Gippsland Jersey Pty Ltd
Milk Processing Facility
79 Bunga Creek Rd Lakes Entrance
Works Approval Application

Volume 1 Final Report
15 August 2019

GOOD FOR FARMERS, GOOD FOR YOU.

Document Control

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Document History

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Limitations

Out-Task Environmental (OTE) has prepared this report for use by Gippsland Jersey Pty Ltd and EPA Victoria and only those parties who have been authorised in writing by OTE.

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The Report (Volume 1) and all its attached Figures (Volume 2) and Appendices (Volume 3) should be read in full. No responsibility is accepted for use of any part of this document in any other context or for any other purpose or by third parties. This document does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

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1 Introduction

1.1 Company Legal Entity – The Applicant

Gippsland Jersey Pty Ltd is a small dairy business located about 1.5km north of Lake Entrance township in Gippsland Victoria. Gippsland Jersey is seeking to re-establish its Lakes Entrance milk processing operations for production of bottled light, full cream and flavoured milk and cream.

Gippsland Jersey is the Works Approval applicant, future operator and EPA licence holder. The factory site and surrounding land for irrigation will be leased from the landowner for the construction and operation of the dairy factory and associated onsite effluent reuse scheme.

An ASIC Registry Certificate for the Applicant are provided in Appendix A (Volume 3 of this report).

1.2 Location of Works

The milk processing facility is located at 79 Bunga Creek Road, Lakes Entrance as shown in Figure 1.

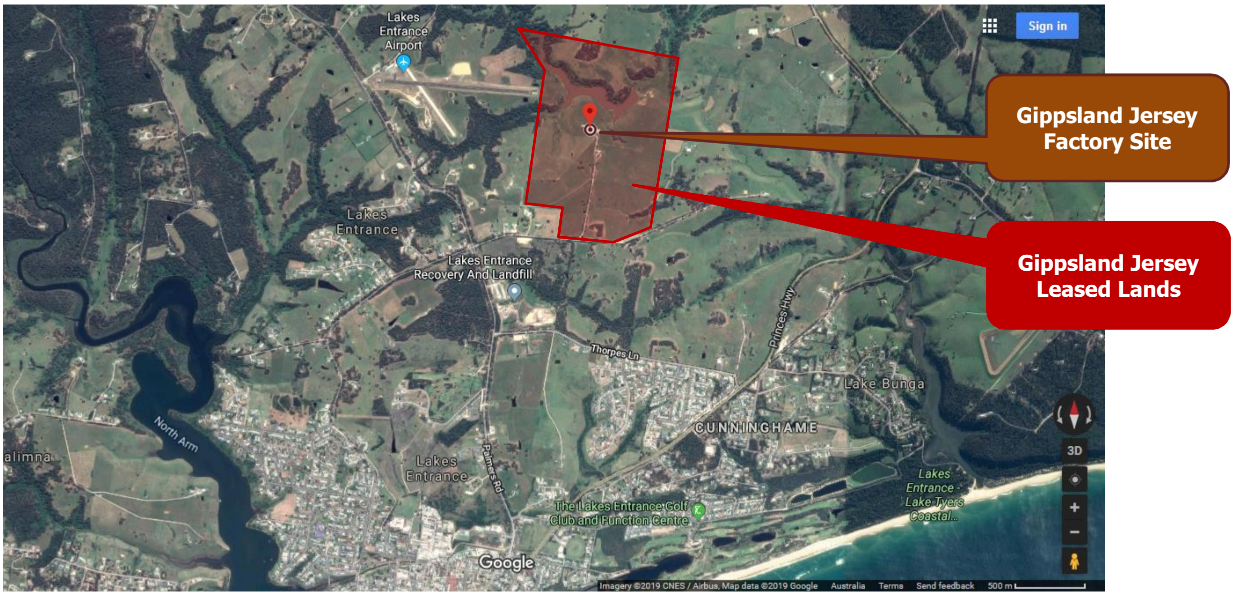


Figure 1 Gippsland Jersey Milk Factory Locality Plan (Google Maps 2019)

Gippsland Jersey has a lease for the factory site at Lot 79 Bunga Ck Rd (~67 Ha) and additional land at 79A Bunga Ck Rd (~62 Ha) for effluent reuse (up to 12Ha irrigation area proposed). The areas to be subject to a lease with the landowner are within the land highlighted red in Figure 1. The key operations to be established for this project will be as follows:

(i) Refurbishment of existing milk factory including: milk tanker bay, raw milk storage tanks (~26KL total), milk wet processing equipment (~28kL total tankage including pasteuriser/separator/homogeniser tank, various product holding/mixing tanks, butter churner/extruder), bottling and packaging plant, cool store, loadout bay, office and shop;

(ii) Raw water supply from existing onsite Bunga Creek dam pumped to alum dosing tank, water filtration plant (WFP), storage tank to supply potable water quality for factory milk process washdown;

(iii) Wastewater collection in 5 kL sump, wet weather storage in 40kL above ground tanks, emergency pumping to existing farm dam in irrigation area (~250kL capacity);

(iv) Pumping of wastewater to onsite irrigation areas (~12Ha suitable land identified).

Figure 1 shows the properties to be leased by Gippsland Jersey that in total represent the "premises" upon which all the above described works are to be located for the purposes of this WAA. Appendix C provides relevant title documents for the leased lands.

Annual production is expected to be about 1 – 2 ML/Year (or 1000 – 2000 tonnes/year) of fresh milk products. A similar volume of wastewater from factory washdown is expected to be generated.

1.3 Need for Works Approval

EPA Works Approval and Licensing requirements are triggered based on expect milked throughput. Works Approval is triggered by the *Environment Protection (Scheduled Premises) Regulations 2017*, for the following premises activities:

> *D07 – Milk processing or dairy product manufacturing works, which are designed to produce at least 200 tonnes per year of product(s).*

Due to the milk processing facility being a Scheduled Premises, ancillary activities including wastewater irrigation scheme onsite are also triggered by the Regulations. Impacts of premises wide emissions and discharges to land and air segments of the environment from these activities are considered in this works approval application document.

1.4 Cost of Works

The estimated cost of new capital works related to this works approval is $210,000, which excludes pre-existing works associated with previous factory operations including: factory building, milk processing plant and equipment, water supply system, boiler, wastewater and stormwater drainage systems.

1.5 This Works Approval Document

Proposed milk process design and operations, wastewater reuse scheme, and environmental impact assessments are documented in this Works Approval Application (WAA).

The structure and content of this report is in accord with EPA's Licensing and works approvals – guidance for business website pages, "Works Approval Application Guideline" (Pub. 1658, June 2017), as well as State Environment Protection Policy and other dairy industry environmental guidance.

The format and content of this document has been prepared according to the tailored template produced from EPA's Works approval application checklist page.

The Works Approval has also been prepared having regard to EPA's email of 19 March 2019 "FW: EPA Pathways Form for Gippsland Jersey Milk Processing Plant - Lakes Entrance", which provided feedback on the Approvals proposal pathway form submitted to EPA on 1 March 2019. In its email, EPA advised that "it has been determined that the application can be dealt with as a fast track works approval".

This WAA report provides details of the milk factory and production processes, wastewater collection and storage works, water balance calculations, effluent reuse irrigation scheme, greenhouse gas and noise emissions, and associated environmental impact assessments.

The EPA Supporting Information Form signed by Gippsland Jersey is provided in Appendix B.

Supporting technical information, plans, drawings, water balance calculations, land capability assessment, groundwater bore search and other specialist assessments are provided in Volume 2 Figures and Volume 3 Appendices annexed to this report.

2 Description of the Proposal

2.1 Project Area – Milk Factory and Wastewater Reuse Scheme

This works approval application (WAA) is to allow refurbishment of the existing milk factory and associated wastewater collection, storage and effluent reuse irrigation scheme located as shown in Figure 2. The factory site is located on rural land at 79 Bunga Creek Rd (67.45 Ha western allotment), whilst the wastewater spray irrigation areas are at 79A Bunga Rd (63.29 Ha eastern allotment).

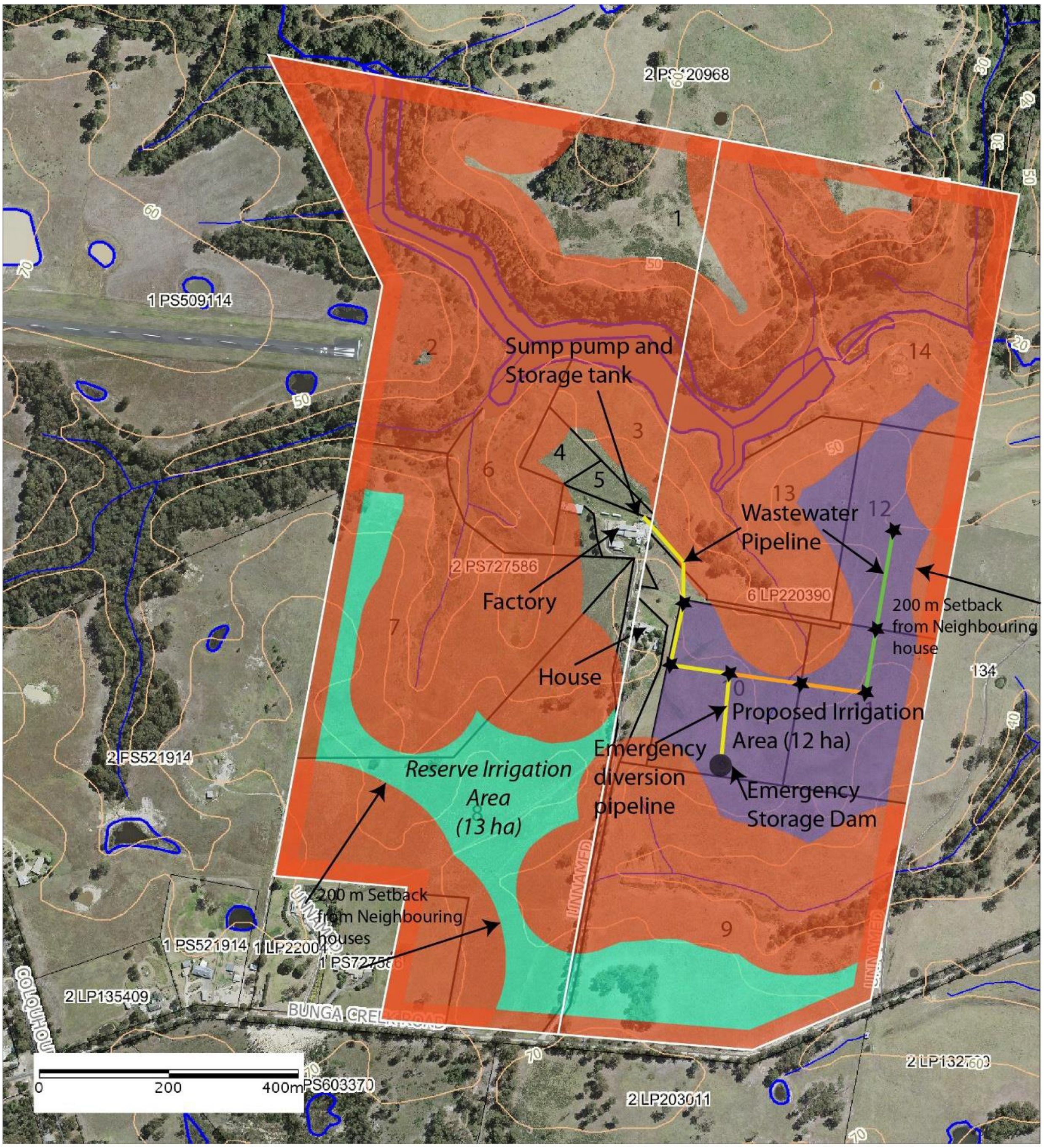


Figure 2 Gippsland Jersey Milk Factory Site and Wastewater Reuse Irrigation Areas

2.2 Overview of Proposed Operations

Gippsland Jersey is a family-run milk producer sourcing raw milk from its dairy farm at Jindivick as well as other local dairy farms. Bypassing the large milk processors allows Gippsland Jersey to ensure a fair price is paid to farmers, and gives consumers are clear choice when buying their milk. The story and history of Gippsland Jersey can be found on their website: www.gippslandjersey.com.au/our-story.

Gippsland Jersey seeks to re-establish small-scale milk processing operations at the existing Lakes Entrance factory for production of fresh milk products including light and full cream milk, flavoured milk and small quantities of cream and butter.

Milk processing will recommence in the existing factory that was built by the family in the mid-1980's to produce fresh milk products from raw milk supplied from the adjoining milking shed. The dairy factory once produced small quantities of ice cream, fresh milk and yoghurt. The previous factory and milking shed effluents were combined and co-treated in two small dams then irrigated onsite for many years without environmental incident.

The factory building is to be updated to handle higher milk throughputs including new raw milk storage tanks, upgraded processing equipment (pasteuriser, homogeniser and separator), mixing and holding tanks, butter making and bottling plant. The wastewater collection, storage and irrigation systems are also to be upgraded.

Raw milk will be delivered on site from Gippsland Jersey's Jindivick dairy farm as well as other farms in the region for processing into fresh milk products including bottled full cream milk, light/skim milk and small quantities of bottled cream and packaged butter. Flavoured milks will be also be produced. General process flows are shown in Figure 3.

