

BEFORE THE HEARING PANEL

AT HAMILTON

IN THE MATTER

of the Resource
Management Act 1991

AND

IN THE MATTER

of the Proposed Waikato
Regional Plan Change 1
Waikato and Waipā River
Catchments

AND

IN THE MATTER

of Variation 1 to the
Proposed Waikato
Regional Plan Change 1
Waikato and Waipā River
Catchments

**STATEMENT OF EVIDENCE IN CHIEF OF DR HUGH ALLISTER ROBERTSON
FOR THE DIRECTOR-GENERAL OF CONSERVATION**

FRESHWATER WETLANDS, INCLUDING WHANGAMARINO WETLAND

BLOCK 3

3 JULY 2019

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INTRODUCTION

1. My full name is Hugh Allister Robertson.
2. I hold the position of Principal Science Advisor-Freshwater in the Aquatic Unit, Department of Conservation. I have been in this role since October 2008.
3. I am presenting this evidence for the Director-General of Conservation in relation to protecting and restoring the values of wetland ecosystems through addressing water quality pressures in the Waikato and Waipā catchments.

QUALIFICATIONS AND EXPERIENCE

4. My qualifications and experience are set out in my statement of evidence prepared for Block 1 dated 15 February 2019.

CODE OF CONDUCT

5. While this is not an Environment Court hearing, I have read the Environment Court “Code of conduct for expert witnesses”, and I agree to abide by it. I have prepared this Statement in accordance with that Code. I confirm that my evidence is within my area of expertise. I have not omitted to consider any material facts known to me that alter or detract from the opinions I express in this Statement. I have acknowledged the material used or relied on in forming my opinions and in the preparation of this Statement.

SCOPE OF EVIDENCE

6. I have been asked to provide evidence on matters being addressed in Block 3 of the Proposed Waikato Regional Plan Change 1, relating to:
 - Policy 15 – proposed amendments to ensure the ecosystem health of all wetland habitats in Whangamarino Wetland are provided for;
 - Implementation methods for Whangamarino Wetland. Focusing on catchment wide programmes to reduce phosphorus, nitrogen

and sediment sources, and to provide for a hydrological regime to reduce water quality contaminants;

- Implementation methods for wetlands in general. Including the benchmarking of wetland nutrient and sediment status and research on the attenuation capacity of wetlands;
- Implementation methods for accounting and monitoring – specific requirements for benchmarking and reporting on objectives for freshwater wetlands.

MATERIAL CONSIDERED

7. Key documents and information I have used in preparing this evidence are:

- Proposed PC1
- S42A Officer's Report for Block 3, and associated amendments to PC1
- Operative Waikato Regional Policy Statement
- Operative Waikato Regional Plan
- Vision and Strategy for the Waikato River

POLICY 15 – WHANGAMARINO WETLAND

8. The proposed PC1 puts forward a suggested policy and rule framework to protect and restore the Waikato and Waipā river catchments and their associated waterbodies by reducing discharges of nitrogen, phosphorus, sediment and microbial pathogens. The management of diffuse and point source discharges of nitrogen, phosphorus and sediment is critical not only for lakes, rivers and streams, but also for natural wetlands, including Whangamarino Wetland (refer my EIC presented in Block 1).
9. The evidence in chief I prepared for Block 1 of PC1 outlined the significance of Whangamarino Wetland, the impact of water quality contaminants on ecosystem health and described the recommended

attributes and targets for protecting and restoring the values of Whangamarino.

