WAIKATO DISTRICT PLAN REVIEW SUBMISSION

SUBMITTER: GRANT & MERELINA BURNETT

TOPIC: Extent of Country Living Zone at Te Awa Lane, Tamahere

STATEMENT OF EVIDENCE OF STEPHEN GEORGE BIGWOOD

Dated: 12 February 2021

INTRODUCTION

- 1. My full name is Stephen George Bigwood.
- I am currently employed as the Planning Manager at Bloxam Burnett & Olliver ("BBO"), a firm of consulting engineers, planners and surveyors based in Hamilton. I have been employed by BBO since 1996. Prior to that, I have worked as a Planner at the Matamata-Piako District Council.
 I have 30 years of experience in the field of planning and resource management in New Zealand.

QUALIFICATIONS AND EXPERIENCE

- 3. I hold the qualifications of a Bachelor of Social Science with Honours majoring in Geography and Resources and Environmental Planning from the University of Waikato (1993), and a Post Graduate Diploma in Resources and Environmental Planning from the University of Waikato (1995). I am a full member of the New Zealand Planning Institute and a member of the Resource Management Law Association. I am also an accredited decision maker under the Ministry for the Environment's Making Good Decisions Programme.
- 4. My planning and resource management experience has been gained on a wide range of projects throughout New Zealand. I have experience in District Plan reviews and plan changes under the Resource Management Act 1991, including submitting and participating in mediation and hearings on behalf of private clients.

INVOLVEMENT IN BURNETT SUBMISSION

- 5. I have been requested, in my capacity as a planner, to present expert planning evidence related to the submission made by Grant & Merelina Burnett ("Burnett" or "the Submitters") in relation to the zoning of their property at 50 Te Awa Lane, Tamahere as proposed under the Proposed Waikato District Plan ("PWDP").
- 6. The Burnett's submission was prepared by my former colleague, Stephen Gascoigne. Stephen has since left BBO and I have taken over this project.
- 7. I have visited the site on numerous occasions, with my most recent visit on 19 October 2020.

CODE OF CONDUCT

8. I have read the Environment Court Code of Conduct for Expert Witnesses in the Environment Court of New Zealand and agree to comply with it. My qualifications and experience as an expert are set out above. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

9. The evidence that I give in these proceedings is within my area of expertise, except when I rely on the evidence of another witness or other evidence, in which case I have explained that reliance.

SCOPE OF EVIDENCE

- 10. The purpose of this evidence is to provide a summary of the submission lodged against the PWDP on behalf of the Submitters, which opposes the Rural Zone being applied to their property and seeks that the Country Living Zone ("CLZ") be applied instead. This evidence further evaluates the consistency of the rezoning with the applicable strategic planning framework.
- 11. The following evidence report addresses the matters listed below:
 - a) A summary of the submission lodged by the Submitter against the PWDP.
 - b) An outline of the strategic context that frame this report and associated submission.
 - c) An analysis assessment of the relevant legislation and strategic documents.
 - d) A summary of expert technical advice and advice from service providers that has been prepared in support of rezoning and the development potential of the property that is subject to this submission.
- 12. I have prepared a section 32AA analysis in relation to the proposed rezoning (Appendix K).
- 13. I have structured this evidence to follow the approach recommended in the s42A Framework Report.

OVERVIEW OF SUBMISSION

- 14. A copy of the Submitter's submission is attached as **Appendix A**.
- 15. The subject property is located at 50 Te Awa Lane, Tamahere and comprises a total area of 4.0898ha. The site currently contains one dwelling and associated residential curtilage situated in the south-western extent of the property. A farm storage shed located near the eastern boundary has recently been removed. The remainder of the property is predominantly in pasture grass (that is not grazed by the property owners) and mature specimen trees.

- 16. Surrounding sites are similarly developed and likewise are used for predominantly rural residential living, most of which are between 0.8-1ha in area.
- 17. The site is accessed off the end of Te Awa Lane which is a cul-de-sac. The site is connected to Councils water supply reticulation and has existing connections to electricity and telecommunications.
- 18. **Figure 1** below provides an aerial photograph locating the property in orange outline (the outline indicating the extent of the site sought to be rezoned).

Figure 1 – 50 Te Awa Lane, Tamahere



19. The site is zoned Rural under the Operative District Plan (**"ODP"**) and the existing Rural Zoning is retained through into the PWDP. Under the PWDP the site is also subject to a number of overlays which include, the Waikato River Catchment Overlay, and a portion of the site (where it adjoins the Waikato River) is subject to the Significant Amenity Landscape Overlay - this area is also identified as being a Significant Natural Area (**"SNA"**). A Maori Pa Site is identified as

being a Maaori Site of Significance near the south western corner of the site. The submission lodged against the PWDP on behalf of the Submitter requests the rezoning of the subject site from Rural to CLZ and does not request any changes to the overlays noted above.

- 20. The rezoning of the site is sought for the following reasons:
 - The site is surrounded by properties that are zoned Country Living to the north and east. The site adjoins the Waikato River on the western boundary and a local purpose reserve (walkway) on the southern boundary.
 - The site is legally and physically separated from adjoining lots zoned Rural where a
 potential for amalgamation would otherwise exist to give effect to sustainable rural
 land use according to the Zone;
 - Sustainable rural land uses are dictated by minimum parent lot size pre- and postsubdivision in Chapter 22 of the PWDP which do not align with the size of the site; and
 - Should the owners wish to use the site under an intensive or horticultural rural land use, consent is highly unlikely to be granted in consideration of high-risk reverse sensitivity effects in a locality where the site is immediately surrounded on all boundaries with land use activities that are residential in character.
- 21. The PWDP zoning and land use patterns for the surrounding area are shown on **Figure 2** below (with the blue outline indicating the extent of the site).



Figure 2 – Zoning pattern of Site and surrounding area

SUITABILITY OF PROPERTY FOR COUNTRY LIVING DEVELOPMENT – ENVIRONMENTAL CONSTRAINTS

- 22. To confirm the suitability of the property to accommodate Country Living development, expert assessments have been prepared regarding geotechnical site conditions, potential contamination, transportation, and archaeology. The findings of these experts are attached and has been relied upon for the following discussion.
- 23. Advice has also been sought from utility infrastructure providers regarding the feasibility and serviceability of the rezoning regarding the development that would be enabled through the rezoning of the subject site. This advice is also attached and has been relied upon for the following discussion.

Geotechnical Investigation

- 24. A Geotechnical Investigation has been undertaken by **CMW Geosciences** to confirm the suitability of the subject site for development, the report is attached as **Appendix B**.
- 25. The geotechnical investigation explored the slope stability, soakage rates, liquefaction risk and ground condition assessment in relation to potential future development of the subject site (if rezoned). Broadly, the report concluded the following:
 - Ground conditions are good, although minor ground improvement is recommended, along with rib raft foundations for any future building platform.
 - The risk of liquefaction and lateral spread is low.
 - The natural slope of the area identified as potential Lot 6, being the north western extent of the site does not meet the required safety factor criteria due to the steepness of this slope and as a result, a 10m setback is recommended from the top of the slope of the gully or alternatively remedial works may be considered. Notably this has not been raised as a matter that would restrict future development proceeding rather a matter that requires geotechnical input.
- 26. Based on the above, I am satisfied that through geotechnical and engineering input all concerns that are raised through the geotechnical investigation can be satisfactorily mitigated through engineered designs that would be required at the time of resource consent application.

Preliminary Site Investigation

- 27. A Preliminary Site Investigation ("PSI") has been prepared by 4Sight Consulting and is attached as Appendix C. The PSI included a review of the site's history, limited soil sampling and field observations. The main findings of the PSI investigation are summarised below:
 - The site is not listed on the Waikato District Council or the Waikato Regional Council HAIL registers.
 - There is presence of lead and asbestos in the soil that exceed recommended guidelines, however, these readings are found in selected locations, immediately surrounding the shed, with the assumed source being the shed cladding materials. Based on that assumption the concentration of potential contaminants in soils across the vast majority of the site are considered highly unlikely to pose a risk to human health in light of the proposed rezoning.
 - Subdivision of the site is concluded to be a Permitted activity under Clause 8(4) of the National Environmental Standard for Assessing Contaminants in Soil to Protect Human Health ("NESCS") and soil disturbance across the site is concluded to be a Permitted activity under Clause 8(3), provided relevant thresholds are met.
- 28. Following the PSI, the farm storage shed has been removed and all contaminated land and materials removed from the site to a registered disposal facility.
- 29. Based on the above, I am satisfied that any future development enabled through the rezoning of the site to Country Living will not be restricted by soil contamination. Future soil disturbance and subdivision will be able to be assessed as Permitted activities under the NESCS.

Service providers

- 30. The following service providers have confirmed availability and capacity of infrastructure within the vicinity of the site.
 - Waipa Networks Ltd have provided written confirmation that the existing distribution network that is located within the vicinity of the subject site has capacity to supply future subdivision/development of the subject site (up to 5 additional lots). The written confirmation provided from Waipa Networks Ltd is attached as Appendix D.
 - Ultra-Fast Fire Ltd have provided written confirmation that an Ultra-Fast Fibre telecommunications connection can be made available for future

development/subdivision of the subject site. The written confirmation provided from Ultra-Fast Fire Ltd is attached as **Appendix E**.

- Chorus have provided written confirmation that they have infrastructure available within the vicinity of the subject site to supply future potential subdivision/development of the subject site. The written confirmation provided from Chorus is attached at Appendix F.
- Waikato District Council GIS and Council staff have confirmed that there is a Council Rural Zone water supply reticulation that runs along the eastern and southern boundaries of the site and is situated within Te Awa Lane. No concerns were raised regarding the existing capacity or supply network through this correspondence. It is noted that in the unlikely event there are future capacity issues that on-site water supply (traditional roof or water bore supplies) could be provided for. A copy of this correspondence is attached as Appendix G.

Road Capacity Assessment

- 31. A Road Capacity Assessment has been prepared by Traffic Engineer, Mr Lindsay Boltman from Bloxam Burnett and Olliver, which is attached as **Appendix H**. Any subdivision and development of the subject site that is enabled through the rezoning will generate additional vehicle movements that will need to be catered for within the existing roading network. The report prepared by Mr Boltman makes the following points regarding the capacity of Te Awa Lane and the surrounding road networks:
 - If rezoned, the site has the potential to be subdivided into five additional lots for rural-residential development purposes. Five additional lots would generate approximately 50 vehicle movements per day ("vpd") that would need to be catered for within the existing road network.
 - Te Awa Lane and Te Awa Road are in a rural-residential area and both roads are cul-desacs, therefore both roads are low volume with low traffic growth potential.
 - The District Plan indicates that a Rural/Country Living Zone public road with a sealed carriageway width of 6m can accommodate daily traffic movement between 80 to 500 vpd. Te Awa Lane currently caters for 150 vpd and therefore has plentiful capacity to accommodate additional traffic movements that may result from the proposed rezoning.
 - Te Awa Road currently carries 580 vpd over the 270 m length between Pencarrow Road and Te Awa Lane. This is already slightly more than the District Plan indicative suitable

range of 500 vpd. With the additional 50 vpd generated from the potential five additional lots, Te Awa Road daily traffic would increase to around 630 vpd. However, although the District Plan identifies 500 vpd as the indicative upper limit, this varies based on topography, road geometry, frequency of access ways, and percentage HCV. Te Awa Road is relatively flat, has good access sightlines, very low HCV content, low vehicle speeds and no evidence of safety issues. Accordingly, it is unlikely an additional 50 vpd due to five additional dwellings would create any serious or significant safety issues.

32. Based on the expert advice, I am satisfied that the existing road network has sufficient capacity (without upgrade) to cater for the additional vpd that would result from development of the subject site.

Natural Feature Overlays

- 33. The western extent of the subject site, where it adjoins the Waikato River is identified by the Proposed Waikato District Planning Maps as being Significant Natural Area and a Significant Amenity Landscape.
- 34. There are no changes that are requested to these overlays. The boundary of the Significant Natural Area broadly reflects the top contour of the riverbank, therefore, development in this area would not be possible.
- 35. The Significant Amenity Landscape is identified as being an approximately 50m strip of land extending along the length of the adjoining river boundary (western site boundary). The PWDP contains rules relating to earthworks within a Significant Amenity Landscape and prescribes that subdivision that divides a Significant Amenity Landscape is a Restricted Discretionary Activity. Council's discretion is restricted to, landscape, amenity and character values and effects on notable trees. If future subdivision proposes the division of the Significant Amenity landscape, I am of the opinion that this can be appropriately addressed and assessed at the time of resource consent application.

Archaeological Assessment

 Technical advice on archaeology has been provided from Mr Warren Gumbley, of W Gumbley Archaeologists Ltd. Mr Gumbley's Technical Memorandum is attached as Appendix I.

- 37. Mr Gumbley has undertaken a site inspection of the subject site in effort to determine the presence and significance of archaeology within the site. Mr Gumbley identified two areas of Maori made soils on the property, one on the lower terrace and one on the upper. The made soils within the lower terrace are near the existing external property boundaries, therefore any future development that complies with the relevant boundary setbacks (12m) will be clear of this area. In regard to the small area of made soils within the upper terrace, Mr Gumbley notes that the area is effectively outside any likely building platform and that any effects of development would be mitigated with a detailed archaeological investigation prior to soil disturbance.
- 38. Additionally, a Pa site is recorded on the site which is located within the approximate location of the existing dwelling. Today there is no visible evidence of the Pa site recorded as S15/65 due to the former construction of the existing dwelling which occupies the Pa site.
- 39. Based on Mr Gumbley's advice, I conclude that the existing archaeology is not a rezoning constraint, and should the subject site be rezoned, any potential adverse effects of development can be appropriately assessed at the time of consent application through the PWDP Rules.

Conclusion

- 40. Based on the environmental constraints assessment provided above, I am of the opinion that there are no environmental matters that would prevent the site from being fully developed for Country Living purposes. The assessment clearly confirms that the site is suitable and appropriate in the context of the area.
- 41. If subdivided in accordance with the CLZ rules, the subject site could be subdivided into up to six lots (five additional developable lots) ranging in size from 5,009m² (nett) 8,480m² in total area. A feasible subdivision layout is attached as **Appendix J**. This provides an example of the level of development and density that would be anticipated by the rezoning and which clearly exists on all neighbouring properties.

SUITABILITY OF PROPERTY FOR COUNTRY LIVING DEVELOPMENT – POLICY FRAMEWORK

42. In this section I set out and discuss the relevant statutory matters that provide for the proposed change to the PWDP.

43. The Council's Section 42A Framework Report ("**s42A Framework Report**") sets out the policy framework within which the submission is to be assessed, and I accordingly address the proposal in the context of that report in the following paragraphs.

Council's Section 42A Framework Report

- 44. The s42A Framework Report, released 19 January 2021, provides the framework within which the Council intends to consider submissions seeking the rezoning of land.
- 45. The s42A Framework Report sets out that submissions will be considered through a series of 'lenses': firstly, the alignment of the proposal with relevant objectives and policies of the PWDP; secondly, the alignment and consistency of the proposal with higher order documents; and thirdly, an assessment of the submission against 'best practice' planning guidelines.
- 46. In terms of context, the s42A Framework Report establishes that:
 - The Waikato District, and in particular specific townships and Hamilton City fringe areas (in which the subject property is located), are experiencing high levels of growth.¹
 Factors such as the COVID-19 pandemic and the proximity of the District to major populations centres (Auckland and Hamilton) mean that the levels of growth are anticipated to continue.²
 - The growth targets in the PWDP as notified are out of date, because of ongoing growth and new requirements introduced by the National Policy Statement on Urban Development (NPS-UD), which came into effect post the PWDP being notified.³ As it stands, the PWDP does not give effect to the requirements of the NPS-UD.⁴ To meet demand (and the requirements of the NPS-UD), the PWDP needs to consider zoning additional areas.⁵
 - In particular, the NPS-UD requires that the Waikato District Council provide at least sufficient development capacity to meet expected demand, plus 20 percent to support choice and competitiveness in the housing market. The nature of the District and its dispersed small scale of the towns (and rural residential living areas) means that a more nuanced approach will be required than that currently adopted by the PWDP, by

¹ s42A Framework Report, para. 173.

² Ibid, paras. 177 – 186.

³ Ibid, para 188.

⁴ Ibid, para 93.

⁵ Ibid, para 92.

providing more growth areas around existing towns (including Hamilton fringe areas) to ensure competitive markets.⁶

- 47. In relation to the need to meet growth demand predictions, both the s42A Framework Report and the peer-review⁷ of that report commissioned by the Waikato District Council states that *"there is not a 1:1 relationship between zone-enabled land and development feasible land"*, given the multitude of other factors that dictate whether land can be utilised for its zoned purpose. Accordingly, the *"demand +20% metric needs substantially more land zoned than the raw number thereby calculated"*.⁸ This amplifies the issue identified in the s42A Framework Report that there is indicatively *"a shortfall in the PWDP zone capacity to cater to demand"*.⁹
- 48. Within this context, the following provides an assessment of the proposal against the framework set out in the s42A Framework Report.

Lens One - Consistency with PWDP objectives, policies and strategic direction

49. Appendix 2 of the s42A Framework sets out a matrix of the strategic direction, objectives and policies of the PWDP relevant to various scenarios of rezoning requests. Those that are relevant to requests for the rezoning of rural land to Country Living are identified and discussed in the following table:

⁶ Ibid, para. 189.

⁷ "Peer Review: Hearing 25 Zone Extents Framework Report – Dr Mark Davey", prepared by David Hill, dated 26 January 2021.

⁸ Ibid pg. 3.

⁹ s42A Framework Report, para. 267.

Table 1 – Direction, objectives and policies of the PWDP relevant to rezoning request

1.5. : (b)	1 Compact urban development Urban forms of residential, industrial, and commercial growth in the district will be focused primarily into towns and villages, with rural- residential development occurring in Country Living Zones. Focusing urban forms of growth primarily into towns and villages, and encouraging a compact form of urban development, provides opportunity for residents to "live, work and play" in their local area, minimises the necessity to travel, and supports public transport opportunities, public facilities and services.	The proposed land to be rezoned Country Living is located proximate to an existing CLZ. The land is the only subdividable property within Te Awa Lane (a cul-de-sac) not zoned Country Living. Rezoning the land therefore does not compromise a compact form of development as it is the only property served by Te Awa Lane that is not of a Country Living density and size.
1.5.2	2 Planning for urban growth and development	Policy 1.5.2(a) of the PWDP states that the "growth areas" for the District
(a)	Defined growth areas have been zoned and their development will be	have been identified and zoned accordingly. The Burnett land is not zoned
	guided through the application of objectives and policies and through	as a growth area, and accordingly the proposal can be considered to not
	processes such as the development of master plans, comprehensive	align with this clause. As noted in the s42A Framework Report, the
	structure plans, the district plan and any future changes to the district	assumptions made in the PWDP as drafted concerning the extent of growth
	plan. The agreed Future Proof settlement pattern for urban growth	areas required have been superseded by the level of growth experienced in
	and development is to avoid unplanned encroachment into rural land	the District, and the requirements of the NPS-UD. There will be no
	and is to be contained within defined urban areas to avoid rural	inconsistency with this policy if the zoning is changed to Country Living
	residential fragmentation.	(rural residential) as the property adjoins a defined area.
1.12	.3 Built environment	The proposal aligns with this direction, in that it will enable additional land
(a)	A district which provides a wide variety of housing forms which reflect	supply to provide for rural residential housing to establish, in a manner
	the demands of its ageing population and increases the accessibility to	that promotes a compact urban environment being adjacent to established
	employment and community facilities, while offering a range of	rural residential housing. The additional housing will strengthen the well-
	affordable options.	being of the existing Tamahere community by supporting the community
(b)		infrastructure and facilities that have been established to support, amongst
(c)	A district that has compact urban environment that is focused in	others, the Te Awa Lane growth area.
	defined growth areas, and offers ease of movement, community well-	
	being and economic growth.	
1 1 2	9 Stratagia abiastivas	The following comments are made in relation to these directions:
ב.12	.o summary, the overarching directions include the following:	
0)	in summary, the overal time unections include the following.	

	(i)	Urban development takes place within areas identified for the	i.	While the Burnett landholding has not been zoned for Country
		purpose in a manner which utilises land and infrastructure most		Living development in the PWDP, the land is essentially located
		efficiently.		within the CLZ and is afforded the benefits of the infrastructure
	(ii)	Promote safe, compact sustainable, good quality urban		that has been provided to serve the area. Rezoning will not
		environments that respond positively to their local context.		result in infrastructure upgrades for this area.
	(iii)	Focus urban growth in existing urban communities that have	ii.	The rezoning request directly adjoins land identified for urban
		capacity for expansion.		development (that is, zoned Country Living (Rural Residential)),
				and will support the development of a compact, sustainable
				and good quality environment.
	(vi)	Protect and enhance green open space, outstanding landscapes	iii.	The rezoning request relates to the existing Te Awa Lane
		and areas of cultural, ecological, historic, and environmental		community, and concerns land that is suitable to accommodate
		significance.		rural residential activity given existing infrastructure and the
				specialist reviews confirming the ability for the site to be
				developed for rural residential activity.
			VI.	The subject land is not identified as having any landscape,
				cultural, ecological, historical or environmental values that
				would be adversely impacted should the land be developed for
				rural residential activities. Expert assessments have been
				land, the petertial effects of development and the
				and, the potential effects of development and the
				opportunities available to enhance those values.
4.1.2	Ob	ojective – Urban growth and development	The propos	Sai supports this objective by identifying land adjoining the
(a)	Futur	e settlement pattern is consolidated in and around existing	existing le	Awa Lane CLZ area that is able to accommodate future growth.
	towns	s and villages in the district.		

4.1.3 Policy - Location of development(a) Subdivision and development of a residential, commercial and	The proposal is broadly consistent with this policy. Existing infrastructure is available to service development of the site.
 industrial nature is to occur within towns and villages where infrastructure and services can be efficiently and economically provided. (b) Locate urban growth areas only where they are consistent with the Future Proof Strategy Planning for Growth 2017. 	The Burnett land is not located within the Indicative Urban Limits identified in Future Proof 2017, but this is to be expected as no Country Living areas, including existing areas, are identified.

5.1.1 (a)	 Objective – The rural environment Subdivision, use and development within the rural environment where: (i) high class soils are protected for productive rural activities; (ii) productive rural activities are supported, while maintaining or enhancing the rural environment; (iii) urban subdivision, use and development in the rural environment is avoided. 	The s42A Framework Report discusses the tensions that exist between this protection policy and other policies in the PWDP and the RPS which seek to enable growth. The Report author reaches the position that additional rural residential subdivision and development in the rural zone should be avoided where it would result in the fragmentation and loss of productive farm land. The problem with this position is that it assumes that the zone boundaries are already in the correct place. This fact is highlighted by the peer-review of that report commissioned by the Waikato District Council where the peer review author comments <i>"in other words, in many undefined instances the existing zones have simply been carried forward from the operative district plan, seemingly without close attention to their fit with the broader proposed policy framework. That itself, creates material room for well-reasoned zone changes"</i> ¹⁰ .
		The rezoning of the Burnett property is a case in point. The surrounding environment is not rural. Subdivision and development are very much rural residential in nature, even on land zoned Rural. Given this development pattern, fragmentation of the rural environment will not result from the rezoning – the Burnett land is in fact an 'island' amongst rural residential development. Furthermore, the property does not support productive rural activities and due to the environment should productive rural activities be proposed they would likely be incompatible with the surrounding rural residential activities. The rezoning would be an appropriate rationalisation of the CLZ boundary.
5.3.1	Objective - Rural character and amenity	These policies relate to the maintenance of the rural environment, where
(a)	Rural character and amenity are maintained.	land has been zoned and is intended to be continued to be used for that
		purpose.

¹⁰ Ibid pg2.

5.3.4 (a) (b)	Policy - Density of dwellings and buildings within the rural environment Retain open spaces to ensure rural character is maintained. Additional dwellings support workers' accommodation for large productive rural activities.	As noted above, the rezoning of the land to provide for rural residential development is generally consistent with the objectives and policies that seek to consolidate growth around existing Country Living fringe areas where the rezoning can maintain the established environment. In this case
5.3.8 subd (a) (b) (c) (d) (e) (f)	 Policy - Effects on rural character and amenity from rural vision Protect productive rural areas by directing urban forms of subdivision, use, and development to within the boundaries of towns and villages. Ensure development does not compromise the predominant open space, character and amenity of rural areas. Ensure subdivision, use and development minimise the effects of ribbon development. Rural hamlet subdivision and boundary relocations ensure the following: (i) Protection of rural land for productive purposes; (ii) Maintenance of the rural character and amenity of the surrounding rural environment; (iii) Minimisation of cumulative effects. Subdivision, use and development opportunities ensure that rural character and amenity values are maintained. Subdivision, use and development ensures the effects on public infrastructure are minimised 	the surrounding environment is clearly rural residential in nature not rural and the density of development that would be enabled by the rezoning would be consistent with the surrounding development density. Retaining the rural zoning would potentially adversely impact on the neighbouring CLZ amenity and character. The land is suitable for CLZ development as demonstrated earlier in this report.

- 50. In summary, the main areas of tension in terms of alignment relate to those PWDP objectives that limit urban development to existing defined growth areas and avoiding urban development in rural environments that would result in fragmentation or loss of productive farm land.
- 51. As discussed in the **Table 1** above, the proposal is not considered to be contrary to these objectives and policies for the following reasons:
 - While the site is not located in a *"defined growth area"* identified in the PWDP, it is located on land that sits within (note within not adjacent or nearby) land developed for rural residential purposes.
 - The site is the anomaly in the area. The site is zoned rural but is surrounded by rural residential development and is physically separated from productive rural land (both by the local purpose walkway and rural residential developed properties).
 - The site is identified as containing elite soils, such that its conversion to residential activity
 will remove highly productive land from being utilised for primary industry. However, the
 area of elite soils in question is limited to but a few hectares and these are such located
 that expansion to neighbouring sites is not possible.
 - In terms of rural amenity, the surrounding land uses are Country Living zoned or rural residential sites. Rezoning would not in any way retain the existing open space and rural character of the rural environment.
- 52. Overall, the proposal is considered to be generally consistent with, and in the majority not contrary to, the objectives and policies of the PWDP as notified.

Lens Two – Alignment and consistency with higher order documents

53. The higher order documents relevant to the proposal are considered to be National Policy Statements, Regional Policy Statements, and overall purpose and principles of the RMA.

Waikato Regional Policy Statement

54. The Waikato Regional Policy Statement ("**RPS**") is a high-level broad-based document which details a number of issues that are regionally significant and also contains objectives and policies to address the relevant issues. The objectives and policies ultimately seek to achieve the integrated management of natural and physical resources within the Waikato Region. The RPS provides a strong policy lead to ensure built environment occurs in a planned and coordinated manner.

- 55. The issues identified in the RPS that are considered most relevant to this proposal are, **1.4** *Managing the Built Environment*¹¹ which seeks development to be undertaken in a manner that ensures the built environment and associated infrastructure does not impact negatively on the environment and **1.6 Health and Wellbeing of the Waikato River**¹² which seeks to restore and protect the health and wellbeing of the River and its environs.
- 56. Objectives and policies of relevance to this report are included and assessed in the following sections.

¹¹ Issue 1.4 Managing the built environment

Development of the built environment including infrastructure has the potential to positively or negatively impact on our ability to sustainably manage natural and physical resources and provide for our wellbeing.

While addressing this issue generally, specific focus should be directed to the following matters:

a. high pressure for development in Hamilton City, Waipa District, Waikato District, around Lake Taupō, along the Waikato River and in the coastal environment;

b. increasing potential for natural hazards;

c. increasing conflict with, and demands for, new infrastructure;

d. the need to use existing infrastructure efficiently and to maintain and enhance that infrastructure;

e. protecting domestic and municipal water supply sources from the adverse effects of land use;

f. the effect of development on access to mineral resources (particularly aggregates), high class soils, and future energy development sites;

g. increasing impacts on and conflicts with existing resource users;

h. the underperformance of some elements of Hamilton's central business district and consequential effects on its function, amenity and vitality as a result of unplanned dispersal of retail and office development;

i. the integrated relationship between land use and development, and the transport infrastructure network;

j. the contribution of regionally significant industry and primary production to economic, social and cultural wellbeing, and the need for those industries to access natural and physical resources, having regard to catchment specific situations;

k. increased need for the future provision of infrastructure to respond to resource demands from within and outside the region and the need to enable efficient installation of that infrastructure; and

the availability of water to meet existing, and reasonably justifiable and foreseeable domestic or municipal supply requirements to support planned urban growth, including promoting the integration of land use and water planning.

