Statement of Environmental Effects

for the construction and operation of a new Farm Building (Dairy Milking Shed) on 'Yarrimbah' 2813 Cobb Hwy, Mathoura

May 2025

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Related Documents

Type	Author	Name	Date
Environmental Impact Statement	Progressive Rural Solutions	J128 – EIS – V1R4	17/11/2020
Effluent Management Plan	Progressive Rural Solutions	J384 – EfMP – V2R4	23/05/2025
Biodiversity Test of Significance	Progressive Rural Solutions	J128-BTOS-V1R4	17/11/2020
Aboriginal Cultural Heritage Assessment	McCardle Cultural Heritage	Yarrimbah	22/09/2020
Odour Assessment and Management Plan	Progressive Rural Solutions	J128-OMP-V1R4	17/11/2020
Land Use Conflict Risk Assessment	Progressive Rural Solutions	J128-LUCRA-V1R4	17/11/2020
Bushfire Response	Progressive Rural Solutions	J128-BMP-V1R4	24/12/2020
Approval	Murray River Council	DA 10.2020.356.1	24/02/2021
Licence	NSW EPA	EPL-21531	01/06/2021
Licence	WaterNSW	50WA505802	09/03/2021

Related Plans

Plan Number	Revision	Plan Title	Prepared by	Date
J0023	FINAL	Yarrimbah dairy existing conditions	JC Surveys Pty Ltd	26/05/2025
J0023	FINAL	Yarrimbah dairy proposed layout	JC Surveys Pty Ltd	26/05/2025
J0023	FINAL	Yarrimbah dairy shed dimensions	JC Surveys Pty Ltd	26/05/2025

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1. INTRODUCTION

1.1. ORGANISATION

This document has been prepared Mr Ray Smith, Director of JDJB Pty Ltd – property owner and ***Applicant***. The ***Applicant*** is seeking to apply for Development Approval for a new 80 cow Dairy Milking Shed connecting to existing associated infrastructure on the property ‘‘Yarrimbah” 2813 Cobb Hwy, Mathoura, NSW.

Progressive Rural Solutions (PRS) representatives, Clare Fitzpatrick and Rebecca Moodie, will be the relevant contacts throughout the application assessment process and, where required, will provide support during construction work in line with approvals.

Construction work will be undertaken by a suitably experienced and qualified team of contractors and managed by a dedicated Project Manager, Mr Nico Polato who has managed construction of the existing Intensive Dairy System on the property. All contractors utilised throughout the project will be selected based on recent performance on similar projects, capability and capacity following the receipt of relevant approvals. Building Certification will be through qualified Certifiers Brent Williams and Associates.

1.2. PURPOSE

This Statement of Environmental Effects (SEE) has been prepared by Progressive Rural Solutions (PRS) to accompany the required application for a Murray River Council Development Application.

1.3. APPLICATION TYPE

The application is being made under Part 4 of the New South Wales *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg). The NSW EP&A Reg requires applications for certain developments to be in the approved form - being one that has been approved by the Planning Secretary. This report has been prepared to meet the mandatory documents and drawings identified as required to accompany applications made under the EP&A Act 1979.

The Planning Circular titled *‘Application Requirements’*, March 2022 has been reviewed and the related information included in this report. The information provided in this report has also been prepared in consideration of the relevant matters in the *Development Referrals Guide*, NSW Dept of Planning and Environment, October 2024. The proposal has been designed to meet the relevant provisions of the *Murray Local Environment Plan 2011* (LEP), and the *State Environmental Planning Policy (Biodiversity and Conservation)* 2021.

Details of concurrence and referral requirements in line with NSW Planning’s statutory requirements for this application are summarised below included in **Section** 5. of this document.

This application is being made as a new Murray River Council Development seeks approval to construct and operate a new Dairy Milking Shed and associated infrastructure to support the approved intensive dairy operation at the property. The definition under the *Murray Local Environment Plan 2011* relating to the application is:

Farm building which is defined as *a structure the use of which is ancillary to an agricultural use of the landholding on which it is situated and includes a hay shed, stock holding yard, machinery shed, shearing shed, silo, storage tank, outbuilding or the like, but does not include a dwelling.*

The property maintains an existing approval (Development and Licence) for an intensive dairy development which in NSW is defined as:

*A **dairy (restricted)** means a dairy that is conducted on a commercial basis where restriction facilities (*in addition to milking sheds *and holding yards) are present and where cattle have access to grazing for less than 10 hours in any 24 hour period (excluding during any period of drought or similar emergency relief). It may comprise the whole or part of a restriction facility.*

This application relates only to the construction and operation of the new dairy and does not relate to any change to the construction or operation of the existing restricted dairy system. The new dairy milking shed will house up to 650 cows at any time and as a result, is not defined as a scheduled activity under the *Protection of the Environment Operations Act* 1997. Similarly, it is not defined as Designated Development under the EP&A Reg, 2021 as the facility does not *accommodate more than 800 head of cattle for the purpose of milk production*.

The site connects to existing approved access, electrical and water supply infrastructure on the property with **no change** proposed to those activities.

1.4. ESTIMATED DEVELOPMENT COST

The estimated cost of the development is inclusive of the cost of any erection of buildings, carrying out of works (including any subdivision works) and demolition involved in the development has been estimated has been calculated in accordance with the Planning Circular 24-002 and is calculated as:

Table 1-1 – Estimated cost of development summary

Works	Cost
Planning & Design	$90,000
Shed Building – supply and install	$1,250,000
Plant, fittings & connections	$1,630,000
Total (ex GST)	**$2,970,000**
GST	$ 297,000
Grand Total	$3,267,000

1.5. BACKGROUND

The rural property relating to this application is known as 'Yarrimbah' and is addressed as 2901 Cobb Hwy, Mathoura. The property encompasses a total area of 573Ha and was purchased in 1989 becoming an addition to the original family dairy operation that was relocated to this area from Mt Scobie, Victoria in 1984.

Since the purchase of this and their other properties, Raymond, his wife Leanne, together with their children Justin, Brendan, Darren and Jessica, their partners and children have expanded and developed their business into the successful dairy operation that it is today. This family business prides itself on being innovative and adaptive within a complex agricultural and irrigation climate.

In 2020, after undertaking a review of its operation, and following years of research, the business evaluated its options in considering their long-term plans, sustainability, productivity, biosecurity and animal welfare. A transition of its operation to a 2,112-cow dairy freestall Housing operation. This conversion was approved under DA10.2020.356.1 and required the application of an EPA licence which is current under Licence 21531.

The operation has now completed construction of the two approved freestall housing facilities and this application is for a new dairy to support the increase heard and milking demand. The current dairy at the site will remain and be utilized to milk 150 cows a day which will include the hospital (antibiotic) and fresh (Colostrum) cows, where milk will be processed separately to the main heard.