10. Reducing nutrient (nitrogen and phosphorus) and sediment contamination is fundamental to protecting and restoring the ecosystem health of Whangamarino Wetland.
11. Policy 15 of the notified version of PC1 aims to protect and make progress towards the restoration of Whangamarino Wetland. Specifically:

Policy 15: Whangamarino Wetland/Te Kaupapa Here 15: Ngā Repo o Whangamarino

Protect and make progress towards restoration of Whangamarino Wetland by reducing the diffuse discharge of nitrogen, phosphorus, sediment and microbial pathogens in the sub-catchments that flow into the wetland to:

- a. Reduce and minimise further loss of the bog ecosystem; and*
- b. Provide increasing availability of mahinga kai; and*
- c. Support implementation of any catchment plan prepared in the future by Waikato Regional Council that covers Whangamarino Wetland.*

12. The S42A officer's report recommends that Policy 15 is retained, with no amendments proposed.
13. From a technical perspective I support the general intent of Policy 15, as it provides a focus in PC1 to address water quality contamination at Whangamarino Wetland.
14. However, in my opinion the definition of Policy 15 is inadequate. For example, it does not recognise all wetland habitats and it does not correspond to achieving a specific ecosystem health target.
15. I recommend that amendments to Policy 15 are made to ensure that:
 - the policy aims to achieve the natural succession of the wetland system, allowing for natural peatland (bog) development and ensures the protection and restoration of other wetland habitats (fen, swamp, marsh) which are key ecological features of Whangamarino Wetland.
 - the policy acknowledges the inter-relationship between water quality contamination and wetland hydrology and promotes the

management of water levels that do not exacerbate water quality issues, while also protecting critical wetland habitats.

- the policy is directly linked to achieving short-term and long-term water quality targets for Whangamarino Wetland, including the targets proposed for Table 3.11-1 (refer Joint Witness Statement).
- the policy requires specific actions to address the high rate of sediment deposition and high nutrient levels in the wetland.
- the policy requires that impacts from both diffuse and point-source discharges are avoided, remedied or mitigated to ensure the sustainable management of the Whangamarino Wetland.

16. In addition to the amendments recommended above, I consider Policy 15 inadequate because it simply seeks to *reduce or minimise* further loss to the bog ecosystem. It does not seek to *avoid* loss to the bog ecosystem and it is silent on protecting the ecological condition of the bog, fen, marsh or swamp wetland habitats.

17. As detailed in Block 1 (EIC para 65), Whangamarino Wetland contains approximately 1812 ha of bog habitat, 1908 ha of fen habitat, 736 ha of marsh habitat and 2249 ha of swamp habitat. All these habitats are ecologically significant, and they are all susceptible to water quality contamination.

18. *Avoiding* further loss to the bog habitat is critical to protect the wetlands significant ecological values. The extent of representative bog habitat has declined substantially since 1963, from covering 53% of the wetland in 1963 to 35% in 2014 (Reeves 2015). Decline in bog extent is due to impacts associated with changes in catchment land use and altered hydrology (Blyth 2011).

19. At present, Policy 15 does not provide any mechanism to measure progress in reducing discharges of sediment or nutrients. Further it is not clear as to whether the Lake Waikare discharge is considered a point-source or diffuse discharge for the purposes of Policy 15 and PC1.

20. Given that the underlying aim of Policy 15 is to reduce all anthropogenic sources of sediment and nutrients from impacting on ecosystem health

and mahinga kai values of Whangamarino Wetland, irrespective of whether the sources are diffuse or point-source, I recommend that Policy 15:

- Refers to both 'diffuse' and 'point source' discharges
- Is tied to achieving numeric targets for Whangamarino Wetland proposed for 3.11-1 (Joint Witness Statement)

21. The evidence of Ms Kissick presents the specific amendments to Policy 15 proposed by the Director-General of Conservation. These amendments address the changes I recommend in paragraphs 15 and 20 above.

IMPLEMENTATION METHODS - PROPOSED DELETION OUTLINED IN S42A OFFICER'S REPORT

22. The S42A officer's report recommends deletion of many of the implementation methods from PC1 (i.e. deletion of section 3.11.4). It is suggested that these implementation methods are duplicative of other sections of PC1 (Objectives, Policies, Rules) or comprise "business as usual" activities for council.

23. In my opinion, key technical elements are described in the implementation methods in section 3.11.4 that are not covered elsewhere in PC1. For example, the implementation methods define how the council will undertake monitoring, detail the accounting system to be implemented and identify key research priorities that have emerged during the development of PC1.