¹²Issue 1.6 Health and wellbeing of the Waikato River catchment

The health and wellbeing of the Waikato River, its major tributary the Waipa River, and their catchments has been and continues to be degraded. Of particular concern is:

a. adverse effects on the mauri of the Waikato and Waipa Rivers;

b. the ability of the Waikato and Waipa Rivers to sustainably and safely provide food and cultural, economic and recreation opportunities;

c. the effect this has on the relationship of Waikato-Tainui, Ngāti Tūwharetoa, Te Arawa River Iwi, Maniapoto and Raukawa and the regional community with the rivers; and

the need to restore and protect the health and wellbeing of the Waikato River while providing for the existence and continued operation and output of the Waikato hydro scheme.

- 57. *Objectives, 3.2 Resource use and development*¹³*, 3.10 Sustainable and efficient use of resources*¹⁴*, 3.12 Built Environment*¹⁵*, 3.21 Amenity*¹⁶ and their supporting policies seek to ensure that the use and development of resources is sustainable and any effects are appropriate for the environment for which the development will be enabled within.
- 58. The purpose of the CLZ is to respond to growth pressures faced by the District, by providing for low density development that has little to no rural land use component. The CLZ also provides for rural residential living opportunities to alleviate the pressure for further development and subdivision to create a rural residential living outcome within the Rural Zone ¹⁷. Furthermore, the CLZ Section 32 Report prepared by Waikato District Council addresses the need for sites to be fit for purpose so that they are of a size where lots are not too small to farm and are not too large to garden.
- 59. The greatest concern with rezoning/developing rural zoned land is the loss of land that would have otherwise been productive. The PWDP Rural Zone subdivision rule 22.4.1.2 enables subdivision of a 20ha lot (subject to a title date being prior to 6 December 1997) where one

- d. access to the significant mineral resources of the region; and
- e. the availability of water for municipal and domestic supply to people and communities.

¹⁴ Objective 3.10 Sustainable and efficient use of resources

Use and development of natural and physical resources, excluding minerals, occurs in a way and at a rate that is sustainable, and where the use and development of all natural and physical resources is efficient and minimises the generation of waste.

¹⁵ Objective 3.12 Built environment

Development of the built environment (including transport and other infrastructure) and associated land use occurs in an integrated, sustainable and planned manner which enables positive environmental, social, cultural and economic outcomes, including by:

- a. promoting positive indigenous biodiversity outcomes;
- b. preserving and protecting natural character, and protecting outstanding natural features and landscapes from inappropriate subdivision, use, and development;

- d. integrating land use and water planning, including to ensure that sufficient water is available to support future planned growth;
- e. recognising and protecting the value and long-term benefits of regionally significant infrastructure;
- f. protecting access to identified significant mineral resources;
- g. minimising land use conflicts, including minimising potential for reverse sensitivity;
- h. anticipating and responding to changing land use pressures outside the Waikato region which may impact on the built environment within the region
- i. providing for the development, operation, maintenance and upgrading of new and existing electricity transmission and renewable electricity generation activities including small and community scale generation;
- j. promoting a viable and vibrant central business district in Hamilton city, with a supporting network of sub-regional and town centres; and

providing for a range of commercial development to support the social and economic wellbeing of the region.

¹⁶ Objective 3.21 Amenity

The qualities and characteristics of areas and features, valued for their contribution to amenity, are maintained or enhanced.

¹⁷ Waikato District Council s32 Evaluation Report – Country Living Zone

¹³ Objective 3.2 Resource use and development

Recognise and provide for the role of sustainable resource use and development and its benefits in enabling people and communities to provide for their economic, social and cultural wellbeing, including by maintaining and where appropriate enhancing:

a. access to natural and physical resources to provide for regionally significant industry and primary production activities that support such industry;

b. the life supporting capacity of soils, water and ecosystems to support primary production activities;

c. the availability of energy resources for electricity generation and for electricity generation activities to locate where the energy resource exists;

c. integrating land use and infrastructure planning, including by ensuring that development of the built environment does not compromise the safe, efficient and effective operation of infrastructure corridors;

additional lot between 8,000m²-1.6ha in area may be created. This indicates that Council consider 8,000m²-1.6ha to be of an appropriate sized lot to cater for rural residential development (within the Rural Zone), which presumably provides area to act as a buffer to satisfy reverse sensitivity concerns and that a title of 18.4ha is of a satisfactory size to accommodate a typical rural activity. Notably the subject site is significantly less than 18.4ha (13.6ha less) and as a result I consider the site too small to farm however, I also consider the area (4.8ha) too large to garden. Further to the above, adjoining sites are of a size that are consistent with CLZ expectations and are utilised principally for residential purposes, this situation also limits the rural use of the subject site as reverse sensitivity effects are likely to arise.

- 60. The level of development that would be enabled through rezoning the site would be consistent with the density and type of development that is observed on surrounding sites and therefore will be consistent with the amenity and character of the receiving environment.
- 61. Based on the above, I conclude that the rezoning of the subject site will be consistent with the outcomes sought by objectives 3.2, 3.10, 3.12 and 3.21 and the supporting policies of the RPS. Ultimately, rezoning the site to enable country living development would be a more sustainable and productive use of the site.
- 62. Objectives 3.4 Health and well-being of the Waikato River¹⁸, 3.9 Relationship of tangata whenua with the environment¹⁹ and 3.18 Historic and cultural heritage²⁰ and supporting policies seek to restore and protect the health and wellbeing of the Waikato River and ultimately ensure that Te Ture Whaimana o Te Awa (the vision and strategy for the Waikato River) is achieved while maintaining and respecting the relationship of Tangata Whenua with the River.
- 63. The rezoning of the subject site will not compromise the health and wellbeing of the Waikato River. Any development that may result from the rezoning will be required to provide adequate infrastructure on site to ensure that wastewater and stormwater are able to be satisfactorily

b. the role of tāngata whenua as kaitiaki.

¹⁸ Objective 3.4 Health and wellbeing of the Waikato River

The health and wellbeing of the Waikato River is restored and protected and Te Ture Whaimana o Te Awa o Waikato (the Vision and Strategy for the Waikato River) is achieved.

¹⁹ Objective 3.9 Relationship of tangata whenua with the environment The relationship of tangata whenua with the environment is recognised and provided for, including:

a. the use and enjoyment of natural and physical resources in accordance with tikanga Māori, including mātauranga Māori; and

²⁰ Objective 3.18 Historic and cultural heritage

Sites, structures, landscapes, areas or places of historic and cultural heritage are protected, maintained or enhanced in order to retain the identity and integrity of the Waikato region's and New Zealand's history and culture.

managed. Additional to the above, an archaeological investigation has been undertaken by Mr Warren Gumbley who has confirmed that there are areas of cultural heritage within the site boundaries. However, Mr Gumbley has noted that effects on these areas resulting from development have either been realised in the case of the existing dwelling or they can be mitigated through archaeological investigation. Notably this process will inevitably involve consultation with local iwi to ensure the relationship of Tangata Whenua and the environment is upheld and respected.

64. Section 6 of the RPS addresses the built environment, and contains policies relevant to the rezoning of land to provide for new urban development. Policy 6.1.1 of the RPS states that *"Local authorities shall have regard to the principles in Section 6A when preparing, reviewing or changing regional plans, district plans and development planning mechanisms such as structure plans, town plans and growth strategies"*. The principles in Section 6A are outlined in implementation method 6.1.8. Implementation method 6.1.8 requires that district plan zoning for new urban development is supported by information which identifies a range of matters, as appropriate to the scale and potential effects of development. These matters are set out in **Table 2** below:

a.	the type and location of land uses (including residential, industrial, commercial and recreational land uses, and community facilities where these can be anticipated) that will be permitted or provided for, and the density, staging and trigger requirements;	The type and location of land uses that will be permitted is set out in the CLZ rules, but these are expected to be large lot residential developments not industrial, commercial or recreational in nature. The likely density will be confirmed through subdivision consents, however it is envisaged that 5 additional lots greater than 5,000m ² will eventually be able to be realised on the land.
b.	the location, type, scale, funding and staging of infrastructure required to service the area;	In general, existing services with the exception of stormwater and wastewater are present which the site can connect to. Stormwater and wastewater can easily be disposed of on- site through proven and effective treatment systems which are common in the area. No infrastructure upgrades have been identified as being required to accommodate the rezoning and development of the site.
C.	multi-modal transport links and connectivity, both within the area of new urban development, and to neighbouring areas and existing transport infrastructure; and how the safe and efficient functioning of existing and planned transport and other regionally significant infrastructure will be protected and enhanced;	The existing CLZ is serviced by the roading network. The rezoning and development of the site will not adversely affect the safe and efficient functioning of this network. No regionally significant infrastructure will be impacted upon by the rezoning and future development.

Table 2 – Implementation method 6.1.8 of the WRPS

d.	how existing values, and valued features of the	This is discussed positively above.
	area (including amenity, landscape, natural	
	character, ecological and heritage values, water	
	bodies, high class soils and significant view	
	catchments) will be managed;	
e.	potential natural hazards and how the related	Refer to Geotechnical Report (Appendix B).
	risks will be managed;	No other natural hazards identified.
f.	potential issues arising from the storage, use,	No contamination is present on the site. Refer
	disposal and transport of hazardous substances	to Site Contamination Report (Appendix C).
	in the area and any contaminated sites and	
	describes how related risks will be managed;	
g.	how stormwater will be managed having regard	The site is suitable for on-site stormwater
	to a total catchment management approach and	treatment for the potential 5 lot development
	low impact design methods;	including availability of suitable areas and site
		soakage characteristics.
h.	any significant mineral resources (as identified	N/A
	through Method 6.8.1) in the area and any	
	provisions (such as development staging) to	
	allow their extraction where appropriate;	
i.	how the relationship of tangata whenua and	The archaeological assessment (Appendix I)
	their culture and traditions with their ancestral	confirms that 5 lots can be developed without
	lands, water, sites, wahi tapu, and other taonga	identified Balsite on the property is already
	has been recognised and provided for;	compromised by the location and
		construction of the existing dwelling.
i.	anticipated water requirements necessary to	Council's rural trickle supply has capacity to
ſ	support development and ensure the availability	service the 5 additional lots. Traditional roof or
	of volumes required, which may include	domestic water bore supplies are also viable
	identifying the available sources of water for	and available sources of water.
	water supply;	
k.	how the design will achieve the efficient use of	Design to be determined at resource consent
	water;	stage based on site specific development.
١.	how any locations identified as likely renewable	N/A
	energy generation sites will be managed;	
m.	the location of existing and planned renewable	N/A
	energy generation and consider how these areas	
	and existing and planned urban development	
	will be managed in relation to one another; and	
n.	the location of any existing or planned electricity	N/A
	transmission network or national grid corridor	
	and how development will be managed in	
	relation to that network or corridor, including	
	how sensitive activities will be avoided in the	
	national grid corridor.	

65. Overall, the rezoning proposal (and resultant expected (permitted) development) is considered to be generally aligned with, and not contrary to, the objectives and policies of the RPS.

Te Ture Whaimana – Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010

- 66. The Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 (**"Settlement Act"**) gives effect to the Deed of Settlement entered into by the Crown and Waikato-Tainui in relation to Treaty of Waitangi claims regarding the Waikato River on 17 December 2009. The Settlement Act has the overarching purpose of restoring and protecting the health and wellbeing of the Waikato River for future generations.
- 67. Section 9(2) of the Settlement Act confirms that Te Ture Whaimana, the Vision and Strategy for the Waikato River, applies to the Waikato River and activities within its catchment affecting the Waikato River.
- 68. As well as being deemed part of the RPS in its entirety pursuant to s 11(1), the Settlement Act prevails over any inconsistent provision in a national policy statement, and ss 11 to 15 of the Settlement Act prevail over ss 59 to 77 of the RMA (which relate to regional policy statements, regional plans and district plans) to the extent to which the content of the Settlement Act relates to matters covered under the RMA.

Waikato-Tainui Environmental Plan; Tai Tumu, Tai Pari, Tai Ao

- 69. The Waikato-Tainui Environmental Plan (**"WTEP"**) is required to be taken into account in accordance with section 74(2A). The overarching purpose of the WTEP is to provide a pathway that returns the Waikato-Tainui rohe to the modern-day equivalent of the environmental state it was in when Kiingi Taawhiao composed his maimai aroha. It provides guidance to external agencies regarding Waikato-Tainui values, principles, knowledge and perspectives on, its relationship with, and objectives for, natural resources and the environment, including the Waikato River.
- 70. The sections of the WTEP that are most relevant to this assessment in relation to the rezoning of the Burnett property are Section B, Chapter 6 (Consultation and Engagement) and Section C Chapter 11 (Vision and Strategy for the Waikato River). These sections are addressed in turn below.
- 71. Chapter 6 sets out the consultation and engagement expectations of Waikato-Tainui. No formal engagement regarding the rezoning request has been undertaken with Waikato Tainui at this point, however, comment has been sought from Mr Warren Gumbley (Archaeologist) in relation to the cultural sites that are identified on the site. Mr Gumbley's investigations have found that there are two areas of cultural significance (Maori made soils) within the boundaries of the site

and recommends that effects of future development in regard to these sites can be mitigated. It would be expected that through such an investigation that consultation will be undertaken with local hapu, Heritage NZ and Mr Warren Gumbley. Thereby meeting the expectations of Chapter 6.

- 72. Chapter 11 addresses the Vision and Strategy of the Waikato River. The proposed rezoning aligns with the Vision and Strategy as discussed earlier in this report and future development will be guided by the District Plan provisions and resource consent conditions where required.
- 73. Section 19 of the WTEP relates to the management and protection of freshwater resources. Key objectives require the protection of water quality to protect the natural state of water bodies. Any development that is enabled through the rezoning will be required to comply with the relevant infrastructure and servicing rules within the District Plan, Regional Plan and other relevant statutory documents. Site specific systems will be able to be designed at time of development that will ensure the water quality of the adjoining Waikato River is not adversely affected. As such, future development that is enabled through the rezoning is able to uphold the preservation of water quality. The larger sized allotments within the CLZ provides scope for efficient and effective systems which may not be possible under more intensive development density (of say a Residential zone).
- 74. Section 25 of the WTEP relates to land use planning, and in particular seeks that development and subdivision in the rohe is prevented from giving rise to cumulative or ad-hoc effects on the rural environment. The rezoning of the site will give rise to development that is consistent with the CLZ District Plan rules which seek to create a rural/residential transition between residential and rural living. The subject site adjoins the CLZ to the north and east where development has advanced consistently with the expectations of this zoning. The adjoining properties to the south are located within the Rural Zone, however, they are of a size between 1.6ha 9000m² which is considered to be more consistent with the CLZ density and development expectations rather than the Rural Zone. Given that the site is surrounded by development that is consistent with CLZ expectations, ad-hoc or cumulative effects on the rural environment will not occur.
- 75. By way of illustration, Figure 3 below highlights the pattern of land development around the subject property. Development is overwhelmingly rural residential with properties being at their highest density. The exception being the site (50 Te Awa Lane) which is a larger landholding. However, the site is restricted from amalgamation with other rural land to form a more productive rural lot by developed CLZ sized properties to the south which are the true transition properties between residential and rural living.

Figure 3 – Pattern of development of the surrounding area



National Policy Statement for Freshwater Management

- 76. The National Policy Statement for Freshwater Management ("NPS-Freshwater") sets out the statutory framework for the management of freshwater across New Zealand. The NPS Freshwater requires Regional Councils to recognise the national significance of freshwater and freshwater quality within a region must be maintained or improved. The concept of Te Mana o Te Wai (the integrated and holistic well-being of a freshwater body) must also be recognised. The NPS-Freshwater sets out six key principles relating to the roles of tangata whenua and other New Zealanders in the management of freshwater and places a hierarchy of obligations in terms of managing freshwater resources.
- 77. The subject site adjoins the Waikato River on the western boundary. Any development within close proximity to a river or stream has the ability to compromise the health and well-being of the water body.
- 78. Any future development of the subject site (if rezoned) will be required to comply with the relevant District Plan and Regional Plan rules as well as the requirements of the National Environmental Standard for Managing Freshwater which directly gives effect to the NPS Freshwater. Any future development will be subject to approval by the relevant regional and/or territorial authorities under the aforementioned plans/standards and will be required to be

serviced via onsite means for stormwater and wastewater, these systems will be subject to engineered design and construction methods. Future development will either obtain water supply from the Council reticulation or will be collected via roof collection.

79. Due to the above, and through the appropriate design and construction of management systems for stormwater and wastewater, the quality of the adjoining Waikato River will not be compromised as a result of development (Rural Residential) that will be enabled through the rezoning request. Furthermore, Council can be satisfied that existing legislation outside of the District Plan is able to satisfactorily address any concerns in this regard.

National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

- 80. The National Environmental Standard for Assessing and Managing Contamination in Soil to Protect Human Health (**"NES-CS"**) contains regulations and consenting requirements in relation to sites that are or may be contaminated due to past or present land uses.
- 81. The rezoning of the site will result in a change of land use and will give rise to subdivision and development opportunities that are greater than what is provided for under the current Rural zoning of the site. These changes along with the associated soil disturbance that development will result in will trigger an assessment to be undertaken under the NES-CS. A Preliminary Site Investigation (PSI) has been undertaken by 4Sight Consulting Limited (**Appendix C**) to indicate the level of assessment or compliance that can be achieved with the NES-CS.
- 82. The PSI has found that there is a presence of cadmium and lead above natural background levels which have likely resulted from past farming activities and structures these are within isolated areas of the site. With the exception of these "hot spots" all heavy metal concentrations across the remainder of the site are below the adopted NESCS rural residential criteria and are therefore considered highly unlikely to pose a risk to human health during or post development.
- 83. Based on the findings of the PSI it is concluded that the NES-CS will not restrict development from taking place on the site to the extent where the rezoning is no longer appropriate.
- 84. Furthermore, Council can be satisfied that the Burnett's have, since the completion of the PSI, engaged a specialist to remove and appropriately dispose of all soils that were deemed to be contaminated. Again, this positive action means that the entire site is available for development without restriction for a soil contamination perspective.

Lens Three – Best practice planning guidance

- 85. The s42A Framework Report identifies guidance on "best practice" to apply in considering rezoning requests. The matters that are considered of relevance to this proposal, include:
 - Retention of the site provides no economic benefit as the site is too small for viable productive purposes and the site cannot be amalgamated with other properties to produce an economic rural unit. Development for CLZ purposes is a positive use of the site that is demonstrated to be suitable in all respects for said use and is reflective of the area.
 - Changes to zone boundaries are consistent with the maps in the PWDP that show overlays or constraints. There are no overlays or constraints identified in the planning maps that would have relevance to the location of the zone boundaries.
 - Changes to zone boundaries take into account the features of the site in that there are no features that need to be taken into account that would prevent CLZ development.
 - Zone boundary changes recognise the availability of major infrastructure. As discussed above, infrastructure has been assessed as part of the proposal and it is considered that existing and planned infrastructure will be able to provide for the zone boundary change.
 - There is adequate separation between incompatible land uses. The existing rural
 residential development to the south of the site provides a separation buffer, as does the
 walkway around the southern boundary of the site. Both of these provide a more logical
 zone boundary than that proposed by the PWDP.
 - Zone boundaries are clearly defensible, and follow property boundaries. The proposed zone boundaries are defined by the Burnett's site, which will form a logical boundary between CLZ and rural development at its southern limits. The northern limits of the zone boundary are currently CLZ.
- 86. Accordingly, the proposal is considered to be generally aligned with the best practice guidance that has been identified.
- 87. The s42A Framework Report at pages 52 and 53 provides commentary on the CLZ. The report author concludes his discussion by recommending that there be no additional rezoning of CLZ in the PWDP. With respect, such a blanket recommendation is highly inappropriate and does not accord with the provisions of the RMA. Moreover, the recommendation also does not acknowledge some of the flaws in the CLZ as proposed. For example, the s42A Framework Report commentary states that the CLZ is largely carried forward from the ODP and that this was done because it was Council policy not to add any land to the CLZ. The s42A Framework Report then

acknowledges that this rationale for the proposed CLZ is therefore not completely robust. The peer review report further comments that 'that suggests that zone boundaries can and ought to be adjusted to fit the broader policy framework without the need for adjusting the policy itself'. I concur with the peer reviewers' comments and wholly support an approach where well-reasoned zone changes are adopted by Council. I submit that the rezoning of the Burnett property is a case in point in that it has unique circumstances that support its rezoning to CLZ.

- 88. The s42A Framework Report further comments that Council did not want to rezone further land CLZ because residents of the CLZ expected higher levels of service. This may well be the case, however in respect of the Burnett property they are located at the end of a cul-de-sac and are afforded all of the services and amenities of their neighbours. Should Council improve the level of services would Council really stop these short of the Burnett property clearly not. The services would be made available to the Burnett property. The rezoning would not therefore result in additional demand for services as that demand is already established by the neighbouring CLZ properties along Te Awa Lane.
- 89. The final point made in the s42A Framework Report for declining any new CLZ areas is that the CLZ acts as a transitional zone that needs to be urbanised and that the cost of that urbanisation would need to be met by forward funding from Council. I can accept that this would be the case where the CLZ is on the periphery of urban areas. However, the Te Awa Road/Lane CLZ is not so located being some distance from any urban town. Further, the area is already largely developed, it is not a new area, and each property therein has appropriate services for the form of development. The area also has a recreation reserve and walkways vested in Council. Accordingly costs to Council from 5 additional lots is not a justifiable reason in my opinion.

STATUTORY FRAMEWORK

- 90. The rezoning submission is subject to a range of the provisions in the RMA, including the Purpose and Principles in Part 2 (sections 5 8) of the Act, sections 31 (functions of territorial authorities),
 32 and 32AA (requirement for evaluation reports), 74 (matters to be considered) and Part 1 of Schedule 1 (requirements relevant to process).
- 91. Under s 31(1) of the RMA, WDC as a territorial authority has a number of functions for the purpose of giving effect to the RMA in its district, including the establishment, implementation, and review of objectives, policies and methods to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources of the Waikato District.

Section 32

92. As the rezoning submission seeks to make changes to the notified PWDP a section 32AA evaluation is required. That evaluation is to be undertaken in accordance with s32, subsections 1-4. The full 32AA analysis is attached as **Appendix K**.

Section 75

- 93. In addition to setting out what the PDP must and may state, s 75(3) says that the PDP must 'give effect to' (relevantly):
 - a) any national policy statement;
 - b) a national planning standard; and
 - c) any regional policy statement.
- 94. The relevant statutory documents have been assessed in detail earlier in this report.

Part 2 – Purpose and Principles

- 95. As identified above, the rezoning request must be in accordance with the provisions of Part 2 of the RMA. The RMA has a singular purpose which is to promote the sustainable management of natural and physical resources (section 5). The area of land subject to this report is a natural resource, and therefore it is incumbent to demonstrate how that resource will be sustainably managed.
- 96. Section 6 of the RMA contains 'matters of national importance' that must be recognised and provided for. The matter of national importance considered most relevant to this proposal includes, the preservation of natural character of rivers and its margins.
- 97. The margin of the Waikato River forms a part of the subject site. The portion of the site that adjoins the river is identified as a Significant Natural Area and is also subject to the Significant Amenity Landscapes Overlay through the PWDP, these overlays seek the protection and preservation of the existing natural environment as it currently exists. The rezoning of the subject site will not alter the overlays that the site is also subject to. If the site were to undergo subdivision as would be enabled through the rezoning an esplanade reserve will be required to be created which will then be vested in Council. This will create a 25m separation buffer between the site boundary and the River. As a result of the creation of the esplanade, and the existing special

feature overlays, the margin of the Waikato River will be protected and resultantly the natural character of the river margin will be preserved.

- 98. Section 7 of the RMA lists the matters that the consent authority is required to have particular regard to in achieving the purpose of the RMA. Those which are considered relevant are assessed below:
- 99. **The efficient use and development of natural and physical resources:** The rezoning of the subject site will give rise to development consistent with the CLZ District Plan rules. The rezoning will result in a logical extension of the CLZ where development of this nature is existing and expected. The site is well connected to the existing road network, is accessible and serviceable (as discussed in greater detail earlier in this report). The site is of a size (4.8ha) that is deemed inefficient to cater for a productive rural activity. Due to the physical separation from other Rural land holdings, the potential for practical amalgamation opportunities to increase the area of the site is limited and likely infeasible due to the necessity for multiple land holdings to be purchased to achieve amalgamation. As a result of the above, I conclude that rezoning the site to Country Living will provide for a more efficient use of the land (natural resource) rather than the existing and proposed Rural Zoning.
- 100. The maintenance and enhancement of amenity values: The receiving environment has a high standard of amenity as expected within the CLZ. The adjoining properties to the north, east and south of the site have been developed to a standard and density that is largely consistent with the CLZ District Plan rules, albeit that the adjoining properties to the south are located within the Rural Zone. On this basis, the amenity expectation of the receiving environment that the site is contained within is tempered by the context and surrounding. Any development enabled through the rezoning will maintain and enhance the existing amenity value, as will be shaped by the District Plan development controls.
- 101. The maintenance and enhancement of the quality of the environment: Effects of future development relating to the quality of the environment are able to be appropriately managed through the provision and capacity of existing servicing infrastructure and the ability to manage wastewater and stormwater onsite through appropriate engineered designed systems. Earthworks and construction activities associated with developing the site will be undertaken utilising best practice initiatives, and if required consents will be obtained and therefore, effects will be controlled through consent conditions. Furthermore, if subdivided, a 25m wide esplanade reserve will be vested in Council that will provide a buffer separation between the developable

area of the site and the River which will contribute to bettering the quality of the river environment.

102. Section 8 of the RMA states that in achieving the purpose of the RMA all persons shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi). Advice has been sought from Mr Warren Gumbley (Archaeologist) regarding the presence and significance of cultural archaeology within the subject site. Mr Gumbley's Technical Memorandum is attached as **Appendix I**. Two isolated non-developed areas containing evidence of archaeology (Maori made soil) have been identified within the subject site and it is recommended within Mr Gumbly's report that should any development be proposed that may affect these areas, that a detailed archaeological investigation shall be undertaken. If rezoned and resultantly developed, meaningful engagement with Tangata Whenua will be required to better understand the cultural significance of these sites. Overall, the rezoning of the site does not contravene the principals of the Treaty.

CONCLUSION

- 103. To conclude, the submission that this report relates to seeks to rezone the property located at 50 Te Awa Lane, Country Living rather than Rural as proposed through the PWDP. The rezoning of the subject site is consistent with the purpose of the RMA, is consistent with the relevant objectives and policies of the RPS and also aligns with the relevant sections and expectations of the WTEP, as assessed in the earlier sections of this report.
- 104. The rezoning of the subject site will enable a more efficient, effective and sustainable use of the subject site, given that it is of a size that is too small to farm and too large to garden. Rezoning the site will better provide for the people and community, as recent trends indicate that 50% of the growth predicted for the Waikato District will likely seek to live in rural residential environments²¹. Through the provision of appropriately identified and well-planned parcels of Country Living Zoned land, it encourages the retention of Rural Zoned land elsewhere that may be able to be amalgamated to create larger, more productive rural land parcels. Additional to the above, due to the size, location and separation from other rural zoned properties, the proposed rezoning of the subject site will result in a logical extension of the existing Country Living Zone and is deemed a more appropriate and efficient use of the site than the existing Rural Zoning.