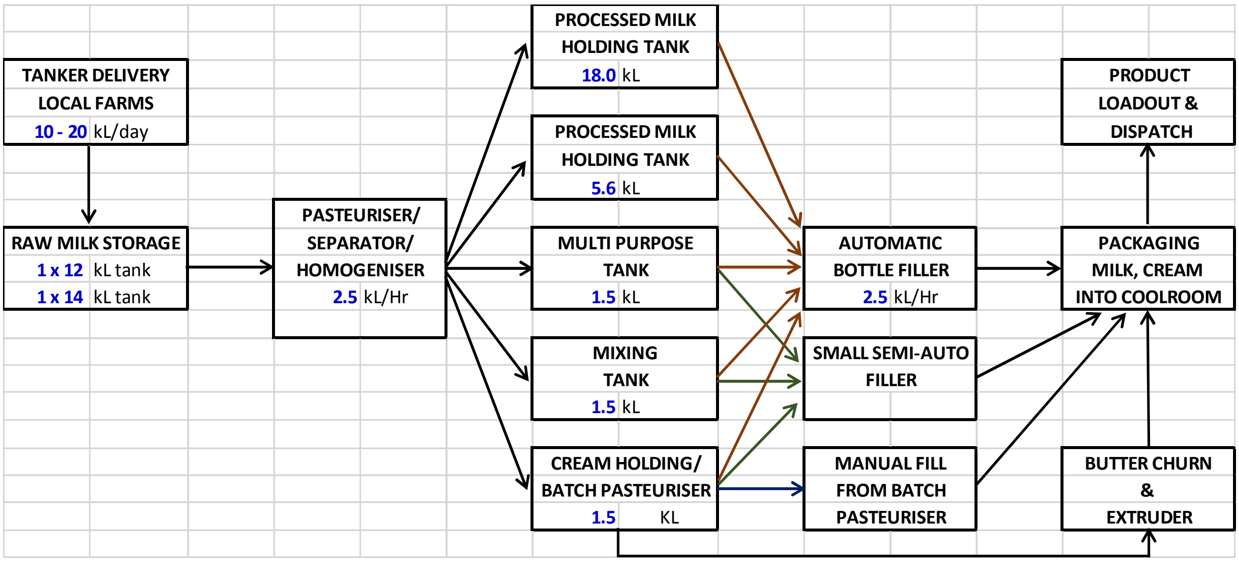


Figure 3 Gippsland Jersey Milk Factory Production Flowchart

The factory will initially process up to 20 kL of milk each week over 2 x 10kL processing days, for an annual throughput of ~1 ML/Yr. By year 3, milk processing will increase to 3 – 4 days/week for an annual milk throughput of 1.5 – 2 ML. About 1 – 2 milk tanker loads each processing day will enter the site from Bunga Creek Road.

Year 1 butter production is expected to approach 2.5 tonne/yr increasing to about 5 tonne/yr by year 3. Cream production is expected to be up to 30 tonne/yr in year 1, increasing to 60 tonne/yr by year 3.

Wastewater will be produced from washdown of factory and milk processing equipment. It is estimated that about 1 litre of wastewater will be generated per litre of milk processed containing about 1 – 2% milk loss. It is therefore anticipated that ~1 ML/Yr of wastewater will be generated in Year 1 increasing to ~2ML/Yr by Year 3, which is to be spray irrigated onsite for production of pasture/fodder.

Gippsland Jersey currently leases the factory site at 79 Bunga Ck Rd (~67 Ha) and will also extend the lease to include land at 79A Bunga Ck Rd (~62 Ha) for effluent irrigation reuse. The Ag-Challenge Land Capability Assessment (LCA) Report (Appendix G) has identified 25Ha of suitable land for irrigation, with 12Ha proposed initially as shown in Figure 2. The organic material and nutrient value of the wastewater will be beneficially utilised by onsite irrigated pasture and fodder.

The key works and associated activities for the proposed dairy factory are summarised in Table 1.

Table 1 Summary of Proposed Works – Gippsland Jersey Milk Factory

Activity	Description
Milk tanker deliveries	• Milk tankers (1 – 2 loads/day) via existing driveway from Bunga Creek Rd • 10 – 20 kL/d deliveries
Milk tanker bay	• Roofed and bunded area containing 1 x 12kL, 1 x 14kL stainless steel vats • Washdown, minor rainfall derived runoff to wastewater collection system. • Any unplanned spills contained in concrete bunded area and wastewater collection system.
Milk processing in factory	• Pasteurisation and homogenisation of raw whole milk • Whole milk bottling post homogeniser • Separation into light milk and cream for bottling • Butter making and packaging • Flavoured milk production and bottling • Washdown waters or equipment and tanks to wastewater floor drains
Coolstore	• Bottled milk, cream, packaged butter held in coolroom for subsequent loadout
Product Loadout Bay	• product loadout bay under roof • product vehicles depart via Bunga Creek Rd
Water filtration Plant (WFP)	• Raw supply pumped from Bunga Crek dam to fitration plant. • SRW Surface Water diversion licence • Water filtration (micro screens) and UV disinfection plant to supply potable water to the factory.
Wastewater collection and storage	• Factory wastewater collected by floor drains, discharegto 5kL storage sump for pumping to irrigation area (during dry weather) or to 40kL wastewater storage tanks (during wet weather) • Recirculation pumps in storage sump and tank to ensure no sludge build up and maintain mixed conditions for odour control. • Existing farm dam (capacity ~0.25ML) at high point at south end of irrigation area available for additional short-term emergency effluent storage for containment of excess wastwater from storage tanks. Short-term storage in dam only, transferred out to irrigation area as soon as irrigation conditions are favourable.
Irrigation Area	• Wastewater pumped to 3 x 4Ha (12 Ha total) irrigation areas east of factory on 79A Bunga Rd as shown in Figure 2. Annual rotation of 4 Ha each year.

Activity	Description
Sewage	• Staff office, future shop and amenities - sewage and sullage discharged to onsite septic tank and effluent disposal system (local council EHO approved system)
Stormwater system	• Clean stormwater collected from roofs and other clean areas discharged to onsite drainage lines to Bunga Creek dam onsite (north of factory site) • No wastewater runoff from spray irrigation areas (auto controller with timer and controlled irigation rate < soil infiltration rate). • Unplanned milk/wastewater spills from factory site to be isolated and contained in pump sump and storage tank • Existing ex-dairy shed ponds immediately downslope of sump/tanks compound (see figures in Volume 2 - Stormwater and wastewater systems) provide backup spill containment if capacity of sump and storage tanks exceeded. The ponds are immediately pumped out to irrigation area as soon as conditions are favourable
Electrical Services	• Lumo Energy, Grid supply (100 kVA) • Main power uses (total ~63kW) for factory processes, coolstore, water supply, WFP and wastewater irrigation pumps
Boiler	• NuWay/Bentone diesel-fired boiler, 185kW, 15 l/hr • Air emissions: particulates, NOx, SOx and CO well below Works Approval triggers

An indicative layout of the factory showing the main operational areas is provided in Figure 4.

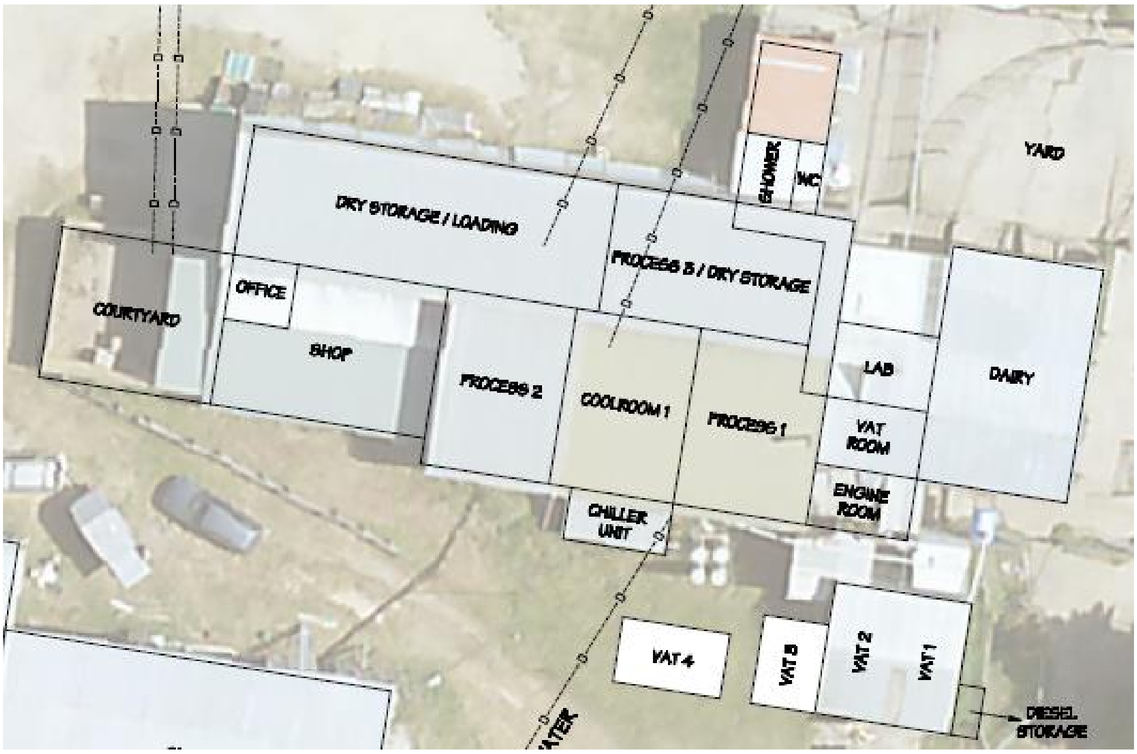


Figure 4 Gippsland Jersey Milk Processing Factory – Indicative Floor Plan

Further technical details, layout plans and environmental assessments for the above works and operations are provided in the various Chapters to following in this works approval as well as the Figures (Volume 2) and Appendices (Volume 3) attached.

2.3 Land Use

2.3.1 Choice of Location for New Premises

Gippsland Jersey selected this location for its milk processing operations for the following key reasons:

- well-established dairy farming area providing reliable sources of fresh milk
- history of onsite dairy farming and small-scale milk processing operations, factory originally built in the mid-1980's and successfully operated without environmental incident
- compatible Rural Living and Farming zoning for factory site, irrigation area and surrounding lands (see Figure 5)
- adequate separation distances between factory site and nearest private residences (>100m as required by EPA guidelines 1518, >300m Threshold Distance required by Clause 53.10 of the Planning Scheme)
- existing water supply, pumping and pipeline infrastructure from Bunga Creek dam
- adequate electrical power from mains supply from Bunga Creek Rd
- availability of existing ponds for emergency storage, which were previously used for dairy shed and milk factory operations
- suitable climate, soils, drainage and available irrigation land onsite east of the factory site for sustainable effluent reuse area
- relatively deep watertables and clay substrata providing suitable underlying geological and hydrogeological conditions to ensure low risk to groundwater from wastewater irrigation
- support and acceptance of milk processing operations by the local dairy farming community for supply of milk to factory, local employment and contract services, and flow-on economic benefits
- Low environmental risks and minimal potential impacts from facility operations in terms of air quality, odour, noise, surface water, land and groundwater based on the above.

2.3.2 Planning and Other Approvals

The land use zonings for the Factory site (79 Bunga Ck Rd), irrigation area (79A) and surrounds are shown in Figure 5. The factory site and irrigation area are located within the Rural Living Zone (RLZ). The East Gippsland Shire (EGS) Planning Scheme does not prohibit any of these proposed land uses associated with the proposed milk factory or wastewater reuse operations.

As stated above the dairy factory meets the minimum 300m threshold distance requirement of Clause 53.10 of the Planning Scheme (refer to Section 7.2 for further discussion).

EGS Council has confirmed in writing on 23 November 2018 that the property (79 Bunga Creek Rd) has enjoys the benefit of existing use rights (as a dairy factory) in accordance with clause 63 of the EGS Planning Scheme – see attached letter in Appendix E. Therefore, EGS Council does not require a planning permit application for this project.

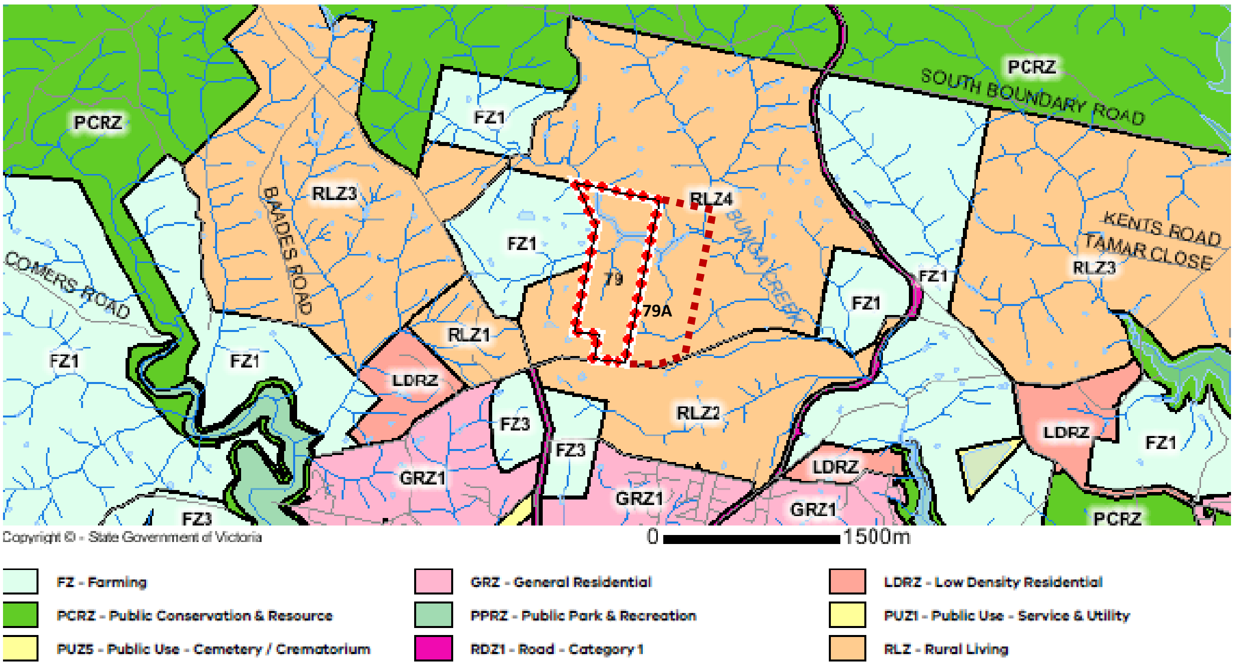


Figure 5 Gippsland Jersey Milk Factory - land use zones (EGS Planning Scheme)

2.4 Community Engagement

The site is surrounded by other compatible farming uses and the Great Lakes Airport. The nearest neighbouring private farmhouses are as follows:

- 2 neighbours to the south-south-west approximately 700m from the factory site
- 1 neighbour to the east about 600 metres from the factory

The house on the property at 79A Bunga Creek Rd is the owner of the 79 Bunga Creek Rd land holding on which the factory site is located. This house is about 150m south of the factory. However, this owner is a close family member of one of the Directors of the Gippsland Jersey company. The factory site and irrigation areas on the two properties are to be leased by Gippsland Jersey for milk production and wastewater reuse, so this family member is fully supportive and not expected to object to the project. A letter of authority has been signed by the landowner stating that a lease is currently being formalised to enable factory and wastewater irrigation operations across 70 and 70A Bunga Creek Rd.

