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Application for a permit for a 2,206 head beef cattle feedlot

for "**Llowalong Beef Co"** at 852 Llowalong Road, Llowalong, Victoria

May 2026

Executive Summary

This report has been prepared to support a planning permit application for the development and operation of a 2,206 head (2,160 SCU) covered housing beef cattle feedlot system at 852 Llowalong Road, Llowalong, Victoria.

The proposed development represents a significant long-term agricultural investment within the Wellington Shire and broader Gippsland region and forms part of the ongoing expansion and diversification of the ***Applicants***' established farming enterprise. The proposal has been developed to support modern livestock production through the incorporation of advanced covered feedlot housing infrastructure, improved environmental management systems and integrated nutrient reuse practices designed specifically for Victorian farming and climatic conditions.

The development is also considered to represent one of the first, purpose-designed greenfield covered beef cattle feedlot systems in Victoria and reflects the continued progression of the livestock industry toward more advanced, resilient and environmentally responsible production systems. In addition to supporting ongoing agricultural production on the property, the proposal is expected to provide broader regional benefits through the engagement of local contractors, transport operators, agricultural service providers and associated rural industries during both the construction and operational phases of the development.

Assessment of the proposal has been undertaken against the *Victorian Code for Cattle Feedlots* (1995) (***the Code***), the Wellington Planning Scheme and the supporting technical assessments prepared for the application, including the Odour Assessment, Waste Management Plan and Traffic Engineering Assessment.

The assessment demonstrates that the proposal satisfies the objectives and performance outcomes of ***the Code*** and represents a modern covered housing feedlot system designed to support improved environmental management, operational control, livestock welfare and long-term agricultural productivity. The proposed development incorporates roofed cattle accommodation areas, controlled drainage infrastructure, runoff capture and reuse systems, nutrient recovery measures and integrated farm management practices specifically designed for Victorian farming and climatic conditions.

Unlike conventional open feedlot systems contemplated by ***the Code***, the proposed covered housing design substantially reduces direct rainfall interaction with cattle accommodation areas, supporting improved management of bedding, manure, runoff and nutrient recovery throughout the operation. The design also provides enhanced operational resilience during seasonal conditions while facilitating efficient maintenance, cleaning and environmental management practices.

The assessment has identified that several Approved Measures within ***the Code*** are based on conventional open feedlot design principles. Where alternative measures have been adopted, the assessment demonstrates that the proposal continues to satisfy the relevant objectives and performance outcomes of ***the Code*** through the incorporation of covered housing infrastructure, controlled drainage systems, runoff capture and reuse, nutrient recovery measures and contemporary operational management practices.

The proposal has been developed as part of the ***Applicants***' broader farming enterprise and will support livestock finishing, fodder production, nutrient reuse and associated agricultural activities operating across the property. The development represents a significant long-term agricultural investment within the region and is expected to provide ongoing support to local contractors, transport operators, agricultural service providers and associated rural industries throughout both the construction and operational phases.

Assessment of the proposal indicates that potential impacts associated with odour, noise, traffic, drainage, wastewater management, nutrient reuse, land capability and surrounding land use have been appropriately considered and can be effectively managed through the implementation of the design measures, management practices and mitigation strategies identified throughout this report and supporting technical assessments.

Subject to the implementation of the operational and environmental management measures identified throughout this report and supporting technical assessments, the proposed development is considered suitable for the site and surrounding agricultural locality and is capable of operating in a manner consistent with the objectives of the Wellington Planning Scheme and the *Victorian Code for Cattle Feedlots* (1995). Accordingly, the proposal is considered appropriate for approval.

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Locality Plan	NJC Irrigation Solutions	IS-800 Shed Locality Plan	02/06/2026
Landscape Plan	Progressive Rural Solutions	Landscape Plan – V1	01/06/2026
Site Buffer Plan	Progressive Rural Solutions	Feedlot site buffer plan - V2	28/05/2026
Waste Application Plan	Progressive Rural Solutions	Waste Application Buffer Plan – V2	28/05/2026
Sensitive Receptors Plan	Progressive Rural Solutions	Receptor Plan V1	28/05/2026

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GLOSSARY

Terms that are referenced throughout this document regularly are provided below. All definitions have been replicated from the *National Guidelines for Beef Cattle Feedlots in Australia (The Guidelines*), 2012.

Table 0-1 - Reference terms used throughout this document

Term	*Description*
Average recurrence interval (ARI)	*A statistical estimate of the average period in years between the occurrence of an event, such as a flood or storm, of a given size.*
Buffer / Buffer distance	*The distance between a feedlot complex or waste utilisation area and a watercourse or wetland when considering waste material such as manure or effluent.*
Catch drain	*A drain to capture runoff from smaller areas within a controlled drainage area, such as a row of feedlot pens, and convey the captured runoff to the sedimentation system and ultimately, the holding pond.*
Community amenity	*The maintenance of the environmental attributes that contribute to physical or material comfort of community members.*
Compost	*An organic material that has undergone aerobic and thermophilic treatment and has achieved a suitable level of 'pasteurisation' and stabilisation or 'maturity'.*
Controlled drainage area	*A self-contained catchment surrounding those parts of the feedlot complex from which uncontrolled stormwater runoff would constitute an environmental hazard. The controlled drainage area includes feedlot pens, manure and bedding storage areas, drainage infrastructure, settling infrastructure and runoff storage systems designed to capture and manage runoff generated within the operational area.*
Controlled drainage run-off	*Runoff captured within the controlled drainage area of the feedlot generated from rainfall, operational washdown and incidental water entering operational surfaces associated with the feedlot system.*
Covered Accommodation Area	*A roofed cattle housing area designed to provide climatic protection, controlled drainage and improved operational management while maintaining natural ventilation and cattle accessibility.*
Covered Housing System	*A cattle feeding system where cattle are maintained within partially or fully roofed accommodation areas designed to provide shelter from rainfall and climatic conditions while incorporating controlled drainage, manure recovery and operational management systems*
Effluent	*Captured runoff or liquid generated within the controlled drainage area containing nutrients, sediment or organic matter associated with feedlot operations.*
Evaporation Pond	*A type of holding pond where the primary disposal mechanism of the effluent is by evaporation*
Manure	*The solid waste product by cattle. In feedlots this is the material that collects on the surface of the pen and consists principally of cattle dung and urine.*
Nutrient Recovery	*The collection, storage, handling and beneficial agricultural reuse of nutrients generated within the feedlot operation through manure, bedding and controlled drainage runoff management systems.*
Recoverable Solids Stream	*The manure and bedding material generated within the feedlot system that is periodically removed, temporarily stored and beneficially reused within agricultural production systems.*
Separation distance	*The separation distance is the distance between a likely source of an emission and a receptor likely to be sensitive to that emission. A separation distance (also variously referred to as buffer, setback or offset distances) is measured from the nearest physical part of the emission source to the nearest point of the potential receptor.*
Terminal pond	*A pond located at the end of an effluent irrigation area. It is intended to capture the initial and possibly heavily polluted runoff from a storm event. It is also intended to capture and hold tailwater generated by effluent irrigation systems.*
Waste Utilisation Area	*An area of land to which manure or effluent is applied.*

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1. INTRODUCTION

1.1. ORGANISATION

This document has been prepared for Llowalong Beef Co, being the owners and operators of the proposed covered beef cattle feedlot system at 852 Llowalong Road, Llowalong, Victoria. The report provides a description of the proposed development, its operation and associated infrastructure, and assesses the proposal against the requirements of the *Victorian Code for Cattle Feedlots* (1995) (“***the Code***”), relevant planning controls and best-practice industry guidance relating to covered housing feedlot systems.

While ***the Code*** remains the primary statutory assessment framework within Victoria, the proposed development incorporates a modern covered feedlot housing system, controlled drainage and nutrient recovery principles consistent with the MLA *Feedlot Covered Housing Systems - Best Practice Design and Management Manual* (2023).

The report has been prepared utilising information supplied by the ***Applicant*** together with supporting investigations, plans and technical assessments prepared by appropriately qualified consultants. Consultation with Agriculture Victoria and Wellington Shire Council has also been undertaken during preparation of the application, with relevant matters addressed throughout this report.

1.2. APPLICANT DETAILS

Table 1-1 - Applicant and ownership details

Land Ownership Organisation	
Property address	852 Llowlong Road, Llowlong
Operation Organisation	'Llowalong Beef Co'
Operation ABN	37 253 380 929
Business Address	‘Nerina’ 852 Llowalong Road, Llowalong VIC 3862
Contact Name	
Position	Owner/Operator

1.3. AUTHORS AND GUIDELINES

This report has been prepared by Progressive Rural Solutions Pty Ltd, a consultancy specialising in agricultural development, intensive livestock industries, irrigation infrastructure and natural resource management across regional Australia.

The author, holds a Diploma of Applied Science (Agriculture) and has more than 28 years’ experience in agricultural development, environmental management and the design and assessment of intensive livestock, irrigation and agricultural infrastructure systems. is a qualified effluent system designer with extensive experience in the preparation of Waste Management Plans, Odour ‘S Factor’ Assessments and Environmental Management Plans for intensive animal industries including beef cattle feedlots, dairies and associated agricultural enterprises.

is also an accredited member of the EPA Victoria Odour Panel, providing specialist expertise in the assessment and management of odour emissions associated with agricultural and intensive livestock developments. This includes the review of odour generation characteristics, separation distance assessments and operational management practices associated with intensive agricultural systems.

Professional experience includes the design, assessment and regulatory approval of intensive animal industries, including feedlots, dairy operations, irrigation developments and associated manure and nutrient management systems across Australia. This experience is supported by ongoing industry engagement and training relating to livestock biosecurity, emergency animal disease (EAD) preparedness and industry best practice, including programs delivered through Meat & Livestock Australia (MLA) and other agricultural industry bodies.

This experience, together with the technical input of specialist consultants and the operational expertise of the project proponents, has informed the design and assessment of the proposed development. The following documents and guidelines have been utilised in the preparation of this assessment and represent the relevant statutory requirements, industry guidance and modern best practice principles relating to the design, construction and operation of cattle feedlots and covered housing feedlot systems.

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Table 1-2 - Project related guidelines

Document	Proposal	Operation
Victorian Code for Cattle Feedlots (1995)	✓	✓
National Guidelines for Beef Cattle Feedlots in Australia – 3rd Edition (2012)	✓	✓
MLA Feedlot Covered Housing Systems Best Practice Design and Management Manual (2023)	✓	✓
National Beef Cattle Feedlot Environmental Code of Practice – 2nd Edition (2012)	✓	✓
Beef Cattle Feedlots: Design and Construction (MLA, 2016)	✓	
Beef Cattle Feedlots: Waste Management and Utilisation (MLA, 2015)	✓	✓
Australian Animal Welfare Standards and Guidelines for Cattle (2016)	✓	✓
Model Code of Practice for the Welfare of Animals – Cattle (CSIRO, 2004)	✓	✓
Australian Animal Welfare Standards and Guidelines – Land Transport of Livestock (2012)		✓
National Biosecurity Manual for Beef Cattle Feedlots (2013)	✓	✓
National Feedlot Accreditation Scheme (NFAS) Standards		✓
Relevant conditions and approvals issued by Wellington Shire Council and relevant regulatory authorities	✓	✓

Note: some portions of the guidelines may not be relevant to this proposal.

1.4. PROJECT BACKGROUND

The ***Applicants***, both have strong agricultural backgrounds, having grown up on cotton and dairy farming enterprises respectively. In 2015, they commenced their own farming enterprise by leasing approximately 200 hectares and establishing a first-cross ewe operation. Since then, the business has progressively expanded and now manages more than 1,300 hectares of owned and leased land within the region.

The current enterprise is a diverse mixed-farming operation comprising cattle breeding, backgrounding and finishing, together with fodder production including maize and lucerne. The business also provides agricultural contracting services within the local area, supporting regional farming operations and maintaining strong ties to the local agricultural community.

The growth of the enterprise demonstrates the ***Applicants'*** long-term commitment to agriculture and their capacity to adapt and innovate within a changing industry. actively participate in industry benchmarking and sustainability programs and currently supply beef under the Greenham *Never Ever* and *Sustainable Beef* programs, reflecting their ongoing commitment to responsible land management, animal welfare and environmental stewardship.

The property at 852 Llowalong Road, Llowalong forms part of the broader family cattle breeding and agricultural enterprise. The proposal seeks approval for a covered housing beef cattle feedlot with a maximum capacity of 2,206 head, equivalent to approximately 1,830 Standard Cattle Units (SCU). It represents both a continuation of the ***Applicants***' existing operations and a progression toward a more integrated cattle feeding, nutrient recovery and agricultural production system.

The proposed development has been designed and assessed in accordance with ***the Code***, while also incorporating purpose-designed covered housing, controlled drainage and nutrient recovery principles consistent with the MLA *Feedlot Covered Housing Systems Best Practice Design and Management Manual* (2023), the *National Guidelines for Beef Cattle Feedlots in Australia* and other relevant industry guidance.

A covered housing feedlot system has been selected in preference to a conventional open feedlot to improve operational management, controlled drainage, manure and nutrient recovery, cattle welfare, and the management of environmental and amenity impacts.

In addition to the planning permit process, the proposed feedlot will seek accreditation under the *National Feedlot Accreditation Scheme* (NFAS), the national quality assurance framework for the Australian feedlot industry. NFAS accreditation requires documented systems for animal welfare, environmental management, feed quality assurance, biosecurity, staff training and operational monitoring, supported by independent auditing and ongoing compliance. The ***Applicants***' commitment to NFAS accreditation further demonstrates their intention to operate the facility in accordance with recognised industry best practice and contemporary environmental and animal welfare standards.

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1.5. STRATEGIC AND AGRICULTURAL BENEFIT

The proposed development is a significant agricultural investment in Wellington Shire and the broader Gippsland region, reflecting the shift toward more efficient, resilient and environmentally responsible intensive livestock systems. As one of Victoria's first purpose-built greenfield covered housing beef cattle feedlots, the proposal incorporates advanced covered housing, controlled drainage and nutrient recovery systems designed for local climatic and operational conditions.

The design also accommodates advanced operational technologies, including feed-table systems capable of supporting conventional and robotic/automated feeding, livestock monitoring and improved data management. Together, these features are intended to improve feeding efficiency, animal monitoring, resilience in wet conditions and overall operational consistency.

The feedlot is designed to integrate with the ***Applicants***' broader farming enterprise and support local supply chains through livestock finishing, fodder production, feed use, nutrient reuse and related agricultural activities. Construction and operation are also expected to engage local contractors, transport operators and agricultural service providers across earthworks, fabrication, electrical works, irrigation infrastructure and ongoing feedlot operations.

Compared with conventional open feedlots, the covered housing system is expected to improve environmental performance by reducing rainfall interaction with manure and bedding, increasing nutrient capture and reuse, reducing wet operational areas, and improving runoff management. Overall, the proposal represents both a continuation of the existing agricultural enterprise and a long-term investment in advanced agricultural infrastructure and regional livestock production in Victoria.

1.6. PLANNING CONSIDERATIONS

A cattle feedlot falls within the land use definition of *Animal Production* under Clause 73.03 of the Victoria Planning Provisions and the Wellington Planning Scheme, being land used to keep or breed farm animals for the production of livestock, eggs, fibre, meat, milk or other animal products.

Within the Farming Zone, a cattle feedlot may operate without a planning permit under Clause 35.07-1 where it accommodates no more than 1,000 cattle and complies with Clause 53.08 and ***the Code***.

The proposed development comprises a covered housing beef cattle feedlot with a maximum capacity of 2,206 head, equivalent to approximately 1,830 Standard Cattle Units (SCU), and therefore requires a planning permit under the Wellington Planning Scheme. The proposed capacity remains below the threshold requiring a Development Licence under the Environment Protection Regulations.

This report assesses the proposal against the requirements of ***the Code*****,** relevant planning controls, modern industry guidance and operational standards associated with covered housing feedlot systems. The proposal has also been developed with regard to future accreditation under the National Feedlot Accreditation Scheme (NFAS).

The Code establishes a framework of objectives, accepted standards and approved measures for the design, operation and environmental management of cattle feedlots. Assessment of the proposal against the relevant elements of ***the Code*** is provided in Section 5 of this report. In addition, the Wellington Planning Scheme has been reviewed in relation to site-specific planning controls and considerations, as discussed in **Section 4**.

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2. EXISTING ENVIRONMENT

2.1. LOCATION

The property is located at 852 Llowalong Road, Llowalong within the Wellington Shire municipality of Gippsland, Victoria. The site is centrally located between the regional townships of Maffra (approximately 6.7km to the south-west), Stratford (approximately 7.4km to the south-east) and Briagolong (approximately 6.7km to the north-east). A Property Planning Report has been prepared and accompanies this application (**Appendix 2**).

The proposed covered housing feedlot system has been sited within the north-western portion of the property and is setback a minimum of 50m from adjoining property boundaries and road reserves. The nearest non-associated dwelling is located in excess of 700m from the feedlot works area. Review of available groundwater information also indicates there are no registered active groundwater bores located within the immediate vicinity of the proposed development area.

The project site currently forms part of the broader agricultural enterprise and has historically been utilised for grazing and cropping activities associated with the existing farming operation. The proposal represents an expansion and intensification of the existing agricultural enterprise through the establishment of a covered housing beef cattle feedlot system integrated with the broader livestock and fodder production activities undertaken on the property.

The proposed covered accommodation areas have been designed in a north-south orientation to support operational functionality, natural ventilation and integration with the proposed controlled drainage infrastructure and surrounding agricultural operations.

The location of the proposed development is shown in **Figure 2-1** and **Table 2-1** below.

Table 2-1 - Land details of the feedlot area

Details	Specific related to project site	
Address	852 Llowalong Road, Llowalong	
Crown Allotment	2	
Plan	PS905315	
Parish	Stratford	
Local Shire Council	Wellington	
Catchment Area	Thomson	
Surface Water Source	Avon River	
IBRA Sub-region	Gippsland Plain	
Traditional Owners/Land Council	Gunaikurnai Land and Waters Aboriginal Corporation	
Land Stature	Freehold	
Area of project (Works area)	9ha	
GPS Reference:	**MGA Zone**	55
	Easting	502720
	Northing	5805447
	Longitude	-37.898492
	Latitude	147.030938

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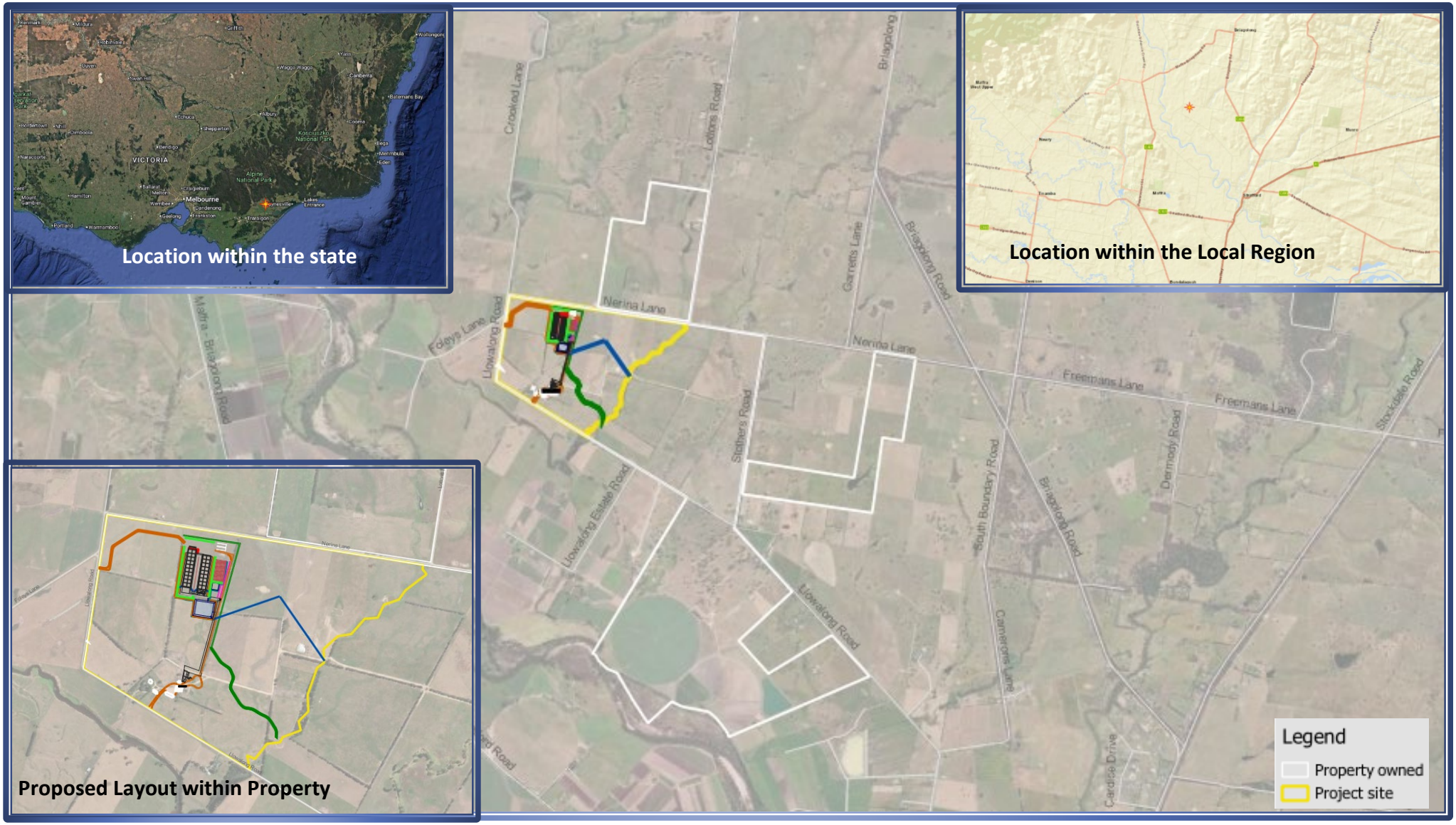

Figure 2-1 - Location of proposed feedlot in relation to the State, local region, property owned and project property (Source PRS QGIS)

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2.2. SITE DESCRIPTION AND LAND ZONING

The proposed feedlot works area and associated infrastructure are located within an existing agricultural landscape that has historically been utilised for grazing and cropping activities. Review of historical aerial imagery indicates that the broader property and proposed development area have been regularly used for annual cropping and pasture production as part of the ongoing farming operation.

Existing plantation vegetation occurs along the eastern, southern and western boundaries of the proposed feedlot works area, providing existing visual screening and contributing to landscape integration. Additional plantation vegetation is proposed along the northern boundary of the development area, considering the electricity infrastructure traversing the area external of the property boundary adjoining this portion of the property.

The proposed controlled drainage storage pond, commodity storage areas, silage storage areas and manure and bedding storage areas are similarly located within areas historically utilised for agricultural production activities. No remnant native vegetation has been identified within the proposed works area, with existing vegetation associated with planted shelterbelts and agricultural landscaping.

The land is zoned Farming Zone (FZ) under the Wellington Planning Scheme. The surrounding locality is characterised by broadscale agricultural land uses including grazing, fodder production, cropping and rural residential development associated with the broader agricultural landscape.

The zoning and locality context of the proposed development area are shown in **Figure 2-2**.

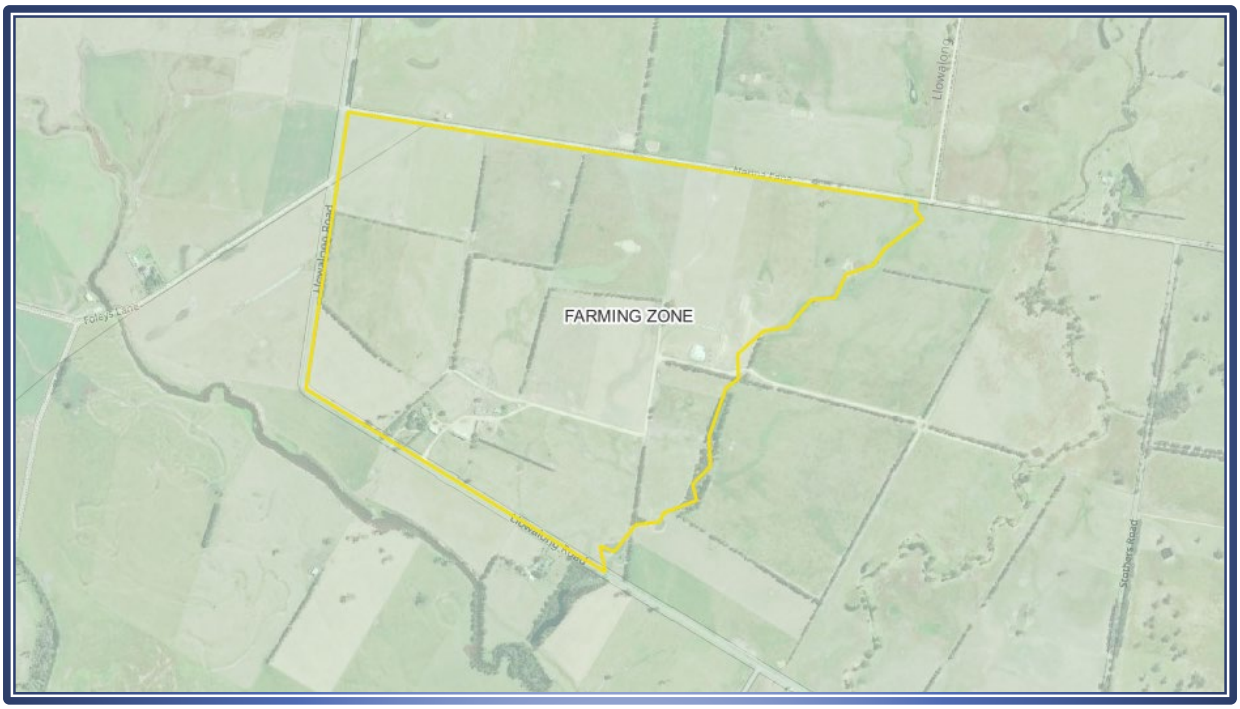

Figure 2-2 - Imagery of project area showing the Land Zone (Source: QGIS with Vic Planning Overlays)

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Figure 2-3 – Aerial image of the north side of the property showing the proposed feedlot approximate area (Source: PRS May 2025)

2.3. SURROUNDING AREA

The project is located within the Central Gippsland region of eastern Victoria, an area characterised by a long-established and highly productive agricultural landscape. Land uses within the locality include dairy farming, beef and sheep grazing, irrigated and dryland cropping, fodder production and associated agricultural enterprises.

The broader surrounding area comprises a mixture of grazing land, irrigated pasture and annual cropping systems supported by irrigation infrastructure supplied from the Avon River. Cropping activities within the locality commonly include winter cereals, oilseeds and legumes integrated within pasture and livestock production systems. Livestock production has historically formed an integral component of the agricultural landscape throughout the region.

The subject property and adjoining landholdings are similarly utilised for agricultural production activities including grazing, fodder production and cropping operations associated with sheep and cattle enterprises. The proposed covered housing feedlot system is therefore considered consistent with the broader agricultural character and productive land use patterns of the locality.

The area is serviced by an established rural infrastructure network including local road access, electricity supply, telecommunications services and access to pumped river water associated with the surrounding irrigation network.

An overview of the surrounding locality is provided in **Figure 2-4**.

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Figure 2-4 - Aerial image looking east from the property showing the local area (looking west over the site) (Source: PRS May 2025)

2.4. NEIGHBOURING LAND USES

The surrounding locality is characterised predominantly by agricultural land uses including grazing, fodder production, irrigated agriculture and associated rural residential development typical of the broader Central Gippsland region. **Figure 2-5** identifies the location of the proposed covered housing feedlot system, the broader property operations area and surrounding sensitive land uses including neighbouring rural dwellings and nearby townships.

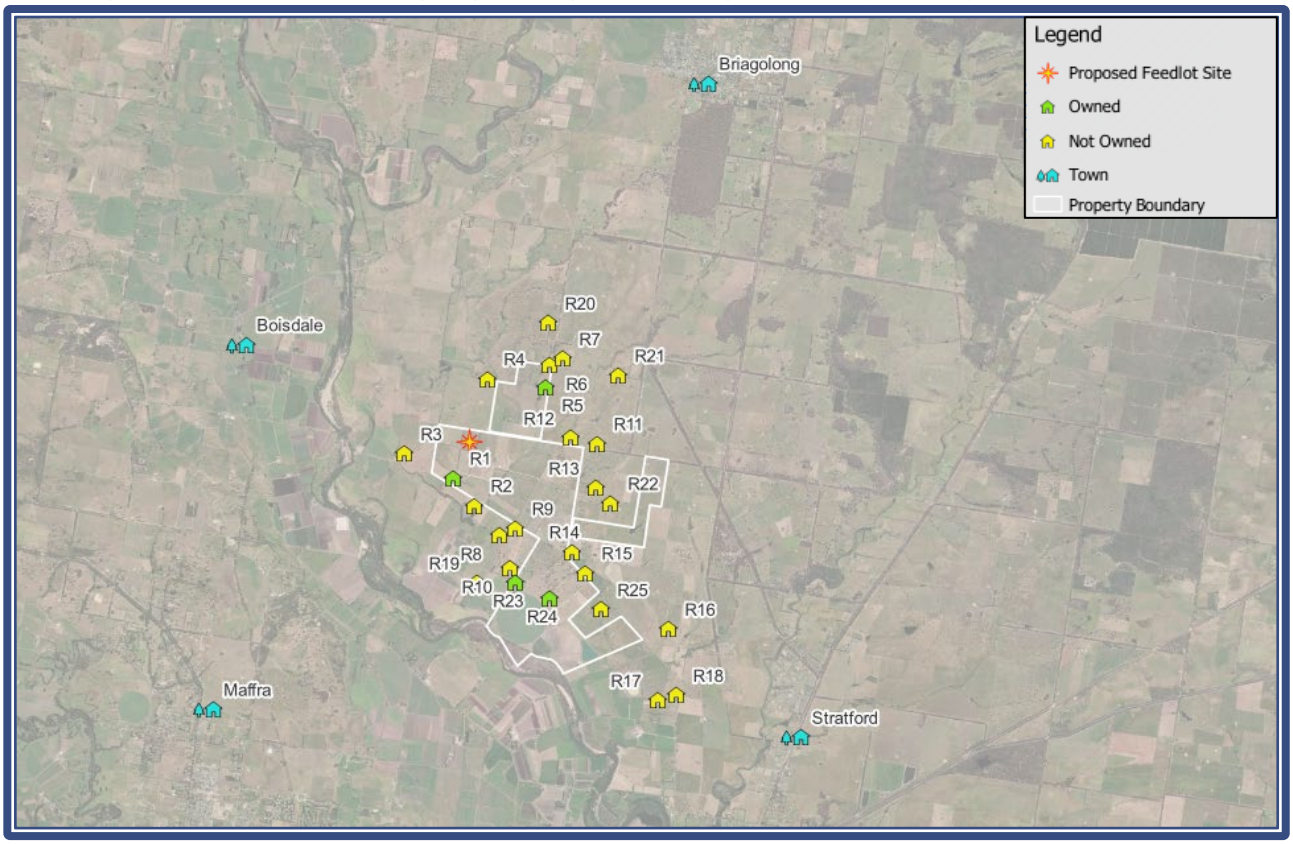

Figure 2-5 Project site in relation to neighbouring land uses (Source: PRS QGIS)

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Review of the surrounding area identified a dispersed rural settlement pattern comprising isolated rural dwellings, agricultural holdings and small clusters of rural residential development. The nearest non-associated dwelling is located approximately 823m from the proposed feedlot works area, with the majority of surrounding dwellings located greater than 1km from the site.

The surrounding townships of Stratford, Boisdale, Maffra and Briagolong are all located well beyond the minimum separation distances identified through the S-Factor Odour Assessment. Detailed assessment of surrounding receptors and separation distances is provided within the S-Factor Odour Assessment and summarised in **Table 2-2** below.

Table 2-2 -Surrounding Sensitive Receptors

ID	Address	Type	Distance (m)	Comment
R1	862 Llowalong Road Llowalong	Single Dwelling	490	Associated dwelling
R2	809 Llowalong Road Llowalong	Single Dwelling	823	Non-associated dwelling
R3	56 Foleys Lane Llowalong	Single Dwelling	897	Non-associated dwelling
R4	253 Crooked Lane Bushy Park	Single Dwelling	906	Non-associated dwelling
R5	85 Lottons Road Llowalong	Single Dwelling	1,260	Associated dwelling
R6	125 Lottons Road Llowalong	Two Dwellings within 250m	1,570	Non-associated dwelling near R7
R7	136 Lottons Road Briagolong	Two Dwellings within 250m	1,752	Non-associated dwelling near R6
R8	26 Llowalong Estate Road Llowalong	Single Dwelling	1,381	Non-associated dwelling
R9	729 Llowalong Road Llowalong	Single Dwelling	1,393	Non-associated dwelling – small title
R10	713 Llowalong Road Llowalong	Single Dwelling	1,968	Non-associated dwelling – application area
R11	174 Nerina Lane Briagolong	Single Dwelling	1,872	Non-associated dwelling
R12	220 Nerina Lane Briagolong	Single Dwelling	1,479	Non-associated dwelling – application area
R13	120 Stothers Road Llowalong	Single Dwelling	2,034	Non-associated dwelling
R14	6 Stothers Road Llowalong	Single Dwelling	2,210	Non-associated dwelling – application area
R15	592 Llowalong Road Stratford	Single Dwelling	2,594	Non-associated dwelling – application area
R16	394 Llowalong Road Stratford	Single Dwelling	4,224	Non-associated dwelling – application area
R17	329 Llowalong Road Stratford	Two Dwellings within 250m	5,000	Non-associated dwelling – application area near R18
R18	331 Llowalong Road Stratford	Two Dwellings within 250m	5,120	Non-associated dwelling – application area near R17
R19	111 Llowalong Estate Road Llowalong	Single Dwelling	2,114	Non-associated dwelling
R20	193 Lottons Road Briagolong	Single Dwelling	2,083	Non-associated dwelling – application area
R21	10 Garretts Lane Briagolong	Single Dwelling	2,397	Non-associated dwelling – application area
R22	852 Llowalong Road Llowalong	Single Dwelling	2,318	Non-associated dwelling – application area
R23	633 Llowalong Road Llowalong	Single Dwelling	2,227	Associated dwelling
R24	633 Llowalong Road Llowalong	Single Dwelling	2,648	Associated dwelling
R25	523 Llowalong Road Stratford	Single Dwelling	3,241	Non-associated dwelling – application area
	Stratford	Large Town	5,828	
	Boisdale	Town	3,502	
	Maffra	Large Town	5,009	
	Briagolong	Town	6,235	

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2.5. CLIMATE

The project area experiences a temperate climate characterised by warm summers, cool winters and moderate annual rainfall distributed throughout the year. The climate of the locality supports a diverse agricultural landscape including grazing, fodder production and irrigated agriculture.

Climatic data for the locality has been reviewed using information obtained from the East Sale weather station and other relevant regional climate datasets. The average annual rainfall for the locality is approximately 592mm, with rainfall occurring throughout the year and generally increasing during the spring and early summer months. Recorded annual rainfall has historically varied significantly between dry and wet years, reflecting the seasonal variability typical of the Gippsland region.

Temperature conditions within the locality are similarly variable, with hot summer conditions and occasional frost conditions during winter months. Climatic conditions within the area have been considered in the design of the proposed covered housing feedlot system, including drainage management, runoff capture, manure and bedding management and nutrient reuse infrastructure.

Wind conditions within the locality are influenced predominantly by westerly and south-easterly airflow patterns, with stronger and more directional winds generally occurring during afternoon periods. Prevailing wind conditions and surrounding sensitive receptors have been considered as part of the S-Factor Odour Assessment prepared in support of the application.

The proposed covered housing design substantially reduces direct rainfall interaction with manure and bedding materials relative to conventional open feedlot systems and supports improved operational management during wet seasonal conditions.

Climatic observations relevant to the locality are summarised in Table **2-3** and Figure **2-6** to Figure **2-8** below.

Table 2-3 – Table showing climate observation data (East Sale)

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Highest High Temp (°C)	44.6	44.4	40.4	35.9	28.3	23.2	24.0	28.3	33.9	34.9	40.8	42.1	44.6
Mean High Temp (°C)	25.6	25.4	23.6	20.4	16.9	14.3	13.9	15.1	17.2	19.4	21.5	23.6	19.7
Mean Low Temp (°C)	13.0	13.2	11.6	8.7	6.3	4.2	3.3	4.2	5.7	7.6	9.7	11.5	13.0
Lowest Low Temp (°C)	3.9	3.3	2.8	-1.7	-4.2	-4.5	-6.6	-5.6	-3.7	-1.0	1.1	2.2	3.9
Mean rainfall (mm)	45.5	41.2	48.8	48.2	49.1	47.2	40.5	45.7	49.5	58.4	63.0	55.3	592.4
Mean rainfall days	8.6	7.8	9.1	10.5	12.5	13.6	14.1	14.8	14.0	13.6	12.0	10.4	141.0
Mean 9am wind speed	12.6	11.1	10.4	10.3	9.5	9.5	9.9	11.9	13.9	15.1	15.3	14.6	12.0
Mean 3pm wind speed	22.6	21.2	19.7	17.9	15.6	15.3	17.1	19.8	21.1	22.2	22.8	23.0	19.9
Mean daily evaporation	6.5	5.8	4.4	2.8	1.7	1.4	1.5	2.2	3.1	4.0	5.1	6.0	3.7

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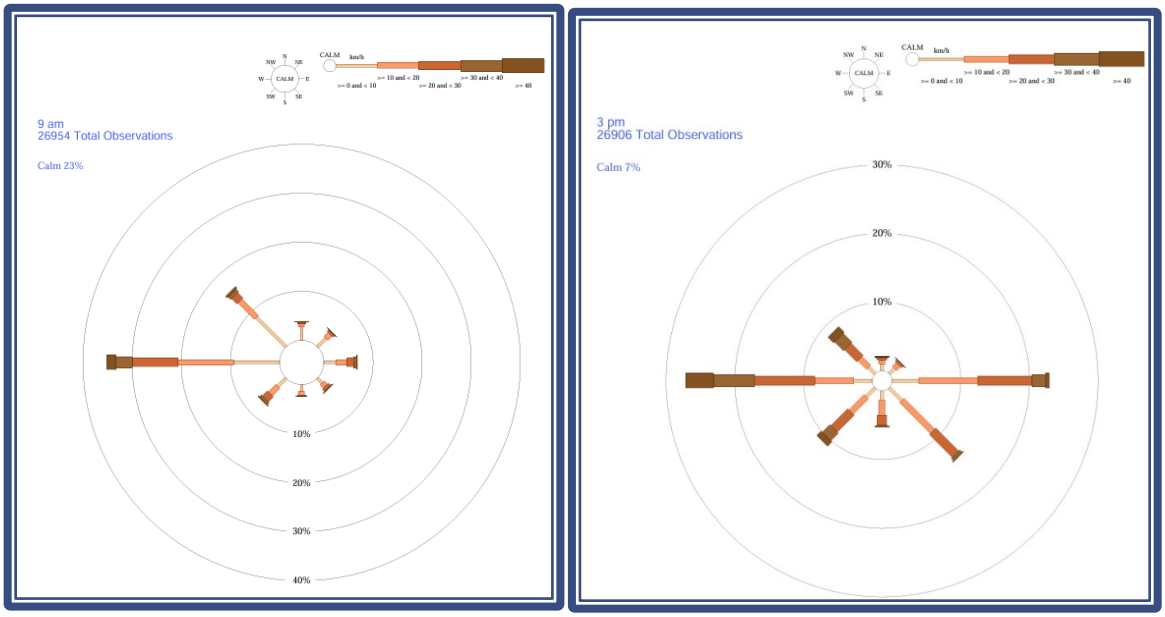

Figure 2-6 - 9AM and 3PM wind rose data (Source: BOM East Sale weather station)

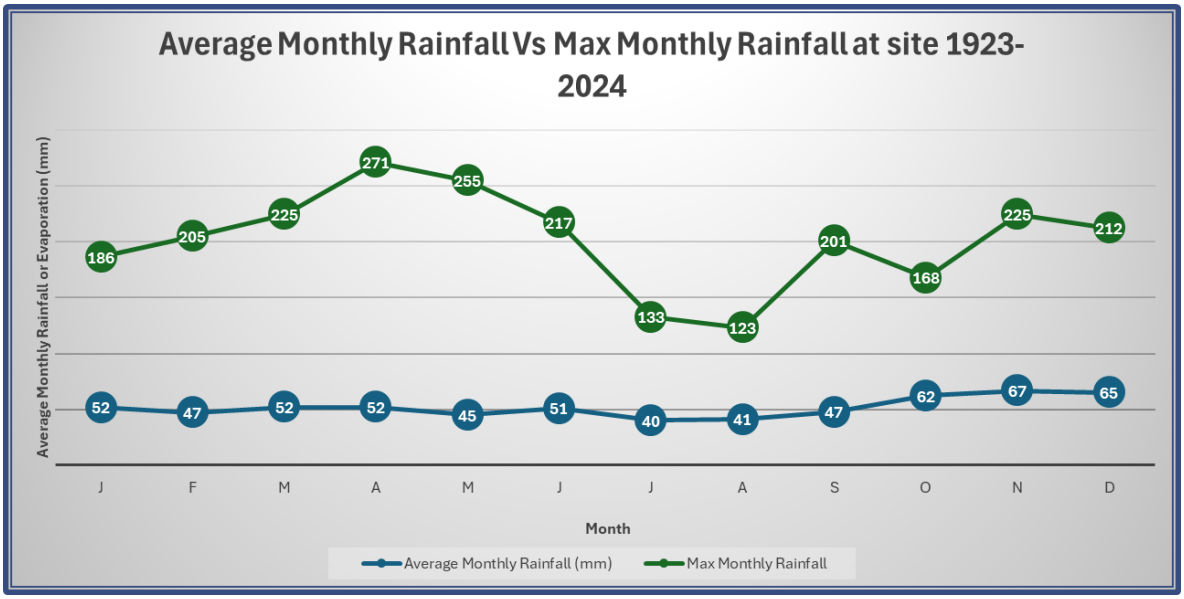

Figure 2-7 – Graph of average monthly rainfall (Source: Silo)

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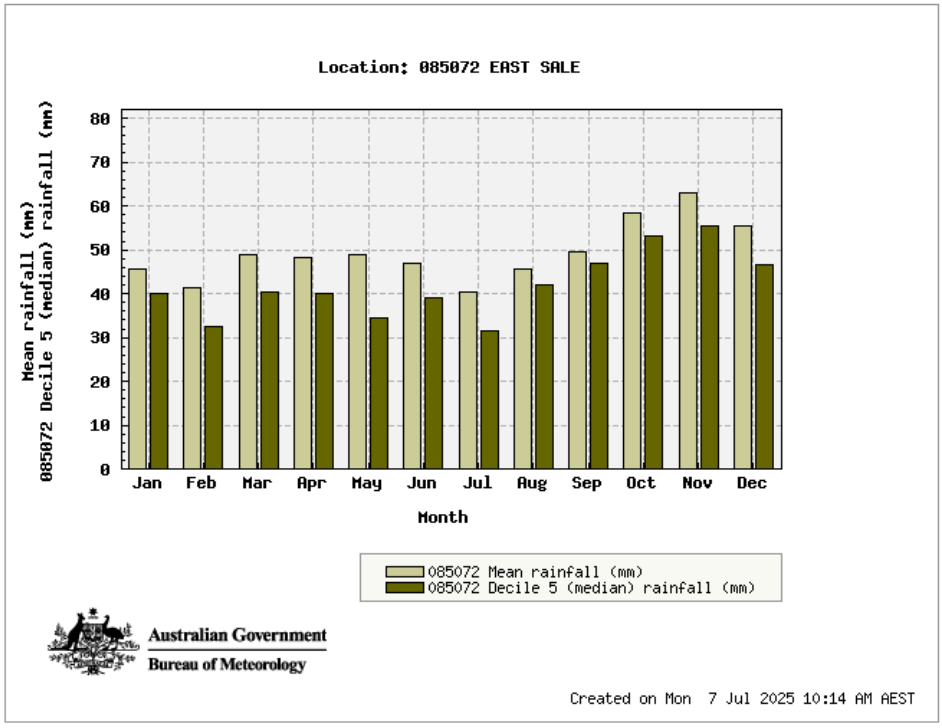

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Mean rainfall (mm) for years 1943 to 2025	45.5	41.2	48.8	48.2	48.8	47.0	40.5	45.7	49.5	58.4	63.0	55.3	591.8	82
Statistics	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**	**Years**
Decile 5 (median) monthly rainfall (mm) for years 1800 to 3000	39.9	32.4	40.4	40.1	34.6	39.0	31.4	41.9	47.0	53.0	55.6	46.7		83

Figure 2-8 – Sale weather station median monthly rainfall vs highest daily rainfall (1997-2024) (Source: BOM)

2.6. GEOLOGY, GEOMORPHOLOGY AND BROAD VEGETATION

The project site is located within the Central Gippsland area of eastern Victoria which is characterised by a diverse mix of fertile river plains, undulating foothills, and coastal lowlands. The Latrobe, Avon, and Macalister rivers, along with associated floodplains and irrigation districts, create highly productive agricultural land, particularly suited to dairying, beef grazing, and cropping. The region contains extensive alluvial soils in the valleys, while the surrounding foothills and ranges support mixed farming, plantation forestry, and remnant native vegetation.

The site is underlain by the Qc1 geological formation associated with late Quaternary alluvial, colluvial and coastal plain sediments comprising clay, silt, sand and gravel deposits associated with historical river and floodplain processes.

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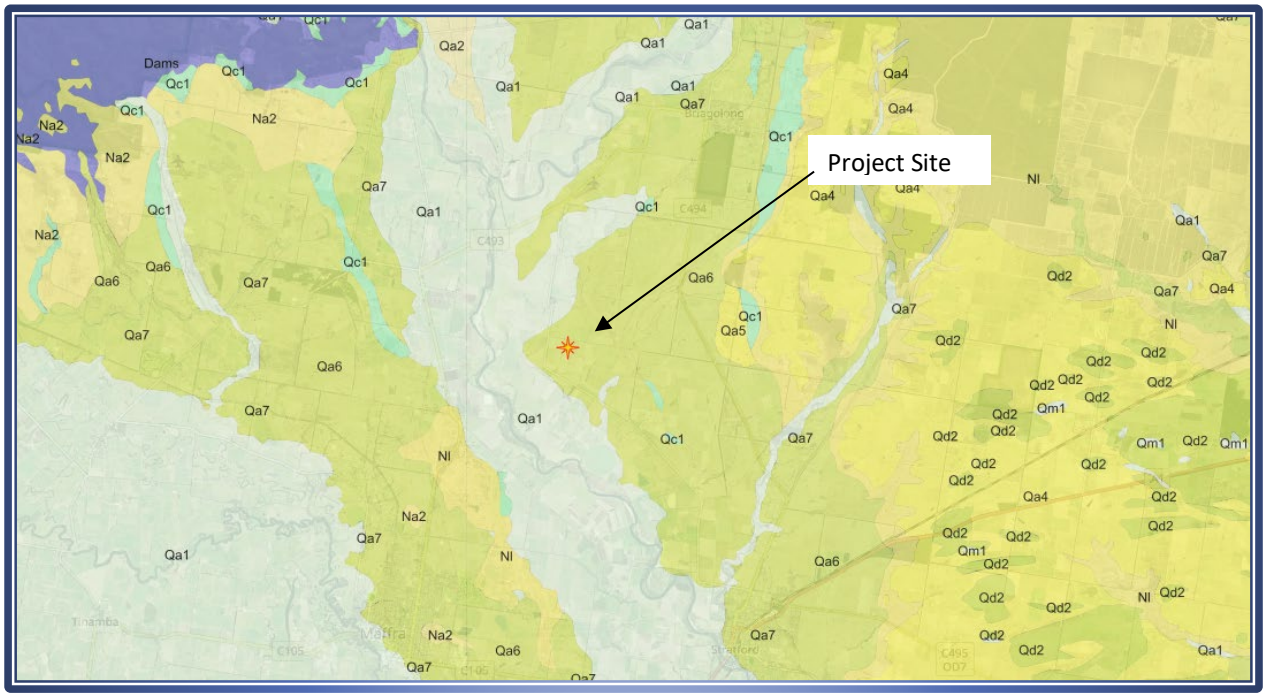

Figure 2-9 - Image showing the geology of the area and project site (Source QGIS geol250 Overlay)

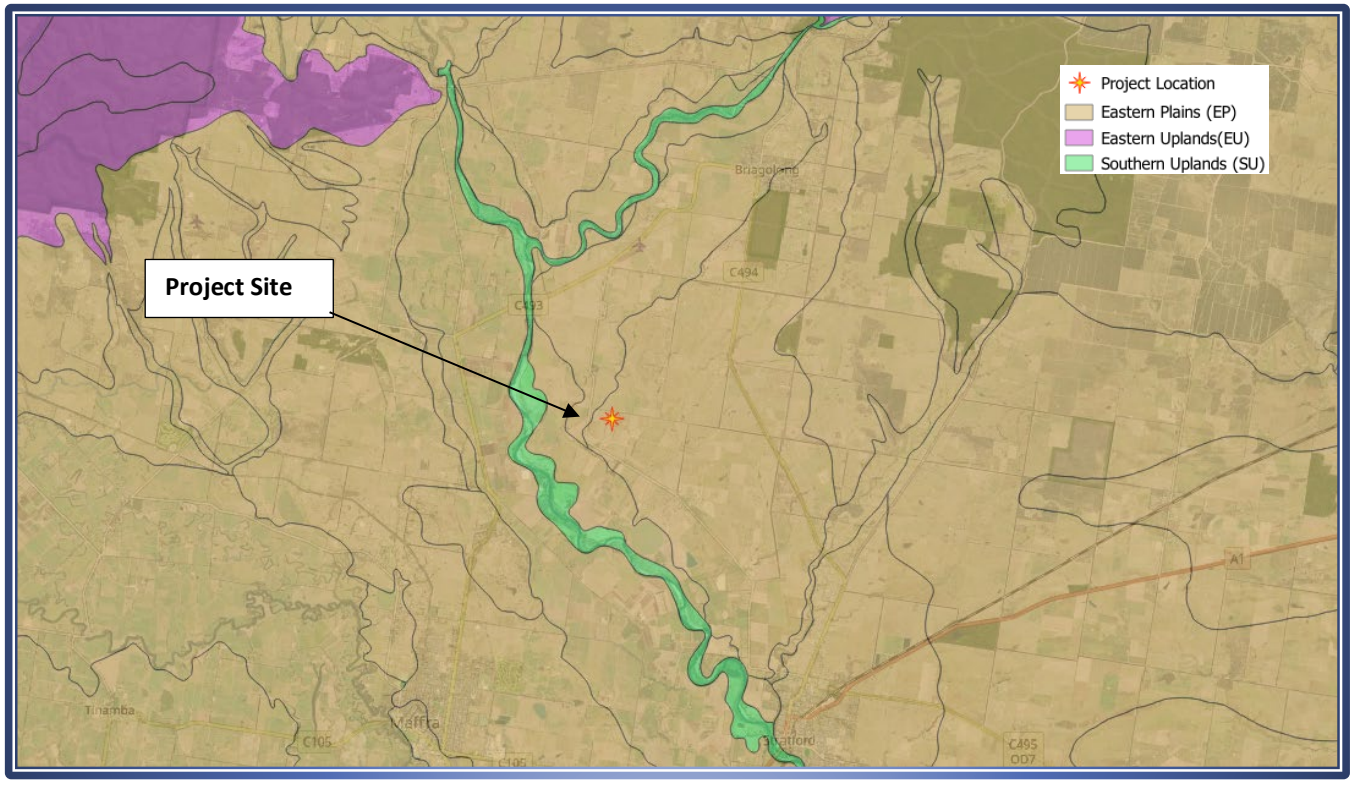

Figure 2-10 - Geomorphic map of the area showing Tier 1 categories (Source QGIS and gmu250 Overlay)

The site is within the Eastern Plans geomorphic unit which consists largely of broad, low-lying alluvial and colluvial plains formed on unconsolidated Quaternary sediments. These plains are typically flat to gently undulating, with slopes rarely exceeding a few degrees. The landform is shaped by long-term river activity, sheet wash, and wind deposition.

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Figure 2-11 – Overview of the site in relation to Vegetation (Source QGIS with Ecological Vegetation Class Group Overlay)

The generally flat alluvial landscape and soil profile of the locality are consistent with the broader agricultural land capability and support the suitability of the site for the proposed controlled drainage feedlot development.

2.7. TOPOGRAPHY

The general trend of slopes within the locality is toward the west in the direction of the Avon River, with grades across the site generally ranging between approximately 1% and 1.5%. The project area is relatively flat to gently undulating and has an average natural surface elevation of between approximately 35m and 36m Australian Height Datum (AHD).

The relatively gentle grades across the site are considered suitable for the proposed covered housing feedlot system and associated controlled drainage infrastructure, allowing for controlled runoff capture and drainage management while minimising erosion potential.

Topographic characteristics of the site and surrounding locality are shown in **Figure 2-13**.

Figure 2-12 - Image showing topography of the project site. (Source en-gb.topographic-map.com)

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2.8. SURFACE AND GROUND WATER

The project site is located within an area supported by both surface water and groundwater resources utilised for agricultural production and irrigation purposes. Existing water infrastructure associated with the broader farming enterprise supports livestock operations, irrigation activities and agricultural water supply requirements.

Figure 2-13 identifies the location of recorded groundwater extraction points and surface water extraction infrastructure associated with the property and surrounding locality.

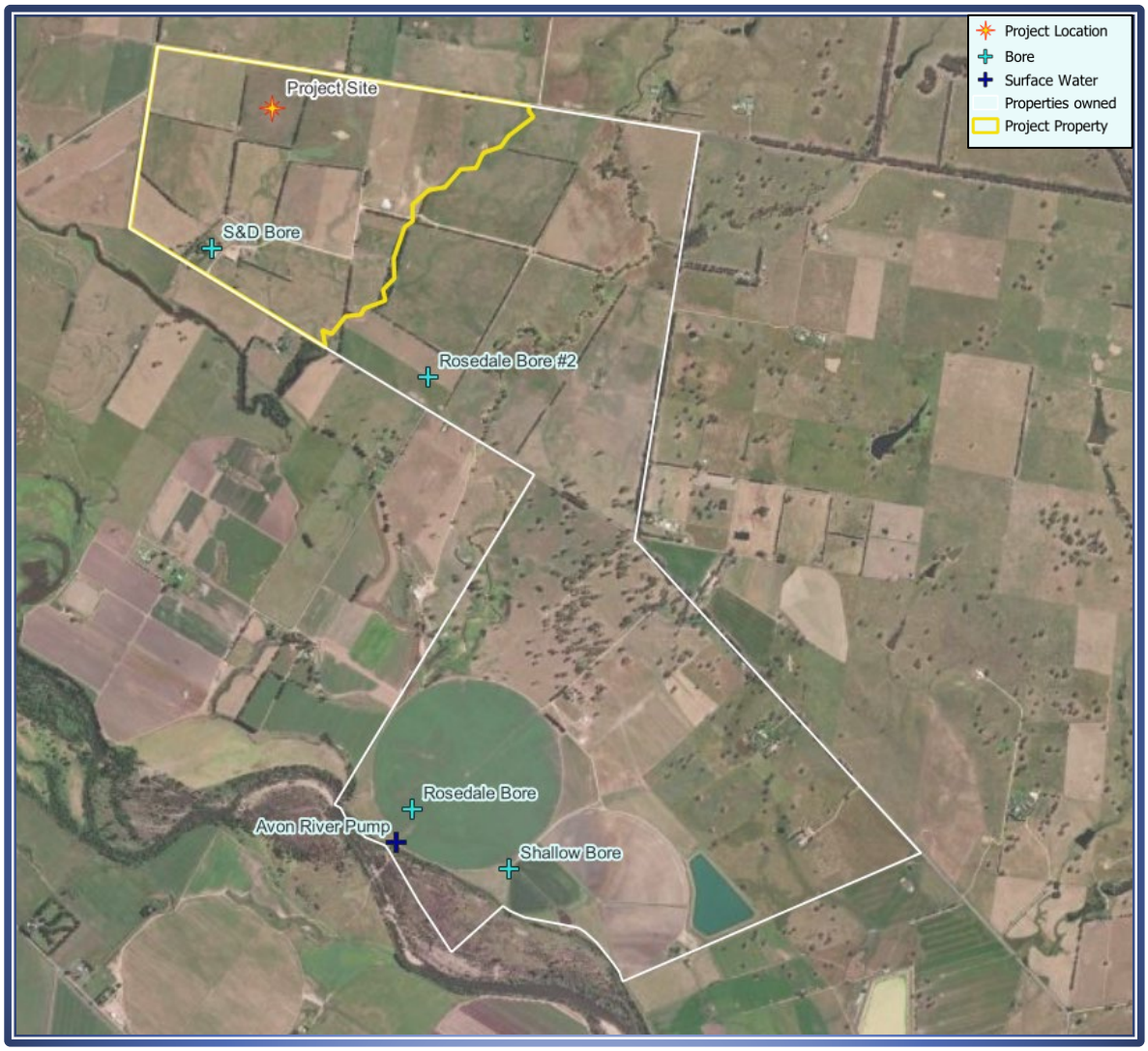

Figure 2-13 - Map showing water extraction points associated with the operation

2.8.1. SURFACE WATER

The property is located within the Thomson/Macalister catchment, with the Avon River forming part of the southern boundary of the broader operational landholding. Existing approved surface water extraction infrastructure associated with the farming enterprise provides water supply for irrigation, stock and domestic purposes.

Review of the Wellington Planning Scheme flood-related overlays indicates that the proposed feedlot works area is not affected by the Land Subject to Inundation Overlay or identified Flood-Prone Land, as shown in **Figure 2-14**.

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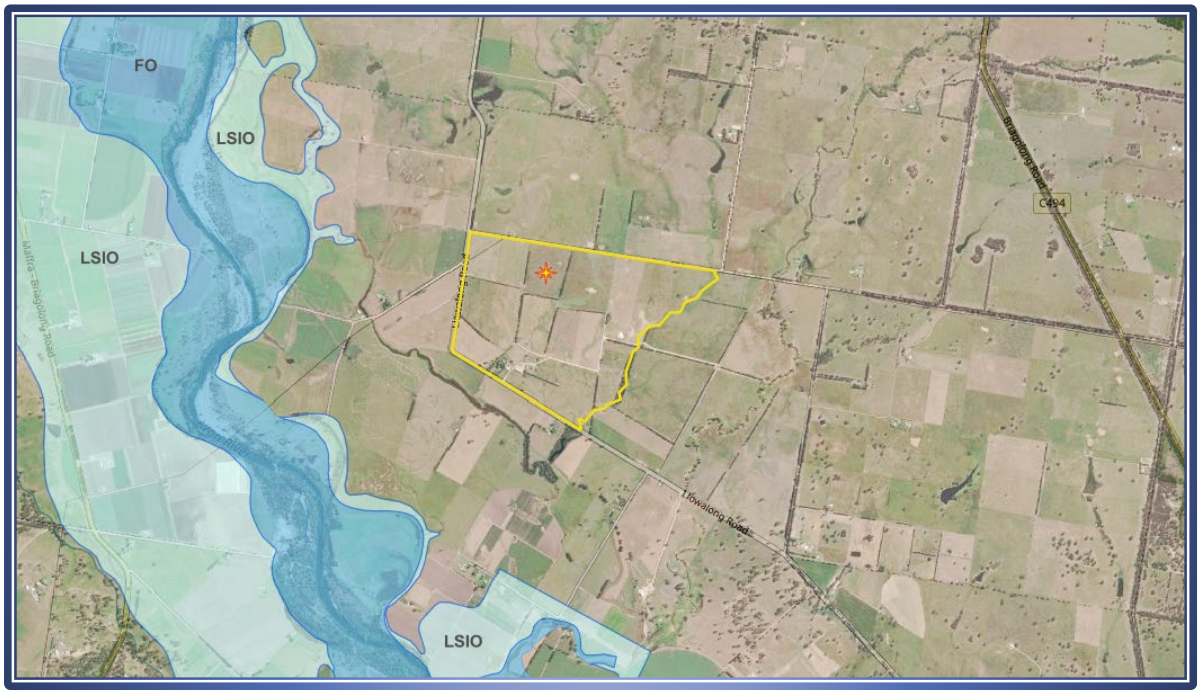

Figure 2-14 - Flood & Land Subject to Inundation Overlay

2.8.2. GROUNDWATER

The proposed feedlot site is located within the Central Gippsland groundwater catchment area and the broader farming enterprise has access to groundwater resources associated with the We De Lock and Rosedale Groundwater Management Units (GMUs).

The proposed feedlot works area and associated nutrient reuse areas are not located within 200m of an active groundwater bore utilised for stock, domestic or irrigation purposes. Groundwater conditions relevant to the site are shown in **Figure 2-15**.

Figure 2-15 - Images of the site showing the local Groundwater Management Areas

Groundwater conditions within the locality were reviewed using the "Visualising Victoria's Groundwater" database. Available mapping indicates that the site is located within an area identified as Class B beneficial use groundwater, with estimated groundwater depths generally between 5m and 10m below ground level. Groundwater salinity within the locality is anticipated to range between approximately 1,000mg/L and 3,500mg/L.

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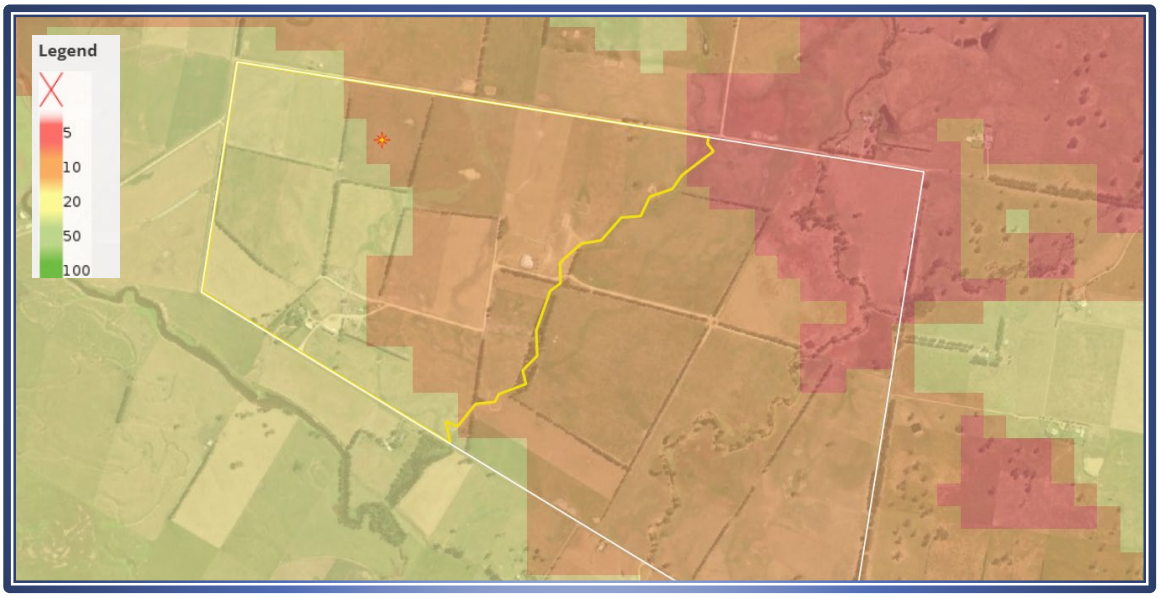

Figure 2-16 - Depth to water table (Source: VVG)

2.8.3. WATER APPROVALS AND REQUIRED AMENDMENTS

The broader farming enterprise benefits from a range of existing water entitlements and associated works approvals relating to both surface water and groundwater extraction. Existing approvals associated with the operation are summarised in **Table 2-4** below.

Table 2-4 - Property Water Approvals

Instrument	Identifier	Volume	Type	Reliability	Water Source
Water Licence	[redacted]	247ML	Surface Water	High Reliability	Thomson/Macalister - Avon River
	[redacted]	87ML		High Reliability	
	[redacted]	200ML	Groundwater	-	Central Gippsland catchment- We De Lock GMU
	[redacted]	541.2ML		-	Central Gippsland catchment – Rosedale GMU
Works Licence	[redacted]	-	Bore - irrigation	-	Central Gippsland catchment – Rosedale GMU
	[redacted]	-	Surface water – irrigation S&D and Dairy	-	Thomson/Macalister - Avon River

The existing water portfolio associated with the operation provides access to multiple water sources across both surface water and groundwater systems, supporting operational water security and ongoing agricultural production activities associated with the broader farming enterprise.

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3. DETAILS OF PROPOSAL

3.1. FEEDLOT DESCRIPTION

The proposal comprises the construction and operation of a covered housing beef cattle feedlot system with a maximum operational capacity of 2,206 head, equating to approximately 1,830 Standard Cattle Units (SCU). The proposed development has been designed as an integrated cattle feeding, controlled drainage and nutrient recovery system associated with the broader agricultural operations undertaken on the property.

The feedlot has been designed in accordance with the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***"), while also incorporating advanced covered feedlot pens, controlled drainage and nutrient recovery principles consistent with current industry guidance for covered housing feedlot systems.

The proposed covered housing system incorporates roofed cattle accommodation areas designed to reduce direct rainfall interaction with manure and bedding materials while supporting improved operational management, nutrient recovery and animal welfare outcomes relative to conventional open feedlot systems.

The proposed development includes the following infrastructure and operational components:

- Covered production pens and roofed accommodation structures,
- Hospital and recovery pen,
- Holding and exit yard area,
- Partial covered and external cattle movement lanes,
- Feed access lanes and commodity handling areas,
- Controlled drainage infrastructure including drains, settling infrastructure and runoff storage pond,
- Manure and spent bedding storage area,
- Mortality composting infrastructure,
- Water supply and feed delivery systems,
- Silage and commodity storage infrastructure, and
- Associated operational infrastructure and landscaping works.

An overview of the proposed feedlot layout is shown in **Figure 3-1**.

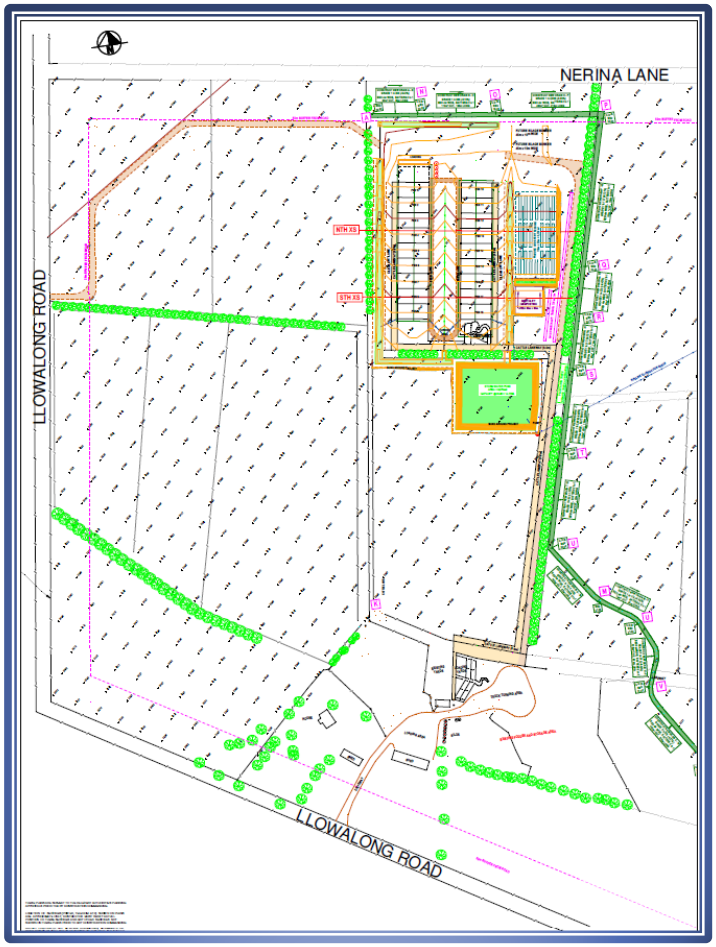

Figure 3-1 - Overview plan of the feedlot (Source: NJC Irrigation Solutions)

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A summary of the proposed Infrastructure and their staged construction timing are included in **Table 3-1**. Specific details of the size and dimensions of the project are shown in **Table 3-2** below.

Table 3-1 – Summary of Proposed Feedlot Infrastructure

Infrastructure Component	Description	Stage	Purpose
Covered production pens	Covered cattle accommodation pens	Stage 1 & 2	Cattle accommodation
Hospital pen	Dedicated hospital and recovery pen	Stage 1	Animal welfare and segregation
Holding and exit yards	Temporary cattle holding and dispatch areas	Stage 2*	Livestock handling
Feed access lanes	Feed delivery access infrastructure (feed table style)	Stage 1 & 2	Feed management
Cattle movement lanes	Cattle access lanes to and from pens and yards	Stage 1 & 2	Livestock movement
Controlled drainage drains	Runoff collection drains	Stage 1 & 2	Runoff management
Sediment basin	Runoff settling infrastructure from manure storage	Stage 1	Sediment capture
Controlled drainage storage pond	Runoff storage prior to reuse	Stage 1	Runoff capture and reuse
Manure and bedding storage area	Temporary manure and spent bedding storage	Stage 1	Nutrient recovery
Mortality composting area	Routine mortality composting area	Stage 1	Mortality management
Commodity and silage storage	Feed and fodder storage areas	Stage 1 & 2	Feed supply
Water supply infrastructure	Livestock and operational water supply systems	Stage 1 & 2	Water supply

*– existing yards to be used in Stage 1, Stage 2 will incorporate new yards.

Table 3-2 – Indicative Feedlot Areas and Dimensions

Infrastructure Component	Approximate Area (m^2)	Indicative Dimensions	Comments
Covered production housing	17,396	190.5 x 43.5 Sheds x 2	Pens stocked at 6m2/SCU
Feed access lanes	2,650	6m wide	Internal operational access
Cattle lanes	1,245	8m wide	Livestock movement
Controlled drainage storage pond	9,000	15ML	Runoff storage
Sediment basin	100	Variable	Initial settling basin
Manure storage area	4,850	110m × 40m	Temporary storage
Mortality composting area	1,500	50m × 30m	Routine mortality management
Commodity and silage area	5,400	2 x silage storage and grain handling area	Feed storage
Commodity hardstand	5,400	-	Operational hardstand
Landscaping and balance area	44,629	Variable	Vegetation and operational buffers
Total controlled drainage area	90,000	-	Total feedlot operational area

3.2. SITE SELECTION

3.2.1. KEY SITE SELECTIONS CRITERIA

The Code, the National Guidelines for Beef Cattle Feedlots in Australia and best practice industry guidance for covered housing feedlot systems identify a range of key considerations relevant to feedlot site selection, design and operation. Key site selection considerations include:

- **Climate** – including animal welfare, operational management, water requirements, odour, dust generation and drainage management considerations.
- **Topography** – including site grades, drainage characteristics and the suitability of the landform for controlled drainage infrastructure and associated earthworks.

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- **Natural Environment** – including remnant vegetation, threatened species, waterways and broader environmental considerations.
- **Water Resources** – including availability of suitable water supply infrastructure and protection of surrounding surface water and groundwater resources.
- **Soils and Groundwater** – including geotechnical suitability, salinity, groundwater conditions and suitability for nutrient reuse activities.
- **Amenity and Sensitive Receptors** – including separation distances, surrounding land uses and the potential for odour, noise and visual amenity impacts.
- **Roads, Traffic and Access** – including access to the existing road network, internal vehicle movements and suitability for construction and operational traffic requirements.
- **Cultural Heritage and Land Use Constraints** – including Aboriginal cultural heritage, historic heritage values and other land use planning constraints.
- **Planning and Operational Considerations** – including compliance with local and state planning requirements, industry standards and operational integration with the broader agricultural enterprise.

These considerations have informed the selection and design of the proposed covered housing feedlot system within the ***Applicants***' existing farming enterprise. The selected site provides suitable separation distances to surrounding sensitive receptors, access to existing water resources and agricultural infrastructure, appropriate topographic conditions for controlled drainage management and opportunities for integrated nutrient reuse within the broader agricultural operation. Relevant assessment of these matters is provided throughout this report and the supporting technical assessments accompanying the application.

3.3. INFRASTRUCTURE

The proposed development incorporates a range of operational, environmental management and agricultural infrastructure components associated with the operation of the covered housing feedlot system. The infrastructure has been designed to support cattle welfare, controlled drainage management, nutrient recovery, operational efficiency and integration with the broader agricultural enterprise.

3.3.1. ACCESS AND TRAFFIC

Existing access to the property is currently provided via an established farm access from Llowalong Road servicing the broader agricultural operation, including existing cattle yards, sheds, silos and operational infrastructure. As part of the proposed development, the existing southern access point from Llowalong Road will continue to service general farm operations, staff access, livestock deliveries and operational movements associated with the broader farming enterprise.

In addition, a new dedicated feedlot access is proposed from Llowalong Road along the western boundary of the property to provide direct access to the covered housing feedlot system, commodity storage areas and livestock export facilities. The separation of operational access points has been incorporated to improve internal traffic efficiency, minimise conflicting vehicle movements, ensure effective biosecurity management at the site and support the safe operation of the site.

Internal access infrastructure associated with the proposal includes:

- internal gravel access tracks,
- feed access lanes,
- livestock movement laneways,
- loading and unloading areas, and
- operational turning and manoeuvring areas suitable for heavy vehicles.

The internal access network has been designed to accommodate the operational requirements of the proposed feedlot system, including access by semi-trailers, feed delivery vehicles, livestock transport vehicles and agricultural machinery. Swept path assessments prepared by Traffix Group demonstrate that the site access arrangements and internal loading areas are capable of accommodating heavy vehicle movements associated with the development.

Traffic generated by the proposal is associated predominantly with livestock transport, feed deliveries and agricultural operational movements. The Traffic Engineering Assessment prepared by Traffix Group (**Appendix 7**) concludes that the proposed increase in traffic movements will not adversely impact the surrounding road network and that the existing and proposed access arrangements are appropriate for the development.

