IN THE MATTER OF the Resource Management Act 1991

AND

IN THE MATTER OF proposed private Plan Change 12 to the Waipā District Plan by Sanderson Group Limited and Kotare Properties Limited for the rezoning of Growth Cell T2 from 'deferred residential zone' to 'residential'

STATEMENT OF EVIDENCE OF HAYDEN JOHN VINK

STORMWATER MANAGEMENT

15 March 2021

Introduction

1. My full name is Hayden John Vink.

2. I am a Civil and Environmental Engineer and a Director of Wainui Environmental Ltd. I have a Bachelor of Engineering (Civil) from Auckland University and I am a registered member of Engineering New Zealand (MEngNZ).

Code of Conduct for Expert Witnesses

3. I am familiar with the Code of Conduct for Expert Witnesses (Environment Court Consolidated Practice Note 2014) and although I note this is a Council hearing, I agree to comply with this code. The evidence I will present is within my area of expertise, except where I state that I am relying on information provided by another party. I have not knowingly omitted facts or information that might alter or detract from opinions I express.

Scope of evidence

4. My evidence will cover:

   (a) Site catchment and receiving environment;

   (b) Stormwater design considerations;

   (c) Stormwater management strategy;

   (d) Stormwater management system operation and maintenance;

   (e) Waikato Regional Council Stormwater Discharge consent;

(f) Submissions;

(g) The Section 42A report.

5. My evidence focuses on stormwater management considerations for the southern (Stage 1) part of the T2 growth cell as the retirement village and residential subdivision within this area has been the subject of preliminary design. I also comment on the principles that will apply to the northern (Stage 2) area which drains northward towards Pirongia Road.

6. My evidence summarises the stormwater management design/assessment methodology described in detail within the document prepared by Wainui Environmental Ltd titled 'Sanderson Group Ltd & Kotare Developments Ltd Stormwater Management Plan' dated July, 2020 including the preliminary design plans presented in this report.

7. I have read and am familiar with the submissions, officer's report and the proposed changes to be made to the Waipa District Plan.

8. I have visited the site and Wainui Environmental staff have also visited the site on multiple occasions to assess the existing site catchment area and downstream receiving environment under various seasonal conditions.

Executive summary

9. The subject site comprises a localised, natural pasture basin feature with no existing watercourses or wetlands and draining westward to discharge into an artificial farm drainage network prior to discharging to the Mangapiko Stream approximately 3km below the site.

10. A stormwater management strategy has been developed for the site which is based upon managing potential adverse water quality and quantity effects in

accordance with the best practice methods outlined in the Waikato Stormwater Guideline 2020 (TR2020/07) and the Waikato Regional Infrastructure Technical Standards 2018 (RITS).

11. The proposed stormwater management strategy comprises a piped reticulation network extending throughout both the retirement village and residential development areas to convey flows to a centralised stormwater wetland device and a wetland swale device to provide the designed stormwater treatment, attenuation and detention functions.

12. The proposed design is considered to achieve the required stormwater quality and quantity management functions in accordance with the best practice design guidelines and standards and to ensure that potential effects within the downstream receiving environment are negligible. The design will also contribute to enhanced amenity and ecological values within the subject site.

13. Stormwater discharge consent AUTH142118.02.01 has been obtained from the Waikato Regional Council which confirms the proposed stormwater management strategy as achieving best practice design guideline and standard requirements to ensure that any potential downstream effects will be no more than minor.

14. I have considered the points raised in the submissions of Frontier Developments Ltd and Martine Underhill in regard to stormwater management for the proposed development site. Neither party's properties will be adversely affected by post development stormwater discharges and the items raised in these submissions have been adequately addressed within the preliminary Stormwater Management Plan document.

15. Overall, I consider that the preliminary Stormwater Management Plan developed for the site adheres to typical, best practice stormwater management requirements in-line with Council requirements. Accordingly, I

consider that stormwater discharge activities can occur from this site in accordance with the methods outlined in the Stormwater Management Plan without resulting in any adverse environmental effects that would be more than minor.

Site catchment and receiving environment

16. The site catchment topography is characterised by a natural basin area draining westward from the ridgeline located along the eastern site boundary as gentle to moderate pasture slopes falling towards a central site outlet point at the western site boundary. In this respect, the site comprises a localised headwater catchment area with all runoff occurring as surface runoff across the pasture surfaces to this outlet point. There are no existing watercourses or wetlands within the site. The site is located within the Mangapiko Stream/Waipa River catchment.