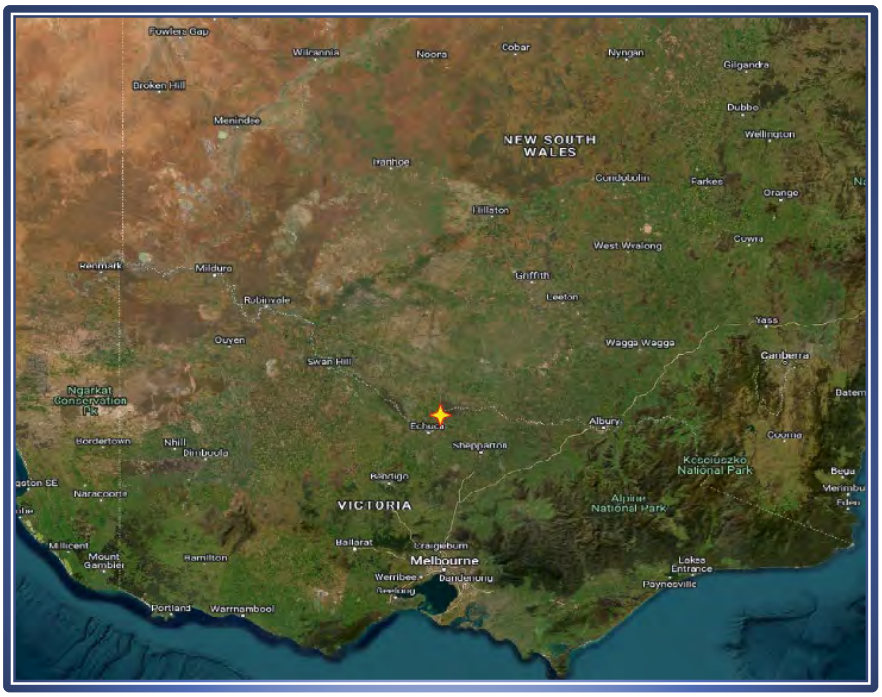


Figure 1-1 - Map showing location of Dairy Operation within the State

Figure 1-2 – Map showing location of the Dairy Operation within the region

1.6. APPLICATIONS AND APPROVALS HISTORY

The following table nominates the existing approvals within the operation and surrounds to support the operation.

Table 1-2 – Approvals

Approval Type	Reference	Date Approved
Development Application	DA10.2020.356.1	24 March 2020
Environmental Protection Licence	21531	1 June 2021
Groundwater	WAL12192	1/11/2006
	WAL15170	25/01/2008
Work Approval (Bore and Storages)	50WA505802	17/05/2007
Combined Work and Use Approval (Groundwater)	50WA504695	01/11/2006

2. ENGAGEMENT AND APPLICATION REQUIREMENTS

During the application preparation and review of the proposed works, relevant referral authorities for this project have been consulted to ensure the projects aims, objectives, works and ongoing management and operation are in line with current permitted activities. **Table 2-1** below summarises the relevant referral authorities and their considerations relating to this application. Further information on the authorities that have been consulted, both within NSW and where relevant at a national level, with the described outcomes is included as referenced in the table. Specific copies of the correspondence where gained are included in **Appendix 4**.

2.1. REFERRAL AUTHORITY SUMMARY

This Development Application is to be assessed by the Murray River Council who will consider the requirements for concurrence and referral based on project works. To assist in this determination the below table has been prepared in reference to the *NSW Development Referrals Guide (October 2024*) to summarise referral authorities and their role in project approvals.

Table 2-1 - Summary of Engagement Considerations (based on NSW Development Referrals Guide published October 2024)

Role	Authority	Consultation	Integrated	Concurrence	Referral	Notes
Development Impacting Electricity	Essential Energy	Yes	No	No	No	The proposal relating to this application does not propose any alteration or increase in demand that would propose any impact on the local electricity network and as a result, no consultation has been undertaken. **See below**.
Bush fire Protection	NSW Rural Fire Service (NSW RFS)	Yes	No	No	No	Application to NSW Rural Fire Service with relation to the fire protection measures is underway. **See below.**
Development impacting roads	TfNSW – Roads	No	No	No	No	There is no change to the traffic number, movements or access to the site. The new dairy moves the productive herd to a new system**. See below.**
Development impacting railway infrastructure	Multiple	No	No	No	No	Not relevant to this application.
Water Management (Part 1) – Controlled Activities	Department of Planning and Environment - Water	No	No	No	No	The works are not related to any waterway and do not propose any works within a flood way or groundwater aquifer.
Water Management (Part 2) – Water Licences and Approvals	WaterNSW	No	No	No	No	No change to water supply, works, approvals or licences at the site
Aquatic and Marine matters	DPI – Fisheries	No	No	No	No	Not relevant to this application or proposal. .
	Transport for NSW - Maritime	No	No	No	No	Not relevant to this application or proposal.
Water Quality	WaterNSW	No	No	No	No	No consultation was conducted, and works are not expected to impact on Water Quality.
Development impacting water and wastewater infrastructure	WaterNSW	No	No	No	No	Not relevant to this application or proposal.
Flood prevention	DPIE	No	No	No	No	The proposed works are not within the flood planning overlay; no consultation has been undertaken.

Role	Authority	Consultation	Integrated	Concurrence	Referral	Notes
Heritage Conservation	Heritage Council of NSW (Heritage Council)	No	No	No	No	The impact of the project on Heritage has been considered in **Section 6.6** and Aboriginal Heritage in **Section 6.5.**
Aboriginal Cultural Heritage	Heritage NSW	No	No	No	No	Works are proposed within a highly modified landscape that has been subjected to previous disturbance. The original EIS completed a review of the property and works area with no objects identified. See **Section 6.5**.
Environment Protection	Multiple	No	No	No	No	No consultation has been undertaken however a Biodiversity Assessment have been completed and included in **Section 6.3.4** of this report
Coal mine subsidence	Subsidence Advisory NSW	No	No	No	No	Not relevant to this application or proposal.
Mining leases	Department of Regional NSW – (MEG)	No	No	No	No	Not relevant to this application or proposal.
Development impacting high-pressure pipeline infrastructure	Multiple	No	No	No	No	Not relevant to this application or proposal.
Development impacting air infrastructure	Air Service Australia, Sydney Airports Corporation	No	No	No	No	Not relevant to this application or proposal.
Development impacting defence infrastructure	Australian Department of Defence	No	No	No	No	Not relevant to this application or proposal.
Development impacting navigable waterways	Transport for NSW - Maritime	No	No	No	No	Not relevant to this application or proposal.
Development at ports	Port operator (NSW Ports)	No	No	No	No	Not relevant to this application or proposal.
Proposed education infrastructure	NSW Department of Education	No	No	No	No	Not relevant to this application or proposal.
Development impacting observatory and meteorological infrastructure	Siding Springs Observatory, Planning Secretary	No	No	No	No	Not relevant to this application or proposal.
Urban design	Design review panels, Government Architect NSW	No	No	No	No	Not relevant to this application or proposal.
Land-use planning	Planning Secretary, Minister for Planning	No	No	No	No	Not relevant to this application or proposal.
Hazardous and offensive development	Environment Protection Authority	No	No	No	No	Project has reviewed the related SEPP with relation to hazardous and offensive development.

2.2. CONSULTATION AND OUTCOMES

Specific details relating to referral authorities' responses and where relevant results of assessments against the referral requirements have been provided below. As part of the original approval, multiple authorities reviewed and commented on the application. In preparing this proposal the previous responses have been considered.

2.2.1. MURRAY RIVER COUNCIL

Role: Consenting Authority

The Murray River Council has statutory responsibilities with regard to the review of the application within its Council area and the aims, objectives and responsible planning in line with State, Regional, Local planning instruments and Development Control Plans.

A preliminary review of the proposed works on the property was undertaken with representatives on behalf of the Applicant, Clare Fitzpatrick and Murray River Council representatives, Mr Chris O'Brien and Mr John Guilfoyle on the 14th February 2024. The proposed works relating to the dairy were outlined, and Council feedback received indicated that a new application for the proposed dairy should be prepared and submitted. As part of the application, the information submitted should include the following information:

- Information in the Rural Building Checklist,
- Review of any information required from the EPA,
- Details on any change from the existing development approvals including:
  - Water supply (Section 6.2.1)
  - Electricity supply (see below)
  - Traffic and access (See below and Section 6.9)
  - Waste generation (see Section 6.10)
- Review of odour and separation distances (**Section 6.7)**
- Recalculation of waste outputs/Effluent Management Plan (**Section 3.3.5**) and **Appendix 7**, and
- Consideration of any relevant Guidelines, Codes or Planning Provisions related to the development (Section 5).

Application Requirement*:* This report and supporting documents have been prepared to provide sufficient information identified during consultation and include the required documentation referred to in the *Planning Circular for Application requirement* (Application requirements for development, 1 March 2022).