3.3.2. CATTLE HANDLING AND OPERATIONAL YARD FACILITIES

The proposal incorporates both existing and future cattle handling infrastructure associated with the operation of the covered housing feedlot system. During Stage 1 operations, the feedlot will utilise the existing cattle handling, loading and processing facilities located within the broader farming enterprise. These facilities are currently used for livestock

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management activities associated with the existing cattle operation and include steel cattle yards constructed on a concrete hardstand surface. The existing infrastructure is capable of accommodating livestock receival, weighing, drafting, treatment and loading activities associated with the initial operation of the feedlot system.

Drainage from the existing yard infrastructure is directed toward the broader controlled drainage management system associated with the farming enterprise.

As part of the Stage 2 development, a dedicated cattle handling and operational yard area will be established adjoining the proposed feedlot works area. The Stage 2 handling facilities will support:

- livestock receival and dispatch activities,
- drafting and weighing operations,
- veterinary and hospital treatment activities,
- temporary holding and recovery areas, and
- operational cattle management associated with the feedlot system.

The proposed staging approach allows the development to utilise existing operational infrastructure during the initial establishment phase while transitioning toward a fully integrated cattle handling and operational yard system associated directly with the covered housing feedlot facility.

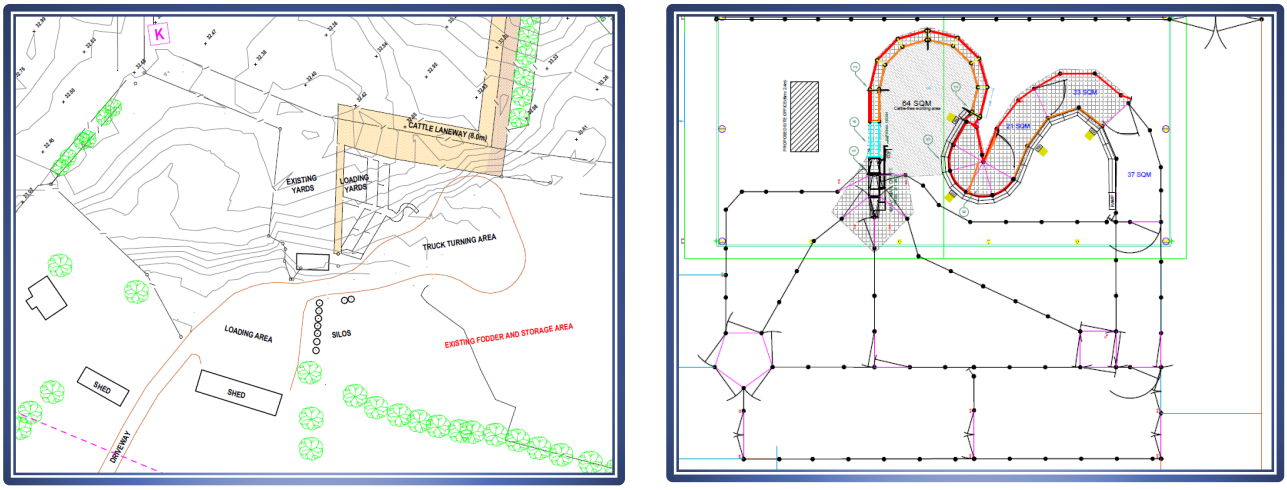

Figure 3-2 – Updated Existing cattle yards (left) and proposed yards (right)

3.3.3. COVERED HOUSING PEN SYSTEM

The proposed development incorporates a covered housing production pen system designed to accommodate a maximum operational capacity of 2,206 head, equating to approximately 1,830 Standard Cattle Units (SCU). The housing system has been designed to support cattle welfare, operational efficiency, controlled drainage management and nutrient recovery while integrating with the broader agricultural enterprise operated on the property.

The feedlot layout comprises a series of covered production pens arranged in parallel rows orientated north-south to support natural ventilation, solar access and operational management. The production pen configuration has been developed to facilitate:

- efficient feed delivery and livestock management,
- separation of cattle classes and production groups,
- operational access for feeding and pen maintenance equipment,
- controlled cattle movement throughout the facility, and
- integration with the controlled drainage and runoff management system.

The covered production pen system incorporates dedicated feed access lanes, cattle movement lanes and operational access areas designed to support routine feeding, livestock handling and manure and bedding management activities. A hospital and recovery pen is also incorporated within the operational layout to facilitate segregation and treatment of sick or injured animals where required.

The covered accommodation structures comprise open-sided roofed housing systems designed to provide weather protection while maintaining natural airflow and ventilation throughout the cattle accommodation areas. The structures incorporate a pitched roof profile with open ridge ventilation to support passive air movement and minimise heat accumulation within the covered areas.

The roof orientation and open-sided configuration have been designed to maximise natural ventilation while substantially reducing direct rainfall interaction with manure and bedding materials relative to conventional open feedlot systems. The

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covered housing configuration supports improved pen condition management, reduced runoff generation and improved operational performance during extended wet weather periods common within the Gippsland region.

Stocking densities and pen sizing have been developed with consideration to:

- the *Victorian Code for Cattle Feedlots* (1995),
- the *National Guidelines for Beef Cattle Feedlots in Australia*,
- *Feedlot Covered Housing Systems – Nest practice design and management manual*, and
- operational requirements associated with the proposed feeding program and livestock classes.

The production pen layout and associated operational infrastructure are shown below in **Figure 3-3** and on the development plans accompanying this application. Detailed operational management measures relating to manure and bedding management, drainage management, animal welfare and environmental controls are provided within the supporting technical assessments prepared for the proposal.

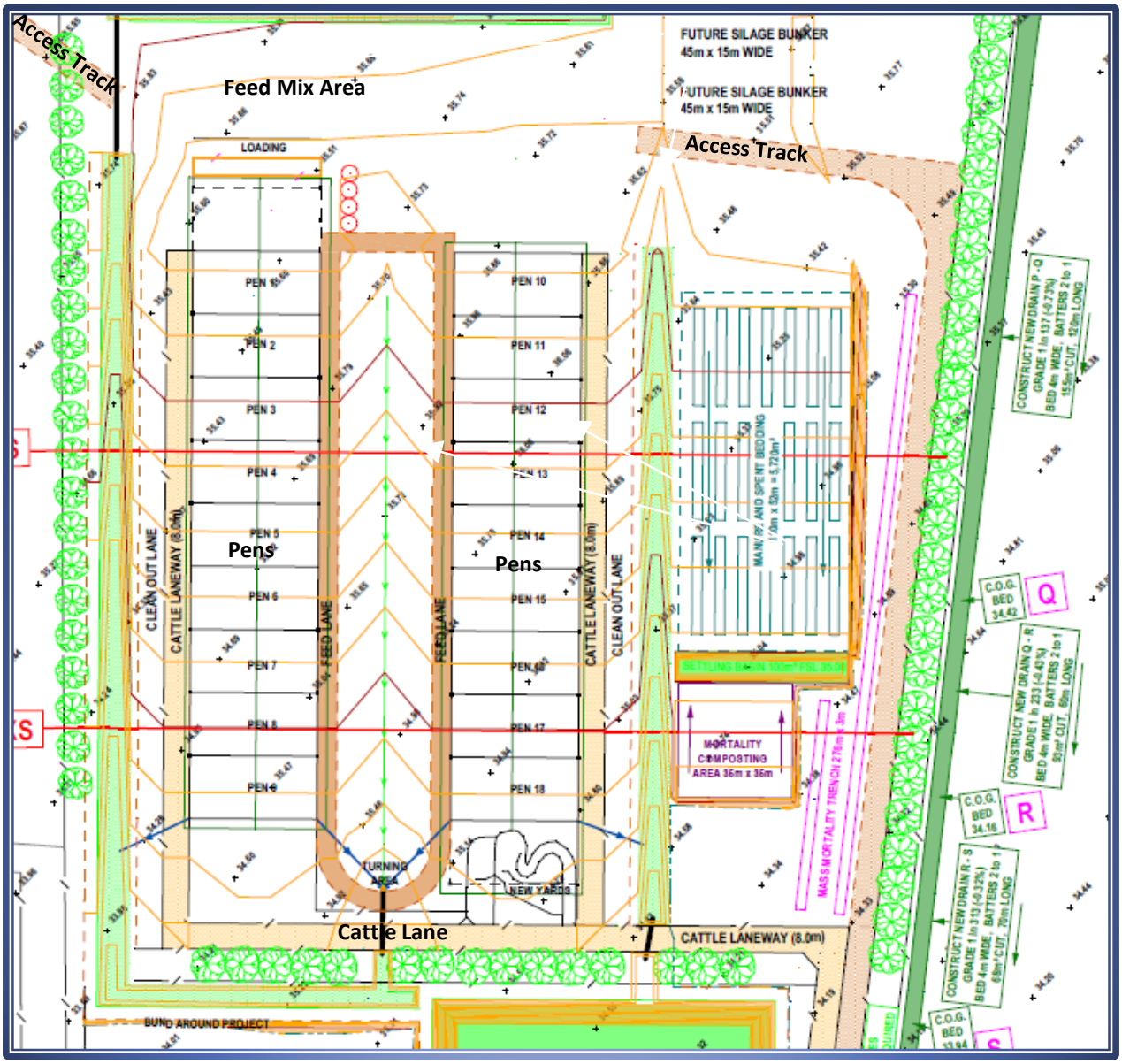

Figure 3-3 - Overview of proposed pen layout system

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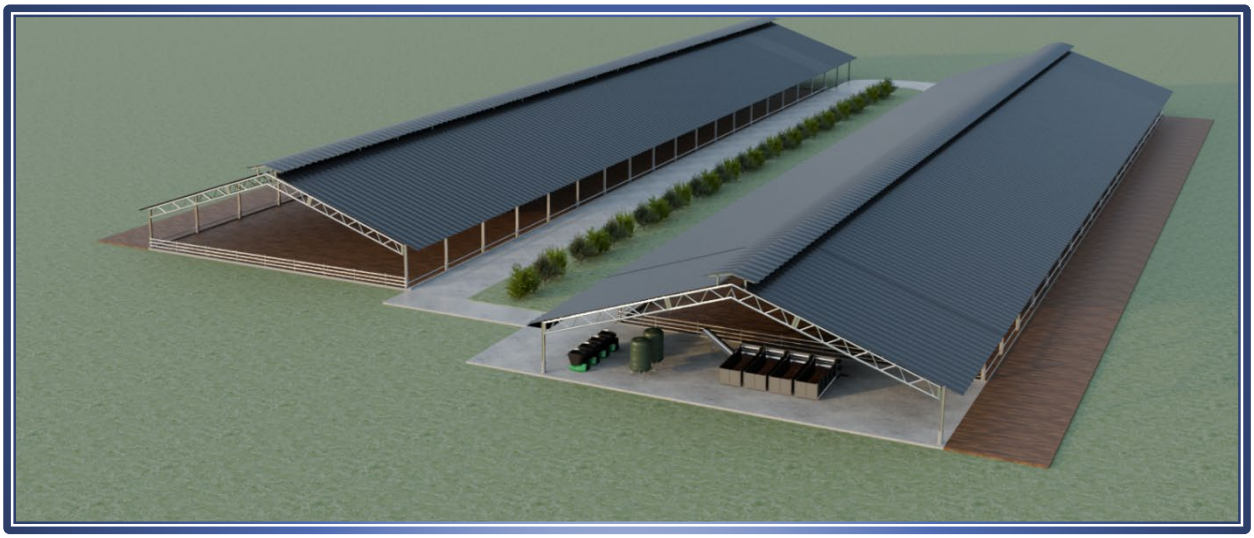

Figure 3-4 – Rendered image showing proposed shed layout including feed kitchen at northern end of shed 1 (Source: DOM Group)

3.3.3.1 PEN DESIGN AND CONFIGURATION

The covered production pens have been designed as a parallel pen system incorporating dedicated feed delivery infrastructure and cattle movement lanes integrated with the covered housing system. Feed delivery will occur via a 6m wide feed table system designed to accommodate either automated robotic feeding infrastructure or conventional mixer wagon feed delivery depending on operational requirements. The feed table arrangement allows efficient feed distribution while minimising vehicle movements within cattle accommodation areas.

A 8m external concrete cattle lane is provided adjoining the covered production pens to support cattle movement, operational access and supplementary feed delivery where required. The concrete lane infrastructure has been designed to support all-weather operation and improve operational efficiency associated with feeding, livestock handling and pen maintenance activities.

Water trough infrastructure is located internally within the pen system and integrated with the adjoining concrete service areas to support livestock access and operational management. External controlled drainage collection drains are positioned outside the primary cattle accommodation areas to capture and direct runoff toward the controlled drainage management system.

The production pens have been designed generally as level pens beneath the covered accommodation structures, with the roofed area incorporating a 1% grade consistent with the natural site topography to support controlled drainage and operational management.

A typical cross section of the proposed covered production pen configuration is shown in **Figure 3-4**.

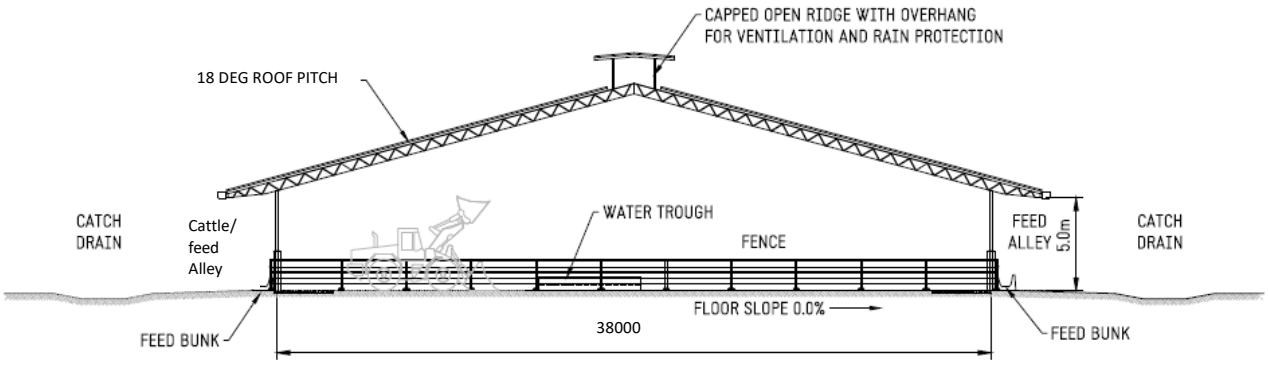

Figure 3-5 – Cross section of the proposed feedlot pens showing the feed alley, pens, cattle land and drain (Source: PRS review of feedlot Plans)

Individual production pens will be constructed within the roofed area, providing an area of approximately 6m² per SCU within the covered accommodation area, supplemented by external concrete feed and cattle movement lanes. Pen surfaces will be constructed using suitable on-site materials and compacted to support operational durability, minimise infiltration and maintain appropriate surface stability within the covered housing system. During operation, the establishment and maintenance of a stable manure interface layer will form part of routine pen management practices associated with the operation of the facility.

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A dedicated hospital and recovery pen will be incorporated within the covered feedlot area to facilitate segregation, monitoring and treatment of sick or injured animals where required. A dedicated treatment crush and operational handling area will also be provided to support livestock management activities associated with the feedlot operation.

3.3.4. FEED DELIVERY AND COMMODITY STORAGE

The proposed covered housing feedlot system incorporates dedicated feed delivery, commodity handling and feed storage infrastructure designed to support efficient feeding operations and integration with the broader agricultural enterprise. Feed commodities utilised within the operation will comprise a combination of fodder and silage produced on the property together with supplementary grain and feed products sourced from external agricultural suppliers where required.

Feed delivery within the covered housing system will occur via an external feed lane and feed table arrangement positioned adjoining the covered production pens. The feed delivery system has been designed to accommodate either automated robotic feeding infrastructure or conventional mixer wagon feed delivery depending on operational requirements and feeding programs.

The external feed lane incorporates a concrete operational surface designed to support all-weather access for feed delivery vehicles and agricultural machinery. The feed table arrangement allows feed to be distributed efficiently to cattle within the covered accommodation areas while minimising operational vehicle movements entering the primary livestock housing areas.

The external cattle lane may also be utilised as a supplementary feed delivery area where required, increasing the available feed access space within the operation and supporting flexible feeding and livestock management practices.

Figure 3-6 –Photo showing feed table style system within covered feedlot

During the initial stages of operation, feed commodities, silage and associated feed preparation activities will continue to utilise existing operational storage and handling infrastructure located adjoining the existing cattle handling facilities within the broader farming enterprise. This infrastructure currently supports existing livestock operations and provides operational efficiency during the staged establishment of the feedlot system.

As the development progresses, additional commodity storage, feed handling and operational hardstand infrastructure will be established adjoining the covered housing feedlot system to support the long-term integration of feed delivery and commodity management activities within the feedlot precinct.

Shed 1 has also been designed to accommodate future automated and robotic feeding infrastructure associated with the external feed table system. The building layout, feed lane arrangement and operational access areas provide flexibility for

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future integration of automated feeding technologies should they be adopted as part of the ongoing operation of the facility.

Figure 3-7 - Concept image of Automated Feed Kitchen (Source: DOM Group)

3.3.5. WATER SUPPLY INFRASTRUCTURE

The proposed covered housing feedlot system will utilise existing surface water and groundwater resources associated with the broader farming enterprise together with dedicated water supply and distribution infrastructure servicing the feedlot operation. Existing water entitlements and supply infrastructure associated with the property provide a secure and diversified water supply network capable of supporting both livestock and operational water demands associated with the development.

Water utilised within the operation will comprise a combination of surface water and groundwater resources supplied via the existing agricultural water infrastructure servicing the property. Existing pumps, pipelines, tanks and reticulation infrastructure associated with the broader farming enterprise will continue to support the operation of the feedlot system.

Water supply infrastructure within the covered housing feedlot system includes:

- livestock drinking water infrastructure,
- internal trough systems servicing production pens,
- operational water supply infrastructure,
- pipeline and reticulation systems, and
- water storage infrastructure associated with the broader farming enterprise.

Water troughs are positioned internally within the covered accommodation system adjoining concrete operational surfaces to support livestock access and operational management. The water supply system has been designed to support operational reliability, livestock welfare and integration with the broader agricultural enterprise.

A review of the water requirements for the feedlot are as follows:

Table 3-3 - Feedlot water supply requirements

Water Demand	Estimate Volume	Volume Required	Volume available	Complies
Annual operational demand	24ML per 1,000 head	53ML	>1,000ML – permanent Significant ML available temporary	Yes
Maximum Daily Demand	55L/head/day	121,330L	56ML	Yes
Three days storage	363,990/day		Tank holding, storage, bore	Yes

3.3.6. MANURE STORAGE AND MANAGEMENT

Pens will be cleaned on a routine basis as part of the ongoing operation and management of the covered housing feedlot system. Manure and bedding materials removed from the production pens will either be directly reused within the

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broader agricultural enterprise or temporarily stored within the designated manure storage area located inside the controlled drainage area.

The manure storage area comprises an operational hardstand area of approximately 110m by 45m (approximately 4,950m²) designed to accommodate temporary storage of manure and bedding materials in windrows prior to agricultural reuse. The storage area has been designed to provide operational access for manure handling equipment while maintaining integration with the controlled drainage management system associated with the development.

Manure and bedding materials generated within the feedlot system represent a valuable agricultural by-product and will be reused within the broader farming enterprise in accordance with seasonal conditions, crop nutrient requirements and operational management practices. Nutrient reuse activities associated with the operation will reduce reliance on synthetic fertilisers and support integrated nutrient cycling within the farming system.

The covered housing configuration substantially reduces direct rainfall interaction with manure and bedding materials relative to conventional open feedlot systems and supports improved manure condition management, reduced nutrient mobilisation and reduced runoff generation.

A dedicated mortality composting area is also incorporated within the operational layout to facilitate management of routine livestock mortalities associated with the operation. Mortality management infrastructure has been designed to support biosecurity, operational management and nutrient stabilisation outcomes associated with routine agricultural operations.

Detailed manure generation estimates, storage calculations, nutrient reuse assessments and operational management measures are provided within the Waste Management Plan and further detailed in the following Element 5 prepared in support of the application.

Figure 3-8 – Photo of a manure storage and management in a feedlot yard (Source: midwestbiosystems.com)

3.3.7. CONTROLLED DRAINAGE AND SURFACE WATER

The proposed development incorporates an integrated stormwater and controlled drainage management system designed to capture, convey, settle and store runoff generated within the operational footprint of the feedlot. The system has been designed in accordance with the principles of ***the Code*** and covered housing feedlot guidance.

Unlike a conventional open feedlot system, the proposed covered housing arrangement substantially reduces direct rainfall interaction with manure and bedding materials within the primary cattle accommodation areas. As a result, the majority of rainfall falling within the feedlot footprint will comprise roof water and relatively clean stormwater runoff managed separately from nutrient-rich operational runoff wherever practicable.

The feedlot drainage system incorporates catch drains located along both sides of the covered housing rows, directing runoff toward the southern end of the development where settling infrastructure and stormwater storage pond system is located. The manure and bedding storage area and mortality management area are also incorporated within the

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controlled drainage system, with runoff from these areas directed through the settling infrastructure prior to discharge into the stormwater storage pond.

All stormwater generated from the covered housing structures will be collected and reused within the broader farming enterprise for irrigated cropping activities. The stormwater storage pond will form part of the broader irrigation reuse system associated with the farming enterprise and will retain captured runoff for reuse within the existing irrigated cropping areas connected to the property pivot irrigation system.

Due to the covered housing design, routine manure recovery practices and settling infrastructure incorporated into the drainage system, the storage pond will primarily function as a controlled stormwater and irrigation reuse storage rather than a conventional open feedlot effluent pond.

Routine inspection and maintenance of drains, settling infrastructure and storage ponds will be undertaken as part of the ongoing operation of the facility to maintain hydraulic performance, minimise sediment accumulation and support ongoing nutrient recovery and reuse activities associated with the broader farming enterprise.

Table 3-4 - Controlled Drainage Areas

Area	Type of surface	Area (m^2)	% of total
Roofed feedlot area	Hard	17,396	20%
Hard Stand Area (lanes, drains, tracks)	Hard	11,705	13%
Manure & Mortality Storage Area	Hard	6,725	7%
Sediment Ditch	Hard	545	1%
Stormwater storage dam	Pond	9,000	10%
Grassed Areas (Soft)	Soft	44,629	50%
Area of Runoff Served by Sediment Ditch		6,725	7%
Controlled drainage area	**All**	**90,000**	**100%**

3.3.8. LANDSCAPING AND VISUAL SCREENING

The proposed feedlot has been designed to integrate with the existing agricultural landscape and surrounding farming environment through the retention and establishment of vegetation screening and shelter planting associated with the broader farming enterprise. Existing plantation vegetation located along the eastern, southern and western boundaries of the feedlot area will be retained and incorporated into the operational layout of the development.

Additional shelterbelt and landscaping plantings are proposed adjoining the northern extent of the development where practicable, having regard to operational requirements and the existing powerline easement traversing part of the site. Landscaping and shelter plantings associated with the development will assist in:

- visual integration of the feedlot within the surrounding rural landscape,
- wind attenuation and microclimate management,
- screening of operational infrastructure from surrounding roads and neighbouring properties, and
- integration of the development with the broader agricultural setting.

The proposed feedlot is located within an established agricultural landscape characterised by grazing, cropping and plantation vegetation typical of the Central Gippsland region. The retained and proposed vegetation associated with the development will continue to contribute to the existing rural landscape character of the locality.

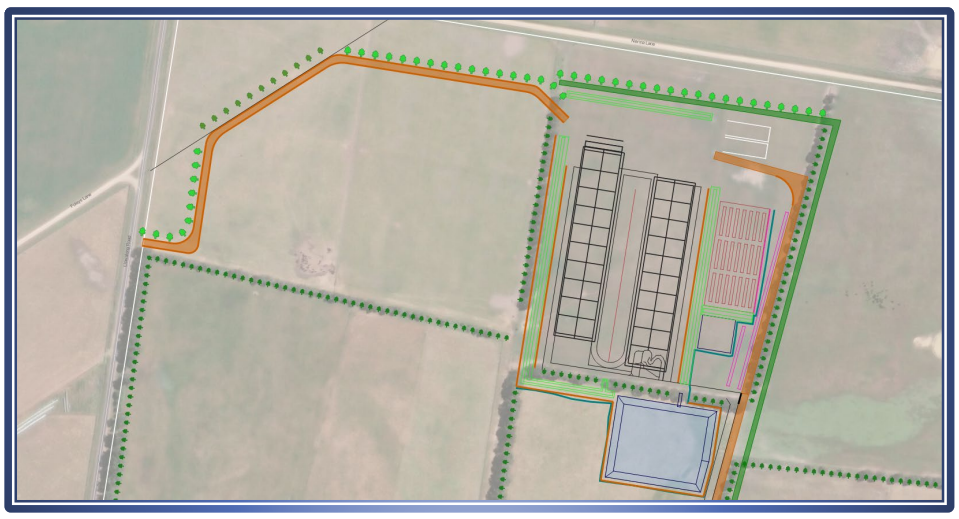

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Figure 3-9 – Overview of the proposed landscape plan (Source PRS)

3.4. PROJECT METHODOLOGY

The proposed development will be established and operated in stages as part of the ongoing diversification of the broader agricultural enterprise. Construction and operation of the feedlot will utilise a combination of existing agricultural infrastructure and new purpose-built feedlot infrastructure designed to support livestock management, nutrient recovery, controlled drainage and feed delivery activities associated with the operation.

The project methodology has been developed with consideration to operational efficiency, environmental management, animal welfare, biosecurity and integration with the broader farming enterprise.

3.4.1. CONSTRUCTION METHODOLOGY

Construction of the proposed feedlot will involve:

- site preparation and earthworks,
- construction of controlled drainage infrastructure,
- establishment of sediment and stormwater storage infrastructure,
- construction of covered housing structures and operational hardstand areas,
- installation of feed delivery and water supply infrastructure, and
- establishment of manure management and operational infrastructure.

Construction activities will be undertaken progressively using suitably qualified contractors and agricultural construction operators. Existing farm access tracks and operational areas will be utilised wherever practicable during construction activities.

Earthworks associated with the development will generally involve balancing of material within the site to establish the required grades, drainage infrastructure and operational surfaces associated with the feedlot layout.

Construction activities will be undertaken in accordance with relevant occupational health and safety requirements and standard agricultural construction practices.

3.4.2. OPERATIONAL METHODOLOGY

The proposed covered housing feedlot system will operate as an integrated cattle backgrounding and finishing enterprise forming part of the broader agricultural operation conducted on the property. Cattle entering the feedlot will generally originate from the applicants existing breeding and backgrounding operations together with externally sourced local livestock where required.

Livestock entering the feedlot will initially be processed through the existing cattle handling facilities associated with the property for induction, weighing, drafting and treatment prior to allocation within the covered housing system. Over time, additional cattle handling infrastructure associated directly with the feedlot precinct will support operational management, hospital treatment and livestock exits.

Cattle within the covered housing system will be managed in production groups based on livestock class, feeding requirements and operational management considerations. Feed delivery will occur via the external feed table system utilising either mixer wagon feeding or future automated feeding infrastructure associated with the operation.

Routine operational activities associated with the feedlot will include:

- livestock feeding and monitoring,
- cattle induction and drafting,
- pen cleaning and manure recovery,
- maintenance of drainage and storage infrastructure,
- commodity handling and feed preparation,
- livestock health monitoring and treatment, and
- irrigation reuse activities associated with the broader farming enterprise.

Pens will be routinely monitored and cleaned as part of the ongoing operation of the facility to maintain livestock welfare, pen condition and operational performance. Manure and bedding materials recovered from the feedlot system will be reused within the broader agricultural enterprise in accordance with crop nutrient requirements and seasonal conditions.

The feedlot will operate in conjunction with the broader farming enterprise and existing irrigated cropping operations associated with the property, supporting integration of feed production, livestock production and nutrient reuse activities within the one agricultural operation.

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The operation of the feedlot will be undertaken in accordance with recognised industry quality assurance, animal welfare and biosecurity standards. The applicants intend to obtain and maintain accreditation under the *National Feedlot Accreditation Scheme* (NFAS), which provides nationally recognised standards relating to feedlot management, livestock welfare, environmental management, food safety and traceability.

The broader farming enterprise also participates in quality assurance and sustainability programs associated with premium beef production, including the Greenham *Never Ever* and *Sustainable Beef programs*. Operational management of the feedlot will continue to align with the requirements of these programs, supporting livestock welfare, feed traceability, responsible environmental management and ongoing market assurance outcomes.

3.5. PROJECT STAGES AND TIMING

The proposed development will be established progressively in stages as part of the ongoing expansion of the broader agricultural enterprise. Initial works will include establishment of the covered housing structures, controlled drainage infrastructure, operational feed delivery systems, manure and mortality management areas and integration with the existing cattle handling infrastructure located on the property.

Existing cattle handling, commodity storage and feed preparation infrastructure associated with the farming enterprise will continue to support the operation during the initial stages of development. Additional feedlot-specific infrastructure, including expanded commodity handling and livestock management infrastructure, may be established progressively as the operation develops over time.

The feedlot has been designed to support future operational flexibility, including the potential integration of automated feeding infrastructure associated with the covered housing system.

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4. VICTORIAN AND LOCAL PLANNING PROVISIONS

A number of planning instruments and controls need to be reviewed in relation to the project. This section reviews Victorian Planning Provisions and Local Planning Provisions where relevant to the project.

4.1. VICTORIAN CODE FOR CATTLE FEEDLOTS

The *Victorian Code for Cattle Feedlots* August 1995 ("***the Code***") is incorporated into all Victorian planning schemes and provides the primary framework for the planning, design and assessment of cattle feedlot developments within Victoria.

The purpose of ***the Code*** is to provide guidance and assistance regarding the development and operation of feedlots in Victoria and to ensure both certainty in the planning and approval process and satisfactory commercial and environmental operation of feedlots.

The Code establishes Objectives, Accepted Standards and Approved Measures relevant to the design, operation and environmental management of feedlots. All feedlots are required to achieve the Objectives and Accepted Standards of ***the Code*****.**

The Approved Measures within ***the Code*** represent "deemed to comply" provisions; however, alternative design and operational solutions may also be considered where they demonstrate achievement of the relevant Objectives and Accepted Standards to the satisfaction of the responsible authority.

This is particularly relevant to the proposed development, which incorporates a modern covered housing feedlot system and associated controlled drainage, nutrient recovery and stormwater reuse infrastructure not specifically contemplated within the original 1995 ***Code*** framework. As a result, this assessment has also considered integrated industry guidance relating to covered housing systems and modern feedlot management practices in conjunction with ***the Code*** requirements.

COMMENT

Appendix 4 of ***the Code*** includes a proposal form intended to assist responsible authorities in assessing feedlot developments against the requirements of ***the Code***. This report addresses the matters identified within Appendix 4, however the assessment format has been modified to allow more detailed consideration of the specific design, operational and environmental characteristics of the proposed development.

4.2. WELLINGTON PLANNING SCHEME

Local Planning Schemes guide planning decisions for Local Government Areas (LGAs). These frameworks include zoning and development controls providing a framework for the way land can be used and ensure local development is undertaken appropriately.

4.2.1. CLAUSE 35.07 – FARMING ZONE

The project area is proposed within the Farming zone which is shown on the map below.

Figure 4-1 – Plan identifying the project site in relation to the land zoning

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The project works are located within one zone being Farming
Farming Zone (FZ) has the following objectives:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To provide for the use of land for agriculture.*
- *To encourage the retention of productive agricultural land.*
- *To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture.*
- *To encourage the retention of employment and population to support rural communities.*
- *To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.*
- *To provide for the use and development of land for the specific purposes identified in a schedule to this zone.*

COMMENT

The proposed development supports the ongoing use of the land for agriculture through establishment of an integrated cattle backgrounding and finishing operation associated with the broader farming enterprise. The proposal will support continued agricultural productivity, value-adding to agricultural outputs and ongoing investment within the rural area while maintaining the primary agricultural function of the land.

CLAUSE 44.03 - FLOODWAY OVERLAY

The project location is shown below with the Floodway Overlay (FO) areas indicated in light blue.

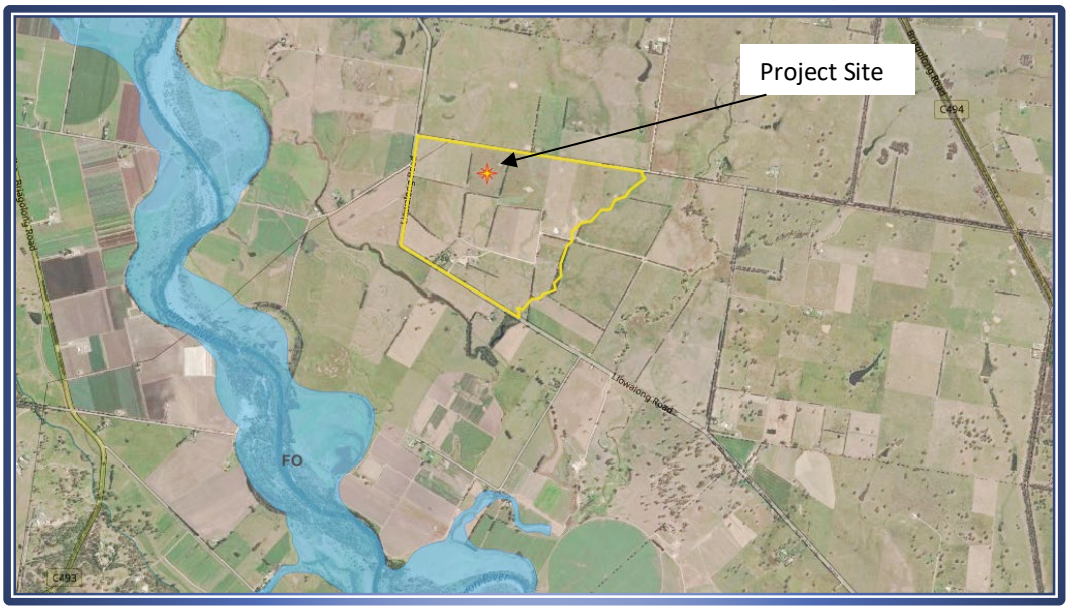

Figure 4-2 Plan identifying the project site in relation to the Flood Overlay

The purpose of the FO map is to:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To identify waterways, major floodpaths, drainage depressions and high hazard areas which have the greatest risk and frequency of being affected by flooding.*
- *To ensure that any development maintains the free passage and temporary storage of floodwater, minimises flood damage and is compatible with flood hazard, local drainage conditions and the minimisation of soil erosion, sedimentation and silting.*
- *To reflect any declarations under Division 4 of Part 10 of the Water Act, 1989 if a declaration has been made.*
- *To protect water quality and waterways as natural resources by managing urban stormwater, protecting water supply catchment areas, and managing saline discharges to minimise the risks to the environmental quality of water and groundwater.*
- *To ensure that development maintains or improves river, marine, coastal and wetland health, waterway protection and floodplain health.*

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COMMENT

The proposed feedlot infrastructure and associated operational areas are not located within land affected by the Floodway Overlay. The development has been sited outside identified floodway areas and is not expected to adversely impact flood storage, flood conveyance or flood behaviour within the locality.

CLAUSE 44.04 – LAND SUBJECT TO INUNDATION

The project location is shown below with the Land Subject to Inundation (LSIO) areas indicated in light blue. The areas adjoining the Flood Overlay have been mapped as LSIO.

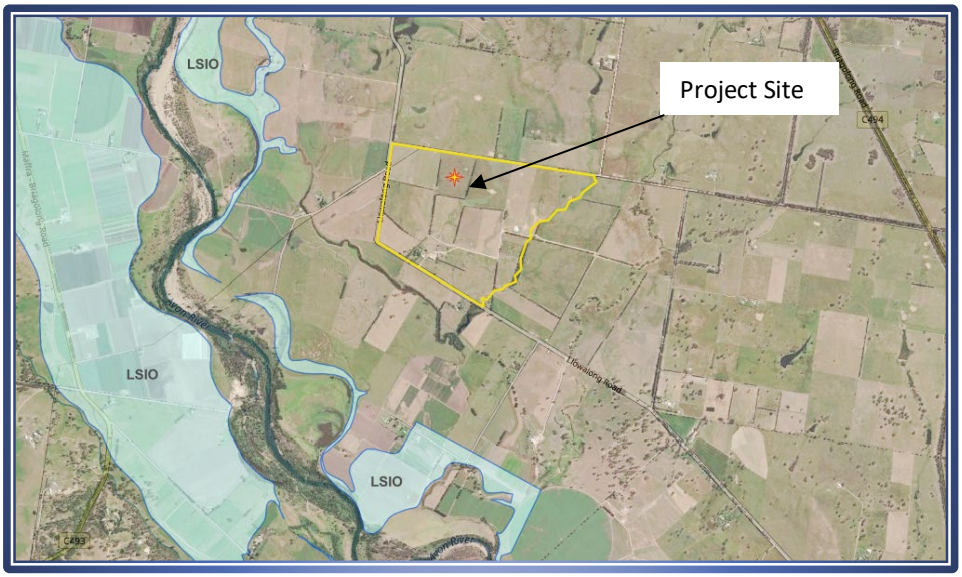

Figure 4-3 Plan identifying the project site in relation to the Land Subject to Inundation overlay

The purpose of the LSIO map is to:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To identify flood prone land in a riverine or coastal area affected by the 1 in 100 (1 per cent Annual Exceedance Probability) year flood or any other area determined by the floodplain management authority.*
- *To ensure that development maintains the free passage and temporary storage of floodwaters, minimises flood damage, responds to the flood hazard and local drainage conditions and will not cause any significant rise in flood level or flow velocity.*
- *To minimise the potential flood risk to life, health and safety associated with development.*
- *To reflect a declaration under Division 4 of Part 10 of the Water Act, 1989.*
- *To protect water quality and waterways as natural resources by managing urban stormwater, protecting water supply catchment areas, and managing saline discharges to minimise the risks to the environmental quality of water and groundwater.*
- *To ensure that development maintains or improves river, marine, coastal and wetland health, waterway protection and floodplain health.*

COMMENT

The proposed feedlot infrastructure and associated operational areas are not located within land affected by the Land Subject to Inundation Overlay. The development has been designed and sited to avoid identified inundation areas and associated flood-related constraints.

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5. ENVIRONMENTAL ASSESSMENT IN ACCORDANCE WITH THE VICTORIAN CATTLE CODE

This assessment has been undertaken with reference to the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***"), including the Objectives, Accepted Standards and Approved Measures identified for the eight elements within ***the Code***.

The proposed development comprises a covered housing beef cattle feedlot system with a maximum operational capacity of 2,206 head, equating to approximately 1,830 Standard Cattle Units (SCU). While ***the Code*** remains the primary assessment framework for cattle feedlot development in Victoria, the proposed covered housing system incorporates modern design and operational principles that differ from a conventional open feedlot system.

Accordingly, the assessment considers the relevant ***Code*** requirements in the context of the proposed covered housing design, controlled drainage system, manure and bedding recovery, stormwater storage and irrigation reuse framework detailed in the Waste Management Plan prepared in support of the application. Where relevant, covered housing guidance and supporting technical assessments have also been considered.

5.1. ELEMENT 1 - LOCATION & SIZE (LOCALITY, SITING AND BUFFERS)

Element 1 of *the* ***Code*** considers the feedlot size in relation to its location and surrounding sensitive uses and land zoned for residential or urban purposes.

The objective of this element is to develop feedlots on the appropriate sites having regard to the existing and foreseeable residential development and urban communities.

5.1.1. OBJECTIVE

O1 The development of feedlots on appropriate sites having regard to existing and foreseeable residential development and urban communities.

5.1.2. ACCEPTED STANDARD

AS1 The development is located a sufficient distance from the nearest residential development so as to not cause material detriment due to odour, noise, dust or other nuisance.

AS2 Where two feedlots are proposed in close proximity, modelling is used to demonstrate adequate separation distances from receptors.

5.1.3. EXISTING ENVIRONMENT

The property is located within the Central Gippsland area of eastern Victoria within the Wellington Shire and is situated between the townships of Maffra, Stratford and Briagolong. The broader locality is characterised by irrigated and dryland agricultural production including grazing, fodder production and mixed farming enterprises typical of the region.

The proposed feedlot site is located within the north-western portion of the property and forms part of the existing agricultural enterprise currently utilised for cattle production and irrigated agricultural activities. The proposed development represents an expansion and intensification of the existing livestock production system through establishment of a covered housing feedlot operation integrated with the broader farming enterprise.

The feedlot infrastructure has been sited to achieve separation from surrounding sensitive receptors, waterways, operational boundaries and identified flood-prone land. The covered housing rows are orientated generally north-south and incorporate integrated feed delivery, controlled drainage and nutrient recovery infrastructure associated with the operation.

5.1.4. ASSESSMENT

An S-Factor assessment in accordance with ***the Code*** has been undertaken to assess the required separation distances from surrounding sensitive receptors. The assessment is detailed further within **Element 3 – Odour** and the Odour Assessment (**Appendix 5**) prepared in support of the application.

In addition to the odour separation distances, ***the Code*** also identifies minimum setback and buffer requirements relating to controlled drainage reuse areas, manure and bedding management areas and feedlot operational infrastructure. Compliance with these requirements is summarised in **Table 5-1** below.

Table 5-1 - Feedlot activity separation distance compliance

Separation from	Liquid waste		Solid Waste		Feedlot Activity Area	
	Required	Complies	Required	Complies	Required	Complies
Site Boundary	20m	Yes	20m	Yes	50m	Yes
Public Area	100m	Yes	100m	Yes	-	NA
Watercourse, bore or spring	100m	Yes	200m	Yes	200m	Yes
Off site residence	200m	Yes	200m	Yes	813m	Yes
Flood prone land (1 in 100 year flood)	200m	Yes	200m	Yes	200m	Yes

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1 – Controlled drainage runoff captured within the stormwater storage and irrigation reuse system is reused within the broader farming enterprise in accordance with the Waste Management Plan.
2- Feedlot separation distances are determined through the S-Factor Odour Assessment detailed in Element 3 and Appendix 5

5.1.5. RESULTS - APPROVED MEASURES

Approved Measure 1 – Separation Distance and Number of Standard Cattle Units

An S-Factor assessment has been undertaken in accordance with ***the Code*** for the proposed covered housing feedlot system with a maximum operational capacity of 2,206 head, equating to approximately 1,830 Standard Cattle Units (SCU).

The assessment identified the following indicative separation distance requirements:

- Large town (>2,000 persons) – 4,064m
- Town (>100 persons) – 3,251m
- Single rural dwelling – 813m
- Two dwellings within 250m – 1,220m

The proposed feedlot site satisfies the required separation distances to surrounding townships and sensitive rural receptors and therefore complies with this Approved Measure. Further detail is provided within **Element 3** – Odour and the Odour Assessment prepared in support of the application.

The feedlot site is not located within the required separation distance of either a large town or single rural residence and therefore complies with this measure.

Approved Measure 2 – Two Feedlots in Close Proximity

No existing feedlots or other intensive animal industries requiring cumulative odour assessment have been identified within the locality of the proposed development. The proposal therefore complies with this Approved Measure.

Approved Measure 3 – Access to Areas for Solid and Liquid Waste Disposal

The proposed development incorporates sufficient land area and associated infrastructure to support the reuse of captured stormwater runoff, manure and bedding materials generated within the operation. Nutrient reuse activities form part of the broader integrated farming enterprise and are detailed within the Waste Management Plan prepared in support of the application. See also **Element 5** below.

Approved Measure 4 – Environmental Buffer Separations

FEEDLOT SITE

The proposed feedlot works area has been sited to meet the relevant environmental buffer separation distances from property boundaries, public roads, watercourses, bores, flood-prone land and off-site residences. The proposed covered housing feedlot system is located outside mapped flood-related overlays and has been positioned to maintain appropriate separation from surrounding sensitive land uses and environmental features.

Table 5-1 above identifies the proposed feedlot works area in relation to relevant separation distances and Figure 5-1 below shows the proposed site in relation to environmental features.

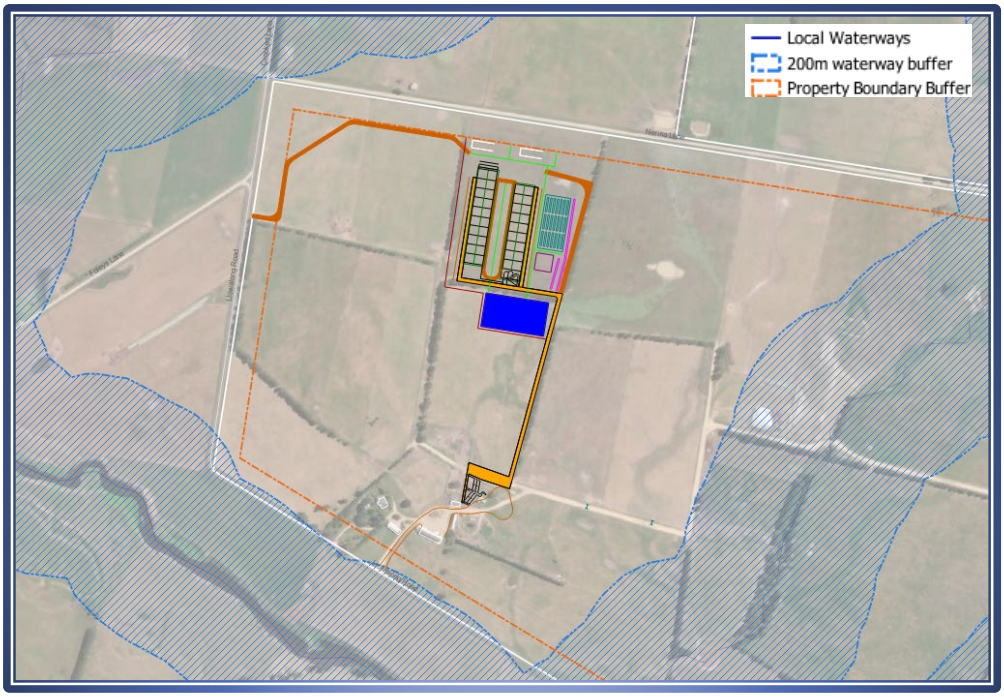

Figure 5-1 Plan identifying the project site in relation to the 'Feedlot works area separation distances' (PRS QGIS)

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CONTROLLED DRAINAGE AND IRRIGATION RE-USE AREA

Captured runoff from the controlled drainage and stormwater storage system will be reused within the broader farming enterprise through the existing irrigation infrastructure associated with the property. The reuse system forms part of the integrated stormwater management and nutrient recovery framework detailed within the Waste Management Plan (**Appendix 6**).

The controlled drainage area and stormwater storage infrastructure associated with the feedlot will be integrated with the broader irrigation area on the property, which comprises 220ha of irrigated agricultural land. Following consideration of the required environmental buffer distances from watercourses, bores, property boundaries and flood-prone land, approximately 106ha of land remains available and suitable for the reuse of nutrient-laden irrigation water associated with the operation.

The Waste Management Plan identified that approx. 5ha is required for sustainable reuse of nutrients associated with the controlled drainage and stormwater reuse system. The available irrigation reuse area therefore significantly exceeds the minimum land area required for ongoing nutrient utilisation associated with the operation.

It should also be noted that runoff captured within the controlled drainage system is expected to comprise a significant dilute runoff stream due to the covered housing design, reduced rainfall interaction with manure surfaces, and separation of manure and bedding materials from direct rainfall. Nutrient concentrations associated with the captured runoff are therefore expected to be lower than those typically associated with conventional open feedlot runoff systems.

Reuse activities will be managed in accordance with seasonal conditions, irrigation demand, crop nutrient requirements and the operational requirements of the Waste Management Plan. **Figure 5-2** identifies the controlled drainage and irrigation reuse area associated with the proposal.

MANURE AND BEDDING RE-USE AREA

Manure and bedding materials recovered from the covered housing feedlot system will be reused within the broader farming enterprise through mechanical application to agricultural land at rates reflective of crop nutrient demand, soil conditions and seasonal requirements.

The available application areas within the operation comprise a combination of irrigated and dryland agricultural land associated with the broader farming enterprise. Irrigated areas have been established and managed under the property's whole farm planning framework and form part of the integrated agricultural production system operated on the property.

The Waste Management Plan identified that approx. 213ha is required for the sustainable reuse of manure and bedding materials generated by the operation. Sufficient agricultural land is available within the broader farming enterprise to accommodate ongoing nutrient re-use activities while maintaining the required setback distances from property boundaries (20m), public areas (100m), watercourses, drains, bores and springs (200m) and off-site residences (200m).

Due to the rotational nature of cropping and nutrient management activities across the farming enterprise, specific manure and bedding re-use areas may vary over time depending on crop establishment, seasonal conditions and operational requirements. Application activities will be undertaken in accordance with the Waste Management Plan and relevant environmental protection requirements, including any applicable manure resource recovery approvals associated with off-site use where required.

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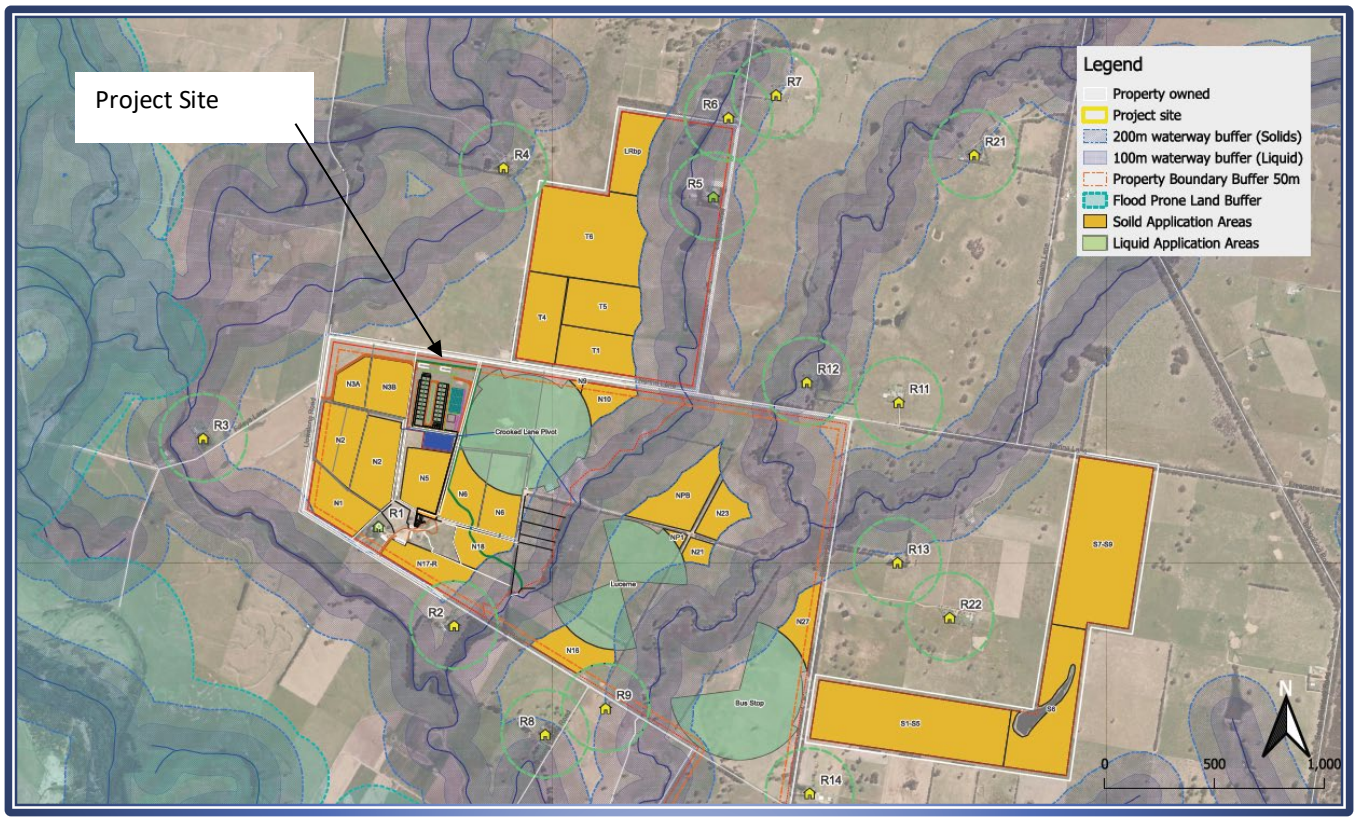

Figure 5-2 - Plan identifying the application areas available within the property (Source: PRS QGIS)

5.1.6. CONCLUSION

The proposed covered housing feedlot system and associated nutrient re-use areas have been assessed against the relevant separation distance, environmental buffer and siting requirements of Element 1 of ***the Code***.

The assessment confirms that the proposed feedlot works area satisfies the required separation distances from surrounding sensitive receptors, property boundaries, waterways, bores and flood-prone land. The S-Factor Odour Assessment also confirms compliance with the required separation distances to surrounding rural dwellings and nearby townships.

Controlled drainage and nutrient re-use activities associated with the operation will occur within the broader farming enterprise in accordance with the Waste Management Plan and relevant environmental protection requirements. Sufficient land area is available to sustainably utilise nutrients generated by the operation while maintaining the required environmental buffers.

Overall, the proposed development is considered to satisfy the Objective, Accepted Standards and Approved Measures for Element 1 – Location and Size (Locality, Siting and Buffers) of the *Victorian Code for Cattle Feedlots*.

5.2. ELEMENT 2 – DESIGN & CONSTRUCTION

The proposed development incorporates a modern covered housing feedlot system which differs from the conventional open feedlot configuration contemplated within ***the Code***.

The covered housing design incorporates roofed production pens, feed table delivery systems, controlled drainage infrastructure, integrated nutrient recovery systems and integrated livestock management infrastructure designed to improve operational efficiency, environmental management and livestock welfare outcomes.

While the proposal generally satisfies the relevant Approved Measures identified within ***the Code***, several design elements adopt alternative approaches associated with covered housing feedlot systems. These alternative design measures are considered to satisfy the Objectives and Accepted Standards of ***the Code*** through improved runoff management, reduced rainfall interaction with manure and bedding materials, enhanced operational management and reduced environmental risk relative to conventional open feedlot systems.

Assessment of the proposal has also considered relevant industry guidance relating to covered housing systems, feedlot design and operational management.

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5.2.1. OBJECTIVE

O1 A coherent layout that provides an efficient design which minimises the impact on the environment and allows the collection and treatment of all wastes in a manner that does not give rise to any off-site detriment.

5.2.2. ACCEPTED STANDARDS

The objective may be achieved where:

AS1 The development is integrated into the landscape to the extent possible utilising slopes on the site.

AS2 The design and layout minimises vehicle movements on site, provides for orderly management of stock, and provides an efficient system for the collection, treatment and handling of all waste.

This may be achieved by:

- Locating the feedlot in a central location on the site or a location which provides ease of access both from within and beyond the site;
- Locating suitable vehicle access from a main or secondary road for stock movement and fodder delivery;
- Designing the layout of pens such that all pens are graded to catch drains leading to the waste management system;
- Constructing the pens and associated works to standards which minimise odour production potential and facilitate cleaning and maintenance.

AS3 The layout recognises the location of any nearby watercourses and provides adequate setbacks and protective devices to prevent contamination by polluted runoff from the feedlot.

5.2.3. ASSESSMENT

The assessment within this section is based on the proposed covered housing feedlot design and supporting technical information detailed within **Section 3** – Details of the Proposal together with the Waste Management Plan, Odour Assessment and associated supporting documentation prepared for the application.

The proposed development has been designed to integrate with the existing agricultural operation and surrounding rural landscape while minimising environmental risk and improving operational efficiency associated with cattle management, feeding, drainage and nutrient recovery.

The feedlot works area is centrally located within the broader farming enterprise and has been positioned to:

- maximise separation from surrounding sensitive receptors,
- utilise the existing internal access network and operational infrastructure,
- integrate with the broader irrigation and nutrient reuse areas on the property,
- minimise interaction with waterways and flood-prone areas, and
- provide efficient vehicle access for livestock, feed and operational movements.

The covered housing design incorporates roofed cattle accommodation areas with integrated feed-table systems, controlled drainage infrastructure, manure and bedding recovery systems and dedicated operational accessways. The layout has been designed to support efficient stock handling, feeding operations, manure management and routine maintenance activities while minimising unnecessary vehicle movements within operational areas.

Surface drainage associated with the operational areas is directed toward the controlled drainage and stormwater storage system through graded surfaces and drainage infrastructure designed to minimise uncontrolled runoff and facilitate capture and reuse of runoff within the broader farming enterprise.

The proposal also incorporates separation distances, vegetation screening, operational buffers and integrated nutrient reuse systems intended to minimise potential environmental and amenity impacts associated with the operation.

Overall, the proposed design and construction framework is considered appropriate for the scale and nature of the development and satisfies the Objectives and Accepted Standards for Element 2 – Design and Construction of ***the Code***.

5.2.4. RESULTS - APPROVED MEASURES

Approved Measure 1 – Pen floor preparation.

The proposed development incorporates a covered housing feedlot system requiring site preparation and construction works associated with the establishment of cattle housing, feed delivery infrastructure, controlled drainage systems and operational access areas. Pen floor preparation and construction will be undertaken generally in accordance with the approved design plans and will include:

- ✓ Pen surfaces will be prepared by laser grading to establish an even and uniform operational surface within the covered housing areas.
- ✓ Pen surfaces and associated operational areas will be compacted using suitable construction methods and equipment.

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- ✓ Where required, suitable on-site materials will be utilised during construction with imported gravel or suitable material introduced where required.

The Approved Measure within ***the Code*** identifies pen slopes of between 2% and 6% for conventional open feedlot systems to facilitate drainage from exposed pen surfaces. The proposed development differs from a conventional open feedlot system through the incorporation of covered cattle housing which eliminates direct rainfall interaction with pen surfaces. Accordingly, the covered housing areas do not require the same pen grading and drainage design characteristics associated with open feedlot systems.

Alternate measure:

While the covered housing pens do not specifically adopt the pen slope requirements identified for conventional open feedlot systems, the alternative covered housing design is considered to satisfy the intent of Approved Measure 1 through:

- ➢ reduced rainfall interaction with manure and bedding materials,
- ➢ improved controlled drainage outcomes,
- ➢ enhanced manure and bedding management practices, and
- ➢ reduced environmental and operational risk relative to a conventional open feedlot system.

Accordingly, the proposal is considered to satisfy the Objectives and Accepted Standards associated with Approved Measure 1 for a Class A feedlot.

Approved Measure 2 – External Surface Runoff Control.

Surface drainage associated with the proposed feedlot will be managed through an integrated controlled drainage system incorporating laser graded surfaces, shallow vegetated drainage lines, collection drains, sediment control infrastructure and stormwater storage infrastructure integrated with the broader irrigation reuse system on the property. The drainage framework has been designed to direct runoff from operational areas, outside the roofed pens, toward the controlled drainage and runoff storage system while minimising erosion risk and facilitating ongoing maintenance access.

The feedlot does not propose to incorporate a fully separated clean and effluent run-off drainage system. Rather, runoff generated from operational areas associated with the feedlot will be collected and managed within a constructed stormwater system where captured water will be irrigated and utilised within the broader farming enterprise.

Areas associated with manure and bedding storage together with the mortality composting area will incorporate sediment control measures prior to runoff entering the stormwater storage system. Sediment control infrastructure associated with these areas is intended to reduce solids accumulation within the downstream storage and reuse system and facilitate ongoing operational management.

- ✓ Runoff from operational areas is directed toward the controlled drainage and stormwater management system.
- ✓ Drainage infrastructure associated with the proposal has been designed to accommodate storm events consistent with the requirements of ***the Code*** including a 1 in 20-year recurrence.
- ✓ Broad vegetated drainage lines and low batter drainage systems are incorporated to reduce erosion potential and facilitate maintenance access.
- ✓ The controlled drainage and storage system has been sized and designed in accordance with the Waste Management Plan and associated water balance modelling to capture and manage runoff generated from the operational areas of the feedlot.

The drainage and runoff management framework associated with the proposal is detailed further within Element 5 – Waste Management and the Waste Management Plan prepared in support of the application.

Alternate Measure

The proposed covered housing feedlot system adopts an alternative runoff management approach to the conventional diversion-based systems contemplated by ***the Code*****.** Rather than maintaining fully separated clean and contaminated runoff systems, the proposal incorporates an integrated controlled drainage and runoff capture system associated with the broader farming enterprise.

Areas associated with manure and bedding storage together with the mortality composting area incorporate sediment control infrastructure prior to discharge into the broader runoff storage system to reduce solids accumulation and facilitate operational management. The proposed drainage design incorporates:

- ➢ laser graded operational surfaces,
- ➢ shallow vegetated drainage corridors,
- ➢ broad low batter drainage systems designed to reduce erosion potential,
- ➢ sediment control infrastructure, and
- ➢ integrated runoff storage and reuse systems.

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While the drainage framework differs from the conventional diversion-based systems contemplated by ***the Code***, the proposed design is considered to satisfy the Objectives and Accepted Standards for runoff management through the capture, management and controlled reuse of runoff associated with the operation.

Approved Measure 3 – Laneways.

The proposed feedlot incorporates a dedicated feed-table laneway system together with separate cattle access laneways associated with the covered housing pens.

The feed-table system will comprise a 6m wide concrete laneway located external to the feed fence line/table and designed to facilitate feed delivery directly to the pens. The feed-table infrastructure has been designed to accommodate both conventional feed wagon operations and potential future automated or robotic feeding systems associated with the operation.

Separate cattle access laneways are proposed on the opposite side of the pens and will comprise approximately 8m-wide concrete laneways designed to facilitate livestock movement, operational access and manure management activities associated with the covered housing system.

- ✓ Feed delivery systems are designed to allow direct delivery of feed to the feed-table infrastructure associated with the pens.
- ✓ Feed-table laneways are designed at approximately 6m in width to accommodate feed delivery vehicles and operational access requirements.
- ✓ Cattle-only laneways are designed at approximately 8m in width consistent with the operational requirements of the covered housing system and the Approved Measures for Class A feedlots.
- ✓ Laneways and operational access areas are designed to provide all-weather access through concrete and consolidated operational surfaces.
- ✓ Surface grading associated with the laneway system has been designed to facilitate drainage toward the controlled drainage and stormwater management system.

Runoff generated from the area of the feed-table and cattle access laneways exposed to rainfall will be directed toward the integrated controlled drainage and stormwater management system associated with the feedlot and broader farming enterprise. The proposed laneway system differs from the conventional feed trough arrangements contemplated by ***the Code*** and has been designed to improve operational efficiency, feeding management and compatibility with covered housing feedlot systems and automated robotic feeding.

The proposed laneway infrastructure is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 3 for a Class A feedlot.

Approved Measure 4 – Cattle Handling Yards

The site proposes to utilise the existing and recently updated yard facilities on the property. These are of suitable size to receive, process and dispatch stock. Sick cattle will be treated within the feedlot in a dedicated crush at the site. See **Section 3.3** – Cattle Handling Facilities above for details.

In addition to the existing yards, a hospital and yard system will be constructed within the feedlot site. This will separate arrivals, treatments and exits within the system. At full operation, an additional and new cattle handling area will be constructed within the southern end of Shed 2.

- ✓ Yard facilities at the site have been prepared and designed for animal and staff welfare. Design allows for reduced stress of stock and minimises impacts to stock when handling.
- ✓ Yards have an all-weather floor surface.
- ✓ Yards are designed to meet animal welfare standards.

The proposed cattle handling infrastructure is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 4 for a Class A feedlot.

Approved Measure 5 – Water Supply

The proposed covered housing feedlot system will utilise existing surface water and groundwater resources associated with the broader farming enterprise together with dedicated water supply and reticulation infrastructure servicing the operation. Existing water supply infrastructure associated with the property provides sufficient capacity to support livestock watering and operational water requirements associated with the proposed feedlot.

Water supply infrastructure includes livestock trough systems, reticulation infrastructure, pumps, pipelines and associated storage infrastructure integrated with the broader farming enterprise. Further detail regarding water supply infrastructure and operational demand is provided in **Section 3.3.5** – Water Supply Infrastructure above.

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Feed storage and preparation infrastructure associated with the proposal has been designed to minimise unnecessary vehicle movement within the site and facilitate direct delivery to the feed-table system servicing the covered housing pens.

- ✓ The water supply system is adequate for livestock watering and operational requirements associated with the feedlot.
- ✓ Existing and proposed water supply infrastructure provides sufficient storage and operational reliability for the proposed scale of development.
- ✓ Feed storage and preparation facilities are located in reasonable proximity to the feedlot pens to minimise unnecessary vehicle movement within the site.
- ✓ The location and operation of feed preparation and storage areas have been considered in relation to operational amenity, noise and dust management.

The proposed water supply and feed preparation infrastructure is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 5 for a Class A feedlot.

Approved Measure 6 – Internal Pen Drainage Control

The Approved Measure relating to internal pen drainage control is based on conventional open feedlot systems where rainfall runoff is generated directly from exposed earthen pen surfaces and managed through catchment and drainage systems.

The proposed development incorporates a covered housing feedlot system where direct rainfall interaction with the cattle accommodation areas is eliminated. Accordingly, the proposal does not incorporate conventional open pen drainage systems or pen-to-pen runoff transfer arrangements contemplated by ***the Code***. Runoff associated with exposed operational surfaces including laneways and external operational infrastructure will be directed toward the integrated controlled drainage and stormwater management system associated with the feedlot.

- ✓ Covered housing pens removes rainfall interaction with cattle accommodation areas.
- ✓ The proposal does not rely on pen-to-pen runoff transfer arrangements associated with conventional open feedlot systems.
- ✓ Surface grading and drainage infrastructure have been designed to direct runoff toward the controlled drainage and stormwater management system.
- ✓ Controlled drainage infrastructure associated with the proposal has been designed to minimise erosion, runoff concentration and operational wet areas.

Alternate Measure

While the proposed covered housing feedlot system does not incorporate the conventional pen drainage arrangements contemplated by ***the Code*****,** the elimination of rainfall interaction within the covered pens together with the integrated controlled drainage and runoff capture system from the feedlot site is considered to satisfy the Objectives and Accepted Standards associated with internal drainage control for a Class A feedlot.

Approved Measure 7 – Feed Troughs

The Approved Measure relating to feed trough design is based on conventional trough feeding systems associated with open feedlot operations. The proposed development incorporates a raised concrete feed-table system rather than conventional feed trough infrastructure. Feed delivery will occur externally along a dedicated concrete feed-table laneway designed to facilitate efficient feed placement, minimise feed wastage and improve operational management associated with the covered housing system.

The feed-table system incorporates:

- ✓ concrete feed-table with low nib wall infrastructure designed to minimise feed spillage and feed contamination,
- ✓ external feed delivery access separate from cattle standing and bedding areas,
- ✓ concrete operational surfaces designed to facilitate mechanical cleaning and maintenance activities, and
- ✓ feed delivery arrangements compatible with both conventional feed wagon systems and potential future automated or robotic feeding systems.

The feed-table arrangement has been designed to minimise the crossover of manure and feed residues between the feed table and bedding areas while facilitating routine cleaning and operational management associated with the covered housing feedlot system.

Figure 5-3 below provides a conceptual cross-section of the proposed feed-table arrangement.

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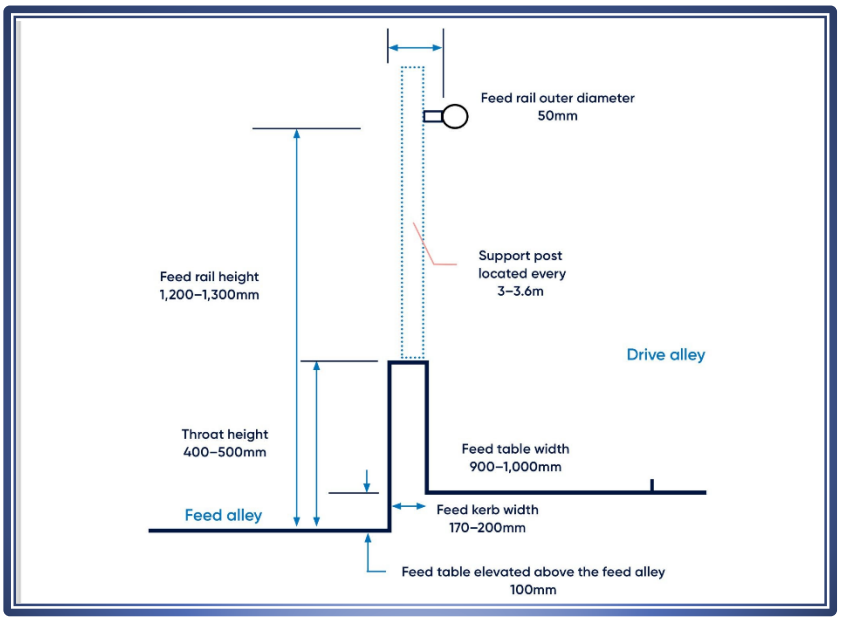

Figure 5-3 - Snapshot of proposed feed table and feed alley (Source: Dairy Australia – Contained housing)

Alternate Measure

While the proposed development does not incorporate conventional feed trough infrastructure contemplated by ***the Code***, the raised concrete feed-table system is considered to satisfy the Objectives and Accepted Standards associated with feed delivery, feed spillage minimisation and operational cleaning requirements for a Class A feedlot.

Approved Measure 8 – Water Troughs

Water troughs associated with the proposed covered housing feedlot system will be installed on concrete aprons within each production pen. Troughs are proposed to be located internally adjoining the rear pen fence line and operational laneway to minimise livestock congregation around feeding areas and facilitate operational access, cleaning and drainage management. Water trough infrastructure has been designed to support livestock welfare, operational efficiency and minimise the accumulation of manure and wet areas within the bedding and cattle accommodation areas.

- ✓ Water drained from troughs during cleaning will be directed from the pen area via hose, drainage point or adjoining drainage infrastructure toward the controlled drainage system without unnecessary wetting of bedding or cattle accommodation areas.
- ✓ Water supply infrastructure servicing the trough system has been designed to accommodate peak livestock demand associated with the proposed feedlot operation.
- ✓ Water troughs incorporate enclosed vertical sides and concrete aprons designed to minimise the accumulation of manure beneath and surrounding the trough infrastructure.
- ✓ Drainage associated with trough cleaning and overflow management is directed toward the controlled drainage and stormwater management system associated with the feedlot.

Water troughs and associated aprons are designed to facilitate routine cleaning, operational maintenance and minimise the development of wet areas within the covered housing system.

The proposed water trough infrastructure is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 8 for a Class A feedlot.

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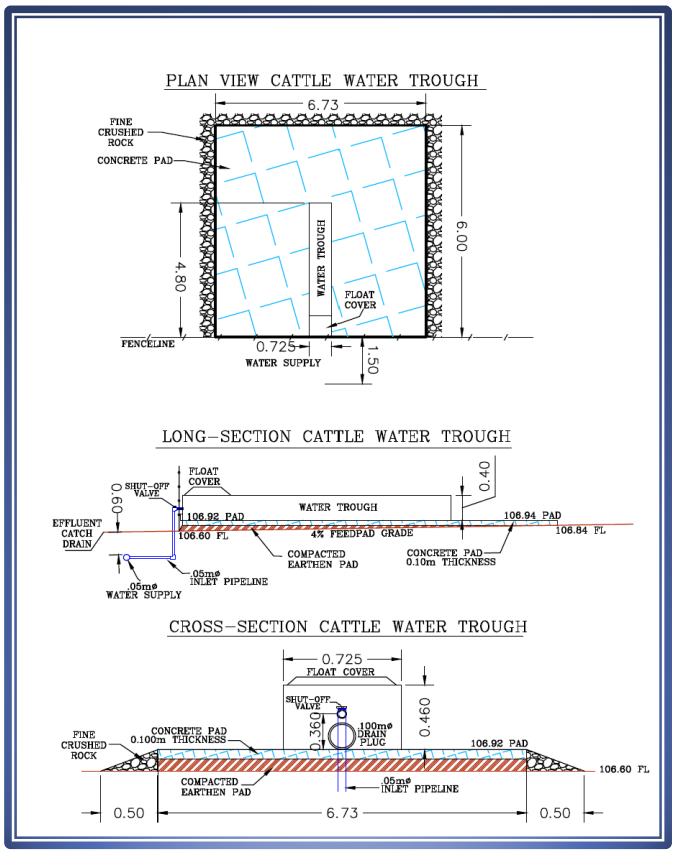

Figure 5-4 - Snapshot of typical water trough apron within a feedlot pen

Approved Measure 9 – Fencing

The Approved Measure relating to fence clearance beneath pen fencing is based on conventional open feedlot systems where mechanical pen cleaning and moisture management beneath fence lines are critical to minimising manure accumulation and wet areas within exposed earthen pens. The proposed development incorporates a covered housing feedlot system with consolidated operational surfaces, controlled bedding management and no rainfall interaction within the cattle accommodation areas. Accordingly, the management of moisture accumulation beneath fence lines is substantially different to that associated with conventional open feedlot systems.

- ✓ Pen fencing associated with the proposal has been designed to facilitate livestock control and operational management within the covered housing system.
- ✓ Fence layouts and operational access arrangements allow for routine cleaning and manure management activities associated with the pens.
- ✓ Covered housing infrastructure eliminates rainfall interaction and moisture accumulation within cattle accommodation and fence line areas.
- ✓ Pen and bedding management practices associated with the operation are designed to minimise wet area development and facilitate routine maintenance access.

Alternate Measure

While the proposed covered housing feedlot system does not specifically rely on the fence clearance arrangements contemplated by ***the Code*** for conventional open feedlot systems, the incorporation of roofed cattle accommodation, consolidated operational surfaces and routine bedding and manure management practices is considered to satisfy the Objectives and Accepted Standards associated with fencing and pen maintenance for a Class A feedlot.

Approved Measure 10 – Feed Trough Aprons

The Approved Measure relating to feed trough aprons is based on conventional feed trough systems associated with open feedlot operations. The proposed development incorporates a raised concrete feed-table system rather than a conventional trough/bunk system. A reinforced concrete apron of 3-4m in width is proposed internally within the pens to facilitate livestock access, operational management and routine cleaning activities associated with the covered housing system.

- ✓ Feed-table and operational apron surfaces are constructed of reinforced concrete suitable for livestock traffic, operational vehicle movements and routine cleaning activities associated with the feedlot.

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- ✓ Reinforced concrete aprons adjoining the feed-table system have been designed to facilitate livestock access, feed delivery and operational management activities within high traffic feeding areas.
- ✓ Consolidated concrete operational surfaces minimise surface degradation, facilitate routine cleaning and reduce the accumulation of manure and feed residues within feeding areas.
- ✓ The covered housing design substantially reduces rainfall interaction within feeding areas and removes the need for conventional outward apron grading associated with exposed feed bunks and trough systems.