17. The site area can generally be split into three separate pasture sub-catchment areas. The central sub-catchment drains into an existing artificial farm pond located at the western site boundary. Observations of this pond, including during the winter period, identify that it is typically dry and does not hold water, although it is understood to hold shallow depths of water at times. Surface runoff from the other two subcatchment areas bypass this pond feature to discharge directly into a downstream outlet drain.

18. The immediate receiving environment below the site comprises an artificial farm drainage system expected to have historically been excavated to drain a natural wetland environment to enable farming activities. Approximately 2.5km below the site, the channel becomes more naturalised and passes under Pirongia Road via a 1200mm culvert and then discharges into the Mangapiko Stream approximately 3km below the subject development site. The Mangapiko Stream drains a large rural and urban (Te Awamutu urban area)

catchment and flows westward along a meandering course within an incised gully system eventuating in the Waipa River at Pirongia.

19. The downstream landuse activities below the site are limited to open pasture land utilised for dairy grazing purposes with no areas of existing development.

Stormwater design considerations

20. Development of the site will replace the existing site pasture surfaces with development impervious surfaces (roads, roofs etc.) and a formalised stormwater conveyance/discharge network which presents potential for a number of adverse environmental effects including:

(a) Water Quality Effects

A change in the type and quantum of potential contaminants contained within catchment stormwater flows. Rural contaminants such as nutrients and sediment occurring as diffuse or non-point source discharges will be replaced by urban contaminants such as heavy metals and hydrocarbons predominantly associated with vehicular and roading surfaces with discharges occurring as point source discharges to downstream receiving environments;

(b) Water Quantity Effects

An increase in stormwater peak flows, velocities, longer duration of high rates of runoff, and more runoff from smaller storms than would have occurred prior to land development. This can result in an increase in the frequency and intensity of flood events and the associated adverse effects on any downstream property located in floodplain areas or in proximity to the subject watercourse. Furthermore, these changes can result in downstream channel erosion and consequent sedimentation in receiving waters, local erosion and

a reduction in the efficiency of downstream drainage systems which can consequently result in degradation of these receiving environments.

21. The stormwater management strategy for the site has been developed based upon the following considerations to ensure that these potential effects are minimised to the greatest extent possible and in accordance with best practice industry standards:

(a) Assessment and design of all aspects of the stormwater management system in accordance with the Waikato Stormwater Guideline 2020 (TR2020/07) and the Waikato Regional Infrastructure Technical Standards 2018 (RITS) as reflective of best practice industry standard;

(b) Limited potential for discharge of post development flows to ground soakage based upon the site slope gradients and ash or clay soils;

(c) Continued conveyance of all site runoff westward to discharge to the existing farm drain receiving environment;

(d) Treatment of all post development stormwater runoff in accordance with TR2020/07 and RITS best practice methods;

(e) Attenuation of post development peak flows to predevelopment levels for the two and ten year storm events to prevent any potential adverse increase in downstream flooding effects;

(f) Extended detention of stormwater runoff from all development surfaces during the smaller, channel forming flow events to prevent any potential adverse downstream channel erosion effects;

(g) Discharge of all development flows in a controlled manner without creating adverse erosion or scour effects at the point of discharge; and

(h) Provision for conveyance of overland flows and greater than design events through the site without creating adverse effects.

Stormwater management strategy

22. The proposed stormwater management strategy developed and presented in the Wainui Environmental Ltd Stormwater Management Plan to address these considerations includes the following features:

(a) Piped stormwater reticulation network sized to convey the 10-yr ARI level of service with secondary overland flow paths provided via the roading network designed to accommodate flows from a 100-yr ARI rainfall event;

(b) Conveyance of catchment flows from the entire Kotare Properties Ltd residential development area (9.26ha) and approximately half of the Sanderson Group Ltd retirement village development catchment (4.92ha) directly to a proposed stormwater management wetland device located within the central reserve area. The wetland is designed to provide water quality treatment, peak flow attenuation of the two and ten year events and extended detention of catchment flows in accordance with TR2020/07, with discharges occurring via a controlled outlet to the downstream outlet channel;

(c) Conveyance of catchment flows from the remaining/north western retirement village development catchment (4.4ha) directly to a proposed vegetated swale device extending down the western site boundary. The swale is designed to provide water quality treatment and extended detention of catchment flows including provision of detention check dam measures along the length of the swale to achieve the design extended detention requirements in accordance with TR2020/07. Discharge from the southern end of the swale for the water

quality/ED event flows will discharge via a controlled pipe outlet to the downstream channel. However, larger flows will divert to a high flow channel into the adjacent wetland device with provision for attenuation of peak flows from this catchment to predevelopment levels within this device;

(d) Design of appropriate energy dissipation and outfall erosion control structures to prevent any adverse erosion and scour effects at both the wetland and swale outfall points.