2.2.2. ESSENTIAL ENERGY

Role: Development impacting electricity

Electrical supply authorities provide advice on potential electrical safety risks in relation to proposed development. This advice is important to minimise the risk of safety issues occurring during construction and operation and to support the ongoing efficient operation of the electricity network. Essential Energy is the retail electricity service provider in this region.

As part of the existing site work and actions generated as a result of the intensive dairy development, applications and design works have been ongoing with Essential Energy. This work has the following Essential Energy reference numbers:

Project Reference Number: ECN-061183
Application Case Number: 00143723
Power Upgrade Design Engineers: Delta Star Design Engineers, Wagga Wagga, NSW

There are no changes proposed in addition to those that are ongoing within the above referenced applications. The construction and building works are not proposed within 5m of any essential energy asset and no asset requires relocation as a result of the proposed works.

Application Requirement*:* The development is not integrated, and no concurrence or referral is required.

2.2.3. NSW RURAL FIRE SERVICES

Role: Development impacted by bushfire

The New South Wales Rural Fire Service (NSW RFS) plays a critical role in assessing Development Applications and rural buildings, particularly in bush fire prone areas. Their involvement ensures that developments are designed and constructed to mitigate bush fire risks, thereby enhancing community safety and resilience.

A preliminary assessment under the Building Code has classified the Farm Building as a Class 8 building. *Planning for Bushfire Protection* (PBP), 2019 identifies the following with relation to Class 5 to 8 buildings:

Whilst bush fire is not captured in the NCC for Class 5-8 buildings, the following objectives will be applied in relation to access, water supply and services, and emergency and evacuation planning:

- *to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;*
- *to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.*
- *to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and*
- *provide for the storage of hazardous materials away from the hazard wherever possible.*

The general fire safety construction provisions of the NCC are taken as acceptable solutions however construction requirements for bush fire protection will need to be considered on a case-by-case basis.

A Performance-based design brief consultation process has been ongoing with relation to the proposed farm building under:
Application reference number: 653T.196-PDBD01 and
FRNSW reference number: FRN25/858.
Designer: NDF Engineering – Nabeel Darwish

This application is assessing the Deemed to Satisfy provision relating to static water supply (greater than 60m) and replacement with non-complying on-site hydrants (in lieu of hard suction within 4m of the water supply).

All other objectives under *Planning for Bushfire Prevention*, 2019 are achieved and consistent with the Bushfire Response plan previously submitted (PRS, 2020) and approved for the site.

Application Requirement: Based on compliance with PBP, the development is not integrated, and no concurrence or referral is required.

2.2.4. HERITAGE NSW

Role: Aboriginal Cultural Heritage

The Environmental Impact Statement included an Aboriginal Cultural Heritage Assessment prepared to meet the Heritage NSW, Department of Premier & Cabinet, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010), the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b), the Secretary's Environmental Assessment Requirements (SEARs) and the brief.

This assessment considered the area of the proposed new dairy within this report and consultation. The assessment did not identify any objects or sites within the investigation area, including the dairy site and surrounds. There were no responses relating to the consultation process and Heritage NSW following preliminary feedback, did not object to the development. The site works as part of that assessment, did not identify any

No further consultation has been undertaken with Heritage NSW. The above referenced detailed results of the assessment have been discussed further in **Section 6.5** of this report.

Application Requirement: The development is not integrated, and no concurrence or referral is required.

2.2.5. ENVIRONMENTAL PROTECTION AUTHORITY (EPA)

Role: Environment Protection

The Environment Protection Authority (EPA) is responsible for administering the *Protection of the Environment Operations Act 1997* (POEO Act) which includes Clean air, water, noise and pollutions including waste.

The site maintains a current EPA licence 21531 and has meet all obligations under its approval and licence conditions. The licensee has an exemplary record with no complaints, non-conformances or pollution incidents at the site.

The original EIS was referred to the EPA as an integrated authority as a licence under the POEO Act is required for the facility to operate. The proposed application is not considered a designated development under the *EP&A Regulations Schedule 3 s49,* as it is ancillary to the existing approved development and the building does not accommodate 800 cows at any one time.

Application Requirement: The development is not integrated, and no concurrence or referral is required.

2.2.6. WATERNSW

Role: Water Management (Part 2) – Water Licences and Approvals

WaterNSW is responsible for supplying NSW's bulk water needs, operating NSW's River and groundwater systems and providing services to its customers with respect to licensing and approvals, water allocation trades, water licence trades and water resource information.

No change is proposed to the supply or use of water or existing approvals and licences on the property as part of this application.

Application Requirement: The development is not integrated, and no concurrence or referral is required.

2.2.7. TRANSPORT FOR NSW - ROADS

Role: Development impacting roads

The road network in NSW is critical for the way that residents live and work in the State. Roads form an essential part of the economy, and it facilitates links within the community. The Transport for New South Wales (previously known as RMS) authority is responsible for ensuring road users have safe and efficient journeys throughout all of NSW, managing the operations and programs for roads.

The original development application was referred to Transport for NSW Planning division for comment. The assessment completed by the Department required an upgrade of the access from Cobb Highway to a BAL treatment. This work was completed under the approved intensive dairy development.

This proposal for a new dairy will not change the number of operation vehicles accessing the site as the new dairy replaces the activity of the existing dairy. There is no increase or change the total production already approved as part of the intensive dairy development.

Application Requirement: Council may re-refer the application to Transport for NSW to consider the application with relation to traffic movements connecting to the classified road network.

2.2.8. NSW DEPT OF PLANNING, INDUSTRY & ENVIRONMENT – BIODIVERSITY CONSERVATION DIVISION

Roles: Biodiversity and flooding

The NSW Department of Planning, Industry and Environment's Biodiversity and Conservation Division (NSW DPIE - BCD) is responsible for conserving biodiversity and managing habitats in New South Wales. Their functions include implementing biodiversity policies, assessing environmental impacts in planning, protecting threatened species, managing wildlife and habitats, fostering conservation partnerships, developing related policies and legislation, conducting research and monitoring, and engaging with the community on conservation issues. The division plays a crucial role in sustainable natural resource management and biodiversity protection in the state.

The original EIS was referred to the BCD division of DPIE who responded with relation to biodiversity, threatened species and Aboriginal Heritage (which was under their role at the time). This application remains aligned with that assessment and does not propose the removal of native vegetation. Works relating to the new dairy remain within the area previously assessed and the activities and use of the site remains generally consistent with that currently undertaken.

Application Requirement*:* Council may choose to refer the modification to this Department for comment however the application is not integrated through this Authority.

2.2.9. NSW DEPARTMENT OF PRIMARY INDUSTRIES

Role: Technical assessment of proposal

The NSW Department of Primary Industries supports agricultural development and ensures that intensive animal proposals can maintain the site with regard to biosecurity, water, odour and without land use conflict.

This application to construct a new dairy to support the existing use on the site has been prepared considering the new NSW DPIRD Environmental Dairy Guidelines, 2024 or which the assessor of this report was a key Author of. This assessment and application have reviewed and considered all requirements within the new Guidelines.

Further to this, the Land Use Conflict Risk Assessment prepared as part of the preceding Environmental Impact Statement remains consistent with this proposal.

Application Requirement*:* Council may choose to refer the modification to this Department for comment however the application is not integrated through this Authority.

2.2.10. NSW DPI CROWN LAND & NSW LOCAL LAND SERVICES

Role: Adjoining landowner

NSW DPI – Crown Land is responsible for the management of NSW's Crown land, covering 42% of the state, including parks, reserves, roads and cemeteries. The department supports a wide range of uses for Crown land. To ensure the land is used correctly, they are responsible for issuing licences, lease and permits.

The original application sought feedback from the Crown lands department with relation to being an adjoining property holder and within their response did not indicate any objection to the approval. As the modification does not propose any change with relation to the adjoining Crown land, no consultation has occurred.

***Application Requirement**:* Council may choose to refer the modification to this Department for comment however the application is not integrated through this Authority.