²¹ Market Economics 2018 – Implications of Subdivision for the Waikato District

- 105. The rezoning of the subject site will not lead to sporadic and uncoordinated land fragmentation and will not pressure Council to upgrade transportation and servicing infrastructure as all services are able to be managed and provided for onsite, or are able to be catered for through the existing capacity within the existing infrastructure.
- 106. I therefore recommend that Council rezone the property located at 50 Te Awa Lane to Country Living rather than Rural as originally proposed. Adopting the relief sought by the Submitter is considered to be a positive planning decision that would enable the Council to better respond to high levels of growth and anticipated demand for housing in the District and provide greater competition and choice in the housing land market.

APPENDIX A: Copy of Submission



RMA Form 5

Proposed	Waikato	District	Plan
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Submission form

ECM Project: DPRPh5-03
ECM #
Submission #
Customer #
Property #

To submit electronically please go to: <u>www.waikatodistrict.govt.nz/pdp</u>

Closing date for submissions: 5pm on Tuesday 9 October 2018

Submitter details: (please note that the (*) are required fields and must be completed)

First name*: Stephen	Last name*: Gascoigne		
Organisation: Bloxam Burnett & Olliver Ltd			
On behalf of: Grant & Merelina Burnett			
Postal address*: PO Box 9041, Waikato Mail Centr	e		
Suburb:	Town/City*: Hamilton		
Country: New Zealand	Postal code*: 3240		
Daytime phone: 07 838 0144	Mobile: 027 622 3742		
Email address:* sgascoigne@bbo.co.nz			
Please tick your preferred method of contact*			
X Email Postal			
Correspondence to*			
Submitter X Agent Both			
Trade competition and adverse effects:*			
I could X I could not			
gain an advantage in trade competition through this submission.			
Note: If you are a person who could gain an advantage in trade competition through the submission, your right to make a submission may be limited by clause 6(4) of Part 1 of Schedule 1 of the Resource Management Act 1991.			
Would you like to present your submission in person at a hearing?			
X Yes			
I do NOT wish to speak in support of my submission and ask that this submission be fully considered.			
If others make a similar submission I will consider presenting a joint case with them at the hearing (do not tick if			
you would not consider a joint case).			

Please complete the following for every submission point:
Provision number (e.g. 22.4.1.2 P2(a)): Proposed District Plan Planning Map 32 (Hautapu)
Physical address of the property concerned (if relevant to your submission):
50 Te Awa Lane, Tamahere
Do you:
Support X Oppose Neutral
The decision I would like is:
The Planning Map (Planning Map 32 (Hautapu)) is amended to remove the Rural Zone as is relates to
the subject site (50 Te Awa Lane) and rezone the subject site as Country Living Zone, with all
other policy overlays unchanged; And, such further relief and/ or amendments to the District Plan
as may be necessary to support the Burnett's relief, as set out in this submission.
My reasons for the above are:
Refer to the attached Submission
Please return this form no later than 5pm on 9 October 2018 to: Waikato District Council, 15 Galileo Street, Private Bag 544, Ngaruawahia 3742, or e-mail: <u>districtplan@waidc.govt.nz</u>
90000pm

Signed: Da (A signature is not required if you make your submission by electronic means)

PRIVACY ACT NOTE: Please note that all information provided in your submission will be used to progress the process for this proposed district plan, and may be made publicly available.
Provision Number: Planning Map 32 (Hautapu)

Physical address of property: 50 Te Awa Lane, Tamahere

Do you:

Support/Oppose/Neutral

I **oppose** the 'Rural Zone' zoning of the subject site located at 50 Te Awa Lane, Tamahere, and legally described as Part Lot 6 DPS 11104 (SA56A/381), on Planning Map 32 (Hautapu) within the Planning Maps of the Proposed Waikato District Plan.

The decision I would like is:

• The Planning Map (Planning Map 32 (Hautapu)) is amended to remove the Rural Zone as is relates to the subject site (50 Te Awa Lane) and rezone the subject site as Country Living Zone, with all other policy overlays unchanged.

The reasons for the above are:

Grant and Merelina Burnett are the owners of the property at 50 Te Awa Lane, Tamahere.

The property subject to this submission is located at the southern end of Te Awa Lane, Tamahere. The 4.0898ha site is elevated well above the Waikato River, which forms the western boundary of the site. The topography of the site is that of a predominantly flat area, except for the western boundary which drops steeply to the Waikato River. The site contains a dwelling in the southwestern corner and various rural sheds. Mature specimen trees and amenity planting are located generally around the fenced perimeter of the site, otherwise most of the site is used to graze two horses. The horses that are presently residing on the property are owned by the adjoining neighbor and reside at the site for



no more than two weeks at a time; otherwise, no livestock is kept on the property. Photographs of the site follow:





Although accessed through and situated at the end of Te Awa Lane (which is a Country Living Zone enclave), the subject site is zoned Rural. That is, the site effectively comprises the southern boundary between Rural zoned properties to the south and the Country Living zoned properties situated along Te Awa Lane, Te Awa Road and Blue Heron Place. Refer to **Figure 1** below:



Figure 1: Proposed Waikato District Plan Zoning

The site is bordered to the north and east by allotments zoned Country Living, with average lot sizes of approximately 1ha. To the south the site is separated from Rural zoned sites, also with average lot sizes of approximately 1ha, by a 3m wide Local Purpose Reserve – Walkway owned by Council. The Rural zoned sites to the south are presently developed for rural residential purposes, with each containing a substantial dwelling, and are accessed via a sealed access road.

The site is legally and physically separated from any adjoining lots zoned Rural where any possible potential for amalgamation might otherwise exist in order to achieve sustainable rural land use according to the Rural Zone.

The wide-view locality plan (**Figure 2**) on the following page demonstrates all adjoining lots are sized between 6,000m² and 1.6ha and are functional and developed solely as rural residential properties. A close-up aerial of the site (**Figure 3**), photos of the walkway and photographs of those adjoining "rural" lots (including access) are also provided below to illustrate the present development of the locality.

Properties developed as Rural Residential Activities

50 Te Awa Lane

New Dwellings

- 6

Figure 2: Wide-View Aerial Photograph

of Locality

Residential border preventing amalgamation



Figure 3: Close-Up Aerial Photograph of Locality

New Dwelling

50 Te Awa Lane

New Dwelling

Local Purpose Reserve Walkway







The development that has taken place in the area and on adjoining sites (as outlined above) has greatly influenced this submission which seeks to rezone the property to Country Living. The adjoining development has fashioned a natural and identifiable zone boundary and has largely dictated what activities are and will be appropriate for the area.

The s32 report completed with regard to the Rural Zone of the Proposed Waikato District Plan has acknowledged that past subdivision has compromised rural land resources, with allotments around 4ha in area being generally considered to be 'unproductive'. The property the subject of this submission has an effective land area under 4ha (when one considers the unusable bank area adjoining the Waikako River).

In acknowledging the lack of productivity due to the size of the subject site it is therefore necessary to consider whether the site has the potential for future amalgamation to preserve a productive use. In this case the site does not adjoin other productive rural sites; the site adjoins a walkway reserve and developed rural residential sized allotments (of approximately 1ha). An assumption that the site could be amalgamated with those adjoining sites is factitious at best, considering the owners would have to progressively purchase multiple lots, including Council owned reserve land, in order to gain a viable rural lot. Viable rural lots, in the opinion of this submission, are those which are the minimum sized balance lots arising from Rural Zone subdivision; being 18.4ha in the case of Rule 22.4.1.2 RD1 'General Subdivision' and 20ha in the case of Rule 22.4.1.5 RD1 'Rural Hamlet Subdivision'.

The potential for the use of the site under the present zoning is also an unrealistic consideration in respect of this submission, in particular as both s32 Evaluation Reports for the Country Living Zone and Rural Zone stipulate avoidance of reverse sensitivity effects is a key matter to be provided for in achieving a rural/ rural residential land use balance.

Farming (agricultural, horticultural and apicultural) activities are permitted as of right and are likely to generate effects from frost fans, the housing of bees and livestock, the use of sprays and the development of packaging facilities that may be undertaken by the submitter. These activities are not accounted for within the character of the adjoining Country Living Zone and are highly likely to be subject to cumbersome controls due to the proximity of dwellings to the site (i.e. creating reverse sensitivity effects).

Overall, it is considered that the proposed Rural zoning presents inefficiencies with regard to the use of the site which is unsustainable and unproductive. This is contrary to the purpose of the Resource Management Act (1991) which requires sustainable management of natural and physical resources. Sustainable management means "managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing".

The site in its proposed state is not fit for purpose and creates an outcome where the site is too small to farm and too large to maintain as gardens. This is averse to the social and economic wellbeing of the owners.

In summary, it is requested the Planning Map 32 (Hautapu) of the Proposed Waikato District Plan is altered for the rezoning of 50 Te Awa Lane, Partt Lot 6 DPS 11104 (SA56A/381) from the present Rural Zone to the Country Living Zone. The rezoning of the site is sought for the following reasons:

- The Local Purpose Reserve Walkway vested in Waikato District Council provides the logical separation point between the Te Awa Lane cul-de-sac Country Living Zone and a Rural Zone;
- The site is legally and physically separated from adjoining lots zoned Rural where a potential for amalgamation would otherwise exist to give effect to sustainable rural land use according to the Zone;
- Sustainable rural land uses are dictated by minimum parent lot size pre- and post-subdivision in Chapter 22 of the Proposed Waikato District Plan which do not align with the size of the site; and
- Should the owners wish to use that site under an intensive or horticultural rural land use, consent is highly unlikely to be granted in consideration of high-risk reverse sensitivity effects in a locality where the site is immediately surrounded on all boundaries with land use activities that are residential in character.

K:\111709\Waikato District Plan Review\Burnett\Submission.docx

APPENDIX B: Geotechnical Investigation Report



20 January 2020

50 TE AWA LANE

TAMAHERE

GEOTECHNICAL INVESTIGATION REPORT

TE PA FRUITS LIMITED HAM2019-0055AB Rev 0

HAM2019-0055AB				
Date	Revision	Comments		
13 January 2020	А	Initial draft for internal review		
20 January 2020	0	Final Issue		

	Name	Signature	Position
Prepared by	David MacPherson	Adflen	Engineering Geologist
Reviewed by	Ken Read	10-30/	Principal Geotechnical Engineer
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Table of Contents

1	INT	RODUCTION	1
	1.1 1.2	Project Brief Scope of Work	1 1
2	SIT	E DESCRIPTION	2
	2.1 2.2	Site Location Landform and Site Description	2 2
3	PR	OPOSED DEVELOPMENT	2
4	INV	ESTIGATION	3
	4.1 4.2	Desktop Study Field Investigation	3 3
5	GR	OUND MODEL	4
	5.1 5.2 5.2. 5.2. 5.2.	Published Geology Stratigraphic Units 1 Topsoil 2 Uncontrolled Fill 3 Loose Sand (Hinuera Formation)	4 5 5 5
	5.2. 5.2. 5.3	 4 Medium Dense Sand (Hinuera Formation) 5 Summary Groundwater 	5 5 6
	5.4	Soakage	6
6	GE	OHAZARDS ASSESSMENT	6
	6.1 6.2 6.3 6.4 6.4 6.4 6.4 6.5 6.6 6.6 6.6 6.6 6.7	Context Seismicity Fault Rupture Liquefaction 1 General 2 Geological Age 3 Soil Fabric 4 Qualitative Assessment Lateral Spread Slope Stability 1 Design Criteria 2 Shear Strength Parameters 3 Slope Stability Analyses Load Induced Settlement	6 7 7 7 8 8 8 8 9 9 9
7	GE		10
	7.1 7.2 7.3 7.4 7.4 7.4 7.4 7.4	Seismic Site Subsoil Category Liquefaction / Lateral Spread Mitigation Slope Stability Management Earthworks 1 General 2 Subgrade Preparation 3 Suitability of Materials 4 Permanent Cut and Fill Batters	10 10 10 . 10 . 10 . 11 . 11

	7.4.5 Earthworks Quality Control	. 11
7.	5 Foundation Bearing Capacity	11
7.	6 Geotechnical Strength Reduction Factor	11
8	STORMWATER SOAKAGE	11
9	ENVIRONMENTAL PRELIMINARY SITE REPORT	12
10	FURTHER WORK	12
11	LIMITATIONS	12
USE	E OF THIS REPORT	13

Drawing

Drawing 01: Geotechnical Investigation Plan

Appendices

- Appendix A: Bloxam Burnett & Olliver Subdivision Scheme Plan
- Appendix B: Selected Publicly Available Geological Information
- Appendix C: Hand Auger Borehole Logs
- Appendix D: Soakage Test Results
- Appendix E: Natural Hazards Assessment
- Appendix F: Slope Stability Analysis Results
- Appendix G: Slope Stability Setbacks
- **Appendix H: Preliminary Site Investigation Report**

1 INTRODUCTION

1.1 Project Brief

CMW Geosciences (CMW) was engaged by Te Pa Fruits Limited to carry out a geotechnical investigation of a site located at 50 Te Awa Lane, Tamahere, which is being considered for a 6 Lot rural-residential subdivision.

The scope of work and associated terms and conditions of our engagement were detailed in our services proposal referenced HAM2019-0055AA, Rev1 dated 2 December 2019.

This report is to support a resource consent application to Waikato District Council.

1.2 Scope of Work

As detailed in our proposal, the instructed scope of work to be conducted by CMW was defined as follows:

- A desktop study comprising a review of publicly available aerial photography, geological maps, any available geotechnical investigation reports and relevant planning documentation;
- Project management including health, safety and environmental planning for field work;
- 8 hand augers up to 4m deep with associated shear vane and scala penetrometer testing to help us define the near surface profile;
- 2 soakage tests in hand auger boreholes;
- A qualitative assessment of liquefaction risk using investigation findings;
- A slope stability assessment for Lot 6;
- Presentation of a geotechnical investigation plan and site investigation records;
- A geotechnical report to support an application for subdivision consent, including a natural hazard assessment, an assessment of ground conditions, preliminary foundation recommendations, preliminary slope stability assessment and a qualitative liquefaction assessment.
- Environmental Preliminary Site Inspection (PSI) including background site research, site visit, with limited targeted soil sampling and testing for cadmium, lead, arsenic and pH level, and a PSI report in general accordance with Ministry for the Environment Contaminated Land Management Guidelines No. 1 (revised 2011) for subdivision application. This work was carried out and reported by a specialist subconsultant, 4Sight Consulting.

2 SITE DESCRIPTION

2.1 Site Location

The site has an area of approximately 40,000m² and is located at 50 Te Awa Lane, Tamahere, as shown on Figure 1 below.



Figure 1: Site Location Plan. Source: openstreetmap.org

2.2 Landform and Site Description

The east end of the site is near level with existing ground levels ranging from RL40m (NZ Vertical Datum 2016) at the south eastern edge to of the site to RL41 at the north western edge.

In the western corner of the site there is a slope down to a terrace at RL34m with a further slope below this terrace down to the Waikato River at approximately RL14.4m.

In the north eastern corner of the site there is a 2m high mound of uncontrolled fill. The general landform and contours are presented on *Drawing 01*.

A residential home with a swimming pool has been constructed on the higher terrace in the south west corner of the site. Access is via a driveway that leads along the north western side of the property before crossing towards the house close to the crest of the river terrace slope.

A shed is present in the north eastern corner of the site, close to the mound of uncontrolled fill.

3 PROPOSED DEVELOPMENT

The current development proposal as shown on the draft scheme plan provided by Bloxam, Burnett and Olliver (BBO) (*Appendix A*), is to subdivide the land into 6 residential Lots of varying size (0.5 to 0.84 ha in area) with an associated access road extending from the existing Te Awa Lane.

Lot 5 has a single storey residential house which is to remain. The BBO plans show the shed in Lot 2 is to be removed.

No earthworks plans have been provided but we assume there will generally be minor cuts and fills associated with the development of Lots 1 to 4. Retaining walls may be needed to aid creation of access to the lower lying Lot 6.

4 INVESTIGATION

4.1 Desktop Study

A desktop study was undertaken, comprising a review of publicly available geological maps, previous geotechnical investigations in the area listed on the New Zealand Geotechnical Database (NZGD), historic aerial photographs, and satellite imagery of the area.

The review of the NZGD found one Cone Penetrometer Test (CPT) and one borehole north of the site as part of the New Zealand Transport Agency and Hamilton City Council Southern Links project. These were carried out in similar geology to that anticipated on this site (Hinuera Formation sands). They found around 3m of loose sand over medium dense sand. Copies of the logs of the CPT and Borehole are presented in *Appendix B*.

Aerial photography since 1939 shows the land has been predominantly used for agriculture, and more recently as a lifestyle block. The house and shed are present in imagery from 1971.

Satellite imagery shows there was recently (2008) a horse arena on the north western boundary of the site, and horse yards in the south eastern corner, both of which have since been removed.

4.2 Field Investigation

The field investigation was carried out on 10 December 2019.

All fieldwork was carried out under the direction of CMW Geosciences in general accordance with the NZGS guidance¹. The scope of fieldwork carried out was as follows

- Eight hand auger boreholes, denoted HA01 to HA08, were drilled using a 50mm diameter auger to target depths of up to 4.0m below existing ground levels to visually observe the near surface soil profile and to facilitate in-situ permeability / vane shear strength testing. Augers HA02B and HA07 were terminated short due to refusal while all other hand augers were terminated at the target depth of the investigation. Engineering logs of the hand auger boreholes, together with peak and remoulded vane shear strengths are presented in *Appendix* C. Soil logging was carried out by CMW geotechnical staff in general accordance with the NZGS guidance²
- Dynamic cone (Scala) penetrometer (DCP) tests were carried out in each hand auger borehole to depths of up to 4m to provide soil density profiles. Graphical results of the DCP testing are presented on the borehole logs in *Appendix C*;
- Soakage tests were undertaken in HA04 and HA07 by hand augering to depths of to 4m (HA04) and 3.3m (HA07) below existing ground level to visually observe the near surface soil profile, and then reaming the boreholes out to 100mm diameter and installing a perforated PVC standpipe. Results of the permeability tests are presented in *Appendix D*;

The approximate locations of the respective hand augers referred to above are shown on the Geotechnical Investigation Plan, *Drawing 01*. Locations were measured using hand held GPS. Elevations were inferred from the survey plan provided by BBO.

¹ NZ Geotechnical Society (2017), New Zealand Ground Investigation Specification, Volume 1.

² NZ Geotechnical Society (2005), Field Description of Soil and Rock, Guideline for the field classification and description of soil and rock for engineering purposes.

5 GROUND MODEL

5.1 Published Geology

The published geological map³ of the area show the regional geology for the area to comprise alluvial soils of the Hinuera Formation overlying older alluvial soils of the Walton sub group (Figure 2). Taupo Pumice Alluvium is shown to be present along the banks of the Waikato River.



Figure 2: Regional Geology (Source: GNS 1:250K geological units map)

Soils of the Hinuera are described as cross-bedded pumice sand, silt and gravel with interbedded peat.

The soils around the adjacent Waikato River channel are typically described as being predominantly pumice sand, silt and gravel alluvium with charcoal fragments. This is shown to be present in the south western third of the site.

³ Edbrooke, S.E. (compiler) 2005. Geology of the Waikato area. Institute of Geological & Nuclear Sciences 1:250 000 geological map 4. Lower Hutt, New Zealand. Institute of Geological & Nuclear Sciences Limited. 1 sheet + 68 p.

Based on the known history of the site and surrounding land levels, some superficial depths of fill could be anticipated as a result of soft landscaping.

5.2 Stratigraphic Units

The ground conditions encountered and inferred from the investigation were found to differ from the published geology. Hinuera formation sands were found across the site. Taupo Pumice Alluvium was not identified. The soils present can be summarised in the following units:

5.2.1 Topsoil

Topsoil depths were found to be vary across the site, ranging between 0.2m to 0.6m.

5.2.2 Uncontrolled Fill

Uncontrolled fill comprising loose fine to coarse sand was encountered in HA02B in a 2m high mound in the north eastern corner of the site. Our investigative hand auger was not able to penetrate through to the base of the fill.

5.2.3 Loose Sand (Hinuera Formation)

Beneath the topsoil (and a thin silt in HA07) well graded loose fine to coarse sand with some silt was encountered in all the HAs, except HA2B, to 4m depth in HAs 01, 02, 03, 04 and 05. DCP blow counts were typically between 1 – 3 blows per 100mm

A 300mm thick stiff silt was encountered beneath the topsoil in HA07, with a vane shear strength of 89kPa.

5.2.4 Medium Dense Sand (Hinuera Formation)

Well graded medium dense fine to coarse sand was encountered at 1.3m (HA07) and 2.4m (HA08) below ground level on the lower terrace. The base of this unit was not encountered in our investigation.

DCP blow counts were typically between 4 – 9 blows per 100mm.

5.2.5 Summary

These depths and thicknesses of these units are summarised below in Table 1.

Table 1: Summary of Strata Encountered					
Unit		Top of Unit (RL m)		Thickness (m)**	
	Min	Мах	Min	Мах	
Topsoil	33.2	41.0	0.2	0.6	
Uncontrolled Fill*	40.8	40.8	-	-	
Loose Fine to Medium Sand, with some Silt (Hinuera Formation)	33.0	40.8	1.3	2.4	
Medium Dense Fine to Coarse Sand (Hinuera Formation)	30.9	32.0	NP	NP	
Notes: * Strata only encountered in HA02B **Thickness only recorded were base of strata has been confirmed.					

The Taupo Pumice Alluvium inferred on the local geology map was not found in our site investigation.

Medium dense sand was found beneath the loose sand on the lower terrace. Based on the publicly available geological information available nearby (Section 4.1) and our experience with the local geology we anticipate it to be present at around 5m depth beneath the loose sand on the upper terrace,.

5.3 Groundwater

Groundwater was not encountered during our investigation. However, given the presence of the Waikato River adjacent to the site the regional groundwater table for the site is likely to be close to river level at around RL15m. Groundwater level is likely to fluctuate seasonally.

While no silt lenses were encountered in the deeper soils during this investigation, it is possible deeper layers of silt exist beneath the site, potentially leading to perched groundwater.

5.4 Soakage

Data logger "divers" were installed at the base of the boreholes to record the rate of water level fall over time. The standpipes were then filled with water. The head of water above the diver was recorded at five second intervals during the test.

Soakage was rapid at this site and a water source with enough capacity to completely fill the pipes was not available. However, enough head was generated to give some permeability test results.

We have assessed the hydraulic conductivity of the subsoils using the CIRIA 113⁴, and the Hvorslev⁵ methodologies.

Our falling head permeability test data and calculations are presented in *Appendix D* and our calculated hydraulic conductivities are presented on Table 2.

Table 2: Falling Head Permeability Test Results				
Hand Auger Borehole No.	Average Hydraulic Conductivity (m/s) CIRIA 113	Average Hydraulic Conductivity (m/s) Hvorslev		
HA04	2.50 x 10 ⁻⁴	8.79 x 10⁻⁵		
HA07	4.24 x 10 ⁻⁴	1.59 x 10 ⁻⁴		

Note: Any designer using these values may consider other calculation methods and must satisfy themselves as to their suitability.

6 GEOHAZARDS ASSESSMENT

6.1 Context

Section 106 of the Resource Management Act (RMA) requires an assessment of the risk from natural hazards to be carried out when considering the granting of a subdivision consent. S106 RMA specifically states that the assessment must consider the combined effect of the natural hazard likelihood and material damage to land or structures (consequence).

The following sections of this report provide an assessment of the geohazards relevant to this site and provide the basis for the Natural Hazards Risk Assessment presented in *Appendix E.*

⁴ Somerville (1986), Control of groundwater for temporary works, CIRIA Report 113, Appendix 4

⁵ Hvorslev (1951) *Time lag and soil permeability in ground-water observations,* Fig 18, p49

6.2 Seismicity

A seismic assessment has been carried out in general accordance with NZGS guidance⁶ to calculate the peak horizontal ground acceleration or PGA (a_{max}) as follows:

$$a_{max} = C_{0,1000} \frac{R}{1.3} x f x g$$

Where: $C_{0,1000}$ = unweighted PGA coefficient (subsoil Class D, see Section 7 for derivation)

R = return period factor given in NZS1170.5, Table 3.5

f = site response factor subject to subsoil class (subsoil Class D, see Section 7 for derivation)

g = acceleration due to gravity

The Ultimate Limit State (ULS) and Serviceability Limit State (SLS) PGAs were calculated based on a 50year design life in accordance with the New Zealand Building Code and importance level (IL) 2 structures.

The calculated PGAs for the serviceability limit state (SLS) and ultimate limit state (ULS) earthquake scenarios are as follows:

Table 3: Design Peak Ground Acceleration (PGA) for Various Limit States				
Limit State	AEP	R	PGA(g)	Magnitude _{eff}
SLS	25	0.25	0.05	5.9
ULS	500	1.0	0.22	5.9
Note: SLS = serviceability limit state; ULS = ultimate limit state; AEP = annual exceedance probability				

6.3 Fault Rupture

The nearest known active fault is the Kerepehi Fault located approximately 40km east of the site. We therefore consider the risk of fault rupture to be low.

6.4 Liquefaction

6.4.1 General

Soil liquefaction is a process where typically saturated, granular soils develop excess pore water pressures during cyclic (earthquake) loading that exceed the effective stress of the soil. In loose soils, some dilation can occur during this process, which can lead to individual soil grains moving into suspension. Following the onset of liquefaction, the shear strength and stiffness of the liquefied soil is effectively lost causing excessive differential settlement of the ground surface, bearing capacity failure and collapse of structures and low-angle lateral spreading of slopes in liquefiable soils.

In accordance with NZGS guidance⁷ the liquefaction susceptibility of the soils at this site has been considered with respect to geological age, soil fabric and soil consistency / density.

A qualitative liquefaction assessment has been undertaken on the site to assess liquefaction susceptibility.

6.4.2 Geological Age

The vast majority, and nearly all, case history data compiled in empirical charts for liquefaction evaluation come from Holocene deposits or man-made fills (Seed and Idriss, 1971). Youd and Perkins, 1978 also state that young Holocene age (15,000 years) sediments and man-made fills are susceptible to liquefaction. Table

⁶ NZ Geotechnical Society publication "Earthquake geotechnical engineering practice, Module 1: Overview of the standards", (March 2016)

⁷ Earthquake Geotechnical Engineering Practice, Module 3: Identification, assessment and mitigation of liquefaction hazards", (May 2016)

1 of Idriss and Boulanger (extracted from Youd and Perkins (1978)), presents the susceptibility of soil deposits to liquefaction based on geological age, which states that Pleistocene aged alluvium (>12,000 years) has a very low to low risk of liquefaction.

The sands of the Hinuera formation are late Pleistocene aged and therefore considered low risk based on age.

6.4.3 Soil Fabric

Soils are also classified with respect to their grain size and plasticity to assess liquefaction susceptibility. Based on more recent case histories, there is general agreement that sands, non-plastic silts, gravels and their mixtures form soils that are susceptible to liquefaction.

The granular nature of the soils present implies they are potentially suspectable to liquefaction.

6.4.4 Qualitative Assessment

While the loose Hinuera Formation sands could be considered susceptible to liquefaction, groundwater is anticipated to be approximately 25m below ground level for Lots 1-4 and approximately 18m below Lot 6.

Potentially damaging surface expression of any liquefaction below the water table is therefore unlikely.

Further our desk study information and knowledge of the local geology suggests that loose sands are generally limited to the upper 5m or so of the soil profile, with the density of the sandy soils increasing with depth.

This is supported by our site investigation results which suggest that below RL30.9 the sandy soils become medium dense, making liquefaction unlikely. We expect that the density of these sandy soils will increase with depth.

6.5 Lateral Spread

Following the onset of liquefaction, the liquefied soils behave as a very weak undrained material, which can give rise to lateral spreading where a free face is present within the vicinity of the site or where proposed cut and fill batters are proposed over or within liquefied soils.

The potential for lateral spread has been assessed as being low for this site. Medium dense sands were encountered below RL 30.9m, above the anticipated groundwater level of RL15m.

Further review of the local geomorphology suggests that there is no evidence of any major lateral spread having occurred historically on this part of the Waikato River.

