BEFORE AN INDEPENDENT HEARINGS PANEL OF WAIKATO DISTRICT COUNCIL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application by Lakeside Developments 2017 Limited for a private plan change

STATEMENT OF EVIDENCE OF MICHAEL STEWART ON BEHALF OF LAKESIDE DEVELOPMENTS 2017 LIMITED

1. INTRODUCTION

1.1 My full name is Michael Stewart. I am a Director and Environmental Chemist at Streamlined Environmental Ltd. I have 20 years professional experience as a chemist. I hold a PhD in Chemistry from the University of Canterbury (awarded 1997).

1.2 From 1997 to 2006 I was involved primarily in natural products research in the UK (pharmaceutical/biotech sector) and Australia (academia).

1.3 Since returning to New Zealand in 2006 (NIWA to December 2014 and Streamlined since then) I have been involved primarily in research and commercial projects in environmental chemistry, including:

(a) Reviews and technical studies of water and sediment quality and emerging contaminants for RMA consenting (Watercare – Omaha WWTP, Warkworth/Snells Beach WWTP);

(b) Assessments of ecological effects of wastewater and/or stormwater discharges to the receiving environment (Watercare – Omaha WWTP, Warkworth/Snells Beach WWTP, Southwest Manukau WWTP (wastewater); Lakeside Developments Ltd – Te Kauwhata WWTP (wastewater); Le Coz Ltd – Whitford Manor Estate (wastewater and stormwater);

(c) Literature review of the risks and adverse effects from waterborne contaminants (Otago Regional Council);

(d) The design and implementation of monitoring programmes on legacy and emerging organic contaminants for Auckland and Waikato Regional Councils;

(e) Critical reviews of state of the environment monitoring programmes for Auckland and Waikato Regional Councils;

(f) Broad scale water quality assessment to inform the Rotokauri Integrated Catchment Monitoring Plan (Hamilton City Council);

(g) Human health risk assessments of contaminants in mahinga kai species (Health Research Council, Whakaora Te Waihora), and;

(h) Water quality trend analysis.

1.4 I have co-authored 22 peer-reviewed scientific publications, 12 as lead author and 21 in international journals. I am still actively engaged in research, especially around the environmental fate and effects of emerging contaminants in New Zealand and the development of methods to measure bioavailable concentrations of chemical toxicants.

1.5 I have read and I am familiar with the Environment Court's Code of Conduct for Expert Witnesses December 2014. For the purpose of this hearing, I agree to be bound by that Code of Conduct and have familiarised myself with the requirements as set out in the Code.

1.6 This evidence is provided in respect of the Lakeside Private Plan Change request made by Lakeside Developments 2017 Limited (**LDL**).

2. MY INVOLVEMENT IN THE PROJECT

2.1 I have been involved in this Project since May 2017.

2.2 I was the author of a memo to LDL on the effect of land use change from dairy farm (current status) to residential (proposed Lakeside development) on nutrient (nitrogen (N) and phosphorus (P)) loads to Lake Waikare (Stewart, 2018).

2.3 I was also the lead author on two reports which assessed the effects to Lake Waikare and further downstream (Whangamarino Wetland and Lower Waikato River) from current and future discharges of wastewater from Lakeside and Te Kauwhata WWTPs (Stewart et al. 2017a) and Lakeside only (Stewart et al. 2017b). These have been incorporated into a separate discharge consent application.

2.4 For the purposes of my evidence I note a third scenario is also possible. This would involve removal of **all** future wastewater discharges to Lake Waikare, with discharge at another location.

3. SCOPE OF EVIDENCE

3.1 My evidence summarises the salient points of a memo to LDL (Stewart, 2018) to address concerns of two submitters – namely Fish & Game New Zealand (hereafter **F&G: submission 15**) and the Department of Conservation (hereafter **DOC: submission 16**) – about increased contaminant loads to Lake Waikare (and further downstream) from the proposed Lakeside Private Plan Change.

3.2 The memo (Stewart, 2018) is appended to this evidence as Appendix 1.

3.3 I note that concerns raised by F&G and DOC are around increased loads from wastewater and stormwater discharges from the development and associated potential increases in adverse effects (Appendix 1).

3.4 To provide perspective, I also note that an assessment of ecological effects from wastewater discharge has been prepared to support a separate discharge consent application. Although this is not summarised in my evidence, pertinent conclusions from this report (Stewart et al, 2017a) that are of relevance are:

- A proposed membrane bioreactor (MBR) wastewater treatment plant with discharge to sub-surface wetlands (hereafter **the MBR wastewater system**) will provide the capacity to treat all wastewater from Lakeside and Te Kauwhata and surrounds up to 2052;
- The MBR wastewater system will **remove direct discharge** of wastewater to Lake Waikare;

- Up to 2052 the MBR wastewater system will provide a **reduction in all contaminant loads and/or concentrations** (nutrients, sediment, metal and organic toxicants, microbial pathogens) compared with the current Te Kauwhata wastewater treatment plant. For the avoidance of doubt, the contaminant loads and/or concentrations produced by the MBR wastewater system (sum of Te Kauwhata + Lakeside influent) in 2052 are forecast to be less than the contaminant loads produced by the Te Kauwhata WWTP in 2015/16.
- Due to large external contaminant loads (mainly diffuse loads from dairying and sheep and beef grazing), these improvements may not manifest in improved lake water quality but are consistent with the concept of "betterment" underpinned by the Vision and Strategy, Regional Policy Statement, and National Policy Statement for Freshwater Management.

3.5 However, despite these reductions in contaminants (and associated effects) from the proposed MBR wastewater system, **further reductions of nutrient loads** will be achieved by land use change from dairy farm to residential development.