The Great Lakes Airport runway is located about 450m north west of the factory site. The factory and associated works and irrigation areas are not located under the flight path of the runway.

Gippsland Jersey is closely involved with the local dairy industry including a support network advocating for farmer mental health and obtaining a fair milk price for farmers. As a result, this project is widely supported by the local community including neighbours.

Other key stakeholders for this project include:

- EGS Council: local planning permit and building permits, statutory referral authority for EPA works approval application, local urban drainage and road authority
- Southern Rural Water (SRW) – licensing of surface water supply and groundwater bores onsite, and local rural drainage authority

- Department of Health: statutory referral authority for EPA works approval application, responsible authority for public health, food safety, pest and vermin control
- Lumo Energy – energy supplier to the site
- Local dairy industry, suppliers, businesses and residences.

Gippsland Jersey's project has been informally publicised as part of the outreach programs to the local farming community mentioned in question 3.1 above. Gippsland Jersey also has a website and has run a crowd funding page that provides general information about the project.

East Gippsland Shire has also been consulted. A letter was sent by town planning consultants Crowther and Sadler on 25 October 2018 outlining the project and seeking council feedback on existing use rights and whether a planning permit would be required for the project. Council responded on 23 November 2018 confirming that the property at 79 Bunga Creek Rd has existing use rights (as a dairy factory), confirming that no planning permit would be required.

EPA was notified of the project through an EPA Pathways Form submission on 1 March 2019 (EPA reference number 1003469). EPA responded by Email on 19 March 2019 advising that "the application can be dealt with as a fast track works approval".

2.5 Track Record

2.5.1 Gippsland Jersey

Gippsland Jersey Pty Ltd will lease and operate the factory site and adjacent irrigation area from the landowner. Gippsland Jersey Pty Ltd has no prior history with the EPA, and does not have any other operations in Victoria that require EPA works approval or licences. The Bunga Creek Road factory will be Gippsland Jersey's first EPA approved/licensed activity.

The land on which the factory is located is on land previously used for dairy farming, milking shed operations and effluent irrigation, and associated agricultural production. There are no known incidents or legacy site contamination issues associated with this land.

Gippsland Jersey operators have extensive previous operational experience with milking shed and dairy factory wastewater irrigation management and possess the appropriate farm and irrigation skills to ensure effective and sustainable use of wastewater and ensure low environmental risk.

3 Process and Integrated Environmental Assessment

3.1 Description of Proposed Works

An overview of proposed milk processing facility and associated wastewater effluent reuse scheme was provided in Section 2.2. The factory site location was provided in Figure 2.

The primary elements of the project that trigger works approval and licensing are:

1. Milk factory operations (10 – 20 kL/day, 1 – 2 ML/Yr milk production); and
2. Wastewater collection (1 – 2 ML/Yr), storage and irrigation onsite (3 x 4Ha areas proposed).

Further details of the chosen process and technology, environmental and sustainability measures for the above proposed works are provided in the sections to follow, with supporting technical information and site plans also provided in Volume 2 Figures and Volume 3 Appendices.

3.2 Process and Technology

3.2.1 Choice of Process Technologies

Gippsland Jersey will produce milk products from its own Jindivick dairy farm as well as other dairy farmers in the region.

The factory will utilise both existing and newly procured equipment, and small-scale milk processing technology that reflects industry best practice and strict food safety and hygiene standards driven by food safety/quality management systems and milk product certifications.

Gippsland Jersey operations will aim to achieve water, energy and wastewater eco-efficiencies at the lower end of the range of benchmarks reported by the industry and in accord with EPA and other industry guidelines.

3.2.2 Milk Processes

The milk process flow and indicative floor plan of the factory were schematically shown in Figure 3 and Figure 4 respectively. The wet processing of raw milk involves the following key stages:

1. Raw milk receival
2. Pasteurisation and homogenisation
3. Pasteurised whole milk bottling
4. Separation into light milk and cream for bottling
5. Butter making (churn and extruder) and packaging
6. Cold storage and loadout.

The factory will process 20 - 40 kL/week of raw milk throughout the year, with milk processing expected to occur up to 50 weeks per year. About $^{2}/_{3}$ of the milk production will be full cream, and $^{1}/_{3}$ light milk. Flavoured milk varieties will also be produced.

Cream and butter will also be produced. Cream production is expected to be initially <30 T/Yr, increasing to about 60 T/Yr by year 3. Butter production is expected to be <2.5 T/Yr in year 1, increasing to about 5 T/Yr by year 3.

3.2.3 Factory Water Filtration Plant

Water supply for the factory (typically up to 20 kL/d required) will be supplied from an onsite water filtration plant (WFP) comprising:

- Raw water supply pumped from onsite dam built across Bunga Creek, subject to surface water diversion licence issued by SRW
- Raw water pumped to an existing above ground 100kL concrete storage tank (primary tank) west of property owner's residence where it is alum dosed to settle colloidal solids, with settled solids drained from tank to adjacent grassed paddock (waterways/drains >100m) during dry conditions
- Settled water from primary tank piped to existing 98kL secondary tank (partly above and below ground) where it will be fed to the WFP
- WFP process: Water from secondary tank is filtered by 8 x 20" micro filter cartridges, then UV disinfected by a 250l/min Microlene Steriflo UV250 disinfection unit (170W lamp power), and further disinfected by hypochlorite if required
- Final water quality from the WFP must meet Dairy Food Safety Victoria (DFSV) and Australian Drinking Water Guidelines (ADWG) standards for use in the milk factory
- WFP (filter cartridge, UV unit) flushing, cleaning and draining flows will be directed to the wastewater sump mixed with factory wastewater and reuse on the irrigation area.

Location of the water filtration plant is south of the factory near the secondary water tank as shown in in the Proposed Drainage Plan in Volume 2.

3.2.4 Wastewater Management

Milk factory operations is expected to generate about 1 - 2 ML/Yr of raw wastewater. This wastewater is expected to contain diluted milk residues (estimated 1 – 2% milk losses) and residues of chemicals used to clean the factory milk processing equipment and areas as indicatively shown in Figure 4. Organic and nutrient loads from the new processing equipment are expected to be relatively low compared to other existing older milk factories with similar milk intakes.

The organic matter and nutrients in the effluent are considered an important fertilizer resource that will be sustainably utilised across the irrigation area. The beneficial use of organic matter and nutrients within the raw wastewater is consistent with industry best practice for the dairy processing industry and wastewater reuse schemes. No wastewater treatment is proposed because of the very high capital and operating cost per unit volume of wastewater treatment for such as low scale of operation, and for little additional agricultural productivity or environmental risk benefit.

The raw wastewater will be collected in a 5 kL below ground sump and pumped to the irrigation area during dry conditions. In the event of extended rainfall, wastewater will be pumped from the sump to the 40kL enclosed storage tank and held until weather conditions are suitable for irrigation onsite.

There is an existing farm dam (~0.25ML) on the south side of the proposed irrigation area that may be utilised for short-term emergency storage in the event of storage tank capacity being reached in conjunction with wet weather preventing irrigation. There are also two ex-milking shed ponds downhill of the factory that will be kept empty to provide further emergency containment for wastewater spills.

A recirculating pump in the sump and tank will keep the wastewater mixed to prevent solids build up, which will also help minimize odour.

Further discussion of the proposed wastewater collection, storage and irrigation reuse system is provided in the Ag-Challenge Land Capability Assessment Report in Appendix G.

3.2.5 Wastewater Reuse Scheme

A Land Capability Assessment (LCA) has been conducted by Ag-Challenge Consulting - report provided in Appendix G. As discussed in the LCA report, factory wastewater will be pumped to the irrigation area onto land east of the factory (79A Bunga Creek Rd) for onsite beneficial reuse. The mainline pipe route and irrigation area is shown in Figure 2. About 12 Ha of suitable land is proposed for spray irrigation. Another 13Ha of reserve irrigation land is available across the site as shown in Figure 2.

The LCA report included baseline soil testing and concluded that suitable soils and adequate land is available for sustainable use of effluent by spray irrigation subject to nutrient load control, wastewater quality/quantity and soil monitoring, fodder harvest and grazing.

Water and nutrient budget calculations have been undertaken to confirm adequate irrigation area is available for containment in at least the 90th percentile wet year. Calculations are provided in the LCA report in Appendix G.

An irrigation management plan (IMP) will be prepared consistent with EPA's reclaimed water guidelines EIP checklist (Pub. No. 464.2). The IMP will include water use, soil, nutrient, runoff and livestock access management strategies, monitoring and annual reporting programs, and roles and responsibilities for the irrigation system operator.

Further discussion about the wastewater reuse scheme is provided in Chapter 6 of this WAA report.

3.2.6 Boiler

Hot water for the factory will be provided by a 185kW diesel-fired boiler. A bunded diesel tank (2 kL) will be installed at the south east corner of the factory - see Figure 4. Combustion emissions will be via a stack at the rear of the engine room (as shown in Figure 4), discharging above the roof line. Further assessment of boiler fuel usage and air emissions are provided in Section 7.3 and Appendix K.

3.3 Environmental Best Practice

The Gippsland Jersey proposal has incorporated environmental best practice in accord with guidance provided in the following EPA publications:

- "Works Approval Application Guideline" (EPA Pub. 1658) – Section 5.4 in particular;
- "Selected Scheduled Premises Prompt Sheets" (Pub. 1659) - *D07 Milk Processing* prompt sheet;
- "Demonstrating Best Practice – Guideline" (Pub. 1517).

EPA publication 1517 provides explanation of "best practice", referring to definitions given in State environment protection policy (SEPP). Definitions of "Best Practice" are given in SEPP as follows:

- SEPP Waters: *best practice means the best combination of techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of that industry sector or activity.*
- SEPP Air Quality Management: *The best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of a generator of emissions in that industry sector or activity.*
- SEPP also defines "minimise" as: *adoption of measures (including those listed in the wastes hierarchy), which reduces the impact of any activity or waste on beneficial uses.*

The proposed milk processing works and associated wastewater reuse scheme as detailed in the various sections and appendices of this Works Approval Application incorporate environmental best practice principles in accordance with EPA's best practice guidelines. The key best practice measures are:

- Separation distances to waterways and private residences easily meets EPA's recommended separation distances and Council minimum threshold distances for milk processing facilities
- Surrounding land use is commensurate with agricultural type operation and the site has a long history as a dairy farm with milking shed, and more recently with a small dairy factory operation
- Small-scale operation with small environmental footprint
- New processing equipment and boiler to be operated with in-built water and energy use efficiency
- Water and energy use and wastewater generation per milk throughput is expected to be within Dairy industry and EPA Guidelines (Publication No. 570) benchmarks – refer to Section 4.3.
    - Beneficial use of nutrients as fertiliser directly on land rather than further energy input to reduce N/P levels, and excess spare land provided for reuse
    - Odour from wastewater avoided by direct reuse of fresh effluent and no need for storage (temporary storage tanks and backup emergency dams provided only - up to 1 week holding)
    - Small scale operation ensures low noise – commensurate with rural area activities. Note the adjacent Lakes Entrance airport is already having impacts on local noise and amenity
    - Socially/locally supported project by farmers and local community.

3.4 Integrated Environmental Assessment

As discussed above, the factory will be refurbished with new dairy processing equipment incorporating water and energy use efficiencies, and low wastewater volume per unit volume of milk processed when compared with environmental performance benchmarks reported by the dairy industry.

The facility will use about 10-20 kL/day of water from an onsite dam built across Bunga Creek. Therefore, the project avoids any water demands on the local EGW Lakes Entrance potable supply system. Use of wastewater for onsite irrigation represents a substitute water source and the nutrient value in the wastewater also provides a supplementary source of nutrients for pasture production, thereby helping to offset purchase and use of inorganic/organic fertilisers.

The overall environmental outcome is a small-scale modern facility operating to milk industry best practice conforming to State Environment Protection Policy, EPA approvals and licensing requirements and relevant EPA dairy industry and best practice guidelines.

Further assessment of wastewater discharge to land and associated environmental impacts, eco-efficiencies, pollution prevention and management plans are discussed in the Chapters to follow.

4 Water Use

4.1 Water uses in process

Milk factory water use is expected to be around 1 – 2 ML/Yr. Most of the factory water use will be for:

- Cleaning and washdown of equipment and factory floors, milk tanker bay, milk storage tank bunded areas and other hard stand areas draining to the wastewater system;
- Other uses in the shop, office and amenities.

4.2 Water use efficiency

The key water-use efficiencies of the project and resultant water demand from Bunga Creek include:

- New processing equipment with in-built water use efficiency
- supply and reuse of wastewater to onsite irrigation areas substituting surface water diversion demands for irrigation from Bunga Ck
- use of Bunga Ck water for factory uses rather than Lakes Entrance potable water supply as a potable water substitution initiative.

4.3 Dairy industry water efficiency benchmarks

The Australian Dairy Manufacturers Sustainability Council (DMSC) regularly surveys the dairy processing industry and publishes Environmental Sustainability Scorecards for a number of sustainability indicators The most recent Environmental Sustainability Scorecard 2016–17 (representing ~75% of the industry in terms of milk processed nationally) reported the following water efficiency benchmarks:

- average 1.85 ML (range 0.9 – 3.1) of water consumed for every ML of milk processed,
- average 1.7 ML (range 0.8 – 3.1) of wastewater per ML of milk processed (NB: only 46% of industry represented).

The DMSC year 2020 water use target is: 1.4 ML of water consumed per ML of milk processed using the 2010/11 as the baseline year.

EPA Victoria "Environmental Guidelines for the Dairy Processing Industry" (Pub. No. 570, 1997) suggests a range of 0.5 - 2.5 ML of wastewater per ML of milk processed, with the lower end considered world's best practice.

DMSC reported a wide range of values across the surveyed sites. This is due to sites producing multiple products such as cheese, yoghurts and retail milk require more water to flush processing equipment and pipework.

For Gippsland Jersey's small-scale operation, it is anticipated than a water use factor of 1 ML per ML of milk processed is achievable because of the new water efficient equipment and simple processes and washdown procedures involved. After commissioning and commencement of operation, Gippsland Jersey expects greater water use efficiencies over time as milk throughputs increase and process improvements are made in particular for plant cleaning and washdown.

