

**BEFORE THE NEW PLYMOUTH DISTRICT COUNCIL
INDEPENDENT HEARING COMMISSIONERS**

IN THE MATTER the Resource Management Act

AND

IN THE MATTER of a request for Private Plan Change NPDC PLC18/00048
 by Oakura Farm Park Limited to rezone land at Oakura
 within the New Plymouth District

**STATEMENT OF EVIDENCE OF ANDREW DESMOND LOVAT FRASER ON BEHALF
OF OAKURA FARM PARK LIMITED**

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INTRODUCTION

1. My full name is Andrew Desmond Lovat Fraser.
2. I am the Managing Director and Principal Engineer of Red Jacket Ltd, and I am authorised to give evidence on its behalf.
3. I am a Chartered Engineer with 38 years-experience in general Civil and Structural Engineering in New Zealand and overseas.
4. My professional qualifications are BE Civil and CMEngNZ.
5. I have developed the relevant experience with the engineering requirements specific to this subdivision over the past 23 years in New Plymouth, including the past 16 years at Red Jacket.
6. Specifically, my more recent experiences with land development projects include:
 - a) Area Q, Bell Block Consultation and Planning with NPDC – Current
 - b) Parklands Avenue 75 Lots, Bell Block – 2019
 - c) Ashwood Park Stages 1 to 3 50 Lots, Bell Block – 2018
 - d) Coby Sydney Drive and Waitaha Place 50 Lots, Bell Block – 2017
 - e) The Paddocks Subdivision 25 Lots, Oakura – 2015
 - f) Ainslee Street 150 Lots, NP – Current
 - g) Mercade Close 25 Lots, Stratford – 2008

- h) Alberta Road 25 Lots, NP – 2012
- i) Redwood Crescent 20 Lots, NP - 2008

CODE OF CONDUCT

- 7. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it.
- 8. I confirm that the opinions expressed in this statement are within my area of expertise except where I state that I have relied on evidence of other persons.
- 9. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

SCOPE OF EVIDENCE

Stormwater

- 10. I have undertaken a review of the New Plymouth District Council, NPDC stormwater management within the overall Wairau Stream and its tributaries catchment area and proposed management for the Wairau Estate Oakura South FUD and plan change areas.

West FUD construction costs

- 11. I have undertaken a review of the overall costs associated with developing the Oakura West FUD area using the proposed Cunningham Lane access.

Services capacity

12. I have undertaken an analysis of information received from NPDC states that infrastructure enhancement is required to provide sufficient wastewater and potable water capacity in Oakura for the proposed Oakura South FUD private plan change as well as all other planned development areas.

SUMMARY OF EVIDENCE**Stormwater**

13. There are three main tributaries contributing to flow and the majority of sub-catchment discharges have no stormwater controls. The majority of the catchment is rural, and the percentage of catchment associated with the Wairau Estate development is minor.
14. Past straightening of sections of the Wairau Stream may have contributed to increased flooding and erosion in the vicinity of Shearer Reserve.

Oakura West FUD construction

15. Access to the Oakura West FUD area requires several large culverted stream crossings. This, coupled with the steep contour adjacent to the unnamed tributary, will mean major earthworks are required for access which will limit economic viability and may impact development. Conversely, the private plan change area requires significantly less infrastructure and development which is likely to lead to the timely supply of residential housing.

Services capacity

16. Information supplied by NPDC states that there is insufficient capacity for supply of potable water to all proposed development areas. It is proposed that additional storage and alternate supply sources may address this shortfall.
17. Information supplied by NPDC confirmed that an upgraded power supply and installation of additional pump units will be required at the Shearer Reserve pump station to accommodate all proposed development areas.

ANALYSIS

Stormwater

18. The Wairau Stream Catchment is approximately 555 hectares. The unnamed tributary, which the majority of the subdivision associated with the proposed plan change, has a catchment of approximately 23 hectares.
19. The Wairau Stream and its tributaries originate on the Kaitake Ranges and discharge into the Tasman Sea adjacent to the Oakura Surf Lifesaving Club on Tasman Drive. The Stormwater Catchments are shown in Appendix 1.
20. The Shearer Reserve Area immediately upstream of Tasman Drive is historically prone to flooding during high intensity rainfall events. The NPDC has recognised this and the Wairau Stream and it's eastern most tributary are subject to Stormwater Management Plans.
21. The NPDC has nominated the lower section of the Wairau Stream and the unnamed tributary west of Telford Terrace which runs generally south-east towards South Road as a Stormwater Asset.
22. There are numerous existing uncontrolled private and public discharges into this channel as shown in Appendix 1.