3.6 In summary, the scope of my evidence summarises the further "gains" that will be achieved for nutrients[1] **over and above** those from the proposed MBR wastewater system, as a result of the land use change from dairy farm to residential associated with the Lakeside Private Plan Change application (Stewart, 2018).

4. SUMMARY OF EVIDENCE

4.1 Dairy farms generally have high N and P loads leaching into groundwater and surface water. N is considerably higher than urban residential blocks (MfE, 2002).

[1] I do not have any clarification around which specific contaminants the submitters mean in their statements around "increased contaminant loads". This evidence shows the land use change from dairy to residential will provide a further improvement for nutrient (N and P) leaching from the dairy farm.

4.2 For the current dairy farm, the estimated N leaching rate from the 2014/15[2] Farm Management Report (Appendix 1) was 22 kg/ha/year, which equates to 4,048 kg N leaching from the farm per year or 11.1 kg N leaching from the farm per day.

4.3 In comparison, urban total nitrogen (TN) leaching rates of 8 kg/ha/year are commonly used (MfE, 2002).[3] The difference (i.e. reduction) in TN leaching rates as a result of the conversion from dairy farm to urban land use (i.e. residential) is 14 kg/ha/year, or 7.1 kg/day.

4.4 Total phosphorus (TP) leaching rates were not reported in the Farm Management Report, however TP leaching rates of 1.0 kg/ha/year are reported for dairy farm and 0.8 kg/ha/year for urban (MfE, 2002). The difference (i.e. reduction) in TP leaching rates as a result of conversion from dairy farm to urban land use is 0.2 kg/ha/year, or 0.1 kg/day.

4.5 If all wastewater is pumped off-site the land use change from dairy farm to residential will provide for major reductions in TN leaching and minor reductions in TP leaching, namely 7.1 kg/day for TN and 0.1 kg/day for TP.

4.6 If all wastewater (i.e. from Lakeside and Te Kauwhata area) is treated on-site and discharged (directly or indirectly) to Lake Waikare (Stewart et al, 2017a), these nutrient reductions "offset" the total wastewater TN and TP loads from the MBR wastewater system.

4.7 Under this scenario, and when considering the worst-case scenario – peak wet weather flow (PWWF) from Te Kauwhata and the year 2052 – the "relative predicted TN loads" when the "offset" is applied is 2.0 kg/d. This "offset" TN load is particularly significant and approximately 30% of the current (2015/16) Te Kauwhata wastewater treatment plant discharge load of 6.4 kg/d.

4.8 In other words, when the land use change is considered as part of the overall wastewater discharges in the nutrient budget for TN, by 2052 there will be a reduction of **at least** 4.4 kg/d of TN to Lake Waikare from current day.

---

[2] This was the most recent farm management report available and includes an Overseer nutrient budget.

[3] For the avoidance of doubt, although the term TN is used for urban and N for the Farm Management Report, they are effectively both leachable nitrogen, predominantly as nitrate-N.

4.9 The “offset” for TP is less significant (0.1 kg/d) and does not make a significant contribution to the TP load calculations.

4.10 **Over the long term**, i.e. for the mature development, the proposed conversion from dairy farm to residential dwellings **will** provide a reduction in nutrient loads to Lake Waikare and downstream receiving environments, supporting the concept of “betterment” used to assess effects. This is because the main sources of nutrients (urine spotting and fertiliser) are removed by ceasing dairy farming.

4.11 The concept of “betterment” is also *possible* during the **development stage**. The proviso to this is that there is a reduction in sediment and nutrient leaching during development than there is from the current dairy farm. This can be achieved with appropriate Waikato Regional and District Council guidelines in place to mitigate erosion (Candor[3], 2017).

REFERENCES

Candor[3], 2017. Lakeside Te Kauwhata. Proposed Infrastructure and Servicing Report. Revision C.

MfE (2002). Lake Managers’ Handbook: Land-Water Interactions. Prepared for the Ministry for the Environment by S Elliot and B Sorrel.

Stewart, M. (2018). Memo to Lakeside Developments 2017 Limited on Effect of land use change from dairy farm to residential on nutrient loads to Lake Waikare.

Stewart, M., Cooke, J., Dada, C. (2017a). Assessment of ecological effects on the receiving environment associated with the discharge from the proposed membrane bioreactor wastewater treatment system. Option 1: Treatment of all wastewater generated by Te Kauwhata (current and future), Springhill Prison (current and future) and the Lakeside development. Report LDL1701–FINAL-V2, Streamlined Environmental, Hamilton, 170 pp.

Stewart., M, Dada, C., Cooke, J. (2017b). Assessment of ecological effects on the receiving environment associated with the discharge from the proposed membrane bioreactor wastewater treatment system. Option 2: Treatment of all wastewater generated by the Lakeside development only. Report LDL1702–FINAL DRAFT, Streamlined Environmental, Hamilton, 167 pp.

Michael Stewart

15 February 2018

APPENDIX 1

ENVIRONMENTAL

PO Box 7003
Hamilton East
Hamilton 3247

24 January 2018

Simon Ash

Lakeside Developments 2017 Ltd

Dear Simon

Effect of land use change from dairy farm to residential on nutrient loads to Lake Waikare

I provide this memo to address concerns by two submitters – namely Fish & Game New Zealand (hereafter F&G: submission 15) and the Department of Conservation (hereafter DOC: submission 16) – about increased contaminant loads to Lake Waikare (and further downstream) from the proposed Lakeside Private Plan Change. The information within this memo clearly demonstrates that the change in land use from a working dairy farm (as is the current land use) to a residential development (the proposal) will result in a long-term reduction in nitrogen (N) and phosphorus (P) loads entering Lake Waikare, and further downstream.