5 Wastewater and Stormwater Management

5.1 Wastewater System

5.1.1 Wastewater Sources

Wastewater from the factory is generated from the scheduled washdowns and sanitary cleaning of milk processing works as follows:

- Processing plant and equipment draining to floor drains;
- Internal surfaces of factory floors and walls draining to floor drains;
- External areas including tanker bay, milk holding vat bunded areas and other hard stand areas draining to the wastewater collection sump;
- Potential milk spill/leak clean-ups; and
- Intermittent WFP flushing/cleaning flows containing residual fine silty matter.

The wastewater will contain residues of milk and sanitising chemicals from cleaning of processing equipment, vats, pipes, etc. Milk losses are expected to be 1 – 2% of raw milk throughput, which is consistent with dairy industry benchmarks.

Total wastewater flows are expected to be about 10 kL on each processing day, with an initial 2 processing days per week producing an estimated 20 kL/week of wastewater, or ~1 ML/Yr. By about Year 3, the factory is expected to be operating 3 – 4 days/week, and with expected higher water use efficiencies will generate about 30 – 40 kL/week or up to ~2 ML/Yr of wastewater.

5.1.2 Wastewater Characteristics

Table 2 provides the forecast composition of factory raw wastewater, which is generally consistent with that given in EPA's Environmental Guidelines for the Dairy Processing Industry (Pub. No. 570, 1997).

Table 2 Trade waste flows and quality characteristics

Wastewater Source & Parameter	Concentration (mg/L or as stated)
Factory – raw wastewater (peak day)	
Biological Oxygen Demand (BOD_5)	1500 – 2000
Suspended Solids (SS)	500 – 1000
Free Oil & Grease (FOG)	100 – 200
Total Nitrogen (TN)	50 – 100
Total Phosphorus (TP)	20 – 40
TDS	< 1000
pH	5 – 10
Sodium Adsorption Ratio (SAR)	10 – 20

Refer to LCA in Appendix G for expected cation/anion balance of wastewater.

5.1.3 Wastewater Collection and Temporary Storage

The normal operating regime will be to ensure all effluent from each milk processing day is irrigated onsite within 12 hours so that all storage tanks are emptied prior to commencement of the next processing day.

Factory wastewater is to be collected in the 5 kL concrete sump. When the wastewater in the sump reaches a set level (~50% of sump capacity) a float switch will automatically trigger the sump pump to transfer wastewater directly to the spray irrigation system. The pump automatically stops when sump volumes reduce below the set level. During wet periods, wastewater will be pumped from the sump to above ground storage tanks (total capacity 40 kL). Once weather conditions are suitable, wastewater in the tanks will drain back to the sump for subsequent pumping to the irrigation area.

A conceptual layout of the wastewater collection and storage system is shown in Figure 6. The proposed location of the wastewater collection and storage works is shown in Figure 7.

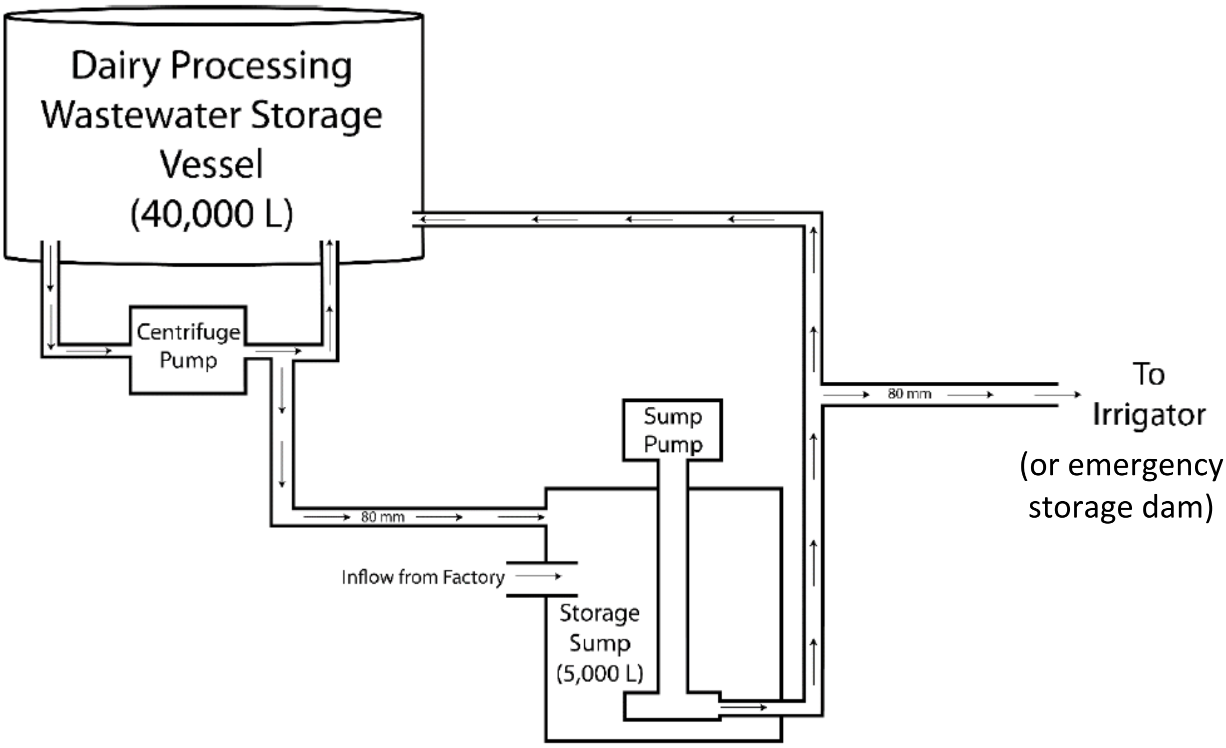


Figure 6 Wastewater Collection Sump, Temporary Storage, & Irrigation Pump System

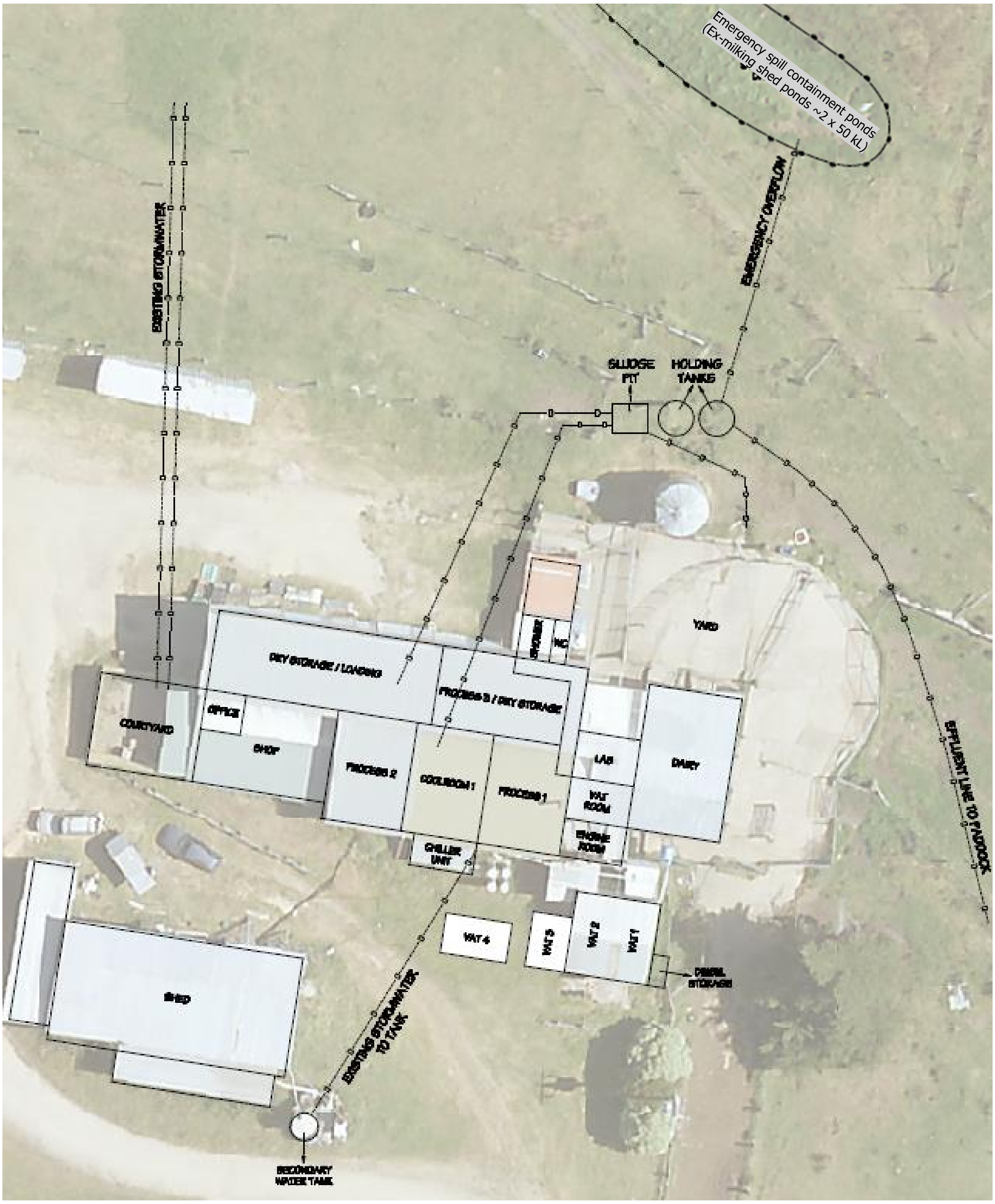
If wet conditions persist and the storage tanks are at capacity, the contingency measure to prevent overflow will be to pump wastewater to the emergency storage dam (existing farm dam, capacity ~0.25ML) located on the south side of the irrigation area (see Figure 8). Wastewater would be temporarily stored in this dam and pumped to the adjacent irrigation area as soon as dry weather conditions return (i.e. by portable pump, or back to sump via emergency diversion pipeline).

Note that if both the storage tanks and the emergency storage dam were full, factory operations would be suspended until it was possible to empty all storages via the irrigation system.

The existing ex-dairy shed effluent storage ponds located downgradient of the wastewater sump and tanks (see Figure 7) are an additional (last resort) contingency measure available to intercept spills or wastewater flows that potentially exceed the capacity of the sump and storage tank.

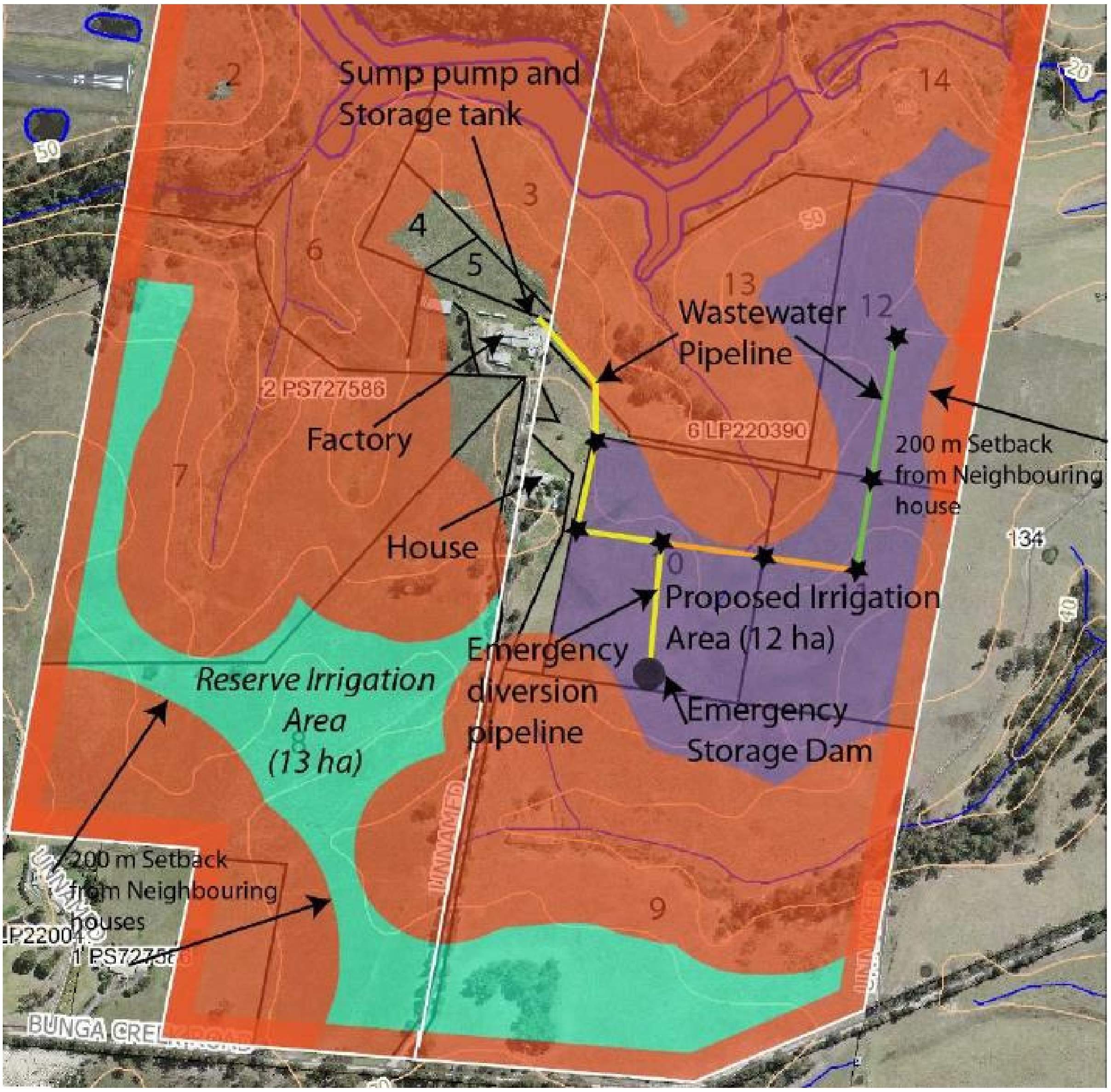
Any wastewater/spills collected in the emergency spill containment ponds would be immediately pumped back to the sump for subsequent irrigation onsite, when conditions are favourable.