23. We have calculated that to achieve hydraulic neutrality a total volume of 2880 m³ of stormwater will need to be retained onsite during a 20% AEP Design Storm for the central 22.6 hectare catchment within the proposed Wairau Estate subdivision.
24. It is proposed to construct several wetland-like ponds with throttled pipe discharges to ensure predevelopment flows are not exceeded.
25. Pond bunds up to 3 metres high are nominated for stormwater retention, however it is not considered that this depth of inundation will occur.
26. The hydraulic neutral discharge will result in a longer flow period at pre-development flow rates.
27. The unnamed tributaries of the Wairau Stream subject to post development flows are predominantly a well cemented rocky stream bed with highly vegetated stream banks between Tasman Parade and SH 45 South Road.
28. Upstream of SH 45 South Road the two tributaries have different characteristics with a mixture of bullrush swamp and defined well cemented channel with a mixture of mature trees and recent riparian plantings in the northern tributary and a cleared channel with adjacent grazing in the southern channel.
29. The proposed multiple pond attenuation will be riparian planted, and it is considered that the stream environments will be resistant to attrition and abrasion that prolonged flows may cause.
30. It is proposed that all Lot stormwater can be disposed of on site. NZBC E1 prescribes that water must be collected and disposed of on site. This will

include possible contaminated water such as car wash. Therefore, no contaminant is likely to enter the gullies and affect ecology.

Oakura West FUD construction

31. Access to the Oakura West FUD area requires several large culverted stream crossings to cross the unnamed tributaries of the Wairau Stream.
32. A development design was completed in 2012 which required two 3.66 mm diameter and one 2.14 m culvert to provide access to the flat land south of Ardern Terrace as shown in Appendix II.
33. This coupled with the steep contour adjacent to the unnamed tributaries and Wairau Stream will mean major earthworks are required for access which will limit economic viability.
34. The lots at the Arden Place cul de sac have historic flooding issues from the cropped farmland immediately to the south. There is flood bunding and private drainage which discharges into Wairau Stream to the east which will require upgrading and formalising through easements to protect those lots unless significant recontouring is to be undertaken to redirect overland flow.
35. The proposed connection to the existing Russel Drive to provide a linked road connection also requires significant earthworks to traverse a 20 metre deep gully as shown in Appendix II.
36. The Russel Drive/Jans Terrace road formation is approximately 10.5 metres wide kerb to kerb. The geometry of this route is quite sinuous. It is not considered to be an attractive option to increase traffic movement numbers at the Jans Terrace/Tasman Parade beach front area.

37. Conversely, the private plan change area requires significantly less infrastructure. The one significant stream crossing to access this area will require a 1050 mm diameter culvert as shown in the calculations of Appendix III.

Services capacity

Wastewater

38. Information supplied by NPDC confirmed that installation of an additional pump unit and power supply will be required at the Shearer Reserve Pump Station to accommodate additional lot discharge associated with the private plan change. NPDC confirmed that sufficient capacity exists in the sewer mains between the private plan change area and the Shearer Reserve pump station to accommodate the proposed growth.

Water Supply

39. Council Technical Three Waters Advice (refer Appendix 7 – s42A NPDC Planners Report) outlines the existing Oakura Water Supply capacity and comments on potential Lot Yield based on supply. See Appendix IV.
40. The two bore pumps have a combined maximum capacity of 3840m³/day and the treatment plant is being upgraded to treat 3500 m³/day. Two reservoirs provide a total of 2500 m³ storage.
41. On the matter of Aquifer Yield, the Technical Advice states "*Since at least 2010 the demand has not required pumping rates greater than 1500 m3/day in order to meet peak demand...*"
42. Regarding aquifer capacity the advice goes on to state "*However, during bore commissioning, pumping tests were conducted taking water from both bores at combined rates of up to 2506 m3/day*"