1. Submissions

You noted in previous correspondence that F&G (submission 15) and DOC (submission 16) covered several issues in their submissions (see Appendix 1). Four comments in the submissions highlight perceived concerns that Lakeside development will lead to increased contaminant loads to Lake Waikare. These are:

- The proposal should only be approved as operational to the extent that it does not enable development in the rezoned area which *increases the total contaminant loading on Lake Waikare* (F&G);
- Stormwater and wastewater from the Lakeside Precinct Plan Area is managed in a way which *minimises the environmental effects* on Lake Waikare including reducing in contaminant load on Lake Waikare (F&G);

- The Director-General is also opposed to any *increase in the level of contaminants into Lake Waikare associated with stormwater runoff* (DOC);
- The proposed plan change should only be approved if the *total contaminant loading on Lake Waikare from stormwater and wastewater is reduced* (DOC).

I note that concerns raised by these submitters are around increased loads from wastewater and stormwater discharges from the development and associated potential increases in adverse effects. I note that an assessment of ecological effects from wastewater discharge has been prepared to support a separate discharge consent application. Pertinent conclusions from this report (Stewart et al, 2017) are:

- A proposed membrane bioreactor (MBR) wastewater treatment plant with discharge to sub-surface wetlands (the MBR wastewater system) will provide the capacity to treat all wastewater from Lakeside and Te Kauwhata and surrounds up to 2052;
- The MBR wastewater system will remove direct discharge of wastewater to Lake Waikare;
- Up to 2052, the MBR wastewater system will provide a reduction in *all* contaminant loads and/or concentrations (nutrients, sediment, metal and organic toxicants, microbial pathogens) compared with the current Te Kauwhata wastewater treatment plant,
- Due to large external contaminant loads (mainly diffuse loads from dairying and sheep and beef grazing), these improvements may not manifest in improved lake water quality but are consistent with the concept of "betterment" underpinned by the Vision and Strategy, Regional Policy Statement, and National Policy Statement for Freshwater Management.

I do not have any clarification around which specific contaminants the submitters mean in their statements around "increased contaminant loads". As stated above, the MBR wastewater system will provide *reductions* in all contaminant loads and/or concentrations (nutrients, sediment, metal and organic toxicants, microbial pathogens) from Te Kauwhata wastewater treatment plant. Furthermore, it can be demonstrated that – aside from wastewater discharge – the land use change from dairy to residential will provide a further improvement for nutrient (N and P) leaching from the dairy farm.

2. Nutrient loads pre- and post-development

The land for the proposed Lakeside development is currently a working dairy farm. Dairy farms generally have high N and P loads leaching into groundwater and surface water. N is considerably higher than urban residential blocks (MfE, 2002).

The most recent Nitrogen Management Report for this dairy farm (2014/15) is provided in Appendix 2, which includes an Overseer nutrient budget. The report states a total effective dairy farm area of 184 ha consisting of rolling land (80 ha), flat land (49 ha), effluent (25 ha) and chicory (30 ha). Total cows calved was 535 for 2014/15 (2.91 cows/ha), with 223,976 kg of milk solids produced. The average application rate of nitrogen across the whole farm was 71 kg/ha/year. Supplementary feed brought onto the farm was 475 tonnes (dry weight).

The estimated nitrogen leaching rate from the Farm Management Report was 22 kg/ha/year (Table 1), which equates to 4,048 kg nitrogen leaching from the farm per year or 11.1 kg nitrogen leaching from the farm per day. In comparison, urban total nitrogen (TN) leaching rates of 8 kg/ha/year are commonly used (MfE, 2002). The difference (*i.e. reduction*) in TN leaching rates as a result of the conversion from dairy to urban land use is 14 kg/ha/year, or 7.1 kg/day (Table 1).

Total phosphorus (TP) leaching rates were not reported in the Farm Management Report, however TP leaching rates of 1.0 kg/ha/year are reported for dairy and 0.8 kg/ha/year for urban. The difference (*i.e. reduction*) in TP leaching rates as a result of conversion from dairy to urban land use is 0.2 kg/ha/year, or 0.1 kg/day (Table 1).

Table 1. Comparison of TN and TP loads from the current farm and an urban development.

Nutrient	Dairy (kg/ha/y)	Urban (kg/ha/y)	Difference (kg/ha/y)	Difference (kg/d)
TN	22[a]	8[b]	14	7.1
TP	1.0[b]	0.8[b]	0.2	0.1

[a] From Farm Management report (Appendix 2)
[b] From MfE (2002)

3. Effect of land use change on nutrient loads

The extra wastewater burden created by the development can be addressed in two ways. The first involves pumping the wastewater off-site to another wastewater treatment plant (e.g. Huntly). The second involves implementing improved wastewater treatment, such that future loads to the receiving environment are less than they are currently.

Under the first scenario – i.e. assuming all wastewater is pumped off-site – the land use change from dairy to residential will provide for major reductions in TN leaching and minor reductions in TP leaching, namely 7.1 kg/day for TN and 0.1 kg/day for TP (Table 1).

Under the second scenario, – i.e. assuming all wastewater is treated on-site and discharged (directly or indirectly) to Lake Waikare – the loads from wastewater need to be included in the calculations. By extension of this point, these nutrient reductions "offset" the TN and TP loads from the MBR wastewater system when assessing whether the activity for which

consent is being is sought should be approved. For TN, when this offset (7.1 kg/d) is applied to the loads from the MBR (pre-wetland treatment), there are significant reductions (Table 2). For example, when considering the worst-case scenario – peak wet weather flow (PWWF) from Te Kauwhata and the year 2052 (Scenario B in Table 2) – the "relative predicted loads"[1] when the "offset" is applied is 2.0 kg/d by 2052. This "offset" TN load is particularly significant and approximately 30% of the current (2015/16) TKWWTP discharge load of 6.4 kg/d (Stewart et al, 2017).