3. PROJECT DESCRIPTION AND ANALYSIS

This section provides a detailed description of the proposal including the current and proposed operational systems.

3.1. LOCATION

The project is located in the New South Wales Riverina region and the Murray River Council Local Government Area. The project site is located on the property known as 'Yarrimbah' which adjoins the Cobb Hwy between Moama and Mathoura.

The location of the proposed dairy is within the properties existing irrigation area, interconnecting significant dairy infrastructure on the property, including the existing dairy. The new dairy site is to the east of the Moira Private Irrigation District's (PID) main supply channel and the freestall housing areas. The nearby existing effluent systems connect the dairy on each side of the Moira channel and the main effluent management system and ponds are located west of the freestall housing areas.

The application related project infrastructure and works will be undertaken on Lot 2 DP1077844 with the remaining portions of the property incorporated for housing, effluent and manure application which will be utilised to grow feed as part of the project operation.

The location of the property is shown in the following figures and tables within this section.

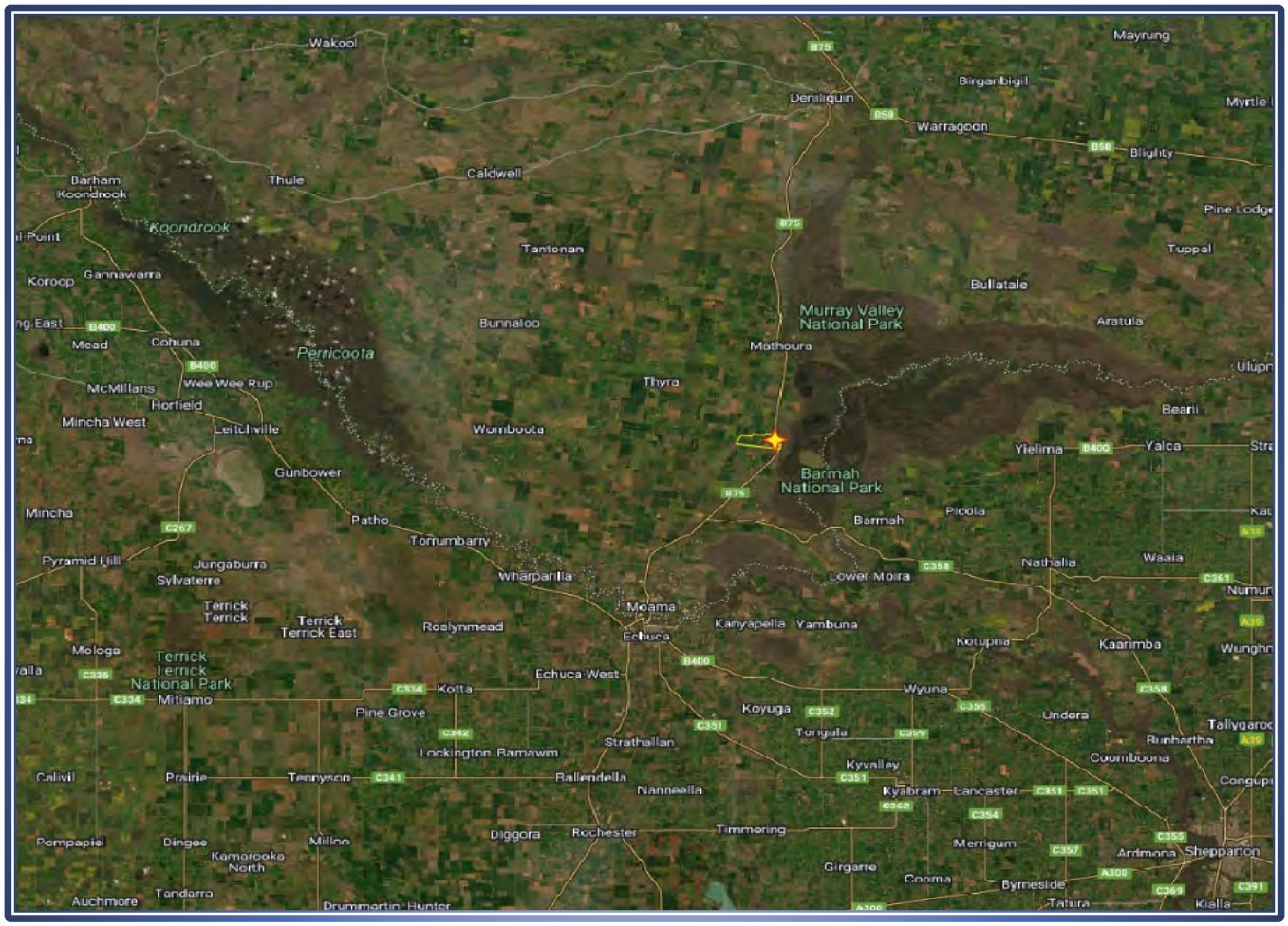


Figure 3-1 – Map showing location of the Dairy Operation within the region

Figure 3-2 – Map identifying the existing site and proposed location of the New Dairy (Source: PRS QGIS)

The land details of the project are summarised as follows:

Table 3-1 - Land details of the project

Details	Specific related to project site
Land Tenure	Freehold
Lot number	2
Deposited Plan	1077844
Parish	Moira
County	Cadell
Local Shire	Murray River Council
LEP Zone	Zone RU1 – Primary Production
Catchment Area	Murray
IBRA Sub-region	Riverina – Murray Fans
Mitchell Landscapes	Murray Scalded Plains
Local Aboriginal Land Council	Moama Local Aboriginal Land Council
Floodplain Management Plan	Nil
Land Stature	Freehold
Area of project works	Approx. 1.6ha
Area of this property	Approx. 573ha
GPS Reference	MGA Zone 55 E:3101145 N:6023126

Other property and connected Lot & DP numbers in relation to the project are:

Table 3-2 - Property identification details

Property Name	Lot	DP	Parish	County	Total Area (ha)	Irrigation Area (ha)
Yarrimbah	2	1077844	Moira	Cadell	573	394
	31	751153				
	124	751153				
	12	751153				
	14	751153				
	13	751143				
	117	455183				

3.2. SITE DESCRIPTION

The site selected for the new dairy, being the subject of this application, has been utilised for irrigated pasture and cropping since the Moira Private Irrigation District's (PID) inception more than 50 years ago. Historically, there has been two irrigation fields at the location, which are supplied from the Moira PID channel via a pumped pipe and riser system. Each field is connected to the existing on-farm irrigation drainage which runs parallel to the Moira irrigation channel and is connected to the dedicated area recycle point. Since construction of the freestall housing systems, the area has been utilised for access through to the site from the property entrance and more recently, excess earth from the effluent ponds and irrigation storage dam have been placed on the site for the pad for the dairy.

The new dairy location is surrounded several features including Moira main channel to the west, including a bridge over the channel, irrigation fields and a recycle system to the south, irrigation fields and existing access to the site from the east, being separated from the Cobb Highway by farming area, and the existing loose housing system to the north.

The existing dairy, calf sheds, and commodities areas, though not part of the application, are included in the effluent management plan and situated north and northwest of the new dairy site.

Power supply upgrades to the property are currently underway with existing power lines and substations being installed. This installation included the power requirements for the new dairy. Existing water supply to the site has also been installed and commissioned which has taken into account the requirements for the new dairy as part of its supply to the freestall housing system.

Figure 3-3 - Image showing existing infrastructure (Source PRS QGIS)

The groundcover on the site during periodic assessments has consisted of either bare earth or of introduced species such as grazing oats and pasture species. There is no standing vegetation on the site where works have been completed. Assessments undertaken as part of the original freestall housing system included consideration and assessment of this area and no objects or artifacts were identified as part of this detailed assessment process.