6.6 Slope Stability

6.6.1 Design Criteria

The stability of slopes under a range of design conditions is expressed in terms of a factor of safety, which is defined as the ratio of forces resisting failure to the forces causing failure. The following performance standards are recommended for slope stability assessment:

Table 4: Slope Stability Factor of Safety Criteria				
Condition	Required Minimum Factor of Safety			
Static long term conditions (drained soil conditions, normal groundwater)	1.5			
Transient short term conditions (elevated groundwater)	1.2			
Ultimate Limit State (ULS) seismic condition	1.0*			
Note*: Factor of safety < 1.0 acceptable where displacement-based approach is adopted.				

6.6.2 Shear Strength Parameters

Drained shear strength parameters for the various geological units that underlie the site were inferred from the field investigation, and experience with the local geology.

Geological Unit	Unit Weight (kN/m ³)	Effective Stress Shear Strength Parameters	
		c′ (kPa)	Ø' (deg)
Loose Sand (Hinuera Formation)	16	0	30
Medium dense Sand (Hinuera Formation)	16	0	35

6.6.3 Slope Stability Analyses

We have assessed the stability of the two slopes on the property.

The upper slope between Lots 3 and 6 is 7m high and grades west at 15° (approx. 1(V):3.7(H)). This slope is not anticipated to pose any stability issues with the proposed land use. For a dry slope in these loose sands a minimum Factor of Safety of 2.15 is estimated.

We have carried a detailed analysis for the lower river side slope below Lot 6.

Slope stability analysis was undertaken using the Morgenstern-Price method of slices for circular failure mechanisms using the proprietary software SLIDE Version 8.

Selected stability printouts are attached in *Appendix F* and the results presented on Table 6 below as follows:

Table 6: Summary of Geotechnical Design Parameters						
Location	Slope Stability Factor of Safety					
	Prevailing	Transient	Seismic			
Geological Section A-A	1.3	1.3 1.1 0.9				

The river side slope is approximately 30° and for a dry sand soil the factor of safety for a planar slide can be approximated by:

 $FoS = tan\phi/tan\beta = 1.21$

Where ϕ = internal angle of friction of the soil (35°) and β = angle of the slope

Our results show that the natural slope below Lot 6 does not meet the required design criteria.

Building setbacks from the crest of the slope and possible remedial options are discussed in Section 7 below.

6.7 Load Induced Settlement

No earthworks plans have been provided for this site but any cuts and fills associated with this subdivision are likely to be minor.

Any fill induced settlement in the loose sand will likely be quick and occur during construction.

7 GEOTECHNICAL RECOMMENDATIONS

7.1 Seismic Site Subsoil Category

Based on the ground conditions encountered and desk study findings the seismic site subsoil category is assessed as being Class D (deep soil site) in accordance with NZS1170.5

7.2 Liquefaction / Lateral Spread Mitigation

As discussed in Section 6.3, we believe the risk of liquefaction and lateral spread is low.

Deeper ground investigation, such as a CPT, should be carried out prior to completion of the subdivision to confirm this is the case.

7.3 Slope Stability Management

The natural slope below Lot 6 does not meet the required factor of safety criteria. Without remedial works to increase the factors of safety appropriate building set-backs may be adopted.

The results of slope stability analyses for slip circles with the required factors of safety are presented in *Appendix G* and these have been used to determine preliminary set back distances.

Our slope stability analyses (Table 7) show that the distance from the crest of the slope to where the requisite factors of safety are achieved is 10m. This equates to a projection line gradient of 1:2.5 (vertical to horizontal) from the toe of the steep escarpment section.

Table 7: Summary of Setbacks					
Location	Setback Distance at which Slope Stability Factor of Safety is Achieved				
	Prevailing Transient Seismic				
Geological Section A-A	8m 1m 10m				

A preliminary Building Restriction Line (BRL) has been designated on *Drawing 01* based on a 1:2.5 projection line.

All structures requiring building consent must be located entirely upslope of the BRL unless supported by further geotechnical investigation and/or assessment by a Chartered Professional Geotechnical Engineer.

Alternatively, an in-ground or palisade retaining wall may be constructed to protect some of the land beyond the BRL and increase the land area available for building construction.

Placement of fill downslope of the BRL is not recommended on account of land stability considerations.

7.4 Earthworks

7.4.1 General

All earthwork activities must be carried out in general accordance with the requirements of NZS 4431 and the requirements of the Waikato Local Authority Shared Services – Regional Infrastructure Technical Specifications (RITS) under the guidance of a Chartered Professional Geotechnical Engineer.

7.4.2 Subgrade Preparation

Preparation of the sandy subgrade should comprise stripping of all vegetation, topsoil, and any existing fill materials. The loose sands found on site may require some compaction or undercuts to meet subgrade requirements.

7.4.3 Suitability of Materials

While no cut or fill plans have been provided, any areas of cut will likely be in loose sand, which should be suitable for use as engineered fill with the appropriate conditioning.

Material testing will provide more information about the type of conditioning required.

7.4.4 Permanent Cut and Fill Batters

To reduce the risk of ongoing minor slumping or scour, self-supporting long term cut or fill batters should be formed to no steeper than 1(V):2.5(H) unless supported to full height by engineer designed retaining walls, or stability assessed by an appropriately qualified geotechnical engineer.

All formed batters should be topsoiled and grassed/planted immediately following construction to reduce the risk and effects of surficial scour.

7.4.5 Earthworks Quality Control

All earthworks including the stripping of existing topsoil and the cutting of any pre-existing fill materials if encountered, must be carried out in general accordance with the requirements of NZS 4431 and the requirements of the RITS under the guidance of a Chartered Professional Geotechnical Engineer who is familiar with the contents of this report.

All fill must be placed, spread and compacted in controlled lifts with compaction achieved by appropriately sized compactor. Imported fill may comprise either granular or cohesive material subject to being free of any organic material and having no particles greater than 150mm diameter.

Cut material sourced from the site should be suitable for reuse as Engineer Certified Fill however soil moisture contents will vary and careful management, conditioning and compaction control will be required.

The source and/or type of material used for Engineer Certified Fill will dictate the type of quality control testing undertaken. The source of any imported fill should be discussed with and approved by the project geotechnical engineer to verify its appropriateness and quality control testing requirements.

For granular (sand and gravel) fill materials, testing following compaction should be principally in terms of 95% of the maximum dry density within the appropriate water content range as determined from a laboratory compaction curve test. This density may be calibrated with a dynamic cone penetrometer.

However, quality control criteria will be subject to specific laboratory testing of soil samples at the commencement of earthworks.

Under no circumstances should spoil be tipped directly over the crest of any slopes due to slope stability considerations.

7.5 Foundation Bearing Capacity

A preliminary geotechnical ultimate bearing pressure of 200kPa should be available for a rib-raft foundation with minor ground improvement, e.g. proof rolling to achieve a DCP average of 3 blows per 100mm required within the shallow natural soils, or localised undercut and recompaction to achieve the same.

Alternatively, piled foundations may be considered.

7.6 Geotechnical Strength Reduction Factor

As required by section B1/VM4 of the New Zealand Building Code Handbook, a strength reduction factor of 0.5 and 0.8 must be applied to all recommended geotechnical ultimate soil capacities in conjunction with their use in factored design load cases for static and earthquake overload conditions respectively.

8 STORMWATER SOAKAGE

Analysis of the in-situ falling head soakage test results, in accordance with CIRIA and Hvorslev methods, gave coefficients of permeability of the order of 1×10^{-4} can be expected within the near surface sand unit. This rate is typical for clean sands or sand gravel mixes.

All soakage systems should be subject to specific design.

9 ENVIRONMENTAL PRELIMINARY SITE REPORT

An environmental preliminary site inspection (PSI) has been undertaken by 4Sight Consulting Limited.

A copy of their report is presented in *Appendix H*.

10 FURTHER WORK

This site investigation was carried out prior to the development of the final civil engineering drawings including any cut/fill earthworks and confirmed building layout plans. Once these have been prepared CMW should be offered the opportunity to review those plans against the recommendations in this report.

Further work should be carried out prior to completion of the sub-division to investigate the deep soil profile and confirm the liquefaction risk to the site.

11 LIMITATIONS

This report has been prepared for use by our client, Te Pa Fruits Limited, their consultants and Waikato District Council. Liability for its use is limited to these parties and to the scope of work for which it was prepared as it may not contain sufficient information for other parties or for other purposes.

It should be noted that factual data for this report has been obtained from discrete locations using normal geotechnical investigation techniques. As such investigation methods by their nature only provide information about a relatively small volume of subsoils, there may be special conditions pertaining to this site which have not been disclosed by the investigation and which have not been taken into account in the report. If variations in the subsoils occur from those described or assumed to exist, then the matter should be referred back to CMW immediately.

USE OF THIS REPORT

Site subsurface conditions cause more construction problems than any other factor and therefore are generally the largest technical risk to a project. These notes have been prepared to help you understand the limitations of your geotechnical report.

Your geotechnical report is based on project specific criteria

Your geotechnical report has been developed on the basis of our understanding of your project specific requirements and applies only to the site area investigated. Project requirements could include the general nature of the project; its size and configuration; the location of any structures on or around the site; and the presence of underground utilities. If there are any subsequent changes to your project you should seek geotechnical advice as to how such changes affect your report's recommendations. Your geotechnical report should not be applied to a different project given the inherent differences between projects and sites.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface investigation, the conditions may have changed, particularly when large periods of time have elapsed since the investigations were performed.

Interpretation of factual data

Site investigations identify actual subsurface conditions at points where samples are taken. Additional geotechnical information (e.g. literature and external data source review, laboratory testing on samples, etc) are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can exactly predict what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

Your report's recommendations require confirmation during construction

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced. For this reason, you should retain geotechnical services throughout the construction stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site. A geotechnical designer, who is fully familiar with the background information, is able to assess whether the report's recommendations are valid and whether changes should be considered as the project develops. An unfamiliar party using this report increases the risk that the report will be misinterpreted.

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical report. Read all geotechnical documents closely and do not hesitate to ask any questions you may have. To help avoid misinterpretations, retain the assistance of geotechnical professionals familiar with the contents of the geotechnical report to work with other project design professionals who need to take account of the contents of the report. Have the report implications explained to design professionals who need to take account of them, and then have the design plans and specifications produced reviewed by a competent Geotechnical Engineer.

Drawing



X:\01 PROJECTS\HAM\HAM2019\HAM2019-0050 TO 0100\HAM2019-0055 50 TE AWA LANE\07 DRAWINGS\HAM2019-0055 D1 GI PLAN REVA.DWG

'S LTD	DRAWN: PROJECT No: WPJ HAM2019-0055	
LANE,	CHECKED: DMM	DRAWING: 01
RE	REVISION: 0	SCALE: 1:1000
STIGATION PLAN	DATE: 10/01/2020	SHEET: A3

Appendix A: Bloxam Burnett & Olliver Subdivision Scheme Plan



INDEPENDENT ENTRANCE FOR LOT 1 TREE TO BE REMOVED										
	3 P/3	23		EP - AL						
MEMORANDUM OF PROPOSED EASEMENTS										
PL	JRPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITTED LAND)						
2		A	LOT 101 HEREON	LOTS 1 - 6 HEREON						
RIGHT OF TO CONV ELECTRIC	- WAY, RIGHT /EY WATER CITY &	В	LOT 6 HEREON	LOT 5 HEREON						
TELECON	TELECOMMUNICATIONS		LOT 2 HEREON	LOT 4 HEREON						
	AMALGAMATION CONDITION: 220(1)(b)(iv) THAT LOT 101 HEREON (LEGAL ACCESS) BE HELD AS TO SIX UNDIVIDED ONE-SIXTH SHARES BY THE OWNERS OF LOTS 1 - 6 HEREON AS TENANTS IN COMMON INTHE SAID SHARES AND THAT INDIVIDUAL COMPUTER FREEHOLD REGISTERS BE ISSUED									
			DATUMS COORDINATES: DATUM: GEODET CIRCUIT: MT EDE LEVELS: LEVELS A ZEALAND VERTIC DRAFT DRA AREAS AND DIM CONFIRMED BY FINAL DRAWING	IC 2000 N RE IN TERMS OF NEW AL DATUM 2016 WING ONLY IENSIONS TO BE FIELD SURVEY AND						
	COMPRISED IN : SA 56A/381									
	REGISTERED OWNER	: M.L.S	5.F BURNETT							
	LOCAL BODY	LOCAL BODY : WAIKATO DISTRICT								
	LAND DISTRICT	- : SOU								
SCHEME PLAN DATE DATE 19.11.2019 SCALE (ORIGINAL SIZE A3) 1:1500 DRAWING NUMBER 146110-00-0111 E										

Appendix B: Selected Publicly Available Geological Information

LOG OF DRILLHOLE

HOLE IDENTIFICATION

Orientation -90°

Co-ordinates 1806950.255mE 5808466.888mN

Elevation 30.06m

DH109

NZTA and HCC

Client Project

Hamilton Southern Links

Project Hamilton S Project number 60164546	Southern Links	Location South Hamilton Feature Ground conditions for	LocationSouth HamiltonFeatureGround conditions for cuts and fills			
GEOLOGICAL DESCRIPTION Weathering, Relative Strength, Colour, Name, Lithological Peatures Stratigraphic Unit Shear Vane residual - peak N Values		Drilling Method Casing remarks	Depth	Solution of the second	D Instrumentation	
Om to 0.1m: Topsoil 0.1m to 6m: Alluvium; brown and grey. Loose to medium dense.		HQWL	- -	Sandy organic CLAY; dark brown. Very soft; moist; medium plasticity; sand, fine to coarse, pumiceous and quartzitic; organic material is fibrous. Clayey gravelly fine to coarse SAND; brown. Moist; sand, quartzitic; gravel is fine to coarse; subrounded to rounded o quartz, sandstone and various igneous lithologies. Organic sandy SILT; dark brown. Soft; moist; low plasticity; sand, fine and pumiceous; organic material is amorphous to fibrous, very slightly decomposed, identifiable plant remains muddy water when squeezed. Gravelly fine to coarse SAND; dark grey. Loose; moist; san pumiceous and quartzitic; gravel, fine to coarse; subrounder to rounded pumice and sandstone.		
Formation	SS 1 1 N=5 1 1 1 N=5 1 1 1 1	SPT	- - - - - - - - - - - - - - -	Gravelly fine to coarse SAND; grey. Loose to medium densi moist; sand, dilatant, pumiceous and quartzitic; gravel, fine medium, subrounded to rounded pumice.	 e; to	
Taupo	1 35 3.5.6 1 1	SPT	- 3 - 3 - 1 - 1	3.7m:Trace fine gravel.		
	I I <td>SPT</td> <td> - - - - - - - - - 5 - 1 - -</td> <td>CORE LOSS 0.3m</td> <td></td>	SPT	- - - - - - - - - 5 - 1 - -	CORE LOSS 0.3m		
GROUNDWATER OBSERVATIONS Depth Date logged 10/01/2012 F 1:12m A 2 27/03/012 Logged AJB C 3.8m A 2 27/03/012 Checked DMM C Casing Details Depth Diameter Remarks H H H			Remarks - Located or Course. - Shear vand Hand held Vane num	Image: Second state state in the state st	Started 10/01/2012 Finished 11/01/2012 6 of 5	

LOG OF DRILLHOLE

HOLE IDENTIFICATION

DH109

Co-ordinates 1806950.255mE 5808466.888mN Orientation -90° Elevation 30.06m

Location South Hamilton

Feature Ground conditions for cuts and fills

Client Project

Hamilton Southern Links

NZTA and HCC

Project number 60164546

GEOLOGICAL DESCRIPTION Weathering, Relative Strength, Colour, Name, Lindhogical Features Stratigraphic Unit	Test Records Shear Vane residual - peak N Values 0-200 VPa 0-50		Core Loss/Lift	Depth	Graphic Log	MATERIAL DESCRIPTION (consistency, relative density, water content, plasticity, grading, etc.)	,		P Instrumentation
0.1m to 6m: Alluvium; brown and grey. Loose to medium dense.		HQWL		- - - -					
6m to 7m: Alluvial and lacustrine sediments; dark brown. Soft to stiff.	SS I I SS I I 2.4.6 I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	SPT		- 0	x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x	Organic sandy CLAY; dark brown. Soft to plasticity; sand, fine Silty CLAY with trace sand; dark brown. F high plasticity; sand, fine and micaceous.	firm; moist; high	_/	
7m to 25.95m: Alluvium with swamp/peat and lacustrine deposits; grey and brown. Cohesive material is stiff to		HQWL		- - - 7 - -		CLAY with some silt and trace sand; grey to dry; high plasticity; sand, fine and mica	. Firm to stiff; moist ceous.	E 	3 <u>7</u>
hard, granular material is medium dense to dense; alluvium is bedded.		SPT		- - -		Silty CLAY; bluish grey. Soft to firm; moist; high plasticity. 7.4m:Grading to bluish grey. Silty Sandy CLAY; bluish grey. Soft to firm; moist; high plasticity; sand, fine. Silty fine to medium SAND; greenish grey. Medium dense; moist; pumiceous. 8.8m:Some fine to medium gravel; subangular to subrounded pumice.			
		PT		8 - - - -			n; moist; high	ım dense; brounded	
		HQWL		- - - - 9			. Medium dense; ar to subrounded		
	I I 7,11,15 I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	SPT		- - - -					
		HQWL		- 10 - -					
	I I SS I I 5,12,17 I I N=29 I I I I I I I I I I I I I I I I I I I I I	SPT		 - - -					
GROUNDWATER OBSERVATIONS Depth Piezometer Reading Date 6.9m B 27/032012 Date logged 10/01/2012 Logged AJB Checked DMM			Remarks Driller - Located on lower river terrace at the end of the 3rd hole of the Narrows Golf Course. Perry - Shear vane tests all proved unable to penetrate. Drill Rig Morooka			Driller Perry Drill Rig Morooka MST800	Star 10/ Finis 11/	ted 01/2012 shed 01/2012	
Depth Diameter Remarks				Vane number Blade Factor vane shear strength per NZGS guideline Page 2			of	5	

NZGD ID: BH_108671

LOG OF DRILLHOLE

HOLE IDENTIFICATION

Orientation -90°

Location

Feature

Co-ordinates 1806950.255mE 5808466.888mN

South Hamilton

Elevation 30.06m

Ground conditions for cuts and fills

DH109

NZTA and HCC

Client Project

Hamilton Southern Links

Project number 60164546

GEOLOGICAL DESCRIPTION Weathering, Relative Strength, Colour, Name, Lithological Features Stratigraphic Unit		Drilling Method Casing remarks	Core Loss/Lift Depth	Graphic Log	MATERIAL DESCRIPTION (consistency, relative density, water content, plasticity, grading, etc)		Instrumentation
7m to 25.95m: Alluvium with swamp/peat and lacustrine deposits; grey and brown. Cohesive material is stiff to hard, granular material is medium dense to dense; alluvium is bedded.	1 1 1 1 1 0 200 /#a 0 -50 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	HQWL			Silty fine to medium SAND; greenish grey moist; pumiceous. 11.1m:Very thin to laminated fine sand.	. Medium dense;	A B
	SS 1	SPT	- - - - - - - -				
		HQWL	- - - 13 - - -		Silty fine SAND; light greenish grey. Medi moist; moderately thin to thin bedding; sa coarsening down to 13.4m.	um dense to dense nd, pumiceous,	;
	SS 10,10,12 1 1 N=22 1 1 1 N=22 1 1 1 1 1 1 1 1 1 1	SPT	 - - - - - 14		Gravelly SAND; grey mottled greenish gree	ey. Medium dense;	
		HQWL	 - - - - - - - - -		moist; moderately thin to thinly bedded; sa gravel, fine to medium, subangular to rour	and, fine to coarse; nded pumice.	
	6,918 N=27	SPT					
					Gravelly fine to coarse SAND; greenish gr moderately thin to laminated, pumiceous; medium, rounded pumice.	rey. Dense; moist; gravel, fine to	
GROUNDWATER OBSERVATIO Depth Piezometer Reading D	DNS Logged AJB Checked DMIV	/2012	Remark - Located Course. - Shear va	S on lower river ine tests all pr	terrace at the end of the 3rd hole of the Narrows Golf oved unable to penetrate.	Driller Perry Drill Rig Morooka MST800	Started 10/01/2012 Finished 11/01/2012
Depth Diameter Remarks				Hand held Shear Vane Core Boxes Vane number Blade Factor vane shear strength per NZGS guideline Page 3			6 of 5

NZGD ID: BH_108671

Client

Project

LOG OF DRILLHOLE

HOLE IDENTIFICATION

Location

Feature

DH109

Co-ordinates 1806950.255mE 5808466.888mN Orientation -90° Elevation 30.06m

Ground conditions for cuts and fills

South Hamilton

Hamilton Southern Links

Project number 60164546

NZTA and HCC

GEOLOGICAL DESCRIPTION Weathering, Relative Strength, Colour, Name, Lithological Features Stratigraphic Unit	Test Records		Core Loss/Lift	Depth	Graphic Log	MATERIAL DESCRIPTION (consistency, relative density, water content, plasticity, grading etc)	,		Definition
7m to 25.95m: Alluvium with swamp/peat and lacustrine deposits; grey and brown. Cohesive material is stiff to hard, granular material is medium dense to dense; alluvium is bedded.	Ss Ss 10,16.22 N=38 11 N=38 11 N=1	SPT		- 17		Gravelly fine to coarse SAND; greenish g moderately thin to laminated, pumiceous; medium, rounded pumice. 16.5m:Becoming dense.	rey. Dense; moist; gravel, fine to		
	I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	SPT		- 18		17.78m:20mm layer of clayey silt; brown. Sti PEAT; dark brown. Very stiff to hard; mois very thin bedding; amorphous; strongly de recognisable plant remains, muddy water when squeezed. Silty CLAY; light brown mottled dark brow moist; medium plasticity.	ff; moist. st; high plasticity; ccomposed, fairly and peat extruded rn. Soft to firm;		
		HQWL		- 19		Gravelly fine to coarse SAND; greenish g moist; bedding thin; gravel, fine, rounded	rey. Medium dense pumice.	;	
	I I SS I I 9,9,9 I I I <td>SPT</td> <td></td> <td>- 20</td> <td></td> <td>PEAT; dark brown to black. Stiff to very si plasticity; amorphous, strongly decompos recognisable plant remains, muddy water material extruded when squeezed.</td> <td>tiff; moist; high ed, fairly and amorphus</td> <td></td> <td></td>	SPT		- 20		PEAT; dark brown to black. Stiff to very si plasticity; amorphous, strongly decompos recognisable plant remains, muddy water material extruded when squeezed.	tiff; moist; high ed, fairly and amorphus		
		HQWL		- 21		Sandy sitty CLAY; brown. Stiff; moist; low fine and pumiceous. Fine to coarse SAND; greenish grey. Med dense; moist; thinly bedded.	plasticity; sand,		
	10,25,25 10,25,25 N=50 	SPT		_					
GROUNDWATER OBSERVATIONS Depth Piezometer Reading Date Date logged 10/01/201		/2012	Rem	narks ated on	lower river	terrace at the end of the 3rd hole of the Narrows Golf	Driller Perry	Start 10/0	ed 01/2012
Checked DMM			Course. - Shear vane tests all proved unable to penetrate. Drill Rig Morooka			Drill Rig Morooka	Finis	hed 01/2012	
Casing Details Depth Diameter Remarks			Hano Vane	d held e num	l Shear V	ane Blade Factor	MST800 Core Boxes	6	
				vane shear strength per NZGS guideline Page 4			of	5	

NZGD ID: BH_108671


Client

LOG OF DRILLHOLE

HOLE IDENTIFICATION

Location

Feature

DH109

Co-ordinates 1806950.255mE 5808466.888mN Orientation -90° Elevation 30.06m

Ground conditions for cuts and fills

South Hamilton

Project

Project number 60164546

NZTA and HCC

Hamilton Southern Links

									1			
GEOLOGICAL DESCRIPTION		Te	st Reco	ords	ethod	s/Lift		Log	MATERIAL DESCRIPTION (consistency, relative density, water content, plasticity, grading etc)			Intation
Weathering, Relative Strength, Colour, Name, Lithological Features Stratigraphic Unit	Char				ling Me	re Los	Depth	raphic				strume
	residua	ir van al-pea	k k	N Valu	es Din C	0-100	1%	U				
7m to 25.95m: Alluvium with swamp/peat and lacustrine deposits; grey and brown. Cohesive material is stiff to hard, granular material is medium dense to dense; alluvium is bedded.			SS) HQW 		- - - -		Fine to coarse SAND; greenish grey. Med dense; moist; thinly bedded.	lium dense to very		
			10,14,15 N=29		 SP1 		_ - - - 23	x x x x x x x x x x x x x x x x x x x	Organic SILT with trace sand; light brown brown. Stiff; dry to moist; medium plasticit	mottled dark y.		
					 	/L			Silty SAND; brown to dark brown. Dense;	moist.		
			ss				- - - - 24			at high placticity		
			4,10,21 N=31		 SP1 		_ = = = =	6 49 49 49 49 40 49 49 49 6 40 49 40 70 40 40 70 40 70 40 70 40 70 40 70 70 70 70 7	PEA1; dark brown to black. Very stirr, moi amorphous. strongly decomposed, fairly r remains, muddy water and peat extruded	st; nign plasticity; ecognisable plant when squeezed.		
					 			0 0				
							- 23 - - - -		Fine to medium SAND; light brown. Dense pumiceous.	e; moist; sand,		
			ss 7,17,14 N=31		 SP1 							
							- 26 _ _ _ _ _		DH109 terminated at 25.95m Target Dept	h		
							- - - - _ - 27					
GROUNDWATER OBSERVATIO	NS ate	Da	ite logge	ed 10/0	01/201	2 F	Remark	3		Driller	Sta	rted
		Lo	gged	AJE	3	-	Located Course.	on lower rive	r terrace at the end of the 3rd hole of the Narrows Golf	Perry	10	/01/2012
		Ch	lecked	DM	IM		Sheal Va	na iasis dii p	אסיכע שומטוכ נט אַכּוּוכּוּ מנכ.	Morooka MST800	11	/01/2012
Depth Diameter Remarks						ŀ	land he	ld Shear \	Vane	Core Boxes	6	
							rane nu rane she	niber ear strend	Blade Factor	Page 5	of	5
L						V	2110 3110	a ononyi		L		

NZGD ID: BH_108671

DRILLHOLE LOG SOIL SLINKS MASTER 24-04-2012.GPJ BASE.GDT 25/06/12



Notes

Date printed 19/04/2012

Narrows golf course

Location

Date photographed: 14/02/2012



Project	Southern Links	Box	3 & 4 of 7
Job no.	60164546	Depth (below ground level)	From 7.35m to 15.55m of 25.5m
Location	Narrows golf course	Notes	Date photographed: 14/02/2012
Data printed 10	04/0040		O of 4

Date printed 19/04/2012

AECOM

PHOTOGRAPHIC LOG OF DRILLHOLE

HOLE IDENTIFICATION

DH 109



Date printed 19/04/2012

AECO	М рното	OGRAPHIC	LOG OF D	RILLHOL	HOLE	ΓΙΟΝ	DH 109
13.4	274 m287	- Rama	- Art				
			and a second				25.5~ SPT
A=CC	DM	ę		8	LUE CYAN	GREEN	YELLOW
0 cm	10 cm 20	cm	30 cm	40 cm	ED MAGENTA	WHITE	BLACK
Project	Southern Links		Box	7 of 7			
Job no.	60164546		Depth (below ground le	From 2	3.9m to 25.5m o	f 25.5m.	
Location	Narrows golf course		Notes	Date pl	hotographed: 14	/02/2012	

Date printed 19/04/2012





























Appendix C: Hand Auger Borehole Logs

Project: Site Loo Project Date: 1	20 Te Awa I cation: 50 Te No.: HAM20 0/12/2019	_ane Awa 19-0	Lan 055	e, Ta	amahere, Hamilton	W	Geo	osci	iena	ces	5
Boreho Positior	le Location: n: 452156.9i	Refei mE;	r to s 6904	ite p 86.3	lan Logged by: LS Checked by: DMM Scale: 1:25 3mN Projection: EDENTM2000			Shee	<u>et 1 o</u>	<u>of 1</u>	
Elevatio	on: 39.40m				Datum: MOTUHT1953 Survey Source: Han	dhelc	I GP	S D	ynamic	c Con	e
Samp Depth	les & Insitu Tests Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency Relative Dens	F (E	ienetro lows/10	meter 00mn 0 1	ה ו) 5
		39.4 39.2 39.0			OL: Organic SILT: brown. (Topsoil) SP: Fine SAND: with minor silt; orange brown. Uniformly graded, subrounded. (Hinuera Formation) SP: Fine SAND: light brownish grey. Uniformly graded. (Hinuera Formation)	D	VL L				
			-								
			4 —		Rorehole terminated at 4.0 m				\downarrow		⊢

rojec ate:	t No.: HAM20 10/12/2019	19-0	055	-, 10	CM	N	Geo	osci	ence
oreho	ole Location:	Refei mE·	to s	ite p	lan Logged by: LS Checked by: DMM Scale: 1:25			Shee	t 1 of
levat	ion: 39.80m	, ,	000-	100.0	Datum: MOTUHT1953 Survey Source: Han	dheld	I GP	S	
Sam	nples & Insitu Tests	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/	(BI	ows/100
1.4 1.8	Type & Results Peak = UTP Peak = UTP	39.8 39.7 38.4 38.0 37.8		ĕ	OL: Organic SILT: brown. (Topsoil) SP: Fine SAND: with minor silt; light brownish grey. Uniformly graded, subrounded. (Hinuera Formation) SP: Fine SAND: with some silt; light greyish brown. Uniformly graded. (Hinuera Formation) SP: Silty Fine SAND: light greyish brown mottled bluish grey. Uniformly graded. (Hinuera Formation) SP: Silty Fine SAND: light greyish brown mottled bluish grey. Uniformly graded. (Hinuera Formation) SP: Silty Fine SAND: light greyish brown mottled bluish grey. Uniformly graded. (Hinuera Formation) SP: Silty Fine SAND: light greyish brown mottled bluish grey. Uniformly graded. (Hinuera Formation)	> 0 D M			
		36.8 36.6	3		SP: Medium to coarse SAND: orange brown. Poorly graded, subangular. (Hinuera Formation) SW: Medium to coarse SAND: light brownish grey. Well graded, subangular. (Hinuera Formation) from 3.60m to 4.00m, colour change to orange brown.	M to W	D		
			4		Borehole terminated at 4.0 m				

HAND AUGER BOREHOLE LOG - HA02B

Client: Te Pa Fruits

Project: 50 Te Awa Lane

Site Location: 50 Te Awa Lane, Tamahere, Hamilton Project No.: HAM2019-0055



Date: 10/12/2019
Borehole Location: Refer to site plan

Logged by: LS Checked by: DMM Scale: 1:25

Sheet 1 of 1

F	Positio	n: 452207.3r	nE;	6904	402.7	mN Projection: EDENTM2000			_			
E	Elevatio	on: 41.00m				Datum: MOTUHT1953 Survey Source: Hand	lheld		S D	vnami	c Cor	e
water	Samp	oles & Insitu Tests	Ê	(E	c Log	Material Description	ture ition	tency/ Densit	F (E	Penetro Blows/1	omete 00mr	r n)
Bround	Depth	Type & Results	RL (Depth	Graphi	Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Mois	Consis	Ę	5 1	01	5
0		21	41.0			OL: Organic SILT: brown		°₽°				
			40.8			(Topsoil)						
			40.7		× × ,	(Fill)						
			40.7			SP: Fine to coarse SAND: with minor fine to medium gravel, with minor silt; orange brown. Poorly graded, subangular.	D	TP				
				-		(Fill)						
						Borehole terminated at 0.6 m						
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					-							
				2-								
					-							
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				3 -								-
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				5 -								
т	erminati	ion Reason [.] For	 Jipme	nt ref	iusal							
s	Shear Va	ine No:			D	CP No:						
F	Remarks	: Groundwater r	not en	coun	tered.							
		This report	is ba	sed o	on the a	attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 -	April	2018.				

