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Addendum to Agricultural Development Report

June 18 2024

Former Kongwak Butter factory

Lot3 of PS331420

### Background to this report

A short two page report on the inherent land characteristics of the property known as the Old Kongwak Butter Factory was prepared in July 2023. The owners of the property are seeking to develop the property for an extensive kitchen garden and small commercial farming operation to supply and compliment a proposed restaurant and accommodation complex for Kongwak. The two page report has been submitted as one of several supporting documents for a planning application to develop the restaurant and accommodation complex.

The planning process has generated a request for further information (RFI). The request is to update the two page Agricultural Development report to include a map which can be read in conjunction with the described 'inherent land characteristics' and 'Agricultural Development' information outlined. The request includes a statement with extracts from the planning scheme whereby objectives for small scale tourism and development must be balanced against the objectives, strategies and decision guidelines of Clause 14.01 (Agriculture) which seeks (amongst other considerations) to protect productive agricultural land from incompatible land uses whilst considering issues such as land capability and impacts to the continuation of agricultural uses on the land.

The RFI goes on to state that while the use of land for 'Group Accommodation' is an allowable use (with a permit) in the Farming Zone, the proposed siting of the accommodation villas in a general east/west line across the existing open paddock, has the potential to fragment productive agricultural land.

This Addendum report is a response to the RFI.

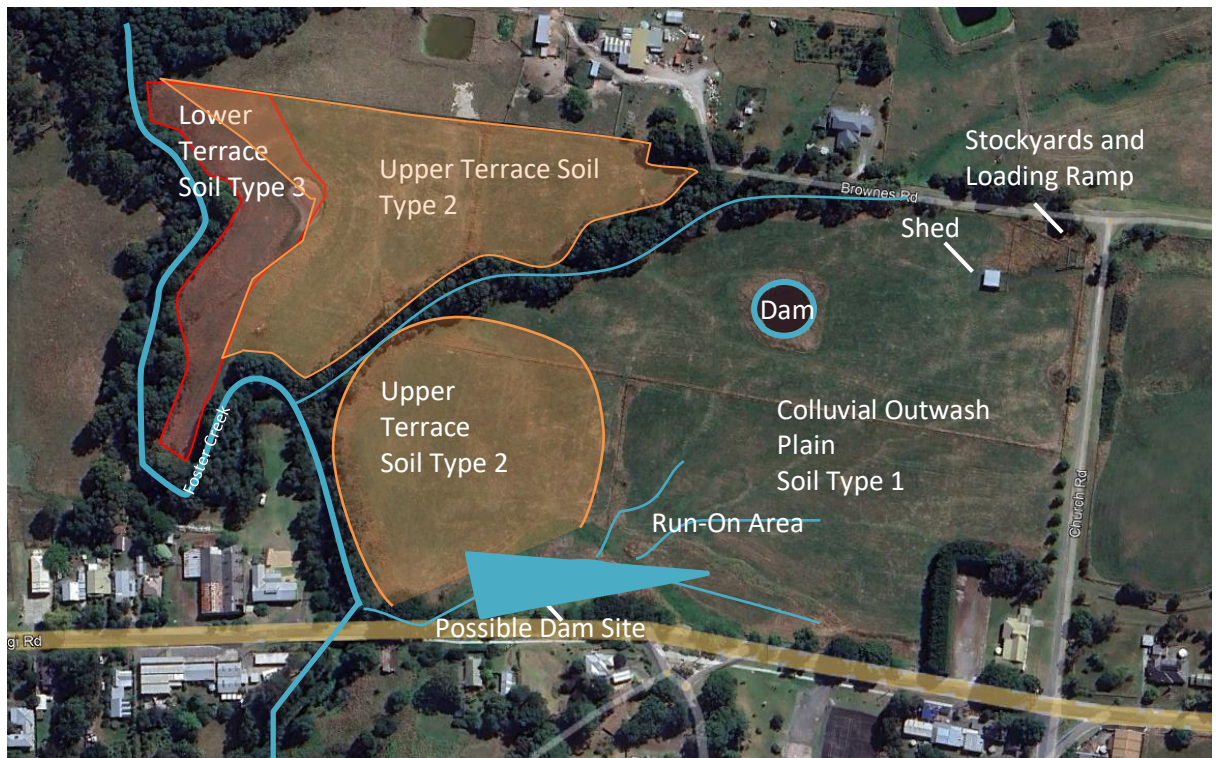
### Map of the Land Types

Figure I has been prepared by examining the soils and their associated landforms across the property. The property was subject to a further investigation on June 3, 2024 and a number of soil profiles were examined and described with the assistance of a soil auger (Appendix I). The investigation confirmed that there are three main land types, or land components on the property. These are associated with three different soil types:

- Outwash colluvial slopes from the nearby hillslopes. This is the dominant landform for the property. Slopes are linear with about 3% fall towards the west. The soils are Brown Dermosols with particularly deep well developed surface soils and represented by Soil Profile 1 (Appendix I). The soils are naturally well drained and have well developed structure. They are suitable for regular cultivation and would be suitable for vegetable and other annual cropping programs. There is one local area which receives run-on from the surrounding slopes and while the soils here are still very well drained with a deep surface soil, this area requires some artificial drainage before it would be suitable for vegetable cropping. The area subjected to run-on is identified in Figure 1.

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**Figure 1 Aerial Photomap and Sketch of the Different Land Types East of Foster Creek**



- A dissected upper terrace lies along the west side Foster Creek. This is the sub-dominant landform on the property. The terrace is almost flat in places, or slopes gently away from a central dome in all directions. Slopes are 0 to 3%. The soils are Grey Dermosols and are represented by Soil Profile 2 (Appendix I). The soils have properties that compromise their suitability for regular cultivation. They have a seasonally perched water table in the surface horizon, as demonstrated by the prevalence of iron staining along root channels. The surface soil is not particularly deep and the B horizon is not well structured and may be prone to hard setting when dry. These soils could be used for intensive agriculture, but the soil should be formed into raised beds to artificially improve the drainage, and permanent crops such as vines or tree crops are recommended so that regular cultivation is not required.
- A lower terrace lies along the western margin of the property and abutting Foster Creek. This is a minor land component on the property and was not separately identified and described from the first property inspection in 2023. However this land component has distinctly different soils which are best described as Brown Kandosols with loam textures throughout and are represented by the description in Soil Profile 3 (Appendix I). They are the best soils on the property for vegetable cropping, being free draining, well suited to regular cultivation, very deep surface soils and likely to have excellent water holding capacity. They are limited in extent, but nevertheless occupy an area of a little over 0.5 hectare and would become suitable for cultivation and farm vehicle traffic fairly quickly after rainfall.

Note that the land type of poorly drained swales and streambeds identified in the Agricultural Development Report has not been described here. This land component does exist but is extremely limited in extent. The east west strips that were identified in the first property inspection as poorly drained swales have been examined in more detail on June 3 2024 and found to be within the colluvial outwash unit but in an area where run-on occurs. They have been included in this latter area in the map in Figure 1 because the soils are deep and well drained and consistent with Soil Site 1. The extent

of the land component of poorly drained swales and streambeds is very limited and essentially confined to the creek that runs through the property and is heavily treed. It is not available for agricultural use and has not been separately delineated or described.

## Agricultural Productivity of These Soils

The two inspections of this property have established that it possesses land types that are inherently capable of more intensive use and potentially suitable for horticultural production. One land type is imminently suitable, that being the lower terraces on the east side of Foster Creek. The soils here are deep loams and would be a valuable wet weather area for a more extensive cropping program. This land type is however quite restricted in extent. The most widespread land type is the outwash colluvial slope and the soils on these slopes are deep, naturally well drained, and have good soil structure such that they are suitable for regular cultivation and the traffic of farm equipment associated with vegetable cropping. They will require careful management in wet weather to avoid loss of soil structure. The third land type is the upper terrace which is not suitable for regular cultivation but could be used for perennial crops such as pome fruits, wine grapes, avocados, and citrus.

While natural rainfall will supply some of the needs for crop growth, irrigation capability is a fundamental part of horticultural crop production in Southern Victoria. To enable the potential productivity of these soils to be harnessed into a commercial production system, the property will need an irrigation capability. There may be a number of ways of achieving this, but one option that is being investigated by the owners of the property is to construct an irrigation storage dam on the waterway that runs along the south side of property, basically close to the Kongwak Korumburra Road. An approximate location of the storage dam is shown Figure 1. There are a number of issues that need to be addressed to enable this dam, or a dam at another suitable location, to be constructed:

- ❖ The area of the various crops to be grown needs to be defined. The area and types of crops will determine the required irrigation volume that will need to be stored each year for potential irrigation use on these crops.
- ❖ An available irrigation licence that can be purchased and transferred to this property needs to be identified. Irrigation licence volumes are capped throughout Victoria so any new irrigation initiative requires the purchase and transfer of an existing licence from another party. There are two steps in this process – to firstly identify a suitable licence that is for sale, and then to determine that it can be transferred to this site. Southern Rural Water is the referral authority for this process and will need to advise as to whether a specific licence(s) can be transferred to this waterway.
- ❖ Once the required storage volume is determined, this volume needs to be compared to the catchment yield for the proposed dam site. There needs to be sufficient runoff yield to allow for diversion of a determined percentage for irrigation use. This will require engagement with Southern Rural Water who are the referral authority and will determine what percentage diversion of runoff for irrigation would be acceptable.
- ❖ The potential dam site needs to be confirmed as suitable for the construction of an irrigation dam. This will require engineering assessment to determine that suitable dam construction material is available on site, and that a dam of the required capacity can be constructed at the chosen location. Depending on the height of the dam wall, Southern Rural Water may again be a referral authority for this.

With these irrigation issues fully resolved, the agricultural use of this land potentially goes to a higher level than its current use. To illustrate this, two gross margins have been attached to this addendum (Appendix II). One is a gross margin for pasture based beef cattle production which is the current land use. The other is a gross margin for potato production which is indicative of the type of vegetable crops that might be grown here with irrigation. The former has a gross margin of \$1333/ha and the

latter has a gross margin of around \$25,000 per hectare. The horticultural use of the property takes the income potential to a completely different level - more than an order of magnitude higher. This comparison could be made with a range of other horticultural crops and the conclusion would still be the same. The productivity of the property is greatly enhanced by changing the use to intensive horticulture.

### Fragmentation of Agricultural Land

The proposed development of 3\PS331420 allocates the land along the south boundary and abutting the Kongwak Korumburra Road for water supply purposes. A substantial dam is proposed to be constructed across the waterway which lies inside the property boundary and runs east west close to the road. The dam wall would store water for irrigation use back up the waterway and towards the east. A formal survey of the waterway and storage area is yet to be undertaken, but it is likely that the east west dimension of the water storage would exceed 100 metres. This area along the south property boundary is proposed to be used for water harvesting and storage.

The proposed villa units for Group Accommodation are to be located in an east west alignment along the north side of this waterway and future water storage dam, essentially spanning the area in Figure 1 identified as receiving Run-On.

The balance of the land to the north of the Group Accommodation area is to be developed for horticultural use. It will remain in a single consolidated and manageable unit.

Thus the east west orientation of the Group Accommodation units do separate two areas of land with agricultural functions – the area for water harvesting and storage to the south, and the area for intensive horticultural use to the north. This physical separation should not affect the integrity of either operation. It is not a requirement for the water storage to be immediately adjacent to the irrigation sprayfields, or vice versa for the irrigation area to be adjacent to the water storage. So long as the two areas are in reasonably close proximity the function of both is preserved.

In consideration of the above, the physical separation of these two areas with important but different agricultural functions is of no substantial consequence.

## Appendix I Soil Profile Descriptions

Soil Profile Site 1 Outwash colluvial slopes

|       |  |
|-------|--|
| 0     | A horizon<br>Brown Loam<br>Strong crumb structure<br>7.5 YR4/2   |
| 50 cm | Diffuse boundary<br>B horizon<br>Brown Light clay<br>Moderate angular blocky structure<br>Faint yellow and brown mottles<br>10 YR 4/3<br><br>Hole terminated at 120 cm |

Soil Profile 1 was a well drained soil and occurred on slopes of around 3 %. Representative of the outwash colluvial slopes.

## Appendix I (con)

### Soil Profile Descriptions

#### Soil Profile Site 2 Dissected Upper terrace

|       |  |
|-------|--|
| 0     | <p>A horizon</p> <p>Brown Light clay or clay loam</p> <p>Moderate angular blocky structure</p> <p>Ferric staining along root channels</p> <p>7.5 YR4/2</p>   |
| 25 cm | <p>Diffuse boundary</p> <p>B horizon</p> <p>Pinkish Grey Light clay</p> <p>Moderate angular blocky structure</p> <p>Yellow and pale brown mottles</p> <p>No ferric staining in the B horizon</p> <p>7.5 YR 6/2</p><br><p>Hole terminated at 120 cm</p> |