Figure 3-4 – Photo showing existing infrastructure layout at the property (Source: PRS)

3.3. KEY COMPONENTS OF THE DAIRY OPERATION

The main components of the dairy operation are as follows:

- Milk harvesting equipment (Dairy),
- Livestock housing and management,
- Feed storage and processing,
- Water supply system,
- Drainage system,
- Effluent and manure management, and
- Access and other components.

These components are described in detail reviewing the current operation elements, their capacity and any changes proposed as part of the modification.

3.3.1. MILK HARVESTING EQUIPMENT (DAIRY)

EXISTING

The existing dairy is a 60-cow rotary dairy that was constructed in the 1990s – which at that time, was a state-of-the-art facility and the first of its kind in the region. This dairy is currently milking the herd in divisions of 550 cow herds with two milkings per day. These activities take the better portion of the entire day due to the age and size of the infrastructure. The current dairy will remain and be re-purposed to milk approx. 200 cows twice daily which will include the hospital (milk withholding) and freshly calved cows, where milk will be excluded from the sale milk and used within the calf area where appropriate.

Currently cows access the dairy crossing the Moira channel, travelling from the housing areas along the western side of the Moira PID Channel and entering the rear of the yard area. This practice will continue however cows from the loose housing system will be the main herd accessing the dairy in the future. This reduces cow traffic and occupation on the existing earthen tracks.

Figure 3-5 - Existing Dairy (Source PRS)

PROPOSED

The proposed dairy is an 80-cow rotary dairy with a 650-cow herd holding yard and industry best features including milk monitoring collection plant, milk silo cooling systems and a milk room that connects directly to an A double capable milk tanker pad for distribution.

The new dairy will milk the herd in approximately 650 cow lots with the continuation of two milking per day. Animal health areas are included in the yard area which allow new Artificial Insemination areas, herd health activities and autonomous drafting systems. The whole dairy system maintains a cow record and monitoring system to ensure any health issues are identified at the earliest opportunity.

Figure 3-6 - Plan of proposed dairy- north elevation (Source: P Shultz design plans)

Access to the dairy facility will be available via the existing purpose-built access lane which has been constructed as part of the housing system. It will allow movement of the herd with ease from the freestall housing system direct across the channel to the handling yard with a separate return lane for cows returning to the housing area. This system ensures that cows are away from their housing areas for the minimum amount of time and least amount of stress.

Figure 3-7 - Cow movement lanes (Source PRS)

3.3.2. LIVESTOCK HOUSING AND MANAGEMENT

FREESTALL HOUSING SYSTEM (EXISTING)

The existing freestall housing systems are covered facilities designed with individual mattress and straw stalls arranged in rows to accommodate cows based on their lactation stage and nutritional needs. They feature a central feed laneway flanked by concrete alleys where cows access feed and includes integrated water troughs at crosswalks. Cows are cooled using automated fans and feed alley soaking systems to maintain optimal body temperature.

The operation includes two existing freestall housing sheds which accommodate up to a total of 2,112 cows. The housing areas are divided into quarters with each section containing two 3.35m wide cow access alleys, one double sided freestall area, one single sided freestall area and one 4.85m wide feed access alley.

Each housing shed has a central 6m wide (including nib walls) feed alley dividing each half of the shed allowing for feed placement along each side, the full length of the shed. Each section of stalls has a cross over alley which contains access to fresh drinking water. A total of eight troughs within each section (total of 32 within each shed).

When originally constructed, the housing systems included outside natural instinct areas, however these have been removed as the cows did not utilise them, preferring to be inside on the stall mattress areas.

Table 3-3 - Table summarising areas (per shed)

Area	Length (m)	Width (m)	Area (m^2)	Stalls	Area/cow
1A – Internal	132.5	20.55	2,723	255	10.7m^2
1B – Internal	132.5	20.55	2,723	255	10.7m^2
1C – Internal	136.4	20.55	2,803	273	10.3m^2
1D - Internal	136.4	20.55	2,803	273	10.3m^2
Feed Alley - Internal	268.9	6.0	1,613	NA	0.51m
Total Internal Shed	**273.4**	**47.5**	**12,987**	**1,056**	**12.3m^2**
Total Project	**282**	**47.5**	**13,395**	**1,056**	**12.7m^2 Avg**

Cows spend on average 22hrs in the housing areas where their feed and water requirements are constantly met. Cows exit the housing areas for milking activities, if they are unwell and require veterinary treatment or when their lactation period is complete.

There are no changes proposed to this system as part of the proposed new dairy.

Figure 3-8 - Aerial view of existing freestall housing systems (Source: PRS)

Figure 3-9 – Left: cows using brush system, Right: internal view of feed lane and cooling areas (Source: PRS)

MATERNITY AND CALF RAISING

The maternity housing system has been incorporated within the existing loose housing system which is a pack bedding system. The housing area incorporates a central concrete feedpad laneway system and includes inside and outside earthen loafing areas which are accessible at all times. Cows that are unsuited to the freestall system, unwell or are preparing for calving are housed in this area.

Cows numbers within this system will vary however a number of 200 total cows has been utilised for the effluent and operation numbers. They will be connected to the existing dairy for milking. **There is no change proposed to this system**.

Figure 3-10 - Maternity/Hospital Loose Housing internal (Source PRS May 2025)

CALF SHED

The operation also includes an existing calf shed within the facility. This area is located the south of the maternity housing shed and includes a concrete flooring system that is hand washed via hoses. Calves are housed in this system until they are old enough to move into the adjoining irrigated pasture system.

Figure 3-11 - Calf Shed (Source PRS March 2025)

Both the maternity and calf sheds are connected to the effluent management system which is currently under revision. The contributions and management of effluent from these areas are detailed in the appended Effluent Management Plan which is summarised below.

3.3.3. FEEDING SYSTEM & COMMODITIES

There are no changes proposed to the feed system and commodities areas as a result of the proposed new dairy. The following section describes the existing areas within the property that supports the existing and new dairy.

FEED PRODUCTION

The property maintains significant productive areas within the site that supports the intensive dairy activities. Crops within the property are grown utilising the manure solids removed from within the effluent system with application rates monitored for sustainable nutrient application and crop utilisation. The existing operation assessment identified that the current effluent generation within the operation required 477ha of the property to utilise applied liquid nutrients and 213 ha for solids. In addition to the required area, there are additional farming areas owned by the Applicant that are suitable for the use of manure. These are shown on the following image including the current monitoring points.

Feed that is not grown on the property is sourced locally from readily available local businesses that produce cereal grain, cereal hay, straw, silage (local only). Supplements when utilised within the ration are sourced from specialist suppliers.

STORAGE

The site and property operation maintains significant capacity for on-site grain and forage storage. This includes over 100 days of grain storage, varying amounts of the total hay and straw requirements (up to 100% of the total usage) and a holding in excess of 2 years silage storage. This capacity allows for conservative storage volumes held within the site to manage varying feed availability.

FEEDING

The dairy system currently utilises a feed mixer wagon that combines and deliver feed rations to the housing areas. The new dairy does not propose feeding ‘in the bail’ and as a result, there are no changes proposed to the feed system within the operation.

3.3.4. WATER SYSTEM

There are no changes proposed to the water supply and storage systems as a result of the proposed new dairy. The following section describes the existing areas within the property that supports the existing and new dairy.

WATER DEMAND

The total water demand for a operation is considered in multiple ways and for several activities. The following assessment is a summary of the total water demand assessment undertaken at the site.

