Appendix I

Water Usage Estimate

Technical Memorandum

Title	**Scenic Rim Agricultural Industrial Precinct (SRAIP)** **Water Use Estimate (V5)**		
Client	Kalfresh Pty Ltd	**Project No**	5103/57
Date	24th February 2020	**Status**	
Author	Brad Warren	**Discipline**	Civil
Reviewer	Matt Walsh	**Office**	Springfield

1.1 Introduction

Cardno have been instructed by Kalfresh Pty Ltd to prepare an estimate of water demand for the proposed 'Scenic Rim Agricultural Industrial Precinct (SRAIP)' at Kalbar. This memo is intended to provide supporting information for negotiations between Kalfresh, SEQ Water, DNRME and the Coordinator General in relation to water allocation from the Warrill Creek.

The water use estimate is high level in nature and is based on the proposed concept site layout (attached) and a number of assumptions and information provided by Kalfresh as set out in this memorandum.

1.2 Water Use Estimate

The calculations contained below represent the estimated water use of the proposed development and are based off the SEQ Water Supply and Sewerage Design & Construction Code (July 2013) and on-farm water usage estimates for the existing processing facilities which have been provided by Kalfresh. Peaking factors have been excluded from the current preliminary analysis.

The proposed development consists of approximately 37 hectares of developable land divided into 15 lots. A copy of the concept site layout has been appended to this memorandum for ease of reference.

The land use for each of the 15 proposed lots has been developed in consultation with Kalfresh. There are four separate land uses proposed for the precinct including;

1) Commercial (i.e. offices, sale yards / centre, service station);
2) Industrial (i.e. warehouses, packing sheds, offices, work-shops); and
3) Processing facilities (i.e. vegetable washing facilities, frozen food production facilities).
4) Bio-energy facility (i.e. digestor)

The water use criteria adopted for each land use are set out below.

1) Commercial

Calculations are based on the SEQ Water Supply and Sewerage Design & Construction Code.

SEQ Code, Table A9 – Scenic Rim (QUU) Water Use based on equivalent persons (EP) = 20 - 45 EP/Ha of net dev area *high and low limit based on figures for different areas within Scenic Rim Regional Council.

SEQ Code, Table 4.1 – QUU – Average Day Demand (AD) per EP = 260 L/EP/Day (including Non-Revenue Water)

2) Industrial

Calculations are based on the SEQ Water Supply and Sewerage Design & Construction Code.

SEQ Code, Table A9 – Scenic Rim (QUU) Water Use based on equivalent persons (EP) = 24 - 30 EP/Ha of net dev area *high and low limit based on figures for different areas within Scenic Rim Regional Council and industry type being general or light.

SEQ Code, Table 4.1 – QUU – Average Day Demand (AD) per EP = 260 L/EP/Day (including Non-Revenue Water)

3) Processing Facilities

Is it assumed that there will be two types of 'high water use' processing facilities on the site.

(a) Vegetable washing (similar to the existing Kalfresh facility); and
(b) Frozen food production.

4) Bio-energy Facility

Is it proposed that one of the lots will be used for bio-energy production through an anaerobic digester.

Given these both (3) the processing facilities and (4) the bio-energy facility, are specialised and unique facilities when compared with standard urban and industrial uses, there are no accurate guidelines available within the SEQ Code. Water use has been estimated from a combination of on-farm water use information provided by Kalfresh and estimates representative of similar facilities in Australia.

As advised by Kalfresh, the vegetable washing facilities are estimated to use between 100,000 L/day/ha GFA and 140,000 L/day/ha GFA when operating, depending on weather conditions, harvest yields and production demand. Kalfresh estimate that there will be four similar facilities once the precinct is fully developed.

The frozen food production facility is estimated to use between 300,000L/day/ha GFA and 400,000L/day/ha GFA. This data has been provided by Kalfresh and is believed to be representative of similar facilities within Australia. Kalfresh have advised there will be one such facility of this type on the fully developed precinct.

Kalfresh propose to source water from the following; (1) existing underground bore water supply, (2) medium priority allocation from Warrill Creek, and (3) high priority allocation from Warrill Creek.

It is estimated by Kalfresh that 150 ML/year can be sourced via the existing underground bores. It is proposed that 30% of the balance will be medium priority allocation and 70% will be high priority allocation. Water from these allocations is proposed to be pumped from the Warrill Creek, across the Cunningham Highway to the precinct. This will be subject to negotiations with the relevant statutory authorities.

Furthermore, Kalfresh have advised that it is anticipated that the SRAIP will be developed in 3 Phases over a period of 7 years. The estimated water use per development phase is also indicated in the table below. The high limit water use estimate has been adopted in this assessment.

Water Use Estimates for the SRAIP are shown on Table 1 on the following page.

Agricultural Water Use

In addition to the four uses above, it is also acknowledged that the overall site will include agricultural activities outside of the industrial precinct that will utilise water. The agricultural use comprises of 18Ha of irrigation land located to the west of the development precinct. It is estimated that 5 ML/Ha/year of irrigation water will be applied to the land, totalling 90 ML/year.