The proposed feed-table arrangement differs from the conventional feed trough apron systems contemplated by ***the Code*** and has been designed to support covered housing feedlot operations including conventional feed delivery and future automated feeding systems.

Alternate Measure

While the proposed feed-table system does not incorporate the conventional outward sloping feed trough apron arrangement contemplated by ***the Code***, the intent of the Approved Measure is addressed through the incorporation of reinforced concrete high traffic feeding areas associated with the covered housing system.

The proposed development does not incorporate conventional feed bunks or exposed feeding aprons where rainfall runoff may accumulate beneath trough infrastructure. The covered housing design substantially reduces rainfall interaction within feeding areas and therefore removes the need for outward apron grading associated with conventional open feedlot systems.

Reinforced concrete feed aprons and operational surfaces associated with the feed-table system have been designed to withstand livestock and operational traffic loads while facilitating routine cleaning, manure management and operational functionality.

The proposed feed-table and apron arrangement is therefore considered to satisfy the Objectives and Accepted Standards associated with feed trough aprons for a Class A feedlot.

Approved Measure 11 – Water Trough Aprons

Water trough aprons have been proposed as a base to install troughs on within the pens adjoining the laneway fence system. They have been designed to be of a size of 6.73m x 6.0m to incorporate a 4.8m long trough. The apron is designed to be of sufficient strength to withstand feedlot use and cleaning. This includes the incorporation of a compacted earth base and reinforced concrete for the apron. Side access includes a minimum of 2.5m from the trough and the trough end is 1.2m. Each apron slopes away from the trough to the outside of the apron.

- ➢ Water trough aprons have been designed to withstand the load of pen cleaning machinery and include both a compacted earth base and reinforced concrete apron.
- ➢ Aprons will include a minimum 2.5m clear of the troughs into the pen along each long side of the trough.
- ➢ Apron extends around the end of the trough.
- ➢ Water trough aprons slope away from the trough into the pen with the predominant slope to the external lane.

The proposed water trough apron infrastructure is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 11 for a Class A feedlot.

Approved Measure 12 – Drains

The proposed drainage system associated with the covered housing feedlot has been designed as part of the integrated controlled drainage and stormwater management framework for the site. Drainage infrastructure incorporates shallow vegetated (grassed) drainage lines, collection drains and controlled flow paths directing runoff toward the stormwater storage and reuse system associated with the broader farming enterprise.

Drainage gradients across the operational areas have been designed to facilitate controlled runoff movement while minimising erosion and avoiding scouring within the drainage network. Surface grading generally directs runoff from the northern and southern portions of the site toward the central controlled drainage system.

- ✓ Drains and controlled drainage infrastructure have been designed with grades generally between 0.4% and 1% where practicable and appropriate for the operational layout of the site.
- ✓ Drainage infrastructure has been designed to accommodate a 1 in 20-year storm event generally consistent with the requirements of ***the Code*** while minimising scouring and erosion potential.
- ✓ Captured runoff and overflow associated with the drainage system is directed toward the controlled drainage and stormwater storage system associated with the feedlot.

The proposed drainage framework differs from the conventional open feedlot drainage systems contemplated by ***the Code*** and incorporates broader vegetated drainage corridors, controlled runoff management and integrated stormwater storage infrastructure associated with the covered housing feedlot system.

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The proposed drainage infrastructure is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 12 for a Class A feedlot.

Approved Measure 13 – Service Roads

The proposed feedlot has been designed to utilise and integrate with the existing operational infrastructure and internal access network associated with the broader farming enterprise. In addition to the existing access network, new internal access roads are proposed as part of the development to support feed delivery, livestock transport, operational access and manure management activities associated with the feedlot.

Vehicle movements associated with the operation are expected to primarily relate to feed delivery, livestock transport, operational access and manure management activities.

- ✓ The feedlot is serviced by internal roads and operational access areas adequate to accommodate the anticipated vehicle traffic generated by the feedlot operation.
- ✓ Existing and proposed service roads and operational access infrastructure satisfy the requirements of Element 6 – Traffic and Parking.

Internal service roads comprise existing and proposed compacted and consolidated access surfaces designed to provide all-weather operational access associated with feed delivery, livestock transport and routine operational management activities.

The proposed service road infrastructure is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 13 for a Class A feedlot.

5.2.5. CONCLUSION

The proposed development incorporates a modern covered housing feedlot system designed to integrate with the broader farming enterprise while improving operational efficiency, livestock welfare, nutrient management and environmental performance associated with the operation. Assessment of the proposal against the *Victorian Code for Cattle Feedlots* (1995) demonstrates that the development generally satisfies the Objectives and Accepted Standards for Element 2 – Design and Construction.

Several Approved Measures within ***the Code*** are based on conventional open feedlot systems involving exposed earthen pens, direct rainfall interaction and traditional feed trough infrastructure. The proposed development adopts alternative advanced design measures associated with covered housing feedlot systems including roofed cattle accommodation areas, feed-table feeding systems, integrated controlled drainage infrastructure, reinforced concrete operational surfaces, integrated runoff capture and reuse systems, and integrated livestock handling and operational infrastructure.

Where alternative design measures have been proposed, these have been demonstrated to satisfy the intent of the relevant Approved Measures together with the Objectives and Accepted Standards of ***the Code*** through substantial reduction in rainfall interaction with manure and bedding materials, improved runoff capture and controlled drainage outcomes, enhanced operational management and cleaning access, reduced erosion and environmental risk, and improved livestock welfare and operational functionality.

Overall, the proposed design and construction framework is considered appropriate for the scale and nature of the development and consistent with the intent of Element 2 – Design and Construction for a Class A feedlot.

5.3. ELEMENT 3 – ODOUR

This element considers the potential for odour generation associated with the proposed feedlot operation and the potential for impacts on surrounding sensitive receptors and rural amenity. Odour generation associated with cattle feedlots is typically related to the decomposition of manure, spilled feed, wet organic matter and runoff management systems. The proposal incorporates a covered housing design together with controlled drainage, routine manure management and operational controls intended to minimise the potential for odour generation when compared with traditional open feedlot systems.

The assessment of odour for the proposed feedlot has considered separation distances, operational management practices, surrounding sensitive receptors, climatic conditions and the proposed feedlot design in accordance with the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***") and relevant industry guidance.

It should be noted that the current odour assessment methodology and separation distance calculations contained within ***the Code*** were developed primarily for conventional open feedlot systems and do not specifically account for the reduced odour generation characteristics associated with modern covered housing or contained feedlot pen systems. In particular, covered systems substantially reduce the exposure of manure and bedding materials to direct rainfall, minimise the development of prolonged wet pen conditions, reduce the generation of anaerobic decomposition zones, and allow for more controlled drainage and manure management practices. As a result, the potential for odour generation is generally lower and more readily managed than for traditional open feedlot operations subject to rainfall exposure and

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uncontrolled runoff accumulation. ***The Code*** methodology is therefore considered conservative when applied to covered housing systems such as the proposed development, as the calculated separation distances do not provide any adjustment or reduction factor to recognise the operational and environmental benefits associated with covered feedlot infrastructure and contemporary manure management practices.

5.3.1. OBJECTIVE

O1 Protection from amenity-reducing off-site odour effects of cattle feedlots by recognising the need for a buffer separation.

O2 Best practice emission control technology is used to ensure that routine emissions satisfy the requirements of State Environment Protection Policy - The Air Environment.

O3 Provision of a guide to planners when considering the zoning of sensitive land use proposals near cattle feedlots.

5.3.2. ACCEPTED STANDARDS

The objectives will be satisfied where:

AS1 No odour is discharged from any feedlot in such concentration and of such duration as may tend to be injurious to or adversely affect human health or welfare, animal life, vegetation, or property or as to interfere with the normal use and enjoyment of animal life, vegetation or property.

AS2 The size of the feedlot is determined having regard to the distance from the proposed site to the nearest residential zone, township zone or group of five or more houses not located on a farm so as to ensure that no offensive odour is able to be detected by the residents within the zone or houses.

AS3 The size of the feedlot shall have regard to the distance to the nearest farmhouse not located on the site of the proposed feedlot so that no significant detriment is caused.

AS4 A design ground level odour concentration of less than (1) one odour unit in a residential area as determined by EPA's Ausplume model.

5.3.3. ASSESSMENT

The odour assessment has been undertaken generally in accordance with ***the Code*** utilising the S-Factor separation distance methodology relevant to traditional feedlot systems. The assessment considers:

- feedlot capacity and operational characteristics,
- surrounding receptor types and sensitivity,
- local terrain and topography,
- vegetation cover,
- prevailing climatic conditions, and
- operational management and manure handling practices associated with the development.

The assessment methodology is based on the following formula:

$$D = S\sqrt{N}$$

Where:
D = required minimum separation distance
N = feedlot capacity in Standard Cattle Units (SCU)
S = composite site factor incorporating:

S1 – Feedlot design and management factor
S2 – Receptor type factor
S3 – Terrain factor
S4 – Vegetation factor

The proposed development differs from a conventional open feedlot system contemplated by ***the Code*** due to the incorporation of covered housing, controlled drainage systems, routine manure and bedding recovery, and reduced rainfall interaction with manure surfaces. These design and operational characteristics have the potential to reduce odour generation when compared with a traditional open feedlot system, particularly through improved moisture management and reduced exposure of manure surfaces to rainfall.

However, it should be noted that the odour assessment methodology prescribed by ***the Code*** does not currently provide a separate assessment framework or adjustment factors for covered housing or contained feedlot systems. Accordingly, the assessment has been undertaken using the standard feedlot methodology prescribed by ***the Code***, consistent with conventional open feedlot assessment requirements. As such, the assessment approach is considered conservative in the context of the proposed development, as the methodology does not specifically recognise or account for the potential odour reduction benefits associated with covered housing systems and associated operational management measures.

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EXISTING ENVIRONMENT

The project site is located within a rural agricultural landscape where the existing air quality environment is generally considered to be good. Seasonal variations in air quality may occur due to climatic conditions, surrounding agricultural activities, cropping operations and naturally occurring dust associated with dry seasonal conditions.

The proposed feedlot has the potential to generate odour and dust associated with cattle housing, manure and bedding management, feed handling activities and controlled drainage infrastructure. Local climatic conditions, including prevailing wind direction and wind speed, have been considered as part of the assessment. As identified in **Section 2.5**, morning winds within the locality predominantly occur from the southeast, south and northwest, while afternoon wind conditions are generally more variable and occur across a broader range of directions between the northeast and south. Morning wind conditions also typically exhibit slightly higher wind speeds and stronger directional influence compared with afternoon conditions.

Several surrounding receptors have been considered as part of the odour assessment including nearby rural dwellings and surrounding rural land uses. These receptors are identified in **Figure 2-5** and **Table 2-2**, with the receptor mapping replicated below.

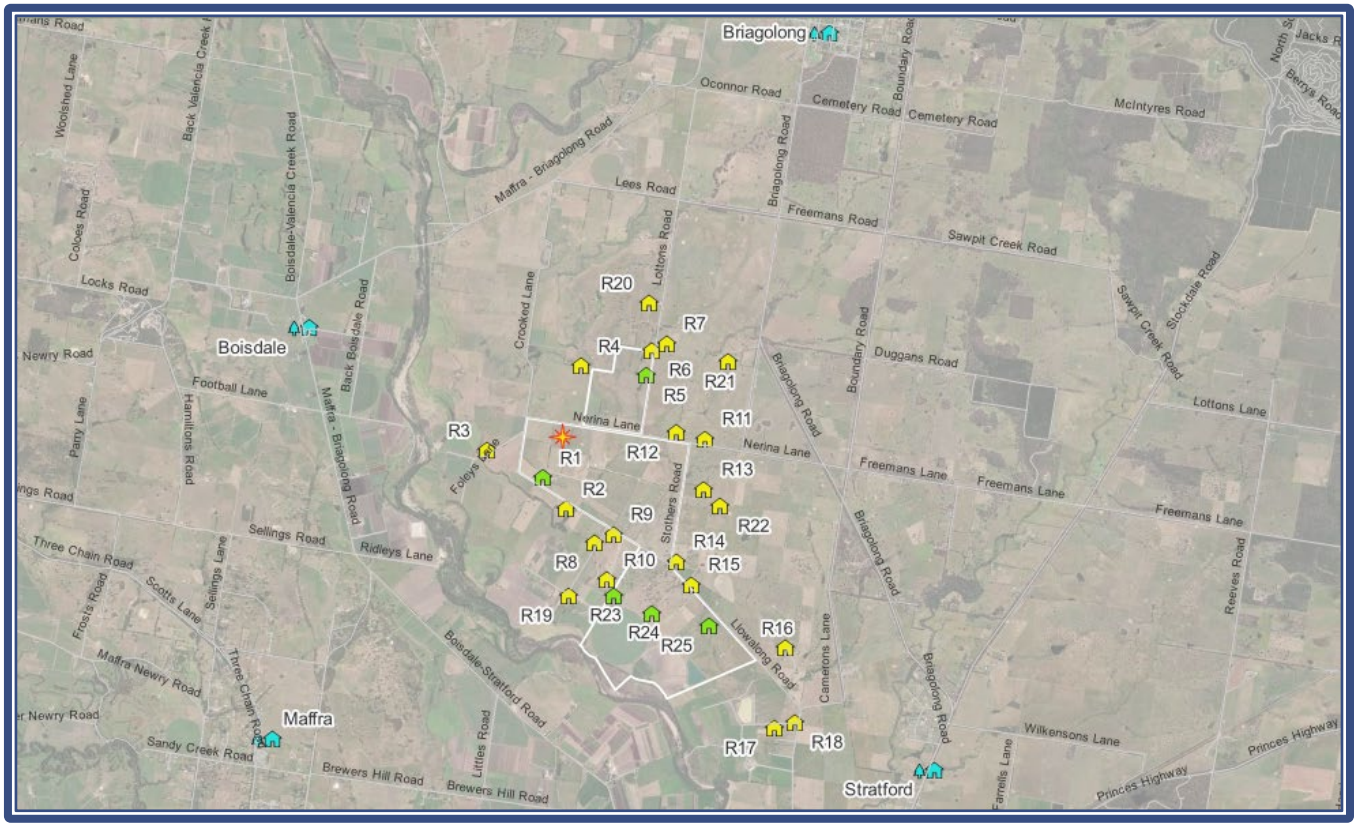

Figure 5-5 – Replicated image showing receptors considered in the assessment (Source: Figure 2-5 above)

S1 -FEEDLOT DESIGN AND MANAGEMENT FACTOR/STOCKING DENSITY

Odour emissions associated with cattle feedlots are influenced by a range of operational and environmental factors including manure accumulation, moisture content, rainfall interaction, drainage conditions and operational management practices.

The proposed development incorporates a covered housing system with controlled drainage infrastructure, routine manure and bedding management, feed-table feeding systems and no rainfall interaction with manure surfaces when compared with conventional open feedlot systems.

The site is located within a climatic region receiving less than 750mm average annual rainfall. The operational management framework associated with the proposal includes routine manure and bedding cleanout, controlled runoff management and operational maintenance procedures intended to minimise odour generation and nutrient accumulation within cattle housing areas.

A Design and Management Factor (S1) of 19 has been adopted for the assessment consistent with the operational characteristics and management framework associated with the proposed development.

S2 - RECEPTOR TYPE

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The receptor factor allows for variation in odour sensitivity based on the type and density of surrounding receptors. Receptors with larger or more concentrated populations have a greater likelihood of containing individuals sensitive to odour impacts.

There are multiple potential receptors that are considered as part of the assessment which include a mix of multiple dwellings in close vicinity, single dwellings and the townships of Stratford and Maffra. The following table shows the relevant values applied to the type of receptor assessed under the Victorian method.

The township of Stratford has been identified as 2,980 people and Maffra has a population of 4,550 people in the 2021 Census.

Table 5-2 - Receptor Factor

Receptor type	Victoria
Large towns, greater than 2,000 persons	5
Towns > 100 persons – Vic / >30-125 persons National	4
Small towns > 20 persons – Vic / >10-30 persons National	3
Rural Residential Zone	3
Rural Residential Zone (3 or 4 houses within 250m)	2
Two houses or house sites within 250m of each other	1.5
Single rural residence	1
Public areas – high usage eg national park	3
Public areas – high usage eg school	2
Public area – rural church or hall – not in town	
Public area (occasional use)	0.1

S3 - TERRAIN

The project site is located within a rural agricultural landscape in the Central Gippsland region characterised by gently undulating terrain with broad drainage lines and limited topographic relief. The following figure identifies the site and surrounding landscape in relation to local terrain and elevation changes based on digital elevation mapping.

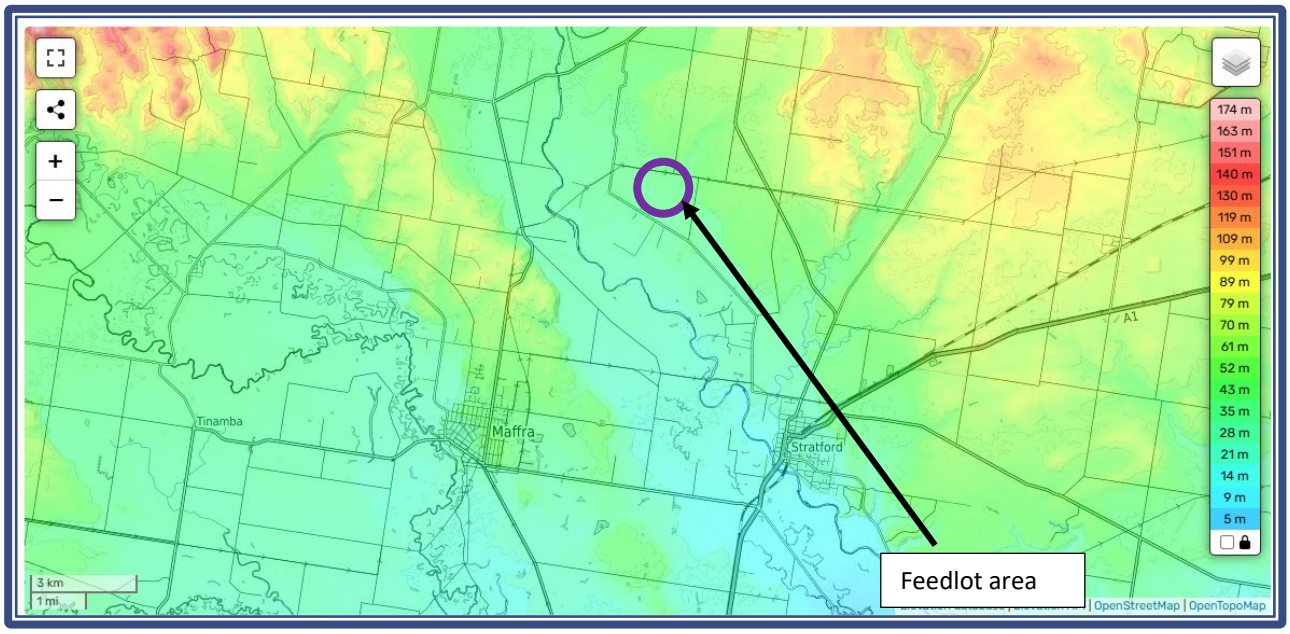

Figure 5-6 - Image identifying the project site in relation to the terrain and topography (Source: topographi-map.com)

For the purposes of the S-Factor assessment, the terrain characteristics are considered representative of a low relief landscape without significant terrain features likely to materially influence odour movement or create valley drainage effects. Accordingly, an S3 terrain factor of 1.0 has been adopted for the assessment.

S4 - VEGETATION

The project site is located within a predominantly cleared rural agricultural landscape with limited remnant vegetation outside waterways and riparian corridors. Vegetation within the locality is not considered sufficient to materially influence odour dispersion characteristics and therefore an S4 factor of 1.0 has been adopted.

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S5 – WIND DIRECTION

Wind direction factors are referenced within the National Guidelines for *Beef Cattle Feedlots in Australia* (MLA, 2012), however the primary odour assessment for the proposed development has been undertaken in accordance with ***the Code*****.**

As the Victorian S-Factor methodology does not incorporate a wind frequency factor, an S5 factor has not been separately applied as part of the assessment. Local wind conditions and prevailing climatic characteristics have nevertheless been considered qualitatively in the assessment of potential odour impacts and receptor separation distances.

RESULTS

Based on the adopted S-Factor assessment methodology and the operational characteristics of the proposed covered housing feedlot, the indicative separation distances identified for the proposal are summarised below.

Table 5-3 – Summary of Indicative Separation Distances

Receptor Type	Indicative Separation Distance
Single rural dwelling	813m
Two dwellings within 250m	1,220m
Small town >20 persons	2,438m
Town >100 persons	3,251m
Large town >2,000 persons	4,064m
Receptor Type	Indicative Separation Distance

The assessment demonstrates that the proposed feedlot achieves the indicative separation distances identified under ***the Code*** for all assessed receptor categories.

5.3.4. RESULTS - APPROVED MEASURES

Approved Measure 1 – Assessment of Separation Distance and Number of SCU's

✓ The formula used to determine feedlot separation distances and feedlot site in AM1 of Element 1 is utilised as the performance measure for odour control.

Based on the proposed operational capacity of approximately 1,830 Standard Cattle Units (SCU) together with the S-Factors identified above, the indicative separation distances for the proposed feedlot are as follows:

- Single rural dwelling – 813m required separation distance.
- Two dwellings within 250m of each other – 1,220m required separation distance.
- Small town (>20 persons) – 2,438m required separation distance.
- Town (>100 persons) – 3,251m required separation distance.
- Large town (>2,000 persons) – 4,064m required separation distance.

The nearest assessed rural dwelling receptor is located approximately 820m from the proposed feedlot works area, while the nearest township and larger population centres are located at substantially greater distances than the indicative separation distances identified above.

The assessment demonstrates that the proposed feedlot achieves the indicative separation distances identified under ***the Code*** for the surrounding assessed receptor categories.

In addition to the physical separation distances achieved, the covered housing design, controlled drainage systems, routine manure and bedding management, and operational management procedures associated with the proposal are expected to further reduce the potential for odour impacts when compared with conventional open feedlot systems.

Accordingly, the proposal is considered to satisfy the intent of the Approved Measures for Element 3 – Odour.

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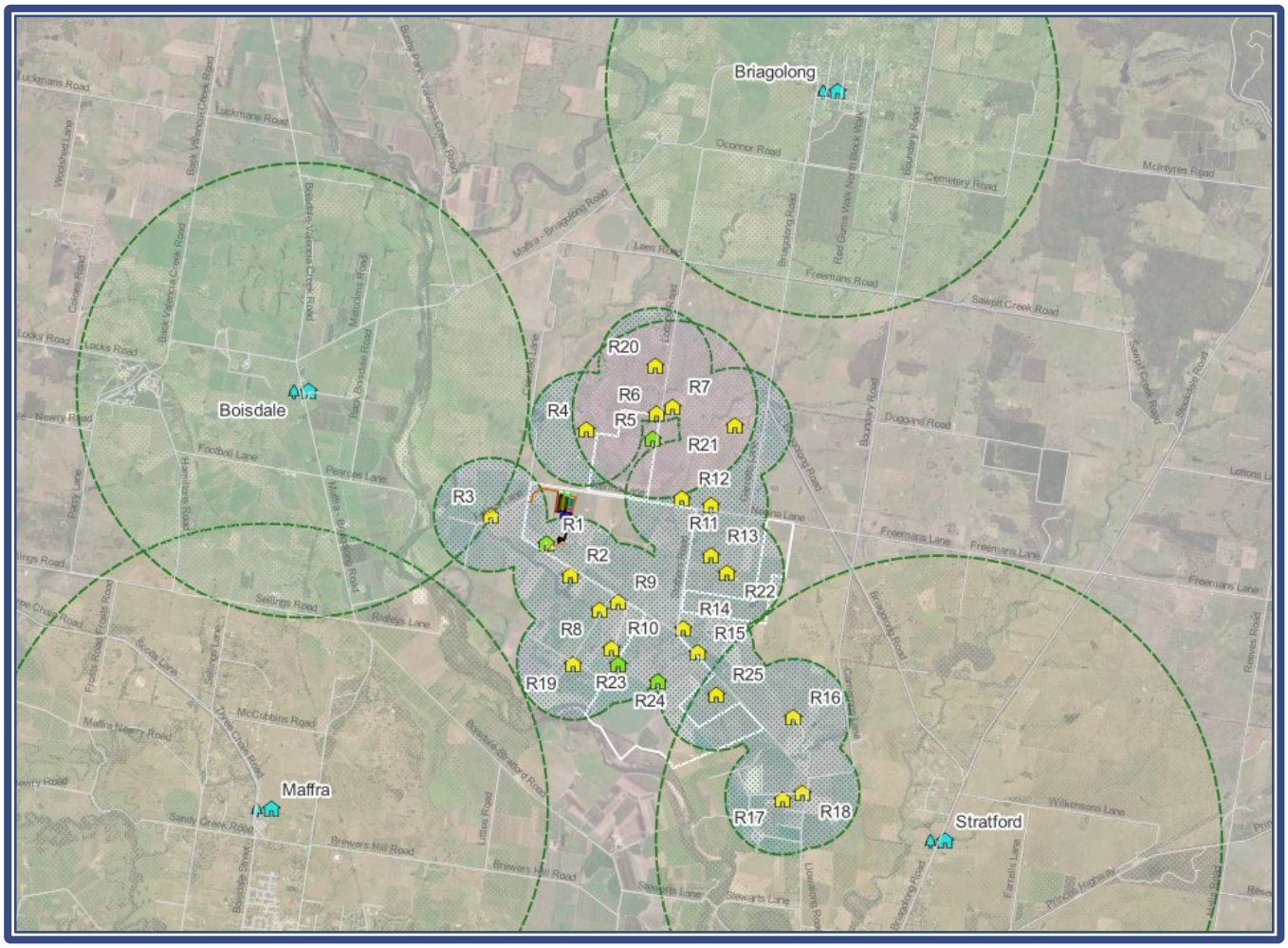

Figure 5-7 – Image from above showing receptors buffer distances considered calculated in the assessment (Source: PRS QGIS)

5.3.5. CONCLUSION

An odour assessment has been undertaken for the proposed feedlot generally in accordance with ***the Code*** utilising the S-Factor separation distance methodology.

The assessment considered the operational characteristics of the proposed covered housing feedlot together with surrounding sensitive receptors, climatic conditions, terrain, vegetation cover and operational management practices associated with the development.

The proposal incorporates several operational and design measures intended to minimise odour generation when compared with conventional open feedlot systems, including:

- covered cattle housing,
- controlled drainage systems,
- routine manure and bedding management,
- reduced rainfall interaction with manure surfaces, and
- integrated runoff capture and reuse infrastructure.

The assessment demonstrates that the proposed feedlot achieves the indicative separation distances identified under ***the Code*** for the assessed receptor categories and is unlikely to result in unreasonable odour impacts on surrounding sensitive land uses.

Overall, the proposed development is considered to satisfy the Objectives, Accepted Standards and Approved Measures for Element 3 – Odour of the *Victorian Code for Cattle Feedlots*.

5.4. ELEMENT 4 - NOISE

Feedlots have the potential to generate operational noise associated with livestock handling, feed preparation, machinery operation and vehicle movements. The design and layout of the proposed covered housing feedlot system has considered the location of noise-generating activities and operational infrastructure relative to surrounding sensitive receptors and transport routes.

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The objective of this element is to ensure that noise generated by the operation of the feedlot does not cause material detriment to nearby residents or persons affected by transport activities associated with the operation.

5.4.1. OBJECTIVE

O1 Noise levels generated by the feedlot do not cause any material detriment to nearby residents or persons affected by transport of cattle and feed associated with the operation of the feedlot.

5.4.2. ACCEPTED STANDARDS

The objective will be satisfied where:

AS1 Location and design of all mechanical equipment including pumps, feed augers, and other equipment minimizes the likelihood of mechanical noise or vibration being identified off-site.

AS2 The areas used for the loading and unloading of cattle and handling of cattle for veterinary or livestock management purposes are located to minimize the likelihood of any noise reaching beyond the site boundaries.

AS3 Truck movements are regulated to minimize the impact on persons living along the route used by vehicles for the delivery and removal of cattle, grain and other goods.

5.4.3. ASSESSMENT

The following assessment has been undertaken with consideration to the *Victorian Code for Cattle Feedlots* and the *National Guidelines for Beef Cattle Feedlots* in Australia, 3rd Edition (2012).

Although feedlots are not generally considered highly noise-intensive agricultural operations, operational activities associated with feed preparation, livestock handling, machinery operation and vehicle movements have the potential to generate intermittent noise.

The proposed covered housing feedlot system has been designed to minimise the potential for off-site noise impacts through the location of operational infrastructure within the property, separation distances from surrounding sensitive receptors and management of operational activities associated with the feedlot.

Typical operational noise sources associated with the proposal are expected to include:

- feed preparation and commodity handling equipment,
- tractors, mixer wagons and telehandlers,
- cattle handling and loading activities, and
- truck movements associated with cattle and commodity transport.

By nature, agricultural activities generate intermittent operational noise, particularly where agricultural machinery, livestock handling and transport activities are involved. These activities are characteristic of rural production areas and are consistent with the broader agricultural land uses surrounding the site.

The nearest surrounding dwelling is located approximately 820m from the proposed feedlot infrastructure, while the primary feed preparation and commodity handling areas are located at substantially greater distances from the majority of surrounding receptors. Existing vegetation, operational infrastructure and commodity storage areas associated with the site also provide partial acoustic buffering between operational areas and surrounding receptors.

A review of indicative sound levels associated with typical agricultural and feedlot equipment indicates that operational noise generated by the proposal is unlikely to result in material detriment to surrounding rural amenity.

Typical sound power levels associated with agricultural and feedlot equipment are summarised in **Table 5-11** below.

Table 5-4 – Indicative sound power levels of Typical Agricultural Equipment

Equipment	Typical Sound Power Level dB(A)
Feed milling	92.9
Generator	73
Tractor & feed Mixer	71
Telehandler	74
Bobcat	64
Cows bellowing	70

(Source: *Noise in Agriculture)*.

Indicative noise attenuation over distance was reviewed for typical operational equipment associated with the feedlot, including feed preparation equipment and tractors utilised within the feeding system.

The nearest surrounding dwelling is located approximately 820m from the feedlot infrastructure, while the primary feed preparation and commodity handling areas are located at greater separation distances from surrounding receptors.

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Based on indicative attenuation calculations utilising the maximum anticipated operational noise sources, the estimated sound pressure levels at the nearest surrounding receptor are approximately:

- Feed preparation activities – 30.9 dB(A)
- Tractor and feeding operations – 38 dB(A)

The table below summarises the indicative limits under EPA Publication 1826.4 Rural Activities Noise Limits.

Table 5-5 Determined limits under Clause 139 of EPA 1826.4 publication in dB LAeq

Period	Regular Activities Limits	Intensive Farm Activities[1]	Determined Noise Limit
Day	46	49	49
Evening	41	44	44
Night	36	39	39

1 - allowance for +3dB for intensive farming

The indicative assessment demonstrates that operational noise generated by the feedlot is expected to remain consistent with typical rural noise criteria for the locality. The assessment assumes open-site conditions without allowance for attenuation associated with vegetation, silage storage infrastructure, buildings and other operational barriers present within the site layout, which are expected to further reduce off-site noise transmission.

Operational noise associated with cattle feeding, livestock handling, pen cleaning and routine agricultural machinery use is therefore unlikely to result in material detriment to surrounding rural amenity or nearby sensitive receptors.

5.4.4. RESULTS - APPROVED MEASURES

Approved Measure 1 – Noise Levels

The feedlot is located approximately 820m from the nearest residential dwelling and more than 3.5km from the nearest township. Operational noise associated with the feedlot is expected to primarily relate to intermittent machinery use, livestock handling, feed preparation and vehicle movements associated with normal agricultural activities.

Operational activities associated with feed preparation, livestock handling and machinery use will generally occur during standard daytime agricultural operating periods where practicable, with livestock management activities undertaken as required for animal welfare and operational purposes.

- ✓ Noise levels generated on the feedlot do not exceed the measures established in State Environment Protection Policy, Control of Noise and Commerce, Industry and Trade NI.

Based on the separation distances to surrounding receptors, operational management measures and the rural character of the locality, the proposal is unlikely to result in material detriment to surrounding rural amenity and is considered to satisfy Approved Measure 1.

Approved Measure 2 – Feed Milling Noise

Feed preparation and commodity handling activities associated with the operation will generally occur during daytime operating periods and are located within the broader farming enterprise at substantial separation distances from surrounding receptors.

- ✓ Noise associated with feed preparation equipment including augers, grain handling and feed transfer infrastructure is not expected to exceed existing rural background noise levels at surrounding properties during sensitive evening and early morning periods.

Feed preparation infrastructure is located approximately 820m from the nearest surrounding receptor and benefits from separation distances together with partial buffering provided by existing vegetation, commodity storage infrastructure and operational buildings.

The proposal is considered to satisfy Approved Measure 2.

Approved Measure 3 – Property Access Points

The feedlot site will utilise the existing property access arrangements from Llowalong Road together with an additional operational access point associated with the western portion of the property.

- ✓ Property access points and internal access roads associated with the feedlot are located greater than 250m from neighbouring dwellings.

The proposal is considered to satisfy Approved Measure 3.

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Approved Measure 4 – Mufflers for Vehicles

Vehicles and machinery operating within the feedlot will comprise standard agricultural and heavy vehicle equipment fitted with manufacturer-installed exhaust and muffler systems appropriate to the intended use of the equipment.

The measure requires the following:

- ✓ Vehicles operating on-site will utilise efficient exhaust muffler systems consistent with normal agricultural and transport industry practice.

The proposal is considered to satisfy Approved Measure 4.

5.4.5. CONCLUSION

The proposed covered housing feedlot system has been designed and sited to minimise the potential for off-site noise impacts through appropriate separation distances, operational management practices and the location of operational infrastructure within the broader farming enterprise.

Noise associated with feed preparation, livestock handling, machinery operation and vehicle movements is consistent with activities typically associated with agricultural operations within the locality and is not expected to result in material detriment to surrounding rural amenity or nearby sensitive receptors.

The proposal is therefore considered to satisfy the Objectives, Accepted Standards and Approved Measures for Element 4 – Noise of the *Victorian Code for Cattle Feedlots*.

5.5. ELEMENT 5 – WASTE STORAGE, TREATMENT AND USE

Liquid and solid waste streams generated through the operation of the feedlot must be managed in a manner that protects surface water, groundwater, land resources and surrounding amenity while supporting the beneficial reuse of nutrients within the broader farming enterprise.

Element 5 of the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***") considers the collection, containment, storage, treatment, recovery and beneficial reuse of solid and liquid waste streams generated by feedlot operations. The Element also considers the protection of surface water, groundwater and land resources together with the sustainable reuse of nutrients within agricultural production systems.

A detailed *Waste Management Plan* (WMP) has been prepared specifically for the proposed development and is included as **Appendix 6**. The WMP assesses:

- waste generation volumes,
- storage and containment infrastructure,
- controlled drainage and runoff management,
- nutrient recovery and agricultural reuse, and
- operational monitoring and environmental management measures.

Supporting plans and assessments prepared as part of the WMP demonstrate the proposed feedlot can appropriately manage and beneficially reuse waste streams generated by the operation.

5.5.1. OBJECTIVE

O1 No liquid or solid waste from the feedlot shall be allowed into any stream or watercourse, ground water or to contaminate any land so as to render it unfit for future farming activities.

O2 The waste treatment system is designed and operated in such a manner as to minimise the likelihood of odour and to allow the maximum recovery of material from the waste stream.

O3 waste products are incorporated into a crop production system so that a balance between nutrients applied and nutrients removed through the crop is achieved.

5.5.2. ACCEPTED STANDARD

WASTE MANAGEMENT

AS1 The drainage system is designed to accommodate the maximum runoff from pens in a 1 in 10 wet year and is capable of retaining runoff from a 1 in 20 year 24 hour storm event using a runoff coefficient of Source of 0.8 for the feedlot pens and associated works.

AS2 Solid waste washed from the pens by stormwater runoff is removed by settling basins.

AS3 All pens, Laneways and other areas used by cattle are regularly cleaned and material is stockpiled at a storage facility within the controlled drainage area.

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WASTE USE

AS1 All waste is disposed of to land on-site or off-site in a manner that allows all nutrients to be incorporated into the production system.

AS2 Nutrients, salts and water in the wastes applied to land are balanced by losses due to evapotranspiration and harvesting of crop product under crop production systems commonly used in the area.

5.5.3. ASSESSMENT

A detailed WMP has been prepared for the proposed development and is included as **Appendix 6**. The assessment has been undertaken with consideration to ***the Code*** together with relevant covered housing and nutrient management principles applicable to intensive cattle production systems.

The proposed covered housing feedlot has been designed to minimise uncontrolled runoff generation, improve nutrient recovery and support the ongoing reuse of nutrients within the broader farming enterprise. The waste management system incorporates:

- covered cattle housing infrastructure,
- controlled drainage and settling systems,
- manure and bedding storage areas,
- stormwater and runoff storage infrastructure, and
- agricultural reuse areas for recovered nutrients and organic material streams.

The WMP identifies that the majority of nutrients generated by the operation are expected to remain within the recoverable solids stream due to the covered housing arrangement and reduced rainfall interaction with manure and bedding materials. Recovered manure and bedding material will be routinely removed from cattle accommodation areas and temporarily stored within the designated storage area prior to reuse within the farming enterprise.

Runoff generated from operational areas will be directed through catchment and where relevant settling infrastructure prior to storage and reuse within the irrigation system associated with the property. Assessment undertaken within the WMP identified that:

- sufficient storage and settling infrastructure is available for the proposed operation,
- sufficient land area is available for sustainable nutrient reuse, and
- nutrient application can be managed in accordance with agronomic demand and crop utilisation requirements.

The WMP also includes operational monitoring, inspection and contingency management measures relating to storage infrastructure, nutrient reuse activities and ongoing environmental management of the operation.

Overall, the assessment demonstrates that waste streams generated by the proposed feedlot can be appropriately managed and beneficially reused in accordance with ***the Code*** and relevant agricultural nutrient management practices.

5.5.4. RESULTS - APPROVED MEASURES

Approved Measure 1 – Settled Manure Volume

The Code identifies a methodology for calculating settled manure volume associated with runoff generated from exposed open feedlot pens during rainfall events.

The proposed development differs from a conventional open feedlot system as the cattle accommodation areas are fully covered and do not operate as exposed manure-covered pens subject to direct rainfall interaction. As a result, rainfall will not directly mobilise manure from within the covered cattle housing areas in the same manner contemplated by ***the Code*** for conventional open feedlot systems.

Assessment undertaken within the Waste Management Plan identified that the exposed open pen area applicable to the settled manure volume calculation is therefore **0m^3**.

The WMP identifies that sediment generation requiring specific assessment is expected to primarily arise from the exposed manure and bedding storage area and associated operational surfaces, where rainfall may contact stored organic material and mobilise sediment or nutrient-rich runoff. Runoff from these areas will be captured within the controlled drainage system and directed through settling infrastructure prior to discharge into the primary stormwater storage pond.

Table 3-2 of the WMP identifies the following assessment outcome:

- Settled manure volume required for exposed pen areas – **0m^3.**

"The proposed covered housing system substantially reduces rainfall interaction with manure and bedding materials relative to conventional open feedlot systems and therefore eliminates settled manure volume requirements associated with exposed open pen areas."

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The proposal is considered to satisfy the intent and requirements of Approved Measure 1 through the adoption of an advanced covered housing and controlled drainage design approach.

Approved Measure 2 – Settling Basin Stilling Volume

The Code requires settling infrastructure to provide sufficient stilling volume to allow sediment and organic material mobilised within runoff to settle prior to discharge into the primary runoff storage system.

The settling basin associated with the proposed development primarily receives runoff generated from exposed operational areas including the manure and bedding storage area and mortality management area. Unlike a conventional open feedlot system, the covered cattle housing areas are roofed and therefore removes rainfall interaction with manure and bedding materials. As a result, runoff from the cattle accommodation areas is significantly reduced relative to conventional open feedlot systems.The settling basin stilling volume assessment undertaken within the WMP applied the methodology outlined within ***the Code*** using:

- rainfall intensity for a 1-hour, 1 in 20 year storm event,
- a detention time of 0.5 hours, and
- the contributing catchment area associated with the exposed manure and bedding storage infrastructure.

The WMP identified:

- contributing catchment area – 5,380m^2,
- required stilling volume – approximately 100m^3, and
- settled manure volume associated with exposed pen areas – 0m^3.

The total required settling system capacity for the development is therefore approximately **100m^3**. The proposed settling infrastructure has been designed to provide sufficient capacity to facilitate sediment capture and hydraulic stilling prior to discharge into the primary stormwater storage pond.

- ✓ The proposed settling infrastructure has been designed in accordance with the settling basin stilling volume methodology outlined within the Victorian Code for Cattle Feedlots.

The proposal is considered to satisfy Approved Measure 2.

Approved Measure 3 – Runoff Storage

Runoff storage requirements for the proposed feedlot have been assessed within the WMP using the runoff storage methodology outlined in ***the Code***.

The WMP assessed the required storage volume using both:

- Method 1 – 80% of runoff generated from a 1 in 20 year, 24-hour storm event; and
- Method 2 – runoff generated from a 1 in 10 year annual catchment yield.

This site proposes a connected controlled drainage system pond that captures run-off for use within the irrigation system. As a result, an assessment including a Total Water Balance and the 1 in 20 year 24 hour storm event has been completed. Additional consideration was given to the Method 2 – run-off generated from a 1 in 10 annual catchment yield event however noted that this was not a relevant consideration with the proposed operation.

- Method 1 – Major Storm Event: approximately 15ML,
- Method 2 – Annual Catchment Yield: approximately 44ML.
- Total Water Balance – maximum water storage – 15ML

The relevant operations and major storm event volume has therefore been adopted as the design storage volume. The proposed stormwater storage pond provides approximately **15ML** of available storage capacity and therefore satisfies the adopted storage requirement.

Runoff generated within the operational footprint will be directed through the integrated stormwater and controlled drainage system toward the primary stormwater storage pond. Runoff from the manure and bedding storage area will pass through the settling system prior to discharge into the storage pond to reduce sediment transport and organic loading.

- ✓ The proposed stormwater storage pond has sufficient capacity to retain captured runoff prior to irrigation reuse within the broader farming enterprise.

The proposal is considered to satisfy Approved Measure 3.

Approved Measure 4 – Runoff Dispersal Area

The proposed development does not utilise direct runoff dispersal from the settling system to land as contemplated for smaller Class C and D feedlots under ***the Code***. Instead, runoff generated from operational areas associated with the feedlot will be directed through the catchment and, where relevant, settling infrastructure and captured within the

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primary stormwater storage pond prior to controlled reuse within the broader irrigation system associated with the farming enterprise.

The WMP identifies that the stormwater and controlled drainage reuse system is connected to 220ha of existing irrigation area, with 106ha being available for nutrient application after consideration of relevant buffer distances and operational constraints.

Assessment undertaken within the WMP identified that:

- the available irrigation reuse area substantially exceeds the area required for sustainable reuse of nutrient-laden runoff, and
- runoff captured within the storage system can be beneficially reused within the farming enterprise in accordance with agronomic demand and crop utilisation requirements.

The proposed reuse system has been designed to ensure captured runoff remains within the controlled irrigation and nutrient management framework associated with the property and does not result in uncontrolled discharge beyond the site boundaries.

- ✓ Captured runoff will be contained, stored and beneficially reused within the existing agricultural production system associated with the property.

The proposal is considered to satisfy the intent and requirements of Approved Measure 4.

Approved Measure 5 – Waste Stockpile

Recovered manure and bedding material generated by the proposed feedlot will be temporarily stored within the designated manure and bedding storage area located within the controlled drainage area of the development.

The manure and bedding storage area has been designed to:

- prevent external runoff entering the storage area,
- direct runoff generated from the stockpile area into the controlled drainage system, and
- allow temporary storage of recovered manure and bedding material prior to agricultural reuse.

- ✓ External runoff will be diverted from the manure and bedding storage area through the controlled drainage system associated with the feedlot.

The WMP identifies that the manure and bedding storage area will comprise a compacted operational surface suitable for stockpile management and machinery access. Runoff generated from the stockpile area will drain toward the settling infrastructure prior to discharge into the stormwater storage pond.

Recovered manure and bedding material will be routinely removed from cattle accommodation areas and managed in windrows within the designated storage area prior to reuse within the broader farming enterprise. Material will be managed to minimise excessive moisture accumulation and facilitate suitable handling, storage and agricultural reuse outcomes.

- ✓ The manure and bedding stockpile area incorporates appropriate containment, drainage and operational management measures consistent with the requirements of the *Victorian Code for Cattle Feedlots*.

The proposal is considered to satisfy Approved Measure 5.

Approved Measure 6 – Solid Waste Use

Recovered manure and bedding material generated by the proposed feedlot will be reused within the broader farming enterprise through application to existing cropping and pasture areas associated with the property holdings. The WMP includes assessment of nutrient generation volumes together with nutrient balance and land capability considerations associated with the proposed reuse system. As the proposed feedlot exceeds 1,000 SCU, the assessment has been undertaken through preparation of nutrient balance calculations and review of the available agricultural land area associated with the operation.

The WMP identified that:

- 213ha of land is required for the sustainable reuse of manure solids generated by the operation, and solids generated by the operation will be applied to established agricultural land associated with cropping and pasture production systems, with application rates managed in accordance with agronomic demand, crop utilisation and seasonal conditions.
- ✓ Solid waste generated by the feedlot can be sustainably incorporated into agricultural production systems associated with the broader farming enterprise.

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Application areas utilised for manure reuse will be managed in accordance with relevant setback requirements and operational controls identified within the WMP. Application will occur on suitable agricultural land located outside flood-prone areas associated with the 1 in 20 year flood extent.

- ✓ Solid waste reuse areas are located outside flood-prone land and are suitable for ongoing agricultural nutrient reuse activities.

The proposal is considered to satisfy Approved Measure 6.

Approved Measure 7 – Monitoring

The WMP incorporates monitoring and review measures associated with nutrient reuse areas, storage infrastructure and the ongoing environmental management of the feedlot operation. Soil testing associated with areas utilised for nutrient reuse will be undertaken periodically to monitor nutrient levels, soil condition and ongoing suitability for agricultural reuse activities. Monitoring programs will be adapted over time in response to operational requirements, crop production systems and observed soil conditions.

- ✓ Soil monitoring will be undertaken for areas associated with nutrient reuse activities.

Cropping and pasture production areas associated with the farming enterprise will continue to be monitored as part of routine agricultural management practices, including review of crop performance, seasonal productivity and nutrient utilisation outcomes.

- ✓ Monitoring of crop and pasture production associated with nutrient reuse areas will be undertaken as part of ongoing farm management practices.

Surface water management associated with the operation has been designed around containment, settling and reuse of runoff generated within the operational footprint. Monitoring and inspection of drainage infrastructure, storage systems and surrounding environmental conditions will form part of the ongoing operational management framework identified within the Waste Management Plan.

- ✓ Monitoring and inspection of drainage systems, storage infrastructure and surrounding environmental conditions will be undertaken as part of the ongoing management of the feedlot operation.

The proposal is considered to satisfy Approved Measure 7.

Approved Measure 8 – Runoff Irrigation

The WMP includes assessment of nutrient balance, water balance and available irrigation reuse areas associated with the proposed runoff reuse system. Captured runoff from the controlled drainage and stormwater storage system will be reused within the broader farming enterprise through the existing irrigation infrastructure associated with the property.

- ✓ The irrigation reuse area has been assessed based on nutrient generation, water balance and agronomic reuse principles associated with the farming enterprise.

The WMP identified that the runoff reuse system is connected to 220ha of irrigation area associated with the property, with 111ha remaining available for nutrient application after consideration of setback distances and operational constraints.

Assessment undertaken within the WMP identified that the available irrigation area substantially exceeds the minimum irrigation area typically adopted under ***the Code*** for a feedlot of this scale. Nutrient-laden runoff captured within the storage system will be diluted through integration with the broader irrigation system prior to reuse within cropping areas associated with the farming enterprise.

- ✓ Sufficient irrigation reuse area is available for the sustainable reuse of captured runoff generated by the operation.

Areas utilised for runoff irrigation are separate from the primary areas nominated for routine solid waste application associated with manure and bedding reuse activities. This separation allows flexibility in nutrient management and assists in balancing nutrient loading across the broader farming enterprise.

- ✓ Runoff irrigation areas are separate from the primary solid waste reuse areas associated with the operation.

The proposal is considered to satisfy Approved Measure 8.

Approved Measure 9 – Runoff Dispersal System

The proposed development does not utilise a direct runoff dispersal system as contemplated for smaller feedlots under ***the Code***. Runoff generated from operational areas associated with the feedlot will instead be captured within the controlled drainage system, directed through settling infrastructure and stored within the primary stormwater storage

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pond prior to irrigation reuse within the broader farming enterprise. As such, the provisions relating to direct runoff dispersal areas for feedlots less than 500 SCU are not applicable to the proposed development.

The irrigation reuse areas associated with the proposal form part of an established agricultural production system incorporating existing irrigation infrastructure and ongoing crop and pasture management practices. These areas will continue to be monitored and managed as part of the broader farm nutrient and irrigation management framework identified within the WMP.

- ✓ Irrigation reuse areas and associated infrastructure will be monitored and maintained as part of the ongoing operation of the farming enterprise.

The proposed irrigation reuse areas are not located within a declared special water supply catchment area or identified groundwater recharge area requiring exclusion under ***the Code***.

- ✓ The proposal does not involve direct runoff dispersal systems within sensitive water supply or groundwater recharge areas.

The proposal is considered to satisfy the applicable requirements of Approved Measure 9.

Approved Measure 10 – Avoidance of Groundwater Contaminant

The proposed feedlot has been designed to minimise the potential for seepage and groundwater interaction through the use of compacted operational surfaces, controlled drainage infrastructure and containment systems associated with the development. Covered cattle housing areas, operational surfaces, manure collection areas and drainage infrastructure will be constructed using compacted materials suitable for feedlot operations and associated environmental management requirements.

- ✓ Pen surfaces will be prepared through laser grading and compaction to establish stable and low permeability operational surfaces suitable for the covered housing system.
- ✓ Manure collection areas, operational drains and associated controlled drainage infrastructure will comprise compacted surfaces designed to minimise seepage and uncontrolled infiltration.

The WMP identifies that the stormwater and controlled drainage storage pond will be constructed and managed as part of the integrated containment system associated with the feedlot. Where required, compaction and suitable construction materials will be utilised to achieve the operational and environmental performance requirements of the storage system.

- ✓ Storage ponds associated with the controlled drainage system will incorporate appropriate compaction and construction measures to minimise seepage potential.

The manure and bedding storage area will also comprise a compacted operational surface designed to support stockpile management activities while reducing the potential for infiltration into underlying soils.

- ✓ Manure and bedding stockpile areas will be compacted and managed to minimise seepage and groundwater interaction.

The proposal is considered to satisfy Approved Measure 10.

Approved Measure 11 – Waste Management Plan

A detailed Waste Management Plan (WMP) has been prepared specifically for the proposed development and is included as **Appendix 6**. The WMP has been prepared with consideration to the requirements of ***the Code*** and best practice nutrient management principles associated with intensive cattle production systems.

The WMP includes:

- identification of areas associated with nutrient reuse activities,
- nutrient, salt and water balance assessments,
- storage and containment infrastructure assessments,
- runoff collection, storage and irrigation reuse arrangements,
- manure and bedding management procedures,
- cropping and agricultural reuse considerations,
- monitoring and environmental management measures, and
- operational contingency and management arrangements.

- ✓ A Waste Management Plan has been prepared addressing the relevant requirements of the *Victorian Code for Cattle Feedlots*.

Nutrient reuse associated with the operation is proposed to occur within land areas connected to the broader farming enterprise associated with the applicant's operation. The WMP identifies that sufficient agricultural land area is available to sustainably incorporate nutrients generated by the feedlot through cropping and pasture production systems.

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The WMP also incorporates monitoring, inspection and operational response measures associated with storage infrastructure, irrigation reuse systems and environmental management of the operation. Ongoing review and updating of the WMP will occur as part of the continuing management of the feedlot and associated farming enterprise.

- ✓ Monitoring, operational management and contingency response measures are incorporated within the Waste Management Plan.

The proposal is considered to satisfy Approved Measure 11.

Approved Measure 12 – Salinity

The Approved Measures require consideration of groundwater salinity in the preparation of the Waste Management Plan. Review of the Victorian Government "Visualising Victoria's Groundwater" mapping system identifies groundwater salinity within the locality as generally ranging between 1,000 and 3,500 mg/L.

Salt levels within feed rations will be managed having regard to livestock nutritional requirements together with the salinity of the drinking water supplied to the operation.

Nutrient and runoff reuse associated with the operation will be undertaken in accordance with agronomic demand and crop utilisation requirements identified within the WMP. Application rates will be managed to minimise the potential for nutrient or salt accumulation within reuse areas.

- ✓ Regard has been given to groundwater salinity in the preparation of the Waste Management Plan.
- ✓ Salt levels in feed will be managed having regard to livestock requirements and the salinity of the drinking water supply.

The proposal is considered to satisfy Approved Measure 12.

Approved Measure 13 – Salt Budget

The WMP includes consideration of salt generation and reuse associated with the proposed feedlot operation together with the ongoing management of nutrient and runoff reuse areas. Salt loading associated with the operation may arise from feed inputs, drinking water supplies and concentration of salts within the controlled drainage storage system through evaporation processes.

The WMP identifies that nutrient and runoff reuse associated with the operation will occur within established agricultural production systems managed in accordance with agronomic demand, crop utilisation and seasonal conditions. Ongoing soil monitoring associated with reuse areas will assist in identifying any potential accumulation of salts within the soil profile over time.

- ✓ A salt budget and associated nutrient management assessment has been prepared for areas utilised for nutrient and runoff reuse.

Review of the relevant planning and agricultural information available for the locality did not identify any specific Salinity Management Plan applicable to the subject site requiring additional assessment or response within the Waste Management Plan.

- ✓ Consideration has been given to salinity management within the preparation of the Waste Management Plan.

The proposal is considered to satisfy Approved Measure 13.

Approved Measure 14 – Disposal of Animal Carcasses

Mortalities

As identified above, the feedlot proposes a feeding operation with an estimated annual throughput of approximately 6,198 head. Based on industry management assumptions, a general mortality rate of approximately 1% of incoming cattle may be expected across the annual operational cycle.

Routine mortalities generated through the operation are proposed to be managed through:

- ➢ collection and removal by licensed rendering contractors where appropriate, and
- ➢ on-site composting of unexplained mortalities or animals unable to enter the rendering stream due to withholding or animal health requirements.

Mortality composting areas associated with the operation are located within the controlled drainage area of the feedlot and form part of the broader waste management framework identified within the WMP.

Mass Mortality Events

In the event of a significant disease outbreak, emergency animal disease event or other large-scale mortality incident, disposal of carcasses would be undertaken in consultation with relevant authorities including Agriculture Victoria, veterinarians and EPA Victoria as required. Under NFAS accreditation, significant planning for Emergency Animal Disease

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management and Death, Destruction and Decontamination plans are also required. These will be prepared in line with the QA manual prior to operation and in preparation for the feedlots Accreditation.

Emergency mortality disposal measures may include burial, composting or other approved disposal methods depending on the nature of the incident and relevant biosecurity requirements. Where burial is required, burial pits would be constructed to ensure:

- a minimum soil cover of 1m above carcasses,
- separation from groundwater systems and surface water features, and
- suitable soil conditions to minimise seepage potential.

- ✓ Deceased animals will be disposed of in accordance with relevant regulatory and biosecurity requirements.
- ✓ Soil conditions and site management practices will minimise the potential for seepage to groundwater systems.
- ✓ A contingency framework exists for the management of large-scale mortality events associated with disease or emergency situations.

The proposal is considered to satisfy Approved Measure 14.

5.5.5. CONCLUSION

The proposed covered housing feedlot system incorporates an integrated waste management and nutrient reuse framework designed to minimise uncontrolled runoff generation, maximise nutrient recovery and support the sustainable reuse of waste streams within the broader farming enterprise.

The Waste Management Plan demonstrates that sufficient settling, storage, containment and reuse infrastructure is available to appropriately manage runoff, manure, bedding material and other operational waste streams generated by the development. Nutrient and runoff reuse areas associated with the operation are of sufficient scale to sustainably incorporate recovered nutrients in accordance with agronomic demand and ongoing agricultural production activities.

The proposal also incorporates operational monitoring, environmental management and contingency measures relating to nutrient reuse, salinity management, mortality management and protection of surrounding land and water resources.

Overall, the proposed development is considered capable of operating in a manner that protects surface water, groundwater, soil resources and surrounding amenity while supporting the beneficial reuse of nutrients within the farming enterprise.

The proposal is therefore considered to satisfy the Objectives, Accepted Standards and Approved Measures for Element 5 – Waste Storage, Treatment and Use of the *Victorian Code for Cattle Feedlots*.

5.6. ELEMENT 6 - TRAFFIC & PARKING

This element considers vehicle movements associated with the operation of the feedlot together with the provision of appropriate on-site access, circulation and parking arrangements. The proposal has been designed to ensure safe and efficient access for staff, service vehicles, feed delivery vehicles and livestock transport while minimising impacts on surrounding roads and nearby rural residents.

A Traffic Engineering Assessment has been prepared by Traffix Group and is appended to this report (**Appendix 7**).

5.6.1. ACCEPTED STANDARDS

The objectives will be satisfied where:

PARKING ON SITE

AS1 Provision is made for parking on site for trucks and cars. A car park area is provided for staff and visitors to the feedlot.

AS2 Parking for trucks is provided in order that trucks do not have to queue along the access driveway during any high-volume movement periods. An area with sufficient turning circle for articulated vehicles is provided adjacent to the cattle loading docks and the area where stock feed is brought into the area.

ACCESS AND TRANSPORT ROUTES

AS3 Access to the site is provided from an arterial road or semi-arterial road which is constructed to a standard to take articulated vehicles. Access should only be provided from a private street or local road where it is not practicable to provide access from a main or secondary arterial.

AS4 Vehicle routes should avoid local areas of high residential population. The routes should avoid nearby townships and other urban settlements. Access to the site should be located at a point in excess of 250m from any nearby dwellings not located on the feedlot.

5.6.2. ASSESSMENT

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A Traffic Engineering Assessment has been prepared by Traffix Group to assess the operational traffic generation, vehicle access arrangements, internal circulation and parking requirements associated with the proposed feedlot development. The proposal incorporates the use of the existing property access from Llowalong Road together with a new dedicated feedlot access located on the western boundary of the site. The dual-access arrangement has been designed to improve operational efficiency and reduce internal conflict between livestock transport, feed delivery vehicles and general farm traffic.

Heavy vehicle movements associated with the operation are expected to increase relative to the existing agricultural enterprise; however the Traffic Engineering Assessment identifies that this equates to an average increase of approximately 1.4 additional semi-trailer movements per day along Llowalong Road.

The assessment concludes that the increase in vehicle movements is relatively minor within the context of the surrounding rural road network and will not adversely affect the operation or function of Llowalong Road or surrounding transport routes.

Internal access tracks, loading areas and manoeuvring areas associated with the feedlot have been designed to accommodate articulated vehicles, including semi-trailers and B-double vehicles associated with cattle transport and feed deliveries. Swept path assessments prepared by Traffix Group demonstrate that all vehicles are capable of entering, manoeuvring and exiting the site in a forward direction.

Staff and visitor parking associated with the operation will continue to be accommodated within the existing gravel operational areas adjoining the silos and sheds. The Traffic Engineering Assessment identifies that no significant increase in staffing levels is anticipated as part of the proposal and that sufficient on-site parking is available to accommodate operational requirements.

Access to the site will continue to occur via Llowalong Road with heavy vehicle routes directed toward Stratford and Briagolong Road. No regular traffic movements associated with the proposal are expected to occur north of the proposed new feedlot access.

5.6.3. RESULTS - APPROVED MEASURES

Approved Measure 1 – Access and Expected Vehicle Movements

Access to the site is required for a range of operational activities including:

- Heavy Vehicle
  - Cattle entry and exit,
  - Feed delivery and exit, and
  - Manure export to other parts of the property.
- Light vehicle
  - Staff (daily monitoring, feeding, operational etc)
  - Vet and maintenance (supporting services)

Heavy vehicle access to the site exists at two points on the property from Llowalong Road with an additional direct feedlot access from the western boundary on Llowalong Road.

- The access design has been approved by the Department of Transport and Planning (DoTP), formally Vic Roads, or the Responsible Authority.

Swept path analysis demonstrates that 20-metre semi-trailers can safely enter, manoeuvre and exit the site in a forward direction, while the internal setback to gates allows trucks to queue within the site without impacting Llowalong Road. The proposed access arrangements are therefore considered appropriate for the scale and nature of the development and satisfy the intent of Approved Measure 1.

Approved Measure 2 – Driveways and Access Roads

Traffic Engineering Assessment confirms that the site access and internal road network have been designed to safely accommodate heavy vehicles associated with feedlot operations.

The proposal retains the existing southern access and introduces a new western access to Llowalong Road to improve traffic separation and site functionality. Both access points are designed to accommodate 20-metre semi-trailers, with swept path analysis demonstrating safe entry and exit movements in a forward direction.

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Figure 5-8 - Property Main Entrance Llowalong Road (Source PRS May 2025)

Internally, accessways are a minimum of 3m wide, allow for vehicle passing, and provide adequate manoeuvring space adjacent to loading and silage areas. A gate setback of approximately 50m from the road reserve ensures that vehicles can be held within the site if required, preventing any encroachment onto Llowalong Road. No trucks are to be parked parallel to the roadway.

- Driveways and access roads are not less than 6m wide and 9m where truck parking is provided parallel to the roadway.

The internal access network has been designed to safely accommodate the anticipated vehicle movements associated with the feedlot operation. Swept path analysis demonstrates that articulated vehicles can safely manoeuvre throughout the site, with internal passing opportunities, loading areas and operational setbacks incorporated into the site layout.

Approved Measure 3 – Loading Ramp Location

The existing and proposed loading and receival areas have been located and designed to ensure safe and efficient heavy vehicle access entirely within the site. The proposal includes two loading areas: the existing loading area proximate to the southern access servicing the cattle yard and sheds, and a new loading area adjacent to the northern silage/feed storage area. These areas are connected via internal access tracks designed to accommodate articulated vehicles.

The cattle loading and receival areas are positioned to allow direct truck access, internal queuing and manoeuvring clear of other operational traffic movements.

- The cattle loading ramp is sited to allow direct truck areas clear of other vehicle movements and the holding area for waiting trucks where multiple truck movements are likely.

The location of the loading ramps within the operational core of the site, separated from public roads and residential areas, ensures that loading activities occur entirely on-site, minimise traffic conflict, and do not adversely affect road safety or surrounding amenity, consistent with the intent of Approved Measure 3

Approved Measure 4 – Surface Treatment

The Traffic Engineering Assessment confirms that access and circulation areas are appropriately designed and constructed to accommodate heavy vehicle movements associated with the feedlot. The proposed development includes new gravel internal access tracks and loading areas designed to service cattle pens, silage storage and the cattle yard.

Access roads, loading areas and hardstand surfaces comprise existing and proposed compacted gravel and crushed rock areas suitable for all-weather heavy vehicle access. The roads and operational surfaces have been designed and will be maintained to provide sufficient drainage capacity and accommodate runoff associated with the operation. Parking and operational vehicle areas have been incorporated into the site layout to accommodate staff, visitors, feed delivery vehicles and livestock transport associated with the feedlot operation.

- Car and truck spaces and access roads are formed, defined and drained to enable use in accordance with the feedlot plan. Access roads are surfaced with crushed rock and are drained to stormwater runoff areas with culverts where necessary.

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The proposed surface treatments will provide durable and trafficable access for all expected vehicle types, minimise the risk of mud or debris being tracked onto the public road, and ensure safe and efficient operation of the feedlot, consistent with the intent of Approved Measure 4.

Approved Measure 5 – Parking

The site maintains existing staff, truck, and car parking areas with sufficient area. The proposal does not anticipate an increase in staff numbers and therefore does not generate additional parking demand beyond the existing operation.

- The feedlot must have a minimum of:
  - One car space per employee plus three visitor car spaces,
  - One truck loading bay,
  - One truck parking space plus one truck parking space per 5000 SCU for cattle trucks, and
  - One truck parking space for feed trucks.

The proposal provides sufficient on-site parking and manoeuvring areas for staff, visitors, cattle trucks and feed delivery vehicles, ensuring that all operational vehicle movements and parking occur within the property boundaries and is consistent with the intent of Approved Measure 5.

Approved Measure 6 – Maintenance

Access roads, loading areas and operational surfaces associated with the feedlot will be maintained to provide all-weather access for operational vehicles, livestock transport and service vehicles. Ongoing maintenance of gravel surfaces, drainage infrastructure and access tracks will form part of routine site management. During periods of significant rainfall, operational activities may be adjusted where necessary to minimise wear on internal access tracks and protect road conditions.

The proposal therefore satisfies the intent of Approved Measure 6.

5.6.4. CONCLUSION

The proposed feedlot incorporates appropriate access, circulation, loading and parking arrangements to safely accommodate the operational traffic associated with the development. The Traffic Engineering Assessment demonstrates that the surrounding rural road network is capable of accommodating the anticipated increase in vehicle movements without adversely affecting the safety or function of Llowalong Road or surrounding transport routes.

Existing and proposed access points, internal access tracks, loading areas and manoeuvring spaces have been designed to accommodate articulated vehicles associated with cattle transport, feed delivery and operational activities, while ensuring that vehicle queuing, loading and parking activities occur within the site boundaries.

The proposal also incorporates suitable all-weather access arrangements, drainage measures and ongoing maintenance commitments to support the long-term operation of the feedlot and minimise impacts on surrounding rural amenity. Overall, the proposal is considered to satisfy the Objectives, Accepted Standards and Approved Measures for Element 6 – Traffic and Parking of the *Victorian Code for Cattle Feedlots*.

5.7. ELEMENT 7 – LANDSCAPING

Landscaping forms an important component of the proposed development by assisting in reducing visual impacts associated with the feedlot and integrating the operation into the surrounding rural landscape. Landscaping associated with the proposal has been designed to provide visual screening of operational infrastructure while maintaining appropriate separation from covered housing areas, drainage systems and operational accessways.

Existing vegetation surrounding the property will be retained where practicable and incorporated into the broader landscape treatment for the site. Additional planting is proposed surrounding key operational areas, access roads and areas visible from surrounding roads and adjoining rural properties.

Some minor plantation vegetation will require removal to facilitate connection works for drains and irrigation pipeline works however this is proposed to minimise the number of trees within the plantation that requires removal.

Species selection associated with the proposal will focus on hardy, locally appropriate species capable of establishing under low-maintenance conditions and compatible with the operational requirements of the feedlot.

5.7.1. OBJECTIVE

O1 A visual screen to the major buildings, handling areas and pens from surrounding properties and roads.

O2 Assistance with the take up of any waterborne nutrients that have escaped from the waste system.

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5.7.2. ACCEPTED STANDARDS

The objective may be achieved where:

AS1 An area around each appropriate side of the feedlot works area is landscaped to provide a visual screen from roads, public areas and nearby residences.

AS2 Trees and other vegetation are located downslope from the feedlot works area in a location suitable to assist in filtering of any water seepage.

AS3 Major existing trees and other vegetation are to be retained wherever practicable.

AS4 The landscape design should utilise local species and be of a low maintenance approach.

5.7.3. ASSESSMENT

Landscaping associated with the proposed feedlot has been designed to assist in reducing visual impacts associated with the development while maintaining appropriate operational, drainage and biosecurity separation from the covered housing and associated infrastructure.

The proposal incorporates retention of existing vegetation where practicable together with supplementary landscape planting surrounding the operational areas of the feedlot. Landscaping has been focused primarily along property frontages, access roads and areas where the development may be visible from surrounding roads or adjoining rural properties.

Due to the covered housing design and the operational requirements associated with drainage, airflow and pen management, dense vegetation planting is not proposed immediately adjacent to the cattle accommodation structures. Landscaping has instead been positioned to provide visual softening and screening while maintaining appropriate separation from operational areas and controlled drainage infrastructure.

Existing vegetation surrounding portions of the property already provides partial visual buffering from surrounding roads and adjoining rural landholdings. Additional planting associated with the proposal will further assist in integrating the development into the broader rural landscape character of the locality.

Species selection associated with the landscaping will focus on hardy, locally occurring or regionally appropriate species suitable for the climatic conditions of the area and capable of establishing under low-maintenance conditions. Landscaping associated with the proposal will also assist in reducing dust movement, improving visual amenity and supporting uptake of any minor nutrient seepage associated with the broader farming enterprise.

The establishment of a new tree line around the property boundary at the feedlot site adjacent to Nerina Lane has been undertaken in 2025 with this to extend along the western boundary along Llowalong Road through 2026.

Figure 5-9 - Overview of the proposed landscape plan (Source PRS)

5.7.4. APPROVED MEASURES

Approved Measure 1 – Landscaping and width of landscaping

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A plantation of screening vegetation of 30m wide against the northern boundary fence is being undertaken as part of the property and feedlot proposal.

- Landscape strips of not less than 30m in width are located not closer than 20m to the perimeter fence of the feedlot works area.

The proposed landscaping is considered to provide an appropriate visual buffer to the feedlot works area and satisfies the intent of Approved Measure 1.

Approved Measure 2 – Screening of Feed and Service Buildings

Landscape screening associated with the proposal includes plantation vegetation along the western and northern boundaries of the feedlot works area. The proposed landscape strips are positioned to provide visual screening while maintaining appropriate separation from operational infrastructure and controlled drainage areas.

- Where feed and service buildings are not located separately from the feedlot works area and are visible from outside the site, suitable screen landscaping is provided.

Buildings and operational infrastructure associated with the feedlot are located within the broader feedlot works area and benefit from the proposed landscape screening together with existing vegetation established on the property. Existing operational buildings located to the south of the proposed feedlot have been established for an extended period and already benefit from existing landscape screening and vegetation surrounding the site.

The proposed landscaping is considered appropriate to soften the visual impact of the feedlot infrastructure and satisfies the intent of Approved Measure 2.

Approved Measure 3 – Access road planting

The existing property entrance incorporates established vegetation and landscape planting associated with the existing farming operation. The proposed secondary access from the western boundary will adjoin existing vegetation and supplementary landscape planting associated with the feedlot development.

- Access roads to the feedlot are provided with either boulevard style planting or suitable random planting along both sides.

The submitted landscape plan (**Appendix 1**) incorporates landscape treatment associated with the site access arrangements and is considered to satisfy the intent of Approved Measure 3.

Approved Measure 4 –Approval of Landscape Plan by Responsible Authority

A landscape plan has been prepared and submitted as part of the application documentation. The landscape plan incorporates locally appropriate and low-maintenance species suitable for the climatic conditions of the area and compatible with the operational requirements of the feedlot.

- A landscape plan is approved by the responsible authority.

The submitted landscape plan is considered appropriate for the scale and nature of the proposed development and satisfies the intent of Approved Measure 4.

Approved Measure 5 – Landscaping Maintenance

The landscape plan incorporates establishment and maintenance measures targeting a 90% survival rate for planted species within the site.

- Landscaping is maintained and any dead or diseased plants are replaced.

The submitted landscape plan is considered appropriate for the scale and nature of the proposed development and satisfies the intent of Approved Measure 4.

5.7.5. CONCLUSION

A landscape plan has been prepared and submitted as part of the application documentation which identifies the proposed landscaping measures associated with the feedlot development. The landscaping strategy incorporates retention of existing vegetation together with supplementary planting designed to provide visual screening, soften the appearance of operational infrastructure and integrate the development into the surrounding rural landscape.

Proposed landscaping has been focused along key property boundaries, access roads and areas potentially visible from surrounding roads and adjoining properties, while maintaining appropriate separation from covered housing areas, operational infrastructure and controlled drainage systems.

Species selection associated with the proposal focuses on hardy, locally appropriate and low-maintenance vegetation capable of establishing within the local climatic conditions. The landscape plan also incorporates ongoing maintenance and replacement measures, including a target survival rate of 90% for planted vegetation.

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Overall, the proposed landscaping is considered appropriate for the scale and nature of the development and satisfies the Objectives, Accepted Standards and Approved Measures for Element 7 – Landscaping of the *Victorian Code for Cattle Feedlots*.

5.8. ELEMENT 8 – OPERATION AND MANAGEMENT

This section considers the proposed operational and management framework associated with the feedlot including feeding activities, pen and infrastructure maintenance, waste management, drainage management and routine operational procedures associated with the ongoing operation of the facility.

Appropriate operation and management of the feedlot is critical to minimising the potential for odour, runoff generation, waste accumulation and impacts on surrounding amenity. The proposed feedlot is intended to operate as a Class A feedlot under the *Victorian Code for Cattle Feedlots* and has therefore been designed and will be managed in accordance with the operational standards applicable to that classification.

Operational management measures associated with the proposal are further supported through the Waste Management Plan, NFAS accreditation components within the Quality Assurance manual and associated operational procedures prepared for the development.

5.8.1. OBJECTIVE

O1 Circumstances leading to odour production and other detriment due to the operation of the feedlot are avoided.

O2 Appropriate operations and maintenance related to the class of feedlot.

5.8.2. ACCEPTED STANDARDS

The objective may be achieved where:

AS1 The frequency of cleaning is sufficient to ensure that the feedlot meets the requirements of Element 1 and Element 4.

AS2 Standard of maintenance and operation of the waste usage system employed under the Waste Management Plan do not lead to soil degradation or pollution offsite and to any material detriment due to odour or other cause.

5.8.3. ASSESSMENT

The proposed feedlot has been designed and will be operated as a Class A feedlot in accordance with ***the Code***. Operational management of the facility will focus on maintaining high standards of animal management, feed handling, waste management, drainage control and infrastructure maintenance to minimise potential impacts on surrounding land uses and environmental values.

The covered housing design significantly reduces rainfall interaction with manure and bedding materials when compared with traditional open feedlot systems. This assists in reducing runoff generation, wet pen conditions, odour generation and nutrient mobilisation within operational areas of the site.