Table 3-4 - Total Operation Water Demand

Month	Drinking Water (ML)	Cooling Requirement (ML)	New Dairy Shed (ML)	Current Dairy Shed (ML	Flood wash (ML)	Total per operation
Jan	24.14	3.10	2.04	2.01	23.29	54.58
Feb	21.81	2.80	1.85	1.81	21.04	49.30
Mar	21.73	2.48	2.04	2.01	23.29	51.55
Apr	18.69	0.90	1.98	1.94	22.54	46.05
May	19.31	0.62	2.04	2.01	23.29	47.27
June	16.35	-	1.98	1.94	22.54	42.81
July	16.90	-	2.04	2.01	23.29	44.24
Aug	16.90	-	2.04	2.01	23.29	44.24
Sep	17.52	0.90	1.98	1.94	22.54	44.88
Oct	20.52	1.86	2.04	2.01	23.29	49.72
Nov	22.20	3.00	1.98	1.94	22.54	51.65
Dec	24.14	3.10	2.04	2.01	23.29	54.58
Total	**240.2**	**18.8**	**24.1**	**23.6**	**274.2**	**580.9**

The annual water requirement for the dairy and housing system is 580.9 ML, with peak demand of 54.6 ML in January and December, and the lowest use of 42.8 ML in June. Water is sourced from the Moira PID channel system (available August–May), year-round groundwater access, and a licensed 170 ML off-river storage dam. To ensure 100% supply reliability, dual sources—channel and groundwater in summer, and groundwater and storage in winter—are used, supported by a high-capacity pump network. Winter demand (130.3 ML) is less than storage capacity, and total water needs are well within the licensed groundwater (1,064 ML) and Moira PID allocation (>5,000 ML), confirming the adequacy of current water entitlements and infrastructure.

3.3.5. DRAINAGE SYSTEM

The site has been designed to ensure that the site drainage separates run-off water from 'clean' irrigation areas and contains areas where manure is generated. All areas where surface water is collected within the dairy site, is directed to the effluent management system. All other areas are directed around these catchments areas and are maintained through the irrigation recycle and storage system.

The site is not located in an area subject to flooding.

3.3.6. EFFLUENT MANAGEMENT

The existing effluent treatment and storage system has been constructed and operated as part of the freestall housing system collectively since its approval in 2021. Currently there are two separate management systems, one for the existing dairy, loose maternity housing and calf shed and a second for the freestall housing system.

A review of the new dairy site, including the total water use, contributing areas, contributing volumes of excreta (manure and urine) and the management equipment for collection and conveyance of effluent has been completed. The total volumes of effluent and manure have been assessed and the total nutrients generated reviewed in line with sustainable application within the operation.

In undertaking this review, the following was reviewed and detailed:

- Excreta (manure and urine) from the yard area of the new dairy is removed via a floodwash system from the lead up yard, and hand hoses from the animal welfare area. This effluent is combined with the existing freestall laneway system, entering a (soon to be constructed) pump pit and conveyed via pipeline to the rear of freestall shed 2. This enters into the sediment ditches 5-8.
- Excreta from the rotary parlour, pit and plant wash are collected at the north side of the new dairy and consolidated with the existing effluent from the loose housing system (internal and external), calf shed and existing dairy. This system has a new trafficable solids trap (TST) previously proposed to capture the solids from within this area and convey the liquid component into the existing freestall effluent storage pond system.
- The total volumes of excreta within the system contributing to the existing ponds remained unchanged as the original assessment considered 24 hours of contribution.

- The detailed assessments confirmed the following:
  - There is sufficient capacity within the proposed TST for the new dairy.
  - There is sufficient capacity within the proposed pump pit and system to convey effluent from the new yard to the effluent system.
  - The existing sediment collection ditches are sized to adequate capacity to meet all requirements of the existing system and new dairy.
  - The existing effluent storage ponds have capacity in a 90th percentile wet year to capture and contain all liquid contributions from the effluent system, including run-off areas and store for the winter storage period (May through August).
  - The operation maintains sufficient irrigation and dryland areas to sustainably utilise liquid effluent and solids removed from the effluent system.

Figure 3-12 - Overview of the Site including the Effluent Storage Pond System (Source PRS)

3.3.7. ACCESS AND PARKING

Access to the operation is currently and will continue to be from the existing entrance from the Cobb Highway. This access was upgraded to include a BAL treatment as part of the approved restricted housing system. This application will include minor reconfiguration and connection of the existing internal access track which will allow direct access to the new dairy for milk collection, rural fire service vehicles and will include a staff and visitor parking area suitable for up to 14 light vehicles.

Further details are included in **Section 6.9** of this report.

3.3.8. LIGHTING

Lighting will continue to be required to safely undertake operations and ensure a safe working environment for staff. This includes lighting within the sheds, yards and over livestock laneways surrounding the yards.

3.3.9. ANIMAL WELFARE

This operation is proposing an expansion in herd size that is aimed at improving animal and herd health, happiness and wellbeing. The *Australian Animal Welfare Standards and Guidelines for Cattle* identify the following requirements to meet the basic physical and behavioural needs of all cattle:

- *a level of nutrition adequate to sustain good health and welfare,*
- *access to sufficient water of suitable quality to meet physiological needs,*
- *social contact with other cattle,*
- *sufficient space to stand, lie and stretch their limbs and perform normal patterns of behaviour,*
- *handling facilities, equipment and procedures that minimise stress to the cattle,*
- *procedures to minimise the risk of pain, injury or disease,*
- *provision of appropriate treatment including humane killing if necessary,*
- *minimising the risk of predation,*
- *provision of reasonable precautions against extremes of weather and the effects of natural disasters,*

- *selection and breeding of cattle appropriate for the environment and the level of planned herd management to be provided,*
- *assessment of the need to undertake any husbandry procedures that may result in significant short-term pain against alternative strategies for the long-term welfare of the cattle, and*
- *undertaking any husbandry procedures required for planned herd management in a manner that reduces the impact of these procedures and minimises risks to cattle welfare.*

It is in the operations best interests to maintain the highest standard of animal welfare, comfort and disease management. The dairy industry maintains stringent quality assurance systems to ensure their suppliers meet animal welfare and quality control systems. The project has been designed to meet the above criteria with animal welfare, comfort and cow happiness a key design consideration.

Ongoing operation management incorporates the above practices to ensure animal welfare standards are maintained with the new dairy design proposed to meet these requirements.

3.3.10. HEAT LOAD

Excessive heat load occurs where a combination of local environmental conditions and animal factors lead to an increase in body heat beyond the animals' normal physiological range and its ability to cope with this environment. Cattle function optimally by maintaining their core body temperature within a reasonably narrow range I.E. in warm conditions normally in the range 38.5 – 39.5 degrees C. Excessive heat load (EHL) in ruminants is the result of a number of complex interacting factors including:

- Physical climatic conditions including heat, humidity, radiation & air movement
- Issues such as breed, coat colour, body condition & health status
- Nutrition eg. metabolic heat of nutrients, diet, time of feeding, water availability
- Management practices such as livestock care, staff experience & work practices

The operation has a site dedicated weather station and climate monitoring systems that will be incorporated into each housing facility. These systems provide forecasting and current data to ensure herd health and wellbeing is managed. Should a power outage occur during a hot period that places animals at risk, the herd can be released onto shaded farming areas on the property or alternately a back-up generator can be utilised to ensure ongoing systems are maintained.

The new dairy also includes significant cooling systems within the site which include cooling fans, orientation for airflow and minimal time spent away from the housing areas.

3.3.11. BIOSECURITY

The dairy operation includes a Biosecurity plan which will be updated to include the new dairy prior to operation. The site has the ability for excellent control and prevention of disease introduction due to the controlled access at the site. All staff and contractors utilised within the operation will be assessed for biosecurity risk and measures in place to ensure disease transmission risks are minimal.

Feed grain and forage within the system is proposed to by grown within the existing farming systems and properties. Should a shortfall of commodities occur, feed imported into the system will require a biosecurity declaration and feed utilised accordingly.

3.3.12. VERMIN AND PEST CONTROL

Vermin including rodents, lice and flies can be attracted to intensive livestock operations through a readily available source of feed and housing. Vermin populations at the new dairy shed are proposed to be managed in conjunction with the existing dairy shed and commodities area management. Should vermin population reach a nuisance level, a baiting program will be implemented which will include fly traps around the housing and dairy and other baits around the feed storage and processing area.