In other words, when the land use change is considered as part of the overall wastewater discharges in the nutrient budget for TN, by 2052 there will be a reduction of at least 4.4 kg/d of TN to Lake Waikare from current day.

The "offset" for TP is less significant (0.1 kg/d) and does not make a significant contribution to the TP load calculations (Table 2). For example, when considering the worst-case scenario – peak wet weather flow (PWWF) from Te Kauwhata and the year 2052 (Scenario B in Table 2) – the "relative predicted loads" when the "offset" is applied is 5.4 kg/d by 2052. This "offset" TP load is approximately 70% above the current (2015/16) TKWWTP discharge load of 3.2 kg/d. Therefore, with minimal gains from land use change for TP, then by 2052 wetland treatment and/or MBR effluent treatment (such as alum) will still be necessary to reduce TP to below 2015/16 loads. This has been shown to be achievable (Stewart et al, 2017).

Table 2. Relative predicted load of TN and TP (kg/d) discharged from the MBR plant in 2022 and 2052 with the land use "offset" applied.

Scenario	TN (kg/d)		TP (kg/d)	
	2022	2052	2022	2052
(A) Sanitary flows only	-1.6	1.6	3.2	5.1
(B) PWWF from TK, sanitary from Lakeside	-1.2	2.0	3.4	5.4
2015/16 Te Kauwhata WWTP loads	6.4		3.2	

Therefore, over the long term, i.e. for the mature development, the proposed conversion from dairy farm to residential dwellings will provide a reduction in nutrient loads to Lake Waikare and downstream receiving environments, supporting the concept of "betterment" used to assess effects. This is because the main sources of nutrients (urine spotting and fertiliser) are removed by ceasing dairy farming.

[1] 'Relative predicted loads' are post-MBR treatment loads offset by nutrient budget savings created by conversion from dairy to residential land use.

The concept of "betterment" is also possible during the development stage. The proviso to this is that there is a reduction in sediment and nutrient leaching during development than there is from the current dairy farm. There will be an immediate removal of the main sources of nutrient leaching (urine spotting and fertiliser). However, sediment runoff (and legacy nutrients associated with the sediment) during earthworks may still be an issue, if not controlled. During development, earthworks are known to release large amounts of sediment (and nutrients) especially during high rainfall events (if no mitigation measures are in place) (Cooke et al., 2015). Measures are proposed to mitigate erosion and runoff of sediment (and nutrients) during the development phase. These measures are consistent with appropriate Waikato Regional and District Council guidelines (Candor[3], 2017). Therefore, with these erosion measures in place there is likely to be a reduction of sediment runoff during the development satisfying the concept of "betterment".

However, with high nutrient leaching from the wider catchment, and legacy nutrient loads from dairy farming on the Lakeside site, observable benefits to lake water quality may only be manifest in the long term as part of overall lake rehabilitation efforts. This would need to include a significant reduction in N and P loads from wider catchment sources, together with dredging or capping of sediments, which are sustaining N and P in the water column, for a significant improvement in the trophic state of the lake.

Yours sincerely,

Mike Stewart

Director/Environmental Chemist

Streamlined Environmental Ltd

4. References

Candor[3], 2017. Lakeside Te Kauwhata. Proposed Infrastructure and Servicing Report. Revision C.

Cooke, J., Stewart, M., Phillips, N., Cox, T., 2015. Rotokauri ICMP – Broad scale Water Quality Assessment. 95 pp. Hamilton City Council.

MfE, 2002. Lake Managers' Handbook: Land-Water Interactions. Prepared for the Ministry for the Environment by S Elliot and B Sorrel.

Stewart, M., Cooke, J., Dada, C., 2017. Assessment of Ecological Effects on the Receiving Environment Associated with the Discharge from the Proposed Membrane Bioreactor Wastewater Treatment System. Option 1: Treatment of All Wastewater Generated by Te Kauwhata (Current and Future), Springhill Prison (Current and Future) and the Lakeside Development. Report LDL1701–FINAL, Streamlined Environmental, Hamilton, 168 pp.

5. Appendix 1: F&G and DOC submissions

#15
ECM
1837030

Statutory managers of freshwater sports fish, gamebirds and their habitats.

Submission by

Auckland Waikato Fish and Game

on

Proposed Private Plan Change 20 to the Waikato District Plan

Auckland/Waikato Region
156 Brymer Rd, RD 9, Hamilton 3289, New Zealand. Telephone (07) 849 1666 Facsimile (07) 849 1648
Email: admin@awfg.org.nz www.fishandgame.org.nz

Statutory managers of freshwater sports fish, gamebirds and their habitats.

Form 5 - Submission on publically notified proposal for policy statement or plan, change or variation

To: Waikato District Council

Submitter: Auckland Waikato Fish and Game

This is a submission on a change proposed to the following plan, Proposed Plan Change 20 (the **Proposal**): **Waikato District Plan**

The specific provisions of the Proposal my submission relates to are: contained in the following pages (pp3-9).

My submission and reasons: contained in the following pages (pp3-9).

Decision sought: contained in the following pages (pp3-9).

Trade competition: Pursuant to Clause 6 of Schedule 1 of the Resource Management Act 1991, Auckland Waikato Fish and Game confirm that they could **not** gain an advantage in trade competition through this submission.

Hearing: I **wish to be heard** in support of my submission and will consider presenting a joint case at any hearing with other parties presenting on similar matters.

Signed by:

Anna Sintenie
Environmental Officer
Auckland Waikato Fish and Game

Date: 18/10/2017

Address for service: Auckland Waikato Fish and Game
156 Brymer Road
RD 9
Hamilton 3289

Telephone: 07 849 1666
Email: asintenie@awfg.org.nz

Statutory managers of freshwater sports fish, gamebirds and their habitats.

