another party, the content of this evidence is within my area of expertise.

3 Background and Scope of Evidence

3.1 Background

13. KiwiRail is seeking to designate approximately 177.7 hectares of land between Palmerston North Airport and Bunnythorpe for a new Regional Freight Hub.

14. The Freight Hub will consist of a centralised hub incorporating tracks, marshalling yards, maintenance and service facilities, a train control and operation centre, freight handling and storage facilities (including for logs and bulk liquids), provision of access, including road and intersection upgrades where required, and specific mitigation works including noise walls/bunds, stormwater management devices and landscaping. In addition, the North Island Main Trunk rail line will be relocated to sit within the new designation area and directly adjacent to the Freight Hub. The activities at KiwiRail's Tremaine Avenue freight yard (excluding the passenger terminal and the network communications centre) will be relocated to the new site to form part of the new Regional Freight Hub.

[1] M Baber, M Christensen, J Quinn, J Markham, G Kessels, G Ussher and R Signal Ross, *The use of modelling for terrestrial biodiversity offsets and compensation: a suggested way forward*. Resource Management Journal, April 2021.

15. A detailed description of the Project is set out in 6.3 of the AEE submitted by the applicant and a summary description in the s42A Planning Assessment.

16. The Freight Hub will result in extensive modification of the existing rural landuse. The majority of the stream length within the designation area will be culverted or reclaimed,[2] and small areas of vegetation will be cleared to enable the development within the site. Wetlands may be present within the site, which would likely be impacted by the Freight Hub footprint. Native trees will be planted around the boundary of the site and along a newly constructed stream channel.

3.2 Scope of evidence

17. My evidence addresses the ecological elements of the NoR application and the natural character assessment insofar as to ecology matters. In summary, my evidence considers the following matters:

    a. Key issues in contention.

    b. The statutory context.

    c. The adequacy of the applicant's investigations and interpretation of the findings of those investigations.

    d. An overview of the existing environment in terms of the scale and nature of the ecological values.

    e. The likely key ecological and natural character effects (positive and adverse) on the environment of allowing the Project.

    f. The appropriateness of any proposed mitigation measures or monitoring.

    g. Submissions relating to ecological values and effects on these values if the Project is allowed to proceed.

[2] Reclamation (as it relates to streams) is not defined within the One Plan, however the National Planning Standards 2019 are relevant and define reclamation as "*the manmade formation of permanent dry land by the positioning of material into or onto any part of a waterbody, bed of a lake or river or the coastal marine area, and:*
(a) includes the construction of any causeway; but
(b) excludes the construction of natural hazard protection structures such as seawalls, breakwaters or groynes except where the purpose of those structures is to form dry land".

h. An overview of the National Policy Statement for Freshwater Management 2020 and the concept of te mana o te wai in the context of the Project.

18. My evidence should be read in conjunction with the expert evidence of the other experts contributing to the s42A Planning Assessment. In particular, the evidence of Mr Arseneau and Ms Baugham, and Ms Whitby, is relevant to the consideration of matters I address.

19. I recognise that many of the ecological matters will be addressed in more detail at the regional consenting stage, outside of this current NoR process. This is made clear within the Ecology Report and the response to further information request ("**s92 Ecology Response**") from the applicant.[3] However, there is repeated reference in the application materials to the 'very low' or 'positive' ecological and natural character effects resulting from the NoR. These overall 'negligible' effects appear to be a key part of the assessment or justification for this NoR.[4] Therefore, I consider it is important to review the accuracy of the ecology assessment. In my opinion, it is best practice to have a clear understanding of the effects associated with a project at this stage, including over those matters where further consents are required.

20. Therefore, the scope of my evidence considers the information submitted by Kiwirail to support the NoR, the assessment of environmental effects and the conclusions drawn in support of the Freight Hub. My evidence focuses on ecological matters and related methodology within this context, with the knowledge that more detailed assessment will need to occur once detailed design is confirmed through resource consent applications.

3.3 Reports and material considered

21. As part of preparing this statement of evidence, I have read the following reports and documents:

a. Assessment of Ecological Values and Effects Report -s92 (draft), prepared by Boffa Miskell Limited, dated 15 February 2021 (Ecology Report).

[3] Attachment 2b Updated Technical Assessment- Ecology "Assessment of Ecological Values and Effects Report" (updated version compared to original lodged as 'Volume 3, Appendix F') and Attachment 2a: KiwiRail Regional Freight Hub NoR – s92 response Ecology (dated 15 February 2021).

[4] Section 7, Ecology Report.

b. Kiwirail Regional Freight Hub NoR – s92 Response, memorandum from Jeremy Garrett-Walker (Boffa Miskell) to Karen Bell (Stantec), dated 15 February 2021 ("**s92 Ecology Response**").

c. Appendix F4 – Specialist Assessment – Natural Environment Criterion Palmerston North Regional Freight Hub Multi-Criteria Analysis and Decision Conferencing Process. June 2020.

d. KiwiRail Regional Freight Hub Assessment of Environmental Effects, October 2020.

e. Technical Report E – Landscape and Visual Effects Assessment, October 2020.

f. Appendix C – Landscape Plan (draft and indicative) 12 October 2020.

g. Attachment 10 s92 Response Landscape and Visual Effects Assessment, February 2021.

h. Technical Report A – Design, Construction and Operation. October 2020.

i. Technical Report G – Stormwater Flooding Assessment, October 2020.

j. Attachment 6 s92 Requests and Responses – Stormwater, 15 February 2021.

k. Appendix A – Regional Freight Hub Further Information Request s92 response table.

l. Appendix B' Updated NoR Conditions for s92 Response – track changes'.

22. I also spoke with the applicant's ecologist, Mr Garrett-Walker, in a meeting (December 2020) following the distribution of further information requests.

3.4 Site visit

23. I undertook a site visit on 8 November 2020. Due to access limitations, my site visit involved visual assessments of the wider designation area from the roadside. I was able to observe several of the stream systems, evidence of

wetland habitats, and I could clearly see the extent of landscape modification from current landuse practices.

3.5 Statutory Context

24. The statutory documents and provisions relevant to the evaluation of the NoR are set out in the s42A Planning Assessment. To prepare this evidence, I have had particular regard to the National Policy Statement for Freshwater Management 2020 ("**NPSFM**") and the associated National Environmental Standards for Freshwater ("**NESF**").

25. I have considered objectives and policies of the Horizons Regional Council One Plan ("**One Plan**") and NESF insofar as they are relevant to the NoR, including Chapter 5 Water; Chapter 6 Indigenous Biodiversity; Chapter 13 Landuse activities and indigenous biological diversity; Chapter 14 Discharges to land and water; Chapter 16 takes, uses, and diversions of water and bores; and Chapter 17 activities in artificial watercourses, beds of rivers and lakes and damming. The following schedules of the One Plan also apply:

    a. Schedule B Surface Water Management Values and Schedule E – Surface Water Quality Targets

        i. The site is located within the Upper Mangaone Stream (Mana_11d) Water Management Sub-Zone to which the zone-wide values apply and only 'flood control and drainage) as site specific values.

    b. Schedule F – Indigenous Biological Diversity.

26. I provide further discussion in respect of the NPSFM later in my evidence.

4 Existing Environment

27. The existing ecological environment is broadly described at Section 2.1 'the project' and Section 4.1 'site context' of the Ecology Report. The site falls within the Manawatū Plains Ecological District and the Mangaone Stream catchment. The Manawatū Plains Ecological District has flat-surfaced floodplains and terraces, with its original forests and wetlands largely displaced by farming practices. Several tributaries of the Mangaone Stream transect the site east to west, with headwaters in the plains to the east of Bunnythorpe. The Mangaone Stream flows roughly north to south along the western boundary of the designation and discharges to the Manawatu River

approximately 14 km southwest of the site. The landuse within the proposed designation is predominantly rural, with some rural-residential properties present.

5 Data Collection and Assessment Techniques

28. Notwithstanding the limitations to site access and the assertion that field data will be collected to inform regional consenting, I have concerns regarding Kiwirail's approach to assessing ecological values and effects as reported within the Ecology Report. These assessments have implications on the overall effects of the designation and the measures likely to be required to address effects when regional consents are sought.

29. The scope of the Ecology Report (set out at Section 3.2) is as follows:

> This report assesses the ecological values present and the level of potential ecological effects of the proposed activities for which the NoR is sought. For the purposes of this assessment, we have assessed the ecological values of the Designation Extent and the likely ecological effects based on a conservative assessment of the proposed activities for which the NoR is sought. This report outlines:
>
> - The methods of assessment;
> - The existing environment;
> - The ecological values of the site;
> - The potential ecological effects of the Freight Hub; and
> - Recommendations to mitigate potential effects.

30. I have reviewed the Ecology Report in light of this scope.

5.1 Assessment of effects methodology

31. The EIANZ Ecological Impact Assessment Guidelines ("**EcIAG**")[5] have been used to inform the assessment of effects in the Ecology Report. The EcIAG were prepared to provide nationally consistent direction on the approach to be adopted when assessing ecological impacts. This method provides a

[5] Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. 2018. Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

standardised approach to determining ecological values and magnitudes of effects, which combined provides an overall level of ecological effect. In brief, this involves four steps summarised as follows:

a. Determine the ecological value of the environment as being Negligible, Low, Moderate, High or Very High (Step 1);

b. Determine the magnitude of potential ecological effect from each of the proposed activities as being Negligible, Low, Moderate, High or Very High (Step 2);

c. Combine the 'value' at Step 1, with the 'magnitude' at Step 2, to gain an 'overall' level of effect (of Very Low, Low, Moderate, High or Very High) to determine if further measures to manage effects are required (Step 3, shown in Figure 1 below);

d. Re-assess the magnitude and overall level of effect following implementation of measures to avoid, remedy and mitigate effects (Step 4, repeating Step 2 and Step 3).

Ecological Value ▶ Magnitude ▼	Very high	High	Moderate	Low	Negligible
Very high	Very high	Very high	High	Moderate	Low
High	Very high	Very high	Moderate	Low	Very low
Moderate	High	High	Moderate	Low	Very low
Low	Moderate	Low	Low	Very low	Very low
Negligible	Low	Very Low	Very low	Very low	Very low
Positive	Net gain	Net gain	Net gain	Net gain	Net gain

Figure 1: Table of overall effect from the EcIAG (Table 10).