Livestock vaccination programs will continue with stock vaccinated for Blackleg and Leptospirosis, Pestivirus Infertility, Botulism and Clostridial.

3.3.13. HAZARDS & RISK

FIRE MANAGEMENT STRATEGY

The site being located in the vicinity of the Moira National Forest has a low potential bushfire risk. The new dairy has been reviewed and classified as a Class 8 farm building. The site of the proposed new dairy is located within a Vegetation Category 2 and its buffer area. It must be noted however that there is no vegetation on the site or directly adjoining the

dairy. A review of the *Planning for Bush Fire Protection, 2019* identifies that this proposal falls within Chapter 8 – Other development – specifically Section 8.3.2 which states that *Whilst bush fire is not captured in the NCC for Class 5-8 buildings, the following objectives will be applied in relation to access, water supply and services, and emergency and evacuation planning:*

- *to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;*
- *to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;*
- *to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and*
- *provide for the storage of hazardous materials away from the hazard wherever possible.*

The general fire safety construction provisions of the NCC are taken as acceptable solutions however construction requirements for bush fire protection will need to be considered on a case-by-case basis.

The existing freestall housing sheds are considered a Class 10a building structure and will meet the relevant building code requirements for fire control. A review of the *Planning for Bush Fire Protection, 2019* identifies that this proposal falls within Chapter 8 – Other development – specifically Section 8.3.2 which states that "*There is no bush fire protection requirements for Class 10a buildings located more than 6m from a dwelling in bush fire prone areas. Where a Class 10a building is located within 6m of a dwelling it must be constructed in accordance with the National Construction Code*" (NSW RFS, 2019).

The new dairy and the existing housing systems are located adjoining the Moira PID irrigation channel and are surrounded by irrigation channels and irrigation areas. There is a freshwater storage dam with a supply of up to 170ML of water which is located adjoining the freestall system. This dam is connected to a significant backup generator system with all pumps maintaining 100% redundancy allowing for full time, fully back up water supply from the system. In addition to this, the area maintains a high 400kPA ring main system that supplies high pressure water to the flood wash systems and hose systems within the dairy and housing areas.

As the project is nearly 100% surrounded by water storing infrastructure that will remain with damp or with water during the entire fire danger period, it is unlikely that the new dairy or existing infrastructure will be at risk from bushfire. The sheds are constructed from steel and concrete and incorporate a significant flood wash systems. As the internal portion of the shed does not contain highly combustible material, and there is a readily available source of water to the system, internal fire management is also considered low risk.

The property maintains many access points in every direction. Should evacuation be required, there are sufficient options to do so. A Bushfire Management Plan has been prepared and reviewed as part of the intensive dairy system application and remains relevant to this application and the current site operations.

3.3.14. OPERATION HOURS

The project, being a significant operation supporting over 2,000 live animals, will operate over 24 hours every day however there are activities that will not occur at all times. Items of plant such as water supply pumps and cooling systems will operate on an as needed basis. Milking activities and related feed deliveries are expected to occur between the hours of 2:30AM and 9PM at night pending season and herd requirements. These activities will require the use of feed mixing and delivery systems and lighting for safe working areas. These activities are consistent with the current operation and based on the distance of receivers unlikely to cause any impacts on surrounding users.

3.3.15. EMPLOYMENT

The construction portion of the project will utilise local contractors within their area of expertise. Where there is a shortage in available resources, other contractors within the region will be sourced to undertake works. Local contractors are proposed to be utilised due to the ongoing services and maintenance that will be required for the operation (pumps etc).

The operation currently employs sixteen full time equivalent staff to work on farm including undertaking milking, animal husbandry and farm works as necessary. There are no changes proposed to this number however it is envisaged that sourcing staff to work within the new dairy will be significantly easier with new technology and much improved working conditions.

3.3.16. MAINTENANCE, MANAGEMENT AND MONITORING

WEATHER STATION

The applicant is also the owner of 'Moira station' where there is an installed weather station which is maintained and utilised as part of the operation. This monitoring weather station is a 'Weather Maestro' installed and serviced by Environdata, which includes the following modular systems:

Table 3-5 - Weather station recording conditions

Sensor Type	Identification	Operating Range	Accuracy	Resolution
Wind Speed	WS52	0-75m/s	+/- 0.2 m/s	0.1 m/s
Wind Direction	WD50	0-359 degrees	+/- 1 degree	1 degree
Air Temperature	TA70	-20 to 80 deg C	+/- 0.2 deg C	0.025 Deg C
Relative Humidity	RH70	0 to 100%	+/-2% RH (10% - 90% RH) +/- 4% rh (<10% or <90% RH)	0.1% RH
Rain Gauge	RG50	0-700m/hr	+/- 1% to 200mm/hr +/- 3% to 380mm/hr	0.2mm per tip

The wind speed and wind direction sensors are installed on a 10m high mast in an open environment. The weather station is located at E: 310113, N: 6020661 Zone 55.

Figure 3-13 - Photo showing existing weather station (Source: PRS)

GROUNDWATER MONITORING

Groundwater at the site is monitored in accordance with the approved monitoring plan under the operations current licence. The groundwater at the site is monitored via on site groundwater monitoring points which are identified in the following image.

There is no additional monitoring points proposed as part of the assessment on the basis of extensive utilisation areas and minimal change to application volumes within the site.

Figure 3-14 –Existing Groundwater Monitoring Points (blue) (Source: PRS QGIS)

SOILS, EFFLUENT AND MANURE UTILISATION AREAS

Areas that integrate the use of effluent irrigation and manure application have the potential for nutrient imbalances or overloading. Ongoing monitoring and assessments will continue with specific agronomic advice to be integrated into crop selection and management of cropping areas. This ensures that utilisation areas will remain productive and not be subjected to unmanaged or unbalanced use of the beneficial by-products of the development. At the minimum, soil tests on areas utilising effluent and manure should include:

- Available phosphorus
- Phosphorus sorption
- Total Nitrogen
- Nitrate
- Organic Carbon
- Electrical conductivity

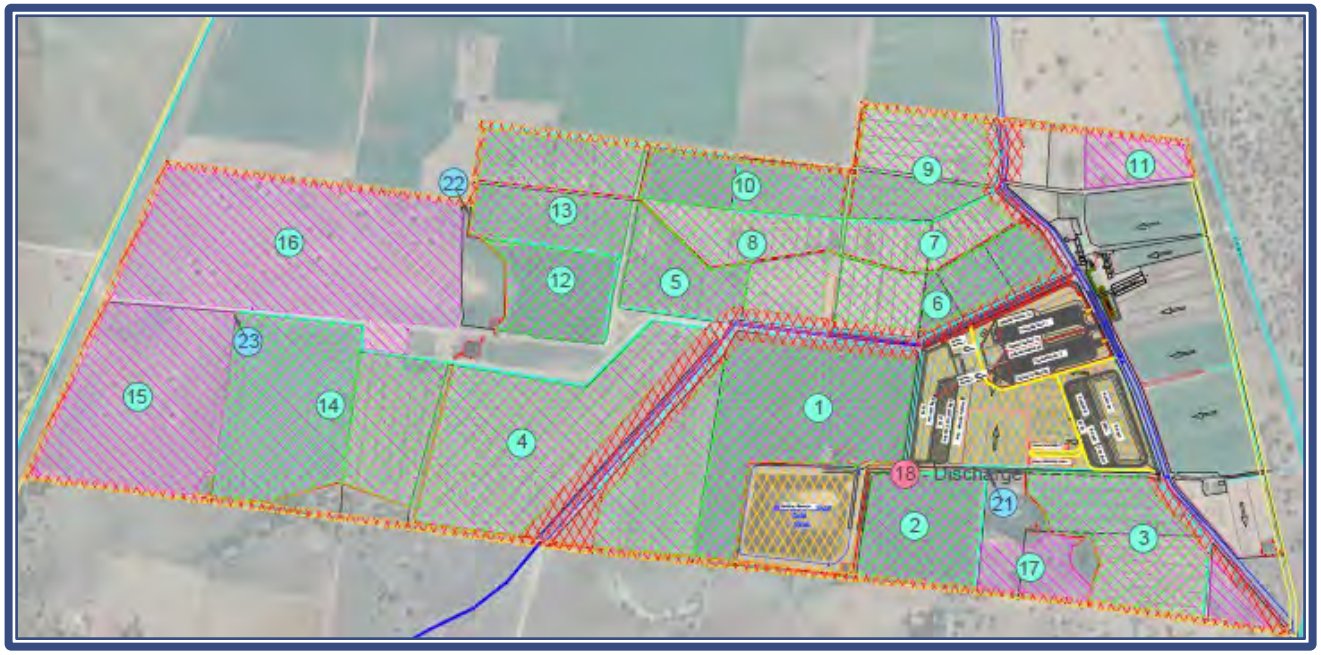


Figure 3-15 –Site showing soil monitoring points (1-17) from the approve EPA licence (Source: PRS Monitoring Plan)