A. INTRODUCTION

1. Auckland Waikato Fish and Game (Fish and Game) appreciates the opportunity to submit on the Proposal.

2. Fish and Game Councils are crown entities established under the Conservation Act 1987 with functions to:

> *26Q (1) … manage, maintain and enhance the sports fish and game resource in the recreational interests of anglers and hunters…*
>
> *(a) to assess and monitor-…*
>
> *(iii) the condition and trend of ecosystems as habitats for sports fish and game:*
>
> *(b) to maintain and improve the sports fish and game resource -*
>
> *(i) by maintaining and improving access; and …*
>
> *(iv) by ensuring there are sufficient resources to enforce fishing and hunting season conditions; and*
>
> *(v) by undertaking such works as may be necessary to maintain and enhance the habitat of sports fish and game, subject to the approval of the Minister, the land owner, or the administering authority, as the case may require:*
>
> *(c) to promote and educate - …*
>
> *(ii) by promoting recreation based on sports fish and game; …*
>
> *(e) in relation to planning,-*
>
> *(i) to represent the interests and aspirations of anglers and hunters in the statutory planning process; and …*
>
> *(iii) to prepare sports fish and game management plans in accordance with this Act; and…*
>
> *(vii) to advocate the interests of the Council, including its interests in habitats…*

3. The resource managed by Fish and Game in the Lake Waikare and Whangamarino Wetland is of increasing significance to a growing population, while simultaneously facing mounting habitat pressures.

4. The experience sought by hunters in the area includes the wilderness experience, the opportunity to engage in hunting for food and enjoyment in a natural/non-built environment with minimal restriction. This is a significant recreational and cultural aspect of the area, particularly given the projected increased settlement in the Waikato District. It constitutes an essential public amenity for an increasingly densely populated area.

B. SUBMISSION, REASONS AND DECISIONS SOUGHT

B.1 Reverse sensitivity and gamebird hunting activities			
Specific Provisions	**Submission**	**Reasons**	**Decision sought**
Part C Amendments to Living Zone rules and Part E Amendments to Rural Zone rules	1. Amendment sought to address reverse sensitivity issues for gamebird hunting activities.	2. Lake Waikare is listed as a recreational site of regional significance for game bird hunting in the Auckland Waikato Sports Fish and Game Bird Management Plan. There are maimai locations along the western shore of the Lake including on the lake margin covered by PPC20, and immediately below the area of PPC20 encapsulated by the culture and heritage overlay. 3. New dwellings and public places in close proximity to areas of recreational significance to hunters can have implications on the future of hunting in these areas, for example, through complaints under s 48 of the Arms Act (the discharge of a firearm in or near a dwelling, house or public place so as to "annoy or frighten any persons"). 4. Despite zoning including the rural buffer, the design and layout of the proposal may result in land use inconsistent with some effects associated with shooting activities at Lake Waikare, ie noise. 5. Noise may be a particular issue for public places such as any equestrian arena (a proposed permitted activity) in the vicinity of maimais used during the gamebird hunting season.	6. Incorporate reverse sensitivity provisions listed below at paragraphs 7-9 or other similar provisions to enable continuation of gamebird hunting on the margins of Lake Waikare. 7. Amend restricted discretionary and controlled activities under 25H and 21E to include discretion and control over reverse sensitivity issues related to gamebird hunting. 8. Rule 25H.5.1 provides for an equestrian arena as a permitted activity. Amend as follows: … *(d) an equestrian arena (provided any buildings comply with the*

			building and effects rules of the plan and issues of reverse sensitivity as a result of gamebird hunting activities are met.) 9. Include an additional provision at 21E.4: ***Reverse sensitivity: Gamebird hunting:*** *The extent to which issues of noise as a result of shooting during the gamebird hunting season that would otherwise exceed permitted activity status in the WDP are addressed. Methods include no complaints covenants and/or consent notices.*

B.2 Lake Waikare water quality			
Specific Provisions	**Submission**	**Reasons**	**Decision sought**
Entire Proposal	1. Oppose any increase in contaminants into Lake Waikare from any development	2. Lake Waikare is listed in the Auckland Waikato Sports Fish and Game Bird Management Plan as regionally significant. Whangamarino Wetland complex is listed as nationally significant. Lake Waikare was once considered "the heart of the Waikato duck factory". These lake and wetland ecosystems are rarely found in New Zealand and are recognised elsewhere as being of international significance.	7. The Proposal should only be approved as operational to the extent that it does not enable development in the rezoned area which increases the total contaminant loading on Lake Waikare

	enabled by PPC20.	3. Fish and Game owns and manages 730ha in the Whangamarino Wetland and 75ha on the western shores of Lake Waikare, south of the Proposal. Fish and Game has undertaken and continues to undertake work on Lake Waikare and the Whangamarino complex, including: • creating and maintaining new ponds and wetlands; • advocating for wetland protection and access; • establishing and maintaining the Whangamarino weir in partnership with DOC (designed to retain groundwater and surface water levels which had been affected by surrounding flood protection works and land uses causing loss of wildlife habitat); • controlling plant pests; • trapping animal pests; • restoring areas bordering Lake Waikare and the Whangamarino Wetland that have been retired from grazing. 4. Any increase of contaminants from any development enabled by the Proposal would be undesirable in light of Fish and Game's considerable efforts pursuant to s 26Q(1) of the Conservation Act in managing maintaining and enhancing the resource at those sites. 5. The Vision and Strategy applies to all activities in the Waikato catchment. It prevails over ss 72-77 of the RMA. 6. Any increase of contaminants into Lake Waikare from any development enabled by the Proposal would not be consistent with the Vision and Strategy, RPS, and National Policy Statement for Freshwater Management.	from current levels. 8. Amend 15D.3.16 as follows: *Stormwater and wastewater from the Lakeside Precinct Plan Area is managed in a way which minimises the environmental effects on Lake Waikare <u>including by reducing in contaminant load on Lake Waikare.</u>* 9. Development should be enabled by the Proposal only where it minimises stormwater generation at source. This includes an emphasis on Water Sensitive Design principles (used in the Auckland Unitary Plan), including, but not limited to: minimising impervious area on sites by site design; clustering houses; use of pervious paving; minimising generation of contaminants, including by the use of building materials that have a low contaminant yield; and

			sediment and nutrient traps.

