

Stratford Properties Limited

Clevedon Kawakawa Road Private Plan Change Request

Responses to LC1, LC2 and LC3 in Appendix 2 of Auckland Council's request for further information pursuant to Clause 23 RMA

LC1

The report *Soils at 278 Clevedon - Kawakawa Road* already contains a list of soil series names (refer to map key, also to tables). A soil series name was identified at each observation hole, and a land resource inventory (including soil series name) was recorded for each area surrounding a hole (map polygon).

New Zealand Soil Classification (NZSC) is one of three methods recommended for recording soil as part of a land resource inventory. However it is not a standard practice when producing a property-scale land use capability map, because a local soil series name is more easily recognised by landowners.

The corresponding New Zealand Soil Classifications are provided below, as further information for Auckland Council staff.

Ka = Karaka loam = typic orthic allophanic

Ka' = Karaka loam (shallow topsoil) = typic orthic allophanic

Kam = Karaka loam (mottled) = typic impeded allophanic

Wps = Whatapaka sandy loam (gleyed) = typic gley allophanic

Wpg = Whatapaka sandy loam (gleyed) with clay subsoil = typic gley allophanic

Cl = Clevedon silt loam with clay subsoil (incl weathered gravel) = typic orthic gley

Cl' = Clevedon silt loam (shallow topsoil) = typic orthic gley

Clm = Clevedon silty clay loam (mottled) = typic orthic gley

Ha = Hauraki clay loam = typic orthic gley

Ham = Hauraki clay loam (mottled) = typic orthic gley

Hag = Hauraki clay (gleyed) = typic orthic gley

Hay = Hauraki peaty clay (raw) = peaty raw

Wm = Whangamaire silt loam = typic fluvial recent

Wmm = Whangamaire silty clay loam (mottled) = mottled fluvial recent

Wmg = Whangamaire silty clay (gleyed) = typic recent gley

Wmr = Whangamaire silt & silty clay (raw) = fluvial raw

LC2

In *Soils at 278 Clevedon - Kawakawa Road* (my report referred to by Auckland Council as “the Soil Assessment Report”), the phrase “a separate assessment by Mr. Stuart Ford confirms that neither area suffices to support a viable horticultural enterprise” refers to Mr. Ford’s *Report on the potential for intensive land use on 278 Clevedon Kawakawa Road as part of a proposed Private Plan Change*. Mr. Ford is the sole author of that report, and that is his conclusion.

LC3

Auckland Council’s LC3 comment is simply incorrect where it states (in third column) that my evidence in the Self Family Trust versus Auckland Council hearing “makes a contrary conclusion regarding the classification of LUC 3”. It is correct where it asserts (in fourth column) that “Dr. Douglas Hicks previously regarded land containing prime soils as both LUC class 2 and 3 land” (I still do), but mistaken where the comment “arguably implies that any soil occupying LUC class 2 and 3 land falls within the definition of prime soils”.

My rebuttal evidence for the Self Family Trust and Auckland Council Environment Court hearing 29875791 (SFT v AC) does not make a contrary conclusion regarding the classification of LUC 3, because the rebuttal evidence refers to specific areas of Class 3 land in the Appeal Area which are indeed land containing prime soil. In contrast, my evidence-in-chief contains a clear statement that not all LUC 2 or 3 land in the Appeal Area meets AUPOiP’s definition of “land containing prime soil” plus an explanation of why this is so.

My evidence about elite and prime soils was accepted by the Environment Court (Paragraphs 262-268 and 401-403, Decision [2018] NZEnvC 49). A subsequent High Court interim judgment (Decision CIV 2018-404-866 [2019] NZHC 276) upheld identifications of elite and prime soil within the Appeal Area (Paragraphs 66-68). However it found that the Environment Court erred in its construction of Policy B2.2.2(2)(j) as regards their protection for food production (Paragraphs 77-95). The High Court's final judgement instructed the Environment Court to determine the proper location of the Rural-Urban Boundary (RUB) having regard to its interim judgment and in its discretion, considering further evidence (Paragraphs 37-39, Decision CIV 2018-404-866 [2019] NZHC 1603).

My soil and land use capability map for 278 Clevedon-Kawakawa Road is entirely consistent with the SFT v AC appeal evidence and subsequent court decisions. My accompanying report identifies several areas of LUC 3 land as prime because they have well-structured volcanic soil although at risk of topsoil erosion (if cultivated). They happen to be small (collectively 6.03 hectares). The report identifies numerous areas of LUC 3 land as other (i.e. "not prime") because they either have shallow volcanic topsoil (re-deposited by runoff) over buried old alluvial subsoil (seasonal wetness in the weathered clay limits cultivation and crop growth), or shallow alluvial topsoil (deposited by floodwater) over buried old alluvial subsoil (flood risk is an additional limitation). These areas are collectively large (35.1 hectares).