F S F	Project Site Lo Project	: 50 Te Awa L cation: 50 Te No.: HAM20 0/12/2019	ane Awa 19-0	Lan 055	e, Ta	mahere, Hamilton		CMV	V	, V Geo	oscie	ences	5
E	Boreho	le Location: F	Refe	r to s	ite p	lan Logged by: IP	Checked by: DMM Scale:	1:25		ę	Sheet	1 of 1	1
F	Positio	n: 452045.6r	nE;	6904	109.7	MN Projection: EDENTM2000	Survey	Source: Handk	aald	CD	c		
<u>ь</u>	Same			_	5	Datum. MOTOITT1933	Survey			sity -	Dyn	amic Con	ie
Groundwat	Depth	Type & Results	RL (m)	Depth (m)	Graphic Lo	M Soil: Soil symbol; soil type; colour; structure; beddir Rock: Colour; fabric; rock nam	laterial Description ıg; plasticity; sensitivity; additional comments. (ori ıe; additional comments. (origin/geological unit)	gin/geological unit)	Moisture Condition	Consistenc Relative Den	(Blo	ws/100mr 10 1	n) 5
			41.0			OL: Organic SILT: dark brown. (Topsoll)							2
	0.3	Peak = 35kPa Residual = 20kPa		- - - -									
	0.6	Peak = 58kPa Residual = 26kPa	40.4			SP: Fine to medium SAND: light brown. Poorly (Hinuera Formation)	graded, moderately thinly bedded.			L			2 2 1 2 2
				1 -									2 3 3 4
				2 -					D to M				3
			38.8			SW: Fine to coarse SAND: with minor fine grav (Hinuera Formation)	vel; light brown. Well graded, Pumiceous g	ravel.					3 2 3 4
										L to MD			
				3		at 3.20m, Becoming darker brown							
													3
													3
				4 -		Borehol	e terminated at 4.0 m						
				· ·									
				-									
					-								
			4	5 —	1								

F S F C	Site Lo Project Date: 1	cation: 50 Te No.: HAM20 0/12/2019	Awa	Lan 055	e, Ta	amahere, Hamilton	N	Geo	oscier	nces
E F	oreho Positio	le Location: I n: 452105.2r	Refei nE;	r to s 690:	site p 318.5	Ian Logged by: IP Checked by: DMM Scale: 1:25 5mN Projection: EDENTM2000		:	Sheet '	1 of 1
E	levatio	on: 40.00m				Datum: MOTUHT1953 Survey Source: Hand	dheld	I GP ≥	S Dynai	mic Cone
Groundwater	Samp Depth	les & Insitu Tests	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/ telative Densi	Pene (Blows	trometer s/100mm) 10 15
			40.0			OL: Organic SILT: dark brown. (Topsoil)				
			39.8			(Topsell) SP: Fine to medium SAND: with trace fine gravel; light orange brown. Poorly graded, sub-angular. Pumiceous gravel. (Hinuera Formation)		L MD		
				5 -	-					
Т	erminati	on Reason: Tar] ·get de	epth	1					

oject	cation: 50 Te No.: HAM20	Awa 19-0	Lan 055	e, Ta	amahere, Hamilton	N			9
ate: 1	0/12/2019	Defe		ite n			Geo	DSCI	enc
ositio	n: 452038.0	mE;	6903	360.6	SmN Projection: EDENTM2000		i	Snee	110
evatio	on: 41.00m	1			Datum: MOTUHT1953 Survey Source: Han	dheld	GP ≥	S D	/namic (
Samp Depth	oles & Insitu Tests Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour, fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/ Relative Densi	(B)	enetrom ows/100 10 10
		41.0	-		OL: Organic SILT : brown. (Topsoil)				+
		40.8			SW: Fine to medium SAND: with trace silt; orange brown. Well graded, subangular. (Hinuera Formation)	D	L		
		40.2			SP: Fine to medium SAND: light grey. Poorly graded, subangular. (Hinuera Formation)				
							MD		
		39.0	2		SP: Medium to coarse SAND: with trace fine gravel; grey. Poorly graded, subangular. (Hinuera Formation)	_	L		
						D to M			
			3						
							MD		
			4		Borehole terminated at 4.0 m				

roject N ate: 10/	lo.: HAM20 /12/2019	19-0	055	с, та	CM	N	Geo	oscie	ence
orehole	Location: 1	Refer mF:	to s	ite p 354.2	lan Logged by: IP Checked by: DMM Scale: 1:25			Sheet	1 of
levation	n: 39.00m	п <u>–</u> ,			Datum: MOTUHT1953 Survey Source: Han	dhelc	I GP	S	
Samples Depth	s & Insitu Tests Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	Consistency/ elative Density	Blo (Blo	netrometi ws/100m
		39.0	-		OL: Organic SILT: dark brown. (Topsoil)		° Ľ		
0.3	Peak = UTP	38.8	1		SW: Fine to coarse SAND: light brown. Well graded, subangular. (Hinuera Formation) SW: Fine to coarse SAND: with minor fine gravel; light brown. Well graded, subangular, Pumiceous gravel. (Hinuera Formation)	D to M	L		
			4		Borehole terminated at 4.0 m		L to MD		

Sit Pro Da	te Lo oject ate: 1	cation: 50 Te No.: HAM20 0/12/2019	Awa 19-0	Lar 055	amahere, Hamilton	CMM		Geo	oscie	ence
Bo	oreho	le Location: F	Refei	r to s	blan Logged by: LS Checked by: DI	MM Scale: 1:25		5	Shee	t 1 of
Ele	evatio	n: 451969.91 on: 33.20m	⊓⊏,	090	Datum: MOTUHT1953	Survey Source: Handhe	eld	GP	S	
	Samp	oles & Insitu Tests	RL (m)	epth (m)	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additio Rock: Colour: fabric: rock name: additional comments. (origi	nal comments. (origin/geological unit)	ondition	nsistency/ ive Density	Dyi Pe (Blo	namic C netrome ws/100
(Depth	Type & Results	33.2	ă	OL: Clayey Organic SILT: dark brown. Low plasticity.		0	Cor Relat	5	10
	0.3	Peak = 89kPa	33.0		(Iopsoil) ML: SILT: with minor fine sand; orange brown. Low plasticity, moderately (Hinuera Formation)	sensitive.				
	0.6	Peak = 80kPa Residual = 28kPa	32.7	-	 SP: Fine SAND: with some silt; light brownish grey. Uniformly graded. (Hinuera Formation) 		D	L		
	0.9	Peak = 95kPa Residual = 28kPa		1 -	from 1.00m to 1.20m, with minor clay.					
	1.2	Peak = UTP	32.0		SP: Fine SAND: light grey. Uniformly graded. (Hinuera Formation)					
			30.9	2 -	SP: Fine to medium SAND: with trace fine gravel; light grey. Poorly grade	D.	o to M	MD		
				3 -	(Finuera Formation) from 3.00m to 3.30m, with fine to coarse gravel; sub-rounded to sub-ang	jular.				
					Borehole terminated at 3.3 m					
				-						
				4 -						
				5 -						

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA08

Client: Te Pa Fruits

Project: 50 Te Awa Lane

Remarks: Groundwater not encountered.

Site Location: 50 Te Awa Lane, Tamahere, Hamilton Project No.: HAM2019-0055



E	Date: 1 Boreho	0/12/2019 le Location: F	Refe	r to s	site n	lan logged by: IP Checked by: DMM Scale: 1:25		UUU ,	Sho		of	1
F	Positio	n: 451991.4r	nE;	690	321.9	JmN Projection: EDENTM2000			SILE		01	<u> </u>
E	Elevati	on: 33.80m		1		Datum: MOTUHT1953 Survey Source: Han	dheld		<u>s</u>		in Cor	
water	Sam	ples & Insitu Tests	Ê	(L)	Graphic Log	Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit)	Moisture Condition	tency/ Density	()	Penetr Blows/	omete 100mr	ie ir n)
Ground	Depth	Type & Results	RL (Depth				Consist telative [5 1) 0 1	5
			33.8		-	OL: Organic SILT: dark brown.		<u> </u>			_	2
												2
	0.3	Peak = 123kPa Residual = 32kPa						VSt				2
		rtesiduai – 52ki a			-							1
	0.6	Peak = 90kPa	33.3		-××	SP: Silty Fine SAND: light yellowish brown. Poorly graded. (Hinuera Formation)			L			1
		Residual = 29kPa	sidual = 29kPa									
	0.9	Peak = 102kPa Residual = 20kPa Peak = 88kPa Residual = 26kPa Peak = 117kPa	33.0	-		SP: Fine SAND: with some silt; light orange brown. Poorly graded. (Hinuera Formation)	-					1
				1 -					-	<u> </u>	-	2
	12				-							1
	1.2						D to M		_			2
						at 1.40m, Becoming light grey mottled orange		L	_			
	1.6			-								2
		Residual = 35kPa							_			
		Peak = UTP	31.0									2
	2.0		51.5	2 -	2 -	3P: Fine SAND: light grey. Poorly graded. (Hinuera Formation)						3
					-							
												3
								<u> </u>	\vdash			5
				-		from 2.50m to 2.80m, Saturated layer						6
]		w					6
					-		<u> </u>	-				6
												g
			30.6 30.4									6
						SP: Medium to coarse SAND: grey. Poorly graded. (Hinuera Formation)	-	D to		Ľ.		6
						SW: Fine to coarse SAND: with trace gravel; dark grey. Well graded, subrounded, Pumiceous gravel.	— м					7
				-		(Hinuera Formation)						6
												6
												5
				4 -								
					-	Borehole terminated at 4.0 m						
					-							
				-	-							
				5 -								
т	erminat	ion Reason: Tar		enth	-					<u> </u>		
S	Shear Vane No: 2349 DCP No: 16											

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

Appendix D: Soakage Test Results





Appendix E: Natural Hazards Assessment



NATURAL HAZARDS RISK ASSESSMENT FOR LAND SUBDIVISION 50 TE AWA LANE, TAMAHERE

A. CONTEXT

Section 106 of the Resource Management Act (RMA) requires an assessment of the risk from natural hazards to be carried out when considering the granting of a subdivision consent. S106 RMA specifically states that the assessment must consider the combined effect of the natural hazard likelihood and material damage to land, other land or structures (consequence).

Section 2 of the RMA defines natural hazards as any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment.

This appendix to CMW report reference HAM2019-0055AB sets out the criteria for and presents the results of an assessment of the geotechnical-related natural hazards associated with this proposed subdivision development. The remaining hazards, i.e. tsunami, wind, drought, fire and flooding hazards are not covered by this assessment.

B. BASIS OF ASSESSMENT

B1. Risk Classification

The occurrence of natural hazards and their potential impacts on the proposed subdivision development is assessed in terms of risk significance, which is based on likelihood and consequence factors. A risk table is used to help assess the likelihood and consequence factors, the form of which used by CMW for this project is presented in Table B1.

Table B1: Natural Hazard Risk Classification										
			Consequence							
		Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5				
	Almost Certain	Medium	High	Very high	Extreme	Extreme				
	5	5	10	15	20	25				
pc	Likely	Low	Medium	High	Very high	Extreme				
	4	4	8	12	16	20				
(eliho	Moderate	Low	Medium	Medium	High	Very high				
	3	3	6	9	12	15				
Ē	Unlikely	Very low	Low	Medium Medium		High				
	2	2	4	6 8		10				
	Rare	Very low	Very low	Low	Low	Medium				
	1	1	2	3	4	5				

B2. Likelihood

With respect to assessing the likelihood or chance of the risk occurring, the qualitative definitions used by CMW for this project are provided in Table B2 for each likelihood classification.

Table B2: Qualitative Natural Hazard Likelihood Definitions								
1	Rare	The natural hazard is not expected to occur during the design life of the project						
2	Unlikely	The natural hazard is unlikely, but may occur during the design life						
3	Moderate	The natural hazard will probably occur at some time during the life of the project						
4	Likely	The natural hazard is expected to occur during the design life of the project						
5	Almost Certain	The natural hazard will almost definitely occur during the design life of the project						

B3. Consequence

In terms of determining the consequence or severity of the natural hazard occurring, the qualitative definitions used by CMW for this project are provided in Table B3 for each consequence classification.

	Table B3: Qualitative Natural Hazard Consequence Definitions							
1	Insignificant	Very minor to no damage, not requiring any repair, no people at risk, no economic effect to landowners.						
2	Minor	Minor damage to land only, any repairs can be considered normal property maintenance no people at risk, very minor economic effect.						
3	Moderate	Some damage to land requiring repair to reinstate within few months, minor cosmetic damage to buildings being within relevant code tolerances, does not require immediate repair, no people at risk, minor economic effect.						
4	Major	Significant damage to land requiring immediate repair, damage to buildings beyond serviceable limits requiring repair, no collapse of structures, perceptible effect to people, no risk to life, considerable economic effect.						
5	Catastrophic	Major damage to land and buildings, possible structure collapse requiring replacement, risk to life, major economic effect or possible site abandonment.						

B4. Risk Acceptance

It is recognised that the natural hazard risk assessment provided herein is qualitative and, due to the wide range of possible geohazards that could occur, is somewhat subjective. Other methods are available to quantitatively assess an acceptable level of geotechnical related natural hazard risk, such as defining an acceptable factor of safety with respect to slope stability or acceptable differential ground settlements with respect to recommended building code limits.

Therefore, to give this qualitative natural hazard risk assessment some relevance to more commonly adopted numerical or quantitative geotechnical assessment techniques, a residual risk rating of very low to medium (risk value = 1 to 9 inclusive) is considered an acceptable result for the proposed subdivision development.

A risk rating of high to extreme (risk value \geq 10) is considered an unacceptable result for the proposed subdivision development.

C. RISK ASSESSMENT

The natural hazards relevant to this proposed subdivision development and adjacent, potentially affected land have been assessed with respect to the criteria outlined above.

Assessment is based on proposed post development ground conditions with and without any geotechnical controls. The latent risk was first assessed with the site in its proposed developed state to consider the risks to the development and surrounding land, including assessment of land modifications from the pre-existing natural state, without any implemented geotechnical controls. The specific geotechnical mitigation measures and engineering design solutions outlined in the table below and CMW report, where relevant, were then considered to determine the natural hazard residual risk remaining after the proposed controls have been implemented.

Table C1: Natural Hazard Risk Assessment Results									
RMA S2 Hazard	Description	Proposed Site Latent Risk of Damage to Land / Structures			Comments and Geotechnical Control	Proposed Site Residual Risk of Damage to Land / Structures OR Acceleration/ Worsening of Hazard with Geotechnical Controls Implemented			
		Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating	
Earthquake	Fault Rupture	1	4	Low 4	Site not in the proximity of any known faults. No controls required.	1	4	Low 4	
	Liquefaction Induced Flooding and/ or Subsidence	1	4	Low 4	Groundwater >15m below ground level, deeper layers of sand medium dense.	1	4	Low 4	

Results of this assessment are presented in Table C1 below.
	Lateral Spread	1	3	Low 3	Low risk of liquefaction effects. No controls required.	1	3	Low 3
Volcanic Activity	Ash & Pyroclastic Falls	1	4	Low 4	Site is not located in a known volcanic area. No controls required.	1	4	Low 4
	Lava flows & Lahars	1	4	Low 4	Site is not located in a known volcanic area. No controls required.	1	4	Low 4
Geothermal Activity	Formation of geysers, hot springs, fumaroles, mud pools	1	4	Low 4	Site is not located in a known volcanic area. No controls required.	1	4	Low 4
Erosion	Cut Batters	3	2	Medium 6	Max 1:2.5 gradient	2	2	Low 4
	Fill Batters	3	2	Medium 6	Max 1:2.5 gradient	2	2	Low 4
Landslip	Global Slope				Building Restriction	F	Risk to	Land
	Instability	3	4	High	Line (1:2.5 projection from toe of slope) or palisade wall	3	4	High 12
		Ũ		12		Risk to Structures		
						1	4	Low 4
	Soil Creep	2		Low	Building restriction line or palisade wall.	Risk to Land		
						2	2	Low 4
			2	4		Risk to Structures		
						1	2	Very low 2
	Bearing Capacity Failure	2	3	Medium 6	Raft foundation for reduce bearing pressure.	1	3	Low 3
Subsidence	Expansive Soils	1	2	Very low 2	Soils non-expansive, no controls required.	1	2	Very low 2

	Sinkholes	1	4	Low 4	Soils not prone to sinkhole formation, no controls required.	1	4	Low 4
	Soft Soils	2	3	Medium 6	Undercut and remove, or ground improvement.	1	3	Low 3
Sedimentation	Inundation	3	2	Medium 6	Appropriate Stormwater drainage design	1	4	Low 4

Notes:

- Assessments include the impact of the proposed subdivision works on adjacent properties.
- The following reference(s) contain information on the hazards contained in this assessment and the non-geotechnical hazards that have not been included:
 - **Waikato** <u>https://waikatoregion.maps.arcgis.com/apps/MapSeries/index.html?appid=f2b</u> <u>48398f93146e8a5cf0aa3fddce92c</u>

Appendix F: Slope Stability Analysis Results







Appendix G: Slope Stability Setbacks







APPENDIX C: Preliminary Site Investigation (PSI)





50 Te Awa Lane, Tamahere

For CMW Geosciences Preliminary Site Investigation Report January 2020

REPORT INFORMATION AND QUALITY CONTROL

Prepared for:	

CMW Geosciences

David MacPherson

Author:	Shannen Barns Environmental Consultant	D
Reviewed and Approved for Release:	Nigel Mather Principal Land and Water Quality Consultant	Mont

Document Name	R_AA5892_CMW_50 Te Awa Lane PSI_V1.0 (Jan 2020)

Version History: V1.0 January 2020









CONTENTS

Page

EXE	CUTIVE	SUMMARYI	I
1	INTRO	DUCTION	L
	1.1	Scope of Works	1
2	SITE D	DETAILS	L
	2.1	Geology and Hydrogeology	3
3	SITE H	listory	3
	3.1	Council Records	3
	3.1.1	Property File Review	3
	3.1.2	WRC Land Use Information Register	4
	3.1.3	Waikato District Council HAIL Report	4
	3.1.4	Hazardous Substances and Incidents Reports4	4
	3.2	Aerial Photographs	4
	3.3	Landowner Information	5
4	SITE V	/ISIT AND SOIL SAMPLING	5
	4.1	Initial Site Walkover	5
	4.2	Soil Sampling	5
	4.2.1	Sampling Methodology	5
	4.2.2	Quality Assurance (QA)/Quality Control (QC)	õ
	4.2.3	Sampling Observations	õ
	4.3	Evaluation Criteria	7
	4.4	Results	7
	4.4.1	Heavy Metals	7
	4.4.2	Asbestos	7
	4.5	Discussion	7
5	CONC	LUSIONS10)
REFI	ERENCE	-S12	2
LIM	ΤΑΤΙΟΙ	NS12	2

List of Tables

Table 1: Address and Site Information	1
Table 2: Aerial Photograph Review	4
Table 3: Soil Sampling Details and Laboratory Analytical Schedule	6
Table 4: Soil Analytical Results	9
Table 4. Son Analytical Results	

List of Figures

Figure 1: Site Location Plan and Sampling L	ocations2
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List of Appendices

Appendix A: Preliminary Development Plans Appendix B: Property File Appendix C: WDC HAIL Report Appendix D: WRC Land Use Information Register Appendix E: Historical Aerial Images Appendix F: Photolog Appendix G: Laboratory Analytical Reports



EXECUTIVE SUMMARY

4Sight Consulting Ltd (4Sight) has been engaged by CMW Geosciences (the Client) to undertake a Preliminary Site Investigation (PSI) with limited soil sampling at 50 Te Awa Lane, Tamahere (the Site) to support a six lot rural residential subdivision.

The purpose of the PSI is to understand the presence and extent of potential soil contamination arising from historical use of the Site that may pose a risk to human health and/or the environment, and to assess potential resource consent implications in accordance with the National Environmental Standard for Assessing Contaminants in Soil to Protect Human Health, 2011 (NESCS).

This investigation included reviewing the Site's history, limited soil sampling, and field observations. The key findings of this investigation include the following:

- The Site is currently a residential property in a rural residential area, comprised of a residential dwelling with an associated garage and swimming pool in the southern corner and a single storage shed in the north-eastern corner. The remainder of the Site in pasture as part of a large well maintained residential lawn. The Site's southern boundary borders the Waikato River. Review of historic aerial imagery and an informal discussion with the landowner identified the Site has historically been in use for rural purposes before the residential dwelling was erected during the 1970's and has remained for rural residential purposes since, with a horse arena and yards present during the 2000's that have since been removed;
- Information obtained from the property file and a search of the Waikato District Council (WDC) HAIL register identified no record of HAIL activities at the Site. The Site does not appear on the Waikato Regional Council (WRC) Land Use Information Register (LUIR). A review of the Hazardous Substances and Incidents Register maintained by the Environmental Protection Agency (EPA) identified no incidents at the Site or within 500 meters of the Site over the period 2006-2011;
- Soil samples were collected from within the areas of the proposed new Lots, as well as targeted sampling adjacent to the farm shed in the north-eastern portion of the Site. Laboratory analysis of selected samples identified the following:
 - The concentration of lead (410 mg/kg) within one sample location (TL-07-0.1) adjacent to the storage shed was elevated above the adopted WRC Cleanfill criteria and NESCS rural-residential criteria; and
 - Chrysotile (White Asbestos) and Crocidolite (Blue Asbestos) were detected in the form of ACM Debris within two samples (TL-07-0.1 and TL-08-0.1) adjacent to the storage shed, with concentrations of combined fibrous asbestos and asbestos fines at TL-07-0.1 (0.004% w/w) exceeding the adopted BRANZ Residential criteria.

Based on the findings of this investigation the following recommendations have been made:

- The presence of lead and asbestos in soil is restricted to the soil in selected locations immediately surrounding the shed, with the source assumed to be shed cladding materials. On this basis, the concentration of potential contaminants in soils across the majority of the Site are considered highly unlikely to pose a risk to human health in light of the proposed rural-residential development;
- Subdivision of the Site is considered a permitted activity under Clause 8(4) of the NESCS;
- Soil disturbance across the Site is considered a Permitted Activity under Clause 8 (3) of the NESCS, provided
 permitted activity thresholds are met;
- Soil directly adjacent to and beneath the storage shed cannot be considered clean fill due to the concentration of lead and asbestos above adopted criteria. This must be removed prior to bulk earthworks and will need to be disposed at an appropriately licensed landfill. This limited extent of soil disturbance can be undertaken as a permitted activity under Clause 8(3) of the NESCS. If soil is to be removed from the remainder of the Site, it can be considered as clean fill. This should be confirmed with the disposal facility prior to removal from the Site.
- All earthworks should be undertaken in accordance with the WRC Erosion and Sediment Control Guide for Soil Disturbing Activities in the Waikato region, Environment Waikato Technical Report No.2009/02; and
- As the existing storage shed building is likely constructed of ACM (based on observations and as identified by the
 presence of asbestos in soils directly adjacent to the exterior of the building), an asbestos survey of the building
 should be undertaken if removed. The removal/demolition should be managed in accordance with the Health and



Safety at Work (Asbestos) Regulations 2016, and the WorkSafe New Zealand Approved Code of Practice for the Management and Removal of Asbestos.

This investigation and associated reporting have been written in general accordance with the requirements of CLMG No.1, and CLMG No. 5, and has been written and reviewed by a Suitably Qualified Environmental Practitioner (SQEP) in accordance with the requirements of the NESCS.



1 INTRODUCTION

4Sight Consulting Ltd (4Sight) has been engaged by CMW Geosciences (the Client) to undertake a Preliminary Site Investigation (PSI) with limited soil sampling at 50 Te Awa Lane, Tamahere (herein referred to as 'the Site') to support the proposed subdivision of the Site.

The purpose of the PSI is to understand the presence and extent of potential soil contamination arising from historical use of the Site that may pose a risk to human health and/or the environment. Additionally, the PSI serves to assess potential implications for the proposed subdivision of the Site under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) (MfE,2011).

Consideration of the NESCS is required for the activities of change of land use, subdivision and soil disturbance on pieces of land that have been subject to any activities or industries listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL).

Land covered in the NESCS is defined in regulation 5(7) as:

A piece of land that is described by one of the following:

- a) An activity or industry described in the HAIL is being undertaken on it:
- b) An activity or industry described in the HAIL has been undertaken on it:
- c) It is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it.