Figure 7 Wastewater Collection and Storage Works – Proposed Location



Based on the expected wastewater flows (10 kL/d), the tanks should provide enough storage to cover 4 processing days. Based on 3 – 4 days processing/week (40kL/week) by Year 3, this would provide about a week's worth of wastewater containment sufficient for typical wet periods occurring in this area.

Figure 8 Wastewater Irigation Area and emergency storage dam



The emergency storage dam (~0.25ML) would provide an additional 6 weeks of storage if needed, but storage over this length of time is not proposed due to the potential for odour. Prior to increasing milk throughputs (i.e. prior to Year 3 forecasts), Gippsland Jersey will assess the need for additional storage tanks at the factory based on performance storage and irrigation systems in the first two years.

Wastewater storage in the tanks will be circulated through the sump to maintain suspension of solids to prevent sludge build up, which will help to minimise odour. Wastewater will only be stored for a few days in the tanks and emergency storage dam to prevent odorous conditions developing.

The wastewater and its nutrient value will be beneficially utilised by pasture and fodder crops grown within the proposed 12Ha spray irrigation area. Further discussion of the wastewater reuse scheme and irrigation method is provided in Section 6.2 and in the LCA in Appendix G.

5.2 Septic Tank System

There is an onsite septic tank and disposal field (located to the north-west downgradient of the factory) for the staff and shop amenities that is completely separate from the factory wastewater system. This is a pre-existing septic tank system approved by local council, that does not require any modifications.

5.3 Stormwater Management

5.3.1 Existing Stormwater Drainage

The existing stormwater drainage system is shown in the "Existing Drainage Plan" by Crowther and Sadler attached in Volume 2. Existing stormwater drainage from the factory roof, courtyard, compound, gravel driveway, yards and surrounds flow to the grassed areas and ex-dairy ponds to the north of the factory. Existing drainage flows are down the slope to the onsite dam built across Bunga Creek, which is used for farm and factory water supply.

5.3.2 Proposed Stormwater Drainage

The proposed stormwater drainage system is essentially unchanged as shown in the "Proposed Drainage Plan" by Crowther and Sadler attached in Volume 2. Clean stormwater will be directed via existing stormwater systems and pathways downslope to the onsite dam built across Bunga Creek.

5.3.3 Spill Control

As discussed in section 5.1.3 and section 6.1, any unplanned spills (milk or wastewater) would be contained within bunded floor areas and drains within the factory. The existing ex-dairy shed effluent storage ponds downgradient of the proposed wastewater sump (Figure 7) are an additional (last resort) contingency measure available to intercept any spills or wastewater flows that potentially exceeded the capacity of the sump and storage tankage. Any wastewater/spills caught in this pondage would be immediately pumped back to the sump and storage tanks or subsequent irrigation onsite when conditions are favourable.

5.3.4 Nearest Surface Waters

Nearest gazetted surface water body is Bunga Creek, as shown in Figure 2. A large dam wall was built across the creek many decades ago (see Figure 9) - date of construction unknown. SRW's surface water diversion licence contains hazardous dam operating licence provisions.

Figure 9 Bunga Creek – Dam across Creek onsite

Gippsland Jersey have an SRW diversion licence to utilise water from the Bunga Creek dam for the factory, domestic and stock and other farm uses. Hence there are added incentives for the applicant to prevent wastewater spills or runoff into this dam.

The 100m setback zone from surface waters is shown (as the orange zone) in Figure 2. Setback distances to high water mark of this dam are at least 100m from the proposed factory wastewater tanks, and about 90m from the ex-dairy milking shed ponds (proposed to be used as emergency spill interception ponds).

The proposed irrigation area will be at least 100m from defined surface waters and drainage lines as shown in Figure 8. Onsite inspection of the property for the LCA confirmed that there are no pronounced drainage lines of depressions within the proposed irrigation area that need to be avoided.

Wastewater runoff from the spray irrigation area is controlled by ensuring irrigation rate is less than long-term soil infiltration rate – refer to Section 6.2 and in the LCA in Appendix G for further discussion.

Bunga Creek at this location is within the Central Foothills and Coastal plains Segment as defined in SEPP (Waters) and categorised as having "slightly to moderately modified" ecosystems. The dam built across Bunga Creek represents a significant modification to the waterway in terms of flow regime and aquatic habitat.

Recent analyses of water samples taken from the Bunga Creek dam onsite is provided in Appendix I. This testing was undertaken as part of design of the water filtration plant for the factory and also part of information required for the DFSV milk processing licence application. The Results indicate good water quality with low levels of solids, turbidity salinity, pathogens and most metals, and neutral pH suitable for both dairy factory wastewater supply (subject to treatment) and irrigation.

DFSV have confirmed with Gippsland Jersey that the water is suitable for factory water supply subject to further water treatment that meets ADWG standards. Section 3.2.3 provides further details of the proposed onsite water treatment process for factory water supply.

Water of this quality would generally comply with environmental objectives of SEPP (Waters) for the Coastal Plains segment. Exceedances of ecosystem protection criteria for some heavy metals (e.g. zinc) could be due to background sources such as agricultural runoff and/or Lakes Entrance Airport runway runoff (potential upstream source of metals, hydrocarbons and other contaminants).

6 Land and Groundwater Assessment

6.1 Factory Works

The factory and associated compound (including previous dairy shed) occupies an area of ~2500m^2. The proposed new works for additional plant (extensions to milk tanker bay, milk vats, diesel tank, etc) will be within the existing factory compound area. The new wastewater sump and storage tank area will occupy an area of around 100m^2 immediately to the north of the factory.

The factory, milk tanker bay and vats are all contained within concrete lined and bunded areas that drain to the wastewater collection system. The diesel tank (2000 ltr) will be within a bund to contain drips, leaks and spills. Water treatment chemicals (not dangerous or hazardous goods) will be stored in watertight IBC's in sheds adjacent to the water treatment plant or factory.

Any spills that inadvertently exceed the capacity of the bunds or wastewater collection system will be intercepted by the ex-dairy ponds located downgradient of the factory – see Figure 7.

Based on the above primary and secondary containment systems and spill control measures, there is a low risk of soil/land or groundwater contamination from factory operations, milk spills, water treatment chemical and diesel storage, etc.

6.2 Wastewater Reuse Scheme

6.2.1 Irrigation System

The areas of the property to be irrigated are the pasture and grazing paddocks on the east side of the main driveway (see Figure 2 and Figure 8). These paddocks have a long history of dairy and beef cattle grazing. These areas are on the crest and upper slopes of the landscape and the gradient is comparatively gentle in these areas. Only areas with slopes less than about 6% are to be irrigated.

Table 3 provides an overview of the irrigation system design elements and operating features. Further design and operational details of the proposed wastewater collection, storage, pumping and irrigation system are provided in the Ag-Challenge LCA report in Appendix G.

Gippsland Jersey's wastewater management strategy is to beneficially utilise milk processing wastewater by spray irrigation onsite. Given that milk processing occurs every 2 – 3 days this will ensure full infiltration of wastewater into the irrigated soils, subsequent plant uptake and surface soil drying before the next irrigation event.

However, there will be times when wastewater needs to be temporarily stored in onsite tanks when conditions are not favourable for spray irrigation (i.e. significant rainfall). The onsite storage tanks in combination with emergency dams will have capacity to contain all wastewater during wet periods.

The irrigation pump is designed to transfer 50kL in <12-hours to the irrigation area, representing the daily volume of factory wastewater (10kL) plus the total 40kL storage tank capacity.

Any wastewater held in emergency storage dams will also be pumped to the irrigation area prior to the next processing day either via draining back to the factory's pump sump, or via operation of a portable pump placed at the dam. If all tanks and emergency storage dams are full, the dairy factory will postpone milk processing operations until adequate wastewater storage capacity has been restored.

Refer to Section 10.3 of the LCA report (Appendix G) for procedural steps for daily (10kL/d) and weekly (50kL backlog) operation of the wastewater irrigation system including during dry and wet conditions.

Table 3 Wastewater Irrigation System Design Elements – Summary

Design Element	Description
Irrigation method	Spray irrigation: K-line pod system and/or travelling irrigator
Factory Wastewater Volume	10 kL/d, 1 – 2 ML/Yr
Tank storage plus sump capacity	45 kL
Emergency storage dam capacity	~250 kL (existing farm dam ~20m x ~20m x ~1m deep)
Emergency spill pond capacity	~100 kL (2 existing ex-dairy shed ponds each ~25m x ~5m x ~1m deep)
Irrigation pumping rate	10 kL/d (average), 50 kL/d (max. including storage tank backlog)
Mainline to Irrigation Area	HDPE/PVC 80mm diameter, ~800m long, with 7 hydrant risers
Distribution from each hydrant	• K-line: ~100m flexi hose connected to 90m moveable K-lines (3 sprinkler pods, 30m diameter each, total area covered: 2121m^2) • Travelling irrigator: short flexi hose connection to irrigator unit (total potential area covered: 38m wide, 150m long, 5700m^2)
Soil water infilltration rate	13 mm/hr (sandy loam over clay soil)
Irrigation application rate	<4 mm/hr (irrigation rate < soil infiltration rate ensures no runoff or ponding)
Soil Water Holding Capacity	Topsoil: 40 – 60 mm (100 – 130 mm/m for sandy loam 40 – 45cm deep) Subsoil: 130 – 170 mm/m (sandy clay) (Ref: EPA Pub. No. 168, 1991)
Typical area irrigated each day	Dry conditions (10kL/d every 3 - 4 days): 400m^2 (travellor) to 2121m^2 (K-line) Moist soil conditions (50kL every ~7 days): 4242m^2 (K-line) to 5890m^2 (travellor)
Irrigation depth (plant demand)	20 – 30 mm/mth in winter 130 – 140 mm/mth in summer
Total Irrigation Area Available	12 Ha (3 x 4Ha paddocks, 4Ha rotation each year)
Irrigation Area Used each year	4 Ha (~20 rotations/yr of 2000m^2)
Irrigation depth per application	Dry conditions: 5mm (K-line, shift every ~5 days) to 25mm (travellor, shift daily) Moist conditions (50kL backlog every 7 days): <13mm (K-line) to <9mm (travellor)
Annual irrigation depth	50mm or 0.5 ML/Ha/Yr (2 ML/Yr over 4Ha)
Annual nutrient load	TN 50 kg/ha/Yr TP 20 kg/Ha/Yr
Pasture Uptake (Kikuyu)	TN 250 kg/Ha/Yr TP 20 kg/ha/Yr
Pasture Uses	Beef cattle grazing, fodder production
Separation Distances	• Surface waters, drains: >100m • Private Residences: >200m
Irrigation area slopes	2 – 6% (gently undulating)
Soil Types	Duplex soil: - Topsoil: sandy loam (A1 & A2 horizon, depth to 40 – 45cm) - Subsoil: sandy clay (B1 horizon, deeper than 40 – 70cm)
Depth to Watertables	Regional Aquifer System: Haunted Hills Formation >20 – 50m. Local perching in shallow Quarternary sediments along Bunga Ck.
Groundwater Segment (TDS)	SEPP (Waters): Segments B & C: TDS 1201 – 5400 mg/L
Surface Water Segment	SEPP (Waters): Central Foothills and Coastal Plains, "slightly to moderately modified" ecosystems

If irrigation conditions are not suitable (i.e. rainfall, high winds and offsite spray drift risk) the operator will manually divert wastewater flows to the temporary storage tanks (and/or to emergency storage dam if these tanks are full). The need for this will be determined by the operator prior to each milk processing day based on weather forecasts and irrigation area inspections.

Wastewater ponding and runoff will be avoided given the permeable deep sandy topsoils, dry weather irrigation scheduling and ensuring spray irrigation rates are lower than soil infiltration rates. Operator inspections will take place during and after irrigation to confirm no ponding, runoff or wastewater springs emerge on the lower slopes with potential discharge to drainage lines or to Bunga Ck. If required, additional runoff controls can be implemented by installation of 300mm high contour banks on the steeper downslope sides of the irrigation area, which are also a typical erosion control measure.

Spray drift controls include prior inspection, avoidance of irrigation during wind conditions (i.e. westerlies in particular given closest resident is to the east), and adequate setbacks to boundaries and nearest houses. Tree screens along the east boundary may be installed as a longer-term measure.

Refer to Section 6.2.3 for a summary of the Ag-Challenge LCA report (provided in Appendix G).

Gippsland Jersey will implement an Irrigation Management Plan (IMP) for the wastewater reuse scheme including wastewater quality and quantity, irrigated volumes, irrigation controls and scheduling, soil testing, inspection and maintenance, etc. See section 6.2.4 for further details.

6.2.2 Water Balance calculations

Water balance calculations have been undertaken using methods described in EPA's Guidelines for Wastewater Irrigation (Pub. No. 168, 1991) for proposed irrigation and nutrient loads designed to optimise plant water and nutrient uptake and minimise potential seepage to deeper soils. Results of calculations are provided in Appendix F.

The LCA report in Appendix G also provides more details of local climate (rainfall and evaporation) and anticipated plant water deficit and excess values for year-round wastewater irrigation.

A summary of the water balance calculations is provided in Table 4, which is based on statistical average rainfall and evaporation for Lakes Entrance.

Table 4 Water Balance Calculations for Wastewater Irrigation

Pasture	UNIT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
AVERAGE RAINFALL YEAR															
Evaporation	mm/mth	A	202	162	136	84	53	42	47	68	93	125	153	186	1351
Rainfall	mm/mth	B1	39	52	55	65	39	97	48	55	50	61	69	67	697
Effective Rainfall Factor			0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	
Effective Rainfall	mm/mth	B2	27	36	39	46	27	68	34	39	35	43	48	47	488
Crop Co-efficient			0.70	0.70	0.70	0.60	0.50	0.45	0.40	0.45	0.55	0.65	0.70	0.70	
Potential ET	mm/mth	C1	141	113	95	50	27	19	19	31	51	81	107	130	865
Max. Plant Demand Depth	mm/mth	C2	114	77	57	5	0	0	0	0	16	39	59	83	450
Max. Plant Demand Vol.	m³/mth	D	4564	3080	2268	196	0	0	0	0	646	1542	2352	3332	17980
Wastewater monthly distribution	%		8%	7%	7%	7%	7%	7%	8%	9%	10%	11%	10%	9%	100%
Wastewater to Irrigation Area	m³/mth	I	158	132	134	138	148	138	155	178	207	218	204	188	2000
WW TN Load	kg/Ha	TN	4.0	3.3	3.4	3.5	3.7	3.5	3.9	4.5	5.2	5.5	5.1	4.7	50
WW TP Load	kg/Ha	TP	1.6	1.3	1.3	1.4	1.5	1.4	1.6	1.8	2.1	2.2	2.0	1.9	20
Plant Water Demand Deficit	m³/mth		4406	2948	2134	58	0	0	0	0	439	1324	2148	3144	16601
Plant Water Demand Excess	m³/mth		0	0	0	0	148	138	155	178	0	0	0	0	621
Wastewater + Rainfall Leaching	m³/mth	S	0	0	0	0	149	158	161	182	0	0	0	0	650
WW TN Leaching	kg/Ha	L	0.0	0.0	0.0	0.0	3.7	3.5	3.9	4.5	0.0	0.0	0.0	0.0	16

Of the total 2 ML/Yr irrigated, at least 1.4ML/Yr would be taken up by plants during the warmer months from September through to April when evapotranspiration exceeds effective rainfall.