#### Soil Profile Site 3 Lower terrace

|   |  |
|---|--|
| 0 | <p>A horizon</p> <p>Dark Brown Loam</p> <p>Strong crumb structure</p><br><p>7.5 YR 3/3</p> <p>No discernible horizon differentiation</p><br><p>Brown Loam at 90 cm depth</p> <p>10 YR 4/3</p> <p>Strong crumb structure at depth</p><br><p>Hole terminated at 120 cm</p> |
|---|--|

Soil extremely well drained and would recover for trafficability quickly after rainfall

## Appendix II Gross Margins

Cattle      Gross margin      Farm Area:      30 Hectares  
Vealer mothers

### Key Assumptions

Vealer sales on a per kg basis      No agents fees or yard fees  
Cow sales on per head basis      fees  
Bull replaced annually      Agents fees and yard fees  
Management unit of 24 cows and one bull  
25% of breeders replaced annually

| Income         | No | Wt  | Price  |             |
|----------------|----|-----|--------|-------------|
| Vealer sales   | 18 | 360 | \$6.80 | \$44,064.00 |
| Cull cow sales | 6  | 550 | \$2.40 | \$7,920.00  |
| Sale of bull   | 1  | 650 | \$2.60 | \$1,690.00  |
|                |    |     |        | \$53,674.00 |

| Expenditure           | No | Cost  |             |
|-----------------------|----|-------|-------------|
| Drenches and vaccines | 55 | 12    | \$660.00    |
| Stock transport       | 25 | 25    | \$625.00    |
| Yard fees             | 7  | 14    | \$98.00     |
| Bull purchase         | 1  | 3500  | \$3,500.00  |
| Fodder conservation   | 80 | 42    | \$3,360.00  |
| Fertilizer            |    | 5000  | \$5,000.00  |
| Agents commision      | 7  | 4.50% | \$432.45    |
|                       |    |       | \$13,675.45 |
| Gross margin          |    |       | \$39,998.55 |
| Gross margin/ha       |    |       | \$1,333     |

## Appendix II (con)

### Gross Margins

Potato    Gross margin  
Fresh Market Sales

1 Hectare

#### Key Assumptions

|                             |    |            |
|-----------------------------|----|------------|
| Crop yield                  | 50 | tonnes /ha |
| Percentage of Premium Grade | 75 | %          |

| Income              | No   | Price    |             |
|---------------------|------|----------|-------------|
| Premium grade sales | 37.5 | \$800.00 | \$30,000.00 |
| Seconds             | 12.5 | \$400.00 | \$5,000.00  |
|                     |      |          | \$0.00      |
|                     |      |          | \$0.00      |
|                     |      |          | \$35,000.00 |

| Expenditure                       | No   | Cost   |             |
|-----------------------------------|------|--------|-------------|
| Seed, \$1000/tonne                | 1.5  | 1000   | \$1,500.00  |
| Fertilizer \$1800/tonne           | 1.5  | 1800   | \$2,700.00  |
| Fuel 150 litres per hectare       | 150  | 1.9    | \$285.00    |
| Insecticides and fungicides       | 5    | 60     | \$300.00    |
| Picking cost \$1.50 per 20 kg bag | 2500 | 1.5    | \$3,750.00  |
| Packaging                         | 2500 | \$0.20 | \$500.00    |
| See storage                       | 1.5  | 180    | \$270.00    |
| Transport                         | 5    | 200    | \$1,000.00  |
|                                   |      |        | \$10,305.00 |

|                              |  |             |
|------------------------------|--|-------------|
| Gross margin for one hectare |  | \$24,695.00 |
|------------------------------|--|-------------|





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## Agricultural Development of the former Kongwak Butter factory

### Lot3 of PS331420

#### Overview

This 14 ha site was formerly part of the operational area of the Kongwak butter factory. The history of the site has not been investigated but it has probably been used in the past for the disposal of whey and more recently for harvesting fodder. It is currently under permanent pasture and used for low intensity grazing. The pastures are in fair to condition, being dominated by bent grass with some ryegrass and other improved species. Current stocking rate capacity is estimated to be around 16 dse<sup>1</sup>/ha.

A property inspection was undertaken on May 19<sup>th</sup> 2023. The current owners intend to develop the property as an extensive food garden, partly to service the needs of an adjoining restaurant and café complex, with any surplus produce being sold in local markets. This document is an overview of the outcomes of the site inspection and preliminary design of the agricultural development and use of the property.

#### Inherent Land Characteristics

The property is comprised of three separate land components.