Routine operational activities associated with the feedlot will include:

- daily inspection of livestock and operational infrastructure,
- routine feeding and watering activities,
- monitoring and maintenance of drainage infrastructure and controlled drainage systems,
- regular removal and management of manure and bedding materials,
- monitoring of water supply infrastructure and trough operation, and
- ongoing maintenance of access roads, hardstand areas and operational surfaces.

Waste materials generated through the operation will be managed in accordance with the Waste Management Plan, including the collection, storage, reuse and monitoring of manure, bedding material and runoff captured within the controlled drainage system.

Operational management of the feedlot will also incorporate routine inspection and maintenance procedures to minimise the development of wet areas, feed accumulation, drainage issues and other operational conditions that may contribute to odour generation or reduced environmental performance.

The proposed operational framework is considered appropriate for the scale and nature of the development and consistent with the operational standards applicable to a Class A feedlot under ***the Code***.

5.8.4. APPROVED MEASURES

Approved Measure 1 – Feeding Out and Watering

The proposed feedlot incorporates a feed-table style feeding system designed to support conventional feed wagon feeding and automated/robotic feeding systems. Feed delivery infrastructure has been designed to allow efficient

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delivery of feed along the external feed apron while minimising feed wastage, spillage and unnecessary vehicle movements within cattle accommodation areas. Feed delivery activities undertaken with a mixer wagon will generally occur during daytime operational periods consistent with standard agricultural management practices. Where robotic systems are utilised, these will rotate on a constant basis supplying feed as required to all stock within the operation throughout the day and night.

Feed tables and surrounding operational areas will be routinely inspected and maintained as part of normal feedlot management procedures. Any feed accumulation outside designated feeding areas will be removed as required to minimise waste accumulation, wet areas and potential odour generation.

Water supply infrastructure associated with the feedlot has been designed to provide sufficient flow rates and supply capacity to meet livestock demand associated with the operation. Water troughs and associated float systems will be routinely maintained to minimise overflow, leakage and unnecessary wetting of operational surfaces.

Water troughs are positioned adjacent to drainage collection areas and designed to allow cleaning and maintenance activities to occur with minimal wetting of bedding and operational surfaces within the covered housing system.

- ✓ Feeding out equipment is operated to minimise spillage.
- ✓ Feed residues and accumulated feed material are routinely removed from feeding areas.
- ✓ Water troughs and float valves are maintained to minimise overflows.
- ✓ Disposal of drainage water from the water trough during cleaning is done without wetting the pad surface.
- ✓ Disposal of drainage water from the water trough during cleaning is done with minimum wetting of the pen surface.
- ✓ Water troughs are located adjacent to drains.

The proposed feedlot design and operational management framework are considered to satisfy the intent of Approved Measure 1 for a Class A feedlot.

Approved Measure 2 – General Routine Cleaning and Maintenance

Routine operational cleaning and maintenance procedures associated with the feedlot are summarised in **Table 5-6** below. Operational management of the facility will be undertaken in accordance with the requirements applicable to a Class A feedlot together with the procedures identified within the Waste Management Plan and associated operational management framework.

Table 5-6 - Feedlot pen operation and management

Activity	Frequency based on Class A Feedlot
✓ Spilt feed is cleaned	Weekly
✓ Wet patches are eliminated	Weekly
✓ Potholes/wear in pen flooring is repaired	Weekly
✓ Cleaning under fences is carried out	Monthly
✓ Drainage channel maintenance is undertaken	After rainfall events or immediately after damage
✓ Diversion banks and dam wall maintenance is undertaken	After rainfall
✓ Settling area maintenance is undertaken	After rainfall events
✓ Stormwater storage pond maintenance is undertaken annually	Prior to winter
✓ Pen cleaning is carried out.	Every 7-8 weeks or at each draft of cattle

The proposed operational management framework is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 2 for a Class A feedlot.

Approved Measure 3 – Mounding

The proposed covered housing feedlot does not rely on conventional open-lot manure mounding practices as part of routine operational management. Bedding and manure management associated with the operation will primarily occur through regular cleanout and removal procedures associated with the covered housing system.

Movement or temporary stockpiling of manure material within cattle accommodation areas may occasionally occur between scheduled cleanouts to maintain suitable bedding depth and operational conditions. Where undertaken, any temporary mounding or stockpiling of manure material will be managed to avoid interference with operational access or animal welfare requirements.

- ~~✓ Mound area is no more than 25% of pen area~~
- ~~✓ Mounds are shaped to maximum depth of 2m with side batters of a slope of not greater than 1:4~~
- ~~✓ Mounds are aligned in the downslope direction~~
- ~~✓ Mounds are located so as not to interfere with pen drainage~~

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Due to the covered housing design and regular manure cleanout regime associated with the proposal, routine manure mounding is expected to occur infrequently and only where operationally required. The proposed operational management framework is considered to satisfy the intent of Approved Measure 3 for a Class A feedlot.

Approved Measure 4 – Pack Removal

Bedding and manure cleanout associated with the covered housing system will be undertaken in a manner that maintains the integrity and operational performance of the underlying pad. The following operational standards will be incorporated into routine cleanout and maintenance procedures associated with the feedlot:

- ✓ The pad, a minimum 50mm layer of compacted soil/manure mix, is maintained
- ✓ Light ripping of the pack is undertaken, if required, prior to pack removal
- ✓ The pack is removed in a manner which does not damage the pad
- ✓ Grading of the remaining pad following pack removal is carried out.

Routine cleanout and maintenance activities associated with the covered housing system are considered appropriate for the scale and nature of the development and satisfy the intent of Approved Measure 4 for a Class A feedlot.

Approved Measure 5 – Pad Renovation

This is not applicable for this feedlot as it will be built and operated to Class A standards.

Approved Measure 6 – Manure Stockpile

The manure storage area is located within the controlled drainage area of the feedlot and is designed to support temporary storage of manure and bedding material prior to re-use within the broader farming enterprise. Manure stockpiles are proposed to be managed in windrows approximately 2.5m high and 5m wide.

The stockpile area has been designed with appropriate grading and drainage control and is positioned to avoid interference with feedlot operations, drainage infrastructure and cattle accommodation areas.

- ✓ Stockpile areas are protected from rainfall runoff by diversion banks or drains.
- ✓ To avoid auto-ignition within the pile the manure is dry (max 25% moisture) before stockpiling.
- ✓ The surface of the stockpile is graded to avoid rainwater ponding.
- ✓ The stockpile area is drained.

The proposed manure stockpile management framework is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 6.

Approved Measure 7 – Runoff Disposal

Runoff captured within the controlled drainage area of the feedlot will be collected, stored and reused within the broader farming enterprise in accordance with the Waste Management Plan and existing irrigation infrastructure associated with the property.

- ✓ All runoff is disposed of in accordance with the approved Waste Management Plan.
- ✓ Only managed irrigation systems must be used to apply collected runoff water.
- ✓ The rate of application and volume applied allows no surface runoff to occur and no percolation into ground water.
- ✓ The volume of water applied does not exceed the capacity of soil or crop to assimilate the organic and inorganic contents of the water.
- ✓ The retention pond is lowered to near bottom water level by the anticipated beginning of the winter.

The Waste Management Plan identifies annual inflows to the controlled drainage and stormwater storage system of approximately 47.5ML, with annual irrigation reuse of approximately 25.7ML. The peak operational storage volume is estimated at approximately 14.8ML, with an end-of-year storage balance of approximately 0.8ML. The proposed stormwater storage pond provides approximately 15ML of available storage capacity.

Following application of the relevant buffer distances, approximately 111ha is available for irrigation reuse activities. This area is considered sufficient to support the reuse of captured runoff through the existing irrigation system in accordance with crop demand, soil conditions and seasonal requirements.

Captured runoff is expected to comprise a low-strength mixed runoff stream due to the covered housing design, separation and recovery of manure and bedding material, and the use of settling infrastructure prior to discharge into the stormwater storage pond. Reuse will be managed through irrigation scheduling to minimise the risk of runoff, ponding, deep drainage or nutrient leaching.

The proposed runoff management and irrigation reuse framework is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 7.

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Approved Measure 8 – Manure Disposal

Manure and bedding material generated through the operation of the feedlot will be reused within the broader farming enterprise in accordance with the Waste Management Plan and associated nutrient management framework described under Element 5 in **Section 5.5.**

Sufficient agricultural land is available within the farming enterprise to sustainably utilise manure generated by the operation while maintaining the required environmental buffer distances and operational constraints associated with nutrient reuse activities.

- ✓ Manure is spread on to pasture, crop or fallow land in accordance with the approved Waste Management Plan
- ✓ The rate of application is in accordance with the specification in Element 5

The Waste Management Plan includes nutrient balance assessments, reuse area calculations and operational management procedures associated with the sustainable reuse of manure and bedding material generated by the feedlot.

The proposed manure management and reuse framework is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 8.

Approved Measure 9 – Vermin and Weed Control

Vermin and weed management associated with the feedlot will be undertaken through routine operational maintenance, feed management and ongoing site monitoring procedures.

- ✓ A program of vermin control is maintained.
- ✓ A program of weed control is maintained to prevent the propagation and spread of weeds within the feedlot and manure usage.

Vermin are commonly attracted to feed storage and feed spillages, therefore routine feed management and timely removal of feed residues will form an important component of site management procedures. Rodent populations, including mice and rats, will be managed through the use of baiting, trapping and routine operational monitoring where required.

Accumulation of manure beneath fences and around operational infrastructure may also create suitable breeding conditions for flies and other pests if not appropriately managed. Routine cleaning and maintenance procedures associated with manure management and operational areas will therefore be undertaken in accordance with the Waste Management Plan and operational management framework for the site.

Weed management within the feedlot and associated nutrient reuse areas will be undertaken as part of the broader farm weed management and cropping program associated with the property.

The proposed operational management framework is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 9.

Approved Measure 10 – Cessation of Operations

In the event that feedlot operations cease, manure, bedding material and any residual waste products associated with the operation will be removed and reused within the broader farming enterprise in accordance with the Waste Management Plan and relevant environmental requirements.

Infrastructure and operational facilities no longer required for ongoing agricultural use will be removed or repurposed as appropriate. The sedimentation basin, controlled drainage infrastructure and storage pond not required for future farm operations would be decommissioned and stabilised, with disturbed areas restored to a suitable agricultural or pasture condition.

- ➢ Upon cessation of feedlot operations, waste material and compacted manure will be removed and the site restored to an appropriate agricultural condition.

The proposed cessation and rehabilitation framework is considered appropriate for the scale and nature of the development and satisfies the intent of Approved Measure 10.

5.8.5. CONCLUSION

The proposed feedlot has been designed and will be operated in accordance with the operational requirements applicable to a Class A feedlot under the *Victorian Code for Cattle Feedlots*.

The covered housing design, together with the proposed operational management framework, provides an advanced feedlot system focused on minimising runoff generation, maintaining appropriate manure and bedding management, and reducing the potential for odour, vermin and amenity impacts associated with the operation.

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Routine operational procedures associated with feeding, cleaning, drainage management, runoff reuse, manure handling and infrastructure maintenance are supported through the Waste Management Plan, Odour Management Plan and associated operational management procedures prepared for the development.

The proposal incorporates appropriate management measures associated with feed delivery, watering systems, manure stockpiling, runoff disposal, vermin and weed management, and long-term site rehabilitation in the event of cessation of operations.

Overall, the proposed operational and management framework is considered appropriate for the scale and nature of the development and satisfies the Objectives, Accepted Standards and Approved Measures for Element 8 – Operation and Management of the *Victorian Code for Cattle Feedlots.*

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6. MAINTENANCE OF STANDARDS – AUDIT REQUIREMENTS

The *Victorian Code for Cattle Feedlots* requires ongoing auditing and compliance verification to ensure that feedlot construction, operation and environmental management standards are maintained throughout the life of the development.

Independent audit statements are required to verify compliance with the construction and operational requirements of ***the Code***. Audit reports are to be provided to the Responsible Authority and Agriculture Victoria, with the cost of preparation and submission met by the feedlot operator.

The Code identifies three categories of audit requirements:

- **Pre-Operation Audit**
  Prior to commencement of operation of a new feedlot or extension to an existing feedlot, an audit statement is required confirming that the construction and organisational requirements of ***the Code*** have been satisfied.
- **Annual Audit**
  An annual audit statement demonstrating ongoing compliance with the operational and environmental management requirements of ***the Code*****.**
- **Additional Audit**
  Where the Responsible Authority reasonably believes that the feedlot is not complying with the requirements of *the Code*, additional audits may be required.

Accreditation under the *National Feedlot Accreditation Scheme* (NFAS) may satisfy the audit requirements of ***the Code*** where the environmental compliance requirements of ***the Code*** are incorporated within the feedlot operators NFAS Quality Assurance Manual and relevant environmental audit documentation is provided to the Responsible Authority and Agriculture Victoria.

The proposed feedlot is intended to operate in accordance with the NFAS and associated industry best-practice standards relevant to animal welfare, environmental management, biosecurity, feed management and operational performance. Operational procedures, monitoring and record keeping associated with the feedlot will be incorporated into the broader management systems for the enterprise to support ongoing compliance with ***the Code*** and NFAS requirements. Where applicable, NFAS auditing and environmental compliance reporting may be utilised to support compliance verification and ongoing operational review associated with the development.

Audit statements are required to be prepared by an appropriately qualified auditor approved for the purposes of ***the Code***. This may include accredited environmental auditors under Victorian EPA legislation, NFAS auditors, or other suitably qualified and experienced persons approved by Agriculture Victoria.

In the event of non-compliance with the requirements of ***the Code***, enforcement proceedings may be initiated through the relevant statutory processes and authorities.

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7. CONCLUSION

This report has been prepared to support a planning permit application for the development and operation of a 2,206 head covered housing beef cattle feedlot system at 852 Llowalong Road, Llowalong, Victoria.

The proposal forms part of the ongoing development and diversification of the Applicants' broader agricultural enterprise and has been designed as an integrated cattle feeding, controlled drainage and nutrient recovery system supporting both livestock production and agricultural reuse activities associated with the property.

Assessment of the proposal has been undertaken against the *Victorian Code for Cattle Feedlots* (1995), the Wellington Planning Scheme, relevant industry guidance documents and advanced covered housing feedlot design principles.

The proposed development incorporates an advanced covered housing feedlot system designed to improve operational management, livestock welfare, nutrient recovery and environmental performance relative to conventional open feedlot systems contemplated by ***the Code***. The proposal incorporates covered cattle accommodation areas, integrated controlled drainage infrastructure, sediment control and runoff storage systems, feed-table feeding infrastructure, reinforced concrete operational surfaces and integrated nutrient reuse systems associated with the broader farming enterprise.

The proposal has also been designed to support advanced operational management systems including future robotic or automated feeding capability and improved livestock monitoring and operational management technologies associated with modern intensive livestock production systems.

Assessment of the proposal demonstrates that the development generally satisfies the Objectives and Accepted Standards of ***the Code***. Where alternative measures have been proposed, these have been demonstrated to satisfy the intent of the relevant Approved Measures through improved runoff management, substantial reduction in rainfall interaction with manure and bedding materials, improved operational management outcomes and reduced environmental risk relative to conventional open feedlot systems.

Supporting technical assessments accompanying the application, including the Odour Assessment, Waste Management Plan and Traffic Engineering Assessment, conclude that the proposal can operate in a manner consistent with acceptable environmental and operational performance outcomes.

The proposal also represents a significant agricultural investment within the region and is considered to be one of the first purpose-designed greenfield covered housing beef cattle feedlot developments within Victoria. Construction and operation of the development will support local contractors, agricultural service providers, transport operators and associated rural industries throughout both the construction and operational phases of the project.

Subject to the implementation of the operational and environmental management measures identified throughout this report, the proposed development is considered appropriate for the site and surrounding agricultural locality and suitable for approval under the Wellington Planning Scheme and the *Victorian Code for Cattle Feedlots* (1995).

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8. APPENDICIES

APPENDIX 1 – PROPOSAL PLANS

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NERINA LANE

LLOWALONG ROAD

HOUSE

LOADING AREA

SILOS

SHED

SHED

DRIVEWAY

YARDS

LANEWAY

Drainage to creek

LLOWALONG ROAD

N

REV	DATE	REVISIONS	DRN	CHKD
0	2/6/26	ORIGINAL CREATED	RJM	NHC

THESE PLANS ARE SUBJECT TO THE RELEVENT AUTHORITIES PLANNING APPROVALS PRIOR TO ANY CONSTRUCTION COMMENCING.

LOCATION OF SERVICES (POWER, TELECOM, ETC) SHOWN ON PLANS ARE APPROXIMATE ONLY, CONTRACTOR MUST VERIFY ACTUAL POSITION OF THESE SERVICES AND ANY OTHER SERVICES NOT SHOWN ON THESE PLANS PRIOR TO ANY CONSTRUCTION COMMENCING.

ACTUAL POSITION OF ANY EXISTING BOUNDARIES, EASEMENTS OR ROAD RESERVES HAVE NOT BEEN SHOWN ON THIS PLAN, BUT SHOULD BE DETERMINED ON SITE BY RELEVANT BODIES PRIOR TO ANY CONSTRUCTION COMMENCING.

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GDA ZONE 55

SCALE OF METRES
1 IN 1500

15 0 30 60 90 120 150

SURVEYED BY	DRAWN	DESIGNED
DATUM A.H.D.	GRID INTERVAL RANDOM	AREA XXX Ha

NJC IRRIGATION SOLUTIONS
SURVEY, CONSULTATION & DESIGN

EXISTING CONDITIONS PLAN

852 LLOWALONG ROAD, LLOWALONG

CROWN ALLOTMENT	SECTION	PARISH	DRAWING NO.	SHEET NUMBER	FILE REF	REV
LOT 2 ON PS905315		STRATFORD	51557X	1 of 1	IS-800	0

0 1 2 3 4 5 6 7 8 9 10 cm
FULL SIZE ON ORIGINAL

Plotted mm 1= 1 Drawing units A0

N

NERINA LANE

LLOWALONG ROAD

50m BUFFER FROM ROAD

CONSTRUCT NEW DRAIN A - N
GRADE 1 in 238 (-0.42%)
BED 4m WIDE, BATTERS 2 to 1
60m³ CUT, 60m LONG

CONSTRUCT NEW DRAIN N - O
GRADE 1 in 666 (-0.15%)
BED 4m WIDE, BATTERS 2 to 1
118m³ CUT, 100m LONG

CONSTRUCT NEW DRAIN O - P
GRADE 1 in 2,000 (-0.05%)
BED 4m WIDE, BATTERS 2 to 1
482m³ CUT, 210m LONG

A | N | O | P

BED 35.80 | C.O.G. BED 35.55 | C.O.G. BED 35.40 | C.O.G. BED 35.30

BED 35.59 | BED 35.72 | BED 35.89

GRADE -0.19%

FUTURE SILAGE BUNKER
45m x 15m WIDE

FUTURE SILAGE BUNKER
45m x 15m WIDE

LOADING

BED 35.50 | BED 35.44 | BED 36.00

GRADE -0.20%

PEN 1 | PEN 2 | PEN 3 | PEN 4 | PEN 5 | PEN 6 | PEN 7 | PEN 8 | PEN 9

PEN 10 | PEN 11 | PEN 12 | PEN 13 | PEN 14 | PEN 15 | PEN 16 | PEN 17 | PEN 18

NTH XS

STH XS

CLEAN OUT LANE | CATTLE LANEWAY (8.0m) | FEED LANE | GRASS AREA | FEED LANE | CATTLE LANEWAY (8.0m) | CLEAN OUT LANE

GRADE 1.00% | GRADE 1.17% | GRADE 1.00% | GRADE 1.00% | GRADE 1.00% | GRADE 1.00% | GRADE -0.30% | GRADE -1.28%

MANURE AND SPENT BEDDING
110m x 52m = 5,720m²

SETTLING BASIN 100m³ FSL 35.00

MORTALITY COMPOSTING AREA 35m x 35m

MASS MORTALITY TRENCH 270m x 3m

BED 34.20 | BED 34.09 | BED 34.65

CONSTRUCT NEW DRAIN P - Q
GRADE 1 in 137 (-0.73%)
BED 4m WIDE, BATTERS 2 to 1
155m³ CUT, 120m LONG

C.O.G. BED 34.42 | Q

CONSTRUCT NEW DRAIN Q - R
GRADE 1 in 233 (-0.43%)
BED 4m WIDE, BATTERS 2 to 1
93m³ CUT, 60m LONG

C.O.G. BED 34.16 | R

CONSTRUCT NEW DRAIN R - S
GRADE 1 in 313 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
68m³ CUT, 70m LONG

C.O.G. BED 33.94 | S

TURNING AREA

NEW YARDS

BED 33.84

CATTLE LANEWAY (8.0m)

BED 33.87 | BED 33.82

GRADE -0.20%

BUND AROUND PROJECT

BED 33.97 | BED 33.79

BNK 34.30 | BNK 34.29

STORM WATER POND
AREA = 8,970m2
CAPACITY @ 33.80 = 14.72ML

GRADE 1 IN 1000

BED 31.86 | BED 31.80 | BED 31.74

BUND AROUND PROJECT

PUMP

PLANTATION TREES
REMOVE TREES AS REQUIRED

PIPELINE TO IRRIGATION AREAS

CONSTRUCT NEW DRAIN S - T
GRADE 1 in 2,000 (-0.05%)
BED 4m WIDE, BATTERS 2 to 1
342m³ CUT, 180m LONG

C.O.G. BED 33.88 | T

CONSTRUCT NEW DRAIN T - U
GRADE 1 in 83 (-1.25%)
BED 4m WIDE, BATTERS 2 to 1
76m³ CUT, 50m LONG

C.O.G. BED 33.20 | U

CONSTRUCT NEW DRAIN U - M
GRADE 1 in 74 (-1.42%)
BED 4m WIDE, BATTERS 2 to 1
165m³ CUT, 92m LONG

M

CONSTRUCT NEW DRAIN M - U
GRADE 1 in 118 (-0.85%)
BED 4m WIDE, BATTERS 2 to 1
76m³ CUT, 58m LONG

BED 31.99

U

C.O.G. BED 31.50

CONSTRUCT NEW DRAIN U - V
GRADE 1 in 143 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
19m³ CUT, 87m LONG

LANEWAY

C.O.G. BED 31.22 | V

CONSTRUCT NEW DRAIN V - W
GRADE 1 in 317 (-0.97%)
BED 4m WIDE, BATTERS 2 to 1
15m³ CUT, 71m LONG

CATTLE LANE

K

CATTLE LANEWAY (8.0m)

EXISTING YARDS

LOADING YARDS

RAMP

TRUCK TURNING AREA

HOUSE

LOADING AREA

SILOS

EXISTING FODDER AND STORAGE AREA

SHED

SHED

DRIVEWAY

50m BUFFER FROM ROAD

FEEDPAD CONSTRUCTION

FOOT PRINT AREA = 7.415 HA

VOLUME OF TOPSOIL STRIP UNDER CUT AREAS @ 0.10m = 3,289m³ (SOLID INSITU)
VOLUME OF TOPSOIL STRIP IN FILL AREAS @ 0.10m = 4,126m³ (SOLID INSITU)

VOLUME IN FILL AREAS = 21,218m³ SOLID INSITU
+ 12.5% COMPACTION = 23,870m³
VOLUME IN CUT AREAS = 27,428m³ SOLID INSITU

NOTE: ALL FINISHED ELEVATIONS ARE TOP OF CLAY LEVELS (IN RED)

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REV	DATE	REVISIONS	DRN	CHKD
0	28/05/2026	ORIGINAL CREATED	RJM	NHC

GDA ZONE 55

SCALE OF METRES 1 IN 1500
15 0 30 60 90 120 150
0 1 2 3 4 5 6 7 8 9 10cm
FULL SIZE ON ORIGINAL

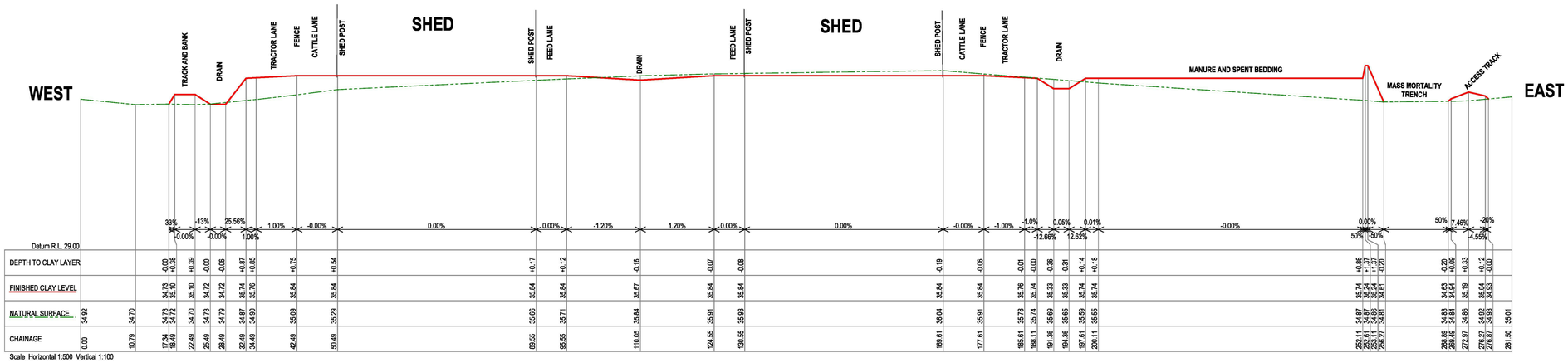
SURVEYED BY	DRAWN	DESIGNED
DATUM A.H.D.	GRID INTERVAL RANDOM	AREA

NJC IRRIGATION SOLUTIONS
SURVEY, CONSULTATION & DESIGN

PROPOSED FEEDPAD LAYOUT

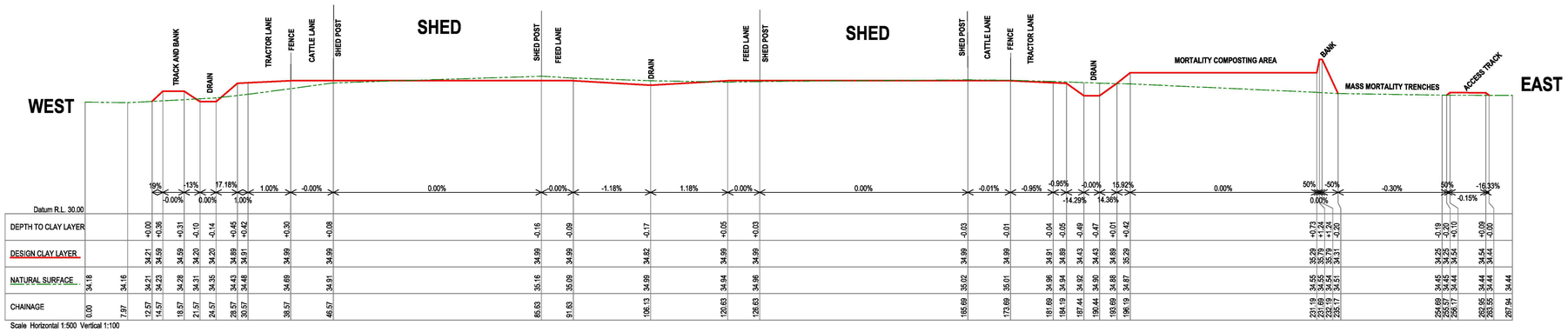
862 LLOWALONG ROAD, LLOWALONG

CROWN ALLOTMENT	SECTION	PARISH	DRAWING NO.	SHEET NUMBER	FILE REF	REV	SHEET SIZE
LOT 2 ON PS905315		STRATFORD	51557	1	IS-800	0	A1



Scale Horizontal 1:500 Vertical 1:100

NORTH CROSS SECTION



Scale Horizontal 1:500 Vertical 1:100

SOUTH CROSS SECTION

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REV	DATE	REVISIONS	DRN	CHKD
0	1/6/26	ORIGINAL CREATED	RJM	NHC

0 1 2 3 4 5 6 7 8 9 10 cm

FULL SIZE ON ORIGINAL

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TITLE BOUNDARIES SHOWN ON PLAN ARE APPROXIMATE ONLY.

SCALE OF METRES AS SHOWN

20 0 40 80 120 160 200

SURVEYED BY	DRAWN	DESIGNED
DATUM A.H.D.	GRID INTERVAL RANDOM	AREA

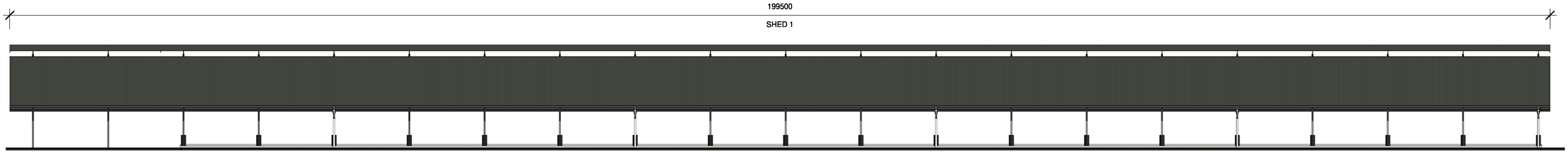
NJC IRRIGATION SOLUTIONS
SURVEY, CONSULTATION & DESIGN

FEEDPAD CROSS SECTIONS

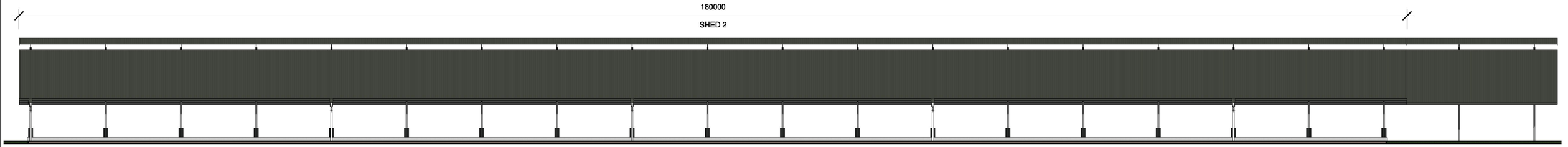
862 LLOWALONG ROAD, LLOWALONG

CROWN ALLOTMENT	SECTION	PARISH	DRAWING NO.	SHEET NUMBER	FILE REF	REV
LOT 2 ON PS905315		STRATFORD	51557	2 of 2	IS-800	0

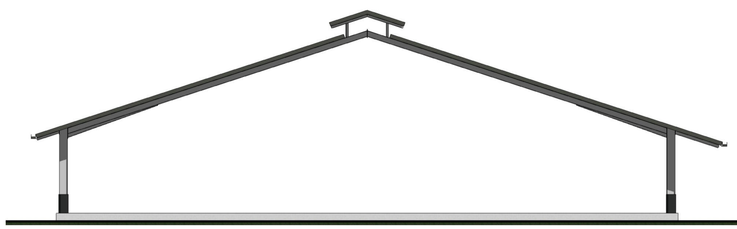
Plotted mm 1= 1 Drawing units A1



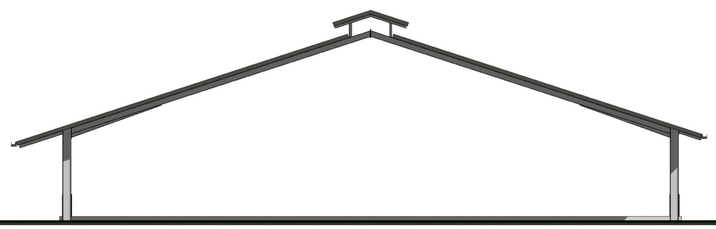
West Elevation
1 : 350

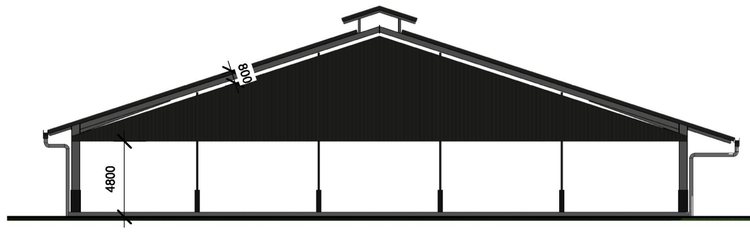


East Elevation
1 : 350

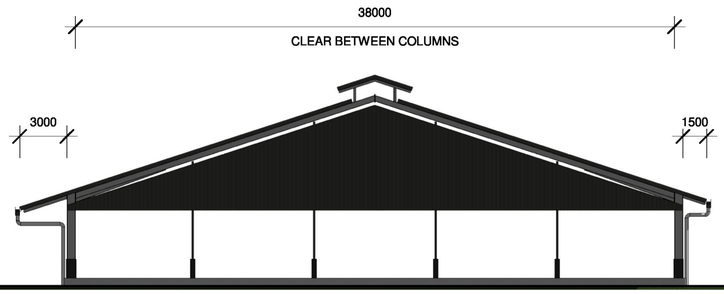


North Elevation
1 : 275





South Elevation
1 : 275



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Bairnsdale ENGINEERING
Manufacturers of Farm & Industrial Sheds Since 1976

Beef Sheds
Llowalong

ELEVATIONS

Style	18° Gable
Size	various
Quotation number	37127
Roof Cladding	Woodland Grey 5-Rib .42BMT
Wall Cladding	Woodland Grey 5-Rib .42BMT
Date	12/05/2026
Drawn by	BJC

A103

Scale: As indicated

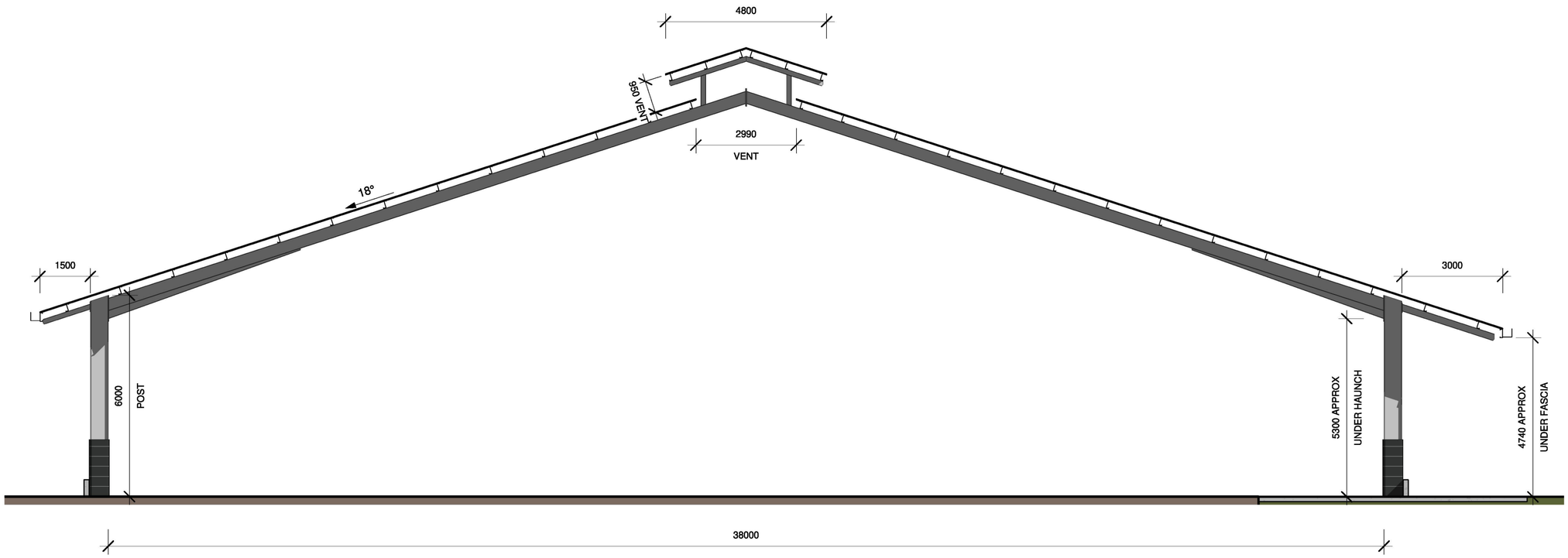
I acknowledge that these are the final plans as varied, and supersede any prior plans signed.

Name:_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Date:_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Signature:_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

CONCEPT ONLY



Shed 2 North Section

1 : 100

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Beef Sheds

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ELEVATIONS

Style	18° Gable
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Quotation number	37127
Roof Cladding	Woodland Grey 5-Rib .42BMT
Wall Cladding	Woodland Grey 5-Rib .42BMT
Date	12/05/2026
Drawn by	BJC

A104

Scale 1 : 100

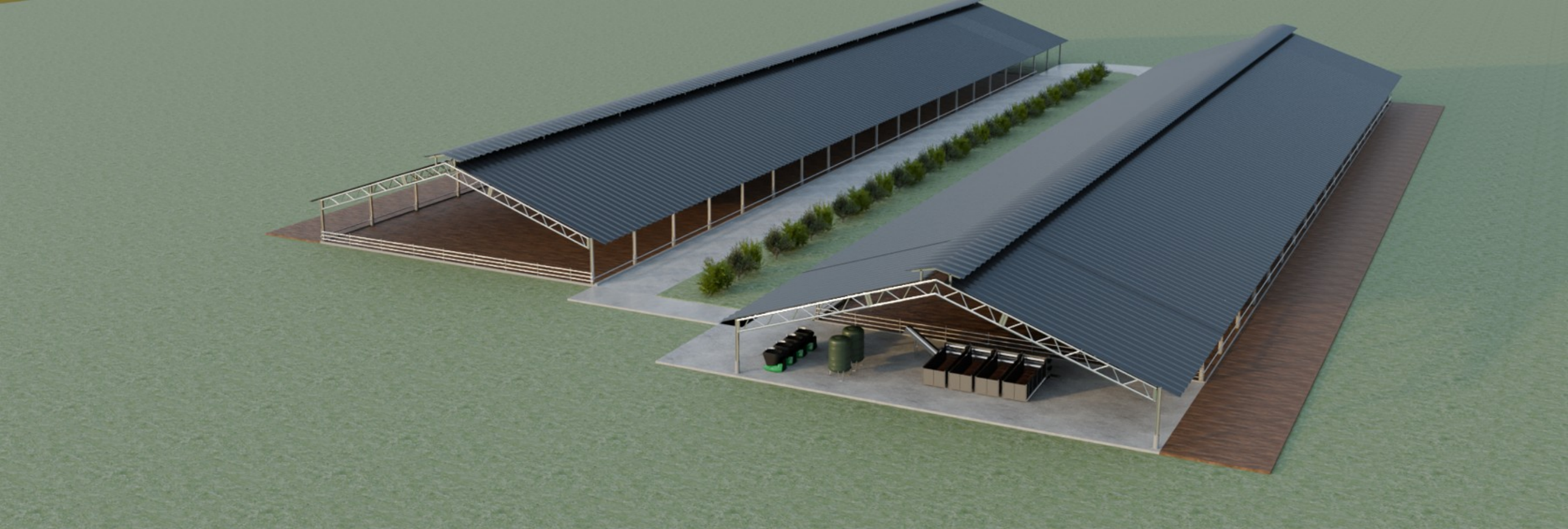
I acknowledge that these are the final plans as varied, and supersede any prior plans signed.

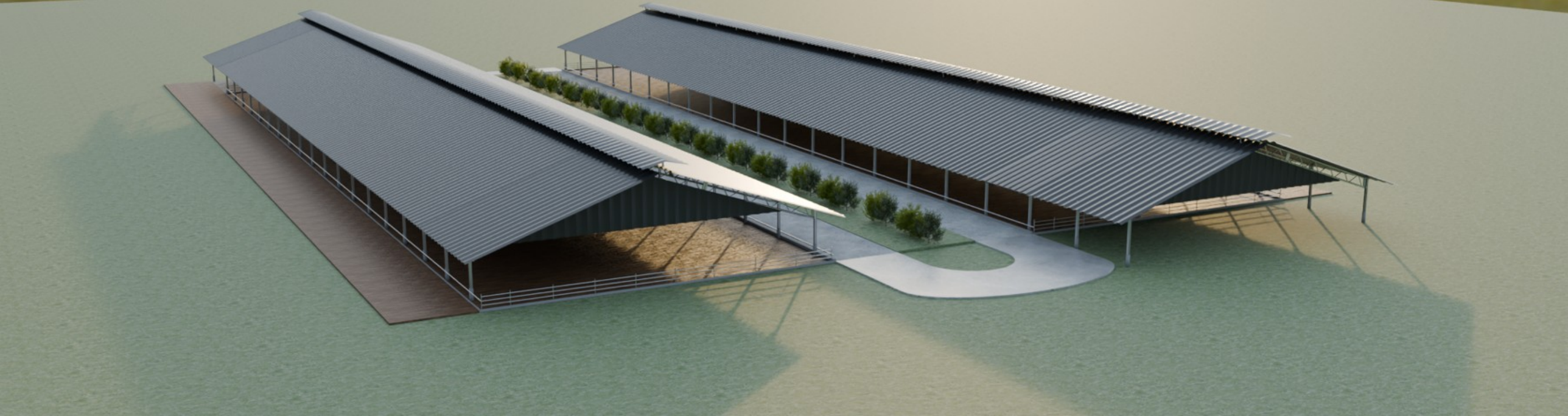
Name:_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

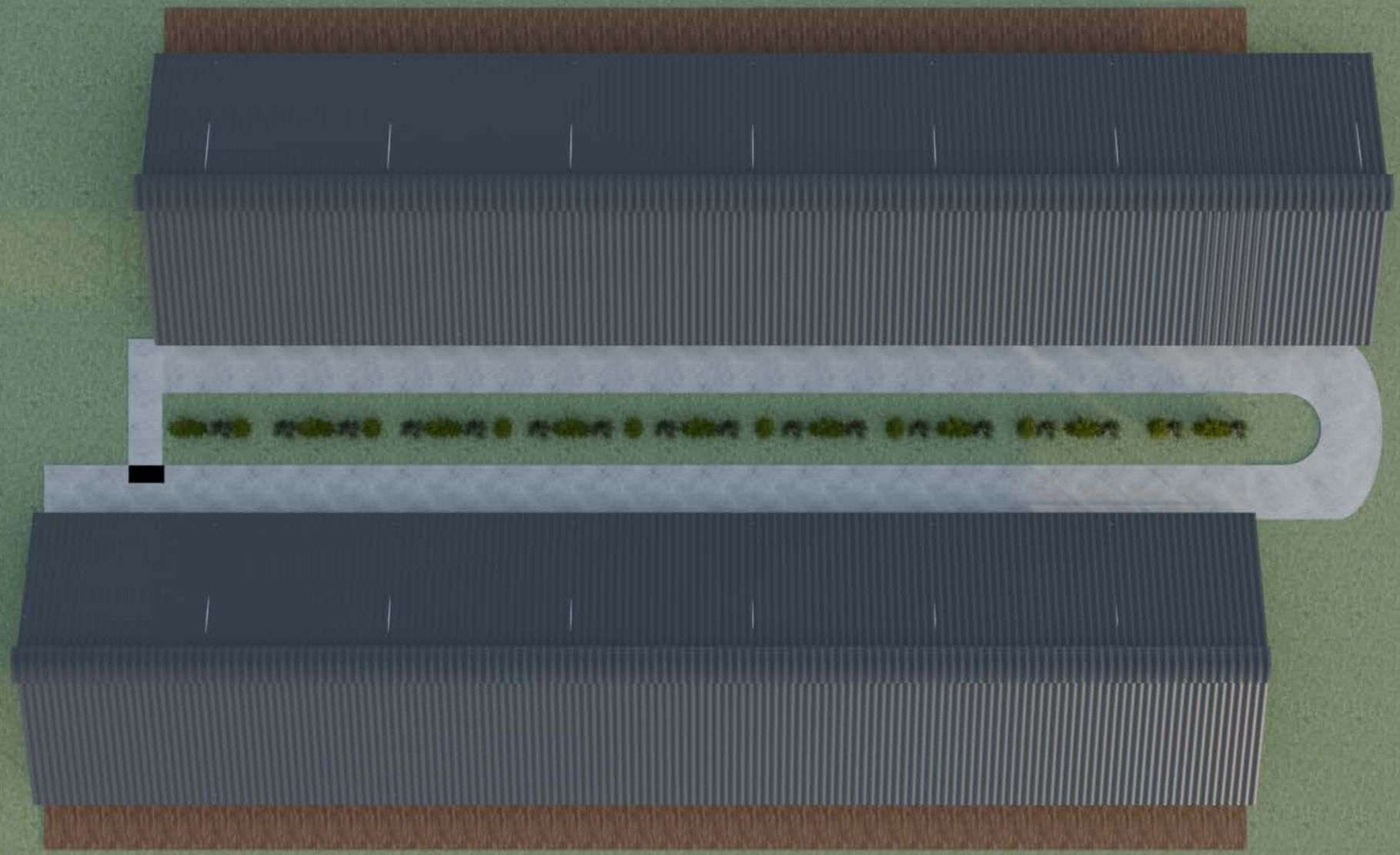
Date:_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

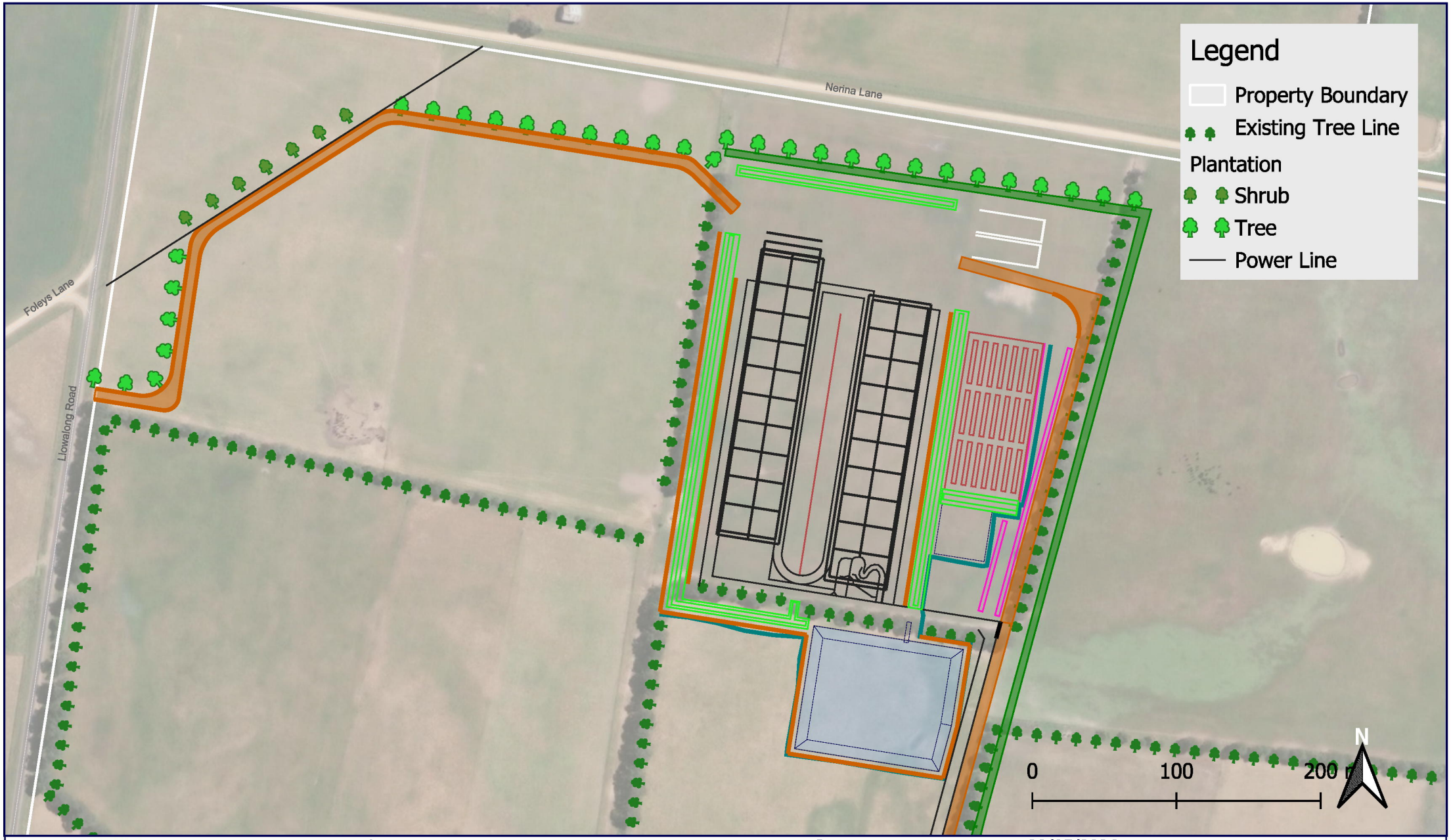
Signature:_ _ _ _ _ _ _ _ _ _ _ _ _ _ _

CONCEPT ONLY









PROGRESSIVE RURAL SOLUTIONS

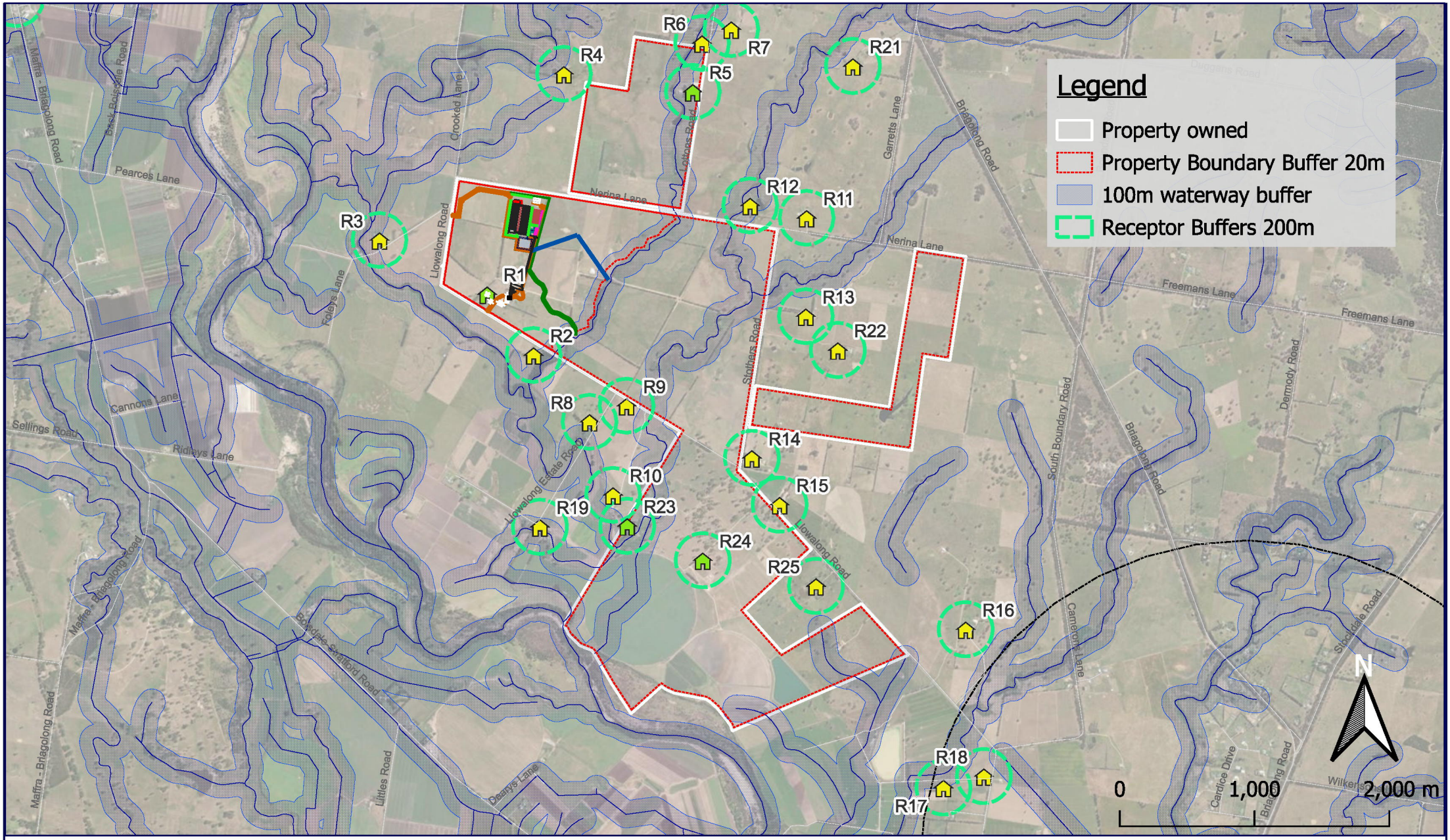
Project Details:

J454 - 'Llowalong Beef Co' - Feedlot

Prepared by:
Progressive Rural Solutions Pty Ltd

Date:	29/05/2026
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Landscape Plan

Version	Date
V1	06/10/2025
V2	02/06/2026



PROGRESSIVE RURAL SOLUTIONS

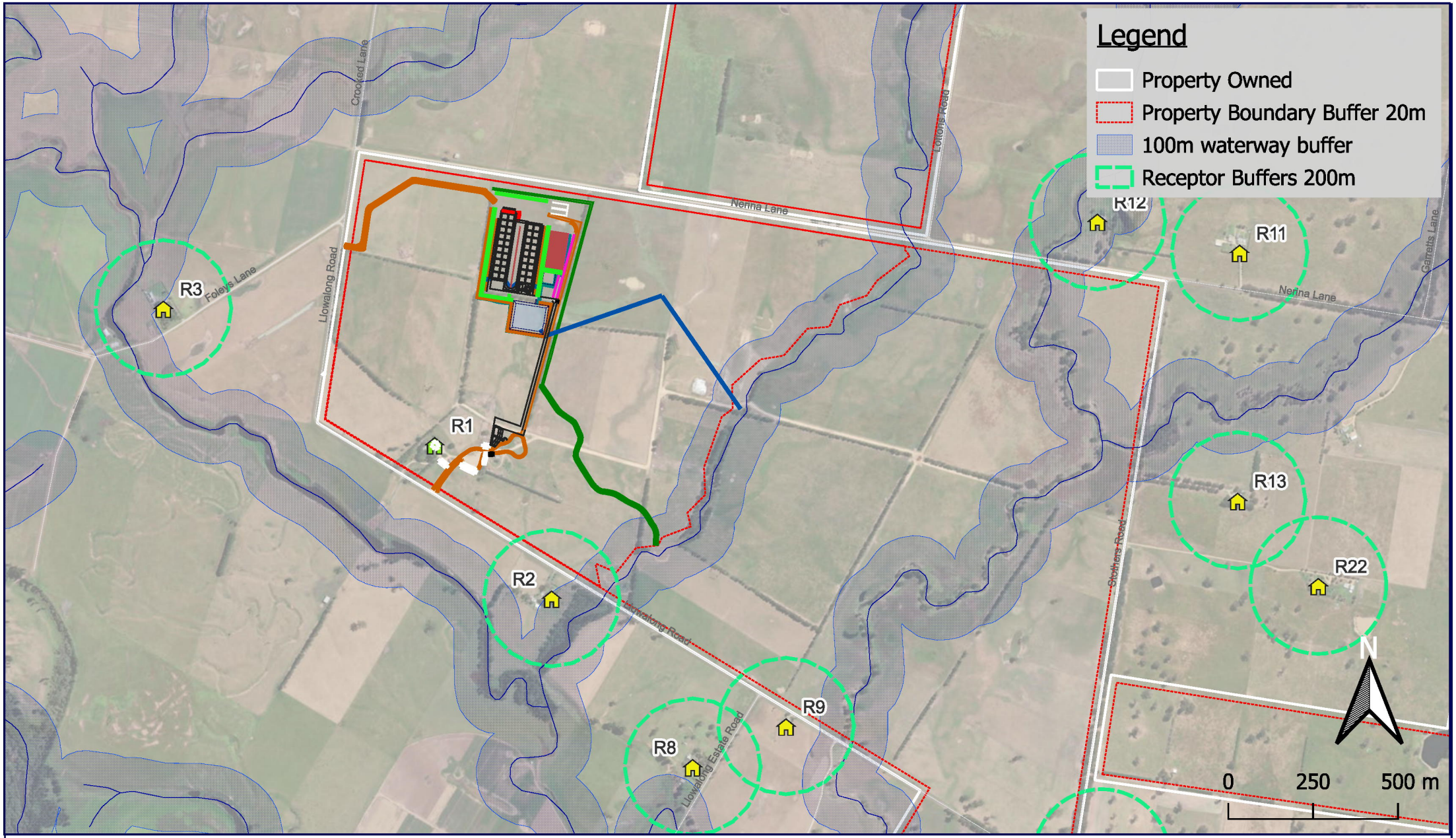
Project Details:

J454 - 'Llowalong Beef Co' - Feedlot

Prepared by:
Progressive Rural Solutions Pty Ltd

Date:	28/05/2026
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Feedlot Site Buffer Plan

Version	Date
V1	06/10/2025
V2	28/05/2026



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Date:	28/05/2026
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Feedlot Site Buffer Plan

Version	Date
V1	06/10/2025
V2	28/05/2026

APPENDIX 2 – PROPERTY PLANNING REPORT & TITLE SEARCH

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PLANNING PROPERTY REPORT

Department of Transport and Planning

From www.planning.vic.gov.au at 07 May 2025 07:44 PM

PROPERTY DETAILS

Address:	**852 LLOWALONG ROAD LLOWALONG 3862**
Lot and Plan Number:	**Lot 2 PS905315**
Standard Parcel Identifier (SPI):	**2\PS905315**
Local Government Area (Council):	**WELLINGTON** www.wellington.vic.gov.au
Council Property Number:	**94706**
Planning Scheme:	**Wellington** Planning Scheme - Wellington
Directory Reference:	**Vicroads 83 B8**

UTILITIES

Rural Water Corporation:	**Southern Rural Water**
Urban Water Corporation:	**Gippsland Water**
Melbourne Water:	**Outside drainage boundary**
Power Distributor:	**AUSNET**

STATE ELECTORATES

Legislative Council:	**EASTERN VICTORIA**
Legislative Assembly:	**GIPPSLAND EAST**

OTHER

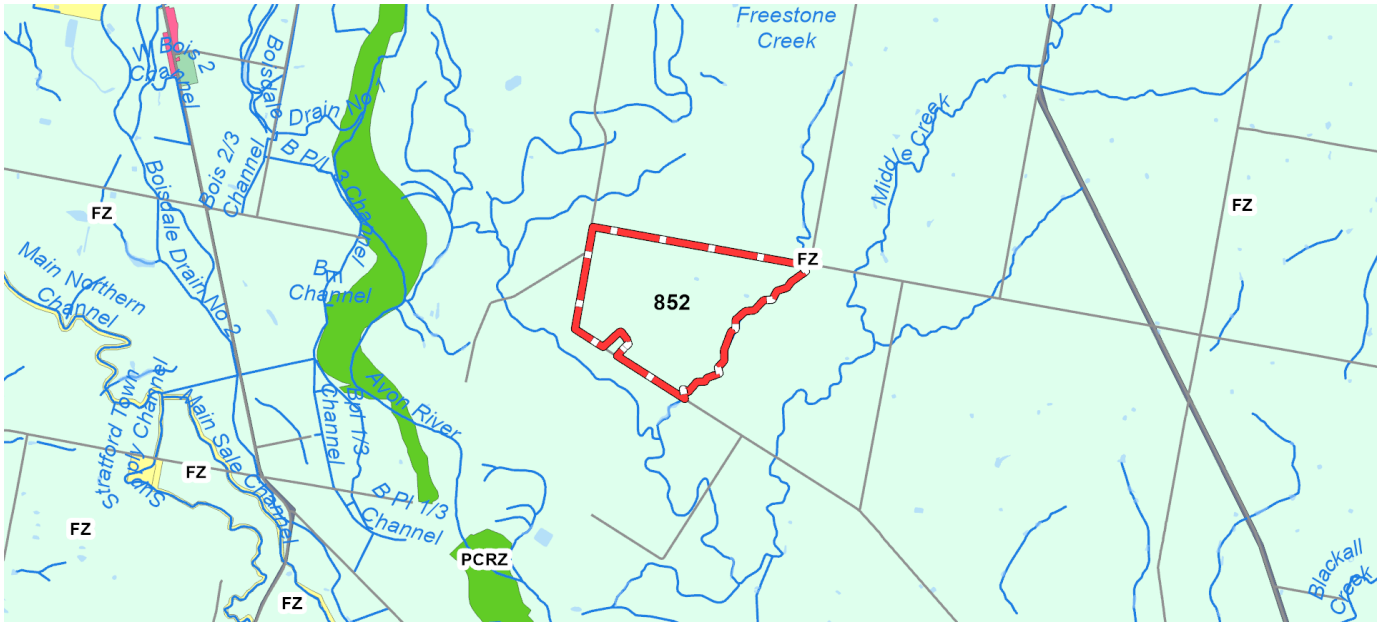
Registered Aboriginal Party:	**Gunaikurnai Land and Waters Aboriginal Corporation**

View location in VicPlan

Planning Zones

FARMING ZONE (FZ)

SCHEDULE TO THE FARMING ZONE (FZ)



FZ - Farming	PCRZ - Public Conservation and Resource	PPRZ - Public Park and Recreation
PUZ1 - Public Use-Service and Utility	PUZ2 - Public Use-Education	PUZ6 - Public Use-Local Government
TRZ2 - Principal Road Network	TRZ3 - Significant Municipal Road	TZ - Township
Water area	Water course	

Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

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PLANNING PROPERTY REPORT

Department of Transport and Planning

Planning Overlay

None affecting this land - there are overlays in the vicinity

OTHER OVERLAYS

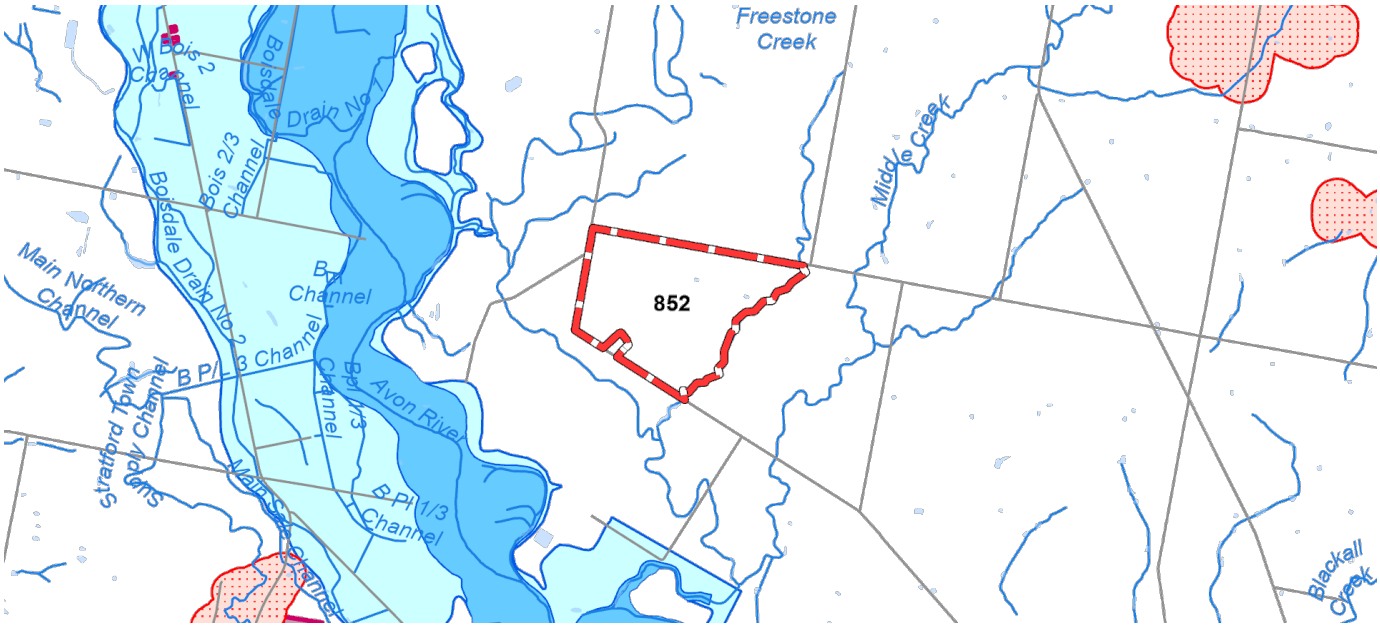
Other overlays in the vicinity not directly affecting this land

BUSHFIRE MANAGEMENT OVERLAY (BMO)

FLOODWAY OVERLAY (FO)

HERITAGE OVERLAY (HO)

LAND SUBJECT TO INUNDATION OVERLAY (LSIO)



BMO - Bushfire Management Overlay

FO - Floodway Overlay

HO - Heritage Overlay

LSIO - Land Subject to Inundation Overlay

Water area

Water course

Note: due to overlaps, some overlays may not be visible, and some colours may not match those in the legend

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PLANNING PROPERTY REPORT

Department of Transport and Planning

Areas of Aboriginal Cultural Heritage Sensitivity

All or part of this property is an 'area of cultural heritage sensitivity'.

'Areas of cultural heritage sensitivity' are defined under the Aboriginal Heritage Regulations 2018, and include registered Aboriginal cultural heritage places and land form types that are generally regarded as more likely to contain Aboriginal cultural heritage.

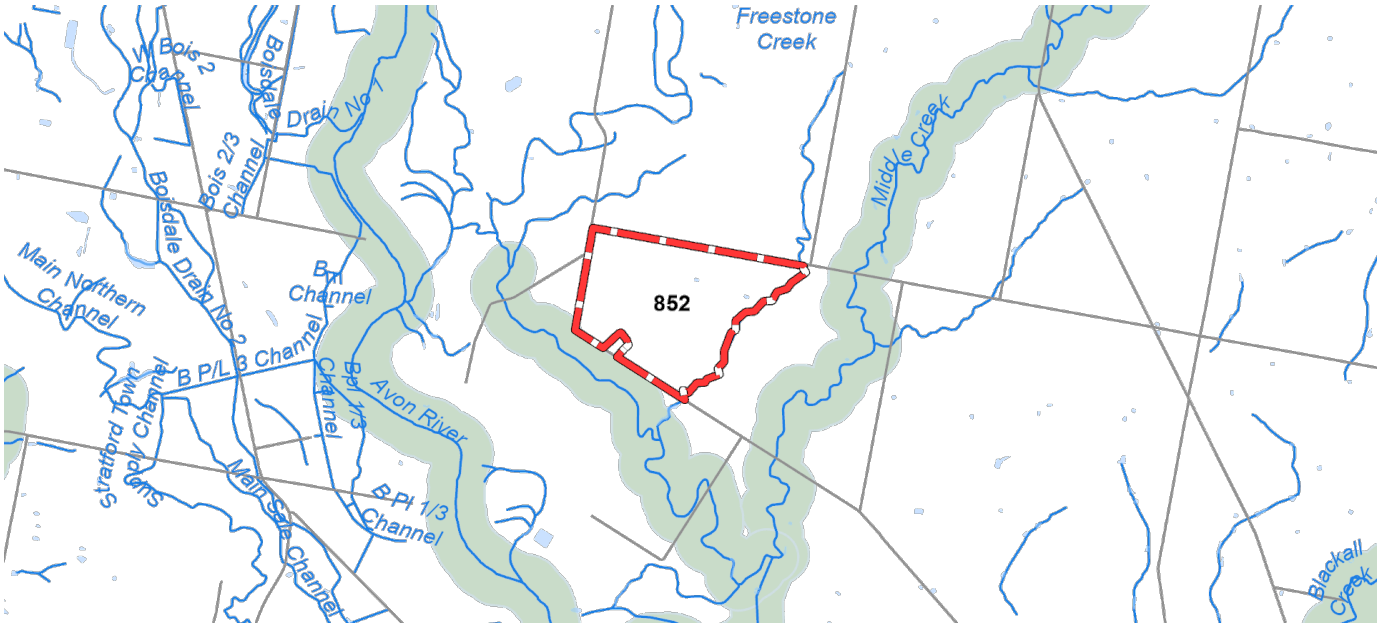
Under the Aboriginal Heritage Regulations 2018, 'areas of cultural heritage sensitivity' are one part of a two part trigger which require a 'cultural heritage management plan' be prepared where a listed 'high impact activity' is proposed.

If a significant land use change is proposed (for example, a subdivision into 3 or more lots), a cultural heritage management plan may be triggered. One or two dwellings, works ancillary to a dwelling, services to a dwelling, alteration of buildings and minor works are examples of works exempt from this requirement.

Under the Aboriginal Heritage Act 2006, where a cultural heritage management plan is required, planning permits, licences and work authorities cannot be issued unless the cultural heritage management plan has been approved for the activity.

For further information about whether a Cultural Heritage Management Plan is required go to http://www.aav.nrms.net.au/aavQuestion1.aspx

More information, including links to both the Aboriginal Heritage Act 2006 and the Aboriginal Heritage Regulations 2018, can also be found here - https://www.aboriginalvictoria.vic.gov.au/aboriginal-heritage-legislation



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PLANNING PROPERTY REPORT

Department of Transport and Planning

Further Planning Information

Planning scheme data last updated on 01 May 2025.

A **planning scheme** sets out policies and requirements for the use, development and protection of land.
This report provides information about the zone and overlay provisions that apply to the selected land.
Information about the State and local policy, particular, general and operational provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting https://www.planning.vic.gov.au

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the ***Planning and Environment Act 1987.***
It does not include information about exhibited planning scheme amendments, or zonings that may abut the land.
To obtain a Planning Certificate go to Titles and Property Certificates at Landata - https://www.landata.vic.gov.au

For details of surrounding properties, use this service to get the Reports for properties of interest.

To view planning zones, overlay and heritage information in an interactive format visit https://mapshare.maps.vic.gov.au/vicplan

For other information about planning in Victoria visit https://www.planning.vic.gov.au

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PLANNING PROPERTY REPORT

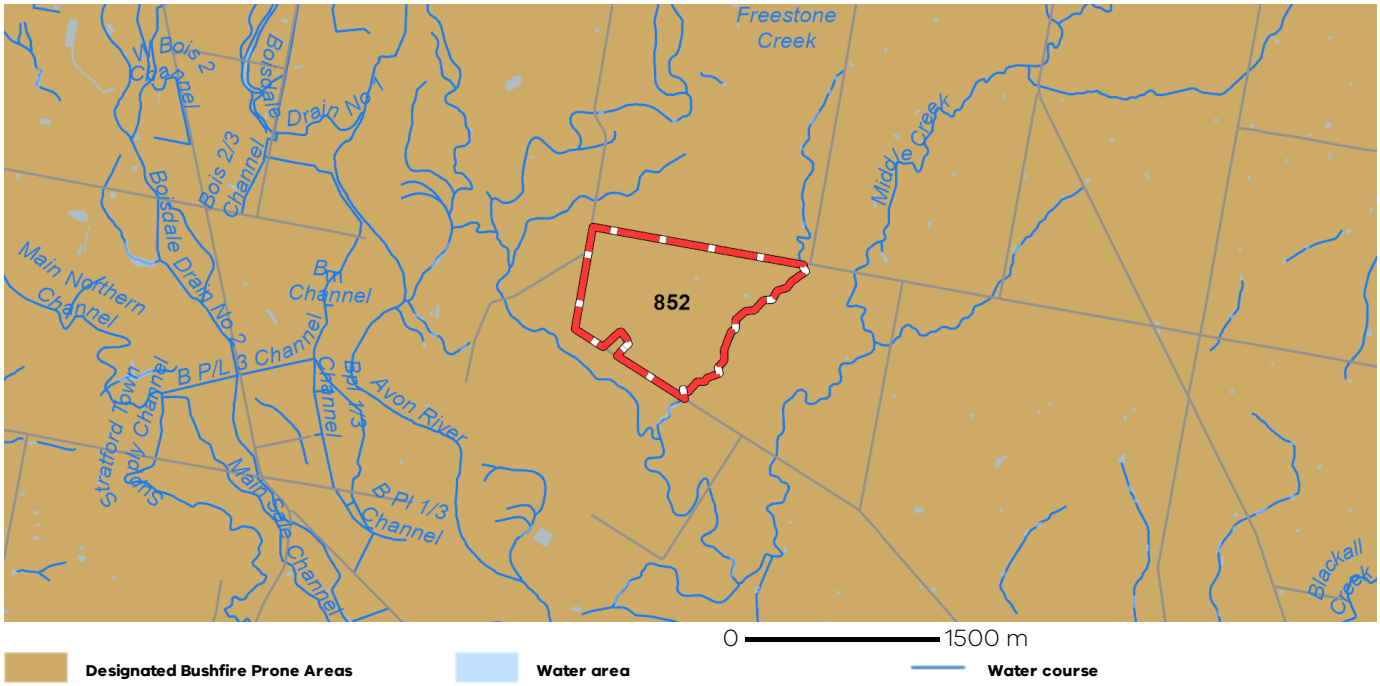
Department of Transport and Planning

Designated Bushfire Prone Areas

This property is in a designated bushfire prone area. Special bushfire construction requirements apply to the part of the property mapped as a designated bushfire prone area (BPA). Planning provisions may apply.

Where part of the property is mapped as BPA, if no part of the building envelope or footprint falls within the BPA area, the BPA construction requirements do not apply.

Note: the relevant building surveyor determines the need for compliance with the bushfire construction requirements.



Designated BPA are determined by the Minister for Planning following a detailed review process. The Building Regulations 2018, through adoption of the Building Code of Australia, apply bushfire protection standards for building works in designated BPA.

Designated BPA maps can be viewed on VicPlan at https://mapshare.vic.gov.au/vicplan/ or at the relevant local council.

Create a BPA definition plan in VicPlan to measure the BPA.

Information for lot owners building in the BPA is available at https://www.planning.vic.gov.au.

Further information about the building control system and building in bushfire prone areas can be found on the Victorian Building Authority website https://www.vba.vic.gov.au. Copies of the Building Act and Building Regulations are available from http://www.legislation.vic.gov.au. For Planning Scheme Provisions in bushfire areas visit https://www.planning.vic.gov.au.

Native Vegetation

Native plants that are indigenous to the region and important for biodiversity might be present on this property. This could include trees, shrubs, herbs, grasses or aquatic plants. There are a range of regulations that may apply including need to obtain a planning permit under Clause 52.17 of the local planning scheme. For more information see Native Vegetation (Clause 52.17) with local variations in Native Vegetation (Clause 52.17) Schedule

To help identify native vegetation on this property and the application of Clause 52.17 please visit the Native Vegetation Information Management system https://nvim.delwp.vic.gov.au/ and Native vegetation (environment.vic.gov.au) or please contact your relevant council.