Between May and July, irrigated wastewater would exceed plant demand and potentially leach beyond the rootzone. If no or very low rainfall occurs during winter, higher plant uptake (evapotranspiration) will occur.

The operating strategy is to irrigate during dry conditions only to ensure higher plant uptake across the year including in winter. The water balance provides a conservatively high estimate of ~0.6ML/Yr of irrigated wastewater leaching to deeper soils between May and July, where it is expected to be fully attenuated onsite (including nutrients and salts) within the unsaturated subsoil zone.

6.2.3 Land Capability Assessment

This section provides an overview of the land capability, nutrient, salinity and sodicity management issues from the LCA report by Ag-Challenge (attached in Appendix G). A summary of the key site characteristics, soil conditions, and irrigation design elements from the LCA were given in Table 3.

The wastewater and its nutrients will be beneficially utilised by pasture and fodder crops grown within the spray irrigation area. The LCA report confirmed that suitable local climatic conditions, onsite soils, topography and setbacks are available for sustainable reuse of the factory wastewater in accord with EPA guidelines and SEPP (Waters). The 12 Ha area onsite was chosen (see Figure 8) for its centralised and elevated position, gentle slopes, deep sandy/loam soils and adequate separation distances to drain lines, surface waters, private residences and the local airport runway.

Organic, Water and Nutrient loadings

The key irrigation management issue is water and nutrient loadings during winter, which can be readily matched to plant nutrient demand by optimising the use the wastewater across larger irrigation areas. Table 5 summarises the expected average wastewater concentrations and annual irrigation area mass loadings.

Table 5 Organic, nutrient, salinity loading rates on irrigation areas

Parameters	Concentration (max.) mg/L	Average Year Irrigation Demand ML/Ha/Yr	Irrigation area loading kg/Ha/Yr
BOD	2000	0.5	1000
Total nitrogen	100		50
Total phosphorus	40		20
TDS	1000		500

The BOD loadings are expected to benefit the onsite sandy-loam topsoils helping to maintain organic matter in topsoils that will ensure optimise pasture growth.

The overall wastewater application rates (0.5 ML/Ha/Yr) and associated nutrient loadings are well below average annual pasture water and fertiliser demands as shown in the Water Balance Table 4. This therefore ensuring full containment of wastewater onsite even in wet years.

Baseline nutrient levels were found by Ag-Challenge to be generally low to adequate in topsoils and low in subsoils. The application of nutrients in the wastewater will benefit the soils and ensure productive pasture growth.

The EPA Water Balance conservatively estimates nitrogen leaching losses of around 16 kg/Ha/Yr to unsaturated subsoils. However, potential losses to deep soils and groundwater are expected to be much less than this given that the wastewater nitrogen will be mostly organic (TKN) and upon infiltration into soils would convert rapidly to ammonia and nitrate, which is then readily taken up in the root zone by the pasture and soil biomass. In addition, a significant proportion of applied nitrogen is expected to be lost to biological denitrification processes particularly in high moisture content soils (i.e. in winter) resulting in N-volatisation losses as nitrous oxide (N_2O) and di-nitrogen (N_2) gases.

Therefore, wastewater applied N loads are expected to be fully taken up by pasture or otherwise naturally attenuated onsite without detectable offsite impacts on groundwater or surface waters.

The low level of expected nitrogen loss from the wastewater will be much less than that from other dairy and beef cattle pasture/grazing and other agricultural enterprises involving inorganic and organic fertiliser applications. Note that any phosphorus exceeding plant demands is expected to be fully attenuated within the rootzone both by the surface topsoils and at the sandy-clay subsoil interface by clay adsorption/fixation processes. No migration of phosphorus is expected to occur beyond the irrigation area nor the site boundaries.

A 3-year rotation is proposed so that a minimum 4 Ha irrigation area is utilised each year. A different 4 Ha area is to be used each year to ensure 2-year resting periods for each of the other 4 Ha paddocks. The full 12 Ha would be utilised over the 3-year rotation. Beef cattle grazing and fodder harvest is proposed to export nutrients from the irrigation area.

Salinity and Sodicity

Ag-Challenge Baseline soil testing in the irrigation area found low and harmless levels of salinity and chloride in both topsoils and subsoils. Sodicity varied from non-sodic in the surface soils (0-10 cm) to sodic in the subsoils (depth 40-60 cm).

The low wastewater application rate and resting each irrigation 4 Ha area in a 3-year rotation will provide adequate time for rainfall to leach salts applied in the wastewater.

Salt leaching losses will occur to the unsaturated subsoil zone where it would be naturally attenuated onsite without detectable offsite impacts in groundwater or surface waters.

The wastewater is expected to have an SAR between 10-20 (but more likely at the lower end). Well-structured sandy-loam topsoils are expected to cope with these SAR levels. The greater risk of potential permeability loss is associated with the sandy-clay subsoils. To ensure irrigation does not have a negative impact on soil structure a regular soil monitoring program will be undertaken to determine what timely remedial actions may be required to correct any undesirable trends in soil sodicity. To ensure soil ESP remains at an acceptable level gypsum may need to be applied annually to reduce the risk of soil permeability loss through a decline in soil structure. The high organic loads from the raw wastewater will help to maintain high organic matter levels and therefore maintain soil permeability.

6.2.4 Irrigation Management Plan (IMP)

An IMP will be prepared in accordance with the Environment Improvement Plan (EIP) Checklist for irrigation schemes <1 ML/D as described in EPA's Guidelines for Reclaimed Water Use (Pub. No. 464.2). The IMP will outline the recycled water use operations and controls, key procedures, monitoring programs (irrigation volumes, soils, nutrients and salinity), emergency notification (e.g. runoff, spills, odour, spray drift, etc) and response, self-assessment annual performance checklist.

Refer to Ag-Challenge LCA report (in Appendix G) for further details of wastewater and soil monitoring programs. Soils will be retested annually, and wastewater will be tested quarterly.

The IMP will be prepared for implementation prior to commencement of factory operations. The complete IMP will be provided to EPA at time of licence application. An indicative table of contents of the proposed IMP with key headings and structure as per EPA's EIP Checklist is provided in Appendix H.

6.3 Groundwater Assessment

6.3.1 Groundwater Bore Search

A search was undertaken for registered groundwater bores within a 1 km distance downgradient from the site using the "Visualising Victoria's Groundwater" (VVG) internet data mapping portal (www.vvg.org.au). The search results are presented in the series of maps provided in Appendix J.

The VVG indicates that there are 3 WMIS GW bores and 2 GEDIS bores within 1km of the site, however none of these are downgradient of the Gippsland Jersey factory or irrigation area. The locations of the bores are shown in Appendix J (Figures 1 to 5).

Groundwater would flow in the direction of Bunga Creek, which is deeply incised into the landscape. All these bores are clearly in aquifers that are either upgradient, cross gradient or hydraulically separated from the Gippsland Jersey site by elevation, topography and the aquifer interception by Bunga Creek and its tributaries.

The groundwater database search provided very limited information about bores downgradient of the site. Groundwater in the area is typically used for domestic and stock water supply. Other bores have been drilled for coal and petrochemical exploration and other observation purposes. Bore numer 56198/WRK043076 is a stock/poultry water supply both located about 1km north east of the proposed irrigation area across the other side of the Bunga Creek steep valley. This bore was drilled in 1973 at a depth of 100 to 106m.

6.3.2 Geological and Hydrogeological Information

A summary of regional and local geological and hydrogeological information based on the VVG database search and the Ag-Challenge LCA report (Appendix G) is presented in Table 6.

Table 6 Geological / Hydrogeological Information

Regional Geology	Neogene (Pliocence to Miocene) unconsolidated Quaternary and Tertiary sedimentary marine and non-marine deposits of gravel and sand. Upper Pliocene (Tertiary) age Haunted Hills Formation consisting of various portions of sand, gravel, and clay.
Local Geology/Soils	Duplex soils, sandy loam topsoil (depth 40 – 45cm), sandy clay subsoil (depth below 40 – 70cm)
Average Depth to Groundwater	>20 – 50m NB: watertable in lowlands is likely to be close to the water level of the dam across Bunga Creek. Top of dam wall is at ~30m elevation, which is about 20-30m below the surface level of the irrigation area.
Local Groundwater Flow Direction	North to north east towards Bunga Creek (steeply incised valley)
Likely Aquifer Quality	SEPP (Waters): Segments B & C: TDS 1201 – 5400 mg/L

Appendix J (Figures 2, 3 and 4) provides maps of groundwater beneficial uses, salinity and geology for the site and surrounds.

6.3.3 Groundwater protection measures for the Factory and Irrigation Area

The land and groundwater protection measures for the Gippsland Jersey project were discussed in sections 6.1 and 6.2. The key measures that ensures a low contamination risk to groundwater include:

- enclosed factory processes, operational area paved areas, EPA compliant bunding and containment systems
- watertight storage tanks and sumps
- minimal seepage emergency storage dams given they are to be rarely used
- wastewater only contains organics, nutrients and low salt levels, and no chemical contaminants
- underlying clayey soil subsoils and geology with low inherent permeability
- current water tables >20m below factory and irrigation areas
- >100m setbacks from factory and irrigation area to Bunga Creek (including drainage lines)
- adequate setbacks to private bores – no bores identified downgradient.
- recycled water irrigation leaching (nutrients, salts) will be fully attenuated onsite by the unsaturated zone (sandy-clay subsoils) and highly unlikely to adversely impact SEPP (Waters) groundwater segment B and C beneficial uses.

The property has been irrigated with dairy shed and milk factory effluent in the past without any reported environmental problems or incidents. The previous dairy farming operation included pasture production to support several hundred head of dairy cattle. Significant quantities of fertiliser and dairy shed effluent and manures would have been applied to the land for many years.

The groundwater impacts from recycled water irrigation leaching and minor emergency pond seepage are expected to be not discernibly different from the impacts of other dairy farm and agricultural activities in the area.

Wastewater irrigation will be managed in accordance with good agricultural and irrigation practice and EPA's wastewater irrigation and reclaimed water use guidelines (Publications 168 and 464.2). Irrigation rates will match plant water and nutrient demands. It is good agricultural and irrigation practice to implement leaching fractions to maintain productive soils that result in high crop yields to maximum nutrient uptake.

An irrigation management plan (IMP) will be put in place for the recycled water scheme based on the EIP checklist given in EPA's reclaimed water guidelines 464.2 - refer to section 6.2.4 and Appendix H.

7 Air Emissions

7.1 Air Quality Issues

The key air quality management issues for the Gippsland Jersey project are potential for the following

- odour from wastewater drains, sump, storage tanks and emergency storage dams;
- odour from spills not promptly cleaned up;
- visual emissions and fumes from diesel boiler unit;
- spray drift and associated aerosol odour from spray irrigation;
- wastewater ponding odour on the irrigation area;
- fugitive dust from hardstand, unsealed areas.

7.2 Separation Distance Assessment

The impact of industrial residual air emissions has been assessed by assessment of compliance with EPA's "Recommended separation distances for industrial residual air emissions" (Pub. No. 1518, March 2013). These guidelines provide recommended setback distances for unintended, industry-generated odour and dust emissions. Recommended separation distances for milk processing and wastewater irrigation are provided in EPA's Publication 1518.

Definition of a "sensitive land use" is subject to interpretation but is typically regarded as a residential zone, school, hospital, or similar. An isolated farmhouse in a farming zone can also be regarded as a sensitive use and the separation distance applies to the footprint of the house, garage, carport, clotheslines, swimming pools, BBQ areas, etc. Depending on the zoning of the sensitive land use, there are two different methods of how to measure the recommended separation distances as per Table 2 of the IRAE guidelines:

1. Method 1: Distance measured from factory building/hardstand (i.e. the residual air emission source) to residential property boundaries (sensitive use) in a Residential or Town Zone
2. Method 2: Distance measured from factory building/hardstand (source) to house building footprint (sensitive use) in Farm Zone.

For the land use zoning at Gippsland Jersey and surrounding areas, "Method 2" applies.