32. I generally agree with the use of the EcIAG because it provides a robust framework against which to measure effects. It is a method I am very familiar with and have applied numerous times myself.

33. The Ecology Report has generally followed the EcIAG approach above to draw conclusions regarding the ecological values and the magnitude of effect but has done so in the absence of much of the on-site information required to support the conclusions reached. I note that the Ecology Report describes the assessment as "conservative".[6] I explain in the sections below why I disagree with this statement.

6 At Section 2.2, and as included at 299 above.

34. I also note that the scope of the Ecology Report includes only recommendations to mitigate the effects of the proposal and does not identify any additional measures to offset or compensate adverse effects.[7] Mitigation measures alleviate the severity of an impact at the point of impact[8] and, therefore, reduce the magnitude and overall level of a given effect (step four at para 31.d above). Where remain residual adverse effects remain after measures to avoid, remedy and mitigate have been implemented, an offset or compensation proposal may be warranted. Measures to offset or compensate residual adverse effects do not reduce the magnitude of effect and therefore the final overall level of effect does depend on what mitigation measures can actually be implemented.

35. I acknowledge that the ecological values and magnitude of effects will be refined at the time of regional consenting. However, they are also effects of the Freight Hub proposal, and I consider they need to be understood in the context of the NoR.

36. In the sections following, I comment on the ecological values and magnitudes relied upon within the Ecology Report and, where necessary, I provide my assessment to identify and explain points of disagreement. For consistency, I have also referred to the same EcIAG methodology as the Ecology Report.

5.2 Overall approach to data collection

37. The Ecology Report draws upon publicly available data from site inventories, national databases, management plans and literature, and data collected from site visits. The Ecology Report identifies that site investigations were undertaken over two days in July 2020.[9] Following further information requests, an additional site investigation was conducted in January 2021.[10] The site

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7 A biodiversity offset is a 'measurable conservation outcome' to address adverse residual effects that cannot reasonably be avoided, remedied or mitigated, in line with certain principles and to achieve a 'not net loss' or 'net gain' standard (Maseyk et al. 2018). While offsetting requires a measurable outcome that has been quantified through a robust and transparent process, biodiversity compensation does not necessarily need to be quantified and measurable (Maseyk et al. 2018; Baber et al. 2021).

8 Maseyk, F, Ussher, G, Kessels, G, Christensen, M and Brown, M. 2018. "Biodiversity offsetting under the Resource Management Act: A guidance document (prepared for the Biodiversity Working Group on behalf of the BioManagers Group, 2018).

9 Section 3.3 of the Ecology Report.

10 The details of this are provided within the s92 Ecology Response. The updated Ecology Report submitted in February 2021 does not include the full description of the site investigations undertaken in January 2021.

investigations were limited to the designation site and did not appear to have considered the downstream receiving environment (the Mangaone Stream).

38. The assessment of ecological values of the site was limited to the following, in part due to site access constraints:

a. 'Potential' wetland habitats were observed from the roadside in January 2021 and wetlands were simply noted as 'not identified' in the updated Ecology Report[11]. Wetland delineations and classifications were not undertaken due to site access constraints.

b. Publicly available data and aerial images were used to identify stream flow paths. Stream classifications were undertaken according to the Auckland Unitary Plan definitions and qualitative habitat assessments were undertaken. Benthic substrates and the presence of aquatic plants and periphyton were visually estimated. However, no specific surveys were undertaken.

c. Freshwater fish data was obtained from a national database. Targeted surveys were intended for January 2021, but the habitat was considered unsuitable for sampling at that time.[12]

d. Macroinvertebrate data was collected from two sites in January 2021.

e. Water quality parameters were not measured as they were deemed not relevant at the NoR stage.

f. Terrestrial vegetation was qualitatively assessed based on visual assessment of current and historic aerial photographs and site observations from accessible areas.

g. Long-tailed bat surveys were not undertaken and deemed unnecessary due to the absence of suitable habitat and no known populations within 10 km.[13]

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11 Refer response to Question 71 in the s92 Ecology Response and Section 6.3 of the Ecology Report.

12 Refer response to Question 74 in the s92 Ecology Response, where it notes sampling was not undertaken as "*the prevailing weather and stream conditions at the time of the second site visit in January 2021 were considered extreme (in terms of temperature, depth etc).*"

13 Refer response to Question 67 in the s92 Ecology Response.

h. Avifauna (bird) records from a national database were obtained, but no site surveys were undertaken.

i. Herpetofauna (lizard) records were obtained from a national database, and aerial images were reviewed for potential lizard habitat. No site surveys were undertaken.

39. Overall, I consider that the quantum of information collected to date and, in particular, the way it has been presented is insufficient to provide confidence in the conclusions drawn regarding the ecological values of the NoR site. I recognise that the ecologists had limited access to the NoR area, and, consequently, I understand that there are some limitations to the information that can be presented at this stage of the project. That said, these limitations should be built into the ecology assessment by applying a degree of conservatism to the conclusion, which, in my view, Kiwirail have not. Consequently, I also disagree with the Ecology Report's conclusion that the assessment of likely ecological effects was 'conservative'.

40. I do not consider that the level of information available to the ecologists justifies the conviction applied to some of the conclusions within the Ecology Report. In the absence of a complete understanding of the site, I consider a high degree of uncertainty remains. In my opinion, this level of uncertainty should be reflected in the conclusions drawn about the ecological values, which would feed into the magnitude and overall level of effect of the Project.

41. In the following sections, I provide an assessment of each of the different ecological values of the site.

6 Ecological Values

6.1 Wetlands

42. Wetlands are recognised as an important ecosystem, highlighted most recently through the direction within the NPSFM and NESF. Due to site access constraints, the full extent of wetlands cannot be confirmed at this stage of the project and will be confirmed during regional consenting. Some areas of 'potential' wetland have been identified,[14] but this is not a complete inventory of wetlands that could be present across the site. While these potential

[14] Refer response to Question 71 in the Ecology s92 Response.

wetlands are identified within the s 92 response information, the Ecology Report states' none identified', and no further assessment is provided.[15] I observed some wetland habitat within the NoR while on-site in November 2020. I also note that submitters have reported that wetlands are present within their properties.[16] Therefore, I consider it highly likely that natural wetlands, as defined by the NPSFM, will be present within the designation. Prior to works commencing within the site, all wetlands must be identified using the Wetland Delineation Protocols.[17]

43. The potential wetlands seen 'from afar' have been identified to likely have 'low' ecological value.[18] Further, the Ecology Report does not consider wetlands' potential value, as is required by the NPSFM,[19] nor is it based on any physical assessment. The assessment does not provide any consideration of the criteria within Schedule F of the One Plan, which classifies 'rare' and 'threatened' wetlands. The assessment does not consider the potential biodiversity values of birds that could use the wetland habitats, some of which are classified as 'Threatened' or 'At Risk'.

44. I agree that the wetlands present within the designation are likely to be of lower ecological value and unlikely to support complex indigenous habitats. Irrespective, they may still meet the 'rare' or 'threatened' criteria within Schedule F of the One Plan. Further, the wetland habitats may provide a temporary or permanent habitat for 'Threatened' or 'At Risk' avifauna discussed further below.

45. Although the protection of wetlands will be assessed during regional consenting, the potential ecological values of the wetlands are part of the environment affected by the NoR and are likely to have higher ecological value than 'low'.

15 Section 6.3, Ecology Report.
16 Refer further discussion at 129.
17 Ministry for the Environment, Wetland Delineation Protocols August 2020, or successive versions of these protocols.
18 Refer response to Question 71, s92 Ecology Response.
19 Once the NPSFM has been adopted into Regional Plans, the loss of both existing and potential values must be considered by Regional Councils when determining resource consent applications. Refer NPSFM Section 3.21 and Section 3.22(3)(a).

6.2 Streams

6.2.1 Classifications

46. The approach to stream assessments has been impacted by the inability to access the entire designation site; however, the aerial photographs do provide an indication of the likely locations of streams.

47. The One Plan adopts the RMA definition of a river, which includes a "continually or intermittently flowing body of fresh water", but offers no further assessment criteria. This means that streams that flow for part of the year (intermittent streams) are considered to be watercourses by the One Plan and are treated the same as permanently flowing streams when it comes to assessing effects. In contrast, those streams that flow only immediately following rain (ephemeral streams) are not.

48. 'Continually and intermittently' flowing streams provide temporary or permanent habitat for aquatic fauna and contribute to various biotic and abiotic functions within a wider aquatic ecosystem. In contrast, ephemeral streams tend to flow only after rain and provide a primarily overland flow path type function. The One Plan does not give specific definitions or indicate how long the stream must flow to be considered 'intermittent' (rather than ephemeral).

49. The Auckland Unitary Plan ("**AUP**") definitions have been used in the Ecology Report to refine the RMA and One Plan definition of a 'river or stream'. The AUP definitions are most useful for delineating intermittent streams from ephemeral streams as follows:

Intermittent Stream

Stream reaches that cease to flow for periods of the year because the bed is periodically above the water table. This category is defined by those stream reaches that do not meet the definition of permanent river or stream and meet at least three of the following criteria:

- *it has natural pools;*
- *it has a well-defined channel, such that the bed and banks can be distinguished;*
- *it contains surface water more than 48 hours after a rain event which results in stream flow;*
- *rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel;*

• *organic debris resulting from flood can be seen on the floodplain; or* • *there is evidence of substrate sorting process, including scour and deposition.*
Ephemeral Stream *Stream reaches with a bed above the water table at all times, with water only flowing during and shortly after rain events. This category is defined as those stream reaches that do not meet the definition of permanent river or stream or intermittent stream.*

50. Intermittent and ephemeral streams are differentiated within the AUP because ephemeral streams are not subject to the same level of protection as intermittent or permanently flowing streams (classified as 'intermittent' and 'permanent' in the AUP). The AUP definitions have been used on other projects in the Manawatū region,[20] and I consider that they are appropriate for this project.