43. This “*2506 m³/day*” has been set by Council as the sustainable limit until such time as further testing is undertaken in the next two to three years. See Appendix IV.
44. Council’s website has information on Oakura Water Usage from 2014 to present. These records confirms that the greatest daily water usage has been *1497 m³/day* during this period with an average daily usage of *743 m³/day*. See Appendix V.
45. Based on this surplus, there is an opportunity for additional storage to be pumped to during low demand periods. This could either be to an additional Council reservoir or trickle feed to tank supply on individual lots.
46. It is acknowledged that the Oakura Water Supply has areas of low pressure which do not provide the required firefighting supply for Council’s FW 3 requirements.
47. It is recommended that a mixture of booster pumps and additional storage at areas of need may be a solution to this shortfall. Discussion should be entered into to determine areas where firefighting supply capacity is critical.
48. With regard to water supply for future growth, the Council’s Technical Advice states “*The limiting factor for the water supply is the aquifer yield. This limits total residential lots to 1,279 lots. Provided development occurs in a logical manner then it doesn’t matter where these lots are placed so long as the total is limited to 1,279.*” See Appendix IV.
49. NPDC’s NZS 4404 Amendments state that demand for urban residential dwellings is *840 l/day*. This means that a daily peaking factor of 2.33 has been employed to calculate lot yield. Daily peaking factor specified in NZS

4404 is 2.00 with hourly peaking factors ranging between 2 to 5, dependant on TA requirements.

50. Of interest, based on the approx. 5 yrs. of available data the actual peaking factor at Oakura calculates as 2.10. If this factor was adopted, which is nearer to the NZS 4404 daily peaking factor of 2.00, the residential lot limit given in the Council's Technical advice would calculate as 1,418 lots.
51. Based on the Council's data, the attributes of the potable water supply and demand for Oakura are summarised in the following table:

Supply		
	Sustainable aquifer yield	2,503m ³ /day
Demand		
	Daily Average	743 m ³ /day
	Peak Recorded Demand	1,497 m ³ /day
	Reservoir Capacity	2,500m ³
	Water Treatment Capacity	3,500m ³ /day

52. Adopting the NZS4404 Daily Household Consumption figure of 840l/day (0.84m³/day) together with the Sustainable Aquifer Yield of 2,503m³, and using the differing Peaking Factors discussed, the estimates of additional residential lots at Oakura that could be serviced from the available supply can summarised as follows:

Source	Peaking Factor	Additional Lots	Residential Lots
NPDC	2.33	1,279	
Actual Historic	2.10	1,418	
NZS4404	2.00	1,489	

53. To ensure that water demand does not exceed aquifer supply, onsite roof water collection may be implemented to augment reticulated supply. Rainwater harvesting with onsite storage by households, supplemented by a restricted flow connection (trickle feed) from the Council mains reticulation would overcome the current limitation of aquifer yield at Oakura. Such a system may require means of backflow prevention to safeguard the Council's potable supply.

CONCLUSION

54. I do not consider there to be any 3 waters infrastructure related reasons to decline the plan change. The proposed land use activities within the plan change area can be appropriately serviced.

Stormwater

55. The on-site Stormwater Management through a series of retention ponds will prevent increase in downstream flow minimising likelihood of negative impacts from the increase of impermeable area associated with the development.
56. The introduction of an enhanced aquatic ecology through construction of wetlands and selected plantings will provide a positive outcome.

West FUD Area

57. The construction complexity and environmental impact of the West FUD area with several culvert crossings and major earthworks do not make it an attractive proposition. The potential lot yields are likely to be much less than originally considered due to contour and this will reduce the economic viability of development.
58. The placement of multiple culvert structures with the Wairau Stream catchment to gain access to West FUD Area will have the potential for negative impact on stream ecology.
59. The geometry of Shearer Drive/Jans Terrace as a collector for the West FUD is not ideal and this area should have a less intense subdivision development constructed.

Services capacityWastewater

60. There is sufficient wastewater main capacity to accommodate the additional discharge to the Shearer Reserve Pump Station. Once upgraded, the Shearer Reserve pump station will have sufficient pumping and storage capacity for the additional discharge.

Water Supply

61. Potable water supply may be provided to service the proposed subdivision by providing additional Council reservoir capacity which can be trickle fed during periods of low demand.

62. The available data suggests there is capacity within the Oakura water supply to service a greater number of lots, by as many as an additional 210, above the limit of 1,279 lots proposed in the Council's Technical Advice.
63. Demand may be reduced further by collection of roof water with positive environmental outcomes.
64. Firefighting requirements may be enhanced by installation of booster pumps and additional storage in areas of poor supply pressure.

Dated 17 June 2019

Andrew Desmond Lovat Fraser