1. A dissected terrace lies along the west side Foster Creek. While the landform is a gently sloping convex dome, the soils show signs of seasonal waterlogging all the way to the soil surface. The surface texture is a clay with moderately weak structure and the subsoil is a medium clay with weak structure. These soils will be difficult to cultivate without them becoming cloddy and are not well suited to annual horticulture. They could be used for perennial horticultural crops, but they would need significant mounding (with intervening hollows) to improve the drainage around the root zone. These dissected terraces occupy around 25% of the property land area.
2. Outwash colluvial slopes from the nearby hillslopes are the main landform on the property and have better drained soils. Surface texture and subsoil texture is similar at clay loam and medium clay respectively but there is no evidence of seasonal waterlogging in the topsoil and only minor root oxidation (which indicates seasonal waterlogging) in the subsoil. These soils could be used for annual horticultural crop but with limitations. In particular, they will need regular applications of organic matter such as chook manure to improve soil structure and workability, they should not be cultivated in wet weather., and access in wet weather should be heavily restricted. These soil would probably benefit from gypsum, and possibly even ripping (dry soil conditions only) followed by gypsum application. Crops should be grown in raised beds to help improve the soil drainage.
3. Limited in extent are poorly drained swales and streambeds. Two east west linear strips of this land type occur, together with an uncertain extent of this land type along the margins of Foster

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<sup>1</sup> Dry sheep equivalents (dse) is a measure of stock fodder requirements/availability. One dse is the amount of feed required to maintain the body weight of a 40 kg wether.

Creek. One of the linear strips lies along the southern boundary where runoff from the surrounding township and road are diverted towards Foster Creek. This linear strip predominantly lies within the township zone, although it would be inappropriate to use this for dwellings due to its wet nature and susceptibility to flooding. The other linear strip of this land type lies along the tributary that runs through middle of the property in east west direction and flows into Foster Creek and is essentially uncleared with remnant riparian vegetation. Both of these areas are very wet and have little agricultural value except for potential water capture and storage.

## Agricultural Development

The better soils and land type for vegetable production is the higher land on the eastern side of the property. Workability of this land can be improved by installing a cut-off drain on the uphill side of the area to be cropped, and forming the soil up into raised beds. There will be large range of potential crops that can be grown on this land, but most of the production will be seasonal. The production should essentially be *market led* and I will provide advice as to which potential crops can and cannot be grown depending on the demand from the restaurant.

The better soils on the north side of the tributary can be used for a mixed orchard planting. Again there should be a cut off drain installed along the uphill side of the orchard, and the land should be formed into linear crests and hollows prior to planting, so that there is free draining soil around the root zone of the planted trees along the crests.

The balance of the land shall be used for grazing. Suggested option is small flock of domestic goats (Anglo-Nubian or similar). The grazing land should be resown to improved pasture species after implementing a bent grass eradication strategy. A minimum of 4 paddocks with goat proof fencing is required, and further subdivision for grazing management can then be undertaken when the livestock are adequately trained to electric fencing. Reticulated stock water is required for each paddock. The livestock numbers should be balanced to the productivity of the grazing land, and a reasonable basis for planning would be to use a revised carrying capacity of 25 dse/ha after resowing. A lactating doe goat will have a feed requirement of around 1.8 dse.

## Water requirements

The water requirement for irrigation of the food garden will vary from year to year and there will be some seasons where summer rainfall means that very little irrigation is required. But in dry seasons the water requirement could be as high as 3 Megalitres per hectare. For water security purposes, this should be the benchmark to be applied when determining water storage needs during the planning process. A slightly lower water requirement would be required for the perennial plantings – nominally 2 Megalitres per hectare. The storage design has to allow for the inability to extract water from the bottom of the storage and a contingency for other uses. For 1.1 hectares of vegetable garden and 0.9 ha of perennial fruit crops are to be grown, a storage with a capacity of 6 Megalitres would be prudent. A suitable site for a storage of this size could potentially be available within the unusable swale along the southern boundary. You would need to obtain specialist advice for the potential of locating a storage here. Approval is required from Southern Rural Water to construct a storage of this size, together with identifying a surface water licence that can be transferred to the property.

## Further Detailed Design

There will be a need for more detailed design work and an operational management plan for the vegetable garden, the orchard and the livestock. It will be important that the plans are not overly ambitious, as managing a multiple enterprise and mixed farming system can become quite complex. There will need to have an experienced permanent manager in charge of the agricultural operations. Ag-Challenge Consulting will be available to assist in the detailed design of the project as required.