51. However, I do not consider that streams within the designation area have been accurately classified according to the AUP definitions within either the Ecology Report or subsequent s92 response. In response to a s92 question concerning stream classification, Kiwirail responded that the stream classifications are of 'minor importance' and do not reflect a particular ecological value.[21] I agree a stream's classification does not dictate the ecological value, and I understand that the classifications will be revisited at the time of regional consenting. However, the scale and significance of the effects associated with the NoR relies on the conclusions drawn regarding stream classification and approximate stream length affected. Within Stream System 1, for example, most of the stream reaches in the eastern portion of the designation have been identified as ephemeral, despite the presence of extensive upstream contributing catchments and physical characteristics consistent with intermittent flows. It is more likely that these streams are intermittent in nature and therefore subject to the provisions of the One Plan (including natural character assessments). Consequently, I consider that the stream classifications are critical when considering the site's ecological values that could be affected by the Freight Hub, and I disagree with Kiwirail's s92 response in that regard.

52. I further consider that there will be stream length present within the site that has not been identified within the Ecology Report or subsequent s92

[20] For example, the recently consented Manawatū-Tararua Highway project.
[21] Refer response to Question 72 in the s92 Ecology Response.

response.[22] For example, I observed a section of stream in the southern corner of the designation during my site visit in November 2020, which is not included in the Ecology Report. The additional stream length and classifications will need to be confirmed through comprehensive site surveys prior to regional consents being sought.

53. I discuss the relevance of this in the context of effects further on in my evidence.

6.2.2 Stream habitat and fauna values

54. A series of qualitative assessment criteria are listed in the methods and then reported on for each stream system within the Ecology Report. In brief, the stream systems typically follow a natural path, with some instream modifications comprising channel straightening, structures (culverts) and agricultural landuse to the stream margin. Most of the streams originate outside (east) of the designation.

55. Macroinvertebrate assessments were undertaken at selected sites within the designation according to standardised sampling protocols. The results are typical of degraded stream systems within agricultural landuse and are a likely reflection of both nutrient enrichment and poor-quality habitat. The macroinvertebrate community index (MCI) scores are below the 'bottom line' within the NPSFM.

56. Fish surveys were not undertaken, although previous records from within the Mangaone catchment were available and referred to in the Ecology Report. The New Zealand Freshwater Fish database results indicate that six species of native fish, kōura and kākahi have been recorded within the catchment. The Ecology Report provides inconsistent information about which species could be present, referring to four fish species being potentially present, identifying a different species as contributing to the ecological value of Stream system 2, and then concluding that only one species is likely to be present within the designation.[23] While the habitats within the designation are likely to be degraded, there are habitats upstream that may be in better ecological condition (particularly those with riparian vegetation). Further, the Mangaone

[22] Refer to Figure 2 in the s92 Ecology Response.

[23] Table 7 of the Ecology Report identifies Shortfin eel, upland bully, longfin eel and inanga (latter two being 'At Risk – Declining') and kōura. In determining the ecological value of Stream system two (page 23), common bully and longfin eel are referred to. The executive summary (and consequently what carries through to the AEE) refers only to longfin eel.

Stream continues past the designation, and fish present within the environment downstream of the site could be impacted by activities within the designation.

57. The streams have been assessed as having either low or negligible ecological value.[24] The only fauna of value has been identified as the longfin eel (tuna), which is classified as 'At Risk – Declining' and consequently has a 'high' ecological value. I agree that the current ecological value of the stream systems within the designation is likely to be at the lower end of the scale due to historic and current degradation. However, I do not consider that the streams within the site are likely to have 'negligible' value, even if highly degraded. In my opinion, negligible value equates to having no habitat or ecological value. It is less than, for example, water flowing through a culverted section or a concrete lined channel completely absent of instream habitat features or fauna.

58. By way of example, the Ecology Report identifies the Southern Tributary as having negligible value and describes it as a '*dry, ephemeral flow path… its only aquatic value is as a contributing hydrological flow path*'.[25] Below, I include a photograph of the Southern Tributary looking upstream, taken from Roberts Line when I visited the site in November 2020. I disagree with the Ecology Report that this is an ephemeral stream as there is evidence of aquatic plants that require water to be present long enough for them to establish – water that would not be available if the stream was ephemeral. I further question the conclusion of 'negligible' ecological value given it is based on a 'dry, ephemeral flow path', which I do not consider an accurate description of the environment.

[24] Section 5.2 Ecology Report.
[25] Section 5.2, 'Southern Tributary' Ecology Report.

Photograph 1. View from Roberts Line, looking upstream to 'Southern Tributary', taken 2 November 2020.

59. The assessment of values appears to have centred on the tributaries of the Mangaone Stream, and a combined ecological value is presented for the streams within the designation.[26] However, an assessment of ecological values of the wider receiving environment (being the Mangaone Stream) is not included within the Ecology Report. This is relevant to the conclusions drawn regarding effects from sedimentation and stormwater reported within the Ecology Report and discussed further below.

60. As for wetlands, the NPSFM directs that potential ecological value be considered by regional councils when determining regional consent applications.[27] Potential values for these streams have not been provided within the NoR application but will be required at regional consenting and will form part of the determination of the overall ecological effect. I discuss this further below in the effects section.

6.3 Terrestrial ecology

61. Due to lack of access, the terrestrial ecology assessment has relied on aerial photographs and previous records from national databases. The agricultural landuse has modified the landscape such that only small areas of woody vegetation remain, and these are primarily isolated trees, along fences, or

[26] Section 6.2 'Mangaone Stream catchment' in the Ecology Report.

[27] Once the NPSFM has been adopted into Regional Plans, the loss of both existing and potential values must be considered by Regional Councils when determining resource consent applications. Refer NPSFM Section 3.21 and Section 3.24(3)(a).

within residential gardens. The vegetation has been assessed as having negligible ecological value.[28]

62. Twenty-seven bird species have been recorded within proximity of the designation.[29] The majority of these are common exotic or native species associated with agricultural landuse. However, eight nationally 'At Risk' or 'Threatened' species have been recorded within the area, mostly along larger waterbodies and their margins. An ecological value of 'low' has been assigned to avifauna values on the basis that there is minimal suitable habitat for these birds within the designation. Avifauna habitat has been further classified as being of 'negligible' value.[30] This assessment of value has been undertaken in the absence of a complete picture of the potential habitat values of the site, including wetlands. Several of the bird species identified could utilise wetland habitats periodically, even those of lower ecological value. Two 'At Risk' species have been reported by submitters, which would contribute to a higher ecological value than the Ecology Report reports.[31]

63. Eight species of native lizards, including six 'At Risk' or 'Threatened' species, have been recorded within proximity of the designation. On the basis that no habitat was observed during the site walkover, the Ecology Report concludes that it is unlikely that any of the 'At Risk' or 'Threatened' species would be present. On the basis that only the northern grass skink ('Not Threatened') is likely to reside within the designation area, the herpetofaunal values of the designation have been assessed as being 'low' and the habitat values' negligible'.[32] This assessment of value has been undertaken without a complete picture of the potential habitat values of the site and an assumption that none of the 'Threatened' or 'At Risk' species may be present. The buildings and remaining trees on site may provide habitat for other species, including, for example, the 'At Risk - Declining' glossy brown skink, which is known to inhabit farmland. This species is assigned an ecological value of 'high' based on the EcIAG method used in the Ecology Report and would contribute to increased habitat values.[33] Further, as a 'conservative' measure, it is common practice when assessing potential effects on cryptic rare or threatened

28 Section 5.4 Ecology Report.
29 Section 4.2.2 Ecology Report.
30 Section 5.4 Ecology Report.
31 Discussed further at 130.
32 Section 5.4 Ecology Report.
33 Table 1, Section 3.1 Ecology Report.

species, e.g. the glossy brown skink, to work on the assumption they are present when habitat is assessed as suitable.

64. Databases provide a good indication of what species can be found, but they are not exhaustive and rely on those areas having been surveyed and data collated/submitted. I agree that the terrestrial ecological values are likely to be lower due to the modified landscape. However, the actual ecological values will need to be determined following a robust survey methodology prior to regional consents being sought. This will need to include, for example, mapping of areas of habitat value, lizard surveys and surveys of wetland birds during the breeding season.

6.4 Natural character

65. I understand that the natural character assessment comprises several components, including biophysical naturalness and perception of naturalness.[34] Ecological, hydrological and geomorphological processes contribute to the 'biophysical naturalness'.[35] While I address natural character in the context of the biophysical features, I reserve broader commentary on the natural character assessment to Ms Whitby.

66. The reliance on the Ecology Report to inform the current natural character values is, in my view, distorted for the reasons outlined above.[36] Specifically, the lack of on-site data collection to inform the strong conclusions reached about ecological values, and consequently the strong conclusions regarding the natural character values. Based on the descriptors provided within the Landscape and Visual Effects Assessment and from a biophysical naturalness point of view, I consider that the streams within the NoR are more closely aligned with the descriptors of 'moderately-low' to 'moderately-high' existing natural character (albeit the lower end of this range), rather than 'low' as indicated in the Landscape and Visual Effects Assessment.

67. As no wetlands were identified in the Ecology Report,[37] wetlands appear to have been excluded from the natural character assessment, which is a gap in the assessment at this time.

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[34] Section 3.3 of the Landscape and Visual Effects Assessment.
[35] Section 3.3 of the Landscape and Visual Effects Assessment.
[36] As indicated in response to Question 84 in the s92 Landscape and Visual Assessment Response.
[37] Acknowledging that potential wetlands have been identified in the s92 Ecology Response.

68. I am also uncertain about Kiwirail's approach to the post-development natural character values, which I discuss in more detail below.

7 Project Effects

69. For the most part, the application materials state that the detail regarding the ecological values and magnitude of effects will be addressed at the regional consenting phase. However, the Ecology Report concludes that the expected overall level of effect resulting from the Project ranges from 'Very Low' or 'Positive', with this conclusion appearing to be partly relied upon to determine the overall appropriateness of the NoR.