24. Implementation methods are an existing component of the Operative Waikato Regional Plan, providing important technical details on how it is intended that the council will set out to achieve the Objectives and Policies.

25. I do not support the proposed deletion of the implementation methods (3-11-4). Instead, I recommend they are expanded to ensure that the

implementation methods clearly define the overarching methods required to deliver PC1 for Whangamarino Wetland and other wetlands.

IMPLEMENTATION METHODS (WHANGAMARINO WETLAND)

26. The notified version of PC1 includes Implementation Method 3.11.4.4 for Lakes and Whangamarino Wetland. Implementation Method 3.11.4.4 details several sub-methods (a-g) that provide technical direction to council to work towards the short-term and long-term targets for Whangamarino Wetland. I recommend that Implementation Method 3.11.4.4 is retained.

27. In my opinion, Method 3.11.4.4 also requires amendment to provide further technical direction on the actions required to achieve the short-term and long-term targets for Whangamarino Wetland. I recommend amendments so that:

- The method requires Council, working with others, to urgently progress the implementation of the Catchment Management Plan for Whangamarino Wetland;
- The method directs investment in catchment wide programmes to reduce sediment, phosphorus and nitrogen sources, to achieve the short- and long-term targets proposed for Table 3.11-1;
- The method requires a review of all consents that relate to the Lower Waikato Flood Control Scheme by 2021, to identify optimal approaches to address water quality; and
- The method requires council to implement options to reduce the impact of altered hydrological regimes, where it exacerbates water quality impacts.

28. The evidence in chief I presented for Block 1 (paragraphs 105-110), and rebuttal evidence for Block 2 presented data on the sediment and nutrient loads and concentrations (e.g. Table 1 below) associated with

inputs from Lake Waikare (as part of the operation of the Lower Waikato Waipā Flood Control Scheme) relative to other water sources.

Table 1 (from Table 3 EIC for Block 1). Summary of water quality monitoring data for primary surface water tributaries for Whangamarino Wetland. Source: LAWA accessed 7 February 2019, except Pungarehu Canal (WRC data, PDP 2018)

Monitoring site	TP Median Conc. (mg/m3)	TN Median Conc. (mg/m3)	Clarity (m)	TSS Annual Load (T/yr)
Matahuru Stm Waiterimu Road Below Confluence	91	1430	0.33	na
Waerenga Stm SH2 Maramarua	42	1100	0.86	na
Whangamarino River Jefferies Rd Br	85	1150	0.4	na
Mangatangi River SH2 Maramarua	62	530	0.51	na
Whangamarino River Island Block Rd	131	1960	0.21	na
Pungarehu Canal at Waerenga Rd or Farm Bridge	138	3000	~0.2	Mean TSS load 1980-2012 approx. 22,000 T/yr. ¹ TSS load in 2017 was 27,000 T/yr

29. This data clearly identifies Pungarehu Canal/Stream (Lake Waikare) as the most critical source of water quality contamination to Whangamarino Wetland. Given this, in my opinion it is appropriate that Implementation Method 3.11.4.4 specifies a method to complete a review of the entire flood scheme by 2021 to identify all opportunities to reduce sediment and nutrient attenuation in the wetland.

30. Further, it is important that Implementation Method 3.11.4.4 directs council to implement options to reduce the impact of altered hydrological regimes, where it exacerbates water quality impacts.

¹ WRC are actively monitoring this site to refine the estimate.