23. Again, the above stormwater management features have all been designed in accordance with the best practice methods outlined in the WRC TR2020/07 and RITS documents and are considered appropriate to minimise any potential stormwater effects within the downstream receiving environment.

24. In addition, the proposed stormwater wetland and swale features are required to be planted throughout with native wetland plant species. This requirement will contribute to both enhanced stormwater treatment through biofiltration functions, along with enhanced amenity and ecological values across the site.

Stormwater management system operation and maintenance

25. The long term effective functioning of the proposed stormwater management system is dependent on the ongoing maintenance of these systems to ensure that they are capable of achieving the design stormwater management functions on an ongoing basis.

26. The stormwater management network at the site will initially be established by the joint applicants (Sanderson and Kotare) with these parties also being responsible for the stormwater devices over an initial defects liability and establishment phase. Following a suitable maintenance period, the intention is that the Waipa District Council will be vested with the residential stormwater

network within the Kotare Properties development area plus the central wetland device for long term operation and maintenance responsibility in accordance with a finalised Operation and Maintenance Plan. The Sanderson Group retirement village stormwater network and wetland swale device will be retained within the ownership of Sanderson Group and hence will fall within the scope of operation and maintenance associated with the overall retirement village site. In this respect, the network and swale for this part of the development area will benefit from provision of a permanent maintenance team responsible for all aspects of site maintenance including buildings, landscaping and infrastructure.

Waikato Regional Council Stormwater Discharge Consent

27. It is notable that the stormwater discharge activities and associated stormwater management strategy for the proposed Sanderson Group and Kotare Properties development area have already been subject to assessment and approval by the Waikato Regional Council with AUTH142118.02.01 granted in September 2020 to authorise these activities.

28. This consent process included detailed assessment of the site receiving environment characteristics and the stormwater management strategy presented in the Wainui Environmental Stormwater Management Plan including all design plans and supporting calculations.

29. This consent process also included preliminary consultation with the Waipa District Council's engineering representative to confirm their initial agreement to the stormwater management design strategy.

30. This consent was granted on the basis of the proposed stormwater management system design being consistent with the specified best practice stormwater management design guidelines and standards and the system being appropriate to ensure that any potential downstream stormwater

discharge effects will be no more than minor, along with achieving consistency with all relevant statutory requirements.

Northern (Stage 2) Area

31. The Stage 2 area comprises a separate subcatchment area which drains northward under Pirongia Road to the Mangapiko Stream, independent of the Stage 1 area. While the stormwater management plan that has been prepared does not provide a stormwater management regime for the Stage 2 area, the best practice design guidelines and stormwater management philosophies including stormwater treatment, attenuation and extended detention, are also applicable to the northern subcatchment and will be used to guide the future design of an appropriate stormwater regime at the time of development. As it is a separate subcatchment the future design can be developed independently and there is no need for the stormwater systems to be integrated across all of the T2 area.

Officer's Report

32. I have reviewed the Waipa District Council Section 42a Report and have not identified any disagreement with the assessment or recommendations outlined in the report regarding stormwater management.

Submissions

33. I am aware of two submissions received by the Waipa District Council on the proposed plan change which raise issues relating to the stormwater management aspects of the development activities and associated preliminary design documents as follows.

Submission of Frontier Developments Ltd

34. The Frontier Developments Ltd property comprises the T1 growth cell development area directly eastward of the site where development activities are currently underway.

35. It is notable that the subject site in both its current undeveloped state and following the proposed development activities does not discharge any stormwater into this adjacent property with all runoff continuing to drain westward away from this adjacent site and hence presents no potential for any adverse effects upon this party.

36. The issues raised in this party's submission in response to the proposed stormwater management system are addressed in the following table.

Issue 1	*The stormwater design has been based on a CN value (runoff coefficient) of 0.74 for existing conditions. This is excessively high given the open pasture and free draining nature of the loams. NZWERF guidelines would indicate between 0.42 and 0.62 depending on the storm event.*
Response 1	There are various calculation methods available to determine development stormwater runoff rates. In this instance, the stormwater design for the proposed development has been undertaken following the Waikato Regional Councils Stormwater Modelling Guidelines 2018. The WRC Guideline adopts the Natural Resource Conservation Service Calculation Method for calculating stormwater flows which utilises Curve Numbers (CN) for estimating runoff from various surface types. A CN of 74 was selected for the pre-developed/existing scenario due to the soil types and ground cover identified across the development site which is considered appropriate and has also been accepted by the WRC stormwater engineer through their review/approval of the stormwater discharge consent application. In contrast, the calculation examples found in the NZWERF Guidelines referred to in the Frontier Development submission adopts the Rational Method for calculating runoff rates. The Rational Method utilises decimal C-factors to estimate runoff potential from various soil types and ground covering. The two calculation methods are different and the C-factors and Curve Numbers (CN) are not comparable.
Issue 2	*There has been no review or efforts made for any stormwater events beyond the 10yr design. The site should attenuate to pre-existing levels for the 100yr design or it will create adverse effects downstream, in particular regard to the culvert under Pirongia road and*