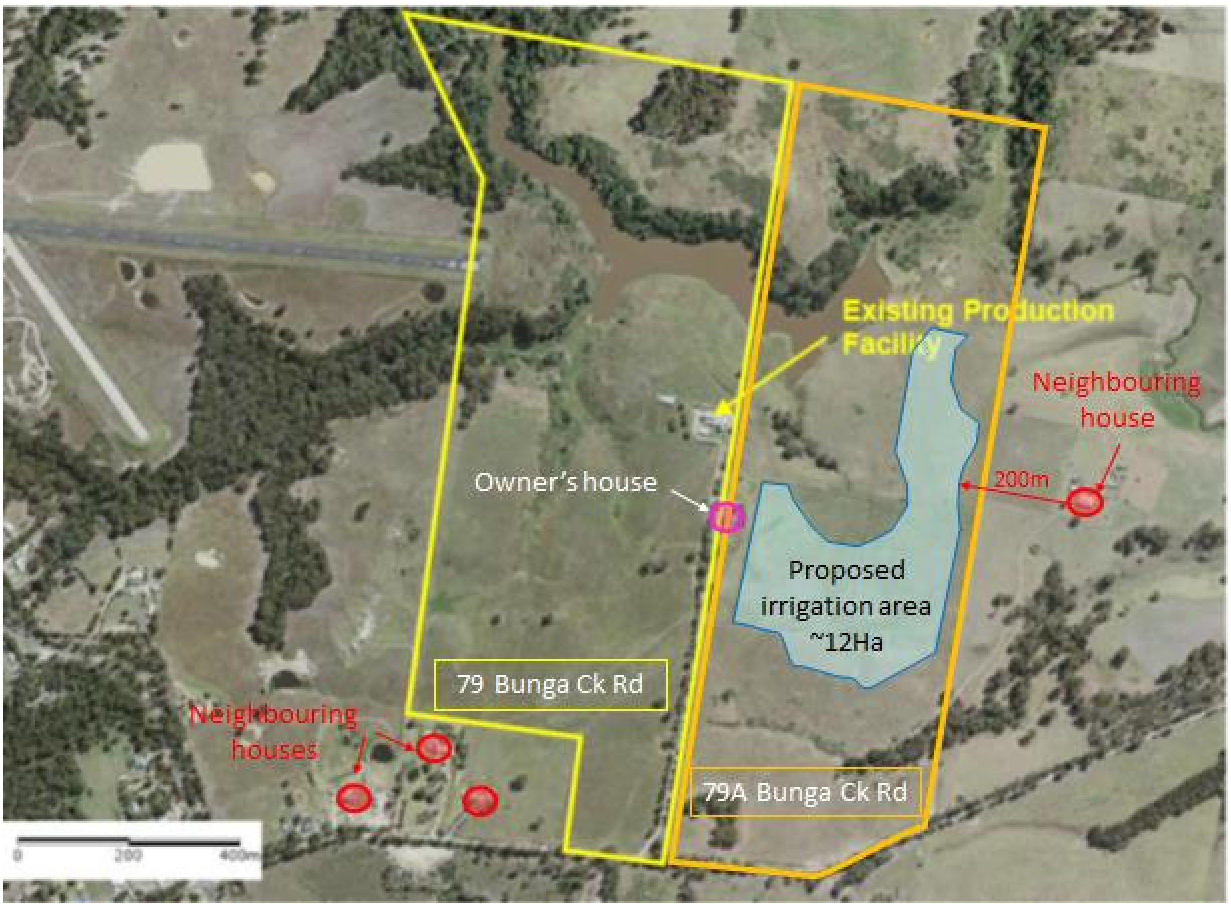
The location of nearest private houses relative to the factory and irrigation area is shown in Figure 10. The nearest neighbouring private farmhouses are as follows:

- 1 neighbour to the east about 600 metres from the factory, 200m from the irrigation area
- 2 dwellings to the south-south-west approximately 700m from the factory site

The house on the property at 79A Bunga Creek Rd is the owner of the 79 Bunga Creek Rd land holding on which the factory site is located. This house is about 150m south of the factory. The owner is a family member of the owner of the Gippsland Jersey company. The factory site and irrigation areas on both properties are to be leased by Gippsland Jersey for milk production and wastewater reuse.

The Great Lakes Airport runway is located about 450m north west of the factory site. The factory and associated works and irrigation areas are not located under the flight path of the runway.

Figure 10 Milk Factory – location of private houses



7.2.1 Milk Factory Separation Distance Requirement

EPA guidelines recommend a separation distance of 100m from milk or dairy production facilities with throughput >200 tonnes/year. This distance applies to the factory compound, which is taken to be at the edge of the hardstand. All private residences are at least 600m from the factory compound.

7.2.2 Wastewater Irrigation Separation Distance Requirement

A 200m setback from the wastewater irrigation area has been delineated along the eastern boundary from the nearest house to the east (see Figure 10).

EPA's guidelines 1518 and 168 recommend a minimum separation distance of 200m for spray irrigation of secondary treated effluent, which is not intended to apply to raw wastewater irrigation.

EPA's guidelines state that the recommended separation distances aim to minimise impacts on sensitive land uses arising from the unintended, industry-generated odour and dust emissions. IRAE guidelines also provide flexibility for site specific variation to separation distances subject to specific criteria. For the irrigation area, a site-specific variation is justified given that the existing separation distances are adequate to prevent offsite spray drift and potential odour based on the following best practice measures:

1. The wastewater to be irrigated will be untreated but fresh and not odorous, typically irrigated on the day of processing or within 4 days (recirculation system in storage tanks maintains mixed conditions to stop build-up of settled sludges/solids and development of anaerobic conditions

2. Lime and/or hypochlorite dosing of tank is possible to raise pH, suppress biological activity and mitigate odour
3. Offsite spray drift from irrigation will be prevented by use of low atomising sprays and scheduling of irrigation during favourable conditions only (avoiding operation during periods of westerly winds).

7.2.3 Council Threshold Distances

Clause 52.10 of the ESG planning scheme indicates the following "threshold distance" for uses with potential for adverse amenity impacts, which are relevant to the development:

- Manufacture of milk products: 300m.

Under the planning scheme threshold distances are usually measured from source boundary to receptor boundary. If not met, these "thresholds" trigger the need for further consideration of the interface between industrial uses and sensitive land, as part of any variation to these minimum distances.

No private houses fall within the above threshold distance.

7.3 Boiler Emissions

As discussed in section 3.2.6, hot water for the factory will be provided by a thermally efficient 185kW NuWay/Bentone diesel-fired boiler. A bunded diesel tank (2 kL) will be installed at the south east corner of the factory - see Figure 4.

Diesel fuel consumption will be about 15 l/hr (~20 kL/Yr). Further details of boiler fuel usage is provided in Appendix K. Combustion emissions will be via a stainless steel stack at the rear of the engine room (location shown in Figure 4), which discharges ~1.2m above the roof line.

Combustion emissions (particulates, NO_x, SO_x, CO, Volatile organic compounds, etc) will be very much lower than EPA regulatory triggers for Works Approval/Licensing. Given the 600-700m setbacks to nearest houses, these low-level emissions will not be detectable or visually noticed at site boundaries Therefore, boiler emissions and need for dispersion modelling was not considered further for this WAA.

7.4 Air quality management practices

To summarise, the best practice air quality protection measures (spray drift, odour) and to be implemented comprise:

- Wastewater management strategy to irrigate all wastewater fresh on the day it is generated
- Wastewater tanks to include recirculation pump to prevent sludge build up, lime/hypo dosing to control pH and prevent biological activity (H_2S generation) and mitigate odour
- Irrigation management plan to prevent ponding by setting irrigation rates < soil infiltration rates
- Avoidance of spray drift by use of low atomising sprays, and avoidance of irrigation on days of high westerly winds.

8 Energy Use and Greenhouse Gas Emissions

8.1 GHG Issues

The milk processing plant and associated water treatment plant and wastewater pumping and irrigation facilities will produce energy related greenhouse gas (GHG) emissions from onsite usage of diesel and electricity.

Estimates of Scope 1 (direct point-source) GHG emissions from diesel usage, and Scope 2 (indirect emissions) from purchase and consumption of electricity are provided in the sections below.

Scope 3 GHG emissions are excluded in this WAA, which are the indirect emissions attributable to the offsite "upstream" extraction, production, transport, transmission, distribution, etc of fuels and electricity.

Non-energy related GHG emissions are negligible at the site and are not considered further.

Estimates of combined annual GHG emissions from onsite usage of diesel () and electricity (are provided below based on "National Greenhouse Accounts Factors" (Commonwealth Department of the Environment and Energy (DEE July 2017).

8.2 Gas Use & Associate GHG emissions

8.2.1 Diesel Usage

Diesel fuel consumption will be about 15 l/hr (~20 kL/Yr). Details of boiler fuel usage was provided in section 7.3 and Appendix K.

8.2.2 GHG emissions from fuel combustion

GHG emission factors for diesel oil are as follows:

- Energy content: 38.6 GJ/kL
- Emission factors: CO_2 = 69.9, CH_4 = 0.1, N_20 = 0.2 CO_{2-e}/GJ
- Total Emission Factor = 70.2 CO_{2-e}/GJ

Based on expected diesel usage, annual energy consumption is expected to be as follows:

- 20kl/Yr x 38.6 GJ/kL = 772 GJ/Yr

Total GHG emissions are therefore:

- 70.2 x 772 = 54,194.4 kg CO_{2-e}/Yr or 54.2 t CO_{2-e}/Yr

8.3 Electricity Usage

8.3.1 Electrical Supply

Electricity supplier to the site is Lumo Energy. Transformer capacity is 100 kVA.

8.3.2 Electricity Usage

About 79% of the electricity demand will be for factory milk processing equipment, pumps and refrigeration. The balance of electricity demand will be for the wastewater system (~14%) and water filtration plant (~7%).

An indicative breakdown of forecast electrical loads and usage is provided in Appendix K. Forecast annual electricity consumption is estimated to be about 79.5 MWHr.

Note that numerous assumptions about power usage have been made because equipment design and selection has not yet been finalised.

Based on the forecast power usage, annual Scope 2 GHG emissions from electricity consumption will be about 140.1 tCO_{2}-e/yr.

8.4 Energy Use - Greenhouse Gas Inventory

A summary of the forecast total diesel and electrical energy usage, and associated Scope 1 and 2 GHG emissions is provided in Table 7. This is based on 3 processing days per week, 52 weeks of the year.

Table 7 Energy use and GHG emissions – Gippsland Jersey Milk Factory (3 days/week)

Energy/fuel type	Used by	Usage	Conversion Factor (DEE July 2017)	GHG emissions tCO_{2}-e/Year
Diesel (Scope 1)	Boiler	772 GJ/Yr	70.2 $kgCO_{2}$-e/GJ	54.2
Electricity (Scope 2)	Factory, Water and Wastewater systems	79.5 MWh/Yr	1.08 tCO_{2}-e/MWh	85.9
Total				**140.1**

In the future, processing is likely to increase to 4 days per week. In that case GHG emissions are expected increase to about 187 tCO_{2}-e/Yr (see Appendix K for calculations).

Note that if we included Scope 3 emissions this would add about 8% to the Scope 1 and 2 GHG calculations. Refer to Appendix K for Scope 3 calculations.

8.5 Non-Energy Related Greenhouse Gas Emissions

Potential non-energy related emissions are negligible – i.e. no anaerobic digestion processes proposed.

8.6 Energy Use Efficiency Measures

The factory is a new operation incorporating new water and energy efficient equipment, variable speed drive pumps, etc. This is consistent with best industry practice energy use.

The energy efficiencies built into the project will enable necessary adaptions to be made in a timely manner to respond to potential fuel or electricity supply pricing or other restrictions in the future that might impact on water, gas and electricity supply services to the site.

8.7 Dairy industry energy efficiency and GHG benchmarks

The Australian Dairy Manufacturers Sustainability Council (DMSC) regularly surveys the dairy processing industry and publishes Environmental Sustainability Scorecards for a number of sustainability indicators The most recent Environmental Sustainability Scorecard 2016–17 (representing about 75% of the industry in terms of milk processed nationally) reported the following eco-efficiencies:

- average 160 tonnes (range about 80-200) of GHG emissions carbon dioxide equivalent (tCO_{2}-e) per ML of milk processed.

DMSC targets for these indicators are as follows (baseline year 2010/11, target year 2002):

- average 125 tCO_{2}-e per ML of milk processed.

Based on Table 7 and Appendix K, for up to 2 ML/Yr raw milk throughput the new Gippsland Jersey factory would have the following estimate GHG emission eco-efficiency:

- ~93.4 tCO_2-e per ML of milk processed for 3 day/week operation
- ~124.5 tCO_2-e of milk processed for a future 4 day/week operation

Forecast GHG emissions are therefore lower than both the average and target DMSC benchmark values.

After commissioning and commencement of operation, Gippsland Jersey expects greater energy use efficiency gains and reductions in GHG emissions over time as process improvements are made and staff are trained.

8.8 Climate Change Considerations

Climate change readiness is inherently built into the project, given that the factory operations are relatively small by industry standards and therefore factory water demand is relatively low compared to the expected water flow availability from Bunga Ck. There is also more than enough land available onsite to sustainably manage the wastewater.

Key climate change considerations are as follows:

- Milk availability variations follow climate variations.
    - During drought there will be lower milk availability and therefore lower processing throughputs. At these times there will be lower effluent loads, which would be easier to manage on the irrigation area during dry conditions.
    - During wet conditions, the strategy would be to reduce milk receival particularly if it is too wet to irrigate recycled water. This would be part of the IMP (see section 6.2.4).
- Reuse of effluent onsite will help to drought proof and maintain farm productivity
- Backup irrigation area can be utilised if short-term or longer-term high rainfall occurs due to climatic change.

9 Noise Emissions

9.1 Noise Assessment Guidance

State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 only applies to Melbourne's metropolitan areas. Guidance on industry noise levels and limits in Regional Victoria is described in EPA's "Noise from Industry in Regional Victoria" (NIRV) guidelines, Publications 1411, 1412 and 1413. In particular Publication 1411 explains how recommended noise levels are set for sensitive receptors potentially impacted by an industrial operation. NIRV adopts SEPP N-1's procedures for setting recommended noise levels and also for measurement of noise.

9.2 Noise Emission Sources

The primary noise sources from the project are:

- Milk tanker bay pumps and truck noise
- Product loadout bays and truck noise
- Milk processing factory
- Refrigeration plant
- Boiler (including stack noise)
- Wastewater and Irrigation pumps
- Other internal and external plant, equipment and ancillary works.
- Staff office and carpark arrivals and departures associated with each shift.

Most of the significant noise sources are located inside the factory, dryer and services buildings, which are provided with acoustic panels. External noise sources are to be provided with noise covers/shrouds as required.

9.3 Sensitive Receptors for Noise Assessment

The closest noise sensitive receptors to the factory operations are as follows:

- 1 dwelling to the east about 600 metres from the factory, 200m from the irrigation area
- 2 dwellings to the south-south-west approximately 700m from the factory site.

The owner's house is located on the property at 79 Bunga Creek Rd about 150m south of the factory. The owner is party to the Gippsland Jersey project and will be leasing the factory and irrigation lands to Gippsland Jersey, so noise limits set down in EPA NIRV guidelines do not need to be met at this house.

9.4 Noise Impact Assessment

The factory is located on a north facing hill just below the 60m contour line as shown on Figure 2 (see also Figure 1 in the LCA Report in G). Potential factory, water and wastewater pumping noise emissions are therefore attenuated by virtue of elevated land (>60 – 70m elevation) between the factory and nearest private houses to the east and south west. The significant distances between the factory and these nearest residences (>600m) will also be sufficient to ensure compliance with rural noise limits set by EPA's NIRV guidelines.

Note that there is likely to be significant background noise at times from aircraft departing from and landing at the Lakes Entrance Airport. The flight paths of the runways are over the northern part of the Gippsland Jersey property, and also over the house to the south west of the site.