B.3 Environmental effects of subdivision and land uses			
Specific Provisions	**Submission**	**Reasons**	**Decision sought**
Part B Objectives, Policies and Methods	1. Support objective 15D.3.9 subject to amendment to the associated policies and amendment to the methods.	1. The Proposal does not recognise the effects of increased cat, dog and animal pests on Lake Waikare and Lake Kopuera avifauna as a result of increased housing densities in the Living Zone. 2. Predators associated with human habitation can travel large distances and would not be confined to the Living Zone marked out in the Proposal, nor the boundaries of the Proposal itself. Avifauna in Lakes Kopuera and Waikare would be subjected to increased predation as a result of subdivision and landuses enabled. 3. Lake Waikare and its wetland margins are recognised in the Waikato Regional Plan (WRP) (Table 3.7.7) as habitat for: *Australasian Bittern, North Island Fernbird, common waterfowl*. 4. Lake Rangiriri (Kopuera) Wildlife Management Reserve is a wildlife refuge which is recognised in the WRP (Table 3.7.7) as a habitat for: *Australasian bittern, North Island Fernbird, spotless crake and common waterfowl... Good quality wetland habitat.* Lake Kopuera is immediately adjacent to the Proposal, separated by the Main Trunk Line. 5. A resulting loss of avifauna is inconsistent with the internal reasons of the Proposal ie: 15D.4.1 and 15D.4.5. Given the values and significance of surrounding avifauna (some with conservation statuses including threatened – nationally critical, at risk – declining and at risk), protection	9. Include an additional policy under objective 15D.3.9: *POLICY 15D.3.19 Effects of increased cat, dog and animal pest densities on Lake Waikare and Lake Kopuera avifauna as a result of increased local housing densities are mitigated.* 10. Amend method 15D.5.3 as follows: *Information, Education and Advocacy: ...* • *Promote within the community the significance of avifauna in surrounding water bodies and the need to control pests and limit cat and dog numbers and their ability to roam.* 11. Amend 15D.6.4 as follows:

		and enhancement should include these species. 6. The focus in the Proposal on planting as environmental restoration without consideration for the effects of the subdivision and activities on fauna will not result in maintained or enhanced ecological value (the Proposal), maintenance or enhancement of indigenous biodiversity (Waikato District Plan), or protection of habitat (RMA, s 6(c)). 7. Waikato District Plan Policy 2.2.5 states *Areas of significant indigenous vegetation and significant habitats of indigenous fauna managed in a way that protects long term ecological functioning including*: ... *(b) undertaking plant and animal pest control ...* *(ea) avoiding housing development close to such areas.* 8. While alternative measures may be supported by Fish and Game, an appropriate approach to address avifauna predation is at a minimum to: a) encourage communities to value and protect nearby wildlife, paired with; b) require consents to be conditional on a financial contribution, services or works by the developer (towards animal pest management in similar, less populated areas elsewhere on Lake Waikare or in Whangamarino Wetland).	*Information, Education and Advocacy ... This may include encouraging the community to enhance and protect lake environment and ecologically sensitive areas <u>and species, particularly avifauna, including through trapping programmes, limiting cat and dog numbers,</u> and by encouraging high-quality design within development.* 12. Amend 15D.5.1 Regulatory Methods to include an additional point: • *<u>Through the comprehensive subdivision require financial contribution, services or works on the Lake Waikare margin or in the Whangamarino Wetland which mitigate the effects of predation on avifauna through animal pest control.</u>*

			13. Or other amendment to address pet and pest predation of avifauna around the subdivision.
Comprehensive subdivision consents (21E2.1; 23C.3; 25H.3)	14. Amendment sought.	15. Reasons listed in paras 1 to 8 above.	16. Amend subdivision consents to include condition(s) that financial contribution or services or works be provided at time of consent to mitigate the effects on avifauna elsewhere on the Lake Waikare margin or in the Whangamarino Wetland. 13. Or other amendment to address pet and pest predation of avifauna around the subdivision.

B.4 Lakeside Walkway			
Specific Provisions	**Submission**	**Reasons**	**Decision sought**
Rule 25H.4.3 Comprehensive Land Development Consent	1. Opposed to the development of a lakeside walkway being non-notified.	2. The walkway mapped in the Lakeside Precinct Plan overlaps with wetland and vegetated areas as well as some areas which are at times inundated with water. Affected parties should have the opportunity to respond to a detailed application for consent of a lakeside walkway to ensure effects are avoided, remedied and mitigated.	3. Provide for applications for a lakeside walkway to be determined as a restricted discretionary activity with provision for notification.

Submission ends.

RECEIVED
20 OCT 2017
BY:

16
#1837601

Department of Conservation
Te Papa Atawhai

DOCM-3190915

20 October 2017

Waikato District Council
Private Bag 544
Ngaruawahia
3742

Dear Sir/Madam

Waikato District Council – Proposed Private Plan Change 20 Lakeside Developments

Please find enclosed the submission by the Director-General of Conservation in respect of Proposed Private Plan Change 20. The submission identifies the Director-General's concerns.

Please contact Jacob Williams in the first instance if you wish to discuss any of the matters raised in this submission (027 578 4094, jwilliams@doc.govt.nz).