This PSI will confirm current and historic activities at the Site, assess the potential risk to human health associated with contaminants in shallow soil resulting from historic activities undertaken at the Site through background research and soil sampling, and determine the requirement for further work and resource consent requirements in relation to the NESCS.

1.1 Scope of Works

The scope of this PSI has included the following:

- Site inspection to visually assess the presence of any activities or industries listed on the HAIL or evidence of any
 potential contamination across the Site;
- Targeted collection of shallow (0 100 mm below ground level (bgl)) and deeper (300 400 mm bgl) soil samples across the Site;
- Analysis of selected soil samples for contaminants of potential concern (CoPC) associated with the historic use of the Site; and
- An overall assessment of the applicability of the NESCS.

2 SITE DETAILS

The Site is located in Tamahere in the Waikato region, and details of the Site are provided in Table 1. The Site location and features are shown in Figure 1.

Table 1: Address and Site Information

Site Address	Legal Description	Certificate of Title	Area	
50 Te Awa Lane, Tamahere 3283	PT LOT 6 DPS 11104	SA56A/381	40,899 m ²	

The Site is zoned as Rural Zone under the Waikato District Council (WDC) Operative District Plan (ODP) (Property Number 1008588) and is currently a rural residential property comprised of a dwelling and associated garages in the



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80m

AA5892 – 50 Te Awa Lane PSI Figure 1: Site Features and Sampling Locations Figure prepared by 4Sight Consulting. Date: 19/12/2019 Version: 1.0 Drawn: Sam Hendrikse Checked: Shannen Barns Approved: Nigel Mather





south eastern corner of the Site, with the remainder of the Site in pasture with well-kept gardens and vegetation. A single farming and storage shed is also present in the north-eastern corner of the Site.

We understand the Site is intended to be subdivided to create six new rural-residential lots between $5,200 - 7,600 \text{ m}^2$ in area with the currently dwelling remaining as Lot 5 (6,080 m²).

2.1 Geology and Hydrogeology

The Institute of Geological and Nuclear Sciences (GNS) 1:250,000 online geological map shows the regional geology consists of two lithologies. The northern two thirds of the Site consist Late Pleistocene river deposits of the Hinuera Formation, described as cross-bedded pumice sand, silt and gravel with interbedded peat. The southern third of the Site, adjacent to the Waikato River, consists of Holocene River Deposits of the Taupo Pumice Alluvium, described as predominantly pumice sand, silt and gravel alluvium with charcoal fragments. Shallow site-specific soils are summarised in Section 4.2.3.

The closest surface water body is the Waikato River which borders the south-eastern boundary of the Site.

A search of the Waikato Regional Council (WRC) groundwater maps indicated that there is one groundwater bore (Well No. 69_1239) within the Site, on the north-eastern boundary adjacent to Te Awa Lane, with a depth of 38.77 m. A further three groundwater bores (Well No. 69_93, 69_558 and 69_559) are located within a 200 m radius of the Site, all within properties directly north and north east of the Site with depths of 33 m, 48.77 m and 21.33 m respectively. Bore use was not identified in this database. There was no other information of relevance contained in the groundwater bore and surface water take search.

During a site visit by 4Sight staff on 11 December 2019, an underground tank was located within the northern quarter of the Site. The tank did not appear to be used for the storage of fuel or other potential contaminants and is likely used for the collection and storage of water.

3 SITE HISTORY

To understand the history of the Site and particularly the nature and location of any potentially contaminating activities, a review of publicly available information for the Site was undertaken. This included searches of:

- Current registered bore and groundwater take search, provided by WRC and described in Section 2.1;
- Property file reports, provided by WDC;
- HAIL Report, provided by WDC;
- Land Use Information Register (contaminated site) search, provided by WRC;
- Hazardous Substances and Incidents report, provided by the Environmental Protection Agency (EPA);
- Selected historical aerial photographs freely available through Retrolens[®] and WRC GIS viewer; and
- Correspondence with the landowner.

3.1 Council Records

3.1.1 Property File Review

The property file for 50 Te Awa Lane, Tamahere was requested and provided to 4Sight by WDC on 13 December 2019.

The following information of relevance to this investigation was obtained from the file with selected excerpts from the file provided in Appendix B:

- Building Permit Application (No. A074984), dated May 1969, to erect a storage shed for the storage of garden tools and a tractor at the Site;
- Building Permit Application (No. A074944), dated April 1970, to erect a residence at The Narrows (the Site); and
- Building Consent (No. BLD0980/12), dated June 2012, for dwelling additions at the Site.



Information obtained from the property file did not indicate any current or historic potentially contaminating activities at the Site.

3.1.2 WRC Land Use Information Register

The WRC maintains a register (known as the Land Use Information Register - LUIR) of properties known to be contaminated on the basis of chemical measurements, or potentially contaminated on the basis of past land use. A copy of the search is provided in Appendix C.

An email received from WRC on 8 January 2020 identified that the Site does not currently appear on the LUIR.

3.1.3 Waikato District Council HAIL Report

A search of the WDC HAIL register was requested, with results provided on 17 December 2019. The results of the search are presented in Appendix D and note that no record of HAIL activities were found on WDC records.

3.1.4 Hazardous Substances and Incidents Reports

The Environmental Protection Agency (EPA) maintained a list of reported hazardous substance incidents over the period July 2006 – December 2011. A review of the EPA register over this period, accessed 30 July 2019, identified no incidents at the Site or within 500 meters of the Site.

3.2 Aerial Photographs

Historical aerial photographs were sourced from Retrolens[®] and WRC GIS viewer. These can be found in Appendix E and are described in Table 2.

Year	Reference	Observations
1939	Retrolens (black & white, earliest available image)	The Site is vacant and is in pasture as part of a larger rural property. Some disturbed earth, possibly from vehicle marking, is present in the western half of the Site. The south-western boundary of the Site is vegetated and borders the Waikato River. The surrounding land use is rural.
1953	Retrolens (black & white)	The Site remains unchanged from 1939 aerial imagery. Stock are visible across the Site and the surrounding land continues to be rural.
1971	Retrolens (black & white)	A large residential dwelling, including a tennis court and swimming pool, has been erected in the southern corner of the Site. A single rectangular shed has been erected in the north-eastern corner of the Site. An unpaved driveway enters the Site from the northern corner and runs along the north-western boundary and through the western half of the Site to the residential dwelling. The remainder of the Site is grassed as part of a large residential lawn with a line of trees present across the Site's south-eastern boundary.
1995	Retrolens (black & white)	The Site remains largely unchanged from 1971 aerial imagery. Trees line the residential driveway through the north-eastern boundary and western half of the Site.
2008	Google Earth Pro (colour)	A small structure is visible on the residential lawn to the north east of the residential dwelling. Within the northern half of the Site, two square fenced paddocks (horse yards) are present at the southern boundary and one rectangular sanded patch (horse arena) is present at the northern boundary. The surrounding land has undergone residential development and a number or residential and rural residential dwellings are neighbouring the Site.

Table 2: Aerial Photograph Review



Year	Reference	Observations
2019	Google Earth Pro (colour, most recent image available)	The horse arena at the Site's northern boundary is no longer visible and the area is now grassed. The fencing of the northernmost of the two horse yards has been removed.

3.3 Landowner Information

During a Site visit by 4Sight staff on 11 December 2019, an informal discussion was undertaken with the landowner as to their knowledge of current and past activities at the Site.

The landowner identified they have resided at the Site for the past 20 years. The shed in the north-eastern corner of the Site has been used to store tractors and gardening tools and equipment and was present at the Site before their time of ownership.

The landowners have owned horses in the past and confirmed the previously sanded rectangular patch at the northern boundary of the Site was used as a horse arena and the smaller square fenced areas were used as horse yards.

To the best of the landowner's knowledge, no potentially contaminating activities have occurred or are occurring at the Site since their time of occupancy.

4 SITE VISIT AND SOIL SAMPLING

4.1 Initial Site Walkover

Photos of the Site taken during the visit by 4Sight staff on 11 December 2019 are presented in Appendix F. The following observations were made during the Site visit:

- A residential dwelling is present in the southern corner of the Site, with a residential driveway leading to the dwelling along the Site's northern boundary with entrance to the Site from Te Awa Lane;
- The majority of the Site is comprised of a well maintained grassed lawn. Trees line a large portion of each of the Site's boundary with a number of trees also present within the lawn area and adjacent to the residential driveway;
- The single storage shed is comprised of timber framing, corrugated iron roofing and possible asbestos containing material (ACM) weatherboards as the exterior. The shed is used to store a tractor, lawnmower and other various building and gardening tools and equipment;
- The top of a concrete underground storage tank is visible at the surface of the grassed lawn in the northern quarter of the Site. The tank did not appear to be used for the storage of fuel or other potential contaminants and is likely used for the collection and storage of water;
- A rectangular patch of sand, approximately 15 m² in area, is present at the north-eastern boundary of the Site, adjacent to the residential driveway. Although grasses have partly covered the patch, some sand is still visible at the surface. Discussion with the landowner identified this area be part of an historic horse arena;
- A square patch of disturbed surface soils is present in the centre of the Site's southern boundary. Discussion with the landowner identified this area to be historic horse yards;
- The topography of the Site in generally flat, with small undulating patches and a steep slope in the southern third of the Site down to the Waikato River, which borders the Site's southern boundary; and
- Housekeeping across the Site is tidy, with no disused equipment and no visible signs of contamination such as oil
 or grease, no stressed or dying vegetation and no evidence of current or historical above/underground storage
 tanks, sumps, pits or lagoons.

4.2 Soil Sampling

Based on the historic activities at the Site, targeted soil sampling was undertaken to determine if historic activities may have impacted shallow soils within the proposed new Lots at the Site. The soil sampling was undertaken in general



accordance with the Contaminated Land Guidelines No.5 Site Investigation and Analysis of Soils (MfE, 1999, revised 2011).

4.2.1 Sampling Methodology

A total of 16 discrete soil samples were collected from eight sampling locations across the Site during a Site visit by 4Sight staff on 11 December 2019 to investigate shallow sub-surface soils (refer to Figure 1). A stainless-steel spade and hand auger were used to collect surface (0 - 100 mm bgl) and shallow sub-surface (between 300 - 400 mm bgl) samples.

Soil samples were collected from within the areas of the proposed new Lots, as well as targeted sampling adjacent to the farm shed in the north-eastern portion of the Site. Additionally, one discrete offsite reference surface sample was collected from the road berm approximately 900 m north of the Site.

Soil samples were collected, placed in laboratory provided sample containers and transported, with Chain of Custody documentation, to RJ Hill Laboratories, Hamilton. Four discrete surface samples (TL-01-0.1 – TL-04-0.1) were composited into one laboratory composite sample upon reception at the analytical laboratory under instruction of 4Sight. Samples were then selectively analysed for pH and the presence of the contaminants of concern; being heavy metals cadmium and lead, and asbestos (semi-quantitative) as per the analytical schedule in Table 3.

The analytical suite was based on the CoPC associated with the known and suspected historic activity at the Site, including the potential for soils to be impacted farming activities (superphosphate fertiliser application) as well as the use of lead based paint and asbestos containing building materials.

Sample ID	Sample Type	Depth (mm bgl)	Soil Type	Lab Analysis	
Composite of TL-01-0.1, TL-02-0.1, TL-03- 0.1 & TL-04-0.1	Laboratory composite			Cadmium, pH	
TL-05-0.1 & Reference-0.1		0 - 100	Topsoil		
TL-06-0.1, TL-07-0.1 & TL-08-0.1	Discrete			Lead, Asbestos	
TL-01-0.3, TL-02-0.3, TL-03-0.3, TL-04-0.3, TL-05-0.3, TL-06-0.3, TL-07-0.3 & TL-08-0.3		300 - 400	Silty Sand	Hold Cold	

Table 3: Soil Sampling Details and Laboratory Analytical Schedule

4.2.2 Quality Assurance (QA)/Quality Control (QC)

Standard field quality assurance protocols were followed. All tools used for sampling were washed in a decontaminant solution between samples to remove the risk of cross contamination. Nitrile gloves were also used and disposed of between each sample. Hill Laboratories are a New Zealand accredited laboratory (by International Accreditation NZ). Their primary quality standard is NZS/ISO/IEC 17025:2005 which incorporates the aspects of ISO 9000 relevant to testing laboratories. Refer to the laboratory analysis report in Appendix G for further information on accreditation.

4.2.3 Sampling Observations

Photos of the Site and the typical soil profile are presented in Appendix F. The following soil characteristics and observations are described below:

- Shallow soils across the grassed area of the Site (locations TL-01 to TL-05) were comprised of dark brown silt topsoil to approximately 100 mm bgl, overlying brown silty sand to approximately 200 mm bgl, overlying light orange brown silty sand to an observable depth of approximately 300 – 400 mm bgl;
- Shallow soils at two locations (TL-06 and TL-07) adjacent to the storage shed in the north-eastern corner of the Site were comprised of reworked dark brown silt topsoil with fragments of broken timber and some plastic to approximately 100 mm bgl, overlying brown silty sand to approximately 200 mm bgl, overlying light orange brown silty sand to an observable depth of approximately 300 – 400 mm bgl. Soils at sample location TL-08 were comprised of light brown sandy silt with minor gravel inclusions to approximately 200-300 mm bgl;



There were no visible asbestos containing material (ACM) and no obvious discolouration or odours located within the soils to suggest contaminants were present at any of the sampling locations across the Site.

4.3 Evaluation Criteria

The soil sample results have been screened against the following criteria:

 NESCS Soil Contaminant Standards (SCS) using the rural residential land use scenario. This is the land use scenario consistent with the proposed future land use;

In the past, composite sample results have been adjusted to compare the results against a soil guideline value, either by scaling the composite sample contaminant concentration up by the number of sub-samples, or by dividing the soil guideline value by the number of sub-samples (in the case of this investigation, by four), in accordance with the requirements of the CLMG No.5). For comparative purposes, we have included the adjusted NESCS guideline values in Table 4, however we note that this approach can result in misinterpretation and overly conservative estimation of concentrations in the area represented by the composite sample (and can result in situation of apparent concentrations being less than background concentrations for the location);

- WRC Cleanfill Criteria. These criteria were selected to provide guidance on suitable offsite disposal options, if required;
- Building Research Association of New Zealand (BRANZ) 2016 New Zealand Guidelines for Assessing and Managing Asbestos in Soil using the Residential land use scenario for ACM and all land use scenario for asbestos fine and fibrous asbestos; and
- Background concentrations for heavy metals (95% upper limit) as presented on WRC's website. These values are
 used as a guideline for typical naturally occurring concentrations in the Waikato Region.

4.4 Results

A summary of the laboratory results is presented in Table 4. The full results are contained in the laboratory analysis report provided in Appendix G. The following is noted:

4.4.1 Heavy Metals

- The concentration of cadmium (0.4 mg/kg) within one sample (Composite of TL-01-0.1 TL-04-0.1) and the concentration of lead (65 mg/kg) within one sample (TL-06-0.1) were elevated above natural background concentrations (0.2 mg/kg and 25 mg/kg respectively); and
- The concentration of lead (410 mg/kg) within one sample location (TL-07-0.1) is elevated above the adopted WRC Cleanfill criteria (120 mg/kg) and NESCS rural residential criteria (160 mg/kg).

4.4.2 Asbestos

 Chrysotile (White Asbestos) and Crocidolite (Blue Asbestos) were detected in the form of ACM Debris within two samples (TL-07-0.1 and TL-08-0.1) with concentrations at TL-07-0.1 (0.004% w/w) exceeding the adopted BRANZ Residential criteria (0.001 % w/w).

4.5 Discussion

The presence of cadmium and lead above natural background levels on the Site suggests soils at selected locations have been impacted by historic farming activities. However, with the exception of soils directly adjacent to the storage shed, all heavy metal concentrations across the Site were below the adopted NESCS rural residential criteria and are therefore considered highly unlikely to pose a risk to human health during development and for ongoing Site users.

The potential source of elevated lead in soils directly adjacent to the storage shed includes the impact from deterioration of lead-based paints on cladding materials. The potential source for the presence of asbestos in soils directly adjacent to the shed includes fragments of broken exterior weatherboards from the current building, which are presumed to contain asbestos based on observations. These potential sources were identified through review of historic aerial images which first identify the shed to be present at the Site during the 1970's, as well as observations



recorded during the Site visit by 4Sight staff which confirmed the shed to be in deteriorating condition. Based on experience and observations, impact from lead and asbestos is likely to be restricted to soils beneath and immediately surrounding the shed.



Table 4: Soil Analytical Results

		Evaluation Criteria									
	Sample Name:	Natural Background Concentrations ¹	WRC Cleanfill Criteria ²	NES CS - Rural Residential ³	BRANZ - Semi Quantitative Asbestos - Residential ⁴	TL - 05 - 0.1	TL - 06 - 0.1	TL - 07 - 0.1	TL - 08 - 0.1	Composite of TL - 01 - 0.1, TL - 02 - 0.1, TL - 03 - 0.1 & TL - 04 - 0.1	Reference - 0.1
Samj	ple Depth (m bgl):					0.1	0.1	0.1	0.1	0.1	0.1
	Soil Type:					Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil
	Date:					11-Dec-19	11-Dec-19	11-Dec-19	11-Dec-19	11-Dec-19	11-Dec-19
	Lab Number:					2291578.5	2291578.7	2291578.8	2291578.9	2291578.18	2291578.6
Dry Matter	g/100g as rcvd										
pH						8	-	-	-	6.1	5.9
Heavy Metals, Screen Level											
Total Recoverable Cadmium	mg/kg dry wt	0.2	1	0.8 (0.2)		0.2	-	-	-	0.4	0.2
Total Recoverable Lead	mg/kg dry wt	25	120	160 (40)		-	65.0	410.0	14.0	-	-
Asbestos in Soil											
					Absent		Asbestos NOT detected.	Chrysotile (White Asbestos) and Crocidolite (Blue Asbestos)	Chrysotile (White Asbestos) and Crocidolite (Blue Asbestos)		
Presence/Absence						-		ACM Debris	ACM Debrie	-	-
Achieves in ACM as % of Total Sample	9/ m/m				0.01	-	< 0.001	ACIVI DEDITIS	ACIVI DEDITIS	-	-
Combined EAUAE as % of Total Sample	76 W/W				0.001	-	< 0.001	0.001	< 0.001	-	-
combined FATAF as % of Total Sample	70 W/W				0.001		< 0.001	0.004	< 0.001	-	-

Notes:

All results and criteria are expressed in mg/kg dry weight.

Any results exceeding adopted criteria are shaded accordingly.

BD = Below Laboratory Detection Limits

1: Natural Background Concentrations for selected elements in soil of the Waikato region, acid recoverable data - 95% upper limit for background. Exceedances are in yellow.

2: Waikato Regional Council Cleanfill Criteria. Exceedances are in green.

3: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) Soil Contamination Standards (SCS) from Table B2 for inorganic substances and Table B3 for organic compounds - using the 'Rural Residential' land use scenario. Adjusted guidline values (adjusted by dividing actual SCS by four, given soil samples are a composite of four primary samples (in accordance with requirments of the MfE CLMG No.5)) are denoted by brackets. Exceedances are in red.

4: BRANZ Assessing and Managing Asbestos in Soil from Table 5. Soil Guideline Values for asbestos in New Zealand using the Residential land use scenario for ACM and asbestos fine and fibrous asbestos. Exceedances are in grey.



5 CONCLUSIONS

4Sight Consulting Ltd (4Sight) has been engaged by CMW Geosciences (the Client) to undertake a Preliminary Site Investigation (PSI) with limited soil sampling at 50 Te Awa Lane, Tamahere (the Site) to support a six lot rural residential subdivision.

The purpose of the PSI is to understand the presence and extent of potential soil contamination arising from historical use of the Site that may pose a risk to human health and/or the environment, and to assess potential resource consent implications in accordance with the National Environmental Standard for Assessing Contaminants in Soil to Protect Human Health, 2011 (NESCS).

This investigation included reviewing the Site's history, limited soil sampling, and field observations. The key findings are:

- The Site is currently a residential property within a rural residential area, comprised of a residential dwelling with
 an associated garage and swimming pool in the southern corner and a single storage shed in the north-eastern
 corner. The remainder of the Site in pasture as part of a large well maintained residential lawn. The Site's southern
 boundary borders the Waikato River;
- Review of historic aerial imagery and an informal discussion with the landowner identified the Site has historically been in use for rural purposes before the residential dwelling was erected during the 1970's and has remained for rural residential purposes since, with a horse arena and yards present during the 2000's that have since been removed;
- Information obtained from the property file did not indicate any current or historic potentially contaminating activities at the Site;
- A search of the Waikato District Council (WDC) HAIL register identified no record of HAIL activities at the Site;
- The Site does not currently appear on the Waikato Regional Council (WRC) Land Use Information Register;
- Review of the Hazardous Substances and Incidents Register maintained by the Environmental Protection Agency (EPA) identified no incidents at the Site or within 500 meters of the Site over the period 2006-2011;
- Soil sampling was undertaken as part of a Site visit by 4Sight staff on 11 December 2019. Soil samples were collected from within the areas of the proposed new Lots, as well as targeted sampling adjacent to the farm shed in the north-eastern portion of the Site. Soils across the majority of the Site consist of topsoil to approximately 100 mm bgl, overlying brown silt to approximately 200 mm bgl, overlying light orange brown silty sand to an observable depth of approximately 300 400 mm bgl. Laboratory analysis of selected samples identified the following:
 - The concentration of lead (410 mg/kg) within one sample location (TL-07-0.1) adjacent to the storage shed was elevated above the adopted WRC Cleanfill criteria and NESCS rural residential criteria; and
 - Chrysotile (White Asbestos) and Crocidolite (Blue Asbestos) were detected in the form of ACM Debris within two samples (TL-07-0.1 and TL-08-0.1) adjacent to the storage shed, with concentrations of combined fibrous asbestos and asbestos fines at TL-07-0.1 (0.004% w/w) exceeding the adopted BRANZ Residential criteria.

Based on the findings of this investigation the following recommendations have been made:

- The presence of lead and asbestos in soil is restricted to the soil in selected locations immediately surrounding the shed, with the source assumed to be shed cladding materials. On this basis, the concentration of potential contaminants in soils across the majority of the Site are considered highly unlikely to pose a risk to human health in light of the proposed rural residential development;
- Subdivision of the Site is considered a permitted activity under Clause 8(4) of the NESCS;
- Soil disturbance across the Site is considered a Permitted Activity under Clause 8 (3) of the NESCS, provided
 permitted activity thresholds are met;
- Soil directly adjacent to and beneath the storage shed cannot be considered clean fill due to the concentration of lead and asbestos above adopted criteria. This must be removed prior to bulk earthworks and will need to be disposed at an appropriately licensed landfill. This limited extent of soil disturbance can be undertaken as a



permitted activity under Clause 8(3) of the NESCS. If soil is to be removed from the remainder of the Site, it can be considered as clean fill. This should be confirmed with the disposal facility prior to removal from the Site.

- All earthworks should be undertaken in accordance with the WRC Erosion and Sediment Control Guide for Soil Disturbing Activities in the Waikato region, Environment Waikato Technical Report No.2009/02; and
- As the existing storage shed building is likely constructed of ACM (based on observations and as identified by the presence of asbestos in soils directly adjacent to the exterior of the building), an asbestos survey of the building should be undertaken if removed. The removal/demolition should be managed in accordance with the Health and Safety at Work (Asbestos) Regulations 2016, and the WorkSafe New Zealand Approved Code of Practice for the Management and Removal of Asbestos.

This investigation and associated reporting have been written in general accordance with the requirements of CLMG No.1, and CLMG No. 5, and has been written and reviewed by a Suitably Qualified Environmental Practitioner (SQEP) in accordance with the requirements of the NESCS.



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 http://www.waikatoregion.govt.nz/Council/About-us/Requests-for-official-information/, accessed December 2019.

Waikato Regional Council [WRC] maps. 2018. Retrieved from

http://maps.waikatodistrict.govt.nz/IntraMaps90/?project=Waikato&configId=b2549ae1-f643-4ac6-9586-211ba985dd8f, accessed December 2019.

LIMITATIONS

This document does not include any assessment or consideration of potential health and safety issues under the Health and Safety at Work Act 2015. 4Sight Consulting has relied upon information provided by the Client and other third parties to prepare this document, some of which has not been fully verified by 4Sight Consulting. This document may be transmitted, reproduced or disseminated only in its entirety.

From a technical perspective, the subsurface environment at any site may present substantial uncertainty. It is a heterogeneous, complex environment, in which small subsurface features or changes in geologic conditions can have substantial impacts on water, vapour and chemical movement. 4Sight Consulting's professional opinions are based on its professional judgement, experience, and training. These opinions are also based upon data derived from the testing and analysis described in this document. It is possible that additional testing and analysis might produce different results and/or different opinions. This document was prepared based on information provided by others. Should additional information become available, this report should be updated accordingly.



Appendix A:

Preliminary Development Plans



AF A T		37				
	12		5	- 5		
	MEI	MORANDU	IM OF PROPOSED EAS	EMENTS		
1	PURPOSE	SHOWN SERVIENT SHOWN TENEMENT (BURDENED LAND)		DOMINANT TENEMENT (BENEFITTED LAND)		
N.C	RIGHT OF WAY, RIGHT TO CONVEY WATER	A	LOT 101 HEREON	LOTS 1 - 6 HEREON		
	ELECTRICITY & TELECOMMUNICATIONS	В	LOT 6 HEREON	LOTS 4 & 5 HEREON		
AMALGAMATION CONDITION: 220(1)(b)(iv) THAT LOT 101 HEREON (LEGAL ACCESS) BE HELD AS TO SEVEN UNDIVIDED ONE-SIXTH SHARES BY THE OWNERS OF LOTS 1 - 6 HEREON AS TENANTS IN COMMON INTHE SAID SHARES AND THAT INDIVIDUAL COMPUTER FREEHOLD REGISTERS BE ISSUED IN ACCORDANCE THEREWITH.						
150	CHEME PLAN		STATUS	/INARY		
			DATE SCALE (ORIGINAL SIZE A3) 20.06.2019 1:1500			
			146110-00-01	11 REVISION		

Ccopyright



Appendix B:

Property File

2 - 1		Contraction of the	20-71 011	
WAIKAT	D COUNTY COUNCIL	Building	g Permit No. FIO14944k.	
		Plumbir	ng Permit No. 54/2	
10		Drainag	e Permit No. 5473	
	Application for	Ruilding	Pormit	
-		Dunung	1 6///11	
To The En	aineer:	2 (See Dack Hereor)		
	I hereby apply for permission to erect a	RESIDE	NCE	
at (Road o	r Street) THE NARROWS	Locality :		
for (Owner	r of Land) Mr E.N. & Mrs J.C	C. Anderson.		
Postal Add	ress: 79 FIRTH ST.	HAMILTON		
according building d	to locality plan and detailed plans, eposited herewith.	elevations, cross-secti	ons, and specifications of	
Particulars	of Land) Lot No. 6 D.P.	11104 Parish o	f Tamahere	
SEE 203 (i)	OVER Allot No. 9 Bloc	ck No. : VII Su	urvey District : HAMILTON	
Valuation N	No.445-49-3 Riding		Area A. 10 R. 1 P. 32	
Area of Gr	ound Floor2870 sq. ft. Area other floo	or(s) <u>523</u> sq. ft.	Area Outbldgs sq. ft.	
Esti	mated Cost—	PERMI	FEES —	
Building	\$ 28-000-000	Building	\$ 72-00	
Plumbing	\$ 1 000 00	Plumbing	\$ 11 - 00	
Drainage	\$ 600	Drainage	\$ 8-00	
Total	\$29,600-00	Total	\$91 -00	
Purp	poses for which every part of building i	is to be used or occ	upied (describing separately	
each part i	ntended for useRESIDENCE			
or occupat	ion for a separate purpose):			
Nature of	ground on which building is to be placed	d and of the subjacen	t strata: SANIZ	
Signature of	of Owner 6.000hr detrin			
Name of B	uilder <u>G. W. Lee & Son</u>	Ltd.		
Address	950 Heaphy Tce.,	A	and and have	
Lic. Plumbe	over R W. Muis	Address 76 Green	wood BT. FRAnkion	
Data Issue	4			
APPROVED	— Building Inspector :			
	Health Inspector :			
	County Planner :			
Remark	100 C		4071.91.1	
	E.N. & J.C. Anderson	Permit N	•. A074944	
	WNER 4443/ 327			
1	Roll No. 44-3/44-3/	29, Value of Permit \$	600	
Ledge	PARTICULARS OF LAND:	Type of DWE.		
By ch	Lot No. 6 DPS 11104	Building 1/6/69	- 4	
	Parish	Issued 4000		
	Riding	Completed & Herf 10	Song Ltd.	
Per	Street Narrows Rd.	Builder G.W. Lee &	DOUD HORES	
a second s	District	Address 950 Heaphy	lerr260.	
	District		2.1	
	7 4 1. 1. 1.	la falon 21	9/69	
	REMARKS Footings franced left	14/14 Iniska	ig stage	
	Some alonal stealing on	170		
	291/10 Complete 29/4,			
	VP 1346			



...