You can find out more about the natural values on your property through NatureKit NatureKit (environment.vic.gov.au)

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APPENDIX 3 – PROPOSAL FORM

Table 9-1 - Proposal Applicant, owner and manager details

Proponent Name:	
Contact Name:	
Postal Address:	
Mobile:	
Email:	
Feedlot Name:	Llowalong Beef
Name of property owner:	
Postal Address:	
Mobile:	
Email:	
Address of feedlot:	852 Llowlong,
	Llowlong, Victoria, 3862
Managers Details	
Name:	
Contact number:	
Email:	
Property Description	
Volume:	12448
Folio:	799
Crown Allotment:	2\PS905315E
Section(s)-	5
Parish:	Stratford
Copy of title provided?	Yes

Table 9-2 - Compliance with Code:

AM			Compliant	Non-Complaint	Report Section
1	Outside a declared special water supply catchment?		✓		2.8
2	Above 1 in 100 year flood level		✓		2.8
	Outside an active flood plain		✓		2.8
3	Distance from the boundary of feedlot works area to nearest dwelling	823m	✓		2.4
4	Set back of feedlot works area from nearest watercourse	Waterway (un-named) 756m	✓		
5	Set back from water storage, bore or take off for potable water supply	Own D&S bore	✓		
6	Setback of feedlot works area – not less than 200m from any road	50m	Alternate Measure		
7	Pen area	13,338m^2 (incl hospital)	✓		
	Density	6m^2/Head – Class A	✓		
	No of cattle	2,206 (1,830 SCU)	✓		
8	Pen slope Not less than 2% and greater that 6%)		Alternate Measure		
9	Mounds or levies shown on plan – waste water cut off	Not relative to application	Alternate Measure		
10	Mounds of levies shown on Plan – freshwater cut off	Border bank levee	✓		Plans
11	Liquid waste dispersal details provided – plan attached	Buffer Plan Effluent Buffer Plan Solids	✓		Plans

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AM			Compliant	Non-Complaint	Report Section
12	Area for liquid waste dispersal (not less than 2 ha)	106ha	✓		WMP
13	Area for solid waste application (not less than 1ha/5 cattle housed)	207ha	✓		WMP
14	Drinking trough surround preparation	Gravel overlaid by concrete apron	✓		3.3.6
15	Feed trough surround preparation	Gravel overlaid by concrete apron	✓		3.3.4
16	Pen cleaning frequency (not less than annually and just prior to onset of wet season)	Min every 7-8 weeks	Alternate Measure		3.3.4
17	Feedlot operation proposed to keep surface in a generally dry condition and avoid development of wet areas within the pen area	Feedlot is a covered housing system	Alternate Measure		3.3.9
18	Feedlot operation proposed to keep feed and water troughs in a clean condition		✓		3.3.4 3.3.6
19	Prevention of propagation of weeds and spread of vermin and flies		✓		3.3.6

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APPENDIX 4 – VICTORIAN CATTLE CODE ELEMENT ASSESSMENT SUMMARY

ELEMENT 1 – LOCATION AND SIZE

Objective

The development of feedlots on appropriate sites having regard to existing and foreseeable residential development and urban communities.

Table 9-3 - Location and Size

1.3	Requirement	Response
Standard Cattle Units	Turn off liveweight	600kg
	No. of standard cattle units	1.0
	No of head	2,206 head
	Total SCU	1,830 SCU
Feedlot Class		A
Proposal Stocking Density	Pen Area:	13,338m^2 Pen area incl hospital
	Total SCU:	1,830
	Calculated Pen Density:	7.2m^2/SCU 6m^2/head
Annual Rainfall		<750mm
Site Description		Flat
		Open country

Receptor separation distance summary

Receptor type	S1	S2	S3	S4	SN	√N	Required	Available
Isolated house	19	1	1	1	19	42.8	813m	823m
Two houses	19	1.5	1	1	28.5	42.8	1,220m	>5,000m
Three houses	19	2	1	1	38	42.8	1,626m	NA
Briagolong/Boisdale	19	4	1	1	76	42.8	3,251m	3,608m
Stratford/Maffra	19	5	1	1	95	42.8	4,064m	4,845m

See **Section 2.4** for further information on Sensitive Receptors

AM	Requirement	Response	Compliant	Report Section
1.2	Access to areas for Solid and Liquid Waste Disposal	See attached plan.	➢	5.5
1.3	Environmental Buffer Separation distances for Solid and Liquid Waste	See attached plan.	➢	5.1
1.4	Boundary Setbacks	See attached plan	➢	5.1

ELEMENT 2 – DESIGN AND CONSTRUCTION

Objective

A coherent layout that provides an efficient design which minimises the impact on the environment, and allows the collection and treatment of all wastes in a manner that does not give rise to any off-site detriment.

AM	Requirement	Response	Compliant	Report Section
2.1	Pen floor preparation	Pen floor is prepared by grading with a smooth, even and compacted finish.	✓	**5.2**
		Suitable clay will be used for compacted base.	✓	
		NA – class A feedlot	NA	
		NA – class A feedlot	NA	
2.2	External Surface Runoff Control	Clean surface runoff is diverted from areas affected by animal waste and spilt feed by diversion structures.	✓	
		The runoff from affected areas is directed to the runoff control system.	Alternate Measure	

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AM	Requirement	Response	Compliant	Report Section
		Diversion structures are designed to accommodate 1 in 20 year recurrence interval storm having a duration producing the maximum runoff flow rate (a one hour figure will be acceptable).	✓	
		Overflow runoff is dispersed before reaching and waterway.	✓	
2.3	Laneways	Feed trucks are able to deliver feed directly to feed bunks.	Alternate Measure	**5.2**
		Cattle handling laneways provide for free movement of stock. Minimum width of 4m for cattle only lanes.	✓	
		Laneways should allow all-weather access, be graded and have consolidated surface.	✓	
		Laneways to have free drainage of runoff, max longitudinal fall 6%.	✓	
2.4	Cattle handling yards	Yards and facilities adequate for speedy trouble free handling of cattle and are included in feedlot layout.	✓	3.3.2
		Yards have an all weather floor surface.	✓	
		Yards are to be designed to meet animal welfare requirements.	✓	
2.5	Water Supply	The water supply is adequate for stock watering and dust control.	✓	3.3.5
2.6	Internal Pen Drainage control	Maximum pen to pen drainage is less than 50% of total runoff. Pen to pen slope = 0.03%.	Alternate Measure	5.2
		Pen to pen slope is less than pen to drain slope. Pen to drain slope = 3%.	Alternate Measure	
2.7	Feed Troughs	Feed spillage is minimised by appropriate trough design.	✓	5.2
		Troughs have fully enclosed bases or are designed to allow adequate mechanical cleaning under troughs. Note feed table system proposed.	Alternate Measure	
2.8	Water Troughs	Water drained from the trough during cleaning is drained directly from the pen – without wetting pen surface.	✓	3.3.5
		Water supply flow is adequate for maximum design.	✓	
		Water troughs are constructed with enclosed vertical sides and ends to prevent the accumulation of manure under trough.	✓	
		Drainage from the trough passes immediately into the feedlot drainage system without passing across the pen floor.	✓	
2.9	Fencing	There is a minimum of 350mm clearance along the bottom of fences to allow mechanical cleaning.	Alternate Measure	5.2
2.10	Feed Trough Aprons	Feed trough aprons are designed to withstand the load of pen cleaning machinery – **reinforced concrete.**	✓	3.3.4
		Aprons extend to a minimum of 2.5m clear of trough into the pen.	✓	
		Aprons slope away from the trough.	Alternate Measure	
2.11	Water Trough Aprons	Water trough aprons are designed to withstand the load of pen cleaning machinery – **reinforced concrete.**	✓	3.3.5 5.2
		Aprons extend to a minimum of 2.5m clear of trough into the pen.	✓	
		Water trough aprons extend around the end of the trough.	✓	
		Aprons slope away from the trough.	✓	
2.12	Drains	Drains have a minimum fall of 0.4% and a maximum fall of 1%.	✓	5.2 WMP
		Drains accommodate a 1 in 20 year peak flow rate using the "rational Method, Australian Rainfall and Runoff" at a non-scouring velocity.	✓	
		Any overflow from the drains that would otherwise escape from the feedlot site boundaries should be diverted to the runoff storage dam.	✓	
2.13	Service Roads	The feedlot is serviced by internal roads adequate to carry the vehicle traffic generated by the feedlot.	✓	5.6
		Roads satisfy the requirements of element 6.	✓	

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ELEMENT 3 – ODOUR

Objectives

- *Protection from amenity-reducing off-site odour effects of cattle feedlots by recognising the need for a buffer separation.*
- *Best practice emission control technology is used to ensure that routine emissions satisfy the requirements of State Environment Protection Policy - The Air Environment.*
- *Provision of a guide to planners when considering the zoning of sensitive land use proposals near cattle feedlots.*

AM		Requirement	Response	Compliant	Report Section
3.1	Have the separation distances determined by AM1 of Element 1 been adopted? If not, supporting documentation to justify any lesser distance must be provided.	An odour assessment has been undertaken utilising the S-Factor separation distance methodology. The assessment considered receptor sensitivity, operational design, climatic conditions, terrain, vegetation and management practices associated with the proposed covered housing feedlot system. The proposal incorporates covered cattle accommodation areas which eliminate direct rainfall interaction within the pens and provide improved operational and environmental management outcomes relative to conventional open feedlot systems. Supporting assessment information is provided within Section 5.3 and Appendix 5 – Odour Assessment.		✓	5.3 Appendix 5

ELEMENT 4 – NOISE

Objective

Noise levels generated by the feedlot do not cause any material detriment to nearby residents or persons affected by transport of cattle and feed associated with the operation of the feedlot.

AM	Requirement	Response	Compliant	Report Section
4.1	SEPP – Noise - Checked	The proposal has been assessed having regard to the requirements of the relevant State Environment Protection Policies and applicable noise management considerations associated with the operation of the feedlot. Operational noise associated with the proposal is expected to be managed through separation distances, covered housing infrastructure and operational management practices associated with the feedlot operation.	✓	5.4
4.2	Night time noise not to exceed ambient levels	Feedlot operations are primarily proposed during daytime operational periods with limited night-time operational activity anticipated at the site. The scale and nature of the operation together with separation distances and covered housing infrastructure are expected to minimise the potential for	✓	

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AM	Requirement	Response	Compliant	Report Section
		unreasonable night-time noise impacts at surrounding receptors.		
4.3	Location of truck access points	Internal service roads and operational access points associated with the feedlot have been designed to utilise the broader farm access network and maximise separation from surrounding sensitive receptors where practicable.	✓	
4.4	Efficient exhaust mufflers to all vehicles	Vehicles and operational machinery associated with the feedlot will utilise standard operational noise controls including appropriate exhaust and muffler systems maintained in operational condition.	✓	

ELEMENT 5 – WASTE STORAGE AND TREATMENT

Objectives

- No liquid or solid wastes from the feedlot shall be allowed to enter into any stream or watercourse, ground water or to contaminate any land so as to render it unfit for future farming activities.
- The waste treatment system is designed and operated in such a manner as to minimise the likelihood of odour and to allow the maximum recovery of material from the waste stream.
- Waste products are incorporated into a crop production system so that a balance between nutrients applied and nutrients removed through the crop is achieved.

AM	Requirement	Response	Compliant	Report Section
5.1	Settled Manure Volume	Covered housing system substantially reduces rainfall interaction with manure and bedding materials. Covered housing system substantially reduces rainfall interaction with manure and bedding materials and eliminates runoff generation from exposed cattle accommodation areas.	✓	5.5.4
5.2	Settling Basin Stilling Volume	Settling infrastructure designed generally in accordance with the requirements of *the Code* and supporting Waste Management Plan. Required stilling volume 100m³.	✓	
5.3	Runoff Storage	Stormwater and controlled drainage storage pond capacity approximately 15ML.	✓	
5.4	Runoff Dispersal Area	Captured runoff reused within existing irrigation system associated with the farming enterprise. 111ha available for nutrient irrigation reuse and nutrient utilisation after setbacks.	✓	
5.5	Waste Stockpile	Stockpile runoff is captured within the controlled drainage system.	✓	
		Manure and bedding storage area constructed with compacted operational surface.	✓	

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AM	Requirement	Response	Compliant	Report Section
5.6	Solid Waste Use	Feedlot exceeds 1,000 SCU therefore nutrient balance assessment undertaken.		
	1a) Is an area of land available to allow a ratio of 5 SCU per ha?	NA		
	1b) Is a nutrient balance statement provided?	Yes	✓	**Appendix 6** - WMP
	2) Land used for solid waste disposal above the 1 in 20 year flood line?		✓	5.1
	3) Is all the land used for disposal on plans attached? If no, provide further details of disposal.	Sufficient agricultural land is available to support nutrient reuse associated with the operation.	✓	**Appendix 6**
	Details of off-site disposal provided?	Yes	✓	Appendix 6 & Plan
5.7	Monitoring	Soil monitoring or reuse areas undertaken periodically.	✓	**Appendix 6** - WMP
		Crop production monitoring undertaken as part of ongoing farm management.	✓	
		Monitoring and inspection of drainage and storage systems undertaken.	✓	
5.8	Runoff Irrigation	Irrigation reuse area based on nutrient, salt and water balance assessment. ~~Ref Guideline 168.~~	✓	**Appendix 6** - WMP
		Available irrigation reuse area exceeds Code minimum requirements.	✓	
		Runoff reuse areas separated from primary solid waste reuse areas.	✓	
5.9	Runoff Dispersal System	Alternate irrigation for <500SCU.	Not applicable	
		Direct runoff dispersal system not utilised.	Not utilised	5.5.4
		Keyline contour cultivation to be incorporated in dispersal system.	Not applicable to Class A	-
		Disposal area checked and re-worked if necessary each year to preserve capacity.	✓	**Appendix 6**- WMP
		Dispersal systems are located outside special water supply or groundwater re-charge areas.	✓	
5.10	Avoidance of Groundwater Contamination	Soil under feedlot pens will be compacted to impermeable state to 90% of max. field compaction	✓	5.2
		Manure collection areas and drains should be treated and compacted so as to be impermeable	✓	
		Ponds in permeable soils should be lined with clay or other suitable material to reduce permeability	✓	
		Manure stockpile pads on permeable soils should be treated and compacted.	✓	
5.11	Waste Management Plan	Provided	✓	**Appendix 6**
5.12	Salinity	Regard is had to salinity of ground water in preparing the waste management plan	✓	
		Salt levels in feed are set having regard to animal salt requirements and salinity of drinking water	✓	

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AM	Requirement	Response	Compliant	Report Section
5.13	Salt Budget	A salt budget is developed for all pasture disposal areas.	✓	Appendix 6 - WMP
		References is made to Salinity Management Plan if one exists for the area in which the feedlot is located	NA	
5.14	Disposal of Animal Carcasses	Dead animals are disposed of in a pit of sufficient depth that there is not less than 1m of soil above the carcass or as disposed of off-site by the responsible authority	✓	5.5.3
		Soil conditions are of a nature that no seepage to groundwater will occur	✓	
		There is a plan for carcasses disposal in the event of a mass mortality event.	✓	

ELEMENT 6 – TRAFFIC AND PARKING

Objectives

- *Efficient operation and function of arterial and local roads and appropriate access to the site. 02 Sufficient and convenient parking for employees, visitors, delivery and service vehicles.*
- *Sufficient area set aside within the site to accommodate all vehicle movements associated with the delivery of cattle and goods to and from the premises.*
- *Detrimental impacts of vehicle accommodation and access on the amenity of nearby residents and population centres is minimised.*

AM			Compliant	Report Section
6.1	Access	Access has been approved by DoTP (formerly Vicroads) or Council (**Existing)**	✓	5.6 (Existing)
6.2	Driveways and Access Roads (Width)	Driveways are not less than 6m wide and 9m wide where truck parking is provide parallel to the roadway	✓	
	Driveway	Must exceed 6m wide and 9m wide where truck parking is parallel.	✓	
6.3	Loading Ramp Location	Ramp is accessible internal of property with sufficient area for turning and parking	✓	
6.4	Surface Treatment. Driveway and access road preparation and treatment	All access roads capped with gravel base	✓	
6.5	Parking Estimated number of employees	1 - existing	✓	
	Number of car spaces	6	✓	
	Number of truck parking spaces	1 at yards, 1 at commodities	✓	

ELEMENT 7 – LANDSCAPING

Objectives

- *A visual screen to the major buildings. handling area and pens from surrounding properties and roads.*
- *Assistance with the take up of any waterborne nutrients that have escaped from the waste system.*

AM	Requirement	Response	Compliant	Report Section
-	Plan of existing & proposed vegetation attached		✓	Plan
1	Landscaping and width of landscaping	30m	✓	5.7
2	Distance from feedlot to landscaping	30m	✓	

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AM	Requirement	Response	Compliant	Report Section
3	Access road planting	Existing and proposed	✓	
4	Approval of plan by responsible authority	Per application	✓	
5	Maintenance to be carried out	Noted	✓	

ELEMENT 8 – OPERATION AND MANAGEMENT

Objectives

- *Circumstances leading to odour production and other detriment due to the operation of the feedlot are avoided.*
- *Appropriate operations and maintenance related to the class of feedlot.*

AM	Requirement Response	Compliant	Report Section	
8.1	Feeding out and Watering		✓	3.3.4
8.2	General Routine Cleaning & Maintenance	Spilt feed is cleaned – weekly	A	5.8
		Wet patches are eliminated – weekly	A	
		Potholes in pens are repaired – weekly	A	
		Cleaning under fences is carried out – monthly	A	
		Drainage maintenance is undertaken - after rainfall	A	
		Diversion banks and dam wall maintenance is undertaken – after rainfall	A	
		Settling area maintenance is undertaken – after rainfall	A	
		Retention pond or dispersion area maintenance is conducted annually – prior to winter	A	
		Pen cleaning by removal is carried out at intervals – 14 weeks	A	
8.3	Mounding	Mound area is no more than 25% of pen area.	Alternate Measure	
		Mounds are shaped to a maximum depth of 2m with side batters of a slope not greater than 1:4.	Alternate Measure	
		Mounds are aligned in the downslope direction.	Alternate Measure	
		Mounds are located so as not to interfere with pen drainage.	Alternate Measure	
8.4	Pack Removal	The pad, a min of 50mm layer of compacted soil/manure mix is maintained	✓	
		Light ripping of the pack is undertaken, if required, prior to pack removal	✓	
		The pack is removed in a manner which does not damage the pad	✓	
		Grading the remaining pad following pack removal is carried out	✓	5.8
8.5	Pad renovation	Any necessary repairs should be made to restore the pad to original pen floor specification following pack removal.	✓	
8.6	Manure Stockpile	Stockpile areas are protected from rainfall runoff by diversion banks or drains	✓	
		Manure is dry (max 25% moisture) prior to stockpiling to prevent spontaneous combustion	✓	
		Surface of stockpile is graded to avoid rainwater ponding	✓	
		Stockpile area is drained	✓	
8.7	Disposal of Runoff	All run-off is disposed of in accordance with approved waste management plan.	✓	
		Only managed irrigation systems must be used to apply collected runoff water.	✓	
		The rate of application and volume applied allows no surface runoff to occur and no percolation into ground water.	✓	

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AM	Requirement	Response	Compliant	Report Section
			The retention pond is lowered to near bottom water level by the anticipated beginning of winter.	✓	
8.8	Manure Disposal		Manure is spread on to pasture, crop or fallow land in accordance with the approved Waste Management Plan	✓	
			The rate of application is in accordance with the specification in Element 5	✓	
8.9	Vermin & Weed Control		A program of vermin control is maintained	✓	
			A program of weed control is maintained	✓	
8.10	Cessation of Operations		When the feedlot ceases to operate, all waste material is removed and compacted manure is removed and the site restored to pasture.	✓	

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APPENDIX 5 - ODOUR ASSESSMENT

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‘S-Factor’ Odour Assessment

for the proposed ‘Llowalong Beef Co’ covered housing cattle feedlot system at 852 Llowalong Rd, Llowalong, Vic

May 2026

Progressive Rural Solutions www.prsltd.com.au

Executive Summary

This S-Factor Odour Assessment has been prepared by Progressive Rural Solutions Pty Ltd (PRS) to support a planning permit application for the establishment of the proposed Llowalong Beef Co Feedlot at Llowalong Road, Llowalong within Wellington Shire, Victoria.

The proposed development comprises a covered housing beef feedlot system with a maximum operational capacity of 2,206 head. Cattle are anticipated to enter the feedlot at approximately 400–450kg liveweight and remain on feed for up to 120 days, reaching a maximum liveweight of approximately 600kg prior to dispatch.
The proposed operation has been designed around a controlled housing, drainage and nutrient recovery philosophy and incorporates:

- Covered housing feedlot system,
- feedlot feeding infrastructure capable of supporting future automated and robotic feeding systems,
- manure and bedding recovery areas,
- integrated stormwater and controlled drainage infrastructure,
- nutrient recovery and reuse systems, and
- supporting operational and agricultural infrastructure.

Unlike conventional open feedlot systems contemplated under the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***") methodology, cattle within the proposed development will be housed within covered accommodation areas for the full feeding cycle. The proposed design substantially reduces direct rainfall interaction with manure and bedding materials within the primary cattle housing areas and is intended to support improved manure management, controlled drainage and nutrient recovery outcomes.

Potential odour sources associated with the operation include cattle housing areas, manure and bedding storage areas, sediment settling infrastructure and stormwater storage systems associated with runoff capture and reuse. The potential for odour impacts has been assessed using the S-Factor methodology outlined in ***the Code***. Based on the anticipated cattle liveweight profile and feeding cycle, the proposed operation equates to approximately 1,830 Standard Cattle Units (SCU). The assessment adopted:

- a Design and Management Factor (S1) of 19,
- a Terrain Factor (S3) of 1.0, and
- a Vegetation Factor (S4) of 1.0.

Application of the S-Factor assessment methodology results in calculated minimum separation distances of:

- 813m for a single rural dwelling,
- 1,220m where two dwellings occur within 250m of each other,
- 3,251m for towns greater than 100 persons, and
- 4,064m for large towns greater than 2,000 persons.

The surrounding townships of Stratford, Boisdale, Maffra and Briagolong are all located beyond the calculated separation distances. Assessment of surrounding rural dwellings using the Rural Method also indicates that all assessed non-owned rural dwelling receptors exceed the applicable separation distance requirements.

The assessment concludes that the proposed Llowalong Beef Co Feedlot incorporates a range of operational and design measures expected to substantially reduce odour generation potential relative to a conventional open feedlot operation, including covered cattle accommodation, routine manure and bedding removal, reduced rainfall interaction with manure and bedding materials, controlled drainage infrastructure and nutrient recovery systems.

Based on the assessment undertaken, the proposed development is considered capable of operating without resulting in unreasonable off-site odour impacts and is considered compliant with the separation distance framework contained within ***the Code***.

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Related Documents

Type	Author	Name	Date
Report	Progressive Rural Solutions	Application for a permit for a 2,206 head covered beef cattle feedlot at 852 Llowalong Road, Llowlong	28/05/2026
Report	Progressive Rural Solutions	Waste Management Plan for the 'Llowalong Beef Co Feedlot' at 852 Llowalong Rd, Llowalong, Victoria	28/06/2026
Site Plans: Existing Condition	NJC Irrigation Solutions	Existing Plan	01/06/2026
Site Plan: Proposed Condition	NJC Irrigation Solutions	IS-800 shedded feedpad Plan	28/05/2026
Cross Section Plan	NJC Irrigation Solutions	IS-800 ..... shedded feedpad cross sections	01/06/2026
Locality Plan	NJC Irrigation Solutions	IS-800 Shed Locality Plan	02/06/2026

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1. INTRODUCTION

1.1. ORGANISATION

This report has been commissioned by **Llowalong Beef Co**, being the landowner and project ***Applicant*** for the proposed feedlot development. Following construction and commissioning, the site will be owned and operated by the ***Applicant***, who is referred to throughout this document as the owner, operator and manager of the facility.

This report has been prepared by **Progressive Rural Solutions Pty Ltd (PRS)**. The principal author of this report is Director of Progressive Rural Solutions, who has been engaged to undertake the odour assessment components associated with the proposed feedlot development and Planning Permit application.

1.2. PURPOSE

The purpose of this Odour Assessment Report is to:

- identify the existing climatic, topographic and surrounding land use conditions relevant to odour generation and dispersion,
- review the proposed feedlot layout, infrastructure and operational characteristics in relation to odour generation potential,
- identify surrounding sensitive receptors utilising publicly available mapping, aerial imagery and information supplied by the Applicant,
- identify and describe the primary potential odour sources associated with the proposed development,
- assess appropriate separation distances for the operation utilising the *Victorian Code for Cattle Feedlots (1995) (**"the Code"**)* 'S-Factor' methodology,
- assess the influence of covered housing infrastructure, manure management and integrated stormwater management on odour generation potential, and
- provide an assessment of the likely odour risk associated with the proposed development.

The assessment has been undertaken using publicly available climatic, topographic and regional land use information together with site inspections and review of the proposed development plans and operational information supplied by the Applicant.

No detailed odour dispersion modelling has been undertaken as part of this assessment. The assessment has instead been based on ***the Code***'s separation distance methodology together with consideration of the proposed covered housing design, integrated stormwater management system and operational mitigation measures incorporated into the development.

1.3. BACKGROUND & PROJECT HISTORY

operate a mixed-enterprise farming business centred around livestock production and fodder cropping in the Llowalong district. Since commencing their farming enterprise in 2015, the operation has expanded from an initial 200-hectare lease to a business now managing more than 1,300 hectares of owned and leased land. The enterprise currently incorporates cattle breeding, backgrounding and finishing operations, supported by fodder production including maize and lucerne together with agricultural contracting services within the local farming community.

The property at 852 Llowalong Road forms part of the family's existing cattle breeding operation. The proposed 2,206 head feedlot represents a logical progression of the established livestock enterprise, providing greater operational control over cattle finishing activities and improving the efficiency, resilience and long-term sustainability of the broader farming business.

The proposed development has been designed having regard to ***the Code*** and relevant industry guidance including the *National Guidelines for Beef Cattle Feedlots in Australia* (2012). The feedlot incorporates covered cattle housing, integrated stormwater management infrastructure, controlled drainage systems, manure and bedding recovery areas and irrigation reuse infrastructure intended to support contemporary environmental management and nutrient recovery practices.

The feedlot has also been designed to integrate with the broader farming enterprise. Fodder produced on-farm will contribute to feed supply, while recoverable manure, bedding material and captured runoff generated by the feedlot will be reused within the existing cropping program as nutrient resources. This integrated approach supports nutrient recovery, improved soil health and broader farm productivity outcomes while also reducing waste generation and minimising the potential for off-site environmental impacts.

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This *Odour Assessment Report* has been prepared to assess the potential odour impacts associated with the proposed feedlot development and to assess the suitability of the site in relation to surrounding land uses. The assessment considers the proposed operational design, covered housing infrastructure, manure and bedding management practices, integrated stormwater management system and the separation distances available to surrounding sensitive receptors.

The ***Applicants*** intend to operate the facility in accordance with recognised industry standards and intend to seek accreditation under the National Feedlot Accreditation Scheme (NFAS), which requires the implementation of robust operational and environmental management systems relevant to manure management, drainage management and environmental performance.

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2. SITE DESCRIPTION

2.1. LOCATION

The proposed feedlot is located at 852 Llowalong Road, Llowalong within the Wellington Shire local government area in Gippsland, Victoria. The site is centrally located between the regional townships of Maffra, Stratford and Briagolong, being approximately 6.7 kilometres north-east of Maffra, 7.4 kilometres north-west of Stratford and 6.7 kilometres south-west of Briagolong.

The proposal forms part of an existing agricultural holding currently utilised for grazing and cropping activities and will represent a transition from broadacre agricultural production to an integrated covered cattle feedlot and agricultural nutrient reuse system.

The proposed feedlot infrastructure has been sited within the north-western portion of the property having regard to separation distances to surrounding sensitive receptors, topography and drainage characteristics, operational efficiency, integration with the broader farming enterprise, prevailing land use patterns and the ability to establish an effective controlled drainage system. The feedlot has been designed in a north-south orientation to support operational functionality, drainage management and shed performance.

The proposed feedlot infrastructure is located generally greater than 50m from property boundaries and adjoining roads and greater than 700 metres from the nearest dwelling. Assessment of available groundwater information has also identified that there are no registered operational groundwater bores within the immediate vicinity of the proposed development area.

The surrounding locality is characterised by agricultural land uses including grazing, irrigated cropping and rural residential development associated with the broader Gippsland farming landscape.

A Property Planning Report has been prepared and supplied as part of the planning application documentation.

The specific location of the project site is shown below in **Figure 2-1** and **Table 2-1** below.

Table 2-1 - Land details of the feedlot area

Details	Specific related to project site	
Address	852 Llowalong Road, Llowalong	
Crown Allotment	2	
Plan	PS905315	
Parish	Stratford	
Local Shire Council	Wellington	
Catchment Area	Thomson	
Surface Water Source	Avon River	
IBRA Sub-region	Gippsland Plain	
Traditional Owners/Land Council	Gunaikurnai Land and Waters Aboriginal Corporation	
Land Stature	Freehold	
Area of project (Works area)	9ha	
GPS Reference:	MGA Zone	55
	Easting	502720
	Northing	5805447
	Longitude	-37.898492
	Latitude	147.030938

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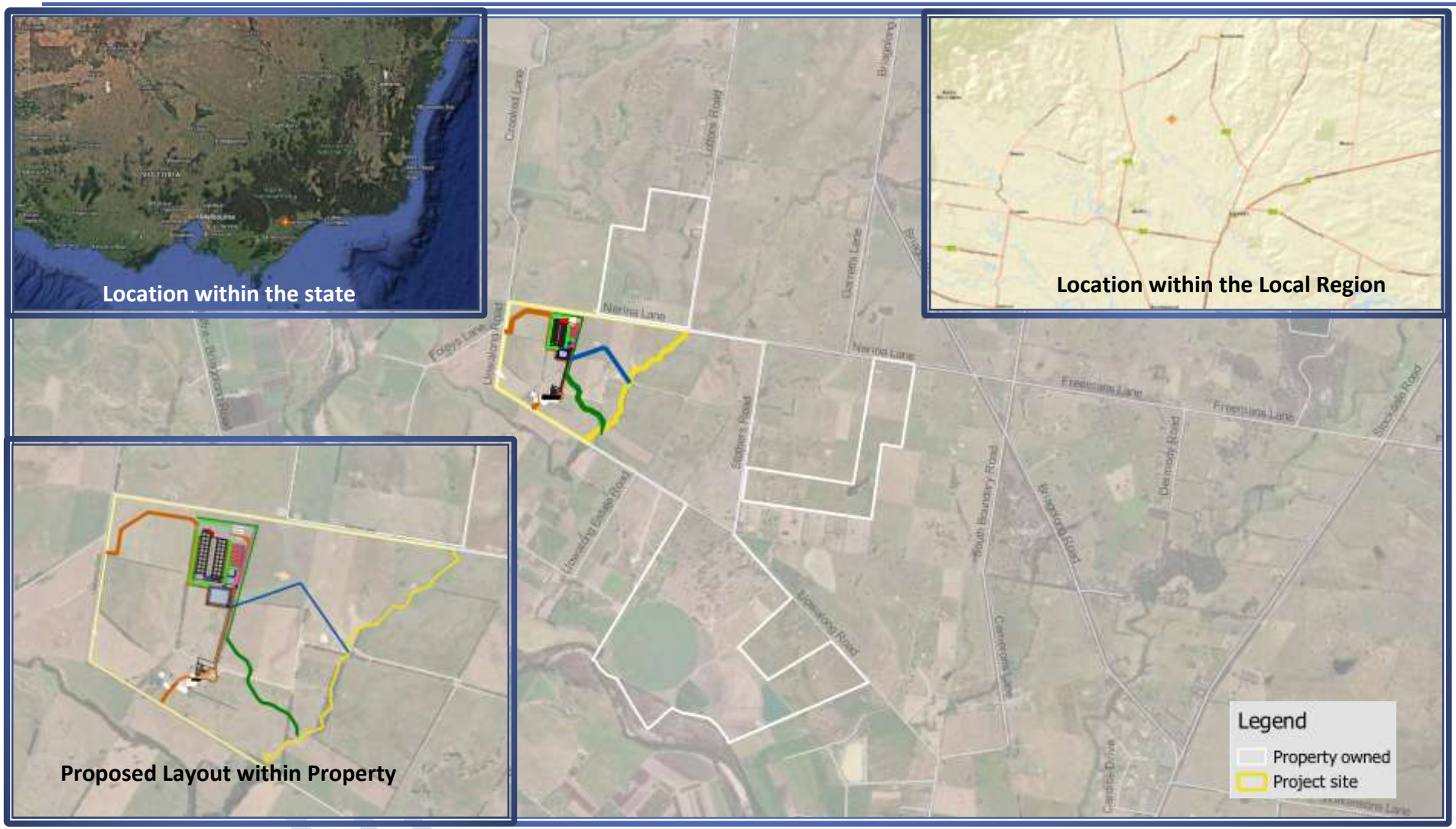

Figure 2-1 - Location of proposed feedlot in relation to the State, local region, property owned and project property (Source PRS QGIS)

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2.2. SITE SURROUNDS

The project is located within the Central Gippsland region of eastern Victoria. The surrounding landscape is characterised by a mixture of fertile river flats, undulating grazing land and broader agricultural production areas typical of the Gippsland farming region. Dairy farming is a dominant land use within the locality, supported by extensive irrigation infrastructure, together with beef grazing, fodder production and broadacre cropping activities.

The subject property and surrounding land are utilised primarily for agricultural production including grazing, irrigated cropping and dryland farming systems. Cropping activities within the locality commonly include winter cereals, oilseeds, legumes and fodder production integrated with livestock enterprises including sheep and cattle production.

The surrounding farming landscape has historically supported intensive and broadacre agricultural activities, including livestock production, as an established component of the regional land use pattern.

The locality is serviced by established rural infrastructure including local road networks, electricity, telecommunications, internet services and irrigation water supplied via existing channel and pumped water systems associated with the Avon River catchment.

2.3. SENSITIVE LAND USES & RECEPTORS

The surrounding locality is characterised by a combination of agricultural and rural land uses typical of the broader region, including dairy farming, beef grazing, dryland cropping and grazing enterprises. Plantation forestry and renewable timber production activities are also established within larger the surrounding area.

Land within the immediate vicinity of the proposed development is generally comprised of large rural allotments utilised for agricultural production purposes. A number of rural dwellings are located throughout the locality, including several dwellings associated with the broader farming enterprise operated by the ***Applicant***.

Potential sensitive receptors surrounding the proposed development primarily comprise:

- rural dwellings,
- nearby township settlements, and
- associated rural residential and agricultural accommodation areas.

The nearest population centres to the proposed feedlot include Stratford, Boisdale, Maffra and Briagolong. These townships, together with surrounding rural dwellings, have been assessed as part of the S-Factor methodology undertaken for the proposed development.

Table **2-2** and Figure **2-2** provide a summary of the identified receptors and their relationship to the proposed feedlot development.

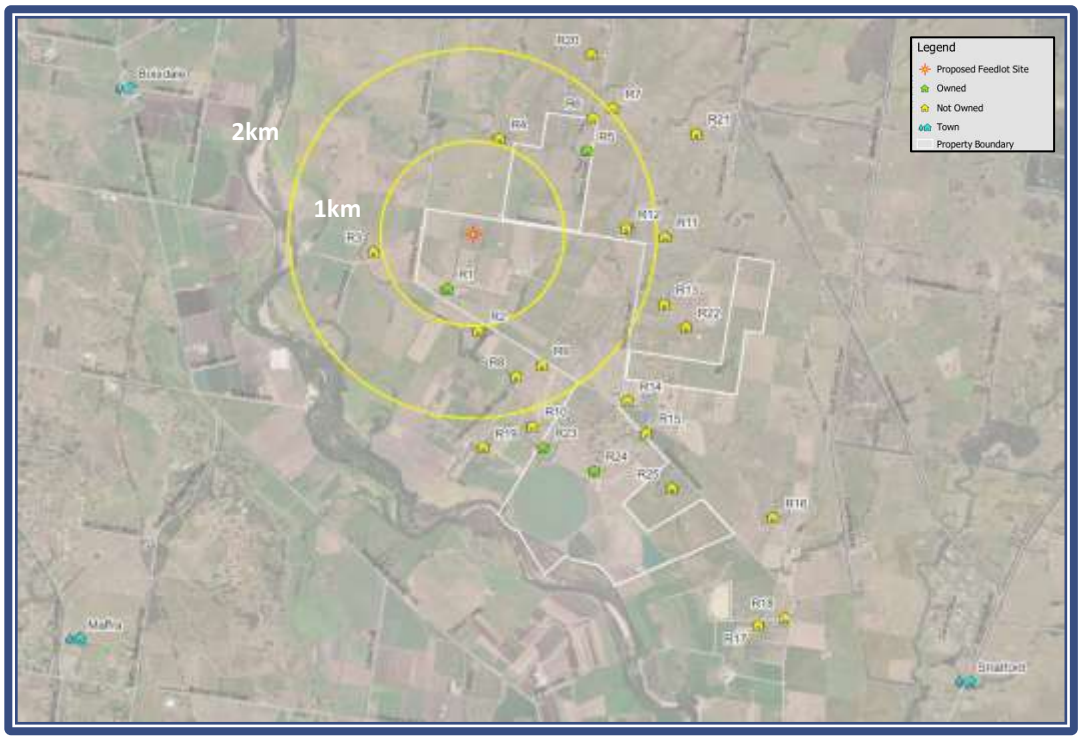

Figure 2-2 Project site in relation to surrounding receptors (Source: PRS QGIS)

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Table 2-2 – Identified Surrounding Receptors in relation to the site

ID	Address	Type	Distance (m)	Comment
R1	862 Llowalong Road Llowalong	Single Dwelling	490	Owned
R2	809 Llowalong Road Llowalong	Single Dwelling	823	Isolated rural dwelling
R3	56 Foleys Lane Llowalong	Single Dwelling	897	Isolated rural dwelling
R4	253 Crooked Lane Bushy Park	Single Dwelling	906	Isolated rural dwelling upslope
R5	85 Lottons Road Llowalong	Single Dwelling	1,260	Owned
R6	125 Lottons Road Llowalong	Two Dwellings within 250m	1,570	Rural dwelling upslope near R7
R7	136 Lottons Road Briagolong	Two Dwellings within 250m	1,752	Rural dwelling upslope near R6
R8	26 Llowalong Estate Road Llowalong	Single Dwelling	1,381	Isolated rural dwelling
R9	729 Llowalong Road Llowalong	Single Dwelling	1,393	Isolated rural dwelling – small title
R10	713 Llowalong Road Llowalong	Single Dwelling	1,968	Isolated rural dwelling – re-use only
R11	174 Nerina Lane Briagolong	Single Dwelling	1,872	Isolated rural dwelling
R12	220 Nerina Lane Briagolong	Single Dwelling	1,479	Isolated rural dwelling – re-use only
R13	120 Stothers Road Llowalong	Single Dwelling	2,034	Isolated rural dwelling
R14	6 Stothers Road Llowalong	Single Dwelling	2,210	Isolated rural dwelling – re-use only
R15	592 Llowalong Road Stratford	Single Dwelling	2,594	Isolated rural dwelling – re-use only
R16	394 Llowalong Road Stratford	Single Dwelling	4,224	Isolated rural dwelling – re-use only
R17	329 Llowalong Road Stratford	Two Dwellings within 250m	5,000	Rural dwelling near R18 – re-use only
R18	331 Llowalong Road Stratford	Two Dwellings within 250m	5,120	Rural dwelling near R17 – re-use only
R19	111 Llowalong Estate Road Llowalong	Single Dwelling	2,114	
R20	193 Lottons Road Briagolong	Single Dwelling	2,083	Isolated rural dwelling – re-use only
R21	10 Garretts Lane Briagolong	Single Dwelling	2,397	Isolated rural dwelling – re-use only
R22	100 Stothers Road Llowalong	Single Dwelling	2,318	Isolated rural dwelling – re-use only
R23	633 Llowalong Road Llowalong	Single Dwelling	2,227	Owned
R24	633 Llowalong Road Llowalong	Single Dwelling	2,648	Owned
R25	523 Llowalong Road Stratford	Single Dwelling	3,241	Isolated rural dwelling – re-use only
	Stratford	Large Town	5,828	
	Boisdale	Town	3,502	
	Maffra	Large Town	5,009	
	Briagolong	Town	6,235	

Note: shaded receptors are owned by the applicant.

2.4. CLIMATE

Meteorological conditions have the potential to influence odour generation, and dispersion associated with the proposed feedlot operation. Climatic factors relevant to this assessment include prevailing wind direction, wind speed, temperature, rainfall patterns and the occurrence of calm atmospheric conditions.

Climate data utilised for this assessment has been sourced from the Bureau of Meteorology East Sale Weather Station (Site No. 085072) together with SILO climate data records for the broader project area. The SILO grid point utilised for the assessment is located approximately 1.3 kilometres north-west of the site (Lat: -37.90, Long: 147.05).

CLIMATE RECORDS

The Llowalong locality experiences a temperate oceanic climate under the Köppen climate classification system, characterised by mild to warm summers and cool winters. Temperature conditions within the region are variable throughout the year, with recorded temperature extremes ranging from 44.6°C to -6.6°C.

Average annual rainfall within the project area is approximately 600mm, with rainfall generally distributed throughout the year and slightly higher rainfall typically occurring during the spring and early summer months. Long-term rainfall records indicate annual rainfall variability ranging from approximately 313mm in dry years to approximately 975mm in wet years.

Relevant climatic data for the locality is summarised in **Table 2-3** below.

Table 2-3 - Climate data

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Highest High	44.6	44.4	40.4	35.9	28.3	23.2	24.0	28.3	33.9	34.9	40.8	42.1	44.6
Mean Max	25.6	25.4	23.6	20.4	16.9	14.3	13.9	15.1	17.2	19.4	21.5	23.6	19.7
Mean Min	13.0	13.2	11.6	8.7	6.3	4.2	3.3	4.2	5.7	7.6	9.7	11.5	8.2
Lowest Low	3.9	3.3	2.8	-1.7	-4.2	-4.5	-6.6	-5.6	-3.7	-1.0	1.1	2.2	-6.6

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Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Mean rainfall	45.5	41.2	48.8	48.2	49.1	47.2	40.5	45.7	49.5	58.4	63.0	55.3	592.4
Mean rainfall days	8.6	7.8	9.1	10.5	12.5	13.6	14.1	14.8	14.0	13.6	12.2	10.4	141.0
Mean 9am wind speed	12.6	11.1	10.4	10.3	9.5	9.5	9.9	11.9	13.9	15.1	15.3	14.6	12.0
Mean 3pm wind speed	22.6	21.2	19.7	17.9	15.6	15.3	17.1	19.8	21.1	22.2	22.8	23.0	19.9
Mean daily evaporation	6.5	5.8	4.4	2.8	1.7	1.4	1.5	2.2	3.1	4.0	5.1	6.0	3.7

WIND RECORDS

Wind conditions within the locality are considered an important factor influencing odour dispersion characteristics associated with the proposed feedlot operation.

Wind rose data sourced from the East Sale weather station indicates that:

- calm conditions (0–1 km/h) occur approximately 15% of the time overall,
- light to gentle winds occur most frequently,
- afternoon wind conditions are generally stronger and more directionally consistent than morning conditions, and
- prevailing winds are typically from the west, south-west and south-east sectors.

Morning wind conditions are generally lighter and more variable, with calm conditions occurring approximately 23% of the time at 9am. Afternoon wind conditions are more active and directional, with calm conditions reducing to approximately 7% of the time at 3pm and westerly wind patterns becoming more dominant.

The predominance of moderate daytime wind conditions within the locality is generally considered favourable for odour dispersion. However, odour generation and dispersion potential may increase during periods of warm temperatures, elevated humidity and low wind speeds, particularly during stable atmospheric conditions.

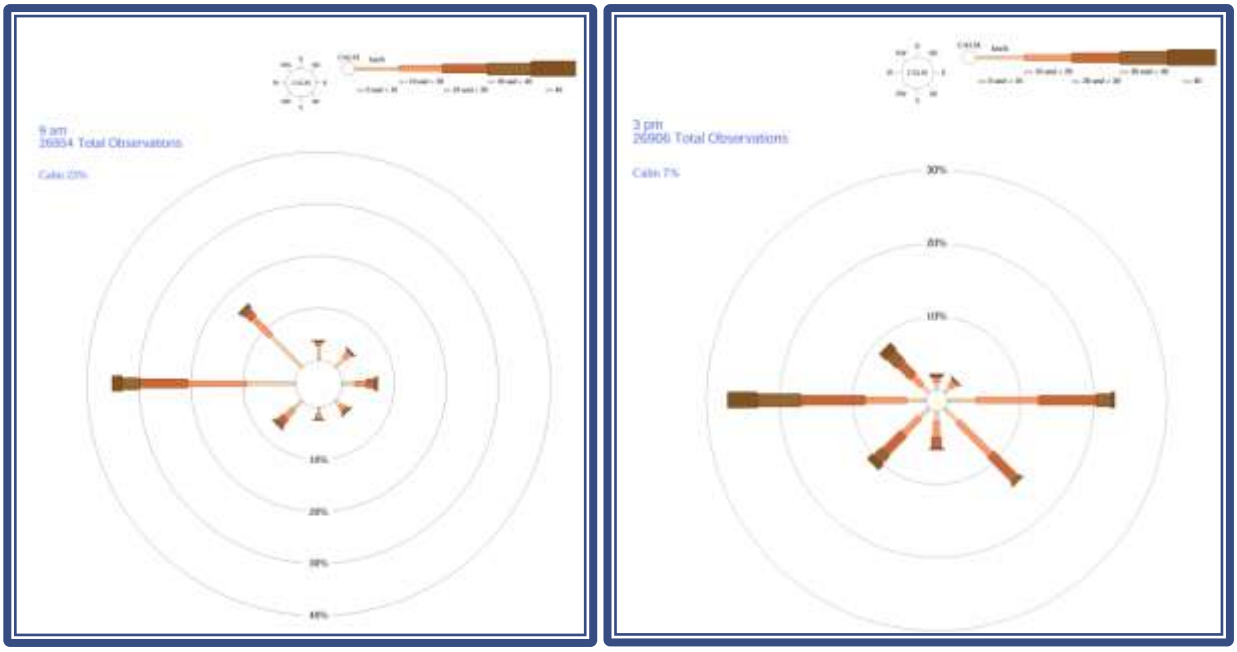

Figure 2-3 - 9AM and 3PM wind rose data (Source: BOM East Sale weather station)

RAINFALL RECORDS

Rainfall patterns influence operational conditions associated with manure moisture content, runoff generation and potential odour generation. The proposed development incorporates covered cattle housing, controlled drainage systems and routine manure and bedding recovery practices intended to minimise rainfall interaction with manure and reduce the potential for prolonged wet anaerobic conditions.

Long-term rainfall data for the locality indicates that rainfall is generally evenly distributed throughout the year, with average monthly rainfall typically ranging between approximately 40mm and 63mm.

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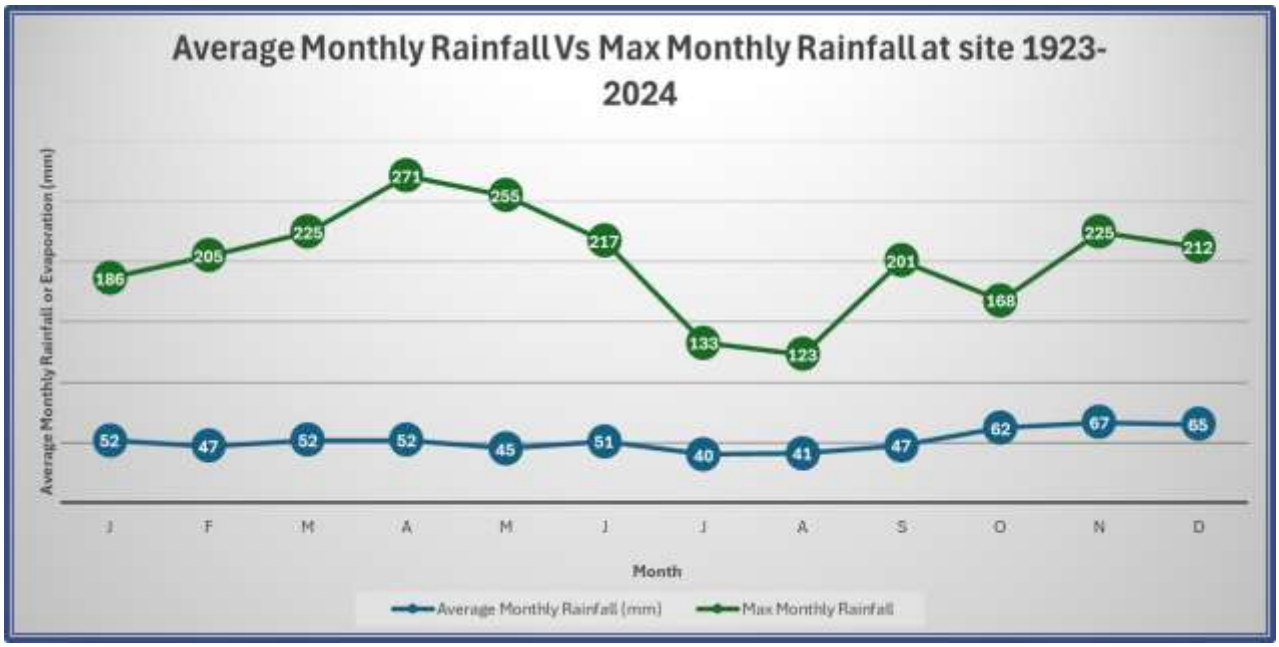
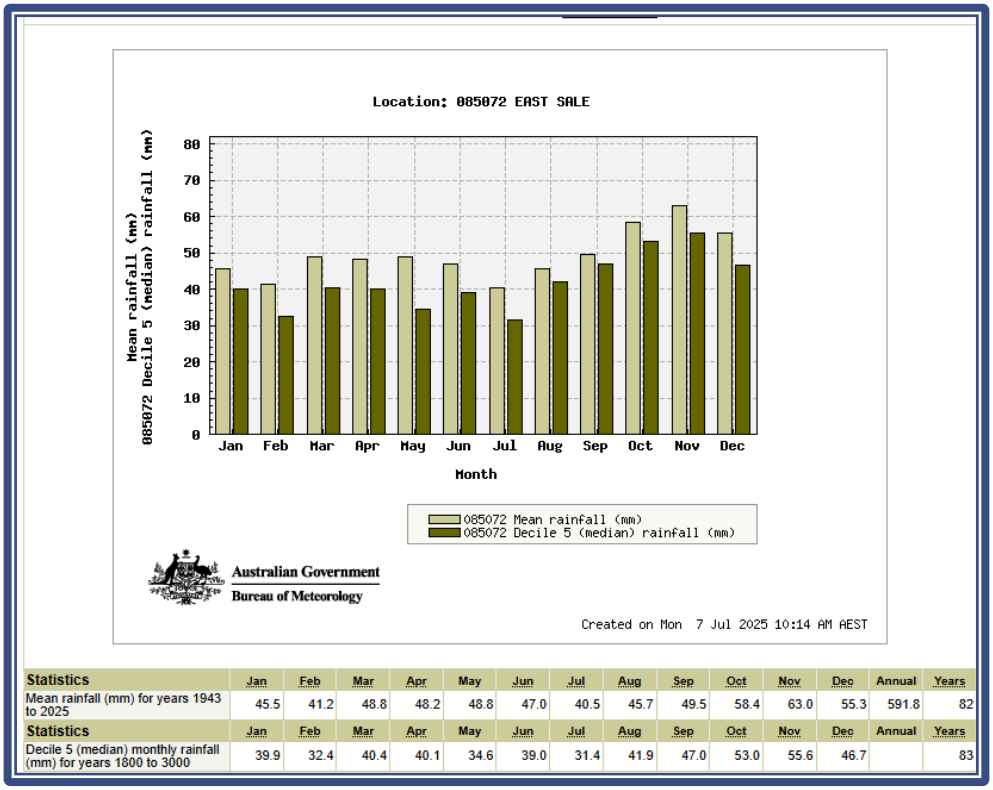


Figure 2-4 – Graph of average monthly rainfall (Source: Silo)



Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Mean rainfall (mm) for years 1943 to 2025	45.5	41.2	48.8	48.2	48.8	47.0	40.5	45.7	49.5	58.4	63.0	55.3	591.8	82
Statistics	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**	**Years**
Decile 5 (median) monthly rainfall (mm) for years 1800 to 3000	39.9	32.4	40.4	40.1	34.6	39.0	31.4	41.9	47.0	53.0	55.6	46.7		83

Figure 2-5 – Sale weather station median monthly rainfall vs highest daily rainfall (1997-2024) (Source: BOM)

2.5. TOPOGRAPHY

The project site and surrounding locality are situated within an undulating rural landscape characterised by low hills and broad drainage valleys typical of the broader Gippsland region. Topographic conditions have been considered as part of the assessment due to their potential influence on drainage behaviour, airflow patterns and local odour dispersion characteristics.

Survey and contour information indicates that the elevation of the proposed feedlot area ranges from approximately 36.00m Australian Height Datum (AHD) within the upper operational areas to approximately 34.30m AHD within the lower stormwater storage and drainage areas.

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The proposed feedlot has been positioned within the landscape having regard to:

- topographic conditions,
- controlled drainage requirements,
- operational functionality,
- separation distances to surrounding receptors, and
- integration with the broader farming enterprise.

The surrounding landscape generally comprises open agricultural land with gently undulating terrain and limited topographic barriers likely to significantly restrict regional airflow patterns.

Figure 2-5 and **Figure 2-7** identify the topographic characteristics of the site and surrounding locality.

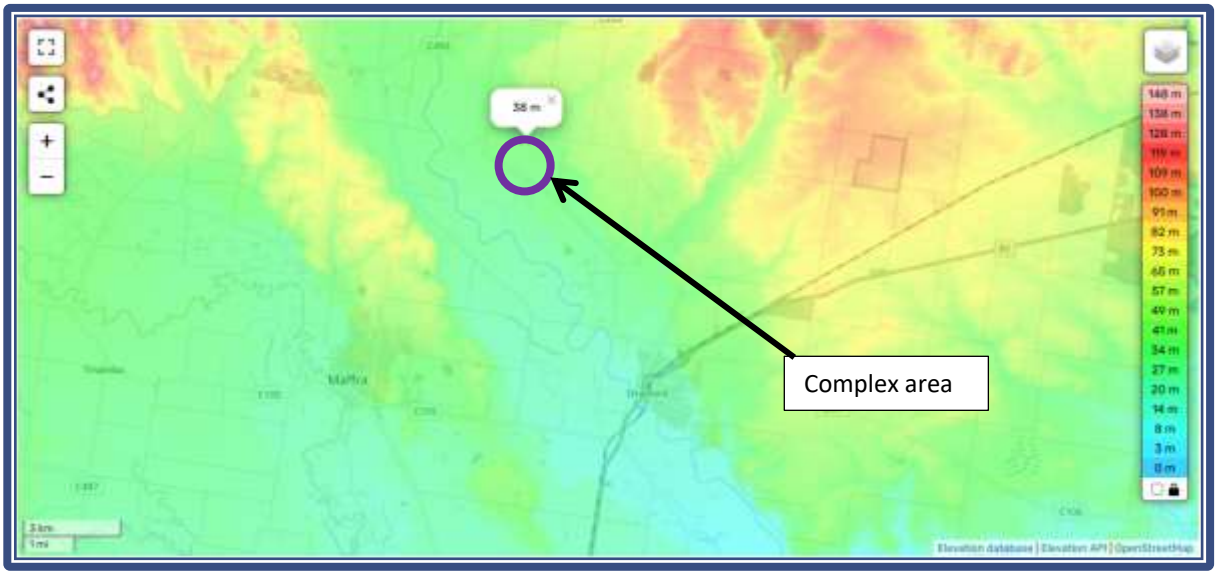

Figure 2-6 -Topography of the site (Source: en-au.topographic map)

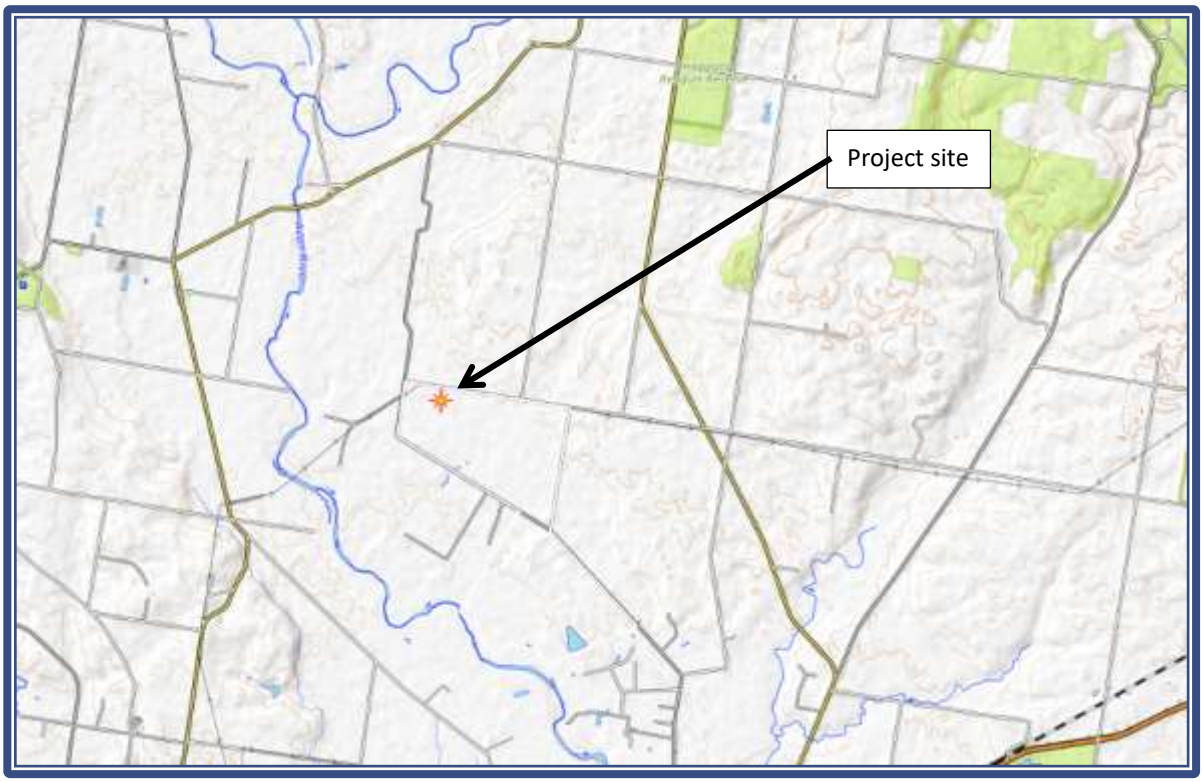

Figure 2-7 -Topography of the general area (Source: PRS QGIS)

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3. PROPOSED OPERATION & ODOUR

3.1. PROPOSED OPERATION

The proposed development comprises a predominantly covered cattle feedlot accommodating up to 2,206 head of cattle within purpose-built covered housing and associated operational infrastructure.

Cattle will enter the feedlot at approximately 420kg liveweight and remain on feed for approximately 120 days prior to dispatch. The feedlot incorporates covered cattle housing areas, feed preparation infrastructure, controlled drainage systems, settling infrastructure, manure and bedding storage areas, mortality management infrastructure and an integrated stormwater storage and irrigation reuse system.

The operational design incorporates extensive roof coverage over cattle housing areas to minimise rainfall interaction with manure and bedding material and reduce uncontrolled runoff generation. Manure and bedding material generated within the covered housing areas will be routinely removed and transferred to the designated manure and bedding storage area prior to beneficial agricultural reuse within the broader farming enterprise.

Captured runoff generated from operational surfaces will be directed through the integrated drainage system to settling infrastructure and subsequently retained within the stormwater storage pond for irrigation reuse.

The proposed operational system differs from a conventional open feedlot through:

- reduced rainfall exposure of manure,
- routine manure and bedding recovery,
- reduced generation of nutrient-rich runoff,
- controlled drainage and runoff capture, and
- integration of nutrient reuse activities within the broader farming enterprise.

The proposed covered housing system incorporates roofed cattle accommodation areas designed to remain naturally ventilated through open-sided construction and building orientation. The design substantially reduces direct rainfall interaction with manure and bedding materials while maintaining airflow and operational functionality.

These design features are expected to reduce the potential for odour generation relative to a conventional open feedlot operation of equivalent scale.

Figure 3-1 - Overview of activity areas (Source: QGIS and NJC Irrigation Plans)

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3.2. PRIMARY ODOUR SOURCES

Odour generation associated with cattle feedlots primarily arises from the decomposition of organic matter within manure, bedding material and captured runoff, particularly where elevated moisture levels and prolonged anaerobic conditions occur.

The proposed development incorporates covered cattle housing, routine manure and bedding recovery, controlled drainage systems and integrated stormwater management infrastructure intended to minimise rainfall interaction with manure and reduce the potential for odour generation relative to a conventional open feedlot system. Due to the covered housing design, the majority of nutrients generated by the operation remain within the recoverable solids stream rather than entering the controlled drainage runoff stream. This substantially reduces the extent of exposed wet manure surfaces typically associated with conventional open feedlot systems

The principal potential odour sources associated with the proposed development are summarised in **Figure 3-2**. and described below.

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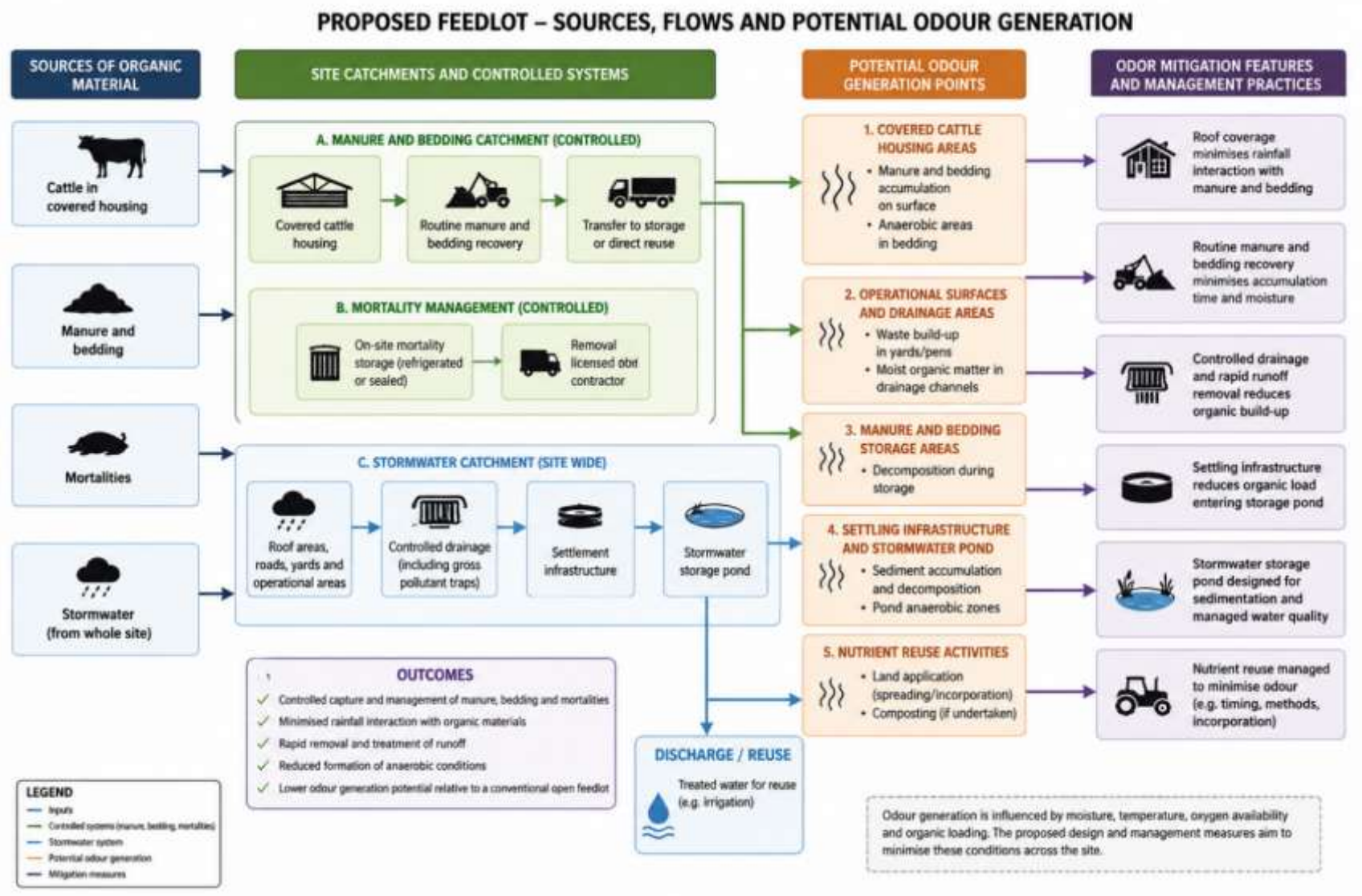

Figure 3-2 - Amended figure from NSW Air Quality Guidance Note - Beef Cattle Feedlots

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The primary potential odour sources associated with the proposed operation include:

1. Covered cattle housing areas,
2. Operational surfaces and controlled drainage areas,
3. Manure and bedding storage areas,
4. Settling infrastructure and stormwater storage pond, and
5. Nutrient reuse activities.

The potential odour sources identified above are further described in the following sections together with the operational and infrastructure measures incorporated into the development to minimise the potential for adverse odour impacts

3.2.1. COVERED CATTLE FEEDLOT PENS

The covered cattle housing areas represent the primary operational area associated with manure and bedding accumulation within the feedlot system. Cattle will be housed within purpose-built covered housing structures incorporating compacted earthen or bedding-based surfaces designed to support drainage, animal welfare and routine operational cleaning.

The covered housing design assists in reducing direct rainfall interaction with manure and bedding materials, limiting excessive moisture accumulation and reducing the potential for prolonged wet anaerobic conditions commonly associated with odour generation within conventional open feedlot systems.

Routine operational management practices, including periodic manure and bedding removal, maintenance of surface condition and management of stocking densities, will be undertaken to minimise excessive manure accumulation and maintain suitable bedding moisture conditions within the housing areas.

The combination of roof coverage, routine manure recovery and controlled drainage is expected to reduce odour generation potential relative to a conventional open feedlot operation of equivalent capacity.

3.2.2. OPERATIONAL SURFACES AND CONTROLLED DRAINAGE AREAS

Operational surfaces and controlled drainage areas associated with cattle movement, feed preparation and runoff collection may also contribute to minor odour generation, particularly following rainfall events or where organic material accumulates within drainage infrastructure.

The feedlot incorporates an integrated controlled drainage system designed to convey captured runoff away from operational areas to the settling infrastructure and stormwater storage pond. Drainage surfaces and infrastructure will be maintained to minimise ponding, sediment accumulation and prolonged wet conditions.

Operational surface design has also been incorporated into the development to minimise organic material accumulation and support effective drainage and cleaning practices. Feed lanes associated with the robotic feed delivery system will be constructed of concrete to provide a durable and easily maintainable surface. Shared cattle movement lanes associated with the alternate feed table areas will also be concrete surfaced, while cattle movement areas extending from the covered housing areas to the cattle yards will comprise compacted hardstand surfaces.

Feed storage and feed handling areas, together with associated access roads, will similarly be constructed and maintained as hardstand operational areas to minimise surface deterioration and support operational cleaning and drainage management.

Routine inspection and maintenance of drains, collection points and operational surfaces will be undertaken to ensure drainage systems continue to operate effectively and minimise the accumulation of organic material within drainage areas.

3.2.3. MANURE AND BEDDING STORAGE AREA

Recovered manure and bedding material generated within the covered cattle housing system will be temporarily stored within the designated manure and bedding storage area prior to beneficial agricultural reuse within the broader farming enterprise.

Potential odour generation from stored material is influenced primarily by moisture content, storage duration, oxygen availability and climatic conditions. Unlike conventional open feedlot manure systems, the proposed development incorporates covered cattle housing and routine manure recovery practices intended to reduce direct rainfall interaction with manure and bedding materials prior to removal from the housing areas.

Operational management measures intended to minimise odour generation from the storage area include:

- routine removal and reuse of stored material,
- management of stockpile moisture content,

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- separation and diversion of clean runoff away from storage areas
- controlled drainage infrastructure surrounding the storage area,
- maintenance of operational access and drainage conditions,
- minimisation of prolonged wet anaerobic conditions, and
- incorporation of recovered sediment solids into the broader manure and bedding reuse stream.

The proposed management approach is intended to minimise prolonged storage periods, reduce moisture accumulation and support aerobic conditions within stored material, thereby reducing odour generation potential relative to conventional wet manure stockpiling systems.

3.2.4. SETTLING INFRASTRUCTRE AND STORMWATER STORAGE POND

Captured runoff generated within the operational drainage system is directed through settling infrastructure prior to discharge into the integrated stormwater storage pond. The settling infrastructure has been designed to capture suspended solids, sediment and entrained organic material generated from operational surfaces prior to runoff entering the stormwater storage pond. Captured solids and settled material will be periodically removed as part of routine maintenance activities and incorporated into the broader manure and bedding reuse stream.

The stormwater storage pond forms part of the integrated stormwater management and irrigation reuse system associated with the development. Due to the covered housing design, routine solids recovery practices and the incorporation of settling infrastructure within the drainage system, nutrient and organic matter concentrations within captured runoff are expected to be lower than those typically associated with conventional open feedlot runoff systems.

The stormwater storage pond is therefore expected to operate predominantly as a controlled stormwater capture and reuse system rather than a conventional high-strength feedlot effluent pond. Routine inspection and maintenance of drains, settling infrastructure and stormwater storage areas will be undertaken to:

- minimise sediment accumulation,
- maintain hydraulic performance,
- manage vegetation and surface conditions,
- maintain storage capacity, and
- reduce the potential for prolonged anaerobic conditions and associated odour generation.

3.2.5. NUTRIENT REUSE ACTIVITIES

Recovered manure, bedding material and captured runoff generated by the feedlot will be beneficially reused within the broader farming enterprise through managed land application and irrigation reuse activities.

Nutrient reuse activities will be undertaken in accordance with the Waste Management Plan prepared for the development, including consideration of:

- separation distances to surrounding sensitive receptors and waterways,
- prevailing weather conditions,
- soil moisture conditions,
- crop nutrient demand,
- land capability,
- irrigation management practices, and
- operational management measures to minimise potential off-site impacts.

Captured runoff retained within the integrated stormwater storage system will be reused via the existing pivot irrigation infrastructure within nominated irrigation areas associated with the broader farming enterprise.

Recovered manure and bedding materials will be applied to agricultural land in accordance with crop nutrient demand and broader nutrient management objectives. Nutrient reuse activities will be managed to minimise the potential for nutrient accumulation, runoff generation, ponding and off-site movement of nutrients or organic material.

The beneficial reuse of recoverable organic material and captured runoff within the broader farming enterprise assists in:

- minimising long-term accumulation of organic material within the feedlot area,
- supporting integrated nutrient recovery and recycling,
- reducing reliance on synthetic fertilisers, and
- maintaining the operational efficiency of the feedlot waste management system.

3.3. SITE ACTIVITY AREA

For the purposes of the odour assessment, the Site Activity Area represents the operational footprint of the feedlot where cattle housing, manure accumulation, manure handling and associated runoff management activities occur and where potential odour generation may arise.

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The adopted Site Activity Area includes:

- covered cattle housing areas,
- operational cattle movement and feed access areas,
- manure and bedding handling and storage areas,
- settling infrastructure, and
- associated controlled drainage areas directly connected to the feedlot operation.

Areas associated solely with broader agricultural activities, cropping operations, irrigation reuse areas and freshwater storage infrastructure are not considered part of the Site Activity Area for the purposes of the odour assessment, as these areas do not contain routine livestock housing or persistent manure accumulation associated with ongoing odour generation.

The integrated stormwater storage pond forms part of the broader operational drainage and runoff management system associated with the development; however, it has not been adopted within the primary Site Activity Area for the S-Factor assessment. This approach has been adopted because the stormwater storage pond differs materially from a conventional feedlot effluent pond system typically associated with open feedlot operations. The proposed development incorporates:

- covered cattle housing,
- reduced rainfall interaction with manure and bedding materials,
- routine manure and bedding recovery,
- settling infrastructure upstream of the storage pond, and
- controlled drainage systems intended to minimise organic loading within captured runoff.

As a result, runoff entering the stormwater storage pond is expected to contain substantially lower concentrations of organic matter and suspended solids relative to conventional open feedlot runoff systems where rainfall directly interacts with exposed manure surfaces across large open pen areas. The stormwater storage pond is therefore expected to function primarily as a controlled stormwater capture and irrigation reuse storage rather than as a conventional anaerobic feedlot effluent pond representing a dominant odour source.

The designated mortality management area is intended primarily for contingency and temporary management purposes rather than routine ongoing waste accumulation. Mortalities will preferentially be removed off-site where practicable, with any temporary on-site management undertaken using controlled composting and operational management practices intended to minimise odour generation and biosecurity risk.

Notwithstanding these distinctions, both the stormwater storage pond and mortality management area have still been qualitatively considered as part of the broader odour assessment and infrastructure review.

The adopted odour assessment boundary utilised for the S-Factor separation distance assessment is illustrated in **Figure 3-3** below.

Figure 3-3 - Image showing current activity boundary (green) and proposed activity boundary (red) (Source: PRS QGIS)

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4. ASSESSMENT OF SEPARATION DISTANCES

4.1. METHODOLOGY

The odour assessment has been undertaken having regard to the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***"), which provides an accepted separation distance methodology for assessing potential odour impacts associated with cattle feedlot developments in Victoria.

The Code and associated S-Factor methodology were developed primarily to assess conventional open earthen feedlot systems where cattle are housed within uncovered outdoor pens and where manure is routinely exposed to direct rainfall and prolonged wetting events. The proposed development differs materially from these conventional systems through the incorporation of extensive covered cattle housing, routine manure and bedding recovery practices, controlled drainage infrastructure and integrated stormwater management systems intended to minimise rainfall interaction with manure and reduce prolonged wet anaerobic conditions.