9.5 Best practice noise control measures

Most factory plant and equipment noise sources will be contained within the building which is provided with insulated panels having significant noise attenuation properties.

There will only be about 1 -2 milk tanker movements per day, and not every day. Milk tankers and product dispatch vehicles will only enter the site during daylight periods. Given the low staff numbers onsite at any one time, there will only be a small increase in traffic volumes at start and end of milk processing shift times.

As stated earlier factory and associated water and wastewater pumping system will be natural shielded by the elevated topography between factory and nearest private houses. This shielding in combination with significant separation distances ensures noise limits at nearest private houses will comply with rural noise limits specified in EPA's NIRV guidelines.

10 Waste management

10.1 Waste Inventory

The types and volumes of wastes generated from the factory are listed in Table 8. Gippsland Jersey will establish a tracking system to monitor generation of wastes and potential recyclable materials.

Table 8 General and Industrial Waste generation and disposal/reuse route

Type of waste generated	Typical Quantity	Disposal/Reuse Route
Construction waste – wood, metal, packaging, plastics, concrete, bricks, soil, etc	To be determined by tracking system following commencement of operations	EPA licensed facilities or construction material recyclers
General Waste - garbage, food wastes		EPA licensed landfill (to Lakes Entrace landfill nearby) ESG kerb side collection or by contractor
Factory packaging and recyclables - paper, cardboard, soft and hard plastics, containers, glass, etc		Recycling facilities – to be collected by contractor
Wooden pallets		Pallet or wood recycling sites
Timber, scrap metal, old plant and equipment, etc		Recycling facilities – to be collected by contractor
Off-spec Milk		Transport to farms, piggeries (stock feed), or emergency irrigation on land (subject to stringent controls on application rates, dilution and separation distances for odour control)
Prescribed wastes: ï Maintenance wastes: waste oils, oily rags, oil filters, etc ï empty containers used for sanitiser, cleaning and water treatment chemicals.		EPA licensed facilities or recyclers – by EPA permitted transport contractor IBC chemical tanks and other containers to be sent back to supplier of to EPA licensed container washing sites.
Wastewater sump sludges and solids pumpouts (if required)		Onsite land spreading (subject to stringent controls on application rates, separation distances and odour control), or to EPA licensed facilities or recyclers – by EPA permitted transport contractor

10.2 Waste Recycling and Resource Recovery

Upon commencement of operations, Gippsland Jersey will identify waste recycling and resource recovery opportunities to minimise disposal to landfill and prescribed waste facilities. It will establish waste management and tracking procedures to record quantities of wastes and recyclables and ensure proper disposal routes for non-recyclable materials to EPA approved and licensed facilities. Refer to Section 11 for further discussion on development of site management plans.

11 Environmental Management

11.1 Risk Assessment of Non-Routine Operations

The key risk aspects for non-routine operations considered to have potential for offsite impact are summarised in Table 9. Residual risk ratings have been determined by qualitative methods consistent with EPA's "Licence Assessment Guidelines for Using a Risk Management Approach to Assess Compliance with Licence Conditions" (Pub. No. 1321.2, June 2011).

Table 9 Risk Management of Non-Routine Operations

Risk Aspect	Description of Mitigation Measures	Residual Risk
Power failure	Milk processing stops, therefore no wastewater discharge during power outage.	Low
Milk spills to stormwater system	Contained within onsite emergency storage dams. Spills promptly cleaned out and pumped to irrigation area.	Low
Wastewater spills – sump/tank overflow	As above	Low
Diesel, Chemical Spill	Contained within bund or wastewater system. Immediate clean-up procedures activated, and wastes collected and transported offsite by EPA licensed transport contractor.	Low
Irrigation pipeline failure, leaks, spills	Pipelines are to be laid underground and protected from cattle and machinery damage. Pipeline will be routinely inspected and tested to ensure there are no unaccounted losses, pipe breaks or leaks. Spills promptly cleaned up to prevent discharge to natural drainage lines	Low
Irrigation runoff, spray drift, odour	Spray irrigation rates will be controlled to match soil infiltration and prevent ponding and runoff. Spray drift controlled through selection of low atomising sprays and avoiding irrigation during unfavourable wind conditions (i.e. strong westerly winds). These risks will be managed though the IMP.	Low
Noise	Noise from factory and associated works is shielded and attenuated by the elevated lands between factory and nearest private residences. Any unwanted noise events will be promptly responded to, and mitigation measure implemented as required.	Low

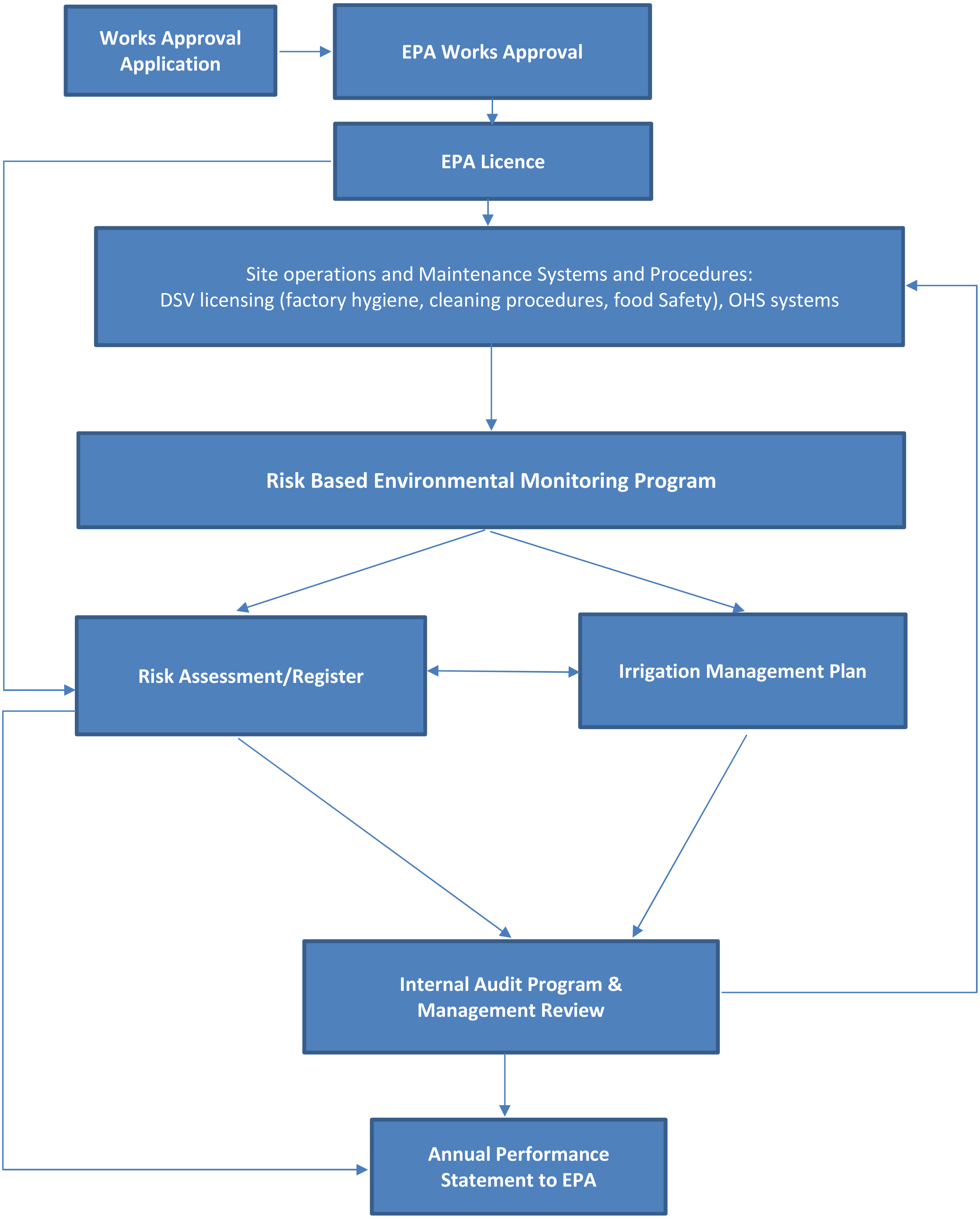
11.2 Management Systems

Gippsland Jersey will develop a risk-based environmental monitoring program consistent with EPA's Licence Assessment Guidelines (Pub. No. 1321.2, June 2011).

Gippsland Jersey will also develop food safety, hygiene and OHS systems as part of Dairy Safe Victoria licensing and Work Safe Victoria requirements. These systems will be developed to high industry standards commensurate with a DSV licensed dairy processing plant.

The Environmental Monitoring Program (see section 13.1) and IMP (section 6.2.4) will be developed prior to commencement of operations and EPA licensing. The proposed environmental management framework is shown conceptually in Figure 11.

Figure 11 Gippsland Jersey Milk Factory - Indicative Environmental Framework



12 Other Approvals

12.1 Commissioning Phase

Gippsland Jersey will construct the new works then notify EPA and seek EPA approval to commence a factory plant and equipment commissioning program to enable:

- Start up of water filtration plant and production of water demonstrated to meet ADWG
- Initial clean water testing of factory milk processing equipment, vessels, pumps and pipework including flow, pressure testing, leak detection, electrical, mechanical, automation checks, etc
- Cleaning and sanitising ready for first milk
- Testing of processes and milk product quality under full scale milk flows to demonstrate compliance with DSV licensing requirements
- Necessary repairs, augmentations and improvements to plant and equipment to meet DSV requirements
- Testing and optimisation of controls for wastewater storage tanks, sump pump and irrigation systems.

Gippsland Jersey will submit a commissioning plan to EPA at time of notification of completion of all works under the works approval. The commissioning period to be sought will be up to 120 days.

12.2 New Licence subsequent to Works Approval

Following completion of the commissioning phase, Gippsland Jersey will submit a commissioning report to EPA together with a licence application to commence full operational phase of the factory.

Gippsland Jersey will see EPA exemption from licensing on the basis that the volume of wastewater irrigated is relatively small (in relation to available land and annual application rates) and that all wastewater and its nutrients is to be beneficially used onsite for productive agriculture (fodder production and grazing).

12.3 IMP

EPA endorsement of the IMP will be sought prior to commencement of irrigation.

The IMP as outlined in Appendix H, will be prepared prior to commencement of the commissioning phase, when wastewater is expected to become available for reuse onsite.

Gippsland Jersey will seek exemption from licensing for the Recycled Water Scheme, subject to EPA's endorsement of the IMP.

13 Post Decision Operational Requirements

13.1 Environmental Monitoring Programs

Gippsland Jersey will develop a risk-based environmental monitoring program, developed in accordance with EPA Publication 1321.2. The monitoring program is expected to include the key elements as summarised in Table 10.

Table 10 Environmental Monitoring Program – Key Elements

Monitoring Element	Method
Factory throughputs – milk receival, products produced	Milk receival records, and product loadout sales. Milk loss estimate: raw milk received minus products manufactured.
Water use – SRW licensed supply from Bunga Creek	Water use meter
Wastewater Flows	Sump pump run time to irrigation area x pump capacity calculation
Wastewater quality - Table 2 parameters	Routine Monitoring ï monthly during commissioning phase ï quarterly during operational/licensing phase ï long-term frequency to be determined after first 3 years of operation
Sludge build-up in tanks	Sludge levels and odour checked by inspection, or by dipping/sampling
Irrigation volumes	Sump pump run time to irrigation area x pump capacity calculation
Odour, spray drift, dust and noise emissions	Daily site inspection/ surveillance runs to verify no odour in tanks, no irrigation spray drift, offensive odour or unwanted noise at site boundaries.
Boiler fuel usage and stack emissions	Diesel tank filling records/receipts. Visual inspection of stack emissions – to verify no visible emissions (other than heat shimmer)
Electricity use	Nuno Energy meter readings and billing records
Mainline - irrigation pipeline	Regular inspection – weekly during irrigation periods to verify no leaks or bursts in pipeline. Pipeline flow/pressure checks at sump pump.
Onsite wastewater reuse, soils, and performance	Monitoring programs and procedures described in the IMP including water use recording by paddock number, date and volume. Annual soil sampling (in autumn each year) of paddocks for agronomic parameters (soil pH, salinity, sodicity, nutrients, trace elements).

Monitoring Element	Method
Climate conditions	Checks of rainfall and evaporation forecasts, water balance calculations
Solid wastes	Tracking system (via invoices) to be implemented to record volumes/tonnages of garbage, recyclables solid and other wastes generated onsite, and disposal/recycling routes. Prescribed industrial wastes to be tracked by EPA's waste transport system (EPA permitted drivers and certificates).

The above monitoring program including testing parameters, frequencies and locations will be developed further during the commissioning phase of the project. A final monitoring program and the risk register that underpins it will be provided to EPA prior to completion of commissioning.

Monitoring results, data and records from the above programs will be maintained in secure environmental files and database repositories for subsequent use in assessing compliance with licence conditions and preparing the Annual Performance Statements to EPA due in September each year.

13.2 Incident Response and Reporting

Gippsland Jersey will develop incident response and EPA reporting procedures for the following:

- factory site — Identification of spills, odour, noise, dust, visual emissions, litter, etc from routine site inspections. Prompt investigation and resolution of incident.
- Irrigation area — Identification of pipeline spills/leaks, non-compliance with IMP – eg. use of wastewater on land not permitted by the IMP, soil risks identified by testing, complaints about irrigation (spray drift, odour, runoff). Investigation, risk assessment and resolution of incident.
- Environmental Complaints — Investigation and reporting of public complaints. Possible complaint categories: spills, odour, noise, spray drift, water pollution, etc. Complaints investigated as soon as practicable, complainants to be contacted on same day. Complaint resolved/reported within 24hrs.

13.3 Annual Performance Statement

Gippsland Jersey will prepare an EPA annual performance statement in accord with the EPA licence conditions and EPA's Annual performance statement guidelines (Publication 1320.3, June 2011). The information and data to be maintained that supports the APS is expected to include:

- Wastewater quantity and quality generated from the factory and reused onsite for irrigation
- Soil test results and any soil/plant productivity problem areas or issues
- Reporting of any non-compliance with licence conditions including the incident report, complaint records as relevant - odour, spray drift, runoff events, soil/pasture productivity issues, etc.

The APS will be submitted to EPA in September each year.

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