. .

85 ST

.....

Permit No. Por4984
WAIKATO COUNTY COUNCIL
Application for Building Permit
BUILDING BY-LAW No. 2 (See Back Hereof)
To The Engineer:
at (Road or Street) Rencomen Road Stee Harn Crauchene
for (Owner of Land) EDWARD NEIL ANDERSON and Giblin ANDERSON
Postal Address: 60 130 4023 Ham Fast according to locality plan and detailed plans, elevations, cross-sections, and specifications of
building deposited herewith. Eart of Title A C/1265
Particulars of Land Lot No. 6 D.P. 11044 Parish of SEE 203 (i) OVER Allot No. Block No.: VII Survey District: Hamilton S.D
Valuation No. Mail Haldriding Area A. 10 R. 1 P. 3.2
Area of Ground Floor <u>476</u> sq. tt. Area other floor(s) sq. tt. Area Outbldgs
Estimated Cost— Building \$ 650 Building PERMIT FEES— \$ 650.00
Plumbing
Drainage
Total Total Total
Purposes for which every part of building is to be used or occupied (describing separately
each part intended for use <u>strange</u> of your rooms and macron
Nature of ground on which building is to be placed and of the subjacent strata:
Signature of Owner POB-11023
Dated 6-5 , 1969 Signature of Builder W Mannows Road Han Est
Name of Lic. Plumber Address Tamelene
This Space reserved for the use of The Inspector of Buildings. Date of Permit
REMARKS :
Date Receipt No. Amount Paid
20 ¥ 69 - 3 4 4 ⊇th - 000.004.00
Per PAID 11 Paules TREASURER

• • •



BUILDING CONSENT NO: BLD0980/12 Section 5.1, Building Act 2004 ISSUED BY: WARATO DISTRICT COUNCIL

THE OWNER	THE CONTACT				
W Burnett, M Burnett	Dla Architects Limited				
50 Te Awa Lane	PO Box 19313				
RD 3	Hamilton 3244				
Hamilton 3283					
	Phone numbers:				
Phone numbers:	Daytime: 07 839 2337				
Landline: (07)856-1117	Mobile: 027 245 3232				
Mobile: (021)808-062	Email address: kirsten@dla.co.nz				
THE BU	UILDING				
Street address of building: 50 Te Awa Lane TAMAHERE Legal description of land where building is located: PT LOT 6 DPS 11104 Valuation Number: 04443/327.00 Property Number: 1008588					
BUILDING WORK	THE PROJECT				
Dwelling Additions	Dwelling Additions \$460000.00				
Specified Intended Life, not less than 50 years					
	Total Est. Value of Projects \$460000.00				

The following building work is authorised by this building consent:

This building consent is issued under Section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building).

This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

This building consent is subject to the following conditions specified in the attached pages headed "Conditions of Building Consent BLD0980/12".

aikato District Council Conditions of Building Consent No: BLD0980/12

The Building Consent is issued subject to the following conditions: **Inspections:**

At least 48 hours' notice is required prior to any of the following mandatory inspections:

•Siting, foundation (prior to pouring concrete)

Bond beam, (prior to pouring concrete)

•Pre-floor plumbing and drainage - Pre-floor building (prior to pouring concrete)

Structural framing (pre-wrap)

•Exterior cladding systems

Pre-line plumbing - Pre-line building

9st-line building

Sanitary sewer and stormwater

Final inspection (Code Compliance Certificate) to be called for (the owner or builder shall be on site at time of inspection)

Owner/builder to locate boundary pegs prior to council carrying out a foundation/siting inspection.

When booking your inspections please ring (07) 824 8633 and quote your building consent number.

Code Compliance Certificate will be issued after your final inspection has been carried out and all documentation has been received and approved.

2 The following Producer Statements / Certificates will be required in order for Council to issue a CCC:

Producer Statements: Sand pad / Sub grade (PS 4) So n/w/c Certificates / Memorandums / Statements / Letters: Waterproofing systems (internal) •Electrical Compliance Certificate (if applicable) Plumbing pressure test Poor CHO •Gas Certificate •As laid drainage plan •Upder floor / Tile heating systems VCICIC AMILANO CHA OF WORKS

Page 2 of 4

BI0 - BldCert12 - version 6 - Feb 12

Compliance Schedule:

A compliance schedule / compliance schedule amendment is not required for the building.

1

Building Consent Advisory Notes:

- 3 Owner/Builder MUST locate boundary pegs prior to Council carrying out a foundation inspection.
- 4 Verandah posts shall comply with Figure 9.2 and 9.3 NZS 3604, 2011.
- 5 Trusses or rafters shall be fixed at tails to top plate with wire dogs at each end.
- 6 The roof shall be braced to comply with NZS 3604, 2011.
- 7 The moisture barrier beneath the floor shall comply with the New Zealand Building Code 1992.
- 8 Provide breather type building paper on outside of frame, to extend to top plate level.
- 9 Lapse of building consent. A building consent lapses and is of no effect if the building work to which it relates does not commence within:
 - a) 12 months after the date of issue of the building consent
 - b) Any further period that the building consent authority may allow
 - c) If reasonable progress on the building work has not been made within 12 calendar months after work has commenced.

The Council can exercise its discretion in either case.

- 10 All drainage and plumbing shall comply with the New Zealand Building Code 1992.
- II At least 24 hours' notice shall be required for plumbing and drainage inspections. Plumbing preline inspection shall be required.
- 12 Plumbing inspection shall be required before pouring floor slab.
- 13 An as built drainage plan and an electrical certificate of compliance is required on completion.
- 14 A gas certificate is required on completion.
- 15 Septic Tank and effluent disposal shall comply with AS/NZS 1547:2001 or TP58. Registered, supervising engineer to provide a PS4 to Council on completion, or approved suitably qualified person to provide a PS3 on completion.
- 16 Stormwater shall be disposed of in an approved manner.
- 17 All roof trusses shall be designed and fabricated by a certified manufacturer.
- 18 No hot and cold water pipes shall be laid under concrete floors unless they are accessible after the job is completed.
- 19 All timber treatment shall comply with NZS 3602:2003.
- 20 Wall and roof framing shall comply with NZS 3604: 2011.
- 21 Domestic smoke alarms must be installed before a final inspection is requested. The number of alarms required and their location in the dwelling is to be in accordance with the New Zealand Building Code.

Restricted Building Work

- This Building Consent involves Restricted Building Work that must be undertaken or supervised by a Licensed Building Practitioner that holds the appropriate license class.
- If you have not already done so, you are required to notify Council in writing, the name of every Licensed Building Practitioner who is going to be engaged to carry out the Restricted Building Work prior to work commencing. LBP notification forms can be found on <u>www.buildwaikato.co.nz</u> – Application Forms & Checklists.
- You will not be able to book inspections for Restricted Building Work until written notification regarding the Licensed Building Practitioners has been received and approved by Council.
- You are required to obtain a Record of Building Work Memorandum from all the Licensed Building Practitioners involved, detailing the Restricted Building Work they have completed. The Record of Building Work Memorandum is to be attached to the application for the Code Compliance Certificate.

Signature:

Trish Simon REGULATORY SUPPORT OFFICER

On Behalf of: Waikato District Council

Date: 05 June 2012



Appendix C:

WDC HAIL Report

Caroline Attwooll

From:	Caitlin Holm <caitlin.holm@waikatoregion.govt.nz></caitlin.holm@waikatoregion.govt.nz>
Sent:	Wednesday, 8 January 2020 11:55 AM
То:	Shannen Barns
Subject:	RE Land Use Information Register enquiry 50 Te Awa Lane, Tamahere (REQ157821) No SLUS

Dear Shannen,

Thank you for your enquiry regarding information the Waikato Regional Council may hold relating to potential contamination at the property indicated below:

• 50 Te Awa Lane, Tamahere: PT LOT 6 DPS 11104 (VRN 04443/327/00)



Background: The Waikato Regional Council maintains a register of properties known to be contaminated on the basis of chemical measurements, or potentially contaminated on the basis of past land use. This register (called the Land Use Information Register) is still under development and should not be regarded as comprehensive. The 'potentially contaminated' category is gradually being compiled with reference to past or present land uses that have a greater than average chance of causing contamination, as outlined in the Ministry for the Environment's Hazardous Activities and Industries List (HAIL): <u>http://www.mfe.govt.nz/sites/default/files/hazards/contaminated-land/is-land-contaminated/hazardous-activities-industries-list.pdf</u>

This property:

• I can confirm that this property **does not** currently appear on the Land Use Information Register.

District Councils: Our records are not integrated with those of territorial authorities, so it would also be worth contacting the Waikato District Council to complete your audit of Council records if you have not already done so. In general, information about known contaminated land will be included on a property LIM produced by the territorial authority.

<u>Rural Land Considerations</u>: Examples of sites that are "more likely than not" to have soil contamination (HAIL sites) include timber treatment activities, service stations and/or petroleum storage, panel beaters, spray painters, etc. Whilst pastoral farming is not included on this list, typical farming activities of horticulture, sheep dipping, chemical storage, petroleum storage and workshops are; but are more difficult to identify and may not be as well represented on the Land Use Information Register. Therefore, individuals interested in pastoral land may be interested in completing further investigations in accordance with Ministry for the Environment Guidelines prior to land purchase and/or development.

Additional Information: Please note that:

- Significant use of lead-based paint on buildings can, in some cases, pose a contamination risk; the use of leadbased paint is not recorded on the Land Use Information Register.
- Buildings in deteriorated or derelict condition which contain asbestos can result in asbestos fibres in soil; the use of asbestos in building materials is not recorded on the Land Use Information Register.
- The long term, frequent use of superphosphate fertilisers can potentially result in elevated levels of cadmium in soil; the use of superphosphate fertiliser is not recorded on the Land Use Information Register.
- We are not currently resourced to fully incorporate historic aerial photographs in our region-wide assessment of HAIL activities. A significant proportion of the Crown historical aerial image archive for the Waikato region is available to view free of charge at <u>http://retrolens.nz/</u>. We recommend this resource is consulted for any HAIL assessment.
- Due to the large volume of enquiries being received, we may not be able to respond to your enquiry as quickly as previously. We are resourced to meet 20 day response times as per LGOIMA, but endeavour to respond more quickly when workload permits. If your enquiry is urgent, please note this first in your enquiry and we will do our best to assist.

Please feel free to contact me if you have any further queries on this matter. For any new enquiries or requests for information please continue to use the <u>Request for Service form</u> for 'Contaminated Land/HAIL.'

Regards,

Caitlin Holm | SCIENTIST | Geothermal & Air, Land Ecology & Contamination, Science and Stra WAIKATO REGIONAL COUNCIL | Te Kaunihera ā Rohe o Waikato <u>Take a look at the work we do</u> P: +6479497129 F: facebook.com/waikatoregion Private Bag 3038, Waikato Mail Centre, Hamilton, 3240

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Appendix D:

WRC Land Use Information Register

Your Ref

In reply please quote HAIL0111/20

If calling, please ask for Sepa Faafetai



Postal Address Private Bag 544, Ngaruawahia 3742 New Zealand

0800 492 452 www.waikatodistrict.govt.nz

17 December 2019

4 Sight Consulting PO Box 911310 Victoria Street West Auckland 1142

Dear Sir/Madam

Property Enquiry - HAIL report

Further to your request for details of whether or not council records indicate that an activity or industry described in the Ministry for the Environment Hazardous Activities and Industries List (HAIL) is being, has been or is more likely than not to have been undertaken on a piece of land I can advise the following:

Property address:50 Te Awa Lane TAMAHEREVNZ Property ID:04443/327.00Legal description:PT LOT 6 DPS 11104 BLK VII HAMILTON SD

No record of a HAIL activity has been found on Council records.

The following records (where applicable) were reviewed in this assessment:

Property file including any parent prop	erty file from which the property was developed
Walkato District Council Land Use Re	gister
Waikato Regional Council Selected La	nd Use Register
Subdivision Consent files	
Land Use Consent files	
Building Consent files	
Aerial Photography:	
1939, 1943, 1953, 1957, 1963	Site is vacant pastoral land
1967	Te Awa Lane has now been formed
1972, 1974	A dwelling is now present in the south-west corner of the site and a shed is also present toward the south-east corner of the site, consistent with 1969 building permits.
1979, 1995, 2002, 2008, 2012	Trees have been planted along the driveway to the dwelling

Disclaimer:

This information is based on records held by the Council and/or Waikato Regional Council and reflects the council's current understanding of the site. The council does not accept any liability for any inaccuracy of this information or liability for any loss or damage suffered by any person acting or refraining from acting on this information.

If this information indicates that no record of a HAIL activity has been identified on council records, this does not imply that no HAIL activity has been undertaken on the site. This simply means that the council holds no record of a HAIL activity being undertaken on the property at this point in time. However, council records may be incomplete. Similarly, if one HAIL activity is identified, this does not preclude another HAIL activity having been undertaken of which no record is held. If an activity is proposed to be undertaken on the site that is covered by the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES), council retains the right to seek further information on the site history of the subject property. Where pastoral farming activities have been identified, Council may seek information in respect of cadmium in soil resulting from application of superphosphate fertiliser if residential activities are proposed.

If you have any queries please feel free to call me.

Yours faithfully

PP

Alan Parkes Contaminated Land Specialist



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Sourced from Waikato District Council Intramaps GIS



Sourced from Waikato District Council Intramaps GIS



Sourced from Waikato District Council Intramaps GIS



Appendix E:

Historical Aerial Images



Aerial imagery sourced from http://retrolens.nz and licensed by LINZ CC-BY 3

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80m

Aerial Photograph of the Site Taken in 1939 Figure prepared by 4Sight Consulting.





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AA5892 – 50 Te Awa Lane PSI Aerial Photograph of the Site Taken in 1953 Figure prepared by 4Sight Consulting.





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AA5892 – 50 Te Awa Lane PSI Aerial Photograph of the Site Taken in 1971 Figure prepared by 4Sight Consulting.





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Aerial Photograph of the Site Taken in 1995 Figure prepared by 4Sight Consulting.





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80m

AA5892 – 50 Te Awa Lane PSI Aerial Photograph of the Site Taken in 2008 Figure prepared by 4Sight Consulting.





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AA5892 – 50 Te Awa Lane PSI Aerial Photograph of the Site Taken in 2019 Figure prepared by 4Sight Consulting.





Appendix F:

Photolog



Photo 1: South-eastern corner of the Site, facing south towards sample location TL-05.



Photo 2: Soil profile at sample location TL-05, comprised of silty sand at approximately 300 mm bgl.



Photo 3: Rectangular outline of historic horse arena visible within grassed lawn, adjacent to residential driveway. Photo taken facing north east.



Photo 4: Sanded area of historic horse arena, facing south west.



Photo 5: North-eastern corner of the Site with disturbed ground cover in area of historic horse yards.



Photo 6: Northern boundary of Site with degrading storage shed.



Photo 7: Soil profile at sample location TL-04.



Photo 8: Photo of storage shed showing presumed asbestos containing cladding.



Photo 9: South-western face of storage shed.



Photo 10: South-eastern face of storage shed with visible contents including lawn mower, wooden pallet, tools and gardening equipment.



Photo 11: View inside southern section of storage shed.



Photo 12: Soil profile at sample location TL-08, adjacent to exterior of storage shed.



Appendix G:

Laboratory Analytical Reports



Hill Laboratories Limited 28 Duke Street Frankton 3204 Private Bag 3205 Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22) Т

Page 1 of 2

- +64 7 858 2000
- Е mail@hill-labs.co.nz

W www.hill-laboratories.com

Certificate of Analysis

Client:	4SIGHT Consulting Limited	Lab No:	2291578 SPv1
Contact:	Shannen Barns	Date Received:	11-Dec-2019
	C/- 4SIGHT Consulting Limited	Date Reported:	17-Dec-2019
	PO Box 911310	Quote No:	82451
	Victoria Street West	Order No:	AA5892
	Auckland 1142	Client Reference:	AA5892 - 50 Te Awa Lane
		Submitted By:	Nigel Mather

Sample Type. Son						
	Sample Name:	TL - 05 - 0.1	Reference - 0.1	TL - 06 - 0.1	TL - 07 - 0.1	TL - 08 - 0.1
		11-Dec-2019	11-Dec-2019	11-Dec-2019	11-Dec-2019	11-Dec-2019
	Lab Number:	2291578.5	2291578.6	2291578.7	2291578.8	2291578.9
Total Recoverable Cadmium	mg/kg dry wt	0.21	0.23	-	-	-
Total Recoverable Lead	mg/kg dry wt	-	-	65	410	14.0
pH*	pH Units	8.0	5.9	-	-	-
	Sample Name:	Composite of TL -				
	Sample Name:	Composite of TL - 01 - 0.1, TL - 02 -				
	Sample Name:	Composite of TL - 01 - 0.1, TL - 02 - 0.1, TL - 03 - 0.1				
	Sample Name:	Composite of TL - 01 - 0.1, TL - 02 - 0.1, TL - 03 - 0.1 & TL - 04 - 0.1				
	Sample Name: Lab Number:	Composite of TL - 01 - 0.1, TL - 02 - 0.1, TL - 03 - 0.1 & TL - 04 - 0.1 2291578.18				
Total Recoverable Cadmium	Sample Name: Lab Number: mg/kg dry wt	Composite of TL - 01 - 0.1, TL - 02 - 0.1, TL - 03 - 0.1 & TL - 04 - 0.1 2291578.18 0.35		-	-	-

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	5-9, 18
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	5-9, 18
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	5-6, 18
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	5-9, 18
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-4
Total Recoverable Cadmium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.10 mg/kg dry wt	5-6, 18
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	7-9
pH*	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH.	0.1 pH Units	5-6, 18





This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.

The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Carole Theoder-Canoll

Carole Rodgers-Carroll BA, NZCS Client Services Manager - Environmental



Hill Laboratories Limited 101C Waterloo Road Homby Christchurch 8042 New Zealand

T 0508 HILL LAB (44 555 22)

Page 1 of 3

Certificate of Analysis

Client:	4SIGHT Consulting Limited	Lab No:	2292360 A2Pv1
Contact:	Shannen Barns	Date Received:	12-Dec-2019
	C/- 4SIGHT Consulting Limited	Date Reported:	17-Dec-2019
	PO Box 911310	Quote No:	82451
	Victoria Street West	Order No:	AA5892
	Auckland 1142	Client Reference:	AA5892 - 50 Te Awa Lane
		Submitted By:	Nigel Mather

Sample Type: Soli						
Sample	e Name:	TL - 06 - 0.1 11-Dec-2019	TL - 07 - 0.1 11-Dec-2019	TL - 08 - 0.1 11-Dec-2019		
Lab N	lumber:	2292360.1	2292360.2	2292360.3		
Asbestos Presence / Absence		Asbestos NOT detected.	Chrysotile (White Asbestos) and Crocidolite (Blue Asbestos) detected.	Chrysotile (White Asbestos) and Crocidolite (Blue Asbestos) detected.	-	-
Description of Asbestos Form		-	ACM Debris	ACM Debris	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	0.004	< 0.001	-	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	0.004	< 0.001	-	-
As Received Weight	g	495.8	456.9	610.5	-	-
Dry Weight	g	354.9	244.3	585.2	-	-
Moisture	%	28	47	4	-	-
Sample Fraction >10mm	g dry wt	0.8	< 0.1	89.5	-	-
Sample Fraction <10mm to >2mm	g dry wt	8.8	12.4	114.8	-	-
Sample Fraction <2mm	g dry wt	344.6	231.5	380.1	-	-
<2mm Subsample Weight	g dry wt	57.1	51.5	54.4	-	-
Weight of Asbestos in ACM (Non- Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	0.01039	0.00361	-	-





This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.

The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Glossary of Terms

• Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.

Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.

ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis

• ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.

Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
 Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil. https://www.branz.co.nz/asbestos

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction

2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil					
Test	Method Description	Default Detection Limit	Sample No		
Individual Tests					
Wgt of Asbestos as Asbestos Fines in <10mm >2mm Fraction*	Measurement on analytical balance, from the <10mm >2mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.00001 g dry wt	1-3		
New Zealand Guidelines Semi Quantitativ	ve Asbestos in Soil				
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-3		
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-3		
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-3		
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-3		
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-3		
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-3		
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1-3		
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-3		
Weight of Asbestos in ACM (Non- Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3		
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3		
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3		
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3		
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3		

Sample Type: Soil					
Test	Method Description	Default Detection Limit	Sample No		
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3		
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3		

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

John Keneth Paglingayen Bachelor of Applied Science Laboratory Technician - Asbestos
www.4sight.consulting

APPENDIX D: Waipa Networks Service Confirmation

4 September 2020



Sarah Osborne Bloxham Burnette & Olliver Ltd PO Box 9041 HAMILTON 3240

Dear Sarah

Subdivision: M.L.S.F. Burnett Your Ref: 146110-00-011-B Our Ref: 14723 50 Te Awa Lane, Tamahere

Waipa Networks Ltd confirms that our distribution network has the capacity to supply the above subdivision.

The full design and Capital Contribution costs incurred for the reticulation of the subdivision along with any electricity easements that are required will be the responsibility of the developer and these will be forwarded once the design is completed.

Yours faithfully

M. G.

Bill Gray CUSTOMER CONNECTIONS SUPERVISOR P:\Correspondence\wpsep20\confirmaiton m.l.s.f. burnett_bloxham burnette oliver ltd bg



WAIPA NETWORKS LTD 240 Harrison Drive PO Box 505 Te Awamutu, 3840

TE AWAMUTU Telephone: 07 872 0745 Facsimile: 07 870 2401 CAMBRIDGE Telephone: 07 827 4014 Facsimile: 07 827 6487



APPENDIX E: – Ultra Fast Service Confirmation

Ref: BBO Surveying - 146110 ID: MT-007-01



4th of September 2020

0800 342 735 info@ultrafast.co.nz

ultrafastfibre.co.nz

CONDITIONAL ACCEPTANCE BY ULTRAFAST FIBRE LIMITED AS TELECOMMUNICATIONS OPERATOR

Subdivision: 50 Te Awa Lane, Tamahere, Part Lot 6, DPS 11104, Waikato District.

- Ultrafast Fibre Limited (UFF) confirms that a UFF telecommunications connection will be made available for each site in the development, providing the developer was to sign an UFF Installation Agreement. Upon approval of this agreement, UFF will undertake to become the telecommunications operator of the telecommunications reticulation in the proposed public roads for the 50 Te Awa Lane, Tamahere, Waikato District, Subdivision by M.L.S.F Burnett (the "Subdivision") Part Lot 6, DPS 11104, to provide network connections to Lot 1 through to Lot 6, in the Subdivision (the "Reticulation").
- 2. The Reticulation will be installed in accordance with:
 - (a) the requirements and standards set by the Waikato District Council and advised to UFF via the Council's website; and
 - (b) the requirements of the Telecommunications Act 2001 and all other applicable laws, regulations and codes (as amended).
- 3. The Reticulation will be installed by Broadspectrum Limited to UFF's satisfaction.
- 4. UFF will be the owner, operator and maintainer of the Reticulation.
- 5. One or more retail service providers will be available to supply telecommunications services over the completed Reticulation when service is available, provided that UFF shall not be responsible if the retail service provider's offer to supply such telecommunications services or the number of such providers varies from time to time.

SIGNED for and on behalf of **ULTRAFAST FIBRE LIMITED** by:

ROLit

Signature:

Name:

Russell Gibson

Date:

4th of September 2020

The ultimate broadband experience



10 50 Te Awa Lane\Drawings\146110-00-0111.dwg 26/6/2019 4:21 PM hwilderm

	32	3	
ME	MORANDU	M OF PROPOSED EAS	
PURPOSE	SHOWN	TENEMENT (BURDENED LAND)	TENEMENT (BENEFITTED LAND)
RIGHT OF WAY, RIGHT TO CONVEY WATER ELECTRICITY &	A	LOT 101 HEREON	LOTS 1 - 6 HEREON
TELECOMMUNICATIONS	D	HEREON	HEREON
AN H SE OV CC CC IN S3	MALGAMA IAT LOT 10 VEN UNDI' WNERS OF DMMON IN DMPUTER I ACCORDA	TION CONDITION: 220 11 HEREON (LEGAL ACC VIDED ONE-SIXTH SHA LOTS 1 - 6 HEREON AS THE SAID SHARES AN FREEHOLD REGISTERS NCE THEREWITH. DRAFT DRA AREAS AND DIM CONFIRMED BY FINAL DRAWING	D(1)(b)(iv) CESS) BE HELD AS TO ARES BY THE S TENANTS IN D THAT INDIVIDUAL BE ISSUED WING ONLY TENSIONS TO BE FIELD SURVEY AND
COMPRISED IN REGISTERED OWNER LOCAL BODY	I : SA 56	ی ج۶ 5A/381 5.F BURNETT (ATO DISTRICT	S.
LAND DISTRICT	: SOUT	TH AUCKLAND	
SCHEME PLAN		STATUS DATE 20.06.2019 DRAWING NUMBER 146110-00-01	AINARY SCALE (ORIGINAL SIZE A3) 1:1500 11 B

APPENDIX F: – Chorus Service Confirmation

Steve Bigwood

From: Sent:	Chorus Property Developments <develop@chorus.co.nz> Thursday, 10 September 2020 9:43 AM</develop@chorus.co.nz>			
То:	Sarah Osborne			
Subject:	Chorus Property Developments, HNE59821 - 50 Te Awa Lane, Tamahere.			
Attachments:	Development Scheme Plan HNE59821.pdf			

Hello Sarah,

Please see below notes provided by our scoping team in relation to your development at 50 Te Awa Lane, Tamahere.

Thank you for providing an indication of your development plans in this area. I can confirm that we have infrastructure in the general land area that you are proposing to develop. Chorus will be able to extend our network to provide connection availability. However, please note that this undertaking would of course be subject to Chorus understanding the final total property connections that we would be providing, roll-out of property releases/dates and what investment may or may not be required from yourselves and Chorus to deliver the infrastructure to and throughout the site in as seamless and practical way as possible.

The cost involved would be a minimum of our current standard fee of \$1600 per lot excluding GST. This cost can only be finalised at the time that you are ready to proceed.

Chorus is happy to work with you on this project as the network infrastructure provider of choice. What this ultimately means is that the end customers (business and home owners) will have their choice of any retail service providers to take their end use services from once we work with you to provide the physical infrastructure.

Please reapply with a detailed site plan when you are ready to proceed.

Kind regards,

Aimee Smith Property Development Coordinator

T 0800 782 386 opt1 M E <u>develop@chorus.co.nz</u> PO Box 9405 Hamilton www.chorus.co.nz

CH ORUS

Please consider the environment before printing this email

From: Chorus Property Developments <develop@chorus.co.nz>
Sent: Monday, 7 September 2020 1:36 PM
To: sosborne@bbo.co.nz
Subject: Chorus Fibre Contract: HNE59821 - 50 Te Awa Lane, Tamahere. 6 Lots (Lots 1-4 & 6 New, Lot 5 Existing)
Simple estimate

Hi Sarah,

Thanks for your email and development plans. We'll assess your application and will be back in touch to advise next steps.