At present, there is no specific Australian odour assessment methodology or prescribed separation distance framework developed specifically for covered or housed beef cattle feedlot systems. As a result, the assessment has required the application of ***the Code*** methodology together with professional interpretation of site-specific operational characteristics and relevant principles derived from:

- conventional cattle feedlot odour assessment methodologies,
- housed livestock system management practices,
- manure moisture and decomposition relationships,
- drainage and stormwater management principles,
- and operational manure and bedding management practices associated with intensive livestock industries.

The assessment has therefore adopted a conservative and evidence-based approach utilising ***the Code*** S-Factor methodology as the primary assessment framework while also considering the manner in which the proposed covered housing system may alter odour generation characteristics relative to conventional open feedlot operations.

Particular consideration has been given to the following operational and infrastructure characteristics incorporated into the proposed development:

- extensive roof coverage over cattle housing areas,
- reduced direct rainfall interaction with manure and bedding materials,
- routine manure and bedding recovery,
- controlled drainage and rapid runoff removal,
- settling infrastructure and integrated stormwater management,
- reduced generation of nutrient-rich runoff,
- minimisation of prolonged wet anaerobic conditions, and
- integration of nutrient reuse activities within the broader farming enterprise.

The assessment also considers surrounding land uses, climatic conditions, prevailing wind patterns, topography, receptor distribution and separation distances available to surrounding sensitive receptors.

No detailed atmospheric odour dispersion modelling has been undertaken as part of this assessment. The assessment has instead relied upon ***the Code*** separation distance methodology together with qualitative assessment of the proposed operational system, infrastructure design and odour mitigation characteristics associated with the development.

Given the absence of directly applicable assessment methodologies for covered feedlot systems, the assessment outcomes should be considered within the context of the proposed operational design and the manner in which the development differs from a conventional open feedlot operation.

4.2. SITE ACTIVITY AREA

For the purposes of the odour assessment, the *Site Activity Area* represents the operational footprint of the feedlot where cattle housing, manure accumulation, manure handling and associated runoff management activities occur. The Site Activity Area is detailed in **Section 3.3** and illustrated in **Figure 3-3**.

The defined *Site Activity Area* includes:

- covered cattle housing areas,
- operational surfaces and associated cattle movement areas,
- manure and bedding handling and storage areas, and
- associated controlled drainage and settling infrastructure connected to the feedlot operation.

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The integrated stormwater storage pond and designated mortality management area have been qualitatively considered as part of the broader odour assessment; however, due to their operational characteristics and expected lower contribution to ongoing odour generation, they have not been adopted as primary Site Activity Area components for the S-Factor assessment. Similarly, the areas associated solely with broader farming activities, cropping operations and irrigation reuse areas are not included within the Site Activity Area for the purposes of the S-Factor assessment.

Given the absence of a specific odour assessment methodology for covered cattle feedlot systems, the Site Activity Area adopted for this assessment has been conservatively defined to include all primary operational areas associated with cattle housing and manure management activities likely to contribute to odour generation.

4.3. S-FACTOR CALCULATION

The S-Factor methodology contained within ***the Code*** relates the scale of the livestock operation to an indicative separation distance through the application of a composite site factor and livestock activity factor.

The methodology was developed primarily for conventional open feedlot systems and therefore does not directly account for operational characteristics associated with covered cattle housing systems, reduced rainfall interaction with manure, controlled drainage infrastructure or routine manure and bedding recovery practices. As discussed in **Section 4.1**, the assessment has therefore adopted ***the Code*** methodology as the primary assessment framework while also applying professional judgement and consideration of site-specific operational characteristics relevant to the proposed development.

For conventional feedlot systems, the principal odour source is typically associated with manure accumulation and moisture interaction within open livestock housing areas. In the case of the proposed development, the operational system differs materially through the incorporation of:

- extensive covered cattle housing,
- reduced direct rainfall interaction with manure and bedding materials,
- routine manure and bedding recovery,
- controlled drainage and runoff management infrastructure, and
- reduced potential for prolonged wet anaerobic conditions.

Notwithstanding these differences, the S-Factor methodology has been conservatively applied using the adopted Site Activity Area and operational cattle capacity associated with the proposed development.

The S-Factor assessment has therefore been undertaken having regard to:

- the maximum operational cattle capacity,
- the adopted Site Activity Area,
- surrounding land uses and receptor characteristics,
- climatic and topographic conditions, and
- operational and management characteristics relevant to odour generation potential.

The results of the S-Factor assessment provide an indicative separation distance intended to minimise the potential for unreasonable odour impacts at surrounding sensitive receptors.

4.4. SEPARATION DISTANCE ASSESSMENT

The separation distance assessment has been undertaken using the S-Factor methodology contained within ***the Code***. The methodology considers the scale of the livestock activity together with environmental and management factors relevant to odour generation, dispersion and receptor sensitivity.

The calculated separation distance has been compared against the actual distances between the proposed feedlot activity area and surrounding sensitive receptors identified within the assessment area. Sensitive receptors considered as part of the assessment include surrounding dwellings and other locations where people may reasonably be expected to reside or regularly occupy for extended periods.

The location of surrounding sensitive receptors relative to the feedlot site is illustrated in **Figure 2-2**.

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The Code S-Factor methodology utilised for the assessment is summarised below.

***Victorian Code for Cattle Feedlots* (1995)**
$D = S\sqrt{N}$
Where: The equation states that the required minimum distance (D) is the equivalent to the product of the square root of the site capacity, in standard cattle/animal units, and a site-specific composite factor, and
D = Minimum Separation Distance
N = Number of SCU
SCU = Standard Cattle Unit
Composite site factor (S1 x S2 x S3 x S4)

The Composite Site Factor (S) is the variable that accounts for the site to site and time to time variations. This is given by:

$$S = S_1 \times S_2 \times S_3 \times S_4$$

Where:

Factor	
S_1 =	Management Factor
S_2 =	Receptor type factor
S_3 =	Terrain characteristics
S_4 =	Vegetative cover

Further details are provided in the following sections relating to each of the factors considered in the assessment.

4.4.1. STANDARD CATTLE UNITS

The Code utilises the concept of Standard Cattle Units (SCU) to standardise feedlot scale across varying cattle liveweights and operational configurations. An SCU represents a standardised livestock unit based on cattle liveweight, allowing feedlot operations containing cattle at different growth stages to be compared on a consistent basis.

For the proposed development, SCU values have been calculated based on:

- the proposed maximum cattle capacity,
- anticipated liveweight ranges during the feeding cycle,
- the anticipated duration cattle occupy each liveweight range during the feeding cycle, and
- the scaling factors contained within ***the Code***.

The proposed feedlot has a maximum operational capacity of 2,206 head. However, cattle within the feedlot will occupy a range of liveweights throughout the feeding cycle and therefore do not represent 2,206 full 600kg Standard Cattle Units at all times.

The likely operational SCU profile for the feedlot has therefore been estimated based on the anticipated cattle distribution across the feeding cycle and the applicable Code scaling factors. The assessment also reflects that cattle are proposed to be managed within covered cattle housing areas for the full feeding cycle. In reality, the likely site operations are expected to equate to the following:

Table 4-1 – SCU scaling factor

Average liveweight (kg)	Feedlot Scaling factor[1]	Days in weight range	Number on site at weight	SCU	% of feedlot
< 400	0.68	23	418	347	19%
401 - 450	0.74	23	418	347	19%
451 - 500	0.81	23	418	347	19%
501 - 550	0.87	23	418	347	19%
551 - 600	0.94	23	418	347	19%
601 - 650	1.00	6	117	97	5%
651 - 675	1.06		0	0	0%
676 - 700	1.12		0	0	0%
701-750	1.18		0	0	0%
Total			2,206	1,830	100%

1 – Referenced in the *Victorian Code for Cattle Feedlots 1995, page 9*

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RESULTS

Based on the adopted feeding cycle, cattle liveweight distribution and ***the Code*** scaling factors, the proposed feedlot operation equates to 1,830 Standard Cattle Units (SCU). This assessment approach reflects the likely operational characteristics of the proposed feedlot rather than assuming all cattle occupy the maximum liveweight category simultaneously throughout the feeding cycle.

The adopted SCU assessment is also considered conservative in the context of the proposed development given:

- cattle are proposed to be housed within the covered cattle housing areas,
- direct rainfall interaction with manure and bedding materials is substantially reduced,
- manure and bedding materials will be routinely removed,
- drainage systems are controlled, and
- ***the Code*** methodology was originally developed for conventional open feedlot systems rather than covered cattle housing operations.

The adopted SCU value of 1,830 has therefore been utilised for the purposes of the S-Factor separation distance assessment.

4.4.2. DESIGN AND MANAGEMENT FACTOR (S1)

The Design and Management Factor (S1) within ***the Code*** is intended to account for operational characteristics which influence odour generation potential within a feedlot system. The primary variables influencing the S1 factor under ***the Code*** are:

- stocking density,
- manure accumulation characteristics,
- pen management practices, and
- climatic conditions, particularly rainfall interaction with manure surfaces.

The Code methodology was developed for conventional open earthen feedlot systems where cattle are housed within uncovered outdoor pens and where odour generation is strongly influenced by rainfall interaction with exposed manure surfaces and prolonged wet pen conditions.

The proposed development differs materially from this conventional operational model through the incorporation of predominantly covered cattle housing, routine manure and bedding recovery practices and integrated drainage systems intended to minimise direct rainfall interaction with manure and bedding materials.

As discussed previously, there is currently no directly applicable Australian methodology for assigning S1 values to predominantly covered or housed beef cattle feedlot systems. ***The Code*** methodology has therefore been applied conservatively having regard to the operational characteristics of the proposed covered cattle housing system.

Stocking Density

Under ***the Code*** methodology, stocking density is utilised as a surrogate indicator of manure accumulation potential, moisture retention and associated odour generation risk within feedlot pens. The proposed development incorporates two distinct operational environments:

- covered cattle housing areas, and
- associated operational and management areas.

Unlike conventional open feedlot systems, the covered housing areas are protected from direct rainfall and incorporate routine manure and bedding management practices intended to maintain relatively dry surface conditions. The proposed covered housing system is proposed to operate at approximately 6m²/SCU, which is below the minimum stocking density range directly contemplated by ***the Code*** methodology. However, the reduced area per SCU occurs within a controlled covered environment where:

- rainfall interaction with manure is substantially reduced,
- bedding moisture is actively managed,
- manure and bedding materials are routinely removed,
- drainage is controlled, and
- prolonged wet anaerobic conditions are minimised.

Accordingly, direct comparison between the proposed covered housing system and conventional open feedlot stocking densities is not considered appropriate.

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Rainfall

Rainfall is a significant driver of odour generation within conventional open feedlot systems due to its influence on manure moisture content, anaerobic decomposition and wet surface conditions. ***The Code*** methodology directly incorporates rainfall into the S1 factor due to the relationship between increased rainfall, wet pen conditions and odour generation potential within open feedlots.

For the proposed development, the influence of rainfall on odour generation is materially altered by the covered housing design. Roof coverage substantially reduces direct rainfall interaction with manure and bedding materials within the primary cattle housing areas and therefore reduces the relationship between regional rainfall conditions and odour generation potential compared to a conventional open feedlot operation.

Notwithstanding this, average annual rainfall has still been considered qualitatively as part of the assessment due to the influence of rainfall on operational surfaces, drainage systems, runoff generation and broader environmental conditions.

As detailed in **Section 2.4**, the average annual rainfall within the locality is 596mm.

Result

This factor varies at each intensive livestock operation based on the density of each Standard Cattle Unit (SCU) housed within the system and the average annual rainfall at the site. ***The Code*** assumes a "Class A" feedlot with a maximum manure depth of 50mm and a pen cleaning interval of 13 weeks.

The S1 value is determined from the average annual rainfall category and the stocking density of the operation. The following table identifies the adopted and extrapolated S1 values associated with varying stocking densities.

Table 4-2 – Value of S1, as related to average annual rainfall and pen stocking density

	Average Annual Rainfall		S1 value
	<750mm	>750mm	
Stocking density (m²/SCU	6	10	19.0*
	7	12	18.5*
	8	13	18.0*
	9	14	17.5*
	10	15	17.0
	11	16	16.5*
	12	17	16.0*
	13	18	15.5*
	14	19	15.0*
	15	20	14.0
	16	21	13.5*
	17	22	12.8*
	18	23	12.5*
	19	24	12.0*
	20	25	11.0

* Extrapolated

The proposed covered cattle housing system operates at approximately 6m²/SCU and is located within an average annual rainfall region of less than 750mm. Extrapolation of ***the Code*** table therefore indicates an S1 value of 19.

While the proposed development incorporates several operational and infrastructure measures expected to reduce odour generation potential relative to a conventional open feedlot system, including roofed cattle housing, routine manure and bedding recovery, active bedding moisture management and controlled drainage infrastructure, the assessment has conservatively adopted an **S1 factor** of **19** for the purposes of the separation distance assessment.

The adopted S1 value is therefore considered conservative given ***the Code*** does not contain a specific adjustment methodology for covered or predominantly housed beef cattle feedlot systems and this number should therefore be considered conservative.

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4.4.3. RECEPTOR TYPE FACTOR (S2)

The Receptor Type Factor (S2) considers the relative sensitivity of surrounding receptors to odour impacts based on the scale and density of population likely to be exposed. In general, areas containing larger populations or more concentrated residential development are considered more sensitive to potential odour impacts than isolated rural dwellings.

The S2 receptor type value allows for a variance in sensitivity to odour based on population density and settlement patterns. The greater the exposed population, the more likely it is that 'sensitive' individuals might be exposed to nuisance odour. (MLA, 2012). The values attributed to each type or receptor from both methods have been provided below.

The Code assigns increasing receptor factors to larger towns and clustered residential development to reflect the increased likelihood of sensitive individuals being exposed to nuisance odour:

Table 4-3 - Receptor Factor

Receptor type	Vic Code
Large towns, greater than 2,000 persons	5
Towns (>100 persons)	4
Small town (> 20 persons)	3
Three or four houses or house sites within 250m	2
Two houses or house sites within 250m of each other	1.5
Single rural residence	1
Public Areas (high usage)	3
Public Area (schools etc)	2
Public Area (forest, halls etc)	0.1

Result

The surrounding locality is characterised predominantly by dispersed rural residential development associated with agricultural land uses. Most identified receptors comprise isolated rural dwellings separated by substantial agricultural land holdings.

A review of surrounding receptor groupings identified one receptor cluster where two dwellings are located within 250 metres of each other, resulting in the application of the "Two houses within 250m of each other" factor under ***the Code***.

The nearby townships of Stratford, Boisdale, Maffra and Briagolong have also been considered as part of the broader receptor assessment based on their respective population thresholds under ***the Code***.

Table 4-4 - Receptor assessment

Receptor	Comment	Vic Code Factor
Stratford	Population 2,980	5
Boisdale	Population 307	4
Maffra	Population 5,380	5
Briagolong	Population 1,156	4
R6 & R7	Houses within 250m	1.5
All other dwellings	Singe rural residence	1

The adopted receptor factors are considered appropriate having regard to the rural character of the locality and the distribution of surrounding sensitive receptors relative to the proposed feedlot site.

4.4.4. TERRAIN FACTOR (S3)

The Terrain Factor (S3) considers the influence of surrounding landform and topography on airflow movement, odour dispersion and the potential concentration of odours within the surrounding landscape. Topographic conditions may influence odour behaviour through the channelling of airflow, reduced atmospheric mixing within valleys or enhanced dispersion across elevated or exposed landforms.

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Table 4-5 - Terrain Factor

Terrain	Vic Code Factor
High relief at (>10% upslope from site)	0.7
Low relief (>5% downslope from site)	1.2
Valley drainage zone	2.0
Flat (<1% slope)	1.0
Area subject to Katabatic drift/drainage	1.5

Result

The project site and surrounding locality are characterised by gently undulating rural landforms typical of the broader Gippsland region. Review of surrounding receptor locations and relative topographic conditions indicates that none of the identified receptors are situated sufficiently upslope or downslope relative to the proposed feedlot to satisfy the terrain thresholds identified within ***the Code***.

While minor elevation changes occur across the broader landscape, the topographic relief between the feedlot and surrounding receptors is not considered sufficient to materially alter odour dispersion characteristics or justify the application of an alternative terrain factor. Accordingly, the "Flat" terrain category has been conservatively adopted for all receptors, resulting in an **S3 factor of 1.0** being applied throughout the assessment.

4.4.5. VEGETATION AND SURFACE ROUGHNESS FACTOR (S4)

The Vegetation and Surface Roughness Factor (S4) considers the influence of vegetation and land surface characteristics on airflow turbulence and atmospheric mixing. Increased surface roughness associated with vegetation and tree cover may increase air turbulence and assist in the dispersion and dilution of odour.

The vegetative cover and surface roughness factor (S4) considers the drag that the earth's surface exerts on air moving over it. Where the surface is rougher (vegetated areas) the more turbulent the air flow which will increase mixing and dilution of air.

Table 4-6 - Vegetation Factor

Vegetation	Vic Code factor
Crops only (no effective tree cover)[1]	1.0
Open grassland (few trees, long grass)	0.9
Forest with significant mid and lower storey	0.7

Result

The surrounding locality is characterised predominantly by agricultural land including grazing land, seasonal cropping areas and open pasture systems with scattered shelterbelts and isolated tree groupings. While some areas of localised vegetation occur throughout the broader landscape, the intervening land between the proposed feedlot and surrounding receptors is generally open agricultural land without continuous dense vegetation cover.

Accordingly, the "Crops only (no effective tree cover)" category has been conservatively adopted for the purposes of this assessment, resulting in an **S4 factor of 1.0** being applied to all receptors.

This approach is considered appropriate as the surrounding landscape does not contain sufficient continuous vegetation cover or forested terrain likely to materially increase atmospheric mixing or odour attenuation between the feedlot and surrounding sensitive receptors.

4.4.6. WIND DIRECTION FACTOR (S5)

The Code does not incorporate a specific wind direction factor within the S-Factor separation distance methodology.

Accordingly, **no wind direction adjustment or attenuation factor has been applied** as part of this assessment.

Notwithstanding this, prevailing wind conditions within the locality have still been qualitatively considered as part of the broader odour assessment, including review of regional wind patterns, receptor locations and surrounding topographic conditions discussed in **Section 2.4**.

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4.5. RESULT

The following section presents the results of the S-Factor separation distance assessment for the proposed feedlot. The assessment has been undertaken using the adopted operational capacity of **1,830 Standard Cattle Units (SCU)**, a Design and Management Factor (**S1**) of **19**, a Terrain Factor (**S3**) of **1.0**, and a Vegetation Factor (**S4**) of **1.0**. The relevant Receptor Type Factor (**S2**) has then been applied to each receptor category in accordance with ***the Code***.

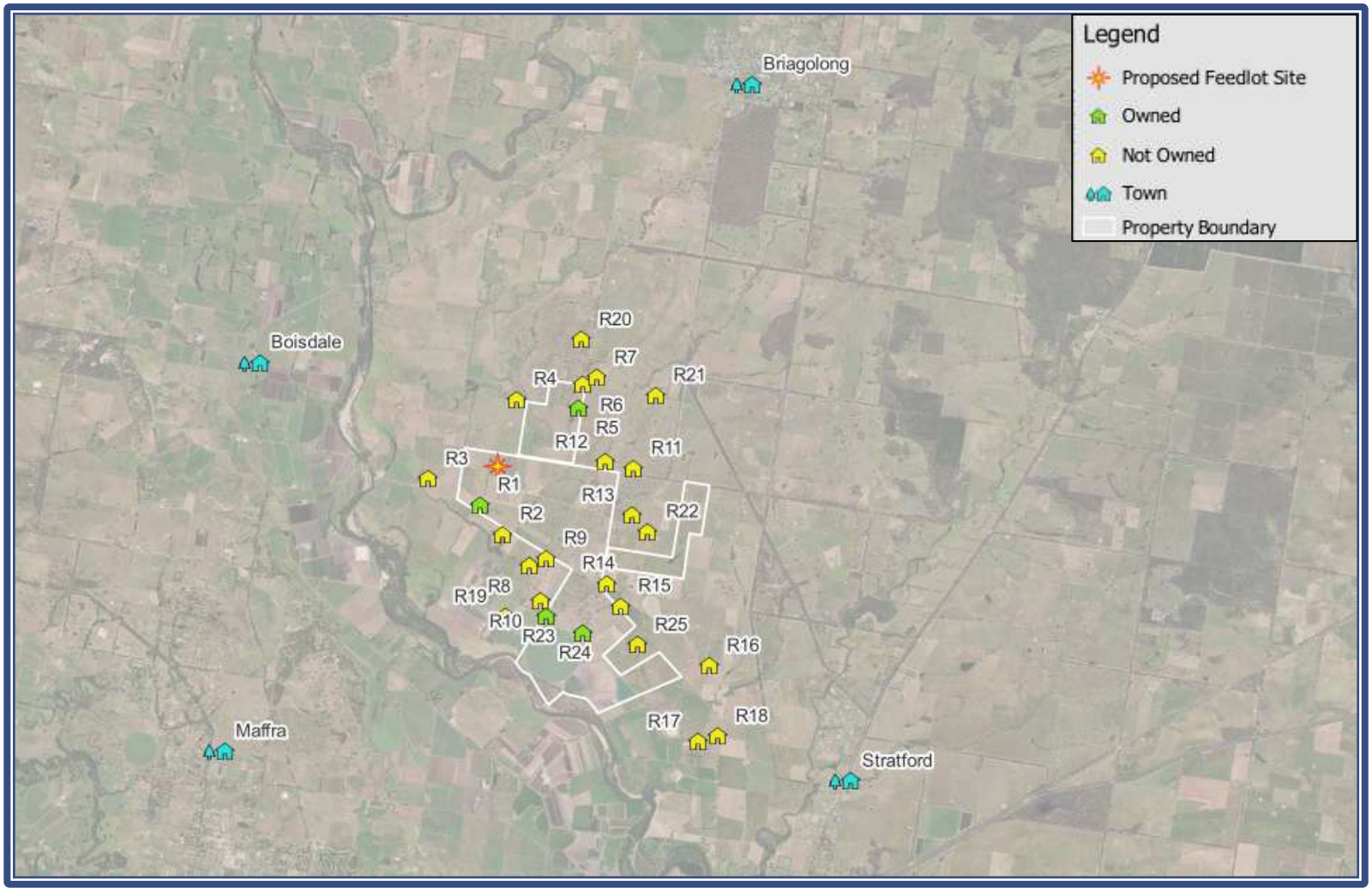

Figure 4-1 – Receptor overview plan (Source: PRS QGIS)

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4.5.1. CALCULATION OF SEPARATION DISTANCES

Based on the adopted assessment parameters:

- Standard Cattle Units (N) = 1,830 SCU
- Design and Management Factor (S1) = 19
- Terrain Factor (S3) = 1.0
- Vegetation Factor (S4) = 1.0

the base separation distance prior to application of receptor sensitivity factors (S2) is calculated as follows:

$$D = S1 \times S2 \times S3 \times S4 \times \sqrt{N}$$

$$\sqrt{1830} = 42.8$$

Accordingly, the base separation distance is:

$$19 \times 42.8 = 813\text{m}$$

The final recommended separation distance therefore varies depending on the type and sensitivity of the receptor in accordance with ***the Code***.

Table 4-7 -Calculated Separation Distances

Receptor Type	S2 Factor	Required Separation Distance (m)
Single rural dwelling	1.0	813
Two dwellings within 250m	1.5	1,220
Small town (>20 persons)	3.0	2,438
Town (>100 persons)	4.0	3,251
Large town (>2,000 persons)	5.0	4,064

4.5.2. TOWNSHIP RECEPTORS

Four nearby townships have been considered within this assessment due to their population size and proximity to the proposed feedlot. These population centres represent the largest potential sensitive receptors within the surrounding locality and have therefore been assessed against the applicable Code separation distance criteria.

The townships assessed include:

- Stratford,
- Boisdale,
- Maffra, and
- Briagolong.

The required separation distance for each township was determined based on the applicable receptor sensitivity factor (S2) associated with the population category under ***the Code***.

Table 4-8 - Township Separation Distance Assessment

Township	Receptor Type	Required Separation Distance (m)	Actual Separation Distance (m)	Result
Stratford	Large town (>2,000 persons)	4,064	6,681	Complies
Boisdale	Town (>100 persons)	3,251	3,608	Complies
Maffra	Large town (>2,000 persons)	4,064	4,845	Complies
Briagolong	Town (>100 persons)	3,251	6,412	Complies

The assessment indicates that all nearby townships exceed the applicable separation distances derived under ***the Code*** methodology. Stratford and Maffra, classified as large towns, both exceed the required separation distance of 4,064m. Boisdale and Briagolong, classified as towns greater than 100 persons, also exceed the required separation distance of 3,251m.

Accordingly, the proposed feedlot complies with the recommended separation distance requirements for township receptors under ***the Code***. **Figure 4-2** provides an overview of the relative topography, contours and elevation profile between the proposed feedlot site and the surrounding township receptors.

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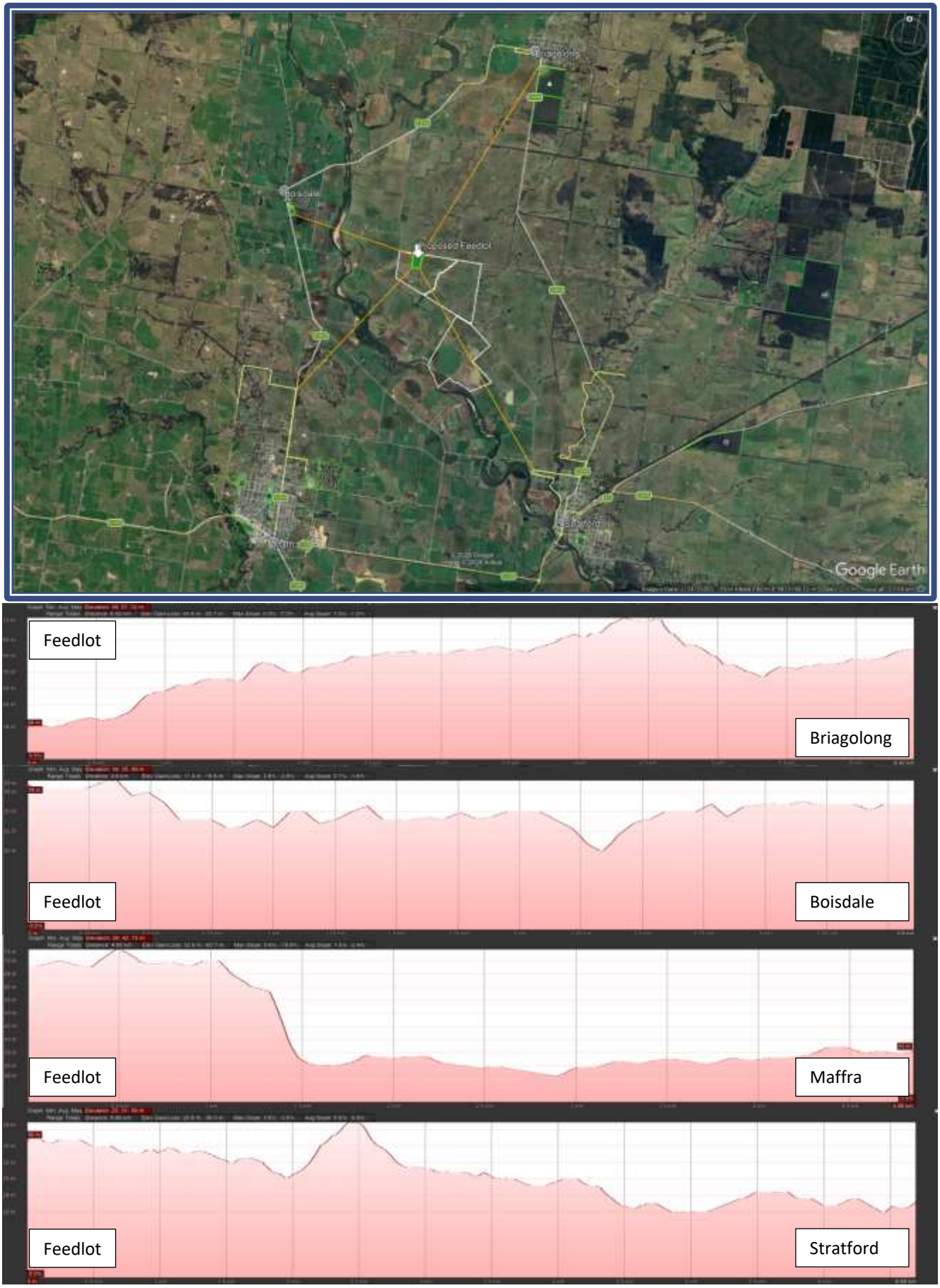

Figure 4-2 –– Image showing the topography and contours of the site compared to the township of Stratford and the Google earth elevation change (bottom).

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4.5.3. RURAL DWELLING RECEPTORS

In addition to nearby townships, individual rural dwellings surrounding the proposed feedlot have been assessed as potential sensitive receptors under ***the Code***. These dwellings represent the closest potential receptors to the proposed feedlot operation and therefore form an important component of the separation distance assessment.

For rural dwelling receptors, separation distances have been assessed using the "Rural Method", whereby distances are measured from the relevant feedlot activity area to the dwelling or dwelling envelope rather than to the property boundary. This approach is considered appropriate for the surrounding locality, which is characterised by broad rural landholdings, dispersed dwellings and agricultural land uses.

Based on the adopted S-Factor assessment parameters, the required separation distance for:

- a single rural dwelling is **813m**, and
- two dwellings located within 250m of each other is **1,220m**.

A review of surrounding land parcels identified a number of rural dwellings within the broader locality of the proposed feedlot. The separation distance between the feedlot activity boundary and each identified dwelling has been assessed against the applicable minimum separation distance requirements using the Rural Method.

Receptors R1, R5, R23 and R24 are owned by the ***Applicant*** and are located within the broader farming enterprise associated with the proposed development. While identified for completeness, these dwellings have not been treated as sensitive receptors for the purposes of the separation distance compliance assessment.

Table 4-9 -Rural Dwelling Separation Distance Assessment

Receptor ID	Receptor Type	Required Separation Distance (m)	Actual Separation Distance (m)	Result
R2	Single dwelling	813	823	Complies
R3	Single dwelling	813	897	Complies
R4	Single dwelling	813	906	Complies
R6	Two dwellings within 250m	1,220	1,570	Complies
R7	Two dwellings within 250m	1,220	1,752	Complies
R8	Single dwelling	813	1,381	Complies
R9	Single dwelling	813	1,393	Complies
R10	Single dwelling	813	1,968	Complies
R11	Single dwelling	813	1,872	Complies
R12	Single dwelling	813	1,479	Complies
R13	Single dwelling	813	2,034	Complies
R14	Single dwelling	813	2,210	Complies
R15	Single dwelling	813	2,594	Complies
R16	Single dwelling	813	4,224	Complies
R17	Two dwellings within 250m	1,220	5,000	Complies
R18	Two dwellings within 250m	1,220	5,120	Complies
R19	Single dwelling	813	2,114	Complies
R20	Single dwelling	813	2,083	Complies
R21	Single dwelling	813	2,397	Complies
R22	Single dwelling	813	2,318	Complies
R25	Single dwelling	813	3,241	Complies

The assessment indicates that all identified non-owned rural dwellings surrounding the proposed feedlot exceed the applicable separation distances derived under ***the Code*** methodology when assessed using the Rural Method. Receptors containing two dwellings within 250m of each other also exceed the applicable minimum separation distance requirements for grouped rural dwelling receptors.

Accordingly, the assessment demonstrates that the proposed feedlot maintains appropriate separation distances from surrounding rural dwellings and complies with the separation distance requirements outlined in ***the Code***.

The adopted assessment is also considered conservative given:

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- the proposed operation incorporates predominantly covered cattle housing,
- direct rainfall interaction with manure and bedding materials is substantially reduced,
- manure and bedding materials will be routinely removed,
- drainage systems are controlled, and
- ***the Code*** methodology was originally developed for conventional open feedlot systems rather than covered cattle housing operations.

Figure **4-3** provides an example of the topographic relationship and elevation profile between the proposed feedlot site and the nearest surrounding rural dwelling receptor.

Figure 4-3 – Topography, contours and elevation profile between the proposed feedlot site and the nearest surrounding receptor (R3)

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5. ODOUR MINIMISATION MEASURES

5.1. COVERED HOUSING

The proposed feedlot incorporates predominantly covered cattle housing areas which differ materially from conventional open feedlot systems contemplated under the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***". The covered housing arrangement is intended to substantially reduce direct rainfall interaction with manure and bedding materials within the primary cattle accommodation areas.

Reduction in rainfall interaction with manure and bedding materials is expected to:

- minimise prolonged wet pen conditions,
- reduce anaerobic decomposition processes associated with odour generation,
- improve bedding condition and surface management,
- reduce nutrient mobilisation within operational areas, and
- reduce the volume of contaminated runoff requiring collection and management.

The covered housing arrangement also supports improved operational management flexibility, including routine manure and bedding removal, controlled drainage management and improved feed delivery efficiency.

5.2. MANURE AND BEDDING MANAGEMENT

Manure and bedding materials generated within the covered housing system will be routinely removed as part of normal operational management practices. Routine removal of accumulated organic material is intended to minimise excessive manure build-up, maintain suitable cattle accommodation conditions and reduce the potential for odour generation associated with prolonged manure accumulation.

Recovered manure and bedding material will be temporarily stored within designated controlled drainage areas prior to beneficial agricultural reuse within the broader farming enterprise. Storage areas will be managed to minimise uncontrolled runoff generation and support practical material handling and nutrient recovery operations.

Beneficial reuse of recovered material within the broader farming enterprise is intended to support nutrient recycling and reduce reliance on imported synthetic fertilisers, while also reducing long-term on-site accumulation of organic materials.

5.3. CONTROLED DRAINAGE & STORMWATER MANAGEMENT

The proposed development incorporates an integrated stormwater and controlled drainage system designed to capture, convey, settle and store runoff generated within the operational footprint of the feedlot. Unlike a conventional open feedlot system, the proposed covered housing arrangement substantially reduces direct rainfall interaction with manure and bedding materials within the cattle accommodation areas. As a result, the volume and strength of nutrient-enriched runoff generated from the primary cattle housing areas is expected to be reduced relative to an uncovered feedlot of equivalent scale.

Runoff generated from exposed operational areas, including manure and bedding storage areas and mortality management areas, will be directed through settling infrastructure prior to discharge to the stormwater storage pond. Captured sediment and organic material will be periodically removed and incorporated into the broader manure and bedding reuse stream.

The stormwater storage pond is expected to function primarily as a controlled stormwater capture and irrigation reuse storage, rather than as a conventional high-strength feedlot effluent pond. Routine inspection and maintenance of drainage lines, settling infrastructure and the storage pond will be undertaken to maintain hydraulic function, minimise sediment accumulation and reduce the potential for prolonged anaerobic conditions.

Captured runoff retained within the storage system will be reused within the broader farming enterprise in accordance with the Waste Management Plan, crop demand, soil conditions and operational requirements.

5.4. OPERATIONAL MANAGEMENT

General operational management measures intended to minimise odour generation within the proposed feedlot include:

- routine inspection and maintenance of drainage systems,
- routine manure and bedding removal,
- management of feed storage and feed delivery infrastructure,
- maintenance of operational traffic areas and drainage surfaces,
- controlled management of nutrient-rich runoff and recovered organic material, and

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- ongoing maintenance of operational hygiene and cattle accommodation areas.

The proposed feedlot has been designed around a controlled drainage and nutrient recovery philosophy intended to integrate cattle housing, manure recovery, nutrient reuse and stormwater management into a coordinated agricultural production system.

Overall, the proposed feedlot incorporates a range of operational and design measures intended to substantially reduce odour generation potential relative to a conventional open feedlot operation.

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6. CONCLUSION

An S-Factor odour assessment has been undertaken for the proposed feedlot in accordance with the *Victorian Code for Cattle Feedlots* (1995) ("***the Code***". The assessment considered the proposed operational capacity, cattle liveweight profile, site characteristics, surrounding sensitive receptors and the operational design of the proposed development.

The assessment adopted an operational capacity equivalent to approximately 1,830 Standard Cattle Units (SCU) based on the anticipated cattle liveweight distribution throughout the feeding cycle. The adopted assessment also incorporated a conservative Design and Management Factor (S1) of 19 together with the applicable receptor sensitivity factors prescribed under ***the Code*** methodology.

The Code methodology was originally developed for conventional open feedlot systems where cattle are housed within uncovered outdoor pens and odour generation is strongly influenced by rainfall interaction with exposed manure surfaces and prolonged wet pen conditions.

The proposed development differs materially from this conventional operational model through the incorporation of:

- predominantly covered cattle housing,
- routine manure and bedding removal,
- controlled drainage infrastructure,
- reduced rainfall interaction with manure and bedding materials,
- nutrient capture and recovery systems, and
- integrated stormwater and operational runoff management.

These operational and design characteristics are expected to substantially reduce odour generation potential relative to a conventional open feedlot operation of equivalent scale.

The assessment demonstrates that all assessed township receptors and non-owned rural dwelling receptors comply with the applicable S-Factor separation distances derived under ***the Code***. Based on the assessment undertaken, the proposed feedlot is considered capable of operating without resulting in unreasonable off-site odour impacts, subject to implementation of the proposed operational design, manure management and controlled drainage measures outlined within this assessment.

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7. APPENDICES

APPENDIX 1 – SITE PLAN

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NERINA LANE

LLOWALONG ROAD

50m BUFFER FROM ROAD

CONSTRUCT NEW DRAIN A - N
GRADE 1 in 238 (-0.42%)
BED 4m WIDE, BATTERS 2 to 1
60m³ CUT, 60m LONG

CONSTRUCT NEW DRAIN N - O
GRADE 1 in 666 (-0.15%)
BED 4m WIDE, BATTERS 2 to 1
118m³ CUT, 100m LONG

CONSTRUCT NEW DRAIN O - P
GRADE 1 in 2,000 (-0.05%)
BED 4m WIDE, BATTERS 2 to 1
482m³ CUT, 210m LONG

CONSTRUCT NEW DRAIN P - Q
GRADE 1 in 137 (-0.73%)
BED 4m WIDE, BATTERS 2 to 1
155m³ CUT, 120m LONG

CONSTRUCT NEW DRAIN Q - R
GRADE 1 in 233 (-0.43%)
BED 4m WIDE, BATTERS 2 to 1
93m³ CUT, 60m LONG

CONSTRUCT NEW DRAIN R - S
GRADE 1 in 313 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
68m³ CUT, 70m LONG

CONSTRUCT NEW DRAIN S - T
GRADE 1 in 2,000 (-0.05%)
BED 4m WIDE, BATTERS 2 to 1
342m³ CUT, 180m LONG

CONSTRUCT NEW DRAIN T - U
GRADE 1 in 83 (-1.25%)
BED 4m WIDE, BATTERS 2 to 1
76m³ CUT, 50m LONG

CONSTRUCT NEW DRAIN U - V
GRADE 1 in 313 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
19m³ CUT, 87m LONG

CONSTRUCT NEW DRAIN V - W
GRADE 1 in 313 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
15m³ CUT, 71m LONG

CONSTRUCT NEW DRAIN M - U
GRADE 1 in 118 (-0.85%)
BED 4m WIDE, BATTERS 2 to 1
76m³ CUT, 98m LONG

CONSTRUCT NEW DRAIN U - M
GRADE 1 in 74 (-1.32%)
BED 4m WIDE, BATTERS 2 to 1
165m³ CUT, 92m LONG

FUTURE SILAGE BUNKER
45m x 15m WIDE

FUTURE SILAGE BUNKER
45m x 15m WIDE

LOADING

PEN 1 PEN 2 PEN 3 PEN 4 PEN 5 PEN 6 PEN 7 PEN 8 PEN 9
PEN 10 PEN 11 PEN 12 PEN 13 PEN 14 PEN 15 PEN 16 PEN 17 PEN 18

CLEAN OUT LANE
CATTLE LANEWAY (8.0m)
FEED LANE
GRASS AREA
FEED LANE
CATTLE LANEWAY (8.0m)
CLEAN OUT LANE

GRADE -0.19%
GRADE -0.20%
GRADE -0.30%
GRADE -1.28%
GRADE 1.17%
GRADE 1.00%

NTH XS
STH XS

MANURE AND SPENT BEDDING
110m x 52m = 5,720m²

SETTLING BASIN 100m³ FSL 35.00

MORTALITY COMPOSTING AREA 35m x 35m

MASS MORTALITY TRENCH 270m x 3m

TURNING AREA

NEW YARDS

CATTLE LANEWAY (8.0m)

BUND AROUND PROJECT

STORM WATER POND
AREA = 8,970m2
CAPACITY @ 33.80 = 14.72ML

GRADE 1 IN 1000

BUND AROUND PROJECT

PUMP

PLANTATION TREES
REMOVE TREES AS REQUIRED

PIPELINE TO IRRIGATION AREAS

CATTLE LANEWAY (8.0m)

CATTLE LANE

EXISTING YARDS

LOADING YARDS

RAMP

TRUCK TURNING AREA

LANEWAY

HOUSE

LOADING AREA

SILOS

EXISTING FODDER AND STORAGE AREA

SHED

SHED

DRIVEWAY

50m BUFFER FROM ROAD

FEEDPAD CONSTRUCTION

FOOT PRINT AREA = 7.415 HA

VOLUME OF TOPSOIL STRIP UNDER CUT AREAS @ 0.10m = 3,289m³ (SOLID INSITU)
VOLUME OF TOPSOIL STRIP IN FILL AREAS @ 0.10m = 4,126m³ (SOLID INSITU)

VOLUME IN FILL AREAS = 21,218m³ SOLID INSITU
+ 12.5% COMPACTION = 23,870m³
VOLUME IN CUT AREAS = 27,428m³ SOLID INSITU

NOTE: ALL FINISHED ELEVATIONS ARE TOP OF CLAY LEVELS (IN RED)

THESE PLANS ARE SUBJECT TO THE RELEVENT AUTHORITIES PLANNING APPROVALS PRIOR TO ANY CONSTRUCTION COMMENCING.

LOCATION OF SERVICES (POWER, TELECOM. ETC) SHOWN ON PLANS ARE APPROXIMATE ONLY, CONTRACTOR MUST VERIFY ACTUAL POSITION OF THESE SERVICES AND ANY OTHER SERVICES NOT SHOWN ON THESE PLANS PRIOR TO ANY CONSTRUCTION COMMENCING.

ACTUAL POSITION OF ANY EXISTING BOUNDARIES, EASEMENTS OR ROAD RESERVES HAVE NOT BEEN SHOWN ON THIS PLAN, BUT SHOULD BE DETERMINED ON SITE BY RELEVANT BODIES PRIOR TO ANY CONSTRUCTION COMMENCING.

TITLE BOUNDARIES SHOWN ON PLAN ARE APPROXIMATE ONLY.

DIAL BEFORE YOU DIG www.1100.com.au

REV	DATE	REVISIONS	DRN	CHKD
0	28/05/2026	ORIGINAL CREATED	RJM	NHC

GDA ZONE 55

SCALE OF METRES 1 IN 1500
15 0 30 60 90 120 150
0 1 2 3 4 5 6 7 8 9 10cm
FULL SIZE ON ORIGINAL

SURVEYED BY	DRAWN	DESIGNED
DATUM A.H.D.	GRID INTERVAL RANDOM	AREA

NJC IRRIGATION SOLUTIONS
SURVEY, CONSULTATION & DESIGN

PROPOSED FEEDPAD LAYOUT

862 LLOWALONG ROAD, LLOWALONG

CROWN ALLOTMENT	SECTION	PARISH	DRAWING NO.	SHEET NUMBER	FILE REF	REV	SHEET SIZE
LOT 2 ON PS905315		STRATFORD	51557	1	IS-800	0	A1

APPENDIX 2 – DETALIED REVIEW OF ALL IDENTIFIED SURROUNDING RECEPTORS

ID	Owned	Address	Title particulars	Type	Distance (m)	Direction	Activity Feature	Required Separation	Pass (Y/N)
R1	Yes	862 Llowalong Road Llowalong	1\PS905315	Single Dwelling	490	S	Controlled Drainage Pond	813	N
R2	No	809 Llowalong Road Llowalong	6~A\PP3504	Single Dwelling	825	SSE	Controlled Drainage Pond	813	Y
R3	No	56 Foleys Lane Llowalong	1\PS839150	Single Dwelling	897	W	Driveway	813	Y
R4	No	253 Crooked Lane Bushy Park	4-LP142809	Single Dwelling	906	N	Feed storage	813	Y
R5	Yes	85 Lottons Road Llowalong	19B~5\PP3504	Single Dwelling	1,260	NE	Feed Storage	813	Y
R6	No	125 Lottons Road Llowalong	19A~5\PP3504	Two Dwellings within 250m	1,570	NE	Feed Storage	1,220	Y
R7	No	136 Lottons Road Briagolong	20A~5\PP3504	Two Dwellings within 250m	1,752	NE	Feed Storage	1,220	Y
R8	No	26 Llowalong Estate Road Llowalong	3~A\PP3504	Single Dwelling	1,381	SE	Controlled Drainage Pond	813	Y
R9	No	729 Llowalong Road Llowalong	2B~A\PP3504	Single Dwelling	1,393	ESE	Controlled Drainage Pond	813	Y
R10	No	713 Llowalong Road Llowalong	1~A\PP3504	Single Dwelling	1,968	SE	Controlled Drainage Pond	813	Y
R11	No	174 Nerina Lane Briagolong	2\LP60093	Single Dwelling	1,872	NE	Manure storage	813	Y
R12	No	220 Nerina Lane Briagolong	27B~5\PP3504	Single Dwelling	1,479	NE	Manure Storage	813	Y
R13	No	120 Stothers Road Llowalong	1\PS329448	Single Dwelling	2,034	E	Manure Storage	813	Y
R14	No	6 Stothers Road Llowalong	2\LP217944	Single Dwelling	2,210	ESE	Controlled Drainage Pond	813	Y
R15	No	592 Llowalong Road Stratford	1\PS927711	Single Dwelling	2,594	ESE	Controlled Drainage Pond	813	Y
R16	No	394 Llowalong Road Stratford	18~4\PP3504	Single Dwelling	4,224	SE	Controlled Drainage Pond	813	Y
R17	No	329 Llowalong Road Stratford	1\LP209174	Two Dwellings within 250m	5,000	SSE	Controlled Drainage Pond	1,220	Y
R18	No	331 Llowalong Road Stratford	1\PS804083	Two Dwellings within 250m	5,120	SE	Controlled Drainage Pond	1,220	Y
R19	No	111 Llowalong Estate Road Llowalong	10~A\PP3504	Single Dwelling	2,114	S	Controlled Drainage Pond	813	Y
R20	No	193 Lottons Road Briagolong	14B~5\PP3504	Single Dwelling	2,083	NNE	Manure Storage	813	Y
R21	No	10 Garretts Lane Briagolong	21A~5\PP3504	Single Dwelling	2,397	NE	Manure Storage	813	Y
R22	No	852 Llowalong Road Llowalong	2\PS905315	Single Dwelling	2,318	E	Manure Storage	813	Y
R23	Yes	633 Llowalong Road Llowalong	7\LP7216	Single Dwelling	2,227	SE	Controlled Drainage Pond	813	Y
R24	Yes	633 Llowalong Road Llowalong	8\LP7216	Single Dwelling	2,648	SE	Controlled Drainage Pond	813	Y
R25	No	523 Llowalong Road Stratford	1\PS333981	Single Dwelling	3,241	ESE	Controlled Drainage Pond	813	Y
	No	Stratford	NA	Large Town	5,828	SE	Controlled Drainage Pond	4,064	Y
	No	Boisdale	NA	Town	3,502	NW	Silage Storage	3,251	Y
	No	Maffra	NA	Large Town	5,009	SW	Controlled Drainage Pond	4,064	Y
	No	Briagolong	NA	Town	6,235	NE	Manure Storage	3,251	Y

Note: shaded receptors are owned by the applicant.

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PROGRESSIVE RURAL SOLUTIONS

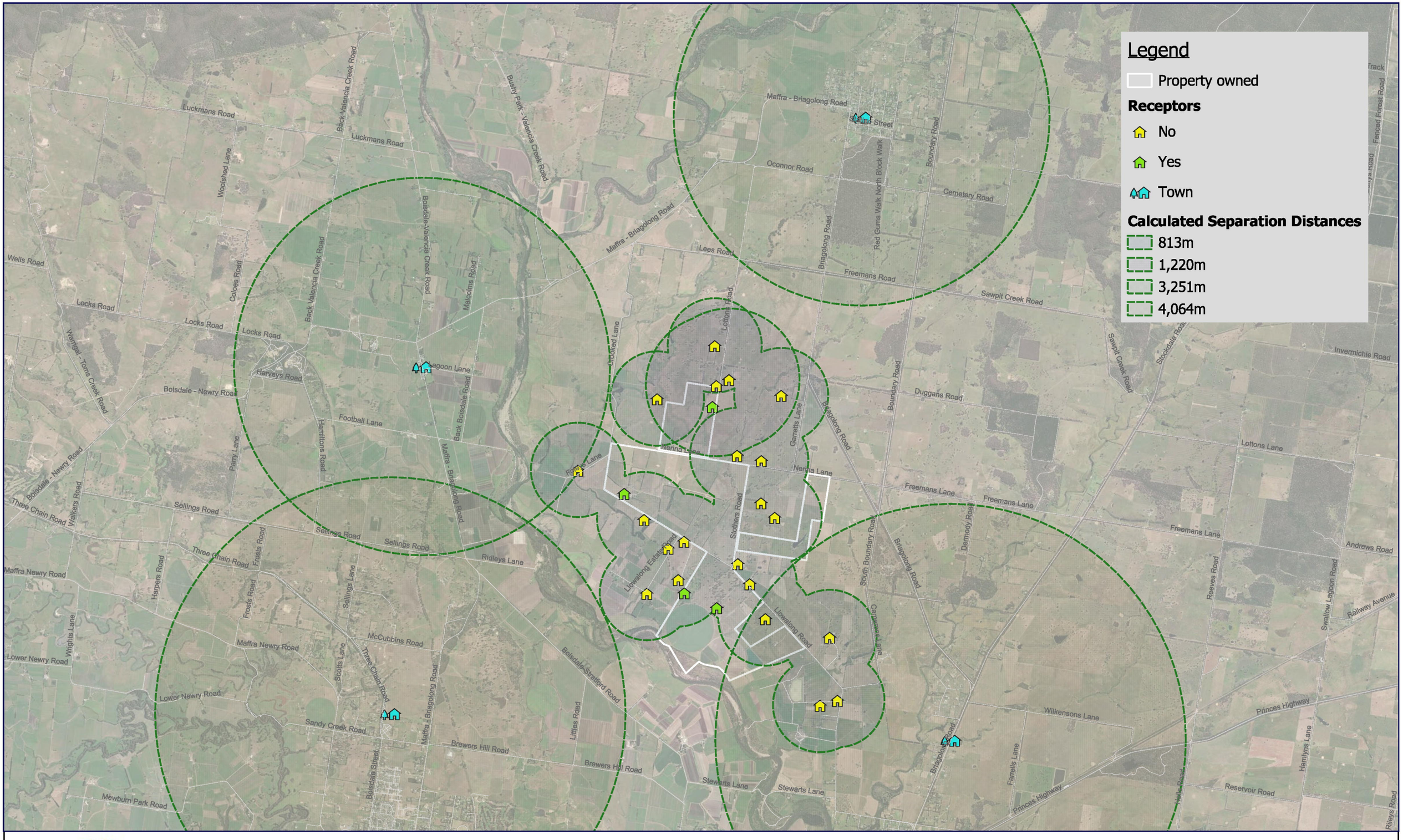
Prepared by:
Progressive Rural Solutions Pty Ltd

Project Details:

J454 - Llowalong Beef Co. Feedlot

Date:	15/05/2026
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Receptor Plan

0 1 2 km



PROGRESSIVE RURAL SOLUTIONS

Prepared by:
Progressive Rural Solutions Pty Ltd

Project Details:

J454 - Llowalong Beef Co. Feedlot

Date:	15/05/2026
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Calculated Separation Distance Plan

0 1 2 km

End of Document

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APPENDIX 6 - WASTE MANAGEMENT PLAN

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Waste Management Plan

'**Llowalong Beef Co**' at 852 Llowalong Rd, Llowalong

May 2026

Progressive Rural Solutions www.prsltd.com.au

Executive Summary

This Waste Management Plan (WMP) has been prepared to support the proposed development and operation of a covered housing beef cattle feedlot system located at 852 Llowalong Road, Llowalong, Victoria. The proposed development comprises an integrated covered cattle accommodation and feeding operation incorporating associated feed preparation and commodity storage infrastructure, controlled drainage and runoff management systems, settling and storage infrastructure, manure and bedding management areas, mortality composting infrastructure and an integrated runoff storage and irrigation reuse system.

The WMP has been prepared to:

- identify waste streams generated by the operation,
- assess storage, handling and reuse requirements,
- establish nutrient utilisation principles,
- outline monitoring and operational management measures, and
- demonstrate compliance with the relevant requirements of the *Victorian Code for Cattle Feedlots* (1995).

The proposed feedlot has been designed around the principles of:

- covered cattle housing,
- separation and recovery of manure and bedding materials,
- integrated stormwater management,
- nutrient recovery and beneficial agricultural reuse, and
- minimisation of uncontrolled runoff generation.

Unlike conventional open feedlot systems, the proposed development incorporates extensive roof coverage and controlled drainage infrastructure which substantially reduces direct rainfall interaction with manure storage areas and operational surfaces. As a result, the majority of nutrients generated by the feedlot are retained within the recoverable solids stream rather than the captured runoff stream.

Recoverable manure and bedding material generated within the covered cattle housing system will be periodically removed and temporarily stored within the designated manure and bedding storage area prior to beneficial agricultural reuse. Captured runoff generated within the integrated drainage system will be directed through settling infrastructure and subsequently stored within the stormwater storage pond for irrigation reuse within the broader farming enterprise.

Storage infrastructure associated with the development has been designed to provide sufficient operational capacity to accommodate:

- manure and bedding storage,
- settling and sediment capture,
- runoff detention and storage,
- irrigation reuse requirements, and
- mortality composting activities.

Runoff storage infrastructure has been assessed in accordance with the Victorian Code for Cattle Feedlots, including both short-duration storm event storage requirements and conservative wet-year runoff storage assessments. The adopted stormwater storage pond provides capacity in excess of the calculated minimum storage requirements.

The WMP identifies that recoverable nutrients generated within both the solids and captured runoff streams can be beneficially reused within the broader farming enterprise through managed land application and irrigation reuse activities. Nutrient utilisation areas are available across the property and application activities will be undertaken in accordance with crop demand, soil conditions, seasonal factors and nutrient management principles.

The Plan incorporates operational controls and monitoring measures relating to:

- manure and bedding management,
- drainage and storage infrastructure,
- irrigation reuse,
- soil nutrient monitoring,
- incident response,
- complaints management, and
- environmental protection.

Overall, the proposed waste management framework demonstrates that wastes generated by the proposed feedlot can be appropriately contained, managed, monitored and beneficially reused in a manner consistent with the Victorian Code for Cattle Feedlots and contemporary agricultural nutrient management practices.

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Project No:	454-0

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Reviewed by:		**Position:**	Director
Signature:		**Date:**	28/05/2026
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Signature:		**Date:**	28/05/2026

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Version	Recipient	Lodgement	Copies
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V1R4	Client for review	Electronic	1
V1R5	Wellington Shire Council for application	Electronic	1
V1R5	Client for review and construction & operation	Electronic & Hard	1

Related Documents

Type	Author	Name	Date
Report	Progressive Rural Solutions	Application for a permit for a 2,206 head covered beef cattle feedlot at 852 Llowalong Road, Llowalong	28/05/2026
Report	Progressive Rural Solutions	'S-Factor' odour assessment for a 2,206head beef covered feedlot at 852 Llowalong Rd, Llowalong, Vic	28/05/2026
Site Plans: Existing Condition	NJC Irrigation Solutions	Existing Plan	02/06/2026
Site Plan: Proposed Condition	NJC Irrigation Solutions	IS-800 shedded feedpad Plan	28/05/2026
Cross Section Plan	NJC Irrigation Solutions	IS-800 shedded feedpad cross sections	01/06/2026
Locality Plan	NJC Irrigation Solutions	IS-800 Shed Locality Plan	02/06/2026
Site Plan – Detailed works	Assorted	Landscape, Feedlot, Waste Management Plans	28/05/2026
Site Plan	Progressive Rural Solutions	Waste Application Buffer Plan	28/05/2026

Confidentiality

No information in this report has been classified as confidential.

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1. INTRODUCTION

1.1. ORGANISATION

This report has been commissioned by **Llowalong Beef Co**, being the landowner and project ***Applicant*** for the proposed feedlot development. Following construction and commissioning, the site will be owned and operated by the ***Applicant***, who is referred to throughout this document as the owner, operator and manager of the facility.

This report has been prepared by **Progressive Rural Solutions Pty Ltd (PRS)**. The principal author of this report is Director of Progressive Rural Solutions, who has been engaged to undertake the waste management assessment components associated with the proposed feedlot development and Planning Permit application.

1.2. PURPOSE

This ***Waste Management Plan*** (WMP) has been prepared to support an application for the development and operation of a 2,206 head covered beef cattle feedlot at 852 Llowalong Road, Llowalong, Victoria. The Plan establishes the framework for the management, recovery, storage, handling and beneficial reuse of solid and liquid material streams generated by the proposed feedlot operation.

The proposed development has been designed as a modern covered cattle housing system incorporating controlled drainage, nutrient recovery and agricultural reuse principles. The operation forms part of a broader integrated farming enterprise involving cattle production, irrigated cropping and nutrient reuse within the agricultural system.

While manure, bedding material, sediment and controlled drainage runoff generated by the operation are managed in accordance with applicable environmental and planning requirements, these materials also represent valuable agricultural by-products capable of beneficial reuse within the farming enterprise. When appropriately managed, these materials provide a recoverable source of nutrients and organic matter capable of reducing reliance on imported synthetic fertilisers and supporting whole-of-farm nutrient cycling.

This Plan therefore provides the operational and environmental management framework for:

- collection and containment systems;
- manure and bedding management;
- controlled drainage and effluent management;
- nutrient recovery and agricultural reuse;
- mortality management;
- operational monitoring and maintenance; and
- contingency management associated with the operation of the feedlot.

1.3. OBJECTIVES

The objectives of this Waste Management Plan are to:

- quantify the amount of solid and liquid material streams generated by the proposed 2,206 head covered beef cattle feedlot,
- characterise manure, bedding material, sediment and controlled drainage runoff with regard to nutrient content, salts, organic matter and water volumes,
- identify and assess land available for the beneficial reuse of recovered organic nutrients and associated material streams,
- assess the ability of soils and cropping systems to sustainably utilise nutrients, organic matter and salts generated by the feedlot operation,
- describe the management of clean stormwater, controlled drainage and effluent collection systems associated with the feedlot,
- demonstrate that sufficient land area is available to sustainably reuse nutrients generated by the operation,
- establish operational parameters for the storage, handling, monitoring and beneficial reuse of manure, bedding material and effluent,
- establish monitoring and review requirements for nutrient reuse areas and associated infrastructure,
- identify any required surface water and groundwater monitoring measures, and
- support the operation of the feedlot in accordance with the *Victorian Code for Cattle Feedlots* and contemporary covered housing management principles.

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1.4. BACKGROUND

Llowalong Beef Co proposes the development and operation of a 2,206 head covered beef cattle feedlot at 852 Llowalong Road, Llowalong within the Wellington Shire, Victoria.

The proposal has been developed as a modern covered cattle housing system designed to integrate cattle production, feed production and nutrient reuse within a broader agricultural enterprise. The development forms part of an existing farming operation incorporating irrigated cropping and livestock production and is intended to support a more integrated and efficient whole-of-farm production system.

The proposed feedlot will accommodate up to 2,206 head of beef cattle entering the facility at approximately 350–400 kilograms liveweight and exiting at approximately 600 kilograms liveweight following a controlled feeding program. The development has been designed as a modern, state-of-the-art covered cattle housing and feeding system incorporating staged infrastructure delivery, controlled drainage, nutrient recovery and future-focused feeding technology integration.

Initial development of the site is proposed to commence with the western shed (Shed 1), incorporating a feed-table style feeding system specifically designed to facilitate integration of automated and robotic feeding technologies. Robotic feeding infrastructure may be installed as part of the initial construction phase or incorporated progressively as part of future operational expansion, including delivery of the eastern shed (Shed 2). The proposed staging and operational flexibility does not alter the overall waste management philosophy, nutrient recovery framework or controlled drainage principles adopted for the development.

Unlike a conventional open feedlot system, the proposed development incorporates covered housing designed to reduce rainfall interaction with manure and bedding materials, minimise uncontrolled runoff generation and improve integrated stormwater and controlled drainage management from controlled drainage areas. The covered system is also intended to support improved pen condition, animal welfare outcomes, operational efficiency and nutrient recovery when compared with traditional open feedlot systems.

The proposal has been designed around the principles of controlled drainage, nutrient recovery and beneficial agricultural reuse. Organic materials generated by the operation, including manure, bedding material and nutrient-rich runoff captured within the controlled drainage system, are intended to be managed as recoverable agricultural by-products capable of reuse within the broader farming enterprise. This approach supports nutrient cycling, improves recovery of organic matter and nutrients and reduces reliance on imported synthetic fertilisers across the farming system.

The proposed development also seeks to support a more regionally integrated beef production model by utilising locally sourced cattle and feed inputs within Gippsland. Feed utilised within the operation will predominantly be derived from locally grown fodder and cropping systems associated with the broader farming enterprise and surrounding agricultural region. Nutrients recovered from the feedlot operation will subsequently be returned to agricultural land through controlled and managed reuse practices.

The site has been selected having regard to operational efficiency, agricultural suitability and environmental management considerations, including:

- suitable separation distances from surrounding sensitive receptors,
- sufficient surrounding agricultural land for sustainable nutrient reuse,
- topography capable of supporting controlled drainage and stormwater management,
- integration with existing agricultural infrastructure and farming operations,
- access to existing cropping and irrigation systems to support nutrient reuse, and
- the ability to establish a contained and operationally efficient feedlot system.

This Waste Management Plan has therefore been prepared to support the integrated management, recovery and beneficial reuse of material streams generated by the proposed operation, while ensuring the protection of surface water, groundwater, soils and surrounding land uses.

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1.5. SITE LOCATION

The proposed feedlot is located at 852 Llowalong Road, Llowalong within the Wellington Shire local government area in Gippsland, Victoria. The site is centrally located between the regional townships of Maffra, Stratford and Briagolong, being approximately 6.7 kilometres north-east of Maffra, 7.4 kilometres north-west of Stratford and 6.7 kilometres south-west of Briagolong.

The proposal forms part of an existing agricultural holding currently utilised for grazing and cropping activities and will represent a transition from broadacre agricultural production to an integrated covered cattle feedlot and agricultural nutrient reuse system.

The proposed feedlot infrastructure has been sited within the north-western portion of the property having regard to separation distances to surrounding sensitive receptors, topography and drainage characteristics, operational efficiency, integration with the broader farming enterprise, prevailing land use patterns and the ability to establish an effective controlled drainage system. The feedlot has been designed in a north-south orientation to support operational functionality, drainage management and shed performance.

The proposed feedlot infrastructure is located generally greater than 50m from property boundaries and adjoining roads and greater than 700 metres from the nearest dwelling. Assessment of available groundwater information has also identified that there are no registered operational groundwater bores within the immediate vicinity of the proposed development area.

The surrounding locality is characterised by agricultural land uses including grazing, irrigated cropping and rural residential development associated with the broader Gippsland farming landscape.

A Property Planning Report has been prepared and supplied as part of the planning application documentation.

The specific location of the project site is shown below in **Figure 1-1**, and **Table 1-1** below.

Table 1-1 - Land details of the proposed feedlot

Details	Specific related to project site	
Address	852 Llowalong Road, Llowalong	
Crown Allotment	2	
Plan	PS905315	
Parish	Stratford	
Local Shire Council	Wellington	
Catchment Area	Thomson	
Surface Water Source	Avon River	
IBRA Sub-region	Gippsland Plain	
Traditional Owners/Land Council	Gunaikurnai Land and Waters Aboriginal Corporation	
Land Stature	Freehold	
Area of project (Works area)	9ha	
GPS Reference:	MGA Zone	55
	Easting	502720
	Northing	5805447
	Longitude	-37.898492
	Latitude	147.030938

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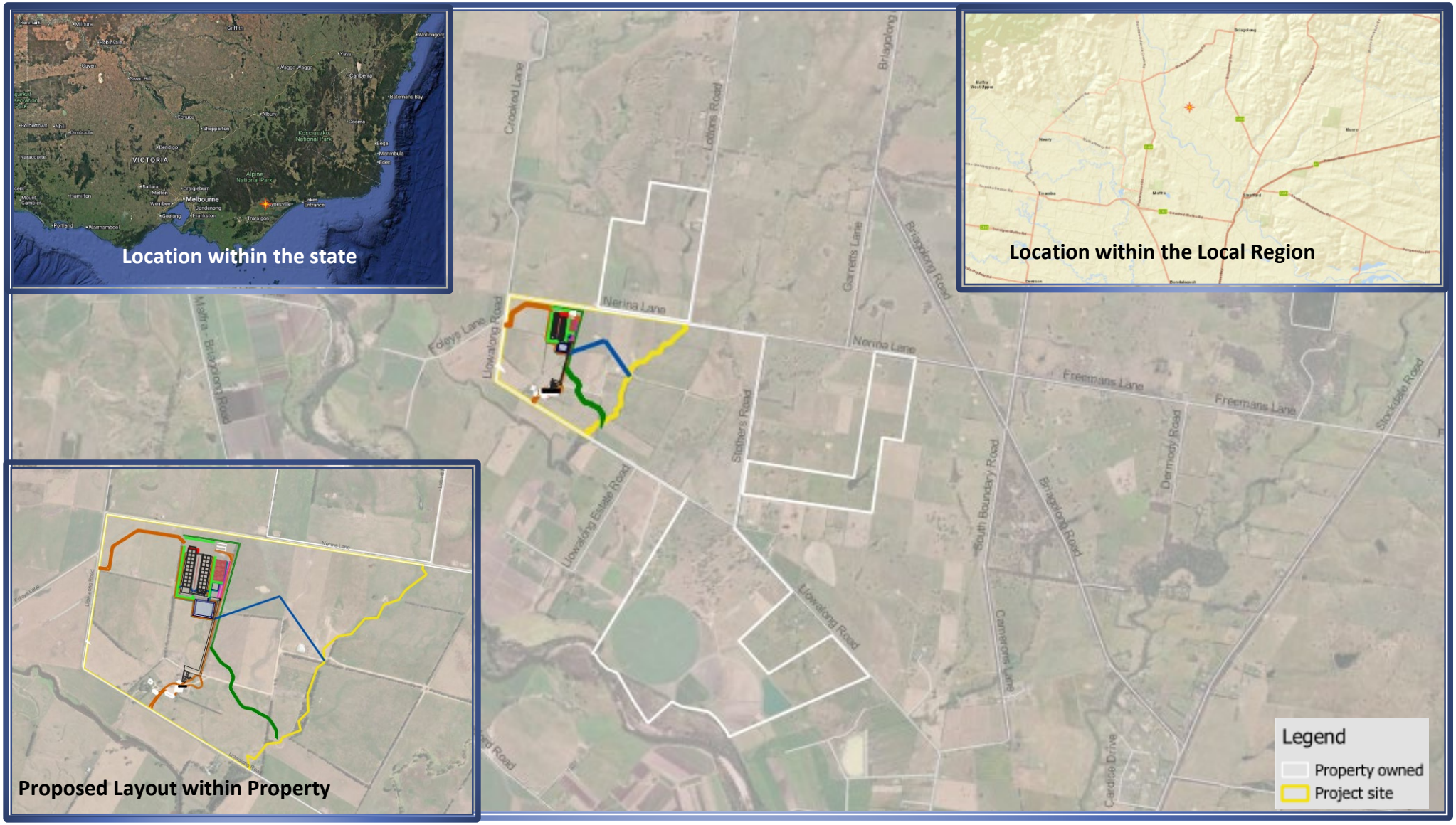

Figure 1-1 - Location of proposed feedlot in relation to the State, local region and property (Source: QGIS)

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1.6. POTENTIAL SENSITIVE RECEPTORS

The surrounding locality is characterised by a mixture of grazing, cropping and rural residential land uses typical of the broader Gippsland agricultural region. Potential sensitive receptors surrounding the proposed feedlot primarily comprise isolated rural dwellings associated with agricultural properties and rural living allotments.

The relationship of the proposed feedlot to surrounding residences is shown in **Figure 1-4** below which identifies a 1-kilometre and 2-kilometre radius from the centre of the proposed development area. **Table 1-2** provides a summary of identified receptors and their approximate distances from the proposed feedlot boundary.

A total of 25 dwellings were identified and considered as part of the broader assessment area. Of these, four dwellings (three unrelated to the ***Applicant***) are located within 1km of the proposed feedlot boundary and eight dwellings are located between 1km and 2km from the proposed development.

Several identified dwellings are either associated with the broader farming enterprise or identified as locations associated with nutrient reuse assessment only. The surrounding pattern of development is therefore generally consistent with a rural agricultural landscape characterised by low-density and isolated residential development.

The nearest non-associated residence is located approximately 820m (using the rural method) from the proposed feedlot boundary. Broader assessment of surrounding dwellings, settlement patterns and township interfaces has been undertaken as part of the accompanying odour and planning assessments prepared for the proposal.

The regional townships of Stratford, Boisdale, Maffra and Briagolong are all located well beyond the immediate project area and are separated from the proposed feedlot by established agricultural land uses and broader rural landscapes.

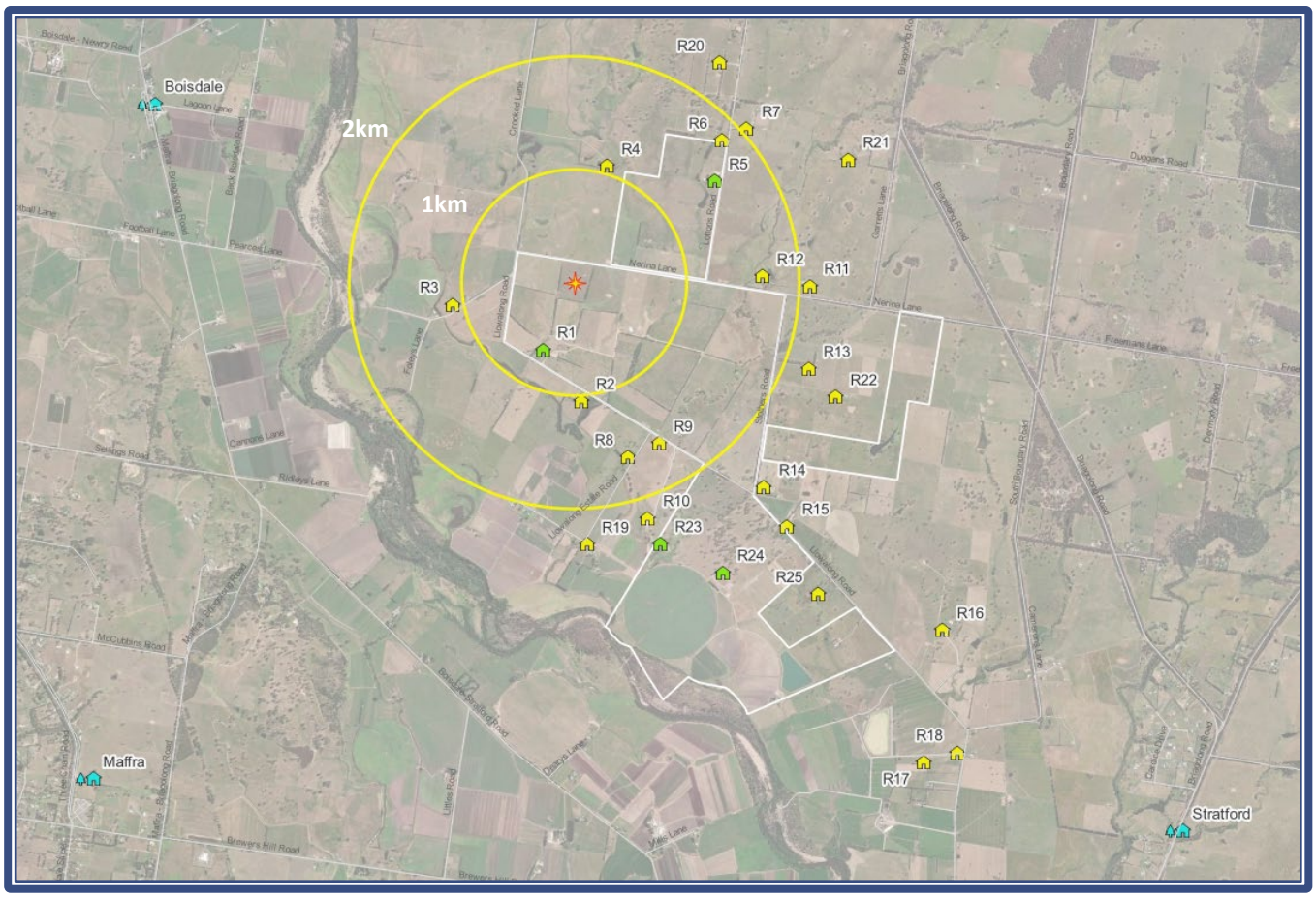

Figure 1-2 - Project site in relation to surrounding residences - white radius 1km and 2km (source QGIS)

Table 1-2 - Project receptors

ID	Address	Type	Distance (m)	Comment
R1	862 Llowalong Road Llowalong	Single Dwelling	490	Owned
R2	809 Llowalong Road Llowalong	Single Dwelling	823	Isolated rural dwelling
R3	56 Foleys Lane Llowalong	Single Dwelling	897	Isolated rural dwelling

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ID	Address	Type	Distance (m)	Comment
R4	253 Crooked Lane Bushy Park	Single Dwelling	906	Isolated rural dwelling upslope
R5	85 Lottons Road Llowalong	Single Dwelling	1,260	Owned
R6	125 Lottons Road Llowalong	Two Dwellings within 250m	1,570	Rural dwelling upslope near R7
R7	136 Lottons Road Briagolong	Two Dwellings within 250m	1,752	Rural dwelling upslope near R6
R8	26 Llowalong Estate Road Llowalong	Single Dwelling	1,381	Isolated rural dwelling
R9	729 Llowalong Road Llowalong	Single Dwelling	1,393	Isolated rural dwelling – small title
R10	713 Llowalong Road Llowalong	Single Dwelling	1,968	Isolated rural dwelling – re-use only
R11	174 Nerina Lane Briagolong	Single Dwelling	1,872	Isolated rural dwelling
R12	220 Nerina Lane Briagolong	Single Dwelling	1,479	Isolated rural dwelling – re-use only
R13	120 Stothers Road Llowalong	Single Dwelling	2,034	Isolated rural dwelling
R14	6 Stothers Road Llowalong	Single Dwelling	2,210	Isolated rural dwelling – re-use only
R15	592 Llowalong Road Stratford	Single Dwelling	2,594	Isolated rural dwelling – re-use only
R16	394 Llowalong Road Stratford	Single Dwelling	4,224	Isolated rural dwelling – re-use only
R17	329 Llowalong Road Stratford	Two Dwellings within 250m	5,000	Rural dwelling near R18 – re-use only
R18	331 Llowalong Road Stratford	Two Dwellings within 250m	5,120	Rural dwelling near R17 – re-use only
R19	111 Llowalong Estate Road Llowalong	Single Dwelling	2,114	
R20	193 Lottons Road Briagolong	Single Dwelling	2,083	Isolated rural dwelling – re-use only
R21	10 Garretts Lane Briagolong	Single Dwelling	2,397	Isolated rural dwelling – re-use only
R22	100 Stothers Road Llowalong	Single Dwelling	2,318	Isolated rural dwelling – re-use only
R23	633 Llowalong Road Llowalong	Single Dwelling	2,227	Owned
R24	633 Llowalong Road Llowalong	Single Dwelling	2,648	Owned
R25	523 Llowalong Road Stratford	Single Dwelling	3,241	Isolated rural dwelling – re-use only
	Stratford	Large Town	5,828	
	Boisdale	Town	3,502	
	Maffra	Large Town	5,009	
	Briagolong	Town	6,235	

1.7. REQUIRED BUFFER DISTANCES

The proposed feedlot operation incorporates a range of fixed and variable separation distances associated with feedlot infrastructure, controlled drainage systems, manure and bedding storage areas and surrounding sensitive receptors. Separation distances have been considered having regard to the *Victorian Code for Cattle Feedlots*, associated waste management requirements, odour assessment considerations and environmental protection objectives relating to surface water, groundwater and surrounding land uses.