70. Overall, I agree that the designation site is degraded and typical of agricultural landuse, and I consider that the site is fundamentally inappropriate for a large-scale development such as this. However, in my opinion, the ecological values are likely understated, and, consequently, the ecological and natural character effects are also likely underestimated. One practical risk of underestimating the ecological values and adverse effects is that the measures necessary to manage the adverse effects (to be addressed at the regional consenting phase) might prove to be unachievable within the designation extent, causing further uncertainty. It would be helpful to understand from KiwiRail whether it has carried out any planning to address that possibility.

71. I also question the spatial scale of assessment used to determine the magnitude of effect. This spatial scale appears to be inconsistent across the ecosystem types affected, with some measures assessed at a landscape scale (for example, stream habitat loss) and some at the designation scale (water quality effects). I note that the natural character assessment specifies that an assessment at the designation scale is appropriate.

72. In general, I expect more information to be available at this stage of the project or more conservatism assigned to conclusions and effects assessments to provide confidence to KiwiRail and the decision-makers that the effects are at least capable of being addressed in the future in a way that aligns with relevant policy requirements. A conservative approach is particularly appropriate where is minimal on-site data exists from which to draw conclusions.

73. In the next section, I discuss the ecological effects of the proposal at a high level, noting my key areas of disagreement concerning the conclusions drawn in the Ecology Report, for the Panel to consider in respect of the scale and extent of the designation (noting that the detail will be necessary at regional consenting stage).

7.1 Wetlands

74. The Ecology Report concludes that no wetlands were identified, although a 'possible wetland' was identified from afar. At least one submitter has identified a natural wetland within their property and I personally observed wetland habitats from the roadside on my site visit. I expect some wetland habitats to be present within the designation.

75. As explained above,[38] there is no assessment of ecological effects on wetlands provided in the Ecology Report. The s92 response identifies that, because the Freight Hub will be 'specified infrastructure', there is a consenting pathway that allows for these wetlands to be modified.[39] In addition, the s92 response concluded that, given the likely low values of the wetlands, there "*would be space and scope to adequately manage any effects on those wetlands*".[40] The s92 response continues that "*it is unlikely that aquatic compensation would need to be applied*".[41]

76. While I acknowledge that these issues will be subject to future regional consenting processes, I disagree with the conclusions drawn. As such, I consider that it is pertinent to offer the following critique of the assessment provided.

77. I agree that the existing wetland values are likely to be at the lower end of the scale. However, as a threatened ecosystem, even marginal, exotic dominated natural wetlands could have a 'moderate' ecological value – for example, if providing habitat for threatened avifauna. Wetlands that meet criteria under Schedule F could be classified as 'rare' or 'threatened'. The

38 At 42.

39 I leave interpretation of whether this proposal would be considered 'specified infrastructure' to the planners, however note that the intention is that wetlands are protected first and foremost, with any modification or loss needing to also demonstrate a 'functional need' for that infrastructure to be placed in that specific location (NPSFM 3.22(1)(b)(iii)).

40 Refer response to Question 71 in the s92 Ecology Response.

41 Refer response to Question 71 in the s92 Ecology Response.

NPSFM requires consideration of current and potential values of wetlands,[42] with 'loss of value' in relation to a wetland including the loss of potential value.[43] Therefore, even if the current value of wetlands is low, the potential value may be higher.

78. If there are wetlands within the site, they will likely be completely lost under the footprint of the Freight Hub (based on the current configuration and the expectation that the site will be filled by up to 5-6 m in some locations[44]). If the loss of wetlands cannot be avoided by the future project works, the magnitude of effect would likely be 'Very High'[45] , and the overall level of effect would be between 'Moderate' (if a low ecological value) or 'High' (if a moderate ecological value).[46] These magnitudes would lead to an overall level of effect of 'moderate' or greater, which typically requires that further measures to offset or compensate are undertaken (assuming further mitigation is not possible).

79. The full extent of wetlands across the designation area is unknown, so Kiwirail's conclusion that there will be sufficient space to address effects within the designation is misleading – it is a conclusion based on an unknown premise. The quantum of impacted wetland and the potential requirements to address these effects must be left to regional consenting stage, which will include an assessment of whether the effects can be managed.

80. The NPSFM directs no net loss of extent or values of wetlands, which provides further direction that additional measures will be required to address these effects. The One Plan also identifies policies related to those wetlands classified in Schedule F. In the event that wetlands are lost, mitigation is unlikely to be possible, so offset or compensation measures will need to be considered. I agree that it is not appropriate to speculate on potential ratios for effects management at this time[47] – the quantum of offset or compensation required should be calculated once a full understanding of the quality and extent of wetlands is known at the regional consenting phase. At the very least, a robust

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42 Subpart 3 Specific Requirements, NPSFM, Section 3.21 definition of 'effects management hierarchy'.
43 Subpart 3 Specific Requirements, NPSFM, Section 3.21 definition of 'loss of value'.
44 Refer to Mr Arseneau's and Ms Baugham's evidence and Section 6.3.5 of the AEE Report.
45 Defined in the EcIAG, and Table 3 of the Ecology Report as "*Total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether*."
46 Refer to 31 above for a description of the EcIAG method.
47 Refer response to Question 71 of the s92 Ecology Response.

and transparent biodiversity accounting framework would need to be applied to determine the quantum of offset required. While it is difficult to quantify the type and magnitude of offsetting or compensation required, I note that where biodiversity models are used to assist with wetland offsetting and compensation requirements, the scale of wetland and restoration enhancement required can be considerably greater than the scale of impact.[48] Based on the current configuration of the Freight Hub, only a small portion of the designation would remain unimpacted (if any at all) and therefore potentially viable to enhance, even if it was wetland habitat worthy of enhancement.

81. In addition to the potential loss of wetlands outlined above, during regional consenting, additional consideration is required regarding any activities within 100 m of a wetland (including those outside the designation) and what controls might need to be in place to address those effects.

7.2 Freshwater stream effects

82. There are several potential effects on freshwater streams and fauna values within and downstream of the designation resulting from the construction and operation of the Freight Hub. These include, but are not limited to:

a. Discharges of sediment laden water during the course of construction having the potential to change in-stream habitat.

b. Effects relating to changes to stormwater runoff including:

i. Changes to water quality within streams and wetlands during construction and operation.

ii. Changes to the rate and volume of flow from the site, having the potential to result in erosion or scour in-stream.

c. Modification and/or loss of stream habitat within the site.

7.2.1 Discharges of sediment laden water during construction

83. During construction, there is the potential for sediment laden water discharges to enter the receiving environment (streams and/or wetlands). Suspended sediments can affect water clarity and be an irritant to fauna, and deposited sediments can alter in-stream habitat and communities. Some measures have

[48] Baber et al, 2021 at 1 above and Maseyk et al, 2018 at 8 above.

been identified to manage these potential effects, which will be outlined in an Erosion and Sediment Control Plan. The Ecology Report concludes that there would be a low magnitude of effect on streams given the underlying soft-bottom nature of them, "*even in a worst-case scenario where a substantial amount of sediment may be discharged*".[49] I strongly disagree that even a 'substantial' amount of sediment would have a low magnitude of ecological effect. Sediment can fundamentally alter the in-stream conditions, both in the short and long term. At a national level, suspended sediment is recognised in the NPSFM as an attribute requiring limits.[50]

84. Further, this position does not appear to consider the existing or potential ecological values downstream of the site, for instance, within the Mangaone Stream itself, where several 'At Risk' species have been identified.[51]

85. Notwithstanding, with the implementation of best practice onsite controls, I consider the potential ecological effects of sediment during construction can be managed. This will need to be addressed further at regional consenting stage.

7.2.2 Operational stormwater runoff effects

86. The Freight Hub will have a substantially higher impervious area than the existing landuse. Runoff from the site will therefore be released at a higher volume and velocity than under pre-development conditions. This runoff has the potential to cause erosion in stream systems, particularly those that have already unstable banks and that may be susceptible to increased flows. Further, the activities within the site will introduce different contaminants to the environment, which could affect natural wetlands or streams. Runoff from the site will carry a higher concentration of urban/industrial contaminants to the receiving environments.

87. Mr Leahy identifies that on-site controls to limit contaminant generation and treatment of high contaminant generating activity areas will be utilised. This is likely to include a combination of 'low impact design' principles, but primarily two treatment wetlands. These wetlands will provide for both water quality

[49] Section 6.2.2 Ecology Report.
[50] Table 8, National Policy Statement Freshwater Management 2020.
[51] Noting that the ecological values of the Mangaone Stream have not been assessed within the Ecology Report however the results of the Freshwater Fish Database search are relevant (at Table 7, Ecology Report).

treatment and quantity control. I defer to Mr Arseneau's and Ms Baugham's assessment as to the appropriateness of these controls.

88. On the basis that Mr Arseneau and Ms Baugham consider the measures are appropriate, I consider that the potential effects of discharges can likely be managed. However, I do not share the Ecology Report's optimistic conclusion that the magnitude of effects will be 'negligible'. Instead, I would expect to at least see a change in the receiving environment commensurate with '*a minor shift away from existing baseline conditions*',[52] equivalent to a 'low' magnitude of effect. This change will depend on the final configuration of the stormwater controls, the ability of the receiving environments to assimilate any contaminants, and the stability of the receiving streams.

89. As for the sedimentation effects, any potential stormwater effects will also be realised in the downstream Mangaone Stream receiving environment. The ecological values of the Mangaone Stream have not been reported in the Ecology Report, and, consequently, the level of effect is not reported. I consider the downstream effect is a key consideration of the NoR that will need to be addressed further at regional consenting stage.

90. Notwithstanding, I consider that the potential ecological effects of operational stormwater quality and quantity can be managed by implementing a best practice stormwater management approach. This will need to be addressed further at the regional consenting stage.

7.2.3 Stream habitat loss and modification

91. One of the more substantial impacts of the Freight Hub will be the loss of stream length and modification of habitat. It is this effect that I consider has been understated most within the Ecology Report.