This water does not result in additional demand for the site as the 90ML/year is proposed to be sourced from industrial wastewater from the processing facilities. This water will be mixed with the liquid digestate from the bio-energy facility (Lot 11) and pumped to the holding dam prior to irrigation. The wastewater will also be sourced from the gravity wastewater reticulation network which is treated at the wastewater treatment plant before being pumped to the holding pond.

The concept layout of the irrigation water pipeline and wastewater reticulation network is indicated on the attached layout.

Table 1 – SRAIP Water Use Estimate

					Low Limit				High Limit				Water Use per Phase		
Lot No.	**Total Area (ha)**	**Est. GFA**	**Land use assumption (est. based on IAS)**	**Water Use Guideline**	**Water Use (l/day)**	**Bore Water Supply**	**Medium Priority Warrill Creek (l/day)**	**High Priority Warill Creek (l/day)**	**Water Use (l/day)**	**Bore Water Supply**	**Medium Priority Warrill Creek (l/day)**	**High Priority Warill Creek (l/day)**	**Phase 1**	**Phase 2**	**Phase 3**
													Year 0-1	**Year 1-3**	**Year 3-7**
1	1.63	0.81	Commercial	SEQ Code - 20 - 45EP/Ha	8466	1755	2013	4698	19048	2832	4865	11351	19048	19048	19048
2	2.16	1.08	Industrial	SEQ Code - 24 - 30 EP/Ha	13472	2792	3204	7476	16840	2504	4301	10035	16840	16840	16840
3	2.00	1.00	Commercial	SEQ Code - 20 - 45EP/Ha	10400	2156	2473	5771	23400	3480	5976	13944	23400	23400	23400
4	1.99	1.00	Industrial	SEQ Code - 24 - 30 EP/Ha	12430	2576	2956	6898	15538	2310	3968	9259	15538	15538	15538
5	2.00	1.00	Commercial	SEQ Code - 20 - 45EP/Ha	10400	2156	2473	5771	23400	3480	5976	13944	23400	23400	23400
6	1.75	0.88	Commercial	SEQ Code - 20 - 45EP/Ha	9105	1887	2165	5053	20487	3046	5232	12208	20487	20487	20487
7	0.55	0.28	Industrial	SEQ Code - 24 - 30 EP/Ha	3432	711	816	1904	4290	638	1096	2556	4290	4290	4290
8	0.51	0.25	Industrial	SEQ Code - 24 - 30 EP/Ha	3154	654	750	1750	3943	586	1007	2350	3943	3943	3943
9	4.98	3.48	Processing Facility (a)	On-farm water use data (L/day/Ha GFA	348320	72197	82837	193286	487648	72512	124541	290595	487648	487648	487648
10	3.99	2.79	Processing Facility (a)	On-farm water use data (L/day/Ha GFA	279440	57920	66456	155064	391216	58173	99913	233130	0	391216	391216
11	5.00	3.50	Bio-energy Facility	On-farm water use data (L/day/Ha GFA	350000	72546	83236	194218	490000	72862	125142	291997	0	490000	490000
12	3.34	2.34	Processing Facility (b)	On-farm water use data (L/day/Ha GFA	701190	145338	166756	389096	934920	139020	238770	557130	0	0	934920
13	3.00	2.10	Processing Facility (a)	On-farm water use data (L/day/Ha GFA	210000	43527	49942	116531	294000	43717	75085	175198	0	0	294000
14	2.00	1.00	Industrial	SEQ Code - 24 - 30 EP/Ha	12480	2587	2968	6925	15600	2320	3984	9296	0	0	15600
15	2.00	1.00	Commercial	SEQ Code - 20 - 45EP/Ha	10400	2156	2473	5771	23400	3480	5976	13944	0	0	23400
TOTAL	**36.9**				**1982689**	**410959**	**471519**	**1100211**	**2763729**	**410959**	**705831**	**1646939**	**614593**	**1495809**	**2763729**
Total (ML/year)					**724**	**150**	**172**	**402**	**1009**	**150**	**258**	**601**	**224**	**546**	**1009**