Here's your development ref #: HNE59821

We continue to monitor the evolving COVID-19 situation very closely and have put measures in place to help keep our people and customers protected. The health, safety and wellbeing of our workforce and customers is and will always be our top priority.

All aspects of our New Property Development process are operational, subject to strict adherence of safe working practices. Due to the impacts from this pandemic and restricted ways of working, there may be delays in completing the field work. We ask for your patience and understanding as we work through this together.

If you believe your build work is urgently required to enable an emergency or essential service, as defined by the government, or it is required for someone with medical or online learning needs, then please provide us with details and we will review.

We're here to help – so please let us know if you need any further information.

Kind regards, Geordie Rumbles Property Development Coordinator

т 0800 782 386 opt 1 Е <u>Develop@chorus.co.nz</u>

PO Box 9405 Hamilton www.chorus.co.nz

C H 🔍 R U S

Good afternoon Stephanie,

I am hoping that you or someone in your Team will be able to help with the following.

BBO are currently scoping the development potential of the property located at 50 Te Awa Lane, Tamahere. The property is accessed directly off the end of Te Awa Lane (no exit road). 50 Te Awa Lane, Tamahere is situated within the Rural Zone under the Operative Waikato District Plan and the Proposed Waikato District Plan. BBO have lodged a submission against the Proposed Waikato District Plan on behalf of the property owner, requesting that the proposed zoning of 50 Te Awa Lane be changed to Country Living. If the site is rezoned to be Country Living, the property will be able to be subdivided into up to six lots (five vacant). In order for us to determine whether this property has the development potential that we anticipate, we are requesting confirmation of the chorus services within the vicinity of the site and that there is capacity available within these services within the vicinity of the site additional lots to be served. Can you please confirm this availability?

Please let me know if you require any additional information to provide the feedback that we request in relation to the above.

Thank you for your time and I look forward to hearing from you soon.

Kind regards,



Sarah Osborne INTERMEDIATE PLANNER Level 4, 18 London Street, PO Box 9041, Hamilton 3240 R +64 7 838 0144 D +64 7 834 7098 M +64 27 842 6585 E sosborne@bbo.co.nz W www.bbo.co.nz

If you wish to send us a large file, please click the following link: <u>https://www.sendthisfile.com</u>

This e-mail is a confidential communication between Bloxam Burnett & Olliver Ltd and the intended recipient. If it has been received by you in error, please notify us by return e-mail immediately and delete the original message. Thank you for your co-operation.

APPENDIX G: Waikato District Council Service Confirmation

Steve Bigwood

From:	Waters Billing <waters.billing@waidc.govt.nz></waters.billing@waidc.govt.nz>
Sent:	Wednesday, 9 September 2020 1:19 PM
То:	Sarah Osborne
Subject:	1008588 Proposed subdvision RE: Water soppy capacity/connection process [# 259D0G]

Hi

Thank you for your query for a new water connection, based on your address this is within the rural supply zone and be restricted supply. This means a flow restrictor will be put in with the water meter that will limit your daily intake to 1.8m³ at a steady flow rate through a water meter. Customers receiving a restricted flow supply shall make provision for onsite water storage of a minimum volume of 22m³ or equivalent of at least 48 hours of average water use where this is greater than 22m³.

If the subdvision was approved for this many connections and based on restricted supply, this would be completed privately by developer/owner at their cost/management. As part of the consent process this would be looked at in detail and capacity/requirements/conditions per Waikato District Council consents process, Water Supply Bylaw (2014) and Regional Infrastruture Tehcinical Speicifications. Thank you.

Should you have any queries, please contact me.

Kind Regards

Jaime Wara

Lead Customer Care Representative

Waikato District Council Services provided by Watercare Waikato

Te Kaunihera aa Takiwaa o Waikato P 07 824 8633 F 07 824 8091 Call Free 0800 492 452 Private Bag 544, Ngaruawahia 3742 15 Galileo Street, Ngaruawahia



-----Original Message-----From: <u>sosborne@bbo.co.nz</u> Sent: Thursday, 3 September 2020 2:38:06 p.m. To: <u>info@waidc.govt.nz</u> Subject: Water soppy capacity/connection process

Attention: Waters Team

Good afternoon,

BBO are currently scoping the development potential of the property located at 50 Te Awa Lane, Tamahere (Part Lot 6 DPS 11104).



A Council water supply reticulation runs along the eastern and southern boundary of the site. Could you please confirm if this supply has capacity to service up to five additional lots (from 50 Te Awa Lane – Part Lot 6 DPS 11104)? If there is capacity, can you please confirm the process to install connections?

Please let me know if you require any additional information to provide the feedback that we request in relation to the above.

Thank you for your time and I look forward to hearing from you soon.

Kind regards,

Sarah

APPENDIX H: Road Capacity Assessment



Level 4, 18 London Street PO Box 9041, Hamilton 3240 New Zealand

> +64 7 838 0144 consultants@bbo.co.nz www.bbo.co.nz

Memo

То	Steve Bigwood
сс	Cameron Inder
From	Lindsay Boltman
Date	22 October 2020
Job No.	146110
Job name	Te Awa Lane, Tamahere
Subject	Road Capacity Assessment

1. Introduction

Bloxam Burnett & Olliver Limited (BBO) has carried out a capacity assessment for Te Awa Lane, to support the rezoning submission that has been lodged against the Proposed Waikato District Plan (PDP) on behalf of the owners of 50 Te Awa Lane (the Submitter). The submission requests that 50 Te Awa Lane be rezoned Country Living rather than the proposed Rural Zoning that the PDP prescribes. If the site is rezoned it will give rise to increased development and subdivision potential.

This report provides a description of the traffic and transportation related effects for the prospect of additional traffic generated by the subdivision. It is not a full Traffic Impact Assessment and sits below that level of investigation. The report includes an assessment of the following:

- A road safety assessment of the existing transportation environment in the vicinity of the site;
- An assessment of the current sight distance standards;
- Investigation of the crash history that could highlight safety issues in the vicinity of the site;
- Estimation of the expected trip generation and assessment of operational or capacity effects, if any.

2. Existing Transportation Environment

2.1 Existing Land use

The subject site is located to south-east of Hamilton City and is predominantly surrounded by rural residential properties. The subject site is approximately 4.09 hectares (ha) in size and is legally described as Part Lot 6 DPS 11104. The site currently comprises of a residential dwelling and garage. The remainder of the site is held in grass and mature landscaping.

There are no significant transportation projects identified in the vicinity of the proposed development, now or in the near future.



2.2 Access to Development

The site currently has an existing vehicle entrance at the cul-de-sac end of Te Awa Lane. The Submitter identifies that the access can be made suitable as a right of way for accessing a subdivision of up to 6 lots. The access is currently unsealed and leads to a gravel driveway approximately 250 m long, to the existing residential dwelling.

2.3 Existing Road Network

The existing network of the roads surrounding the subject site is shown in Figure 1 together with the existing speed environment. Given that this assessment is in relation to a potential plan change, the details around exact development yield are not known at this stage. As such, an overview of the status and capacity of Te Awa Road and Te Awa Lane is included in the following sections of this report. Due to its topographical location with Te Awa Lane being a no exit road, traffic growth will occur only if more development occurs.



Figure 1: Road Network

2.3.1 Te Awa Road

Te Awa Road is approximately 1.07 km in length and operates as a two-lane, two-way sealed cul-de-sac road with a carriageway width ranging between 6 m and 7 m.

According to Waikato District Speed Limit bylaw 2019 (IntraMaps), Te Awa Road has a posted speed limit of 50 km/h. Te Awa Road is considered a low volume road with an Annual Average Daily Traffic (AADT) volume of 580 vehicles per day (vpd) and provides access to three vehicle crossings and one paddock between Pencarrow Road and Te Awa Lane (approximately 270 m). Thereafter, traffic volumes decrease to 360 vpd for the next 280 m and then again to 180 vpd for the remaining 520 m (2020 estimation from Mobile Road).

2.3.2 Te Awa Lane

Te Awa Lane is a two-lane, two-way sealed 'No Exit' road with a carriageway width of 6 m. The overall length is approximately 492 m from Te Awa Road. Te Awa Lane connects to Te Awa Road at a point 270 m from Te Awa Road / Pencarrow Road intersection.



IntraMaps indicates that Te Awa Lane has a speed limit of 100 km/h. However, the operating speed is estimated to be in the region of 80 km/h – 85 km/h based on the road environment. Vehicle speeds are likely to reduce as a horizontal curve is located just past the midway mark of Te Awa Lane with approximately 135 m of road length remaining.

According to the ODP, Te Awa Lane is a low volume Local Road with an AADT of 150 vpd with 4% heavy commercial vehicles (2020 estimation from Mobile Road).

2.4 Road Safety

Crash data for the last ten-year period (2010 to 2020), was sourced from Waka Kotahi New Zealand Transport Agency's Crash Analysis System (CAS) and was analysed to identify any road safety-related issues within the vicinity of the subject site.

The CAS data shows that there have been no reported crashes along Te Awa Lane, and similarly none at the intersections of Te Awa Lane / Te Awa Road, and Te Awa Road / Pencarrow Road over that 10 year period.

2.5 Sightlines

Waikato District Plan specifies that the minimum sight distance for a 50 km/h speed environment within a rural area is 90 m for a vehicle entrance generating more than 40 vehicle movements per day. The achievable sight distances looking west and east from Te Awa Road / Te Awa Lane intersection are summarised in Table 1 below.

Table 1

Sight Distance					
Location	Direction	Sight Distance	Requirement		
To Awa Dood / To Awa Lana Intersection	West	More than 200 m	00 m		
Te Awa Road / Te Awa Lane Intersection	East	More than 100 m	90 m		

Table 1 above shows that the achievable sightlines at the intersection will comply with Council's minimum requirements and therefore, will have no apparent road safety issues with the additional traffic.



3. Road Capacity

3.1 Predicted Trip Generation

NZTA Research Report 453: Trips and Parking Related to Land Use confirms that 10.1 daily trips are generated per residential unit within a rural environment, this data is included in Table 2 below:

Table 2		
Land Us	e: Residential Unit (Rur	al)
Source	Peak Hour Trips	Daily Trip Rate
NZ Trips	1.4 / Dwelling	10.1 / Dwelling

The trip rates for a residential dwelling in a rural area are considered to be in the same region as dwellings in a suburban area. The daily trips do not specify the number of model choices within these trips. Due to the lack of public transport facilities within the area, the 10 daily trips are based on five trips leaving and five returning. It was noted that The Report 453 does not specify the peak hour period to AM or PM generation rates, but it is typically recognised that 80% of AM residential trips are outbound, while the PM peak is less polarised at around 65% / 35% inbound to outbound split.

On the basis of up to five additional lots the development can be expected to generate approximately 50 vpd of which 7 trips will be in the peak hours.

Table 4 Access and Road Performance Standards (refer to as Table 3 of this report) of the District Plan indicates that a rural / country living zone public road with a sealed carriageway width of 6 m is typically suitable for an AADT range of 80 to 500 vpd. Te Awa Lane currently generates 150 vpd, so this is well within the indicative suitable volume range. Given the flat topography, the additional 50 vpd generated by this site is likely to cause negligible impact on the operational capacity and safety of this section of road.

Te Awa Road currently carries 580 vpd over the 270 m length between Pencarrow Road and Te Awa Lane. This is already slightly more than the District Plan indicative suitable range. With the additional 50 vpd generated from the potential five additional lots, Te Awa Road daily traffic would increase to around 630 vpd.

Although the District Plan identifies 500 vpd as the indicative upper limit, this actually varies based on topography, road geometry, frequency of access ways, and percentage HCV. Te Awa Road is relatively flat, has good access sightlines, low HCV content, low vehicle speeds and no evidence of safety issues. Accordingly, it is unlikely an additional 50 vpd due to five additional dwellings would create any serious safety issues.

General					Seal Width			Berms			General						
Road Type	Nun	nber of Ho Allotments or Activitie	ouse : s	Indicative Traffic Volume (AADT)	Speed Environ- ment (km/h)	*Minimum Road/ROW Reserve Width (m)	Minimum Trafficable Carriageway (m)	Parking Provision	Total (m)	I	Services Foot (m) Path Cycle way		Foot Path/ Cycle- way	Kerb and Channel/ WaterTable	Length (m)	gth Turning Area 1) (no exit roads)	
Rural, Coastal,	Pa and C	ountry Livi	ng Zones	5													
Access leg allotme	to an nt	I		10	N/A	Access leg 9m width											
Private access a ROW and a allotme	including in <u>access</u> int	2 to 4	20	to 30	50	9*m	3	N/A	\	3	Side slope or boundary	N	I/A	Optional	0 -	500	Subject to specific design
Access allo	tment	5 to 8	40	to 80		20*m	4			4							Yes
Public	-	>8	80	- 500	100	20	6			6	Adjacent to boundary	1.	5m	All Zones - subject to specific design. Country living - nibs along seal edge.	50	0 +	Yes
			5	+00	100	20	Subj	ect to specific	: design								

Table 3

*Minimum road reserve width excludes additional width required for the turning head.



Conclusion

The following key conclusions are drawn from this assessment of transport effects for the proposed rezoning:

- If rezoned, the site has the potential to be subdivided into five additional lots for rural-residential development purposes. This would generate approximately 50 vpd additional on the road network;
- Te Awa Lane and Te Awa Road are located in a rural-residential area and both roads are cul-de-sacs, therefore both roads are low volume with low traffic growth potential. There are also very few heavy commercial vehicle movements on these roads per day. Both roads have good forward sight distance for the speed environment;
- The District Plan indicates that a rural / country living zone public road with a sealed carriageway width of 6 m can accommodate an AADT of 80 to 500 vpd. Although Te Awa Road currently exceeds the District Plan indicative upper volume, it is not unusual or problematic since the upper volume varies depending on topography, geometry, and frequency of access ways, sight distance and the number of heavy commercial vehicles;
- Te Awa Road is relatively flat, has good access sightlines, low HCV content, low vehicle speeds and no evidence of safety issues. Accordingly, it is unlikely an additional 50 vpd due to five additional dwellings would create any operational concerns or serious safety effects;
- Sightlines at the Te Awa Road / Te Awa Lane intersection are very good, exceeding Council's minimum requirements. The same applies to the Te Awa Road / Pencarrow Road intersection.
- The CAS data shows that there have been no reported crashes along Te Awa Lane, and no crashes at the intersections of Te Awa Lane / Te Awa Road, and Te Awa Road / Pencarrow Road in the past ten years.

Overall, the transportation effects on the adjoining road network are expected to be minor to negligible if the site is rezoned and as a result, developed for up to five additional rural-residential dwellings.

Yours sincerely Bloxam Burnett & Olliver

1 Belturen

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APPENDIX I: Archaeology Assessment



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Archaeological site visit

50 Te Awa Lane

Hamilton

Matthew Gainsford October 2020

Contents

1	Summary	1
2	Physical environment and setting	3
3	Site visit and auger survey	4
4	Results	4
5	Conclusions and recommendations	7
6	References	8

1 Summary

Proposed plan change for a residential subdivision at 50 Te Awa Lane (Part Lot 6 DPS 11104). As part of the process an archaeological site visit was conducted by W. Gumbley Ltd on October 19, 2020 to determine the level of archaeology across the proposed area for development. Personal from W. Gumbley Ltd were accompanied by S. Bigwood from Bloxam Burnett and Olliver (BBO). A soil auger and pedestrian survey was conducted within areas proposed for subdivision and possible development. Survey identified two areas of made soils were identified on the property. These are the same areas as identified on Soil Bureau soil survey map Waikato Lowlands (McLeod 1984).

An un-named large pā, recorded in the NZ Archaeological Association site recording scheme as S15/65 is located within the subject property. This site is partially within 50 Te Awa Lane and partly with 49B Te Awa Lane. The area around 50 Te Awa Lane has reasonably high density with another large pā (S15/19) located immediately to the north and surrounded by a series pre-European Māori horticultural sites (S15/587, S15/588, S15/589, S15/630).



Figure 1. Location of the subject area in the landscape (Source: LINZ).



Figure 2: Map generated by Archsite showing locations of recorded archaeological sites in the vicinity of 50 Te Awa Lane.



Figure 3. Plan for the proposed plan change within Part Lot 6 DPS 11104, the subject area (Source data: BBO).

2 Physical environment and setting

The area for the proposed plan change is located on river terraces of the Waikato River. There is a lower, middle and upper terrace that are affected. The plan change for subdivision is located almost wholly on the middle terrace. The upper terrace appears to have been formed by the Hinuera formation whilst the lower and middle terrace comprises soils of the Waikato series formed on the Taupo Pumice Alluvium.



Figure 4. Image taken from the driveway across the lower terrace to the north of the house; one of the areas with identified made soil. Photo is taken from the east.



Figure 5. Looking northeast across the proposed area for subdivision from the driveway on the middle terrace. The upper terrace is located at the eastern corner of the property and is visible to the left of the image.



Figure 6. Looking northeast towards the raised upper terrace which is the other area of identified made soils.

3 Site visit and auger survey

On October 10, 2020 W. Gumbley and M. Gainsford of W. Gumbley Ltd undertook a site visit and auger survey of the subject area. The purpose was to determine the level of archaeology within the lot. A Dutch-style auger was used to determine the level, if any, of made soils within the lot.

4 Results

A total of twelve auger samples area taken across the lot. Two on a lower terrace north of the house (an area of planner development) and ten within the area for planned subdivision. Eight of those within the planned subdivision area were located on the middle terrace (A3–8 and A11–12) and two on the upper (A9–10).



Figure 7. Location of auger samples within the lot overlaid on the proposed plan. The subject area is denoted by the red polygon. The image identifies the boundary of the subdivision to the house as the red line following the driveway and trees (Source: LINZ)

Results identified two areas of made soils on the property: one on the lower terrace (A1–2) and the other on the upper (A9–10). Stratigraphy on the lower terrace was: topsoil followed by a mixed made soil on top of Horotiu silt loam. On the upper terrace stratigraphy was: topsoil followed by dense sand and gravel that the auger was not able to penetrate more than 25 centimetres.



Figure 8. Location of identified made soils. L=Lower terrace and U=Upper terrace (Source: LINZ).

Also, within the lot is a pā site which is recorded on the NZAA database as site number S15/65. The pā has been highly modified by structures including the newest house constructed about 6–7 years ago (circa 2013–14). It is also evident that the house area has been cut noticeable by a scarp between the edge of the lot and the next lot to the east.



Figure 9. Aerial image from 1939 (SN107-H-1). The image shows clearly two close lying pā S15/19 (red) and S15/65 (blue). S15/65 lies within the subject area, shown further in the image below. Note the earthworks of the pa S15/65 extend onto the lower terrace where auger sample sites A1 and A2 were located. The Waikato River is to the bottom of the image and North is to the left. Note also the borrow pits immediately east of S15/19. (Source: Retrolens).



Figure 10. Location of the pā with the current house overlaid on top. This house was constructed circa six–seven years ago and replaced another on the same location. Note the evidence for a defensive ditch on the lower terrace which is currently not visible on the ground. (1943 SN266/854/33) (Source: Retrolens).

5 Conclusions and recommendations

No visible evidence of the pā S15/65 can be discerned within 50 Te Awa Lane, however we may assume that archaeological features remain, particularly deeper elements such as defensive ditches and pits. Two areas of made soils were identified; on the lowermost and uppermost terraces. The middle terrace, which includes most of the property contains no evidence for Māori horticulture in the form of Māori-made soils.

The lowermost terrace was the location auger sites A1 and A2, which showed clear evidence of a Māori-made soil (Tamahere loam), formed on top of a yellowish-brown silty B horizon. This represents an extension of the recorded horticulture site S15/587. 1943 aerial photography also shows two linear earthworks of the pa S15/65 located on lowest terrace (see figures 9 and 10) and these enclose approximately 400 m² of the lowest terrace. The uppermost terrace was the location of auger sites A9 and A10 and represent at small aspect of the recorded garden sites S15/588 and/or S15/589.

The small area of Māori-made soil identified on the uppermost terrace is both close to the boundary but also represents a very small part of an already disturbed site. Similarly, the Māori-made soils identified on the lower terrace represent a part of the disturbed horticultural site S15/587. The soil auger data indicates that the remaining elements of the horticultural site is probably well-preserved within the lower terrace. Similarly, we can expect the subsurface remains of the pā S15/65 on the lowest terrace to be well-preserved. The effects of development to the horticultural remains in the area may be mitigated with a detailed archaeological investigation.

6 References

Databases

Waikato Regional Council. WRAPS 2016 and LIDAR 2008.

Websites

ArchSite. 2020. New Zealand archaeological associations site recording database. < http://www.archsite.org.nz/>.

LINZ. 2020. Aerial imagery and primary parcel data. http://www.linz.govt.nz>.

Retrolens. 2020. Aerial imagery. <http://www.retrolens.nz>.

APPENDIX J: Subdivision Scheme Plan Example



APPENDIX K: Section 32AA Assessment

SECTION 32AA ANALYSIS

Table 1: Rezoning Proposal

The specific provisions sought to be amended	Assessment of the efficiency and effectiveness of the provisions in achieving the objectives of the Proposed Waikato District Plan (PDP)			
The proposal	Grant and Merelina Burnett seek the rezoning of their property at 50 Te Awa Lane, Tamahere, from Rural Zone to Country Living Zone.			
Relevant objectives and Policies of the PDP	 Growth occurs in defined growth areas (1.5.2(a)) Urban development takes place within areas identified for the purpose in a manner which utilises land and infrastructure most efficiently (1.12.8(b)(i)) Promote safe, compact, sustainable, good quality urban environment that respond positively to their local context (1.12.8(b)(ii)) Focus urban growth in existing urban communities that have capacity for expansion (1.12.8(b)(iii)) Protect and enhance green open space, outstanding landscapes, and areas of cultural, ecological, historic and environmental significance (1.12.8(b)(vii)) Future settlement pattern consolidated in and around existing towns and villages in the district and in 'defined growth areas' (1.5.1(b); 1.12.3(a); 1.12.3(c); 4.1.2(a); 5.3.8) Urban growth areas are consistent with Future Proof Strategy for Growth 2017 (4.1.3(b)) Infrastructure can be efficiently and economically provided (4.1.3(a)) In the rural environment, high class soils are protected for productive rural activities and urban development is avoided (5.1.1(a)) (a) Subdivision, use and development within the rural environment where: (i) High class soils are protected for productive rural activities are supported and development in the rural environment; (iii) urban subdivision use, productive rural activities are supported and development in the rural environment is avoided (5.1.1(A)(i)(ii)(ii); 5.3.8) Rural character and amenity are maintained (5.3.1 (a); 5.3.4 (a) (b)) Effects on rural character and amenity from rural subdivision (a) Protect productive rural areas by directing urban forms of subdivision, use, and development to within the boundaries of towns and villages. (5.3.8(a)) Ensure development does not compromise the predominant open space, character and amenity of rural areas. (5.3.8(b)) Ensure subdivision, use and development minimise the effects of ribbon development. (5.3.8(c)) Subdivisio			

	• Subdivision, use and development ensures the effects on public infrastructure are minimised. (5.3.8(f))			
Scale and significance of the rezoning proposal	The proposal solely relates to the minimum lot size applying to subdivision of the site. As such, it is relatively confined and concise in scope / application and is considered to be limited in scale and significance.			
	The proposed Country Living development is able to be accommodated on the site, having regard to the assessments prepared by expert advisers and service providers.			
Other reasonably practicable options to achieve the objectives (alternative	Given the nature of the proposal, only two options have been identified:			
options)	 Option 1 – Status quo; that is, retain the Rural Zoning of 50 Te Awa Lane 			
	 Option 2 – Rezone 50 Te Awa Lane to be Country Living 			

Table 2: Benefits and Costs Analysis of the Proposal

Rezoning Proposal: Option 1 – Do Nothing							
	Benefits	Costs					
General	 No general benefits identified 	• Loss of immediate opportunity to provide for additional land to be rezoned in a manner that would align with higher order objectives to protect productive rural land					
Environmental	 No change to the current landscape character No environmental benefits identified – maintains the status quo 	 Reduces the availability of rural lifestyle lots which increases the continued subdivision of Rural Zoned land 					
Social	Rural character of existing environment is retained, which may be preference to some in the wider community	 Existing issues of housing affordability remain and may be exacerbated. Limits the ability of the owners to utilise their land productively. If the site were to be utilised for rural activities reverse sensitivity effects are likely to arise due to the close proximity to adjoining sites that have been developed to a country living ended. 					

Economic	No economic benefits identified	Loss of needed capacity in housing market			
		 Lack of competition in housing market due to rural areas being limited to specific landholders 			
Economic Growth	No economic benefits identified	Will not provide for future economic growth of the land			
Employment	No employment benefits identified	Will not provide for potential employment opportunities associated with proposed residential development			
Cultural	No cultural benefits identified	No cultural costs identified			
Rezoning Proposal: Option 2 – Rezone the Site fro	om Rural to Country Living (i.e. Relief Sought)				
	Benefits	Costs			
General	 The proposal will enable the Council to better achieve the objectives and policies of the RPS and align with the expectations of the WTEP. The proposal will rezone suitable land for Country Living purposes thereby better protecting high quality soils in other areas that should be more appropriately protected for rural production. 	No general costs identified			
Environmental	The rezoning of the subject site will enable a more efficient use of the site.	• No environmental costs identified. Note that there are no impediments to development from geotechnical, contamination or archaeological matters; wastewater and stormwater will be able to be managed on site through appropriately designed and constructed infrastructure; the site can be provided with urban services without upgrades; and the roading network can accommodate 5 additional lots without upgrade or other safety issues being created.			

Social	 Enables the property owners to establish a more productive land use across the site. Increases the availability of Country Living Zoned land that is available for development. 	Potential for perceived reduction in countryside amenity by some in the wider community.
Economic	 Promotes growth and extension of the Country Living Zone increasing housing availability 	 No economic costs identified – Note that there are no infrastructure capacity constraints identified, therefore no upgrades are required.
Economic Growth	Enables greater competitiveness in the housing market, with associated increases in housing choice and affordability	No economic costs identified
Employment	 Promotes growth of economy and employment opportunities, in terms of increased construction activity 	No economic employment costs identified
Cultural	No cultural benefits identified.	 The subject site contains archaeological sites. Rezoning the site will enable development that may adversely affect the archaeological sites.

Table 3: Evaluation of the Proposal

Reasons for the preferred option.	selection	of th	The rezoning of 50 Te Awa Lane, Tamahere, to Country Living rather than Rural as proposed through the PWDP is the most appropriate method to address the issue, for the following reasons:	
			 It provides for the efficient use of land and enables development that is well connected and serviceable. The site is legally and physically separated from lots that are zoned Rural and thereby limiting the potential of any logical amalgamation potential. If the site were to be used under an intensive rural land use, the likelihood of reverse sensitivity effects would be high given the total area of the subject site and the proximity of residential land uses on adjoining sites. Enabling development within the subject site that is in accordance with the Country Living Zone District Plan provisions would give rise to development that would contribute to the existing amenity of the receiving environment. 	
Extent to which the objectives of the proposal being evaluated are the most appropriate way to achieve the purpose	The alternate option of retaining the status quo is considered to result in a less efficient use of the Site and does not align with the overall direction of the relevant strategic documents or with the existing development that surrounds the site. The proposal achieves the purpose of the RMA through the provision of growth and development in the Te Awa Road/Lane area to cater for the needs of current and future generations while ensuring the protection and enhancement of the natural and physical resource. The proposal will provide for the efficient use of the land for			
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of the RMA	residential purposes without extensive loss of rural production land, in a location that is well placed to enable the compact growth of an existing urban area.			
Assessment of the risk of acting or not acting if there is uncertain information about the subject matter of the provisions	The risk of not acting on the proposal would be the loss of the existing opportunity for land to be rezoned in an appropriate manner to directly address the existing and ongoing issues of lack of capacity to meet growth demand.			
Conclusion	The proposed option of rezoning the site would be a positive planning decision in line with the purpose and principles of the RMA that would enable Council to better respond to the high levels of growth and anticipated demand for housing in the District and provide greater competition and choice in the housing market whilst protecting other more vulnerable areas of highly productive land that are under high demand for development.			