92. In the order of 3.8 km of stream is estimated to be present within the designation.[53] Following construction, if the Freight Hub proceeds as per the Landscape Plan,[54] Kiwirail expects that the final configuration will comprise 1.6 km of culverted stream length and 445 m of constructed stream channel.[55] Based on these numbers, I estimate that 1.8 km of stream length will be lost

[52] Refer Table 8 of the Ecological Impact Assessment Guideline and Table 3 of the Ecology Report.
[53] Section 6.2, Ecology Report.
[54] Landscape Plan (draft and indicative), October 2020.
[55] Refer response to Question (80)(ii) s92 Ecology Response.

completely through reclamation.[56] While culverted streams can provide some residual ecological value, this is usually when the culvert is short and allows light to easily reach the aquatic habitat within the piped section, allowing ecological functions to continue relatively unimpeded. One of the piped sections is 678 m long[57] and, if piped along its entirety, will be quite limited in respect of aquatic ecological processes. Culverted sections will still contribute to hydrological functioning within the sub-catchments; however, this will likely be quite removed from natural hydrological functioning. In terms of what remains as a functioning stream channel within the designation, this will be restricted to the approximately 445 m of constructed channel that will have culverts along its length. Constructed stream channels with associated riparian planting can be functional and provide for ecological processes, but the value of this will need to be ascertained following further design.

93. The Ecology Report considers that the modification of stream length will result in a 'low' magnitude of effect when considered at a 'Stream System' (sub catchment) scale and 'negligible' magnitude of effect at the Mangaone Stream catchment scale. This conclusion is on the basis that approximately 12% and 7% of total stream length will be lost within Stream System 1 and Stream System 2, respectively.[58] While this scale can be useful to provide some context, it is also necessary to consider this at a more local, designation scale (consistent with the natural character assessment). Within the designation there will be a 100% loss of natural stream length and, post construction, a constructed watercourse will provide for only 11% of what was there pre-construction.[59] Within the designation I consider that the magnitude of effect will be 'very high', commensurate with the EcIAG descriptor' *total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether*'.[60] That is because open stream channels within the site will be effectively lost and their ecological functions severely impeded or lost.

56 Definition provided at 2 above.
57 Refer response to question (80)(ii) s92 Ecology Response.
58 Section 6.2 Ecology Report.
59 I note that this is based on the current extent of stream length within the site which I believe to be underestimated.
60 Refer Table 8, Ecological Impact Assessment Guidelines and Table 3 Ecology Report.

94. Consequently, I also disagree with the overall level of effect concluded in the Ecology Report.[61] I expand on this as follows, considering the ecological values presented above[62] and using the EcIAG method.[63] Based on low to negligible ecological values and a low magnitude of effect, the loss of 3.8 km stream within the designation is claimed to result in an overall 'very low' level of effect, and would not warrant measures to further avoid, remedy, mitigate, or offset effects.[64] The effects assessment presented in the Ecology Report fails to consider the potential values of the stream systems.[65] It also appears to be inconsistent with the NPSFM policy that there be no further loss of extent or values of streams. More importantly, it dilutes the magnitude of effect by applying the larger catchment scale, thereby negating cumulative effects associated with stream loss overall. While this will be subject to further assessment at the regional consenting stage, it is my opinion that this is a major problem with the conclusions in the Ecology Report.

95. I offer, for example, an alternative assessment of overall level of ecological effect, for context. If the stream systems do have low current ecological value, with a more appropriate 'very high' magnitude of effect, the overall level of effect is 'moderate'. If the current values are higher, or potential value is considered, and the ecological values are for example 'moderate', then the overall level of effect increases to 'high'. The EcIAG directs that effects in the 'high' or 'moderate' category represent "*a level of effect that requires careful assessment and analysis of the individual case. Such an effect could be managed through avoidance, design, or extensive offset or compensation actions. Wherever adverse effects cannot be avoided, no net loss of biodiversity values would be appropriate*".[66]

96. In my experience, a moderate or higher overall level of effect is typically aligned with effects that are considered 'more than minor', although I note that is a planning term that I do not use myself. Irrespective of the existing value, a 'moderate' overall level of effect under the EcIAG would require mitigation, offset or compensation measures to be implemented.

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61 Overall effect being a combination of values and magnitude as presented at 31.
62 At 57.
63 At 31.
64 Section 6.2, Ecology Report.
65 Once the NPSFM has been adopted into Regional Plans, the loss of both existing and potential values must be considered by Regional Councils when determining resource consent applications. Refer NPSFM Section 3.21 and Section 3.24(3)(a).
66 EcIAG, 5 above.

97. I agree that the constructed stream channel will provide for some ecological function within the site and this benefit should be considered in the overall package of works at regional consenting. However, the loss or modification of 3.8 km of stream would not be effectively mitigated or offset by this action alone, not least because it would only provide for only 11% stream length of what will be lost.

98. To address the effects of loss of stream habitat (length and stream bed area), a full and complete assessment of the ecological values and effects will be required at the regional consenting phase. Part of this assessment will be to identify the functional need for the stream loss as proposed.[67] As was identified in the early phases of the site selection,[68] mitigation measures are unlikely to be possible and therefore offsetting will be required to address those residual adverse effects. I expect this to provide for, at least, no net loss of ecological values and extent determined through a robust and transparent offset tool.[69] A key part of this will be to provide for the enhancement of stream length (and streamed area) elsewhere that is at least equivalent to the length lost and likely to be several times more.[70] That is, the effects of the stream loss are unlikely to be addressed within the designation.

7.2.4 Fish passage

99. Many of New Zealand's native fish are diadromous, meaning they migrate to and from the ocean to complete their lifecycles. This means that maintaining the connectivity of stream systems is important, particularly in catchments where taonga and threatened species are present.

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67 Section 3.24(1)(a) NPSFM 2020.

68 Refer Section 6, 18 November 2019 assessment in the Specialist Assessment – Natural Environment Criterion.

69 As detailed in the effects management hierarchy defined at Section 3.21 NPSFM and required by Section 3.24(1)(b) NPSFM 2020 and as outlined in the Biodiversity Offsetting under the Resource Management Act A Guidance Document September 2018.

70 As for wetlands a robust and transparent method should be used to determine the quantum of offset required, which will be based on the ecological values lost at the impact site and the ecological gain that can be achieved at the offset site. As an indication of the potential quantum, I refer to recent examples for effects on similar agricultural streams as follows:
The Manawatū-Tararua Highway project used the Stream Ecological Valuation method to calculate offset required for approximately 13 km stream loss). Where offset was provided by stream creation, between 1.1 to 2.1 times the stream bed area lost was required to be created. Where offset was provided by riparian planting between 2.9 to 6.6 stream bed area lost was required to be planted.
The Warkworth to Wellsford project also used the Stream Ecological Valuation method to estimate offset requirements. In sum, approximately 27.1 km of stream is anticipated to be impacted, which is estimated to require 18.3 km stream creation and 71 km riparian planting to address these effects (equating to an approximate ratio of 3.3:1).

100. It is estimated that there will be in the order of 1.5 km culverted stream length within the site. I am uncertain about how the culverts will be configured, but I understand that the individual lengths of the culverts will vary between 27 m and 678 m.[71] KiwiRail intends to 'follow' the NZ Fish Passage Guidelines, some components of which have been passed into legislation through the NESF Permitted Activity Standard (Regulation 70).[72] Despite the concerns I raised in discussion with Kiwirail's ecologist, Kiwirail maintains that culverts constructed in accordance with the Fish Passage Guidelines will provide an improvement to the current situation, and will be a 'positive' effect contributing to an overall 'net gain in fish passage'.[73]

101. A slightly more nuanced response is provided in the stormwater assessment stating that the "upgrade of existing culverts and new culverting provides an opportunity to incorporate specific design measures to facilitate fish passage".[74] It continues that the 'improvements' relate to the ability of the project to "ensure permanent provision of fish passage rather remediating present-day issues".

102. I agree that removing existing culverts and replacing them with 'fish friendly' culverts would improve those sections of the currently culverted stream. However, I disagree that the construction of the proposed culverts will result in a 'positive' effect on fish passage through the site, particularly given that the current values of the site are not completely understood. If constructed poorly, culverts can restrict fish passage and have adverse effects on fauna and habitats. However, if culverts are constructed in accordance with the NZ Fish Passage Guidelines, the potential adverse effects on fish passage can be adequately mitigated. I appreciate that the existing habitat may be of a lower quality, but this does not justify a conclusion that the inclusion of culverts will make fish passage better. This is particularly relevant when considering some of the culverts are proposed to be upwards of 100 m in length and that some species potentially present within the catchment are poor swimmers.[75]. Providing for the variety of fish passage requirements along this length will be challenging and may, in fact, not be possible for all species.

71 Refer response to Question 80(ii) s92 Ecology Response.
72 Refer response to question 80(iv) s92 Ecology Response.
73 Refer response to question 80 s92 Ecology Response.
74 Refer response to Question 88(i) in the s92 Stormwater Response.
75 Inanga have been recorded within the catchment and are known to be poor swimmers.

103. Mr Arsenau and Ms Baugham encourage the use of the Stream Simulation approach described within the NZ Fish Passage Guidelines. This would go some way to avoiding or mitigating adverse effects on fish passage.

104. The ecological values of the fish potentially affected and the magnitude of effect will need to be provided following detailed design and in the context of the wider upstream environment.

7.3 Terrestrial ecology

105. The Ecology Report identifies only one effect on terrestrial ecology, being related to the combined loss of vegetation and fauna habitat resulting from the Freight Hub.[76] It considers that, given the general lack of vegetation present, the clearance of the 177.7ha site and its change to an industrial site/use would have a low magnitude of effect. While I appreciate that the grassed paddocks and sporadic trees may not appear to hold much ecological value, these habitats will be used temporarily or permanently by fauna that may be present on site. Removing these paddocks and replacing them with a primarily hardstand area with industrial and vehicular components will not provide the same habitat. Therefore, I consider that a magnitude of effect more aligned with 'moderate' might be appropriate.[77] Due to the conclusion of 'low' magnitude of effect, the Ecology Report considers that no mitigation measures are required.