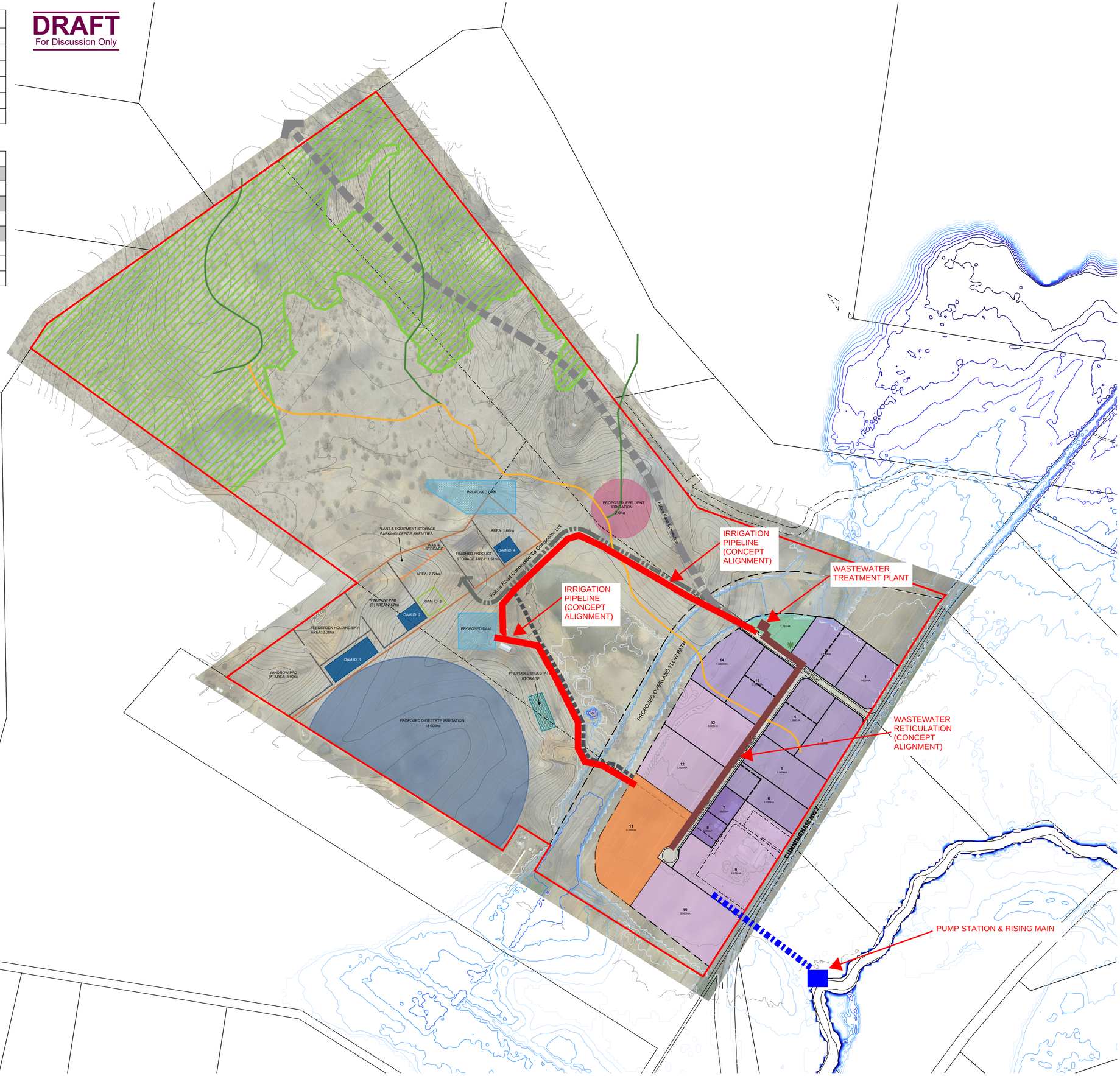
Yield Breakdown

Allotments	Overall
5000m² -1HA Area	2
1HA- 2.99HA Area	8
3HA + Area	4
Total Allotments	**14**
Digester and Energy Site 5HA Area	1

Land Budget

Land Use	Area	%
Saleable Area		
Industry Lots	31.900 ha	78.9%
Road		
Access Street	2.411 ha	6.0%
Environmental		
Digester and Energy Site	5.000 ha	12.4%
Drainage and Bio Basin	1.135 ha	2.8%
Total Site Area	**40.446 ha**	**100.0%**

DRAFT
For Discussion Only



0 25 50 75 100 150 1 : 5,000 @ A1

6200 CUNNINGHAM HWY
KALBAR

OVERALL CONCEPT LAYOUT INDUSTRY ALLOTMENT

PLAN REF: 142489-06G
DATE: 07 FEBRUARY 2020
CLIENT: KALFRESH
DRAWN BY: LZ
CHECKED BY: PHE

Legend

- Site Boundary
- 0.25m Contours
- Existing Boundaries
- Existing Easement
- Drainage
- Proposed Overland Flow Path
- Proposed Flow Path Q100
- Proposed Bio Basin
- Proposed Effluent Irrigation
- Proposed Digestate Irrigation
- Proposed Dam
- Proposed Digestate Storage
- Proposed Composting Area
- Lechate Pond
- Proposed Composter Lot Road Access
- Proposed Plant & Equipment
- Proposed Windrow & Finished Product
- Proposed Stormwater Basin
- Proposed Wagner Quarry Access - *(not part of the SRAIP proposal and subject to separate development approval)*
- Environmental Protection Area *(clearing within the Environmental Protection Area is subject to future investigation/approvals)*
- Low Order Queensland Waterway
- Medium Order Queensland Waterway
- Road Connection to Composter Area

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: DCDB
Adjoining information: DCDB.
Contours: RPS Survey
Aerial photography: RPS Survey
Overland Flow Path: Aurecon

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