31. Research by the University of Waikato (Blyth 2011) concluded that flood events in Whangamarino Wetland are one of the main processes that control the delivery of sediment and nutrients across the wetland, and into the highly sensitive raised bog habitat.
32. Therefore, in addition to addressing the sub-catchment sources of sediment and nutrient contamination, Implementation Method 3.11.4.4 also needs to address the altered flood dynamics, where practical, if the goal is to protect and restore the values of Whangamarino Wetland.
33. It is acknowledged a Catchment Management Plan (CMP) for Whangamarino Wetland has been prepared. Implementation Method 3.11.4.4, subsequently, does not need to refer to preparation of a CMP. Instead, the Implementation Method should shift in focus to delivery, as I have described above (paras 27-32).
34. However, it should be noted that, unlike as PC1 can provide, the CMP:
- does not include short-term or long-term targets for water quality. In my opinion this is a critical gap for PC1 to address.
 - does not put in place a statutory policy or rule framework
 - does not require FEPs, setbacks or other rules/provisions to be undertaken to reduce sediment and nutrient contamination impacts in Whangamarino
35. Overall, while I consider the CMP a very useful non-statutory tool, it does not provide certainty that high priority Implementation Actions will be undertaken to urgently address water quality contamination of Whangamarino Wetland. These are issues that PC1 needs to address.
36. The evidence of Ms Kissick presents the amendments to Implementation Method 3.11.4.4 proposed by the Director-General of Conservation.

These amendments address the changes I recommend in paragraph 27 above.

IMPLEMENTATION METHODS (ALL WETLANDS IN PC1)

- 37. The evidence in chief I presented for Block 1 described and presented data on the sensitivity of all wetlands in the PC1 geographical area to increased levels of nitrogen, phosphorus and sediment (paras 89-103).
- 38. I also described that, with the exception of Whangamarino Wetland, there is a lack of data on the current state of natural wetlands, and this limits the ability for PC1 to prescribe short-term and 80-year water quality targets for wetlands.
- 39. The absence of data is a fundamental issue, particularly given the total area of natural freshwater wetlands in the PC1 geographical area is 15,817 ha, compared to only ~6000 ha for lakes.
- 40. Further, in the Waikato Regional Council report on *‘The health of the Waikato River and catchment’* (Environmental Waikato 2008) it is noted that *“All these remaining wetland areas [in the Waikato River catchment] are highly vulnerable to drainage, damage by pest plants and animals, **sedimentation and nutrient runoff.**”* [emphasis added]
- 41. As an interim approach, it is proposed that narrative targets are established in PC1 for all natural wetlands as outlined in Table 2 below. This is also presented in the Joint Witness Statement for Table 3.11-1, in my EIC for Block 1, and as Table 3.11-3 in the EIC for Ms Kissick for Block 1.

Table 2: Proposed narrative targets for natural wetlands

Wetland type	Attribute relating to water quality (narrative target)			
	TP	TN	Sedimentation	Hydrological regime
Bog	Nutrient status (TP) is within healthy range for the specific wetland type	Nutrient status (TN) is within healthy range for the specific wetland type	Inputs of external sediment are within healthy range for the specific wetland type	Hydrological regime, if altered, does not exacerbate water quality impacts
Fen				
Swamp				
Marsh				

42. The narrative targets for phosphorus, nitrogen and sediment establish a long-term goal that nutrient status and sedimentation, are within the *healthy range* for the wetland type.
43. Different wetland types (bog, fen, swamp, marsh) differ in the amount of nutrients and sediment they naturally receive from surface water or groundwater inputs. Bogs have characteristically low nutrient levels and no direct inputs of mineral sediment, while swamps and marshes are minerotrophic and have higher nutrient levels and will accumulate sediment. Elevated inputs of nutrient or sediment is a risk to all wetland types, and therefore, remaining within the healthy range is important to protect the ecosystem health of all natural wetlands in PC1.
44. Defining the current state of wetlands in PC1 and defining the healthy range, in terms of the attributes in Table 2, will require benchmarking of wetland and nutrient status across the region. This benchmarking will require assessment of wetland soil nutrient status, wetland surface water quality, including sub-catchment sediment and nutrient inputs, and wetland vegetation (as ecosystem health value directly affected by changes in water quality) using established protocols for environmental monitoring.
45. This benchmarking would also be consistent with activities being undertaken by other councils nationally, including the Bay of Plenty Regional Council, Auckland Council and Greater Wellington Regional Council.
46. To provide direction to Council, the purpose and timeframe for wetland benchmarking, and the overarching approach for benchmarking needs to be described in the implementation methods (3.11.4). The benchmarking will enable council to review the performance of the proposed plan change in protecting and restoring wetland values, enable repeat (e.g. 10 yearly) assessment of changes in wetland nutrient and sediment status, and will inform future target setting.
47. Ultimately, I recommend that implementation methods (3.11.4) are amended to include the benchmarking of wetland nutrient and sediment status across the PC1 geographical area by 2023. The specific