106. Following a request for further information, it was clarified that the landscape planting proposed for the Freight Hub is specifically for that purpose and is 'not intended as ecological planting.[78]' If further measures to address residual terrestrial habitat effects are identified through the regional consenting process, I consider that the landscape planting will not be able to contribute to the management of ecological effects. By this, I mean that the landscaping planting cannot be counted towards addressing ecological effects because it will be required by the designation to mitigate landscape and visual effects - it would not be 'additional'.[79] I also note that 'landscape

[76] Section 6.1 Ecology Report.
[77] Table 3 Ecology Report.
[78] Refer response to Question 69 s92 Ecology Response.
[79] Eleven principles of offsetting are identified within Maseyk et al., 2018. One of these is 'additionality', which means that an offset must achieve gains in biodiversity above and beyond gains that would have occurred anyway in the absence of the offset. This means that if planting is required to mitigate landscape effects through conditions of the NoR then it cannot also be used to address ecological effects that may be required at regional consenting.

planting' does not provide the same ecological benefits as 'ecological planting', which would be warranted to address ecological effects.

107. There are other potential effects on fauna that have not been assessed within the Ecology Report. During construction there could be effects on fauna through disturbance, injury and mortality. Despite there being no assessment within the Ecology Report, recommendations are provided to manage these effects, including the need to salvage of lizards and complete nest checks of birds prior to construction. Notwithstanding that the ecolgical values and magnitude of effects are currently unknown, I agree with this recommendation as a minimum standard. I consider that an Ecological Management Plan ("**EMP**") be prepared to manage the potential effects on flora and fauna. The EMP should include management approaches for all of the ecological values of the site. To provide a list of inclusions at this time would be speculative as the ecological values are not fully understood; however, in my view, lizard and avifuana management plans will be required (amongst others).

108. There is also no assessment of potential long term operational effects of noise, lighting, vibration on terrestrial fauna values that may be present. The change from a rural landuse to an industrial activity could well have effects on fauna within proximity of the site. This effect could be on, for example, birds along the margins of the Mangaone Stream. Until such time as the values of the site and surrounds are better understood, the potential magnitude of these effects remains uncertain.

7.4 Natural character

109. The overall commentary on the natural character matters is addressed by Ms Whitby, although several points are relevant to my assessment. Specifically, I comment on natural character effects as they relate to the biophysical naturalness of the rivers, streams and wetlands and their margins.

110. As explained earlier,[80] I do not consider that the Ecology Report provides sufficient detail to have confidence in the existing ecological values of the site. Therefore, I question the validity of the conclusions subsequently drawn in respect of existing and post-development natural character.

[80] At 66.

111. An overall 'moderate positive' effect on natural character has been assigned on the basis of several components contributing to this score.[81] I disagree with several of the conclusions drawn in respect of the post-development natural character scores.

112. The potential adverse effects on natural character have been identified as the *'redirection and constructed conveyance'* of the existing stream channels.[82] In my opinion, this substantially understates the practical realities of the post-development state of the designation area. That is, of the 3.8 km of stream estimated to be within the site, approximately 445 m of stream 'redirected' to a 'constructed conveyance' channel. Of the remaining stream within the site, approximately 1.5 km will be culverted. This leaves at least 1.8 km of stream channel that will cease to exist in any form, with the water itself being redirected to the culverted sections or the constructed channel. In my opinion, a more accurate description would be to identify the adverse effects on natural character as the loss of approximately 90% of the open stream channel with the site. I note again that this does not account for wetland values at all.

113. The 'moderate positive' effects on natural character are based on the proposed 'naturalised channel' and 'mitigation ponds'.[83] I explain my concerns with this conclusion below in light of the effects described above and the relative naturalness of the proposed mitigation measures.

114. While the culverted sections of stream may provide fish passage and will continue to allow water to flow through them,[84] I do not consider that this is sufficient to contribute to an improved biophysical naturalness compared to the existing state. Put simply, the culverted sections of stream will have no riparian margin, will have a highly modified channel shape, geomorphological processes will be influenced by the straightened shape, the hydrological regime will be substantially changed, and the ecological processes will be highly affected – particularly in the culvert of 678 m long. I note that the Landscape and Visual Assessment Report identifies that the culverting activity limits' *future natural character restoration options*'.[85] In my opinion, the post-

81 At 7.2 of the Landscape and Visual Assessment Report.
82 At 6.12 Landscape and Visual Assessment Report.
83 At 7.2 of the Landscape and Visual Assessment Report.
84 Refer 102.
85 At 6.15 of the Landscape and Visual Assessment Report.

development biophysical naturalness of the culverted streams will be notably less than pre-development.

115. The 1.8 km of stream that will cease to exist will have no natural character post-development. In my opinion, this has even less opportunity for future natural character restoration than the culverted sections and the post-development biophysical naturalness will be zero (i.e. less than 'very low' on the seven point scale).

116. On the basis that the culverted and reclaimed streams do not contribute to a positive improvement in natural character, it leaves the constructed channel and 'mitigation ponds' to bring up the overall naturalness to achieve the 'moderate positive' claimed.

117. First, I address the 'naturalised channel' which will 'replace the northern most tributary'. This is claimed to be a 'low positive' effect of the Freight Hub.[86] To be clear, the channel will be 'constructed', not 'naturalised'. A naturalised channel implies that a modified channel is being rehabilitated to reintroduce natural features. The channel will be designed and constructed to have natural features, including providing fish passage, a riparian margin and facilitating the movement of sediment and water through the catchment. If designed and constructed well, these factors contribute somewhat to biophysical naturalness. The alignment of the channel will be relatively confined,[87] which may affect its ability to achieve natural function. I understand that the stream channel will be in the order of 445 m, noting there could be some additional length if some meanders can be introduced. In my opinion, these meanders would be relatively small bends to reflect a 'natural' state and to reduce potential erosion and flow issues. Therefore, I expect these bends would only add a small amount of additional length. It is further recognised that this constructed channel will be discontinuous as several culverts will be located on it.[88]

118. The stormwater ponds are considered to have a 'moderate positive' effect on natural character.[89] Reference is made to the Northern Pond' removing' an existing watercourse with very low natural character values which appears to be partial justification for the 'moderate positive' effect. Further, it is identified

86 At 6.17 of the Landscape and Visual Assessment Report.
87 At 6.6 of the Landscape and Visual Assessment Report.
88 At 6.15 of the Landscape and Visual Assessment Report
89 At 6.43 of the Landscape and Visual Assessment Report.

that the ponds will *'ensure water flow is retained through this area'*.[90] In my opinion, constructed stormwater treatment ponds do not contribute to natural character in respect of the biophysical naturalness of streams. There are two main reasons for this:

a. In ecological terms, the loss of the watercourse is absolute in that the watercourse (and its ecological, hydrological and geomorphological processes) are lost. A pond (natural or otherwise) does not have the same ecological, hydrological or geomorphological functions or processes. Therefore, a pond represents a very different ecosystem.

b. Most importantly, what is proposed is an artificially constructed stormwater treatment device, the primary purpose of which is to provide a sink for contaminants and sediment. Stormwater ponds are not natural features and do not contribute to the assessment of biophysical naturalness. As constructed stormwater treatment devices, stormwater ponds are designed to capture and retain contaminants in such a way that the contaminated material needs to be periodically removed through routine maintenance. Measures are typically put in place to restrict the 'naturalness' of these devices to avoid future management issues. By way of example, providing fish passage into a stormwater treatment device is generally discouraged as the habitat is not conducive to healthy fauna given the contaminants present. Further, having fish within the device can introduce maintenance issues, generating additional potential effects such as injury and mortality. Stormwater treatment devices can however provide valuable habitat for terrestrial fauna (i.e. . wetland birds), which is a small element of biophysical naturalness, could contribute to the perception of naturalness.

119. I note above that the natural character assessment fails to address wetlands on the basis that the Ecology Report did not identify any. In the event that Kiwirail propose that the stormwater treatment devices could contribute to addressing potential natural character effects on wetlands, I provide contrary analysis. I do not consider that the stormwater ponds could contribute to mitigating biophysical naturalness effects on natural wetlands that may occur as a result of the Freight Hub. While some benefit to terrestrial fauna could be attributed to a constructed wetland, the regular maintenance of this device

[90] At 6.43 of the Landscape and Visual Assessment Report.

would reduce the naturalness of vegetation that, for example, may be damaged or impacted periodically by the maintenance. An additional consideration of note is that the NPSFM provides direction as to what constitutes a 'natural wetland'. Wetlands' constructed by artificial means' are not considered to be natural.[91] The Essential Freshwater Interpretation Guidance, in draft, identifies examples of constructed wetlands, and classifies constructed wetlands for stormwater management or water storage as being 'non-natural'.[92]

120. In my opinion, only the constructed channel (and its margins) could contribute to post-development natural character within the site, if designed and constructed appropriately. As this channel will account for only 11% of the pre-development stream length, I do not consider that this alone mitigates the loss of natural character resulting from the remaining 90% of stream length lost or modified. As such, I also do not consider that there will be a post-development 'moderate positive' effect (benefit) from the development in the context of the biophysical naturalness of the streams and their margins. It is my opinion that there will be residual adverse effects on the biophysical naturalness elements of natural character within the site.

121. Additional planting has been mentioned in response to further information requests, which appears to relate to the planting of tributaries between the designation and Mangaone Stream,[93] although I understand no commitment to this has been made within the application materials. While this planting may contribute to a perception of improved natural character,[94] this would appear to relate to streams outside of the site, and therefore not at the same scale as the effects assessment has been undertaken (which I understand is specifically within site only). In my opinion, while this planting may be desirable for other reasons, it would not mitigate the effects on the biophysical naturalness of streams or wetlands within the designation.

122. I note two further matters that may need to be considered at the regional consenting phase. The NPSFM directs that, when making a determination on a resource consent application, Regional Councils must be satisfied that

91 Section 3.21 NPSFM 2020 definition of 'natural wetland'.
92 Essential Freshwater Interpretation Guidance: Wetlands Definitions – Exposure Draft circulated 1 April 2021. I note this is not final guidance with more anticipated to be released shortly.
93 Refer responses to Question 50 of the s92 LVA Response.
94 Assessed by Ms Whitby.

cumulative effects and loss of potential values are satisfactorily addressed.[95] A non-exhaustive list is included, which identifies some components of natural character (for example, ecosystem health, indigenous biodiversity, hydrological functioning, and amenity). In my opinion, if natural character can be so easily positively influenced by planting some trees within the site (as is claimed by the applicant), the potential for an improvement in natural character to be relatively easily achieved and therefore should be considered in the 'loss of potential values'.