	associated potential flooding of the road.
Response 2	Attenuation of peak stormwater flows to predevelopment levels during the 2 and 10 year ARI storm events comprises the typical best practice stormwater management approach for land development to avoid any adverse downstream effects when discharges are occurring into catchments with no known flooding issues or where adverse effects are unlikely to arise. In this instance, all discharges will occur to the downstream rural receiving environment comprising the constructed farm drainage channel extending through a wide, low gradient pastoral environment where there are no known flooding issues. Any increases in peak 100 year ARI event flood levels in this area as a result of the proposed development are expected to be limited to very minor increases in water levels across this broad floodplain area with flood waters expected to recede again rapidly following these peak events. Furthermore, attenuation to 80% of the 100 year ARI event is intended for catchments with known flooding issues affecting buildings or roads and is intended to mitigate cumulative effects of development within a catchment. The subject site is within the T2 Growth Cell and is the western most extent of the Te Awamutu growth area and as such the downstream rural land is not expected to be developed in the near future i.e. no cumulative development effects likely within the downstream catchment. Considering any potential effects at the Pirongia Road culvert during these extreme events, this culvert is identified as being located approximately 2.5km downstream of the subject site and drains a catchment of approximately 306ha. The proposed development site has an area of 18.7ha hence comprising only 6% of the culvert catchment. Hence, the proposed development area comprises a very minor portion of this significant catchment with the localised development activities within this small sub-catchment area unlikely to contribute to any noticeable increases in headwater levels at the culvert inlet during these large rainfall events. Again, consideration of the potential downstream water quantity effects of the proposed development has formed part of the assessment undertaken by the WRC for post development stormwater discharges from this site. The WRC stormwater engineer has confirmed the proposed attenuation of the 2 and 10 year ARI events as appropriate to avoid any adverse downstream effects based upon the nature and characteristics of this receiving environment and further consideration of this matter is considered unnecessary.
Issue 3	*The stormwater report does not appear to correspond to the new (Sept 2020) National Environmental Standards for Freshwater Regulations 2020, and should be amended to suit.*
Response 3	The Stormwater Management Plan document was prepared prior to the new NES-Freshwater coming into force on 3 September, 2020 and hence did not assess the proposal against this new legislation. Accordingly, the WRC discharge consent assessment also did not include any assessment against this new legislation when approving these activities.

	Nonetheless, I am familiar with the provisions of this new legislation which relate primarily to farming or development activities which may impact natural wetlands or rivers. In this instance there are no wetlands or rivers which will be directly affected by the proposed activities and appropriate best practice measures are proposed as part of the recommended stormwater management strategy to manage any potential downstream effects. Accordingly, the proposal is not considered to trigger any additional consent requirements under the NES-Freshwater.

Submission of Martine Underhill

37. The property of Martine Underhill is identified as being located at 29 Frontier Road. This property comprises an existing residential property located on the southern side of Frontier Road, opposite the subject site to the north. The Frontier Road alignment in this location extends along the main ridgeline and hence this property again is located within a separate catchment to the development site and hence the proposed site development activities are not expected to present any potential for adverse stormwater effects upon this party's property.

38. The submission from M. Underhill refers to existing drainage issues and in particular the past 'build up' of Frontier Road which is considered to be resulting in runoff down this party's driveway and into their garage, resulting in health issues (dampness related). There is a concern that the development activities will exacerbate these current issues.

39. I am not familiar with these current drainage issues from Frontier Road upon this property. Furthermore, the preliminary Stormwater Management Plan for the development site relates specifically to the development site area which drains internally away from this property and then to a discharge point to the west. Therefore, I do not expect these existing drainage issues to be exacerbated by the site development activities.

Conclusion

40. The proposed Stormwater Management Plan for the site is in line with the Council's best practice stormwater management standards and guideline documents and if implemented appropriately will ensure that adverse water quality and quantity effects do not arise within the downstream receiving environment.

41. The stormwater management strategy for the site has already been assessed and approved by the Waikato Regional Council based upon adherence to best practice stormwater design and management methods to ensure that any potential effects are no more than minor.

42. I have addressed the submissions relevant to stormwater matters and I conclude that there are no reasons why the proposed plan change could not be approved.

Hayden John Vink

15 March 2021