It would be reasonable to protect a property which is mostly LUC 2 or 3 land from development, if a large part of the land is occupied by prime soil. It would be unreasonable to protect it, if just a small part is occupied by prime soil. Auckland Council's purpose when requiring a soil and land use capability map to accompany a proposed plan change application is - presumably - to determine the extent of prime soil that is actually contained on the site.

For further explanation of why not all the soil within LUC 2 or LUC 3 land is prime, Auckland Council staff could read an information note (*Definitions of elite and prime soil in the Auckland Unitary Plan*) supplied to its Research and Evaluation Unit in July 2019. Much of the information note relates to specific matters in another planning application which should remain confidential between that Applicant and the Council. However Section B applies generally to identification of elite and prime soils for any planning application, so is appended.

**Dr. Douglas L Hicks,
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6 April 2020

References

Decision [2018] NZEnvC 49 Between Self Family Trust (Appellant) and Auckland Council (Respondent)

Decision CIV 2018-404-866 [2019] NZHC 276 Between Joe Gock and Fay Gock (Appellants) and Auckland Council (Respondent)

Decision CIV 2018-404-866 [2019] NZHC 1603 Between Joe Gock and Fay Gock (Appellants) and Auckland Council (Respondent)

Hicks D L 2019 Definitions of elite and prime soil in the Auckland Unitary Plan Information note supplied to Research and Evaluation Unit, Auckland Council

Section B from *Definitions of elite and prime soil in the Auckland Unitary Plan*

B Definitions of elite and prime soil in the Auckland Unitary Plan Operative In Part

Some common misconceptions

These are not verbatim quotes, but misconceptions which appear to underlie a number of requests for further information which have been forwarded to me for a response within recent months:

“All soils within land designated LUC Class 1 are elite” : not so. The AUPOIP definition identifies “land containing elite soil” as LUC Class 1.

“All soils within land designated LUC Classes 2 and 3 are elite” : not so. The AUPOIP definition identifies “land containing prime soil” as LUC Classes 2 and 3.

“Patumahoe clay loam is an elite soil where-ever it occurs” : not so. Patumahoe may be elite (where LUC 1 and it meets soil-related criteria in the definition) or prime (where LUC 2 or 3 and it also meets soil-related criteria in the definition) or other (where LUC 1, 2 or 3 but it fails soil-related criteria) or other (because on land assessed as LUC 4 or worse). Ditto any other soil mapped on LUC 1 land.

“Whakapara clay loam is a prime soil where-ever it occurs” : not so. Whakapara may be prime (where LUC 2 or 3 and it also meets soil-related criteria in the definition) or other (where LUC 2 or 3 but it fails soil-related criteria) or other (because on land assessed as LUC 4 or worse). Ditto any other soil mapped on LUC 2 or 3 land.

“Elite and prime soils are absent from LUC Class 4 or worse land” : not necessarily so. There are circumstances in which a soil could meet all the AUPOIP soil criteria for prime soil - even elite soil - but fail AUPOIP’s criterion that the soil be contained within land mapped as LUC Classes 3, 2 or 1. An example is the Red Hill sandy loam currently being converted to avocado orchards at Tapura. Some of it is LUC Class 3, but much is Class 4 or 5. Another example might be a well-structured slow-draining variant of Marua soil planted in vineyards on Waiheke Island. If mapped at property scale the vineyards’ LUC would likewise range from Class 3 through Classes 4 and 5. Presently a case to keep such soils for high-value food production would be difficult to present in court, because AUPOIP's definitions exclude them.

To avoid the misconceptions, it may be helpful for Auckland Council staff to read recent explanations of the AUPOIP definitions; and of the process by which a soil scientist determines whether a soil meets the definition of elite, prime or (by default) other at a particular site.

How the definitions are actually worded; and how soil scientists identify a soil as being elite, prime or other in terms of the definitions

A recent Environment Court decision (2018 NZEnvC 049) accepted my evidence on behalf of Auckland Council about identification of soils as elite, prime or other. On

this ground and also on other grounds (outstanding natural features, mana whenua values) it upheld Auckland Council's rural production zone over a significant area of elite and prime soil which the appellants wished to urbanise. The decision was subsequently appealed to the High Court on points of law. The High Court referred the case back to Environment Court for re-consideration of evidence about economic viability of horticulture, but upheld its decision on all other grounds including the elite and prime soils issue. It is worth noting as the only one of several AUPOIP appeal decisions so far to uphold Auckland Council's position on protecting elite and prime soils from conversion to non-rural use.