The required separation distances vary depending on the type of activity, the material stream being managed and the nature of the surrounding receptor. Separation distances associated with the feedlot activity area have also been informed by the odour assessment undertaken for the proposed development.

Assessment of the proposed development indicates that the required separation distances associated with liquid waste management areas, solid material storage areas and the broader feedlot activity area can be achieved within the site. The separation distances considered as part of this Waste Management Plan are summarised in Table **1-3** below.

Table 1-3 - Feedlot activity separation distance compliance

Separation from	Liquid waste		Solid Waste		Feedlot Activity Area	
	Required	Complies	Required	Complies	Required	Complies
Site Boundary	20m	Yes	20m	Yes	50m	Yes
Public Area	100m	Yes	100m	Yes	-	NA
Watercourse, bore or spring	100m	Yes	200m	Yes	200m	Yes
Off site residence	200m	Yes	200m	Yes	820m[1]	Yes
Flood prone land (1 in 100 year flood)	200m	Yes	200m	Yes	200m	Yes

1 – See Odour Separation Distance Calculations – excluding surface water catchment dam

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2. FEEDLOT DESCRIPTION AND OPERATIONAL SUMMARY

This Waste Management Plan relates to the proposed development and operation of a 2,206 head covered beef cattle feedlot at 852 Llowalong Road, Llowalong, Victoria.

The proposed development has been designed as a modern covered cattle housing system incorporating controlled drainage, nutrient recovery and beneficial agricultural reuse principles. The operation forms part of a broader integrated farming enterprise involving livestock production, irrigated cropping and nutrient reuse within the agricultural system.

Cattle entering the feedlot will generally range between approximately 350 and 400 kilograms liveweight and will be fed to an approximate exit weight of 600 kilograms. Cattle are expected to remain within the feedlot for an average feeding period of approximately 120 days, subject to seasonal, market and operational requirements.

The proposed feedlot will comprise covered cattle housing infrastructure, cattle handling and processing facilities, automated feeding infrastructure including a robotic feed kitchen, controlled drainage systems, manure and bedding storage areas, nutrient recovery infrastructure, commodity and silage storage areas, mortality management infrastructure and associated operational areas.

The covered housing system has been designed to reduce rainfall interaction with manure and bedding material, minimise uncontrolled runoff generation and support integrated stormwater and controlled drainage management. The development has also been designed to support improved nutrient capture and recovery compared with conventional open feedlot systems.

Feedlot occupancy and stock movements will occur progressively throughout operation, with induction and dispatch occurring on a staged basis. While operational occupancy may fluctuate during induction and dispatch periods, the feedlot will not exceed a maximum operational capacity of 2,206 head of cattle.

The proposed feedlot footprint and associated nutrient reuse areas are shown in **Figure 2-1**..

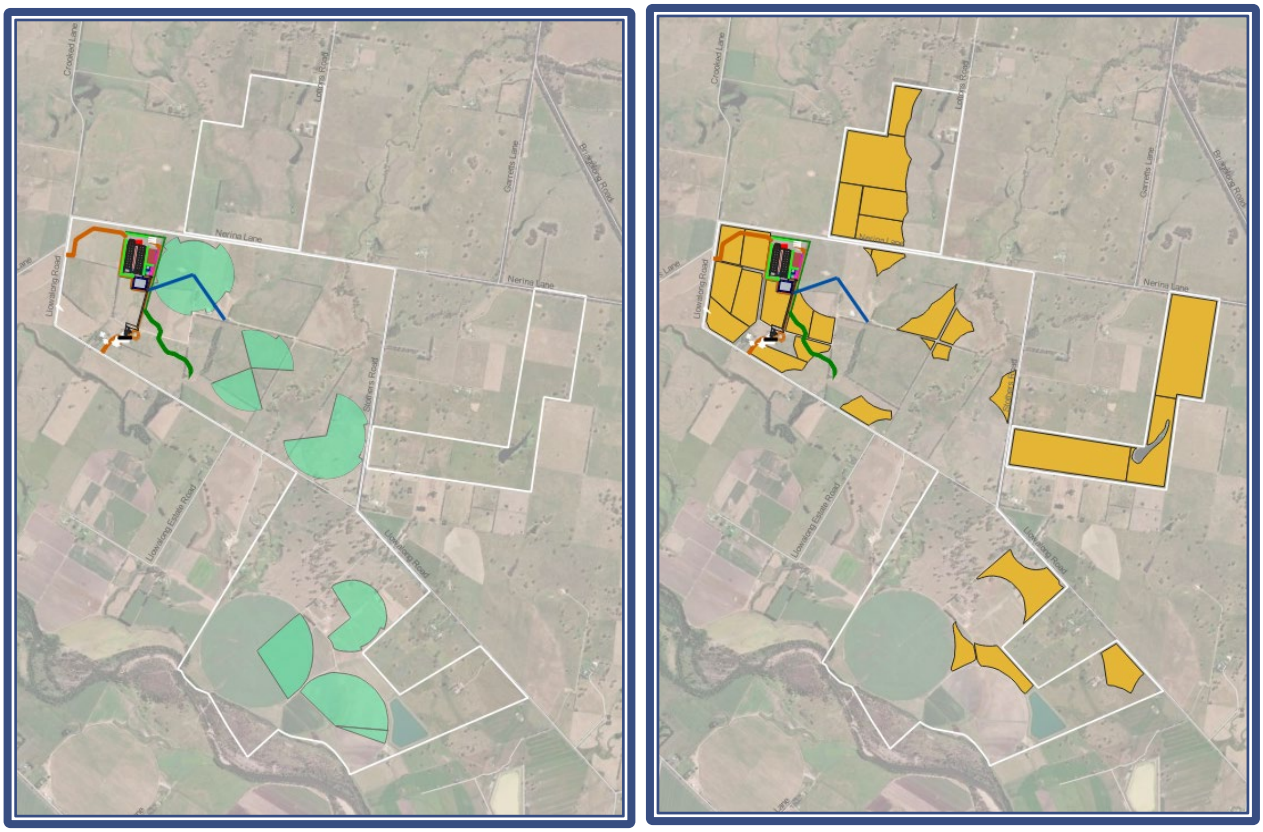

Figure 2-1 – Property overview showing the feedlot and Liquid (left) and Solid (right) waste utilisation areas. (Source: QGIS)

The proposed feedlot has been designed as an integrated covered cattle housing and nutrient recovery system incorporating controlled drainage, solids recovery, stormwater capture and beneficial agricultural reuse principles.

Figure 2-2 below provides a conceptual overview of the proposed waste management framework, including waste streams generated by the operation, on-site management systems, storage and treatment infrastructure, reuse pathways and operational management controls adopted for the development.

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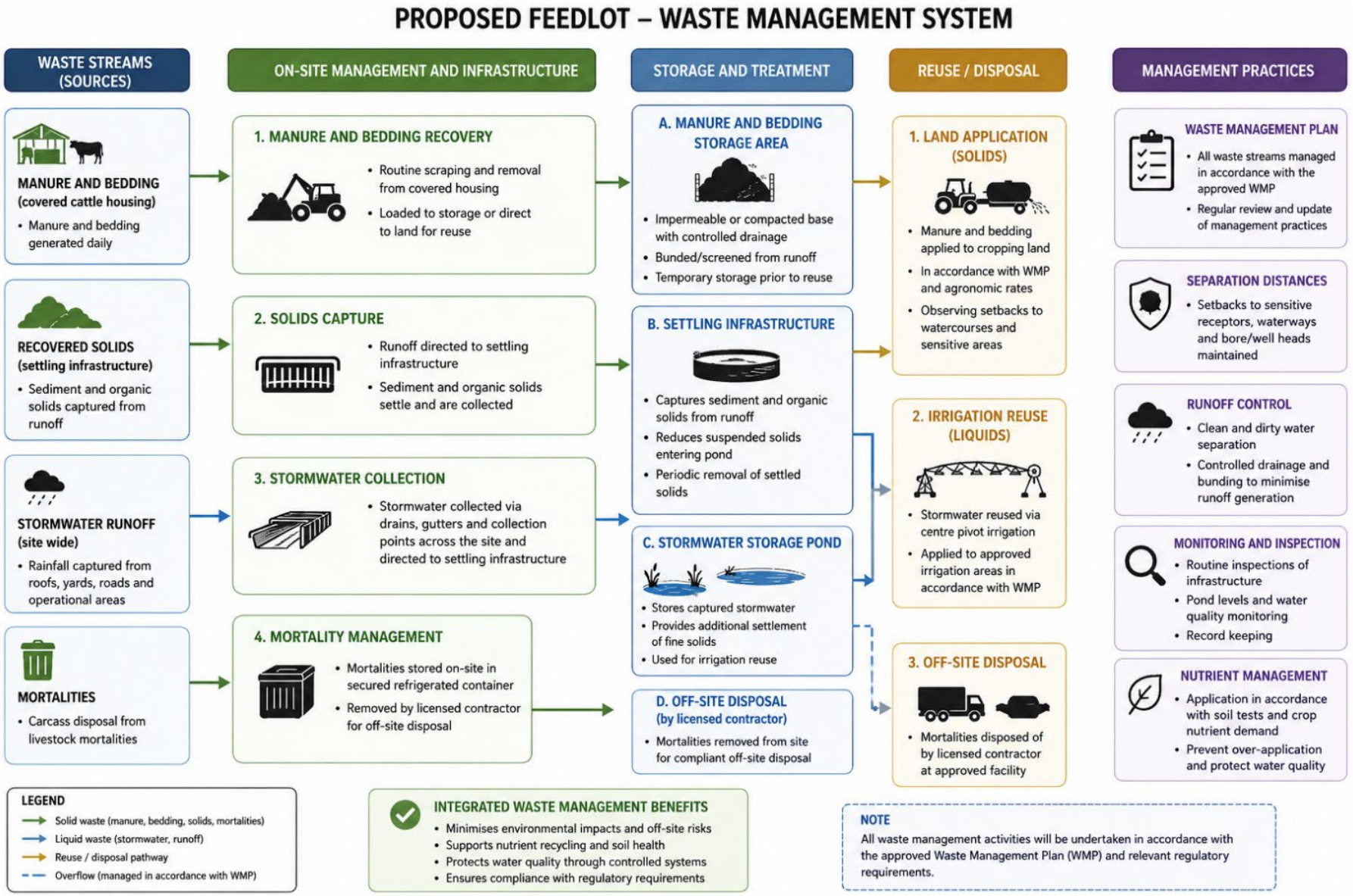

Figure 2-2 - Conceptual waste management framework for the proposed feedlot

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2.1. FEEDLOT INFRASTRUCTURE

The proposed development incorporates a range of operational; drainage, nutrient recovery and support infrastructure associated with the feedlot operation.

The dimensions and approximate areas of the major feedlot components are summarised in **Table 2-1** below.

Table 2-1 – Area of feedlot components within the site.

Infrastructure Component	Approximate Area (m^2)	Description
Covered cattle housing sheds	20,700	Covered housing areas for cattle accommodation
Hospital and isolation pens	Within shed	Veterinary treatment and animal management areas
Cattle handling and dispatch areas	1,245	Induction, drafting and dispatch infrastructure part internal of shed 2.
Feed preparation and robotic feeding infrastructure	1,350	Feed kitchen, robot feeding systems and associated infrastructure and loading area
Commodity and silage storage areas	5,400	Storage of feed commodities and silage materials
Manure and bedding storage area	5,500	Temporary storage of recovered manure and bedding material prior to reuse
Controlled drainage infrastructure	545	Sediment controls and associated drainage systems to main drain
Controlled drainage storage pond	9,000	Storage of captured runoff and nutrient-rich water for reuse
Internal laneways and operational access	4,600 2,650	Vehicle, cattle and operational movement areas
Landscaping, buffers and ancillary infrastructure	44,629	Remaining operational and landscaped areas
Total Feedlot Footprint	90,000	Total operational footprint
Property Area	528 ha	Total property area
Nutrient Reuse Area	208ha – Solids 111ha - Liquid	Area available for nutrient reuse outside separation distances

2.2. FEEDLOT OPERATION AND MANAGEMENT

The proposed feedlot will operate as a controlled covered cattle housing system designed to support cattle finishing, feed efficiency, animal welfare and nutrient recovery within an integrated agricultural enterprise. Cattle entering the feedlot will generally arrive at approximately 350–400 kilograms liveweight and will remain within the system for an average feeding period of approximately 120 days prior to dispatch at approximately 600 kilograms liveweight.

Cattle induction, feeding, treatment and dispatch will occur progressively throughout the year, resulting in continual but controlled stock movement through the facility. Feedlot occupancy may fluctuate during induction and dispatch periods, however operational capacity will not exceed 2,206 head.

The feedlot has been designed around a covered housing system intended to minimise rainfall interaction with cattle accommodation areas, manure and bedding materials. The covered arrangement is intended to support improved pen conditions, reduce uncontrolled runoff generation and integrated stormwater and controlled drainage management compared with conventional open feedlot systems.

Cattle will be housed within covered accommodation areas incorporating bedding material designed to support animal comfort, moisture control and operational management. Bedding material will be monitored and replenished as required to maintain suitable pen conditions and support ongoing cattle health and welfare outcomes.

Feed delivery within the facility will occur through a controlled feed-table style feeding system designed to support both conventional and future automated feeding operations. The system has been developed to facilitate integration of advanced feeding technologies, including robotic feed preparation and feed delivery infrastructure. This approach provides operational flexibility while supporting efficient feed management, ration consistency, labour efficiency and future technological integration within the broader feedlot operation.

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Manure and bedding material generated within the covered housing areas will be routinely removed as part of ongoing operational management. Recovered material will be temporarily stored within designated manure and bedding storage areas prior to beneficial reuse within the broader farming enterprise.

The feedlot has been designed to operate in conjunction with a controlled drainage system intended to capture and manage runoff generated from operational areas associated with the development. Clean stormwater generated from roof areas and external catchments will be separated from controlled drainage areas wherever practicable in order to minimise the volume of water requiring containment and reuse.

Runoff and nutrient-rich water captured within the controlled drainage system will be directed through sediment controls and storage infrastructure prior to reuse within the broader agricultural enterprise in accordance with agronomic demand, operational constraints and environmental management requirements.

The proposed operation therefore forms part of a broader integrated agricultural system incorporating feed production, cattle finishing, nutrient recovery and agricultural reuse within the farming enterprise.

2.3. CONTROLLED DRAINAGE AND NUTRIENT RECOVERY PHILOSOPHY

The proposed feedlot has been designed around the principles of controlled drainage, nutrient recovery and beneficial agricultural reuse. Unlike conventional open feedlot systems where rainfall directly interacts with exposed cattle pens and manure surfaces, the covered housing arrangement will substantially reduce rainfall interaction with manure and bedding materials and minimise the generation of uncontrolled operational runoff.

The development integrates roof water, stormwater and operational drainage management systems wherever practicable in order to reduce the volume of water requiring containment, storage and reuse. Roof runoff and external catchment flows will therefore be managed separately from runoff associated with cattle housing, manure handling and operational feedlot areas.

Organic materials generated by the feedlot, including manure, bedding material, sediment and nutrient-enriched runoff, are intended to be managed as recoverable agricultural by-products capable of beneficial reuse within the broader farming enterprise. The proposed management framework is intended to support nutrient cycling, reduce nutrient loss from the site and reduce reliance on imported synthetic fertilisers across the agricultural operation.

Captured nutrients and recovered organic materials will be reused within the broader farming system subject to agronomic demand, operational requirements, environmental protection measures and ongoing monitoring procedures outlined within this Plan.

The proposed system reflects contemporary best-practice principles for covered cattle housing operations by integrating controlled drainage, nutrient recovery, feed efficiency, animal welfare and operational flexibility within a coordinated agricultural production system.

2.4. STAGING AND FUTURE DEVELOPMENT

The proposed feedlot may be developed progressively in stages in response to operational requirements, market conditions, infrastructure delivery timing and broader business development considerations.

Initial development is proposed to commence with construction and operation of the western covered housing shed (Shed 1), associated controlled drainage infrastructure and supporting operational facilities. Shed 1 is proposed to incorporate a feed-table style feeding system designed to support either conventional feed delivery operations or future integration of automated and robotic feeding technologies.

Robotic feeding infrastructure, including automated feed preparation and feed delivery systems, may be installed during the initial construction phase or incorporated progressively as part of future operational expansion, including development of the eastern covered housing shed (Shed 2).

The proposed staging framework has been intentionally designed to provide flexibility in construction sequencing, operational management and technology integration while maintaining the overall environmental management framework adopted for the development.

Any future staged infrastructure delivery will remain subject to the operational limits, environmental controls and infrastructure requirements identified within this Plan and associated approval documentation.

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2.5. DESIGN BASIS ASSUMPTIONS

The waste generation estimates, storage requirements, nutrient reuse calculations and operational management measures contained within this Waste Management Plan have been developed based on the operational assumptions and design parameters outlined in **Table 2-2** below.

These assumptions represent the proposed operational basis for the feedlot and have been used to inform the assessment of manure generation, nutrient recovery, controlled drainage management, storage infrastructure and beneficial reuse requirements associated with the development.

Table 2-2 - Design basis assumptions

Parameter	Assumption
Maximum cattle capacity	2,206 head
Entry weight	350–400 kg
Exit weight	Approximately 600 kg
Average feeding period	Approximately 120 days
Housing system	Covered cattle housing system
Bedding system	Straw base with woodchips as an alternate
Feed delivery	Feed-table style feeding system designed to accommodate conventional and future automated/robotic feeding infrastructure
Drainage philosophy	Integrated controlled drainage system with settling from manure and bedding storage area
Nutrient reuse	Agricultural reuse within broader farming enterprise
Reuse areas	Approximately 208 ha (Solid) 111ha (Liquid)
Waste streams	Manure, bedding, sediment, controlled drainage runoff, mortalities, waste feed
Stock movements	Progressive induction and dispatch
Operational basis	Continuous operation

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3. MATERIAL STREAMS AND NUTRIENT GENERATION

The proposed feedlot operation will generate a range of solid and liquid material streams associated with cattle accommodation, feeding activities, controlled drainage systems and general operation of the facility. The quantity and characteristics of generated material streams are influenced by factors including cattle numbers, feeding periods, feed composition, bedding management, climatic conditions, operational practices and the effectiveness of the covered housing and controlled drainage systems.

Unlike conventional open feedlot systems, the proposed covered housing arrangement is intended to reduce rainfall interaction with manure and bedding materials, minimise uncontrolled runoff generation and improve the capture and recovery of nutrients generated by the operation.

The principal material streams generated by the feedlot are expected to include:

- manure and bedding material,
- sediment collected within controlled drainage systems,
- controlled drainage runoff and nutrient-rich water,
- roof runoff and clean stormwater,
- mortalities,
- waste feed and feed handling losses, and
- general operational and maintenance wastes.

These material streams are intended to be managed through a combination of collection, storage, containment, recovery and beneficial agricultural reuse systems incorporated into the design and operation of the facility.

The following sections provide an assessment of the expected material streams generated by the proposed operation together with the proposed management, recovery and reuse systems associated with the development.

3.1. ASSESSMENT BASIS

Waste generation, nutrient recovery and material stream management within this Waste Management Plan have been assessed based on a maximum operational feedlot capacity of 2,206 head of beef cattle. Cattle entering the facility are expected to range between approximately 350 and 400 kilograms liveweight and will be fed for an average period of approximately 120 days prior to dispatch at approximately 600 kilograms liveweight.

Assessment of manure generation, bedding material volumes, nutrient recovery and operational water management has been undertaken based on the proposed fully covered cattle housing system and associated operational infrastructure described in Section 2 of this Plan.

The proposed development has been designed to maximise integrated stormwater and controlled drainage management from operational material streams through the use of covered housing infrastructure and controlled drainage principles. As a result, the majority of rainfall falling within the feedlot footprint will be captured as clean roof water and managed separately from nutrient-rich operational runoff.

Controlled drainage runoff generated within the feedlot is expected to primarily arise from exposed operational areas including manure and bedding storage areas, mortality management areas and isolated operational surfaces associated with feedlot activities.

For the purposes of infrastructure sizing and operational assessment, calculations contained within this Plan have adopted conservative assumptions relating to:

- cattle occupancy,
- manure and bedding generation,
- nutrient recovery,
- operational water management,
- sediment generation,
- and controlled drainage capture volumes.

Assessment methodologies and assumptions have been informed by the *Victorian Code for Cattle Feedlots*, National covered housing guidance, published feedlot nutrient and manure generation data and accepted agricultural nutrient management principles.

3.2. SOLID MATERIAL STREAMS

The principal solid material streams generated by the proposed feedlot operation will comprise:

- manure and bedding material recovered from pens within the housing areas,
- sediment collected within controlled drainage infrastructure,

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- feed handling losses and residual organic material, and
- mortalities and associated composting materials.

Unlike conventional open feedlot systems, the proposed covered housing arrangement is intended to substantially reduce direct rainfall interaction with manure and bedding materials. As a result, recovered organic material is expected to remain comparatively drier, more manageable and better suited for controlled storage, handling and beneficial agricultural reuse.

Solid material streams generated by the operation are intended to be managed as recoverable agricultural by-products capable of reuse within the broader farming enterprise subject to operational controls, nutrient demand and environmental management requirements.

3.2.1. MANURE AND BEDDING

The primary solid material stream generated by the proposed feedlot operation will comprise manure and bedding material recovered from covered cattle housing areas. Unlike conventional open feedlot systems, the proposed covered housing arrangement is intended to substantially reduce direct rainfall interaction with manure and bedding materials. This is expected to support improved bedding condition, reduced uncontrolled nutrient mobilisation and improved recovery of organic material suitable for beneficial agricultural reuse.

Bedding material utilised within the feedlot is expected to comprise straw, woodchip, sawdust or similar organic bedding materials selected based on seasonal availability, operational performance and cattle management requirements. Bedding material will be monitored and replenished within the pens, as required, to maintain suitable pen conditions, moisture control and cattle welfare outcomes.

Manure and bedding material will be routinely removed from covered accommodation areas as part of normal operational management practices. Recovered material will be temporarily stockpiled within the designated manure and bedding storage area prior to beneficial reuse within the broader farming enterprise. The manure and bedding storage area will be located within the controlled drainage footprint of the feedlot, with runoff directed toward the controlled drainage storage pond system. The storage area will be constructed and managed to minimise nutrient loss, support effective material handling and reduce the potential for uncontrolled runoff generation.

Annual manure and bedding generation has been estimated using industry reference material and conservative operational assumptions consistent with covered housing feedlot systems. The assessment adopts assumptions relating to bedding application rates, clean-out frequencies and manure accumulation in order to inform storage sizing, nutrient recovery and beneficial reuse requirements.

Reuse of recovered material will occur subject to:

- crop nutrient demand,
- seasonal conditions,
- soil characteristics,
- operational requirements,
- buffer distances, and
- environmental protection measures outlined within this Plan.

Table 3-1 – Manure and bedding generation per year

Item	Unit	Value
Maximum cattle capacity	head	2,206
Bedding application rate	kg/head/day	4
Bedding generated	t/year	3,221
Manure generation rate	kg/head/year	600
Manure generated	t/year	1,324
Total manure and bedding material	t/year	4,545
Assumed bulk density	kg/m³	650
Estimated annual material volume	m³/year	6,992
Bedding clean-out interval	days	60
Estimated clean-outs per year	#/year	6
Estimated material removed per clean-out	t/event	758
Estimated volume removed per clean-out	m³/event	1,165

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Based on the above assessment, the proposed feedlot is expected to generate 4,545t of combined manure and bedding material annually, equivalent to 6,992m^3 of recoverable organic material per annum at the adopted bulk density. Recovered material will comprise a valuable agricultural by-product containing organic matter together with nutrients including nitrogen, phosphorus and potassium capable of supporting crop production within the broader farming enterprise. Beneficial reuse of recovered material is intended to reduce reliance on imported synthetic fertilisers and support whole-of-farm nutrient cycle.

The estimates adopted within this assessment have been used for:

- manure and bedding storage sizing,
- nutrient recovery calculations,
- reuse area assessment,
- operational management planning, and
- controlled drainage infrastructure assessment.

Material generation estimates are based on conservative industry-aligned assumptions and may be refined over time based on operational performance, bedding management practices and observed material recovery rates during operation of the facility.

3.2.2. SEDIMENT GENERATION

The proposed feedlot comprises a fully covered cattle housing system. As a result, rainfall will not directly interact with manure and bedding material within the cattle accommodation areas in the same manner as a conventional open feedlot pen system.

The *Victorian Code for Cattle Feedlots* includes a settled manure volume calculation for open pen runoff, where rainfall mobilises manure from exposed pen surfaces and conveys solids to the drainage and sediment system. This calculation has not been applied to the covered cattle housing areas because these areas are roofed and are not exposed manure-covered pen surfaces.

Sediment generation requiring specific assessment is expected to arise primarily from the exposed manure and bedding storage area, where rainfall may contact stored organic material and mobilise sediment or nutrient-rich runoff. Runoff from this area will be captured within the controlled drainage system and directed through sediment control infrastructure prior to entering the controlled drainage storage pond.

The settling basin stilling volume calculation has therefore been applied to the manure and bedding storage catchment only. Broader runoff storage requirements for the site are assessed separately under the AM3 runoff storage methodology.

SETTLED MANURE/ORGANIC MATERIAL VOLUME

The Code provides the following method to estimate settled manure volume within the drainage/sediment system for conventional open feedlot pens where rainfall directly interacts with manure-covered pen surfaces:

$$V=(D \times M \times A_p \times F_s) / 1000$$

For the proposed development, the cattle accommodation areas are fully covered and do not operate as exposed open pens. Rainfall will not directly contact manure-covered pen surfaces within the pen areas. Accordingly, for the purpose of ***the Code's*** settled manure volume calculation, the exposed open pen area is **0 m²**.

Results

Table 3-2 – Proportion of manure lost (Table 4.6 Feedlot Code)

Factor	Description	Factor Applied	Result
D	Manure depth	100mm	
M	Manure loss factor	0.45	
A_p	Area of exposed open pens	0m^2	
F_s	Safety factor	1.25	
V	Settled manure volume required for pen areas		0m^3

Based on the above assessment, the required settled manure volume for exposed pen areas is **0 m³**, as the proposed cattle accommodation areas are fully covered.

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This calculation relates only to pen areas. Runoff from exposed manure and bedding storage areas, mortality management areas and other exposed operational surfaces is addressed separately under the controlled drainage and stilling volume assessment.

3.2.3. SETTLING BASIN STILLING VOLUME

Runoff generated from the exposed manure and bedding storage area will be directed through a dedicated settling system prior to discharge into the primary stormwater storage pond. ***The Code*** provides the following methodology to determine the required stilling volume for sedimentation infrastructure:

$$S = P \times T \times A_c / 1000$$

Where:

Factor	Description
S	Sedimentation basin stilling volume (m^3)
P	Rainfall intensity for a 1-hour, 1 in 20 year storm event (mm/hr)
T	Detention time (0.5hr)
Ac	Contributing catchment area (m^2)

Results

For the proposed development, the settling system receives runoff generated from the exposed manure and bedding storage area and mortality composting area only. Roofed cattle housing areas and broader operational runoff areas are directed separately to the integrated stormwater storage system and do not form part of the settling basin catchment.

Table 3-3 - Settling basin catchment assessment

Catchment Area	Footprint (m^2)	Runoff Coefficient	Contributing Area (m^2)
Manure and bedding storage area	5,500	0.8	
Mortality composting area (if connected)	1,225	0.8	
Total	6,725	-	5,380

The settling basin stilling volume assessment has been undertaken using the contributing catchment area identified above.

Table 3-4 - Settling Basin Stilling Volume Assessment

Factor	Description	Adopted Value	Result
P	Rainfall intensity	37.3mm/hr	
T	Detention time	0.5hr	
Ac	Contributing catchment area	5,380m^2	
S	Required stilling volume		100.3m^3

The assessment indicates that a stilling volume of approximately 100.3m^3 is required within the settling system servicing the exposed manure and bedding storage catchment. The proposed settling infrastructure has been designed with sufficient storage volume to accommodate the required stilling volume prior to discharge into the primary stormwater storage pond.

Recovered sediment from the settling system is expected to comprise mobilised organic material originating primarily from the manure and bedding storage area. As this material forms part of the manure and bedding stream already quantified within **Section 3.2.1**, sediment recovered from the settling infrastructure has not been separately quantified within the annual solids generation calculations in order to avoid double counting of recoverable organic material volumes.

Total Settling Basin size

The required size of the settling basin is identified through the combination of the Settled Manure Volume and the Settling Basin Stilling Volume.

$$Total = V + S$$

For the proposed development, the settled manure volume associated with exposed pen areas is **0m^3**, as the cattle accommodation areas are fully covered and there are no exposed open feedlot pens subject to direct rainfall.

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The required stilling volume for runoff from the exposed manure and bedding storage area and mortality composting area is calculated as **100m³**.

Table 3-5 -Total Settling Basin Capacity Requirement

Component	Required Volume
Settled manure volume, pen areas only	0m³
Settling basin stilling volume	100m³
Total settling system capacity required	100m³
Available settling system capacity	100m³
Complies	Yes

The total settling system capacity required is therefore **100m³**. The available settling system capacity will be confirmed through detailed design and must provide sufficient capacity to accommodate hydraulic stilling and sediment capture prior to discharge into the primary stormwater storage pond.

Recovered sediment from the settling system is expected to comprise mobilised organic material originating primarily from the manure and bedding storage area and mortality composting area. As this material forms part of the broader recoverable organic material stream already quantified within **Section 3.2.1**, sediment recovered from the settling infrastructure has not been separately quantified within the annual solids generation calculations in order to avoid double counting.

3.3. LIQUID WASTE STREAMS

Stormwater runoff generated within the operational footprint of the feedlot will be managed through an integrated stormwater and controlled drainage system designed to capture, convey, settle and store runoff generated from operational areas of the development.

The majority of runoff generated within the feedlot footprint will comprise:

- roof runoff from covered cattle housing structures,
- runoff from cattle movement and laneway areas,
- runoff from operational hardstand areas,
- runoff from exposed manure and bedding storage areas, and
- runoff from associated operational surfaces within the feedlot footprint.

Runoff generated from the exposed manure and bedding storage area and mortality composting area will first pass through dedicated settling infrastructure prior to discharge into the primary stormwater storage pond. The stormwater storage system has been designed generally in accordance with the relevant principles and methodologies outlined within the *Victorian Code for Cattle Feedlots* and has been sized to provide sufficient containment capacity for operational runoff generated within the feedlot footprint.

Roof runoff captured from the covered cattle housing structures will be collected separately where practicable and reused within the operation for stock watering and other operational activities. For the purpose of this application however, the total volume of the roof catchment has been assumed to contribute to storage.

Table 3-6 - Stormwater and Controlled Drainage Catchments

Catchment Area	Footprint Area (m²)	Surface Type	Drainage Pathway	Included in Settling System	Included in AM3 Storage Assessment
Covered cattle housing roofs	17,396	Roofed	Direct to stormwater storage/reuse	No	Yes
Cattle movement and laneway areas	Part under roof 6,205	Hardstand/trafficable	Direct to stormwater storage	No	Yes
Operational hardstand areas (Commodity)	5,500	Hardstand	Direct to stormwater storage	No	Yes
Manure and bedding storage area	5,500	Exposed organic material storage	Via settling system to stormwater storage	Yes	Yes

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Catchment Area	Footprint Area (m²)	Surface Type	Drainage Pathway	Included in Settling System	Included in AM3 Storage Assessment
Mortality composting area	1,225	Exposed composting area	Via settling system to stormwater storage	Yes	Yes
Balance operational areas	44,629	Mixed operational surfaces	Direct to stormwater storage	No	Yes
Stormwater and sediment storage pond surface	9,545	Open water	Direct rainfall to storage	No	Yes

3.3.1. RUNOFF STORAGE

Runoff storage within the feedlot allows runoff generated from operational areas to be captured and retained on-site prior to reuse within the broader farming enterprise. The required storage volume has been assessed using the runoff storage methodology outlined within the *Victorian Code for Cattle Feedlots* (AM3).

The Code requires the storage pond to provide capacity for the greater runoff volume generated from either:

- **Method 1** – 80% of runoff generated from a 1 in 20 year storm event (24-hour duration), or
- **Method 2** – runoff generated from a 1 in 10 year annual catchment yield.

The design storage capacity has been assessed using both methods, with the higher resulting storage requirement adopted in accordance with the *Victorian Code for Cattle Feedlots*.

The runoff storage volume has been assessed using the following methodology:

$$Q = \frac{[(A_p + A_b)(R_f \times R_o) \times F_s] + (A_s \times R_f)}{1000}$$

Where:

Factor	Description
Q	Required storage volume (m³)
Ap	Operational catchment area (m²)
Ab	Balance catchment area (m²)
Rf	Rainfall depth (mm)
Ro	Rainfall coefficient
Fs	Safety factor
As	Surface area of storage pond (m²)

METHOD 1 – MAJOR STORM EVENT

Method 1 assesses the runoff volume generated from 80% of the 1 in 20 year, 24-hour rainfall event. Based on the BOM IFD data for the site, the adopted 24-hour 5% AEP rainfall depth is 123mm. Applying the 80% factor required by the Victorian Code results in an effective rainfall depth of 98.4mm for contributing catchment areas.

Direct rainfall falling onto the stormwater storage pond has been calculated using the full rainfall depth of 123mm.

Table 3-7 - Major Storm Event Assessment (1 in 20 year, 24-hour rainfall event)

Catchment Area	Footprint Area (m²)	Rainfall Depth	Effective Rainfall Depth (80%)	Runoff Coefficient	Safety Factor	Runoff Volume (m³)
Covered cattle housing roofs	17,396	123	98.4	1.0	1.0	1,712
Cattle movement and laneway areas (external)	4,705	123	98.4	0.8	1.25	463
Operational hardstand areas	1,400	123	98.4	0.8	1.25	6,888

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Catchment Area	Footprint Area (m^2)	Rainfall Depth	Effective Rainfall Depth (80%)	Runoff Coefficient	Safety Factor	Runoff Volume (m^3)
Manure and bedding storage area	5,500	123	98.4	0.8	1.25	541
Mortality composting area	1,225	123	98.4	0.8	1.25	120
Balance operational areas	50,367	123	98.4	0.8	1.25	4,391
Stormwater storage pond surface	9,000	123	123	1.0	1.0	939
Total						**15,055**

Based on the catchment areas identified above, the Method 1 storage requirement is calculated as approximately 15,055m^3, equivalent to approximately 15ML.

METHOD 2 – ANNUAL CATCHMENT YIELD

Method 2 assesses the estimated runoff volume generated from the contributing feedlot catchment during a wet annual rainfall period. It is not a single storm event calculation. Rather, it estimates the volume of runoff that may be generated across the connected catchment over a 1 in 10 wet year annual rainfall condition.

For this assessment, the adopted annual rainfall depth is 750mm. In accordance with the Victorian Code AM3 methodology, a runoff coefficient of 0.4 has been applied to contributing catchment areas, together with a safety factor of 1.25. This results in an effective runoff depth of 375mm across the contributing catchment areas.

Direct rainfall falling onto the stormwater storage pond surface has been calculated separately using the full annual rainfall depth of 750mm and no safety factor.

The Method 2 calculation therefore provides a conservative annual runoff storage requirement for the integrated stormwater storage system.

Table 3-8 -Annual Catchment Yield Assessment (1 in 10 wet year annual rainfall)

Catchment Area	Footprint Area (m^2)	Rainfall Depth	Runoff Coefficient	Safety Factor	Runoff Volume (m^3)
Covered cattle housing roofs	17,396	750	1.0	-	13,047
Cattle movement and laneway areas	4,705	750	0.4	1.25	1,764
Operational hardstand areas	7,000	750	0.4	1.25	2,625
Manure and bedding storage area	5,500	750	0.4	1.25	2,063
Mortality composting area	1,225	750	0.4	1.25	459
Balance operational areas	44,629	750	0.4	1.25	16,736
Stormwater storage pond surface	9,000	750	1.0	-	7,159
Total					**43,853**

The Method 2 assessment identifies a required runoff storage volume of approximately 43.8ML for the proposed feedlot operation. The proposed stormwater storage pond provides approximately 15ML of available storage capacity and therefore satisfies the adopted storage requirements of ***the Code***.

The Method 2 assessment represents a conservative wet-year runoff storage assessment and does not rely upon operational irrigation reuse, evaporation losses or other active drawdown measures to maintain available storage capacity within the stormwater storage system. In practice, captured stormwater will be reused within the broader farming enterprise where conditions are suitable, which is expected to reduce operational storage volumes over time and provide additional operational flexibility within the storage system.

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3.3.2. RUN-OFF STORAGE VOLUME ASSESSMENT

The runoff storage assessment indicates that the greater required storage volume is generated under the Method 2 – 1 in 10 wet year annual catchment yield assessment. The required runoff storage volume for the proposed feedlot is therefore approximately 43.8ML.

The proposed stormwater storage pond has been designed to provide an available storage capacity of approximately 15ML and therefore satisfies the adopted storage requirements of the Major Storm event within ***the Code***. The Method 2 assessment represents a conservative wet-year runoff storage assessment and does not rely upon operational irrigation reuse, evaporation losses or other active drawdown measures to maintain available storage capacity within the stormwater storage system.

An operational runoff and catchment water balance assessment has also been undertaken to assess likely routine operational inflows, irrigation reuse and storage behaviour within the stormwater storage system. The operational assessment indicates that routine irrigation reuse and evaporation are expected to maintain operational storage volumes substantially below the adopted design storage capacity during normal operation.

Table 3-9 - Operational water balance summary

Item	Volume
Annual inflows	47.7ML
Annual outflows	47.0ML
Annual irrigation reuse	35.7ML
Peak operational storage volume	14.8ML
End-of-year storage balance	0.8ML
Adopted AM3 design storage capacity	18ML

The operational runoff and catchment water balance indicates that routine irrigation reuse and evaporation are expected to maintain operational storage volumes substantially below the adopted design storage capacity during normal operation. The detailed operational runoff and catchment water balance assessment is included in **Appendix 3**.

3.4. MORTALITIES

All livestock operations experience occasional mortalities as part of normal operations. Mortalities at the feedlot will be managed in accordance with industry best practice, veterinary advice and relevant regulatory requirements.

3.4.1. ROUTINE MORTALITIES

Where practicable, routine mortalities, including animals that have been unwell or injured, will be removed from site by a licensed rendering contractor. This is the preferred management pathway for routine mortalities generated by the feedlot operation.

Any unexplained or unexpected mortalities will be investigated to determine the cause of death, including consultation with the off-site veterinarian where required. Animals unsuitable for rendering, including autopsied animals or carcasses where collection is not immediately available, will be managed via on-site composting.

For planning and infrastructure sizing purposes, a conservative mortality rate of 1.0% of maximum feedlot capacity has been adopted for the proposed operation.

Table 3-10 - Routine mortalities

Item	Unit	Value
Maximum feedlot capacity	head	2,206
Adopted mortality rate	%	1.0
Estimated annual mortalities	head/year	23
Average monthly equivalent	head/month	2

Routine mortalities are expected to occur progressively throughout the year and are not anticipated to accumulate on-site under normal operating conditions. Where practicable, mortalities will be collected by a licensed rendering contractor. Composting will be utilised as a contingency pathway where rendering is unavailable, delayed or otherwise unsuitable.

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3.4.2. MORTALITY COMPOSTING SYSTEM

A dedicated mortality composting area is provided within the operational footprint of the feedlot. The composting area comprises an above-ground compacted hardstand pad measuring approximately 35m × 35m, providing a total operational footprint of approximately 1,225m².

The mortality composting area has been designed to provide operational flexibility and contingency capacity substantially exceeding the expected routine mortality generation rate for the feedlot operation. Mortalities will be composted using carbon-based materials including straw, woodchip, bedding material or recovered manure solids generated on-site. Composting activities will be undertaken in accordance with industry best practice to ensure:

- adequate carbon cover is maintained at all times,
- odour generation is minimised,
- vermin and scavenger access is prevented, and
- compost windrows are managed to support effective decomposition.

For infrastructure sizing purposes, a conservative composting allowance of 10m³ per adult cattle mortality has been adopted. This allowance incorporates:

- carcass volume,
- base carbon material,
- encapsulation material, and
- operational composting requirements.

Table 3-11 - Active composting design assumptions

Item	Unit	Value
Adopted composting volume allowance	m³/head	10
Typical active composting volume	m³/head	3–5
Routine active composting allowance	head at one time	10–20
Emergency contingency allowance	head at one time	20–40
Adopted design capacity	head at one time	40
Required active composting volume	m³	400

Based on the adopted design assumptions, the mortality composting area provides active composting capacity substantially exceeding the estimated routine mortality requirement for the feedlot operation and provides contingency capacity for periods where rendering collection is delayed or where multiple mortalities occur within a short period.

Finished composted material will be incorporated into the broader recoverable organic material stream and beneficially reused to land in accordance with the nutrient reuse framework outlined within this Plan.

3.4.3. MASS MORTALITY CONTINGENCY

In the unlikely event of a mass mortality incident, management actions will be undertaken in accordance with veterinary advice, relevant Departmental guidance and the site's emergency management procedures. Depending on the nature of the incident and regulatory direction at the time, emergency disposal measures may include:

- emergency composting,
- approved off-site disposal,
- rendering, or
- on-site burial where specifically directed or approved by the relevant authority.

An emergency burial location is nominated within the application (east side of the site) and is:

- located adjoining the operational footprint of the feedlot,
- located at least 250m from any groundwater extraction bore, and
- maintains a minimum vertical separation distance of 1m between the base of the burial pit and the highest seasonal groundwater level.

The nominated contingency area provides sufficient space to accommodate emergency mortality management activities associated with a potential mass mortality event, subject to regulatory direction and emergency response requirements at the time.

Emergency response procedures associated with mortality management will be incorporated into the site's operation management framework for the feedlot, including the development of:

- Biosecurity Management Plan (BioMP),

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- Emergency Animal Disease Plan (EAD), and
- Death, Destruction and Decontamination Plan (DDD),

as part of the sites future National Feedlot Accreditation Scheme (NFAS) operation accreditation, Quality Assurance and management system.

Any emergency disposal activities would only occur in accordance with relevant regulatory approvals, veterinary advice and applicable emergency animal disease and environmental management requirements.

3.5. WASTE FEED

Minor quantities of waste feed may be generated through normal feedlot operations, including:

- unutilised feed remaining within the feed table area,
- feed spillage within commodities and feed handling areas, and
- losses during feed delivery, processing or storage.

Based on an average daily feed intake of 12kg/head/day (as-fed) at a maximum feedlot capacity of 2,206 head, the annual feed delivered to the operation is estimated at approximately 9,461t/year.

For planning purposes, a conservative waste feed allowance of 0.25% of total feed delivered has been adopted.

Table 3-12 - Feed waste volume

Item	Unit	Result
Feedlot capacity	head	2,206
Average days on feed	days	120
Average feed intake (as fed)	kg	12
Total feed delivered per cycle	t/cycle	3,177
Cycles per year	#/yr	3
Total feed delivered	t/yr	9,662
Waste feed allowance	%	0.25%
Waste feed generated	t/yr	24

Waste feed will be managed in accordance with the operational management principles of ***the Code***, including:

- operation of feeding equipment to minimise spillage,
- routine inspection and cleaning of feed handling areas, and
- prompt collection of feed residues where required.

Where practicable, uncontaminated feed spillage will be recovered and reintroduced into the feeding system or otherwise utilised for suitable livestock feeding purposes. Material unsuitable for refeeding, including feed contaminated with manure or soil, will be incorporated into the broader recoverable organic material stream for composting and subsequent beneficial reuse to land.

3.6. GENERAL WASTES

General wastes generated at the feedlot will include domestic-type wastes from staff amenities (food waste, packaging, paper/cardboard), workshop wastes (scrap metal, used parts and rags), plastics associated with feed and agricultural operations (silage wrap, twine and feed bags), and routine maintenance wastes such as filters, containers and similar materials.

These wastes will be managed to minimise odour, litter, vermin, flies and any off-site environmental nuisance in accordance with the operational management requirements of ***the Code***.

General waste management will include the following controls:

- **Collection and storage:**
  - Provide covered, labelled bins/skips at the amenities area and workshop.
  - Store wastes in a manner that prevents wind-blown litter and access by animals or vermin (lidded bins, enclosed skips, fenced storage where needed).
- **Removal and disposal:**
  - General waste will be removed regularly by a licensed waste contractor to an approved municipal landfill or transfer station.
  - Recycling streams (cardboard, plastics where accepted, scrap metal) will be separated and removed to appropriate recycling facilities where feasible.
- **Controlled wastes (where applicable):**

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- Used oils, oily rags, oil filters, chemical containers and similar controlled wastes will be stored within appropriately contained or bunded areas and removed from site by licensed contractors or managed through approved supplier recovery programs where available.
- Any veterinary sharps or clinical-type wastes (if generated) will be stored in approved containers and disposed of via a licensed clinical waste service.

➢ **Housekeeping:**

- Litter patrols will be undertaken after high winds and during routine inspections to ensure no waste material leaves the feedlot works area.
- Waste storage areas will be kept clean and maintained to avoid vermin/flies and odour.

No general waste will be buried, burned or otherwise disposed of on-site.

3.7. WASTE PRODUCTION SUMMARY

The proposed feedlot generates a range of re-use material streams associated with cattle housing, feeding activities, mortality management and stormwater runoff within the operational footprint of the facility.

The primary recoverable organic material stream generated by the operation comprises manure and bedding material recovered from the covered cattle housing system. This material will be periodically removed from cattle housing areas and managed within the designated manure and bedding storage area prior to beneficial agricultural reuse.

Stormwater runoff generated from operational areas of the feedlot, including roof water, cattle movement areas, manure storage areas and associated infrastructure, will be directed through the integrated stormwater management system for collection and reuse within the farming enterprise. Runoff from the manure and bedding storage area will first pass through a settling system designed to reduce sediment transport and organic loading prior to discharge into the stormwater storage pond.

In addition to manure and stormwater runoff, smaller material streams including waste feed, mortalities and general operational wastes are generated and managed through established agricultural, composting and commercial waste management practices.

Table 3-13 - Waste production summary

Waste Stream	Source	Estimated Quantity	Management Method
Manure and bedding material	Covered cattle housing system	4,545t/year (6,992m³/year)	Periodic removal and stockpiling for reuse on agricultural land
Drainage Sediment	Mobilised organic material captured within settling infrastructure	Mobilised organic material captured within settling infrastructure	Mobilised organic material captured within settling infrastructure
Stormwater runoff	Stormwater runoff	Stormwater runoff – 15ML	Stormwater runoff pond
Waste Feed	Feed losses during storage, handling and feeding activities	Feed losses during storage, handling and feeding activities – 24t/year	Feed losses during storage, handling and feeding activities
Mortalities	Natural cattle losses (~1% mortality)	22 head/year	Managed through rendering or composting
General Waste	Staff amenities, packaging and minor operational wastes	Minor quantities	Collected and disposed via licensed waste contractors

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4. STORAGE INFRASTRUCTURE

4.1. OVERVIEW

This section describes the storage infrastructure associated with the proposed feedlot development, including storage of recovered organic materials, stormwater and controlled drainage runoff and mortality composting materials prior to reuse, treatment or removal from the site.

The proposed feedlot has been designed around the principles of covered cattle housing, integrated stormwater management and nutrient recovery. As a result, the majority of rainfall captured within the feedlot footprint will comprise roof runoff and surface water runoff from operational catchment areas directed to the site stormwater storage system.

Runoff from exposed manure and bedding storage areas will be directed through a settling system prior to discharge into the stormwater storage pond in order to reduce sediment transport and organic loading within the broader storage system. Storage infrastructure associated with the development has been designed to:

- contain and manage generated material streams,
- support beneficial agricultural reuse,
- minimise uncontrolled runoff generation,
- protect land and water resources,
- and maintain operational flexibility during periods when reuse or removal is not immediately practicable.

4.2. MANURE AND BEDDING STORAGE

The primary solid material stream generated by the proposed feedlot operation comprises manure and bedding material recovered from the covered cattle housing system. Recovered organic material, including manure, bedding material and sediment recovered from the settling system associated with the manure storage area, will be managed as a single organic material stream and temporarily stored within the designated manure and bedding storage area prior to beneficial reuse within the broader farming enterprise.

As removal and land application may not always align with seasonal crop demand, weather conditions or suitable ground conditions, temporary storage capacity is required within the feedlot operation. The manure and bedding storage area has therefore been designed to provide sufficient temporary storage capacity to support operational flexibility and ongoing nutrient reuse management.

4.2.1. STORAGE REQUIREMENT

Based on the estimated annual manure and bedding generation volume of approximately 6,992m³/year, a conservative four-month storage requirement has been adopted for the proposed development.

Table 4-1 - Manure storage area assessment

Item	Volume
Estimated annual material generated	6,992m^3
Adopted storage period	4 months
Minimum storage volume required	2,330m^3

The adopted four-month storage period provides operational flexibility during periods where land application, beneficial reuse or material removal may not be immediately practicable due to seasonal, operational or agronomic constraints.

4.2.2. STORAGE VOLUME

The manure and bedding storage area incorporates an operational footprint of 110m × 50m, providing a total storage area of 5,500m^2 for approx. 2,500m^3 of material. The storage area has been designed to facilitate stockpiling and windrowing of recovered manure and bedding material to support operational handling, moisture management and beneficial reuse activities.

Windrows are proposed to be orientated generally perpendicular to the site slope to support drainage management and operational access. Separation distances between windrows have been incorporated to allow machinery access, material handling and turning movements within the storage area.

For the purposes of storage assessment, the following windrow geometry has been adopted.

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Table 4-2 - Windrow geometry assumptions

Item	Value
Windrow base width	5m
Windrow height	2.5m
Windrow cross-sectional area	6.25m²
Separation distance between windrows	5m
Edge separation allowance	2m
Turning allowance at end of rows	5m

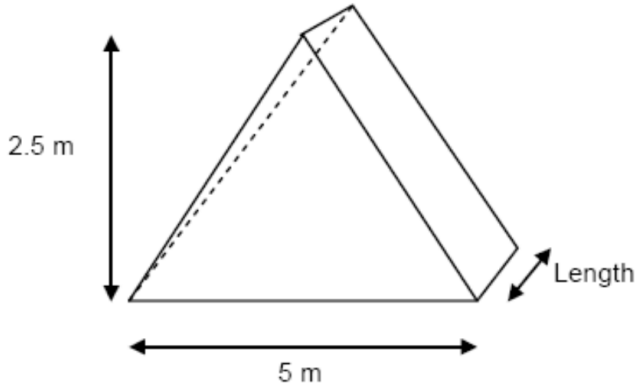

Figure 4-1 - Diagram of manure storage windrow (6.25m²/m)

Using the above assumptions and the available storage footprint, the manure and bedding storage area has the capacity to accommodate approximately four windrows with an effective usable windrow length of up to 100m.

Table 4-3 - Manure Storage Capacity Assessment

Item	Value
Number of windrows	4
Usable windrow length	100m
Usable width	40m
Windrow cross-sectional area	6.25m²
Estimated storage capacity	2,500m³

4.2.3. SOLIDS STORAGE ASSESSMENT

The following table summarises the estimated annual generation of manure and bedding material together with the adopted temporary storage requirements and available storage capacity within the proposed manure and bedding storage area.

Table 4-4 - Solids storage assessment

Source	Volume	
	(m³/year)	Tonnes/year
Manure and bedding material	6,992	4,545
Sediment recovered from settling infrastructure[1]	Included above	Included above
Total annual recoverable material	7,052	4,584

1 - Sediment recovered from settling infrastructure is assumed to comprise mobilised manure and bedding material already included within the primary manure and bedding generation estimates and has therefore not been separately quantified.

Table 4-5 - Storage requirement and capacity (4 months)

Item	Volume
Minimum required storage volume	2,331m³
Available storage capacity	2,500m³
Storage surplus / deficit	169m³

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The proposed manure and bedding storage area provides sufficient temporary storage capacity to accommodate the adopted four-month storage requirement for recovered organic material generated by the feedlot operation.

The storage system has been designed to support:

- routine operational clean-out activities,
- temporary storage during periods unsuitable for land application,
- ongoing nutrient recovery and beneficial reuse within the broader farming enterprise, and
- operational flexibility associated with seasonal and climatic conditions.

Recovered manure and bedding material will be managed as a recoverable agricultural by-product and reused within the farming enterprise in accordance with crop demand, soil conditions and the nutrient management principles outlined within this Plan.

4.3. STORMWATER AND CONTROLLED DRAINAGE STORAGE

4.3.1. OVERVIEW

Stormwater runoff generated within the operational footprint of the feedlot will be managed through an integrated stormwater and controlled drainage system designed to capture, convey, settle and store runoff generated from operational areas of the development.

Runoff generated from operational areas of the feedlot, including roofed cattle housing structures, cattle movement areas, operational hardstands and manure storage areas, will be directed via graded surfaces and drainage infrastructure toward the site stormwater storage system.

Runoff generated from the manure and bedding storage area will first pass through a dedicated settling system prior to discharge into the primary stormwater storage pond in order to reduce sediment transport and organic loading within the broader storage system.

The stormwater and controlled drainage system has been assessed in accordance with the relevant principles and design methodologies outlined within ***the Code***, with detailed calculations provided in **Section 3.3** of this Plan.

4.3.2. SETTLING INFRASTRUCTURE

A dedicated settling system is provided downstream of the manure and bedding storage area to capture mobilised sediment and organic material prior to discharge into the primary stormwater storage pond.

The settling system has been designed to:

- reduce sediment transport,
- minimise organic loading within the primary storage pond,
- facilitate periodic recovery of settled organic material, and
- support ongoing operational management of the integrated stormwater system.

Recovered sediment is expected to comprise mobilised manure and bedding material originating from the manure storage area and is therefore incorporated into the broader recoverable organic material stream for beneficial reuse.

The settling system has been assessed in accordance with the settling basin stilling volume methodology outlined within the *Victorian Code for Cattle Feedlots*.

Table 4-6- Settling infrastructure capacity

Item	Result
Required settling/stilling volume	100m³
Available settling volume	100m³
Complies	Yes

4.3.3. STORMWATER STORAGE POND

Stormwater runoff generated within the operational footprint of the feedlot will be captured within the primary stormwater storage pond.

The storage pond forms part of the integrated stormwater and controlled drainage system and has been designed to:

- contain operational runoff generated within the feedlot footprint,
- provide operational flexibility during elevated rainfall periods,
- facilitate reuse of captured stormwater within the farming enterprise, and
- minimise the risk of uncontrolled runoff discharge from the site.

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The storage pond has been sized generally in accordance with Element 5 – Approved Measure 3 (AM3) of ***the Code***, with detailed design calculations provided in **Section 3.3** of this Plan.

4.3.4. STORMWATER CAPACITY ASSESSMENT

Stormwater runoff generated within the feedlot system consists of:

- runoff from roofed cattle housing structures and operational areas,
- runoff from cattle movement and laneway areas,
- runoff from manure and bedding storage areas following settlement, and
- direct rainfall falling onto the stormwater storage pond.

Runoff generated within the operational footprint of the feedlot is directed via the integrated stormwater and controlled drainage system toward the primary stormwater storage pond. Runoff from the manure and bedding storage area is directed through the settling system prior to discharge into the storage pond in order to reduce sediment transport and organic loading.

The required runoff storage capacity has been assessed generally in accordance with Element 5 – Approved Measure 3 (AM3) of ***the Code,*** with detailed calculations provided in **Section 3.3** of this Plan.

The assessment incorporates:

- 1 in 20 year, 24-hour rainfall data (IFD 5% AEP)
- 1 in 10 wet year annual rainfall (90th percentile = 750 mm)
- Rainfall coefficient Ro = 0.4
- Safety factor Fs = 1.25

Table 4-7 - Stormwater Storage Capacity Assessment

Item	Result
Design storm run-off storage requirements (1in20 year, 24 hour event)	15ML
Min. operation storage requirement outside irrigation periods	15ML
Available stormwater storage volume	15ML
Storage surplus	0ML
Complies	Yes

The runoff storage assessment indicates that a minimum storage volume of approximately 15ML is required to accommodate runoff generated by the adopted design storm event and maintain operational storage requirements outside irrigation periods. The proposed detention pond provides approximately 15ML of available storage capacity and therefore satisfies the minimum storage requirements of ***the Code***.

The estimated annual runoff yield from the operational catchment is approximately 44ML per annum. This volume does not represent a storage requirement, as runoff is routinely removed from the system through irrigation reuse and natural evaporation. Accordingly, operational pond levels are expected to fluctuate throughout the year and remain within the available storage capacity under normal operating conditions. See water balance in **Appendix 3**.

4.4. MORTALITY COMPOSTING AREA

A dedicated mortality composting area is provided within the operational footprint of the feedlot to support temporary storage and composting of mortalities generated by the operation. The mortality composting area comprises an above-ground compacted hardstand pad measuring approximately 35m × 35m, providing a total operational footprint of approximately 1,225m².

The mortality composting area has been designed to provide sufficient operational capacity to accommodate routine mortality management together with contingency capacity substantially exceeding expected routine mortality generation rates.

4.4.1. COMPOSTING CAPACITY ASSUMPTIONS

For infrastructure sizing purposes, a conservative mortality composting allowance of 10m³ per adult animal has been adopted. This allowance incorporates:

- carcass volume,
- carbon base material,
- encapsulation material, and
- operational composting requirements.

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The mortality composting area has been assessed using windrow composting geometry assumptions consistent with operational composting requirements.

Table 4-8 - Mortality composting windrow assumptions

Item	Value
Windrow base width	3m
Windrow height	1.5m
Windrow cross-sectional area	2.25m²
Separation distance between windrows	3m
Edge separation allowance	2m
Turning allowance at end of rows	2m

4.4.2. COMPOSTING CAPACITY ASSESSMENT

Using the above assumptions and the available storage footprint, the mortality composting area has the capacity to accommodate approximately five windrows with an effective usable windrow length of approximately 35m.

Table 4-9 - Mortality Composting Capacity Assessment

Item	Value
Number of windrows	5
Usable windrow length	35m
Windrow cross-sectional area	2.25m²
Estimated composting capacity	405m³

Table 4-10 -Mortality Storage Requirement and Capacity

Item	Volume
Required active composting volume	400m³
Available composting capacity	405m³
Storage surplus / deficit	+5m³

The proposed mortality composting area provides sufficient temporary composting capacity to accommodate the adopted mortality management requirements for the feedlot operation.

Finished composted material will be incorporated into the broader recoverable organic material stream and beneficially reused within the farming enterprise in accordance with the nutrient management principles outlined within this Plan.

4.5. STORAGE SUMMARY

The storage infrastructure provided for manure and bedding material, mortality composting and stormwater runoff exceeds the minimum storage capacities adopted for the proposed feedlot operation and supports ongoing containment, operational flexibility and beneficial agricultural reuse within the broader farming enterprise.

The proposed storage infrastructure has been designed to:

- contain generated material streams within the operational footprint of the feedlot,
- support integrated stormwater management and controlled drainage,
- minimise the risk of uncontrolled runoff or nutrient export, and
- facilitate beneficial reuse of recoverable organic materials and captured stormwater within the farming enterprise.

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5. WASTE UTILISATION

Waste utilisation forms an integral component of the feedlot management system. Organic solids and captured stormwater runoff generated on-site are beneficially reused within the broader farming enterprise in accordance with a nutrient balance approach.

Solid material streams (including manure, bedding material and sediment recovered from settling infrastructure) are applied to both dryland and irrigated cropping areas held by the Applicant. Application rates are determined with regard to nutrient content, crop demand and existing soil fertility to ensure nutrients are utilised productively and do not accumulate within soils.

Captured runoff stored within the integrated stormwater storage system is subsequently reused via the existing centre pivot irrigation system. Stored runoff may be diluted with irrigation water and distributed across designated irrigation areas to supplement crop nutrient and water requirements.

The integrated reuse of solids and liquid effluent:

- Reduces reliance on synthetic fertilisers,
- Returns organic matter and nutrients to the soil profile,
- Supports nutrient recovery and recycling within the farming system, and
- Minimises off-site disposal requirements.

The following sections quantify the nutrient content of recovered organic material and captured runoff together with the proposed land application and reuse framework relative to the available land area.

5.1. WASTE COMPONENTS AND REUSE PATHWAYS

The feedlot operation generates a number of material streams associated with cattle housing, feeding activities, manure and bedding handling, mortality management and rainfall runoff captured within the integrated stormwater and controlled drainage system. As outlined in **Sections 3** and **4**, these materials are contained and temporarily stored on-site prior to reuse, recovery or disposal.

The primary material streams and their intended management pathways are summarised in Table **5-1**. These streams consist primarily of recoverable organic material and captured runoff which are beneficially reused within the broader farming enterprise through nutrient-based land application and irrigation reuse practices, consistent with the *Victorian Code for Cattle Feedlots*.

Table 5-1 - Waste components and re-use pathways

Waste stream	Source	Storage	Reuse pathway
Manure and bedding material	Covered cattle housing areas	Manure and bedding storage area	Land application to cropping/pasture based on nutrients
Sediment recovered from settling infrastructure	Settling system associated with manure and bedding storage area	Manure and bedding storage area	Incorporated into broader solids reuse stream
Captured runoff/stormwater	Integrated stormwater and controlled drainage system	Stormwater storage pond	Irrigation reuse within nominated irrigation areas
Mortalities	Routine and contingency mortalities	Mortality composting area	Rendering (preferred) or composting; compost incorporated into solids reuse stream

5.2. SOLID WASTE COMPOSITION

Solid material generated by the feedlot operation comprises manure and bedding material recovered from the covered cattle housing system together with sediment recovered from the settling infrastructure associated with the manure and bedding storage area. These materials are managed as a combined recoverable organic material stream and are beneficially reused within the broader farming enterprise through land application to agricultural land.

Application may occur to both dryland and irrigated cropping areas located on land controlled by the Applicant. Following consideration of operational constraints and appropriate setback distances to watercourses, drainage lines, dwellings and property boundaries, a substantial land area remains available for nutrient utilisation activities.

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Application rates are determined on a nutrient balance basis having regard to nutrient content, crop demand, soil fertility status, seasonal conditions and operational management considerations. The following sections quantify the estimated nutrient content of the recoverable organic material stream to inform nutrient utilisation planning and land application management.

5.2.1. MANURE NUTRIENT COMPOSITION

The nutrient content of recovered manure and bedding material can be estimated using published industry reference data contained within *Beef Cattle Feedlots: Waste Management and Utilisation* (MLA, 2015). Nutrient concentrations vary depending on factors including manure age, bedding composition, moisture content and storage duration.

For the purposes of this assessment, conservative nutrient concentrations associated with aged feedlot manure have been adopted to estimate the nutrient content of the recoverable organic material stream proposed for land application.

Table 5-2 - Typical nutrient composition of manure (Table 5.1 Feedlot waste manual)

Parameter	Pen	Aged	Compost
Dry matter %	74	63	74
Total nitrogen (% db)	2.5	2.2	2.1
Total phosphorus (% db)	1.0	0.8	1.3
Potassium (% db)	1.9	1.9	2.5
Sodium (% db)	0.3	0.3	0.4

The following calculations have been undertaken to estimate annual nutrient generation associated with the recoverable manure stream generated by the proposed feedlot operation. The assessment has been based on an estimated manure generation rate of approximately 1,324t/year.

The broader recoverable manure and bedding material stream requiring storage, handling and land application is estimated at approximately 4,545t/year, equivalent to approximately 6,992m³/year at the adopted bulk density. However, for the purpose of nutrient generation calculations, only the manure component has been adopted to avoid overstating nutrient loads associated with bedding material, which primarily contributes bulk organic matter and carbon unless otherwise verified through laboratory analysis.

Nutrient concentrations have been applied on a dry matter basis using the adopted aged manure dry matter content of 63%.

Table 5-3 – Estimated nutrient generated to be utilised by solids application

Nutrient Content	% dry basis	Total Kgs/year	T/year
Nitrogen	2.20	18,350	18.4
Phosphorus	0.80	6,672	6.7
Potassium	1.9	15,846	15.8
Sodium	0.30	2,502	2.5

The above calculations indicate that the recoverable manure and bedding material stream generated by the proposed feedlot operation contains significant quantities of plant nutrients suitable for beneficial agricultural reuse.

These values represent the estimated annual nutrient mass available for land application based on adopted dry matter content and average nutrient composition values associated with aged feedlot manure. Actual nutrient concentrations may vary depending on manure age, bedding composition, storage duration and seasonal conditions.

The estimated nutrient content provides the basis for determining appropriate land application rates and ensuring nutrients are applied in accordance with crop demand, soil fertility status and broader nutrient management objectives. Land application rates will be managed on a nutrient balance basis to minimise nutrient accumulation and reduce the risk of off-site nutrient movement while maximising agronomic benefit.

Routine manure analysis and soil testing will be undertaken during operation to verify nutrient concentrations and inform ongoing nutrient management and land application planning.

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5.3. LIQUID WASTE COMPOSITION

Captured runoff stored within the integrated stormwater storage system comprises runoff generated from roofed cattle housing areas, operational hardstand areas, manure and bedding storage areas, mortality composting areas and associated operational catchments within the feedlot footprint together with direct rainfall onto the storage pond surface.

Due to the covered cattle housing design, separation and recovery of manure and bedding material, and the use of settling infrastructure prior to discharge into the stormwater storage pond, nutrient concentrations within the captured runoff are expected to be comparatively lower than those typically associated with conventional open feedlot effluent systems.

For nutrient estimation purposes, representative mean nutrient concentrations from *Beef Cattle Feedlots: Waste Management and Utilisation* (2015) have been adopted as a conservative basis for assessing nutrient redistribution through irrigation reuse.

5.3.1. RUNOFF SOURCE AND CHARACTERISTICS

For the purposes of the nutrient budget, average rainfall, runoff and evaporation figures have been adopted within the water balance assessment to determine the estimated annual volume of captured runoff available for irrigation reuse within an average operational year.

Table 5-4 – Captured runoff nutrient characteristics

Nutrient	Unit	Adopted Concentration (mg/L)
Nitrogen (Total N)	mg/L	20
Phosphorus (Total P)	mg/L	5
Potassium (K)	mg/L	20
Sodium (Na)	mg/L	25
Chloride (Cl)	mg/L	50

A low-strength mixed runoff concentration has been adopted to reflect that the captured runoff volume comprises a substantial proportion of rainfall-derived stormwater, rather than concentrated effluent. These values are considered indicative only and will be verified through routine water quality monitoring during operation.

5.3.2. RUNOFF AND CATCHMENT VOLUME FOR RE-USE

The operational runoff and catchment water balance can be summarised as follows:

Table 5-5 – Operational runoff and water balance summary

Source	Volume (ML)
Annual inflows	47.7
Annual outflows	47.0
Annual irrigation use	25.7
Peak operational storage volume	14.8
End-of-year storage balance	0.8

5.3.3. NUTRIENT MASS AVAILABLE FOR IRRIGATION REUSE

On the basis that the total volume of captured runoff generated for use within the system is 25.7ML, and 1mg/L applied over 1ML is equal to 1kg, the following annual mass nutrient volumes apply.

Table 5-6 - Nutrients generated for use within the captured runoff application system

Nutrient	Unit	Adopted Concentration (mg/L)	Annual Load (kg/year)
Nitrogen (Total N)	mg/L	20	514
Phosphorus (Total P)	mg/L	5	129
Potassium (K)	mg/L	20	514
Sodium (Na)	mg/L	25	643
Chloride (Cl)	mg/L	50	1,285

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The above calculations indicate that irrigation reuse of approximately 25.7ML of captured runoff per annum will result in the redistribution of approximately 0.51t of nitrogen, 0.13t of phosphorus and 0.51t of potassium across the irrigation area annually.

These nutrient loads are comparatively low and reflect the dilute nature of the captured runoff stream associated with the covered feedlot design and integrated stormwater management system.

5.3.4. AREA FOR IRRIGATION REUSE

The areas available for irrigation reuse are identified on the attached Liquid Application Plan and comprise a current total of 222ha of irrigation area. Utilising the existing irrigation infrastructure and excluding the required separation distances, approx. 106ha are available for captured run-off irrigation re-use activities.

Captured runoff generated within the integrated stormwater storage system is reused through the existing centre pivot irrigation system. Based on the estimated annual captured runoff reuse volume of approximately 25.7ML, the average hydraulic application depth across the nominated irrigation reuse area is approximately 24mm/year. This calculated hydraulic loading rate is considered negligible relative to normal irrigation and rainfall inputs within the irrigation area and does not represent a constraint to ongoing agricultural production or soil management.

Captured runoff may be applied in conjunction with irrigation water to support irrigation scheduling aligned with crop demand and to ensure nutrients are distributed evenly across the irrigation area. Irrigation reuse will be scheduled to align with crop water demand and will be managed to minimise the risk of runoff, ponding, deep drainage and nutrient leaching. Irrigation reuse will be avoided during periods of saturated soil conditions or when significant rainfall is forecast.

Particular attention will be given to the management of potassium and soluble salts contained within the captured runoff stream. Application rates will therefore be managed through irrigation scheduling, agronomic management and routine soil monitoring to minimise the risk of nutrient or salt accumulation within the soil profile.

5.4. AVAILABLE USE AREAS

A review of the property and the required separation distances identifies multiple areas that are suitable for the application of recoverable organic material and captured runoff generated by the feedlot. These areas are shown in the following figure and detailed on the attached Property Overview Plan.

The waste utilisation areas have been identified following the application of separation distances required under ***the Code*** and industry best practice. The following buffers have been applied when determining the available application areas:

- 20m from site boundary,
- 100m from public area,
- 100m for liquid application, 200m for solids application from a watercourse (natural), bore or spring,
- 200m from off-site residence,
- 200m from flood prone land (mapped Flood overlay).

After applying these separation distances, the area available for solids application is approximately 208ha, while approx. 111ha is available for irrigation reuse activities. The available utilisation areas substantially exceed the minimum land area typically required for nutrient reuse associated with a feedlot of this scale.

Due to the irregular shape and distribution of these areas across the property, application activities will be managed through GPS-enabled mapping systems within farm machinery. This allows accurate delineation of exclusion zones and ensures that recoverable organic material and captured runoff are only applied within approved utilisation areas.

The below image is an excerpt from the detailed Waste Application Buffer Plan included in **Appendix 2.** This shows the available areas in line with the required buffer distances from waterways, flood prone land, property boundary and sensitive receptors (not owned).