123. In summary, I do not agree that the post-development natural character will be improved to achieve a 'moderate positive' effect on the pre-development natural character. Further, I do not consider that the provision of the constructed stream channel sufficiently mitigates the adverse biophysical naturalness natural character effects. It is my opinion that there will be residual adverse effects on the biophysical naturalness elements of natural character within the site.

7.5 Consideration of alternative sites, routes or methods

124. A Natural Environment Criterion assessment was prepared as part of the multi-criteria analysis completed to inform site selection. This work was carried out in 2019 based on a desktop assessment of stream, wetland and terrestrial habitats across nine potential sites. Two sites were identified as being fatally flawed from an ecological point of view, due to the presence of regionally significant terrestrial forest remnants (Site 5) and an oxbow wetland (Site 7). A second assessment was undertaken on the shortlist of three sites, with additional masterplan layouts overlaid. No wetlands or terrestrial habitats of ecological value were identified at any of these sites so the Natural Environment Criterion assessment was limited to freshwater (stream) habitats. The Natural Environment Criterion identified that of the three shortlisted sites Site 2 was the least ecologically constrained, with Sites 3 and 4 equally weighted. This assessment was based entirely on lineal stream length, measured using aerial imagery.

125. I agree with the approach undertaken to the Natural Environment Criterion assessment. I also agree that the stream length present within each of the sites

[95] Section 3.21(3)(a) and 3.24(3)(a) NPSFM 2020.

was not a 'fatal flaw' and there was unlikely to be substantive differences in ecological values that could provide further differentiation.

126. Site 3, the chosen site, had the longest length of stream present of the three shortlisted options, being over twice the length of stream present at Site 2. The NEC report identifies that the stream loss would result in residual adverse effects and that avoidance, remediation or mitigation would not be possible. Further, the NEC recommends offsetting to achieve a net gain and refers to the likely need to go offsite to achieve this. This conclusion related to the shorter ~900 m affected at Stream 2 and, in my opinion, applies equally to the Site 3 option.

127. In my opinion, it would be near-on impossible to find a site of the scale required by the Freight Hub that would avoid entirely ecological effects. I further consider that it would be unlikely to identify a site that did not have substantial lengths of stream habitat that would be affected. While the final site has a longer length of stream than some others, I do not consider that this warrants an alternative site being selected.

128. I encourage KiwiRail to minimise as much as practicable impacts on streams, wetland and remaining terrestrial vegetation in the detailed design of the Freight Hub.

8 Review of submissions

129. Several submitters[96] supported Kiwirail's intention to plant native trees around the site and along stream margins, but raised concerns regarding the potential for this planting to introduce pests. Submitters identified that planting their own gardens increased native bird life, and they are concerned that introduced pests will impact the wildlife of the area. Pest control was identified as an opportunity to mitigate these potential effects. I support pest control being undertaken along planted corridors within and around the designation. I expect that this would be useful for the Freight Hub anyway, given the types of products being transported through the hub.

130. The submitters[97] also support the waterway 'realignment' and the positive effects purported in the application materials to improve the waterways within

[96] (4) Bruce and Alison Hill; (7) Rochelle and Rex McGill; (57) John Austin and Rosaleen Wapp
[97] (7) Rochelle and Rex McGill; (23) Mike Tate; (24) Zaneta Park;

the site. While I agree that planting streams would be beneficial, I suggest that the quantum of loss versus enhancement was not clearly understood by the submitters when considering the level of 'positive effects'. As I have described at 92 above, the Freight Hub will result in the net loss of at least 3.4 km of open stream channel within the site. There will remain only 445 m which will be constructed and planted, noting that there may be culverts along the channel. The details of this will be subject to future consenting, however, I disagree with the submitters in respect of the positive effects of the watercourse 'naturalisation and planting'.

131. Two submitters identified species of birds of conservation interest. Kevin Stafford[98] lives near Railway Road, and he has observed royal spoonbills (Platalea *regia*) using the paddocks to the north of the industrial development (southern portion of the designation) during winter conditions. Royal spoonbills were not identified within the Ecology Report and are classified as 'At Risk – Naturally Uncommon'[99] in part due to them having a restricted range and having a relatively small population in New Zealand. Peter Gore and Dale O'Reilly[100] noted that they have seen black-fronted dotterel (*Charadriua melanops*), also classified as 'At Risk – Naturally Uncommon', within the Bunnythorpe Farmland. It is not clear whether this observation is specifically within the designation site, but it is an indication that this type of habitat could provide at least temporary habitat for native avifauna. This anecdotal evidence supports my earlier assessment that the avifauna values of the site are likely to be more than 'low' as identified in the Ecology Report.

132. Several submitters[101] raised general concerns with the overall impacts on trees, wildlife, streams and landscape resulting from the Freight Hub. I agree that the Freight Hub will change the current ecological landscape, taking it from agricultural landuse with occasional ecological values to a constructed industrial area with planted margins. There will be an almost complete loss of available freshwater (wetland and stream) habitat within the designation, although there may be more terrestrial vegetation following construction than is currently present.

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98 (18) Kevin Stafford

99 Robertson, H. A., Baird, K., Dowding, J. E., Elliott, G. P., Hitchmough, R. A., Miskelly, C. M., McArthur, N., O' Donnell, C. F. J., Sagar, P. M., Scofield, R. P. & Taylor, G. A. (2017). Conservation status of New Zealand birds 2016. New Zealand Threat Classification Series 19. 27 p.

100 (61) Peter Gore and Dale O'Reilly

101 (22) Fiona Hurley; (36) Helen Thompson; (37) Ian Harvey; (70)Renee Crowther.

133. Dianne Tipene[102] lives on Clevely Line and discusses in her submission the creek and natural wetland on her property (part of Stream System 1 identified in the Ecology Report). She identifies that Ngāti Kauwhata value the wetland and creek system as a source of tuna (eel). Of importance to Ms Tipene is the retention, protection and enhancement of the wetland on her property as a positive effect for the eels, papatuanuku and iwi. Natural wetlands are explicitly protected under the NESF and NPSFM and I support Ms Tipene's submission that the wetland on her property should be protected and enhanced. This would align with the national policy direction discussed throughout my evidence.

134. Peter Gore and Dale O'Reilly consider that insufficient detail has been provided at this stage to assess the environmental effects. They further identify springs under the designation site that appear not to have been addressed within the application materials. They are concerned that the natural landscape effects will be high and that the effects on the Mangaone Stream and its tributaries have not been properly accounted for. For the reasons outlined in the earlier part of my evidence, I agree with this conclusion. I again acknowledge that much of the detailed information will be provided at the regional consenting stage; however, to understand the level of effect of the NoR itself, further information would be useful.

135. Horizons Regional Council will be the consenting authority for the regional consenting phase of the project. Its submission[103] broadly supports the Freight Hub but identifies key ecological measures that Kiwirail should implement to be considered at the regional consenting phase. These include the avoidance of areas of indigenous vegetation and reduction of effects on waterways to reduce the overall level of adverse effects. I support the direction from Horizons Regional Council and note specifically their recommendations to consider the NPSFM and NESF.

136. Rangitāne o Manawatū[104] provided a comprehensive submission outlining a range of concerns with the project as proposed, with specific reference to the potential effects of sediment discharges and erosion, stormwater discharges, freshwater and terrestrial ecology and landscape. Also of particular

[102] (81) Dianne Tipene.
[103] (20) Horizons Regional Council
(61) Te Ao Turoa Environmental Centre/Bestcare Whakapai Hauora Charitable Trust Mandated Iwi Authority for Rangitāne o Manawatū.

relevance is the discussion regarding the NPSFM and consideration of how the proposal will contribute to Te Mana o Te Wai. I concur with their submission that all waterways within the designation have mauri and support life, and that they have potential to be restored. I recognise that Rangitāne o Manawatū speak for the wai, and I consider that the recommendations within their submission aligns with my western science assessment. I agree with Rangitāne o Manawatū that further ecological assessments are required to fully understand the ecological effects of the project. I reiterate that the conclusions drawn within the application materials are based on insufficient information and, therefore, should be treated with caution. I fully support the recommendation from Rangitāne o Manawatū that impacts on taonga species should be reduced, mitigated, offset and, where appropriate, compensated for using a robust habitat and biodiversity accounting model. I further support the inclusion of Rangitāne o Manawatū as kaitiaki for the whenua and wai in the ongoing development of the ecological effects assessment and management approach.

137. Ngāti Kauwhata[105] provided a short submission that echoed some of the points of Rangitāne o Manawatū, including concerns regarding reclamation of waterbodies, discharge of stormwater and the effects on Te Mana o Te Wai, and impacts on significant ecological habitats.

138. Te Runanga o Raukawa[106] and Ngāti Turanga[107] raise similar concerns to Ngāti Kauwhata. The receiving environment, being Mangaone Stream, is within Ngāti Turanga's rohe and they are concerned regarding the impacts of the project on Te Mana o Te Wai.

139. All submissions from iwi requested a collaborative approach to the on-going development of the proposal. I was involved in Te Ahu a Turanga project which applied a co-partnership[108] approach between Waka Kotahi and iwi. In my role as freshwater ecologist on that project, I found the co-partnership approach to be very valuable, and offered an opportunity for matauranga maori principles to be incorporated into effects management alongside

[105] (14) Nga Kaitiaki O Ngati Kauwhata Incorporated
[106] (96) Te Runanga o Raukawa
[107] (49) Ngāti Turanga
[108] The Te Ahu a Turanga Alliance won the New Zealand Planning Institute Award for 2021 Best Practice – Consultation and Participation Strategies and/or Processes.

western science. With this in mind, I am supportive of the relief sought by iwi to have an ongoing role in the project.

9 NPSFM and Te Mana o Te Wai

140. I refer briefly above to the statutory context and the relevant policies to be considered at the regional consenting phase. I provide here a summary of some of the key policies of the NPSFM relevant to this assessment. I understand that it is up to Regional Councils to incorporate the policy direction of the NPSFM into their Regional Plans. Many of these changes will take some time to be implemented. Immediate changes required by the NPSFM are identified at Section 1.7 of the NPSFM and relate to natural inland wetlands, rivers and fish passage. Local authorities must give effect to the NPSFM as soon as reasonably practicable.[109] Given the lapse date requested by Kiwirail, it is reasonably forseeable that the direction of the NPSFM will be fully incorporated into statutory documents at time of regional consenting.