Some key paragraphs in my evidence (from transcript Env-2016-Akl-304-000199) are reproduced here for guidance of Auckland Council staff. They may provide some understanding about how soil scientists interpret AUPOIP's definitions when classifying soils as elite, prime or other, not just at the site subject to appeal but at other sites generally. I am happy to provide further guidance about the topics in any of these paragraphs.

5 MATTERS RELEVANT TO DETERMINING WHETHER SOILS WOULD BE CLASSIFIED AS ELITE, PRIME AND OTHER

5.1 The AUPOiP defines land containing elite soil as:

Land classified as Land Use Capability Class 1 (LUC1). This land is the most highly versatile and productive land in Auckland. It is:

- *well-drained, friable and has well-structured soils;*
- *flat or gently undulating; and*
- *capable of continuous cultivation.*

Includes:

- *LUC1 land as mapped by the New Zealand Land Resource Inventory (NZLRI);*
- *other lands identified as LUC1 by more detailed site mapping;*
- *land with other unique location or climatic features, such as the frost-free slopes of Bombay Hill;*

- *Bombay clay loam;*
- *Patumahoe clay loam;*
- *Patumahoe sandy clay loam; and*
- *Whatitiri soils.*

5.2 The AUPOiP defines land containing prime soil as:

Land identified as land use capability classes two and three (LUC2, LUC3) with slight to moderate physical limitations for arable use. Factors contributing to this classification are:

- *readily available water;*
- *favourable climate;*
- *favourable topography;*
- *good drainage; and*
- *versatile soils easily adapted to a wide range of agricultural uses.*

5.3 These definitions were uplifted and modified from the former Auckland Regional Policy Statement 1999. Other land is not defined, though by default it is any land which does not meet the criteria for elite or prime.

5.4 I consider that some parts of each definition make it difficult for a soil scientist to state clearly whether a soil is elite, prime or other in terms of the AUPOiP wording. These include, but are not limited to the following issues:

(a) "unique location or climatic features" are unspecified (apart from one locality which is certainly not unique);

(b) several highly versatile and productive soils are not listed;

(c) some of the factors contributing to classification of land as LUC 2 or LUC 3 are vaguely worded;

(d) whether LUC 1, 2 & 3 land as mapped by the NZLRI at 1:50,000, or LUC 1, 2 & 3 land as identified by more detailed site mapping, should be equated with land containing elite and prime soil;

(e) where LUC 1, 2 or 3 land contains a mix of soils, whether it fits the definition of land containing elite soil (where there is some elite) or prime soil (where there is more prime than elite) or neither (where other soil occupies a larger part of the land's area).

5.5 From a soil scientist's perspective, the land in the appeal area would be assessed as highly versatile (generally corresponding to 'elite') soil or versatile (generally corresponding to 'prime') soil depending on factors more specific than those listed in the AUPOiP definitions for land containing elite and prime soils. The properties of a highly versatile soil are well summarised by the New Zealand Society of Soil Science's publication *Soils in the New Zealand Landscape* (Molloy 1988):

- *occurs on flat land or very gentle slopes (<5°),*
- *has a potential rooting depth of at least 0.75 m,*
- *offers little resistance to root penetration,*
- *suffers very few days of soil water deficit,*
- *suffers very few days of waterlogging,*
- *has enough large, interconnected pores to ensure good drainage and aeration,*
- *has a low content of stones,*
- *is capable of being cultivated by machines through most of the spring period,*
- *has high structural stability, and*
- *is not likely to suffer from erosion, flooding or salt contamination.*

5.6 The above criteria are accepted and used by professional soil scientists throughout New Zealand.

5.7 A highly versatile soil meets all the criteria. A versatile soil meets most, but falls short on one or more. The limitation - greater slope, shallower rooting depth, etc. - necessitates an adjustment to how the soil is managed. Where field examination of its soil (and other site characteristics) indicates all physical limitations are absent or negligible, a site is classed as LUC 1, defined as *the most versatile multiple-use land with minimal physical limitations for arable use* (Land Use Capability Handbook, Lynn et al 2009). Where field examination indicates a limitation is present but slight, the site is

classed as LUC 2, defined as *very good land with slight physical limitations to arable use, readily overcome by management and soil conservation practices*. Where field examination indicates a limitation is moderate the site is classed as LUC 3, defined as *land (which) has moderate physical limitations to arable use. These limitations restrict the choice of crops and the intensity of cultivation, and/or make special soil conservation practices necessary*.