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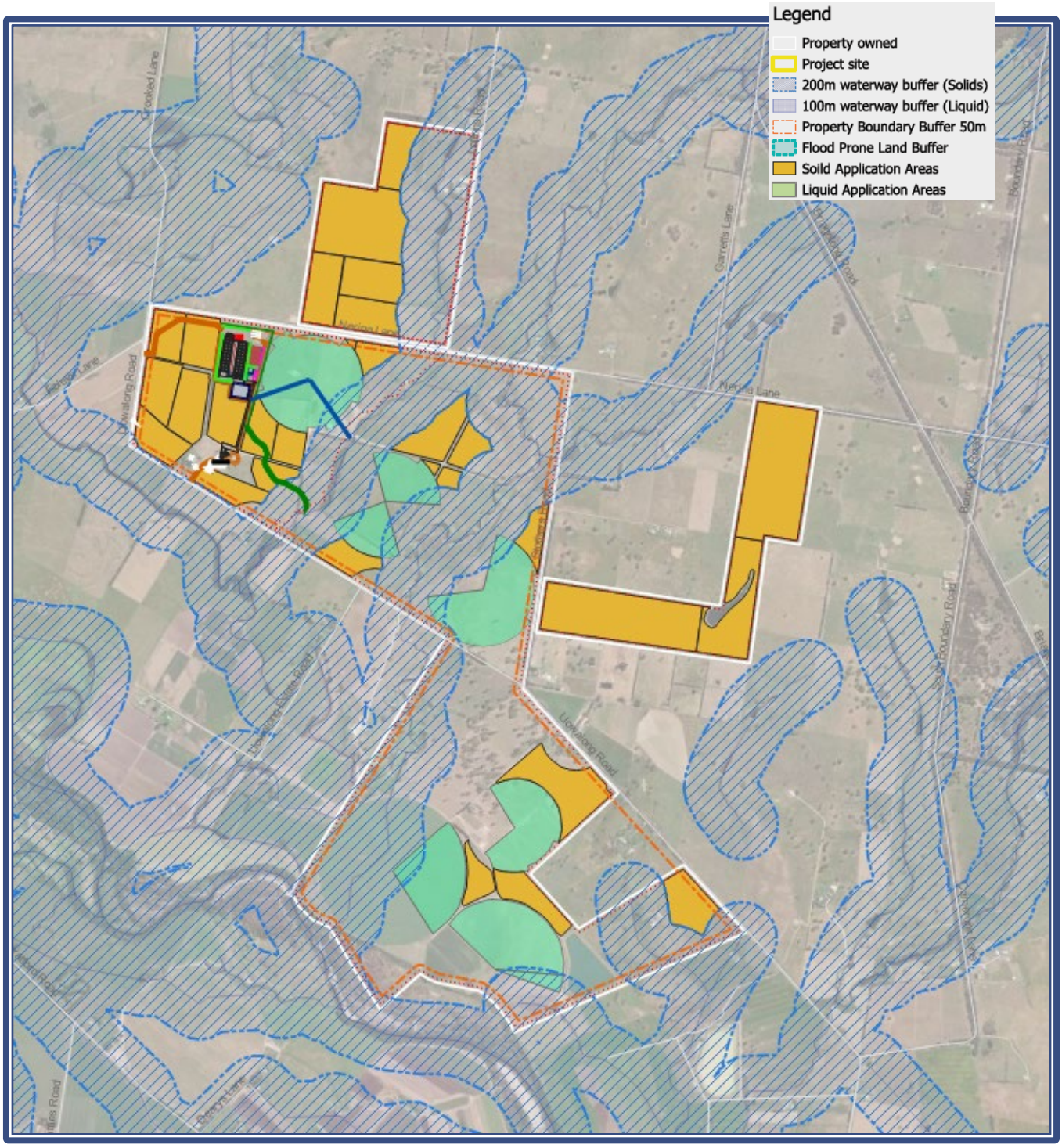

Figure 5-1 - Waste Utilisation Area shown with liquid green shading and solid orange shading (Source: QGIS)

5.5. CROPPING & SUITABILITY

The property operates as a mixed farming enterprise supporting both livestock and cropping activities. Cropping areas surrounding the feedlot are utilised for the production of fodder and grain crops which form part of the broader farm nutrient cycle. These cropping systems provide suitable opportunities for the beneficial reuse of manure and captured runoff generated by the feedlot through land application at agronomic rates.

Cropping systems within the property typically include cereal and forage crops such as wheat, barley, and fodder crops used within the farm enterprise. These crops have moderate to high nutrient demand and are well suited to utilising nutrients contained within feedlot manure and captured runoff. The reuse of manure as a fertiliser source provides an opportunity to recycle nutrients back into the farming system while reducing reliance on synthetic fertilisers.

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The cropping areas identified for manure utilisation consist predominantly of agricultural land currently used for cropping and pasture production. These areas are generally gently sloping and well suited to conventional farming practices including manure spreading and irrigation.

Application areas avoid sensitive features such as watercourses, drainage lines and residential receptors through the application of separation distances described in **Section 5.4**.

Manure and captured runoff application will be managed to align with cropping rotations and soil nutrient requirements. Application timing will generally occur prior to crop establishment or during periods where nutrient demand is highest to maximise nutrient uptake and minimise the risk of nutrient losses to the environment.

5.6. APPLICATION AND UTILISATION

This section outlines the nutrient utilisation framework for the proposed feedlot operation and assesses the available land area relative to the estimated nutrient loads generated within the solids and captured runoff streams. Detailed calculations for nutrient generation are provided in **Sections 5.2 (solids)** and **5.3 (liquid)** and are not repeated here.

To demonstrate that nutrients generated by the feedlot can be beneficially reused without exceeding agronomic nutrient loading rates, a nutrient balance assessment has been undertaken. This assessment compares the estimated annual nutrient loads generated from the manure stream with the typical nutrient removal rates associated with crops grown on the property.

The objective of this assessment is to confirm that sufficient land area is available to utilise nutrients contained within the manure stream while maintaining sustainable soil nutrient levels and minimising the potential for off-site nutrient movement.

5.6.1. CROP NUTRIENT REMOVAL

Typical nutrient removal rates for cropping systems commonly grown within the region have been adopted to provide a representative scenario for nutrient utilisation. These values represent the approximate quantity of nutrients removed from soil through crop harvest and therefore provide an indication of the nutrient uptake capacity of the cropping system.

Table 5-7 - Nutrient utilisation rates of crops

Crop	Yield	Nutrient Concentration (kg/t)			Nutrient Removal (kg/ha)		
	t/ha	Nitrogen	Phosphorus	Potassium	Nitrogen	Phosphorus	Potassium
Oats or Barley	4	13.9	2.6	11.8	55.6	10.4	47.2
Wheat (grain)	4	19	4	24	76	16	96
Wheat (stubble)	2	5	10	24	10	20	48
Total wheat		**24**	**14**	**48**	**86**	**36**	**144**
Forage Maize	15	11	2	9	165	30	135
Lucerne	15	35	4	30	525	60	450

These values represent a typical cropping scenario and provide a basis for assessing the indicative land area required for manure utilisation.

5.6.2. NUTRIENT BALANCE

SOLIDS

Using the nutrient removal rates outlined in **Section 5.6.1**, an indicative land area required to utilise nutrients contained within the manure solids has been calculated.

Table 5-8 - Solids nutrient balance

Wheat	Total Nutrients Generated	Nutrient Removal (kg/ha)	Area required (ha)
Nitrogen	18,350	86	213
Phosphorus	6,672	36	175
Potassium	15,846	144	110

The above table identifies that the selection of a wheat crop, assuming 4t/ha yield of grain and 2t/ha of straw that the following total utilisation per ha would be achieved:

- Nitrogen 86kg
- Phosphorus 36kg

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- Potassium 144kg

Comparison of the estimated annual nutrient generation against adopted crop nutrient removal rates indicates that nitrogen represents the limiting nutrient under the adopted cropping scenario. Based on the estimated total annual nitrogen load generated (not including losses) within the manure stream, an indicative utilisation area of approximately 213ha would be required to sustainably utilise nutrients generated by the operation. Phosphorus utilisation would require approximately 185ha, while potassium utilisation would require approximately 110ha based on the adopted crop removal rates.

The assessment demonstrates that the broader farming enterprise provides sufficient land area to sustainably utilise nutrients generated by the proposed feedlot operation, subject to buffers, appropriate crop selection, rotational management, nutrient monitoring and agronomic management practices.

In practice, nutrient utilisation efficiency may be further improved through rotational cropping, forage production, double cropping systems and seasonal adjustment of application rates based on crop demand and soil nutrient status. Routine soil testing, manure analysis and crop nutrient monitoring will be undertaken during operation to ensure nutrients are applied in accordance with agronomic demand and to minimise the potential for nutrient accumulation or off-site movement.

LIQUID

The total annual nutrient loads generated within the liquid effluent stream have been calculated in Section **5.3.3** and are summarised in Table **5-9**.

Table 5-9 - Liquid nutrient balance

Wheat	Total Nutrients Generated	Nutrient Removal (kg/ha)	Area required (ha)	Volume applied/irrigation kg/ha
Nitrogen	514	86	6	4.8
Phosphorus	129	36	4	1.2
Potassium	514	144	4	4.8

The above assessment identifies that the nutrient loads associated with the captured runoff and effluent reuse stream are relatively low when distributed across the proposed irrigation utilisation area. Based on the adopted nutrient concentrations and an available irrigation area of approximately 106ha, the equivalent annual nutrient application rates are estimated at approximately:

- Nitrogen – 4.8kg/ha/year
- Phosphorus – 1.2kg/ha/year
- Potassium – 4.8kg/ha/year

These application rates are substantially lower than typical agronomic nutrient removal rates associated with irrigated forage or cropping systems and therefore do not represent a significant nutrient loading constraint for the proposed irrigation area. Effluent nutrients are applied in dilute form via irrigation and are managed primarily through irrigation scheduling, hydraulic loading controls and operational management rather than as the primary nutrient source for crop production. Based on the estimated annual captured runoff reuse volume of approximately 25.7ML, the average hydraulic application depth across the nominated irrigation reuse area is approximately 24mm/year.

Given the dilute nature of the captured runoff stream, the proposed irrigation reuse system is not expected to result in excessive nutrient accumulation within soils, provided irrigation management and routine monitoring are undertaken. Ongoing soil testing, effluent analysis and crop monitoring will be undertaken during operation to confirm nutrient balances remain within acceptable agronomic limits.

5.6.3. NUTRIENT MANAGEMENT APPROACH

In practice, manure and effluent application will occur across a rotational cropping system and will be managed based on soil nutrient testing and crop nutrient demand. Application rates will therefore be adjusted to ensure nutrients are applied at agronomic rates and do not exceed crop uptake capacity.

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6. MONITORING

Monitoring forms an important component of the waste management system to ensure that recoverable organic material and captured runoff generated by the feedlot are managed in an environmentally responsible manner. Monitoring activities focus on soil nutrient status, surface water protection and the ongoing operational management of the feedlot waste and stormwater systems.

6.1. GROUNDWATER AND SURFACE WATER

6.1.1. SURFACE WATER

Surface water protection is achieved through the implementation of a controlled drainage system which directs runoff from feedlot pens and hardstand areas to the sediment trap and effluent storage pond. External catchment runoff will be managed to minimise unnecessary inflows into the integrated stormwater storage system where practicable.

The drainage system, sediment trap and stormwater storage pond will be inspected periodically to ensure that they remain functional and free of blockages or structural damage. Any accumulated sediment will be removed as required and incorporated into the manure management system.

Visual inspections of surrounding drainage lines and waterways will be undertaken periodically to confirm that no contaminated runoff is leaving the feedlot site.

6.1.2. GROUNDWATER

Groundwater contamination risk from the feedlot operation is considered to be low due to the design of the integrated waste and stormwater management system together with the operational controls implemented on site. Recoverable organic material and captured runoff generated within the feedlot operation are contained within the integrated drainage and stormwater management system and directed to the settling infrastructure and stormwater storage pond.

Recovered manure and bedding material generated within the covered cattle housing system will be periodically removed and transferred to the designated manure and bedding storage area prior to beneficial land application. Captured runoff generated within the operational drainage system is retained within the stormwater storage pond prior to irrigation reuse.

These design features minimise the potential for nutrient or contaminant migration to underlying groundwater systems.

Given the contained nature of the integrated drainage and stormwater management system together with the operational controls proposed, routine groundwater monitoring is not currently proposed as part of normal operation. However, operational inspections, maintenance activities and adaptive management measures will be implemented to ensure the feedlot continues to operate in a manner that protects surrounding land and water resources.

The stormwater storage pond has been designed to provide sufficient containment capacity in accordance with ***the Code***, further reducing the risk of seepage or uncontrolled release.

6.2. SOILS AND CROPPING

Soil testing will be undertaken within nominated solids application and irrigation reuse areas to monitor soil nutrient status and inform ongoing nutrient management practices. Soil testing will typically be undertaken periodically to assess key parameters including nitrogen, phosphorus, potassium, electrical conductivity and soil pH.

The results of soil testing will be used to guide application rates to ensure nutrients are applied at agronomic levels consistent with crop nutrient demand and broader soil management objectives. Soil test results will also be reviewed periodically to assess trends in nutrient accumulation within application areas relative to background conditions and areas not receiving nutrient application.

Where monitoring identifies elevated nutrient or salt levels within soils, application rates, application timing and utilisation areas will be reviewed and adjusted as required to minimise the potential for nutrient accumulation, salinity impacts or off-site nutrient movement.

6.3. OPERATIONAL MONITORING

The site has been designed to minimise the potential for runoff to leave the integrated drainage and stormwater management system. Drainage lines, catchment dams and surrounding areas within the property will be visually monitored periodically to confirm that runoff associated with the feedlot operation is being appropriately contained within the site drainage system. Water quality monitoring may also be undertaken where considered necessary.

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Monitoring of operational surfaces, drainage infrastructure and settling systems will occur following significant rainfall events, with maintenance and repairs undertaken as soon as practicable where required.

PEN MANAGEMENT

Covered cattle housing areas and operational surfaces will be inspected regularly to ensure surfaces remain in good condition and to identify when manure and bedding removal is required.

DRAINAGE SYSTEM

Drains, settling infrastructure and associated drainage controls will be inspected periodically to ensure runoff is appropriately conveyed through the integrated stormwater management system.

STORMWATED STORAGE POND

Stormwater storage pond levels and embankments will be monitored periodically to ensure adequate storage capacity and structural integrity are maintained.

IRRIGATION REUSE

Irrigation reuse activities will be scheduled based on soil conditions, crop water demand, storage levels and forecast weather conditions.

RECORD KEEPING

Records will be maintained for manure and bedding removal, solids application activities, irrigation reuse activities, maintenance inspections and any corrective actions undertaken.

6.4. MONITORING SUMMARY

The following table summarises the monitoring proposed for the site with relation to waste and stormwater management.

Table 6-1 - Monitoring summary

Monitoring Activity	Frequency	Purpose
Soil testing	Periodic	Determine nutrient levels and guide manure application
Pen inspections	Regular	Maintain pen condition and manage manure and bedding accumulation
Drainage inspection	Periodic	Ensure runoff is contained within the integrated drainage system
Effluent pond inspection	Periodic	Confirm storage capacity and structural condition
Effluent irrigation records	Ongoing	Track irrigation reuse volumes and application areas
Water quality monitoring (if required)	Water quality monitoring (if required)	Water quality monitoring (if required)

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7. RESPONSE STRATEGY

In the event of a complaint, system failure, spill, contamination event or other operational incident, this section outlines the response and notification framework to be implemented for the feedlot operation

7.1. HAZARD IDENTIFICATION

The feedlot has been designed with integrated stormwater management, operational controls and contingency capacity to minimise the likelihood of environmental or operational incidents. However, as with any operational system, there remains the potential for equipment failure, operational error or unforeseen external events.

Potential hazards that may arise during operation include:

- spill, leak or escape of a material or contaminant,
- excessive noise associated with operational activities,
- dust generation,
- offensive odour affecting neighbouring properties,
- inappropriate application of recoverable organic material or captured runoff,
- fire,
- biosecurity incidents,
- stormwater or water contamination events, and
- failure or blockage of drainage or storage infrastructure.

Many minor operational issues may be identified and rectified through routine inspections and daily management activities without requiring further escalation. However, incidents with the potential to impact human health, environmental values or surrounding land uses may require additional investigation, corrective actions and notification of relevant authorities.

7.2. COMPLAINTS

The feedlot will be operated in a manner intended to minimise impacts on surrounding land users and the broader community. Maintaining positive relationships with neighbouring landholders, contractors, suppliers and the community is considered an important component of ongoing site management.

Where operational changes are proposed which may alter the nature of activities undertaken on site, consultation with relevant stakeholders and neighbouring landowners will be undertaken where appropriate.

Where a complaint is received, the matter will be investigated as soon as practicable, and details recorded within the site complaints register. Information recorded may include:

- date and time complaint received,
- details of the complaint and the person receiving the complaint,
- prevailing weather and operational conditions at the time of the complaint,
- investigation findings,
- corrective actions undertaken (where required), and
- response and outcome.

Complaints are most likely to relate to community amenity, including odour, dust, traffic or operational activities. All complaints will be investigated and recorded to document the nature of the complaint, any actions undertaken and the final outcome.

Complaint management procedures, investigation processes and record keeping requirements are further outlined within the site Complaints and Feedback Management Plan.

7.3. INCIDENT IDENTIFICATION AND RESPONSE

Failure of operational infrastructure or management systems may be identified during routine inspections, operational monitoring activities or following significant weather events. Incidents will be categorised according to the severity of the event, the potential environmental impact and any associated risks to human health or safety. Three incident response levels are identified in **Figure 7-1.**.

Figure 7-1 - Incident response levels

Level	Description
Level 1 – Minor operational issue	An abnormal operational condition or slowly developing issue that does not compromise the integrity of the feedlot operation or create an immediate environmental or safety risk. The issue should be monitored and corrective maintenance undertaken as soon as practicable.

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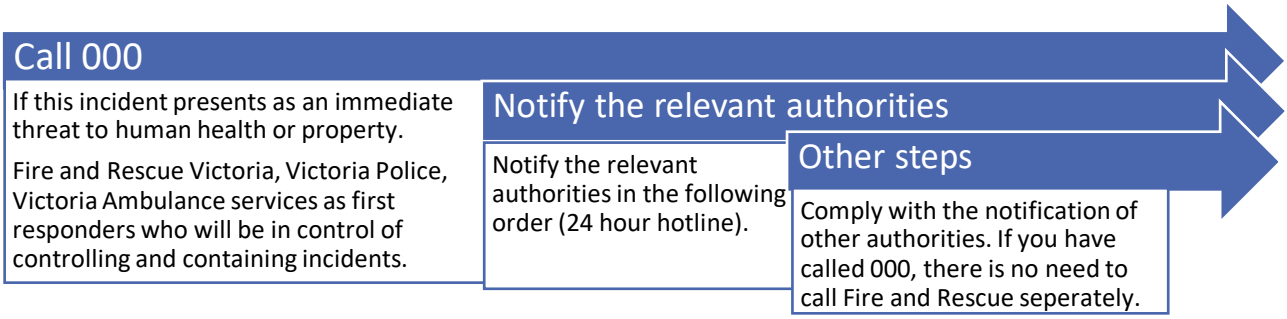
Level	Description
Level 2 – Potential hazard situation	A developing situation with the potential to escalate into an environmental, operational or safety incident. This may result from operational failures, severe weather conditions or external events. Increased monitoring and corrective actions are to be implemented to minimise escalation risk.
Level 3 – Emergency incident	A significant incident or failure resulting in an actual or imminent risk to human health, environmental harm or major operational failure. Relevant authorities and emergency services are to be notified immediately where required and emergency response measures implemented.

The incident response framework includes:

- identification and assessment of the incident,
- implementation of immediate containment or corrective actions,
- notification of management and relevant authorities where required,
- investigation of contributing factors,
- implementation of corrective and preventative actions, and
- record keeping and incident review.

The following flow chart identifies the protocol for industry notification of major incidents, with the contact details of the relevant authorities are below.



7.4. KEY AGENCIES

Authority	Local Contact	Phone numbers/Email
Emergency Services	Emergency response	000
Country Fire Authority (CFA)	Local brigade	000
Victoria SES	Emergency assistance	132 500
EPA Victoria	Pollution and environmental incidents	1300 372 842
Department of Health Victoria	Public health matters	1300 650 172
WorkSafe Victoria	Workplace incidents and safety	1800 136 089
Wellington Shire Council	Local government	1300 366 244
Southern Rural Water	Water authority	(03) 5139 3100
Crime Stoppers	Non-urgent reporting	1800 333 000

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8. REVIEW

As part of the ongoing operation of the feedlot, the generation, storage, handling and reuse of recoverable organic material and captured runoff will be monitored and reviewed periodically to ensure the waste management system continues to operate effectively and in accordance with the objectives of this Plan.

This Waste Management Plan forms part of the ongoing operational management framework for the feedlot and will be reviewed and updated where required in response to operational changes, monitoring outcomes or regulatory requirements.

Review triggers may include, but are not limited to:

- scheduled periodic review (minimum annually),
- changes to feedlot operations, infrastructure or waste management practices,
- changes to surrounding land use or nearby sensitive receptors,
- issues or directions raised by regulatory authorities,
- monitoring results indicating nutrient accumulation or operational performance issues,
- any incident resulting in a failure to meet the requirements or objectives of this Plan,
- significant complaints or recurring operational issues requiring corrective actions, and
- changes to relevant legislation, guidelines or industry standards.

Where review identifies deficiencies or opportunities for improvement, operational procedures, monitoring programs and management measures will be updated accordingly to support ongoing environmental protection and operational performance.

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REFERENCES

MLA. (2015). *Beef and cattle feedlots: Waste management and utilization.* Meat & Livestock Australia Ltd.

(August 1995). *Victorian Code for Cattle Feedlots.*

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9. APPENDICIES

9.1. SITE PLANS

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NERINA LANE

LLOWALONG ROAD

50m BUFFER FROM ROAD

CONSTRUCT NEW DRAIN A - N
GRADE 1 in 238 (-0.42%)
BED 4m WIDE, BATTERS 2 to 1
60m³ CUT, 60m LONG

CONSTRUCT NEW DRAIN N - O
GRADE 1 in 666 (-0.15%)
BED 4m WIDE, BATTERS 2 to 1
118m³ CUT, 100m LONG

CONSTRUCT NEW DRAIN O - P
GRADE 1 in 2,000 (-0.05%)
BED 4m WIDE, BATTERS 2 to 1
482m³ CUT, 210m LONG

CONSTRUCT NEW DRAIN P - Q
GRADE 1 in 137 (-0.73%)
BED 4m WIDE, BATTERS 2 to 1
155m³ CUT, 120m LONG

CONSTRUCT NEW DRAIN Q - R
GRADE 1 in 233 (-0.43%)
BED 4m WIDE, BATTERS 2 to 1
93m³ CUT, 60m LONG

CONSTRUCT NEW DRAIN R - S
GRADE 1 in 313 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
68m³ CUT, 70m LONG

CONSTRUCT NEW DRAIN S - T
GRADE 1 in 2,000 (-0.05%)
BED 4m WIDE, BATTERS 2 to 1
342m³ CUT, 180m LONG

CONSTRUCT NEW DRAIN T - U
GRADE 1 in 83 (-1.25%)
BED 4m WIDE, BATTERS 2 to 1
76m³ CUT, 50m LONG

CONSTRUCT NEW DRAIN U - V
GRADE 1 in 313 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
19m³ CUT, 87m LONG

CONSTRUCT NEW DRAIN V - W
GRADE 1 in 313 (-0.32%)
BED 4m WIDE, BATTERS 2 to 1
15m³ CUT, 71m LONG

CONSTRUCT NEW DRAIN M - U
GRADE 1 in 118 (-0.85%)
BED 4m WIDE, BATTERS 2 to 1
76m³ CUT, 98m LONG

CONSTRUCT NEW DRAIN U - M
GRADE 1 in 74 (-1.32%)
BED 4m WIDE, BATTERS 2 to 1
165m³ CUT, 92m LONG

FUTURE SILAGE BUNKER
45m x 15m WIDE

FUTURE SILAGE BUNKER
45m x 15m WIDE

LOADING

PEN 1 PEN 2 PEN 3 PEN 4 PEN 5 PEN 6 PEN 7 PEN 8 PEN 9
PEN 10 PEN 11 PEN 12 PEN 13 PEN 14 PEN 15 PEN 16 PEN 17 PEN 18

CLEAN OUT LANE
CATTLE LANEWAY (8.0m)
FEED LANE
GRASS AREA
FEED LANE
CATTLE LANEWAY (8.0m)
CLEAN OUT LANE

GRADE 1.00%

MANURE AND SPENT BEDDING
110m x 52m = 5,720m²

SETTLING BASIN 100m³ FSL 35.00

MORTALITY COMPOSTING AREA 35m x 35m

MASS MORTALITY TRENCH 270m x 3m

NTH XS

STH XS

TURNING AREA

NEW YARDS

CATTLE LANEWAY (8.0m)

GRADE -0.19%
GRADE -0.20%
GRADE -0.30%
GRADE -1.28%
GRADE -1.17%

BUND AROUND PROJECT

STORM WATER POND
AREA = 8,970m2
CAPACITY @ 33.80 = 14.72ML

GRADE 1 IN 1000

PUMP

PLANTATION TREES
REMOVE TREES AS REQUIRED

PIPELINE TO IRRIGATION AREAS

CATTLE LANEWAY (8.0m)

CATTLE LANE

EXISTING YARDS

LOADING YARDS

RAMP

TRUCK TURNING AREA

LOADING AREA

SILOS

EXISTING FODDER AND STORAGE AREA

HOUSE

SHED

SHED

DRIVEWAY

LANEWAY

50m BUFFER FROM ROAD

FEEDPAD CONSTRUCTION

FOOT PRINT AREA = 7.415 HA

VOLUME OF TOPSOIL STRIP UNDER CUT AREAS @ 0.10m = 3,289m³ (SOLID INSITU)
VOLUME OF TOPSOIL STRIP IN FILL AREAS @ 0.10m = 4,126m³ (SOLID INSITU)

VOLUME IN FILL AREAS = 21,218m³ SOLID INSITU
+ 12.5% COMPACTION = 23,870m³
VOLUME IN CUT AREAS = 27,428m³ SOLID INSITU

NOTE: ALL FINISHED ELEVATIONS ARE TOP OF CLAY LEVELS (IN RED)

THESE PLANS ARE SUBJECT TO THE RELEVENT AUTHORITIES PLANNING APPROVALS PRIOR TO ANY CONSTRUCTION COMMENCING.

LOCATION OF SERVICES (POWER, TELECOM. ETC) SHOWN ON PLANS ARE APPROXIMATE ONLY, CONTRACTOR MUST VERIFY ACTUAL POSITION OF THESE SERVICES AND ANY OTHER SERVICES NOT SHOWN ON THESE PLANS PRIOR TO ANY CONSTRUCTION COMMENCING.

ACTUAL POSITION OF ANY EXISTING BOUNDARIES, EASEMENTS OR ROAD RESERVES HAVE NOT BEEN SHOWN ON THIS PLAN, BUT SHOULD BE DETERMINED ON SITE BY RELEVANT BODIES PRIOR TO ANY CONSTRUCTION COMMENCING.

TITLE BOUNDARIES SHOWN ON PLAN ARE APPROXIMATE ONLY.

DIAL BEFORE YOU DIG www.1100.com.au

REV	DATE	REVISIONS	DRN	CHKD
0	28/05/2026	ORIGINAL CREATED	RJM	NHC

GDA ZONE 55

SCALE OF METRES 1 IN 1500
15 0 30 60 90 120 150
0 1 2 3 4 5 6 7 8 9 10cm
FULL SIZE ON ORIGINAL

SURVEYED BY	DRAWN	DESIGNED
DATUM A.H.D.	GRID INTERVAL RANDOM	AREA

NJC IRRIGATION SOLUTIONS
SURVEY, CONSULTATION & DESIGN

PROPOSED FEEDPAD LAYOUT

862 LLOWALONG ROAD, LLOWALONG

CROWN ALLOTMENT	SECTION	PARISH	DRAWING NO.	SHEET NUMBER	FILE REF	REV	SHEET SIZE
LOT 2 ON PS905315		STRATFORD	51557	1	IS-800	0	A1

9.2. WASTE APPLICATION BUFFER PLAN

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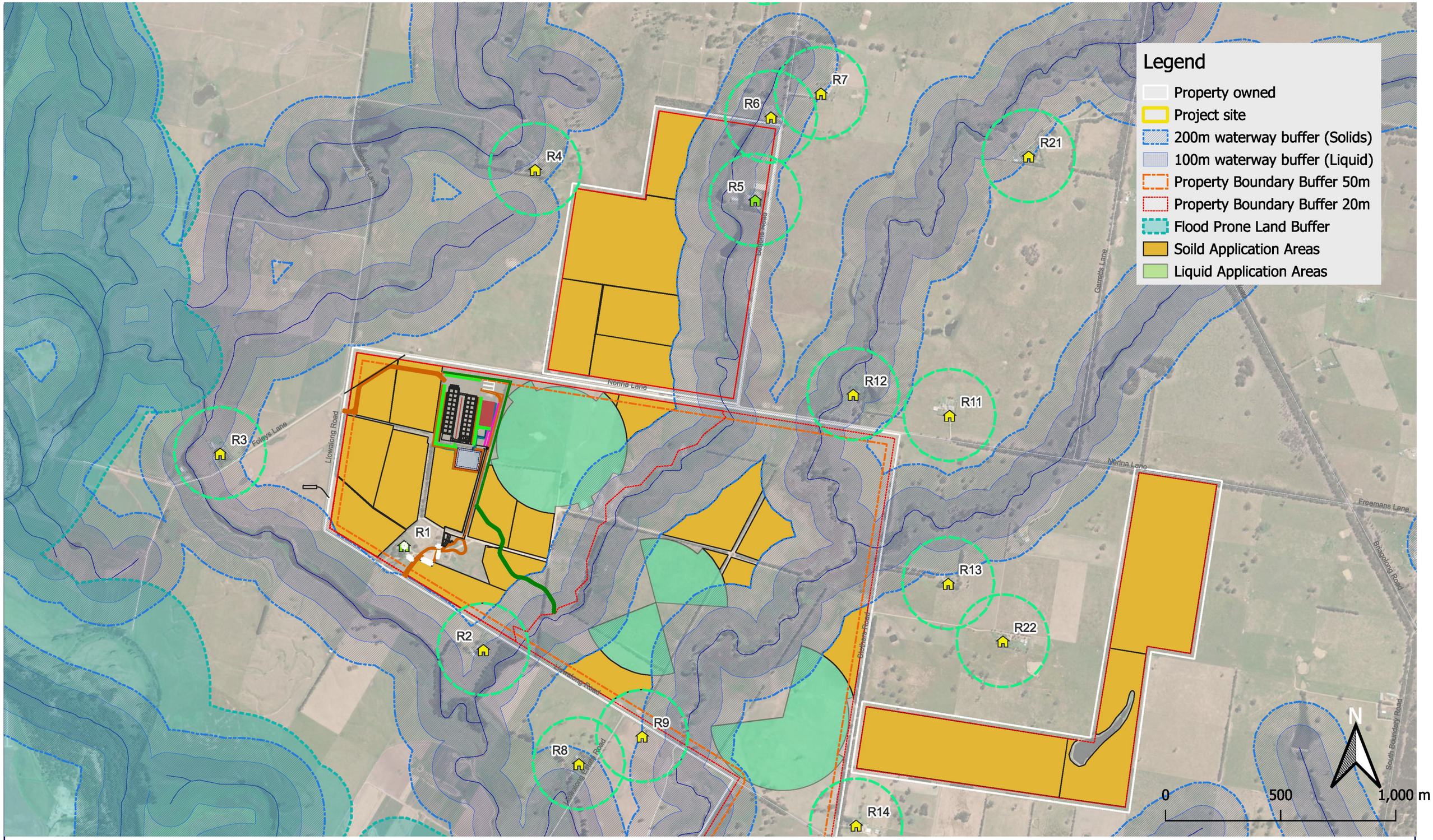


PROGRESSIVE RURAL SOLUTIONS

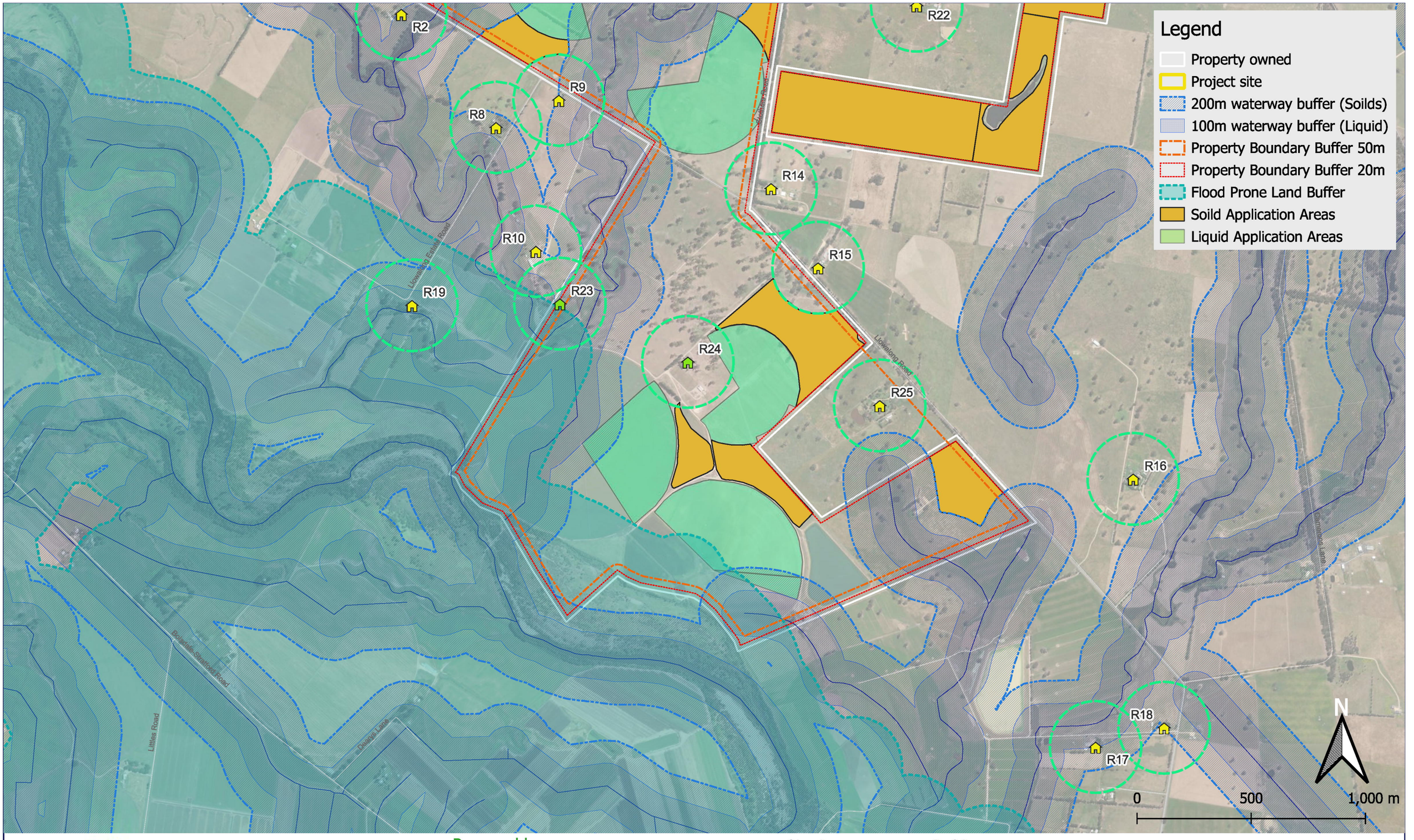
Project Details:

J454 - 'Llowalong Beef Co' - Feedlot

Prepared by:
Progressive Rural Solutions Pty Ltd

Sheet	1 of 3
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Feedlot Site - Waste Utilisation Plan

Version	Date
V1	10/09/2025
V2	05/03/2026
V3	28/05/2026



PROGRESSIVE RURAL SOLUTIONS

Project Details:

J454 - 'Llowalong Beef Co' - Feedlot

Prepared by:
Progressive Rural Solutions Pty Ltd

Sheet	2 of 3
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Feedlot Site - Waste Utilisation Plan

Version	Date
V1	10/09/2025
V2	05/03/2026
V3	28/05/2026

Plan Notes:

Waste Application Buffer Requirements
Liquid (effient) application:
* Waterway Buffer - 100m
* Flood Prone Land Buffer - 200m
* Sensitive Receptor (not owned) - 200m
* Property Boundary - 20m

Solid (manure/bedding) application:
* Waterway Buffer - 200m
* Flood Prone Land Buffer - 200m
* Sensitive Receptor (not owned) - 200m
* Property Boundary - 20m

Distances are in accordance with the Cattle Code, 1995

Calculated Areas Ha

Solid

Field Name	Area Ha
Eaglevale	12.16
LRbp	5.64
Lucerne	9.37
N1	5.43
N10	2.68
N16	4.21
N17-R	4.48
N18	1.34
N18	1.68
N2	6.09
N2	6.9
N21	1.29
N23	3.34
N27	3.44
N3A	2.8
N3A	1.76
N3B	4.78
N3B	0.59
N5	5.49
N6	3.42
N6	3.06
N6	1.23
N9	0.17
Nic's	6.79
NP1	0.37
NPB	7.05
S1-S5	23.38
S6	12.35
S7-S9	25.99
T1	6.39
T4	7.11
T5	7.52

Calculated Areas Ha

Liquid

Pivot Name	Area Ha
Bus Stop	21
Crooked Lane Pivot	25
Eaglevale Pivots	20
Eaglevale West Pivot	15
Lucerne Pivot	15
Otech Pivot	15

PROGRESSIVE RURAL SOLUTIONS

Prepared by:
Progressive Rural Solutions Pty Ltd

Project Details: J454 - 'Llowalong Beef Co' - Feedlot

Sheet	3 of 3
Client:	'Llowalong Beef Co'
Property:	
Project:	Beef Feedlot
Plan type:	Site Plan
Plan Description:	Feedlot Site - Waste Utilisation Plan

9.3. SITE WATER BALANCE

Climate Data		Unit	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Days in month	-		31	28	31	30	31	30	31	31	30	31	30	31	365
Precipitation (mean)	mm		49.7	51.3	41.8	50.8	33.0	56.5	38.9	38.0	42.3	58.1	76.4	59.3	596
Precipitation MR90)	mm		58.3	71.5	45.7	67.9	44.7	92.2	56.8	42.0	53.1	66.0	85.8	73.0	757
Evaporation MR90	mm		171.8	137.4	116.8	73.2	44.9	35.7	39.4	56.0	76.7	104.2	130.9	165.1	1152
Kpan		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	10
Eto	mm		137	110	93	59	36	29	32	45	61	83	105	132	922
Kc	Temperate Perennial Pasture	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	13
Etc	mm		144	115	98	62	38	30	33	47	64	88	110	139	968
Deficit	mm		86	44	52	-6	-7	-62	-24	5	11	21	24	66	211
Inflows	-														
Feedlot Catchment		90,000													0
Roof	ML	17,396	1.01	1.24	0.80	1.18	0.78	1.60	0.99	0.73	0.92	1.15	1.49	1.27	13.2
Hardstand		18,975	1.00	1.22	0.78	1.16	0.76	1.57	0.97	0.72	0.91	1.13	1.47	1.25	12.9
Grassed		44,629	1.04	1.28	0.82	1.21	0.80	1.65	1.01	0.75	0.95	1.18	1.53	1.30	13.5
Water Surface		9000	0.52	0.64	0.41	0.61	0.40	0.83	0.51	0.38	0.48	0.59	0.77	0.66	6.8
Total catchment			3.58	4.39	2.81	4.16	2.74	5.65	3.48	2.57	3.26	4.05	5.26	4.48	46.4
Trough cleaning			0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.44
Washdown							0.23	0.23	0.23	0.23					0.90
Total Inflows			**3.61**	**4.42**	**2.84**	**4.20**	**3.01**	**5.91**	**3.75**	**2.84**	**3.29**	**4.09**	**5.30**	**4.51**	**47.77**
Outflows	-														
Evaporation Loss	ML	9000	1.55	1.2	1.1	0.7	0.4	0.3	0.4	0.5	0.7	0.9	1.2	1.5	10.4
Seepage Loss	ML	7200	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.9
Storage?	Y/N		N	N	N	Y	Y	Y	Y	Y	N	N	N	N	0
Irrigation Application	mm	38	0	8	8	4				4	25	25	10	10	94
Irrigation export	ML		0.00	3.04	3.04	1.52	0.00	0.00	0.00	1.52	9.50	9.50	3.80	3.80	35.7
Total outflows	**ML**		**1.6**	**4.3**	**4.2**	**2.3**	**0.5**	**0.4**	**0.4**	**2.1**	**10.3**	**10.5**	**5.1**	**5.4**	**47.0**
Storage - net monthly	ML		2.0	0.1	-1.3	1.9	2.5	5.5	3.3	0.7	-7.0	-6.4	0.2	-0.9	
Cumulative storage	**ML**		2.0	2.1	0.7	2.7	5.2	10.7	14.0	14.8	7.8	1.4	1.6	0.8	0.8

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APPENDIX 7 – TRAFFIC ASSESSMENT

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Traffix Group

Traffic Engineering Assessment

Proposed Feedlot

862 Llowalong Road, Llowalong

November 2025

G37391R-01A

Document Control

Our Reference: G37391R-01A

Issue No.	Type	Date	Prepared By	Approved By
A	Town Planning	14/11/2025		

AS/NZS ISO 45001-2018 Occupational Health & Safety Management Systems
AS/NZS ISO 14001 Environmental Management Systems
AS/NZS ISO 9001-2016 Quality Management Systems

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Appendix A Development Plans

Appendix B Swept Path Diagrams

1. Introduction

Traffix Group has been engaged to undertake a traffic engineering assessment for the proposed feedlot at 862 Llowalong Road, Llowalong.

The following report provides a traffic engineering assessment of car parking, traffic, design and access considerations associated with the proposed development.

2. Existing Conditions

2.1. Subject Site

The site is located on the north and east side of Llowalong Road and on the south side of Nerina Lane in Llowalong. The site is located approximately 8.5km northeast of Maffra and 8.3km northwest of Stratford.

A locality map of the site is provided at Figure 1.

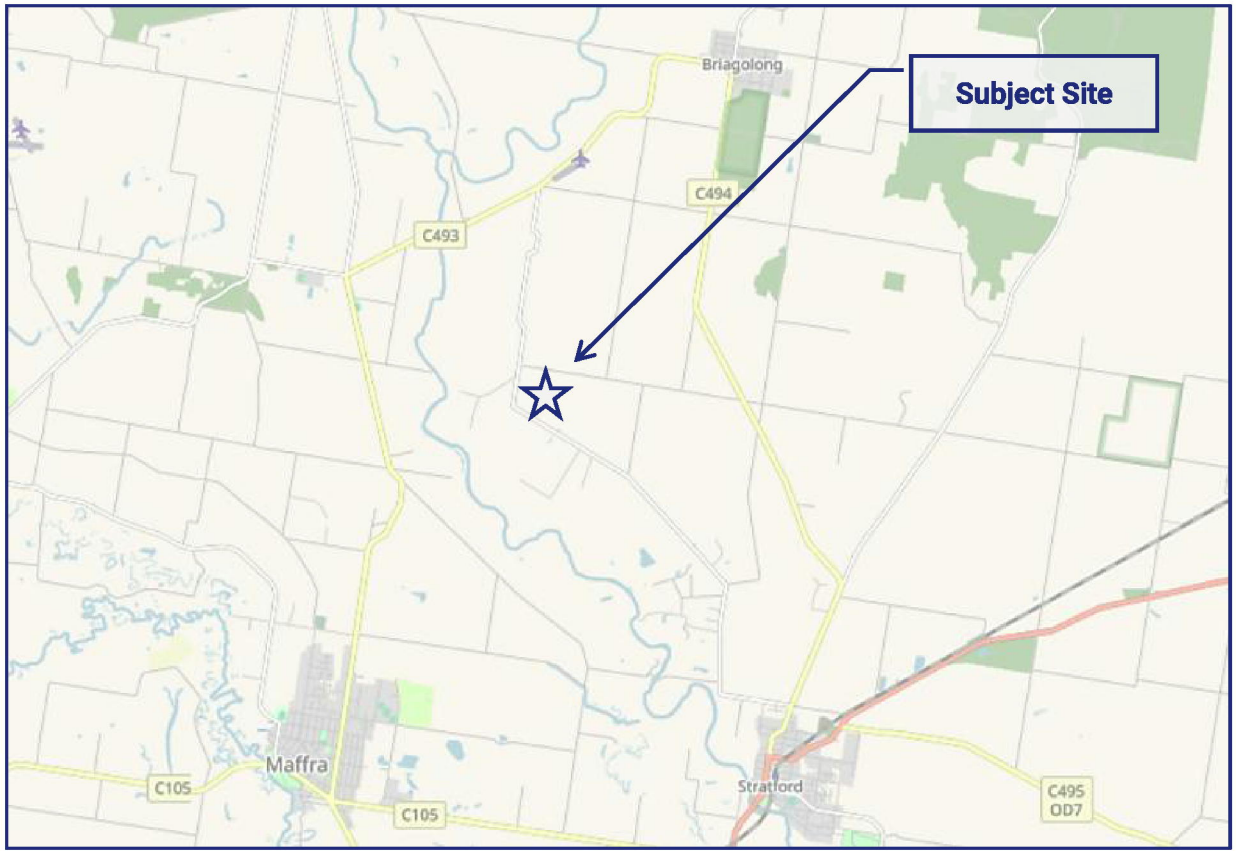


Figure 1: Locality Map (Source: Melway Pty. Ltd)

The subject site includes land addressed as 862 Llowalong Road and 852 Llowalong Road.

Land at 852 Llowalong Road currently operates as a pasture based agricultural farm and has an existing access to Llowalong Road at the south of the site. The site is currently a cropping and grazing operation that generally turns off around 2,000 head of cattle annually.

There is a residential property on the land addressed at 862 Llowalong Road which has a separate access to Llowalong Road located approximately 90m west of the main farm access.

An aerial image and site frontage photo are provided below at Figure 2.

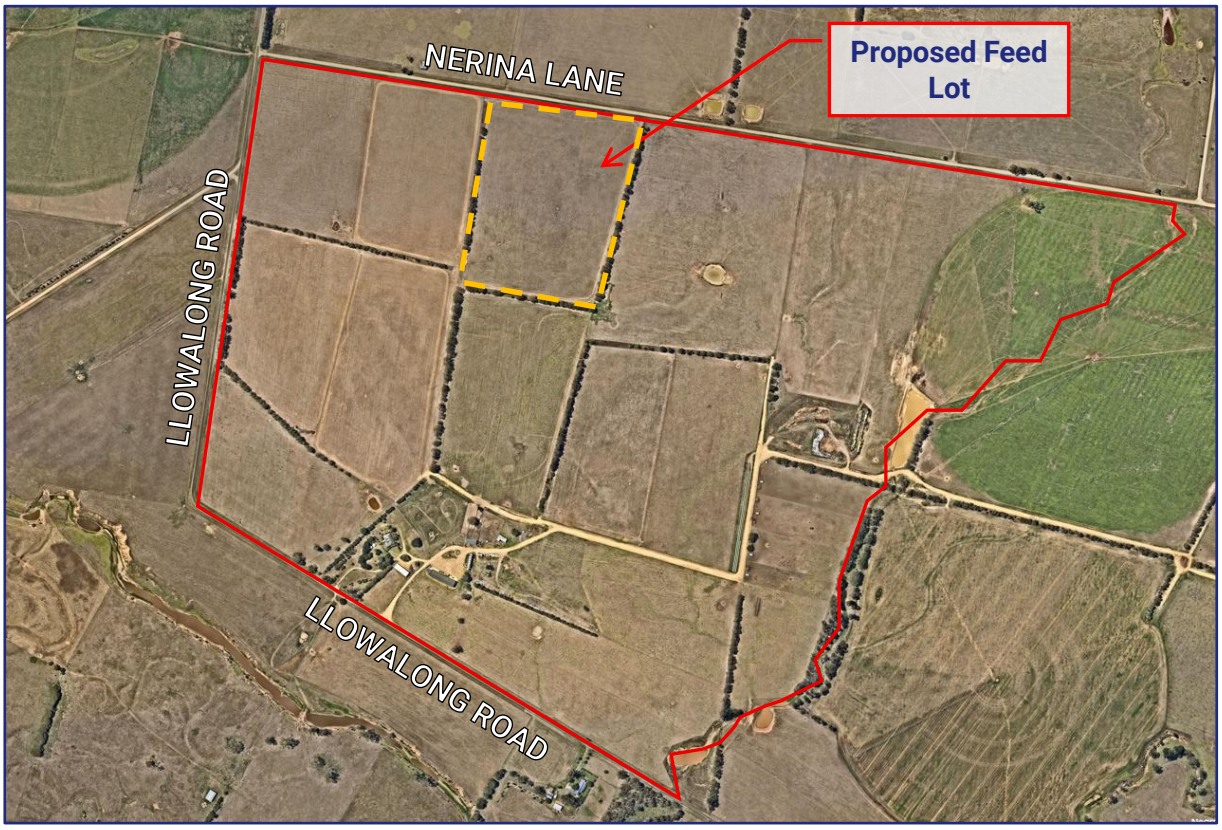


Figure 2: Aerial Image (Source: Nearmap, February 2025)

Figure 3: Property Entrance – view from Llowalong Road

2.2. Land Use

The site is located in a Farming Zone (FZ) under the Wellington Planning Scheme as shown in the land use map at Figure 4.

Surrounding land is also zoned as a FZ and the site is in a Designated Bush Fire Prone Area.

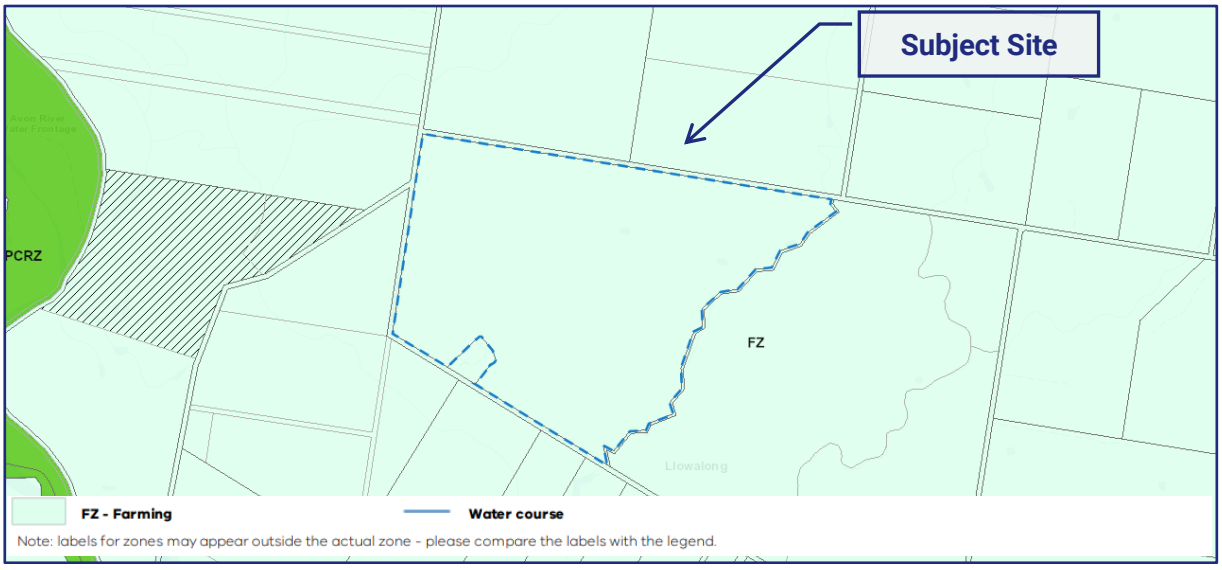


Figure 4: Land Use Zone Map (Source VicPlan)

2.3. Current Road Network

Llowalong Road

Llowalong Road is identified as a 'Local Access A' road in the Wellington Shire Council Register of Public Roads. A 'Local Access A' road is defined as follows:

> *A major access road for local residential or commercial traffic or public facility. Must be a through road or road to significant destination.*

In the vicinity of the site, Llowalong Road extends in a L-shape along the southern and western boundaries of the subject site. Llowalong Road extends between Briagolong Road (near Stratford) and Nerina Lane at the northwest corner of the site where it continues north as Crooked Lane.

In the vicinity of the site access, Llowalong Road is constructed with a 3.8m wide carriageway which accommodates two-way movements. There are no parking provisions along Llowalong Road and a posted speed limit of 100km/h applies.

Photographs of Llowalong Road near the farm access are provided below (sourced from Google Street View, June 2025).

Figure 5: Llowalong Road – View southeast

Figure 6: Llowalong Road – View northwest

3. Proposal

3.1. Development Summary

The proposal is for a 2160 SCU (Standard Cattle Unit) feedlot which will utilise silage and fodder grown on the property with grain and supplementary feed imported from external agricultural operations.

The existing operation turns out approximately 2,000 head of cattle annually from cattle bred or traded within its current grazing system. These will now form part of the proposed feedlot which is expected to process 6,480 head per year. A proportion of cattle bred within the operation will be vertically integrated and transition through the feedlot prior to export off farm.

The proposal will include 18 cattle pens toward the north of the site accessed by an internal access track which extends north from the existing driveway. Additionally, a dedicated cattle track is proposed between the pens and cattle yard for movement of cattle.

There are two loading areas proposed on-site which are described as:

- the existing loading area proximate to the site access which provides direct access to the cattle yard, existing sheds and silos, and
- a new loading area at the northern silage which is accessible from the proposed internal track.

Access to the site is retained via the existing southern connection to Llowalong Road.

A new dedicated feedlot entrance is proposed from Llowalong Road at the western boundary. This will minimise the movement of vehicles within the site.

3.2. Car Parking Considerations

Clause 52.06 of the Wellington Planning Scheme outlines the statutory parking requirements for new developments.

The proposed feedlot is defined under the land use term ‘agriculture’ at Clause 73.03. An agricultural use is an innominate use under Clause 52.06 and therefore parking for the use of the site is to be to the satisfaction of the responsible authority.

On this basis, on-site parking is required to accommodate any likely staff demands.

The proposal does not include an increase in the number of staff, but rather additional activities that are to be undertaken on the site. Accordingly, there is no additional parking demand associated with the proposal.

It is understood that staff currently park informally on-site proximate to the existing sheds/silos. This parking arrangement is considered acceptable for the use of the site.

If there is an increased demand for parking in the future, there is ample opportunity as part of the informal parking which is available to staff on the site.

4. Design Considerations

The carpark layout and access arrangements have been designed in accordance with the Wellington Planning Scheme and where applicable, the Australian Standards.

A review of the proposed site layout follows.

4.1. General Layout

Key elements of the internal design are:

- all accessways are at least 3m wide,
- all vehicles can exit the site in a forwards direction,
- there are no overhead obstructions in traffickable areas,
- the on-site loading areas have been designed to allow for access and manoeuvring by vehicles up to 20m semi-trailers,
- the internal driveway is sufficiently wide and allows for passing to occur,
- the existing site access accommodates semi-trailers movements,
- the proposed access will be constructed as a standard farmgate suitable for 20m semi-trailers.
- Llowalong Road is a straight road and there are no visual obstructions at the site egress in excess of 300m in both directions, and
- there is no formalised parking is proposed on-site.

Traffix Group has prepared swept paths (copy attached at Appendix B) which demonstrate site access and circulation by a semi-trailer.

5. Traffic Engineering Assessment

5.1. Traffic Generation

The proposal will result in a change in the number of heavy vehicle movements to/from the site on an annual basis. The following table details the existing heavy vehicle movements and compares it with that which will occur as part of the proposal.

Table 1: Heavy Vehicle Movements

Use	Existing No. Trucks (annual)	Proposed No. Trucks (annual)	Change
Cattle In	0 x trucks	150 x semi trailers	+150
Cattle Breeding/Export	30 x semi-trailers	270 x semi-trailers	+240
Lucerne Hay Export	240 x semi trailers	0 x semi trailers	-240
Silage/Maize Production	No Change to traffic movements		
Feed/Fodder (Grain)	36 x semi trailers	173 x semi trailers	+137
Supplements	50 x semi trailers	260 x semi trailers	+210
TOTAL	**356 trucks / year**	**853 trucks / year**	**+497**

There will likely be a synergy relating to import/export of cattle where trucks that bring cattle in also take cattle out. For the purposes of a robust assessment, we have assumed this will not take place, despite the high likelihood in practice.

The above table indicates that there will be an average of 1.4 additional semi-trailers per day along Llowalong Road.

5.1.1. Light Vehicles

Light vehicle movements will be associated with staff and vet visits. The proposal is not expected to increase the number of vet visits and any increase in staff will be negligible and associated with staff rotations.

5.2. Traffic Distribution

Heavy vehicles will travel to/from the site via Llowalong Road to the east, connecting to Briagalong Road in Stratford. This is consistent with the current operations of the site.

Each vehicle will generate both an entry to, and an exit movement from the site.

5.2.1. New Access

The provision of a new access directly to the feedlot will allow for fewer turning movements at the existing access point and improved functionality of the use of the site.

The existing access will still cater for traffic movements associated with deliveries of supplements, staff movements and imported cattle.

The new access to the western boundary will cater for traffic movements associated with feed/fodder, silage, and export of cattle.

Use	Existing Access	New Access
Cattle In	150 x trucks	0 x trucks
Cattle Breeding/Export	0 x trucks	270 x trucks
Feed/Fodder (Grain)	0 x trucks	173 x trucks
Supplements	260 x trucks	0 x trucks
TOTAL	**410 trucks / year**	**443 trucks / year**

The creation of a new access will result in an average of 1.1 additional truck movements on the section of Llowaalong Road between the two access points. This level of traffic is negligible and will have no material impact on the function or form of the road.

There are to be no traffic movements associated with this use that extend north beyond the proposed new access point.

The form of the new access will be generally consistent with other farm gate access in the area, including the existing site access, and allowing for semi-trailer movements.

Significantly, the internal road network will allow for a connection between the two access points so that there can be efficiencies gained, i.e. imported cattle deliveries entering the existing access point and the same truck being used for export of cattle via the new access point.

5.3. Traffic Impact

5.3.1. Internal

The site has been designed to accommodate large vehicles and supports the continual use of the site for farming activities.

The prepared swept paths (copy attached at Appendix B) show that there is ample passing opportunity on-site.

There is a gate at the accessway which is located approximately 50m from the edge of the road reserve. This is ample room for a large vehicle to store should the gate be closed.

5.3.2. External

The proposed use of the site is for an extension of the current operations.

The increased vehicle movements associated with the proposal are equivalent to an additional 10 trucks a week (assuming 7-day a week operation) east of the existing access. This level of traffic is low and will not adversely impact the road network.

Our observations of Llowalong Road are that the section of road between the existing access and the new access is well constructed as a single lane of sealed pavement and the provision of an additional truck movement daily will not result in any adverse impacts to the road.

Furthermore, traffic volumes along Llowalong Road are low and the straight alignment of Llowalong Road on the approach to the two access points provides for unobstructed sight lines. Having regard to the above considerations, there are no safety concerns.

6. Conclusions

Having undertaken a traffic engineering assessment of the proposed feedlot at 862 Llowalong Road, Llowalong, we are of the opinion that:

a) the proposed feedlot will include an increase of livestock exports from 2,000 to 6,480 per year,

b) the proposed development includes new gravel internal access tracks and loading areas for access to the cattle yard, silage and pens,

c) the loading areas can accommodate vehicles up to a 20m semi-trailer,

d) there is no formal parking proposed as part of the development, however vehicles will park within the gravel loading area proximate to the sheds which is consistent with the current operations of the site,

e) the number of staff is not expected to increase as a result of the proposal,

f) the new access point to Llowalong Road dedicated to the feedlot along the western boundary of the site is appropriate,

g) the expected number of trucks associated with the site will increase from 356 to 853 annually, this is the equivalent of 10 vehicles a week,

h) there will be no adverse impacts to the road as a result of the additional traffic from the proposed development,

i) there will be no traffic movements north of the proposed access,

j) all traffic movements will be via Llowalong Road toward Stratford,

k) there are no traffic engineering reasons why a planning permit for the proposed feedlot at 862 Llowalong Road, Llowalong, should not be granted.

Appendix A

Development Plans

N

LEGEND

- BUFFER LINES
- FENCELINE
- POWERLINE & POLE
- TELSTRA
- DRAINAGE LINES
- ACCESS TRACKS AND FEED ALLEYS
- CATTLE LANEWAYS
- DRAINAGE RUNOFF SUMP
- PIPELINES
- TREE
- PEG
- TEMPORARY BENCH MARK
- BENCH MARK
- PUMP
- NATURAL SURFACE LEVEL (RL 5.52)
- STOCK TROUGH
- REFERENCE LETTER (A)

NERINA LANE

LLOWALONG ROAD

668m BUFFER FROM RECEPTOR 4

725m BUFFER FROM RECEPTOR 4

50m BUFFER FROM ROAD

SILAGE

LOADING BAY

DRAIN

FUTURE SHED AREA

ACCESS TRACK

FEED ALLEY

CATTLE LANE

PEN 1
PEN 2
PEN 3
PEN 4
PEN 5
PEN 6
PEN 7
PEN 8
PEN 9
PEN 10
PEN 11
PEN 12
PEN 13
PEN 14
PEN 15
PEN 16
PEN 17
PEN 18

MANURE STORAGE

GENERAL MORTALITY AREA

YARDS

SICK BAY

DRAIN DITCH

DRAINAGE POND

PUMP

CENTRE PIVOT
26.73 HECTARES

MASS MORTALITY TRENCH

725m BUFFER FROM RECEPTOR 2

668m BUFFER FROM RECEPTOR 2

668m BUFFER FROM RECEPTOR 3

725m BUFFER FROM RECEPTOR 3

CATTLE YARDS

HOUSE

SHED

LOADING AREA

SILOS

DRIVEWAY

LANEWAY

THESE PLANS ARE SUBJECT TO THE RELEVENT AUTHORITIES PLANNING APPROVALS PRIOR TO ANY CONSTRUCTION COMMENCING.

LOCATION OF SERVICES (POWER, TELECOM. ETC) SHOWN ON PLANS ARE APPROXIMATE ONLY, CONTRACTOR MUST VERIFY ACTUAL POSITION OF THESE SERVICES AND ANY OTHER SERVICES NOT SHOWN ON THESE PLANS PRIOR TO ANY CONSTRUCTION COMMENCING.

ACTUAL POSITION OF ANY EXISTING BOUNDARIES, EASEMENTS OR ROAD RESERVES HAVE NOT BEEN SHOWN ON THIS PLAN, BUT SHOULD BE DETERMINED ON SITE BY RELEVANT BODIES PRIOR TO ANY CONSTRUCTION COMMENCING.

TITLE BOUNDARIES SHOWN ON PLAN ARE APPROXIMATE ONLY.

DIAL BEFORE YOU DIG www.1100.com.au

REV	DATE	REVISIONS	DRN	CHKD
0	12/08/2025	ORIGINAL CREATED	RJM	NHC

GDA ZONE 55

SCALE OF METRES
20 0 40 80 120 160 200
0 1 2 3 4 5 6 7 8 9 10cm
FULL SIZE ON ORIGINAL

SURVEYED BY	DRAWN	DESIGNED
DATUM: A.H.D.	GRID INTERVAL: RANDOM	AREA

NJC IRRIGATION SOLUTIONS
SURVEY, CONSULTATION & DESIGN

PROPOSED FEEDLOT LAYOUT

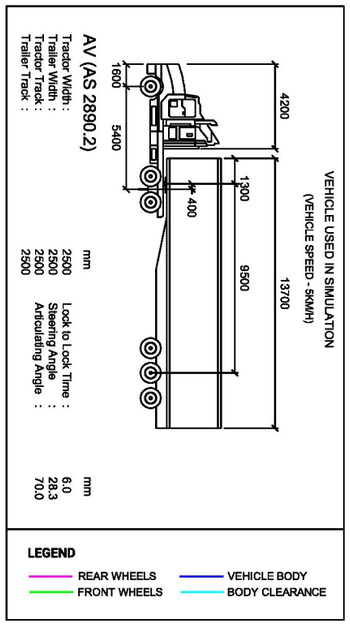
862 LLOWALONG ROAD, LLOWALONG

CROWN ALLOTMENT	SECTION	PARISH	DRAWING NO.	SHEET NUMBER	FILE REF	REV	SHEET SIZE
LOT 2 ON PS905315		STRATFORD	51467	1	IS-800	0	A1

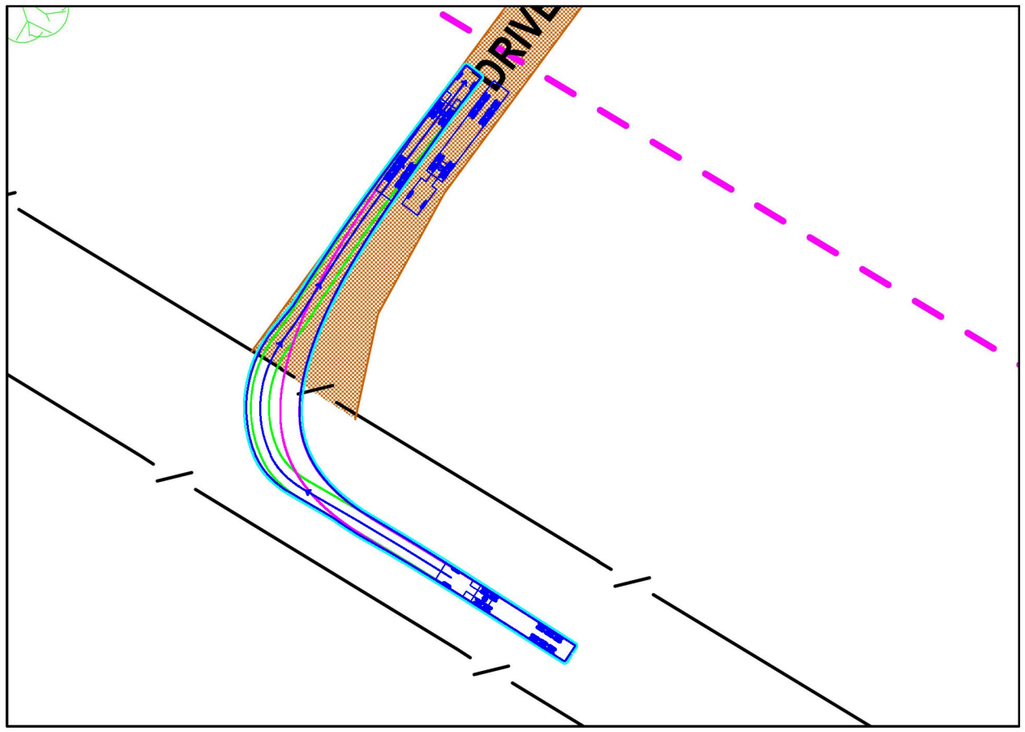
Appendix B

Swept Path Diagrams

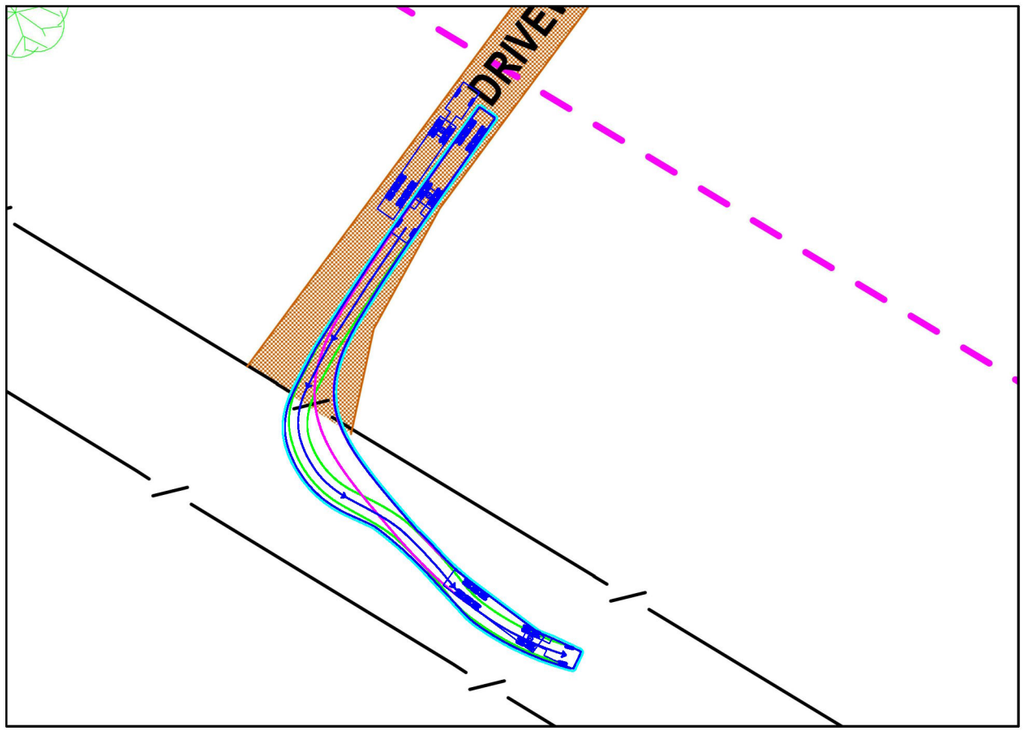
VEHICLE PROFILE



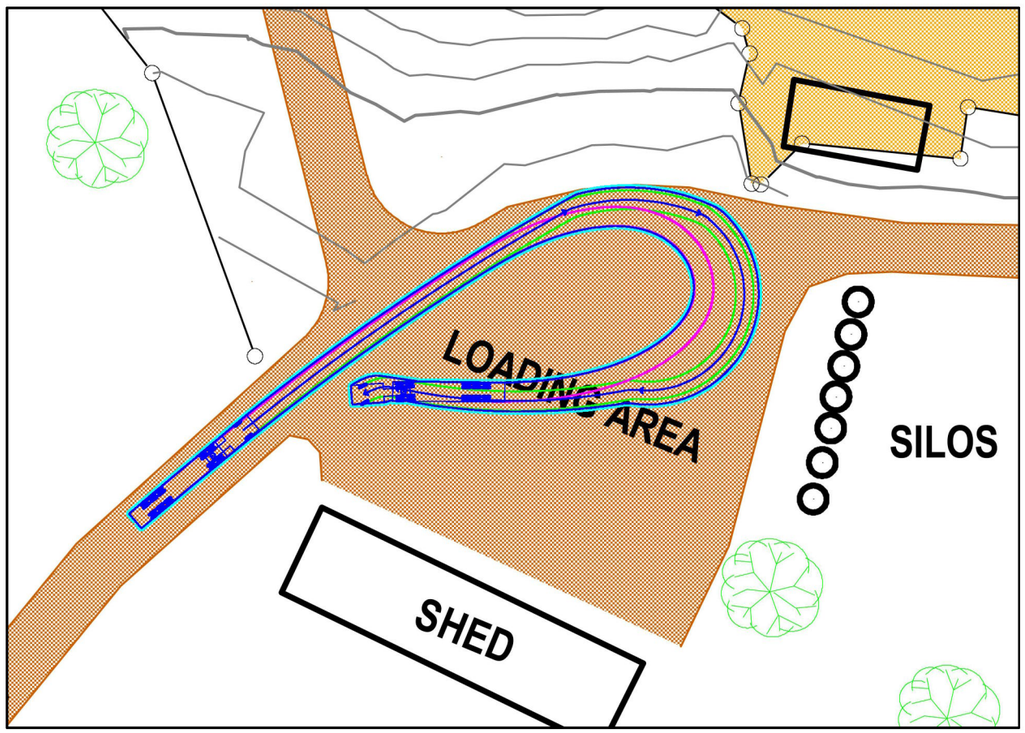
EXISTING SITE ACCESS - B-DOUBLE



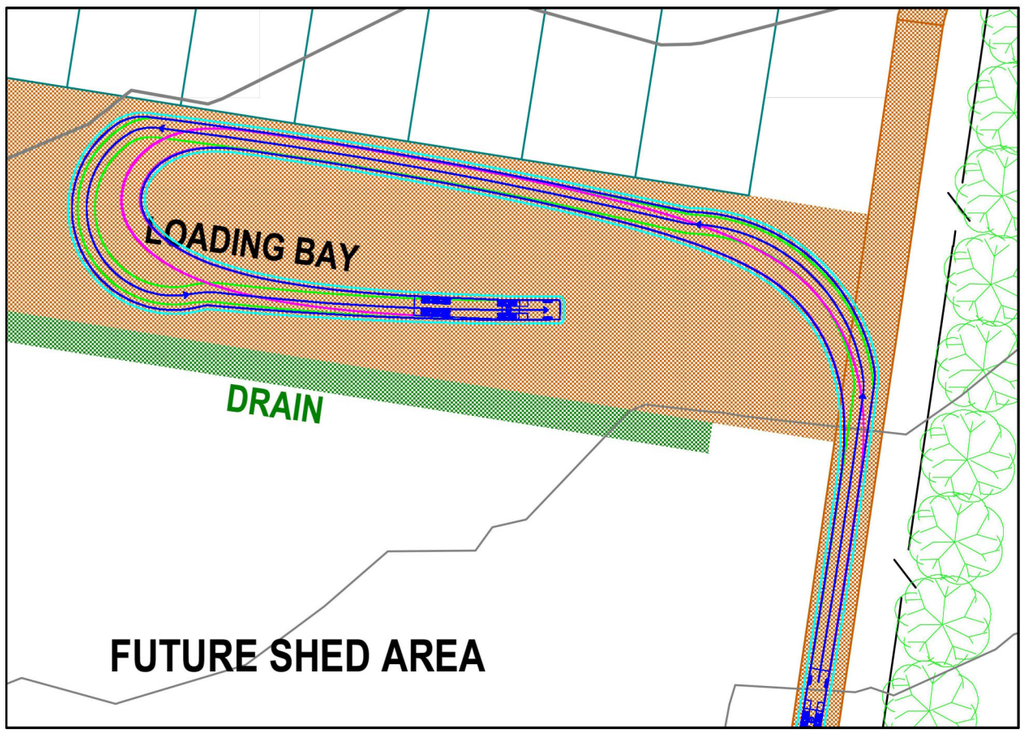
EXISTING SITE EGRESS - B-DOUBLE



CATTLE YARD LOADING AREA - B-DOUBLE



SILAGE LOADING AREA - B-DOUBLE



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	24/09/2025			
B	14/11/2025			

862 LLOWALONG ROAD, LLOWALONG
PROPOSED FEED LOT

GENERAL NOTES:
BASE PLAN 'IS-800 - feedlot layout'
AERIAL FOR CONTEXT ONLY (NEARMAP)

FILE NAME: G37391-01
SHEET NO.: 01

N

SCALE: 1:800 (A3)
0 8 16

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Traffix Group

ATTESTATION

I, being the Director of both

Llowalong Beef Co (applicant) and *(owner),*

the proponent (or where a corporate entity, the public officer of the proponent of the feedlot described in this proposal, undertakes that the feedlot shall at all times comply with the requirements, standards and specifications set out herein and in the *Victorian Code for Cattle Feedlots, 1995*.

Dated this 28th day of *May 2026*

Signed:

_____ _____

Witness Applicant

Witness name:

OR

~~The seal of was affixed with the memorandum and articles of the Company.~~ Signed by the following authorised Company representatives:

Director:

Signed Name

Secretary:

Signed Name

Land owner acknowledgement (where land owner is not proponent)

X_____ _____

Signed Name

Date:_____

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