Yours sincerely

Ray Scrimgeour
Operations Manager
Waikato

Form 13: Submission on publicly notified application concerning a plan change

Resource Management Act 1991

To:	Waikato District Council
Name of submitter:	Lou Sanson, Director-General of Conservation (Director-General)
Applicant:	Lakeside Developments 2017 Limited
Submission on:	Waikato District Plan Proposed Private Plan Change 20 Lakeside Developments.
Trade competition:	I am not a trade competitor for the purposes of section 308B of the Resource Management Act 1991
My submission relates to:	The proposed plan changes generally, and specifically the effects of any future planned development on stormwater runoff and any development of a waste water treatment plan
My submission is:	I am opposed to any increase in discharge of wastewater and stormwater to Lake Waikare.

The reasons for my submission are that:

1. The township of Te Kauwhata is located adjacent to Lake Waikare. Water from Lake Waikare flows into the Whangamarino Wetland through the Pungarehu Stream and then into the Waikato River. Any contaminants that enter Lake Waikare are likely to end up in the Whangamarino Wetland and ultimately the Waikato River.
2. The Whangamarino Wetland is a wetland of international importance and has been a Ramsar site since 1989. Many threatened plant and animal species have been recorded in the wetland including the Australasian bittern, marsh crake, North Island fernbird, black mudfish and the swamp helmet orchid.
3. The proposed plan change will lead to an increase in the population of Te Kauwhata and a subsequent increase in wastewater. If current treatment processes are not changed, the wastewater and additional nutrients and contaminants will flow into Lake Waikare and eventually the Whangamarino Wetland and the Waikato River.
4. The current proposals contained with the application include the creation of a Membrane Bioreactor (MBR) Treatment Plant to treat the current townships (including the proposed increase in population) wastewater. The Director-General is opposed to the proposal as any increase in contaminants into Lake Waikare (including diffuse discharges) is undesirable and contrary to the Waikato Regional Council Regional Policy Statement and the Vision and Strategy for the Waikato River.

5. The Director-General is also opposed to any increase in the level of contaminants into Lake Waikare associated with stormwater runoff. Development should be undertaken in such a way as to reduce the amount of stormwater runoff such as incorporating sediment and nutrient traps, a decrease in impervious surfaces, and increasing the amount of low impact urban design and developments.

6. The Director-General is opposed to having the building of the Lakeside Walkway as a controlled activity with no notification or without the need to obtain written approval of any affected persons.

7. The Director-General currently undertakes weed control activities in Lake Waikare and the Whangamarino Wetland to control pest plants such as Alligator Weed. The Director-General is opposed to any activities that may exacerbate or spread pest plants without adequate controls in place.

Decision sought:

a) The proposed plan change should only be approved if the total contaminant loading on Lake Waikare from stormwater and wastewater is reduced.
b) The objectives and policies need to recognise the internationally significant values of the Whangamarino Wetland and take a precautionary approach to likely adverse environmental effects on the wetland.
c) Proposed Rule 25H.3.3 should be amended to state that the creation of the Lakeside Walkway is a restricted discretionary activity subject to the normal tests for notification and affected party approval.
d) The proposed plan change should only be approved if a biosecurity plan is created that provides management options, raises awareness, and does not exacerbate the spread of pest plants.

The Director-General reserves the right to be heard

.....
Ray Scrimgeour
Operations Manager, Waikato
Acting pursuant to delegated authority

20 October 2017

.....
Date

Note: A copy of the Instrument of Delegation may be inspected at the Director-General's office at Conservation House Whare Kaupapa Atawhai, 18/32 Manners Street, Wellington 6011

Address for service:
RMA Shared Services
Department of Conservation
Private Bag 3072
Hamilton 3240
Attn: Jacob Williams

Appendix 2: Farm Overseer report

SUPPLY FONTERRA

Nitrogen Report 2014/15 Season

SUPPLIER NUMBER: 71757

Fonterra
Dairy for life

This is your farm's Nitrogen Management Report for the 2014/15 season.

It provides you with your farm's Nitrogen Conversion Efficiency (NCE) and Nitrogen Leaching Risk (NL), to help you identify opportunities for further nitrogen use efficiency on your farm. It also gives you a better understanding of the potential business risks to your farm, particularly in regions where nitrogen limit setting is underway by regional councils.

Note: The information presented in this report is only a summary of a more detailed OVERSEER file. We recommend you seek further advice before making any changes to your farm system(s).

OVERSEER **NUTRIENT BUDGETS**

Overseer is the preferred farm systems modelling tool used by fertiliser companies, farm consultants, regional councils and the dairy industry to demonstrate improved nutrient management practice on New Zealand dairy farms. It is well suited to providing an assessment of relative change (year-on-year and farm-to-farm). Your data has been processed through Overseer in accordance with the Overseer Input Use Standard.

The information in this report is based on the Nitrogen Form you sent to Fonterra in mid-2015. If this form was incomplete, our processing teams may have made some assumptions while processing the data through Overseer.

Key information used to model your farm's nitrogen use:			
Total effective dairy farm area			184ha
Farm Management Blocks:			
Rolling land Gran	80ha	Chicory	30ha
Flat land Gley	49ha		
Effluent Gran	25ha		
Total cows calved			535
Total milk solids produced			223,976 KgMS
Average kilograms of nitrogen applied per hectare (across whole farm)			71 KG/HA/YR
Supplementary feed brought onto farm (dry weight)			475t

YOUR NUMBERS **AT A GLANCE**

22
KG/HA/YR

Nitrogen Leaching Risk

This indicates the risk of the loss of nitrogen from the farming system into either the groundwater system or into waterways.

A small number indicates a lower risk of nitrogen loss.