141. The NPSFM provides a hierachy of obligations that recognises first and foremost the health and wellbeing of water bodies and their freshwater ecosystems.[110] Even where freshwater systems are degraded, the health and wellbeing of these systems should be improved.[111] Freshwater should be managed in an integrated way.[112] There is to be no further loss of natural inland wetlands, their values are protected and restoration promoted.[113] The loss of river extent and values is avoided to the extent practicable[114] and the habitats of indigenous freshwater species are protected.[115]

142. The Ecology Report justifies effects on the basis that the freshwater ecological values are low, and that measures to address effects will not be required. In my opinion, this approach is not consistent with the direction of the NPSFM and the Policies outlined above.

143. Te Mana o te Wai has been a recurring theme through the submissions from mana whenua. Much of the detail in respect of the NPSFM will be addressed in regional consenting, however, the overarching principles of the NPSFM are,

[109] Section 4.1(1) NPSFM 2020.
[110] Section 2.1(1)(a) NPSFM 2020
[111] Policy 5, Section 2.2 NPSFM 2020
[112] Policy 3 NPSFM 2020
[113] Policy 6, Section 2.2 NPSFM 2020.
[114] Policy 7 Section 2.2 NPSFM 2020.
[115] Policy 9 Section 2.2 NPSFM 2020.

in my opinion, relevant in considering the appropriateness of the site and the effects of the designation.

144. I understand from my planning colleagues that how Te Mana o te Wai is applied in the context of the NPSFM is something that will be further developed through a consultation process involving mana whenua and others in the Manawatū region. I do, however, consider that I can make some comment on my impression and understanding of the concept of Te Mana o te Wai as a freshwater ecologist. I preface my comments with a statement that I am a Pākehā freshwater specialist with a western science background. It is not my intention to speak on behalf of mana whenua, but rather present my understanding of Te Mana o Te Wai in an ecological setting. I also draw on the submissions from mana whenua to inform my assessment.

145. My understanding of Te Mana o te Wai, is that wai is recognised as having its own life force and values, and that first and foremost the wai should be allowed to function in its own right. Protecting the hauora (health and well-being) of the wai itself takes priority over the use of the wai for other purposes.

146. The proposed Freight Hub will impact the streams and the wai within the Project area. Stream (and probably wetland) habitat will be permanently lost. The flow of water along its natural path will be modified, with some being diverted into culverts and some possibly into different sub-tributaries. The operational activities within the site have the potential to modify the chemistry of the wai. I understand that the mauri and mana of the water will therefore be changed from what is currently there.

147. It is important to consider that the existing environment is modified and therefore the wai is not starting from a place of 'pristine'. However, despite the modified and degraded nature of the waterways on the site, they do support life, and, in my opinion, the potential for improvement based on western science measures, as well as mauri, is high.

148. As described above, while the constructed stream channel will provide some ecological function, it is my opinion that it does not fully mitigate the loss of stream length and habitat resulting from the development, which similarly, I further consider does not mitigate the mauri and Te Mana o Te Wai.

10 Draft Requirement conditions

149. I understand that many of the ecological matters will be raised again during regional consenting and therefore conditions of consent will be developed specific to the actual and potential adverse effects that consent is sought for at that time. Notwithstanding, there is potential for some works to be undertaken prior to the regional consents being authorised, which could have ecological effects. Further, given the paucity of information provided at this stage, there is value in providing some fail safes to protect the ecological values that remain at the site. The following conditions are recommended on this basis, and I expect that they will be revisited at the time of regional consenting.

150. As I have outlined in my evidence, I consider that there is insufficient information to provide confidence that all ecological values of the site have been identified. Therefore, I recommend a condition prohibiting construction works taking place on site until more comprehensive ecological surveys are undertaken to fully understand the values of the site. This condition is important to confirm the presence or absence of ecological values. Thie ecological surveys need to be undertaken prior to works commencing so an appropriate management plan can be put in place:

a. Prior to any works commencing, a full and complete assessment of the ecological values of the site must be undertaken in accordance with best practice methods to identify the extent and values of the terrestrial, freshwater and wetland habitats and values of the site. This assessment must include, but is not limited to, the following:

i. Stream classification, extent and values, including habitat and ecosystem function assessments, within the site and within the receiving environment.

ii. Surveys of streams to identify any erosion prone areas to provide a baseline state against which to measure change.

iii. Wetland extent and values, in accordance with Wetland Delineation Protocols, Schedule F and NPSFM definitions.

iv. Vegetation assessment to identify extent and values, including both habitat values and presence of 'Threatened' or 'At Risk'

species, and against the criteria within Schedule F of the One Plan.

v. Lizard surveys to identify species present and habitat values.

vi. Bat surveys, if the vegetation assessment identifies potential suitable roost trees.

vii. Bird surveys, to identify species likely to use the site on a temporary or permanent basis, including in particular, but not limited to, assessment of wetland birds if wetlands are identified.

viii. Freshwater fauna surveys to identify the presence of fauna within the streams on site, upstream of the site and within the receiving environment downstream of the site.

ix. Water quality including, but not limited to, parameters related to urban and industrial run off, suspended and deposited sediment and presence of periphyton and macrophytes, within and downstream of the site.

151. In the event that some works can take place prior to the regional consents being sought, I note that the Wildlife Act 1953 requirements will apply. I recommend, following the completion of the site survey recommended above, an EMP be prepared for certification by a suitably qualified and experienced ecologist(s) of the Palmerston North City Council (or its experts). The EMP should be comprehensive and address all affected habitat and fauna values identified in the pre-works surveys. Further, the EMP should be developed in partnership with mana whenua to enable them to contribute to the appropriate management of taonga species and undertake their role as kaitiaki.

152. A condition should be included to require the development of a nationally 'Threatened' or 'At Risk' flora and fauna discovery protocol prior to works commencing.

a. In the event that a Suitably Qualified and Experienced Person discovers any nationally 'Threatened' or 'At Risk' flora and fauna (as defined in the current version of the New Zealand Threat Classification System) within the Designation during early works, the Consent Holder shall immediately notify Kiwirail, Department of

> Conservation and Mana Whenua. The Consent Holder shall have regard to any advice provided by the Department of Conservation and Mana Whenua in determining the appropriate course of action to be undertaken. This is with respect to the discovered flora or fauna (eg further surveys, avoidance and/or capture and relocation). Advice Note: The Consent Holder will comply with all relevant provisions of the Wildlife Act 1953.

153. The further detailed design of the Freight Hub should avoid and minimise ecological effects to the extent practicable. For those stream and wetland effects that are demonstrably unavoidable (noting 'functional need'), the effects management hierarchy defined in the NPSFM should be adhered to. Where offset or compensation measures are required, key offsetting and compensation principles[116] should be adhered to, and the offset or compensation type and quantum must be determined using a robust and transparent methodology to ensure measurable conservation outcomes are achieved. Advice note: Suitable methodologies could include the Stream Ecological Valuation[117] method for stream habitats, and the Biodiversity Offset Accounting Model[118] or the Qualitative Biodiversity Model[119] for wetland and terrestrial habitats, noting that more advanced methods may be appropriate at the time. Any offset measures proposed must be additional to those identified within the landscape planting in the designation application materials (and required by NoR conditions).

154. I support the recommendations of Mr Arsenau and Ms Baugham to provide a Stormwater Management Framework, including consideration of water quality, quantity and erosion potential within the site and the downstream receiving environment.

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[116] Maseyk et al, 2018 at 8 above.

[117] Storey, R. G., Neale, M. W., Rowe, D. K., Collier, K. J., Hatton, C., Joy, M. K., Maxted, J. R., Moore, S., Parkyn, S. M., Phillips, N. and Quinn, J.M. 2011: Stream Ecological Valuation (SEV): a method for assessing the ecological function of Auckland streams. Auckland Council Technical Report 2011/009.
Neale, M W., Storey, R G and Quinn, J L (2016). Stream Ecological Valuation: application to intermittent streams. Prepared by Golder Associates (NZ) Limited for Auckland Council. Auckland Council technical report, TR2016/023.

[118] Maseyk et al. 2015 A Biodiversity Offsets Accounting Model for New Zealand – User Manual, 2015. Prepared for the Department of Conservation by Fleur Maseyk, Martine Maron, Richard Seaton and Guy Dutson.

[119] Baber et al, at 1 above.

155. I support the recommendation of Mr Arsenau and Ms Baugham to require the culverts to be designed according to the "Stream Simulation" methodology of the New Zealand Fish Passage Guidelines.

156. I recommend that an erosion and sediment control plan with reference to best practice standards be required.

157. Support the use of the Cultural and Environmental Design Framework, but note that the planting proposed to be undertaken to date has clearly been identified as landscape planting and will not contribute to any ecological offset that may be deemed necessary under the future regional consents. This is due to the concept of 'additionality' discussed previously.[120]

158. These conditions are not intended to supersede or set standards for regional consenting, rather the conditions I have recommended are intended to bridge the shortcomings of the Ecology materials submitted with the NoR.

11 Conclusions

159. Overall, I agree that the designation site is degraded and typical of agricultural landuse, and I do not consider that the site is fundamentally inappropriate for a large-scale development such as this. However, notwithstanding the limitations to site access and the assertion that field data will be collected to inform regional consenting, I have concerns regarding the strength of conviction to the conclusions presented in the Ecology Report.

160. I consider that the Ecology Report understates ecological values and underestimates the ecological and natural character effects. In my opinion, the effects of the Freight Hub will be higher than claimed within the Ecology Report and I am confident that the adverse effects cannot be managed within the designation extent alone.

161. I have recommended some conditions of consent to provide an avenue for the ecological values to be confirmed prior to any works commencing and in advance of regional consents being sought. With this information available, better decisions can be made about how the Freight Hub's design can address or manage adverse ecological effects.

[120] Refer 106.

Justine Quinn

18 June 2021