amendments to this method are detailed in the planning evidence of Ms Kissick.

48. The notified version of the implementation methods (3.11.4) also gives no direction on the high priority research that is required to protect and restore wetlands from discharges of nutrient and sediment.
49. The priority research area for freshwater wetlands, in my opinion, is to further define the current levels of nutrient and sediment attenuation within natural wetlands across the region and the impact on ecosystem health and mahinga kai from water quality contamination.
50. In my view, providing the level of research specificity outlined above (para 49) as an implementation method is important for ensuring the Council has direction to invest in research programmes that are the highest priority for achieving the Vision and Strategy for the Waikato River, and the objectives of PC1.
51. Therefore, I recommend a new implementation method in section 3.11.4 for wetlands, specifically, to undertake research to further defines the current levels of nutrient and sediment attenuation within natural wetlands, the impact on ecosystem health and mahinga kai from water quality contamination.

IMPLEMENTATION METHODS – ACCOUNTING SYSTEM AND MONITORING

52. The notified version of PC1 includes Implementation Methods 3.11.4.10 and 3.11.4.11 that describe the accounting and monitoring system the Council will establish and operate in each Freshwater Management Unit.
53. The S42A officer's report recommends that Implementation Methods 3.11.4.10 and 3.11.4.11 are deleted.
54. I do not support the deletion. In my opinion, it is paramount that the approach to accounting, monitoring and evaluation is specified in PC1.
55. The definitive test for the success of the objectives, policies, and rules contained in PC1, will be how rivers, lakes, wetlands and other

waterbodies respond to changes in catchment management across the region.

56. Data on state and trend of all waterbodies is required to evaluate Plan effectiveness, and Implementation Methods 3.11.4.10 and 3.11.4.11 provide important technical direction on the monitoring parameters and standards that council is required to meet.
57. While the monitoring may be considered business as usual, the fact that no technical direction is provided for monitoring or evaluating the state and trend of wetland ecosystems highlights the importance of setting the overarching monitoring and evaluating framework within PC1. I recommend that Implementation Methods 3.11.4.10 and 3.11.4.11 are retained and amended to include co-ordinated monitoring of wetland environments.
58. For wetland habitats, monitoring and evaluation is required to review performance in achieving the narrative targets (for all wetlands) and achieving the numeric targets for Whangamarino Wetland. This will require monitoring of:
- wetland surface water quality (nitrogen, phosphorus, sediment) including sub-catchment sediment inputs;
 - wetland soil nutrient status (nitrogen, phosphorus, mineral content);
 - wetland vegetation (as the ecosystem health value directly affected by changes in water quality); and
 - wetland buffer extent, to evaluate the rules relating to setbacks.
59. These monitoring parameters are consistent with the parameters outlined for wetland benchmarking and are based on national monitoring standards applied to wetlands in New Zealand (Clarkson et al. 2004).
60. In the absence of PC1 specifying implementation methods for monitoring and reporting on the state and trend of wetland ecosystems, it will not be

possible to evaluate if PC1 is effective in protecting and restoring the >15,000 ha of wetlands that occur in the region.

61. The evidence of Ms Kissick presents the specific amendments to Implementation Methods 3.11.4.10 and 3.11.4.11 proposed by the Director-General of Conservation. These amendments address the changes I recommend in paragraph 58 above.

LITERATURE CITED

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Dr Hugh A. Roberston



3 July 2019