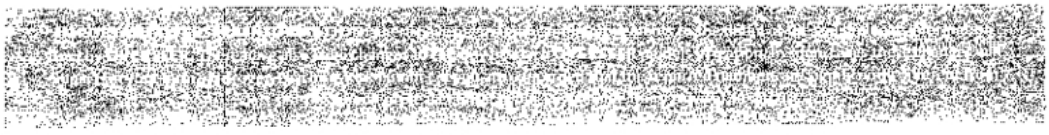
35%

Nitrogen Conversion Efficiency

This is the percentage of nitrogen that is brought into the farming system (fertiliser, supplementary feed and clover fixation) that is converted to products (milk and meat).

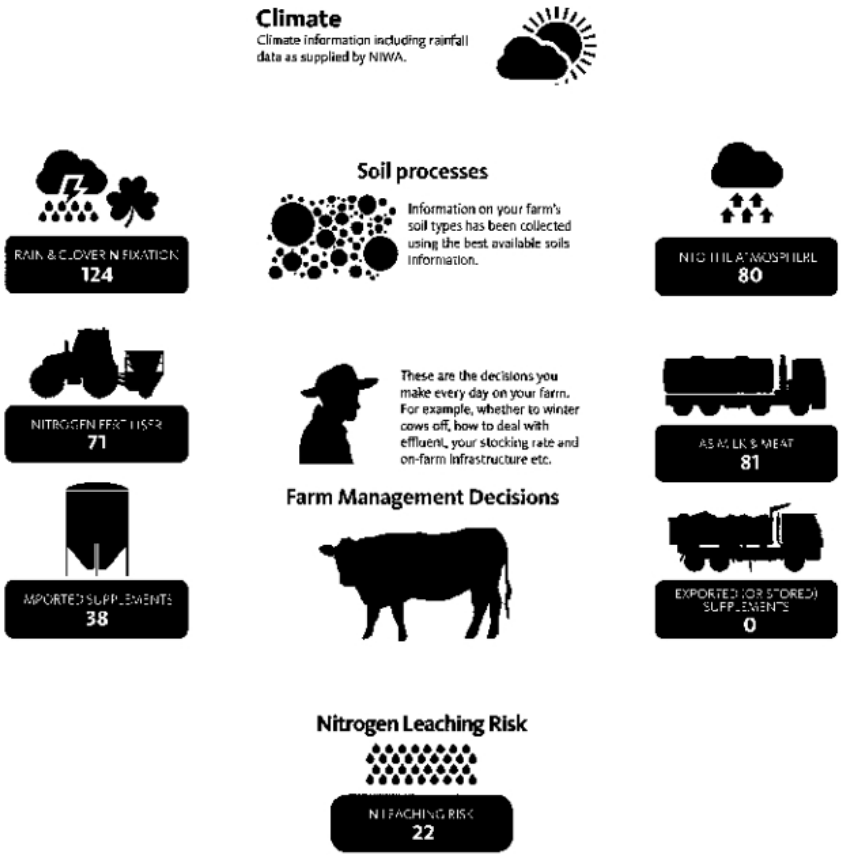
The higher the percentage, the more efficient the farm is at using its nitrogen resources.

Indicative range: 10% to 45%

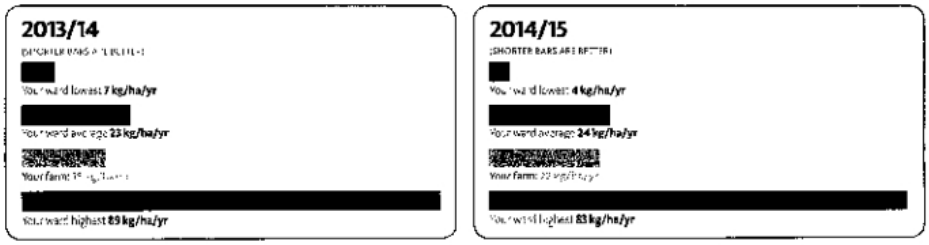


YOUR FARM'S **NITROGEN MODEL**

All numbers on the diagram below refer to kilograms of nitrogen per hectare per year **(KG/HA/YR)**, often called units of N.



COMPARISON OF YOUR FARM'S **NITROGEN LEACHING RISK**

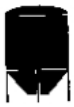


INTERPRETING **YOUR REPORT**

Gains

Rain & Clover N Fixation
Nitrogen entering the dairy farm through rainfall collecting atmospheric nitrogen and clover fixation of nitrogen in the soil.

Nitrogen Fertiliser
This is the nitrogen contained in the fertilisers you have applied.



Supplements
There is nitrogen contained in the protein content of supplementary feeds brought on farm.

Losses

Milk & Meat
There is nitrogen in the protein contained in the milk produced and animals that are sent off farm.

Atmospheric
Nitrogen is lost to the atmosphere (primarily as nitrous oxide gas) from urine patches, dung and effluent ponds.

Exported Supplements
Where supplements are grown on farm and exported (or stored into the next season) there will be a loss of nitrogen from the farm.

Transfers

Stock
Cows and other animals on farm transfer nitrogen around the farm by eating grass and depositing dung and urine.

WHAT TO DO **NEXT**

For more information:

If you would like to discuss this report in more detail please contact your Area Manager or our Service Centre on **0800 65 65 68**

If you would like to view your complete Overseer results in more detail and start exploring ways in which you can reduce your Nitrogen Leaching Risk please contact your Sustainable Dairy Advisor.

If you would like to request a complete Overseer XML file for your own use, or to use with a farm consultant, fertiliser consultant or Regional Council please contact our Service Centre on **0800 65 65 68**

You can download electronic copies of this report from Farm Source to share with other people who work with you on your farm.

Fonterra will keep all of your individual information confidential and will only provide it to third parties with your permission.

Remember to keep records of your farm inputs during the season and complete your Nitrogen Recording Pages for the 2015/16 season.