MONITORING RECORDS GENERALLY

In line with the EPA Licencing requirements all records required to be kept must be:

- In a legible form, or in a form that can readily be reduced to a legible form,
- Kept for at least 4 years after the monitoring or event to which they relate took place, and
- Produced in a legible from to any authorised officed of the EPA who asks to see them.

The following records must be kept in respect of any samples required to be collected for the purposes of the EPA licence:

- The date(s) on which the sample was taken,
- The time(s) at which the sample was collected,
- The point at which the sample was taken, and
- The name of the person who collected the sample.

4. DETAILS OF PROPOSAL

The proposed works relating to this application, and their connection to the existing activities on the site are shown in the following images.

Figure 4-1 - Site overview including proposed works (Source: PRS QGIS)

Figure -2 - Photo showing existing infrastructure layout at the property (Source: PRS)

4.1. KEY COMPONENTS OF THE PROJECT

The criteria used in the design stage of the project have been derived from a range of sources that include the following:

- Guidelines and relevant codes of practice,
- Animal health, welfare and wellbeing,
- Land use and surrounding receptors,
- Biosecurity management,
- Input minimisation,
- Contingency planning,
- Capture, storage and utilisation of effluent and manure produced,
- Retention of nutrients and chemicals on-farm, and
- Improve use of whole farm system.

4.2. PROJECT COMPONENTS

The project is made up of the following components:

- Earthworks for:
    - Completion of shed pad,
    - Footings for structure,
    - Parking area,
- 80 cow Rotary Dairy building and associated infrastructure,
- Septic system approval and installation,
- Connection to existing effluent system (cow access lane way system, yard wash to laneway, pit and platform to consolidated effluent on west side of channel).

4.2.1. EARTHWORKS

Minor earthworks will be required to complete the shed pad prior to building construction as earth from the previously approved intensive dairy system has been utilised in this area. This involves the final grade and trim of the pad and batters. Other earthworks within the pad for footings excavation, pipeline and services installation will be required.

Adjoining the site earthworks will also be required for tanker access, staff and visitors access and parking. This will be completed prior to works construction and will form part of the storage area for equipment during construction.

4.2.2. DAIRY

This application seeks to construct a dairy which will be partially enclosed and partially open. The building will comprise of concrete flooring, concrete panel walls in the lower sections and iron roof and upper walls. The rear yard area will have no walls however will have significant fencing infrastructure. The total roof area including eaves encompasses 3,991m^2.

The rear area of shed which contains concrete washed flooring areas, steel yards and open sides encompasses a total area of 60.2m x 32.3m (ex eaves). The remaining portion of the building includes the area for milking operations. The total footprint of area is 46m x 32.3m and includes the following internal areas:

- Rotary platform (cow milking area),
- Cow entry and exit platform,
- Staff amenities and change room,
- Staff break room,
- Equipment room, and
- Milk storage and filter areas.

A preliminary review of the use of this building has been undertaken by private certifiers, Brent Williams and Associates who have confirmed that based on the use and occupation of the building, that it fulfills the requirements of a Farm Building and classification under the NCC as a Class 8 building. Please see attached Letter to support this assessment in **Appendix 4**.

4.2.3. SEPTIC

As identified above, the proposed building includes a toilet and staff amenities area. This inclusion of this area will require a new and separate Section 68 application which will be undertaken by the selected plumber. A site classification and land capability report are underway to confirm the proposed use and area for the septic installation and septic field.

4.2.4. CONNECTION TO EXISTING SUPPORTING INFRASTRUCTURE

As part of the installation and connection of the new dairy, supporting connections will need to be undertaken. This will include the connection of the following infrastructure:

- Electricity – the sites electrical connection works included revised power connection to the existing and new housing systems. This power will be introduced on the southern side of the new dairy. Existing agreements are in place for these works (see Section 2 – Essential Energy),
- Water – the site maintains significant existing water supply to and surrounding the new dairy location. This is including a high pressure ring main and proposed hydrant system (Deemed to Satisfy Provision) for Rural Fire Services access and water supply to the operation.
- Access (vehicle) – the site has an existing access track constructed as part of the intensive dairy operations. This access will be completed terminating at the new dairy. The access will include a large turning circle for heavy vehicles (milk tanker access) or rural fire vehicles and access and parking for light vehicles. There will be sufficient area for 14 parked cars on the site.
- Access (cows) – the rear area of the new dairy will connect to the existing cow access laneway system. This laneway is existing and allows the cows access from the freestall housing, loose housing, existing dairy and the pasture areas into and out of the yards to the new dairy.
- Effluent systems (rear yard area - being the majority of the new dairy building and main cow area) will be floodwashed and connected to the existing laneway effluent capture and conveyance system. This system captures all floodwashed water from the laneways and conveys it to the existing effluent sedimentation ditches at the rear of the freestall housing system.
- Effluent systems (pit, platform and equipment services) – this area will be connected via a new pipeline into the existing effluent system which consolidates all loose housing, calf shed and existing dairy effluent. This system is currently designed to include a Trafficable Solids Trap to capture solids in the system and convey effluent water to the effluent storage ponds.

4.3. PROJECT METHODOLOGY

The proposed methodology relating to the project following the obtaining of all approvals is as follows:

1. Relevant approval if granted are received from relevant Authorities,
2. Conditions reviewed and where required acted on including Building Certification and Construction Certificate,
3. Earthwork completion,
4. Construction of Building,
5. Fit out of new dairy, and
6. Commissioning.

4.4. PROJECT STAGES AND TIMING

The project works for will be completed in one stage and are planned to commence upon receipt of all approvals. The estimated timeframes (pending weather) are:

Table 4-1 - Proposed construction timeframes

Stage	Phase	Timeframe
1	Earthworks	1 week
	Dairy Building Construction	16 weeks
	Dairy fit out	20 weeks

5. PLANNING CONTEXT

A number of statutory planning controls need to be addressed for this project. This section reviews Commonwealth, State and local planning legislation and policies to determine what approvals are likely to be required to allow the proposed development to proceed.

5.1. COMMONWEALTH

5.1.1. ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

This Act is the Australian Governments central piece of environmental legislation. The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the EPBC Act as Matters of National Environmental Significance (MNES).

These nine matters to which this Act applies are:

- *World heritage sites,*
- *National heritage places,*
- *Wetlands of international importance (Ramsar wetlands),*
- *Nationally threatened species and ecological communities,*
- *Migratory species,*
- *Commonwealth marine areas,*
- *Nuclear actions,*
- *The Great Barrier Reef Marine Park, and*
- *Water resources relating to coal seem gas and mining development.*

The EPBC Act confers jurisdiction over actions that have a significant impact on the environment where the actions affect, or are taken on, Commonwealth land, or are carried out by a Commonwealth agency.

COMMENT

A review of the nine matters referred to above has been undertaken and the project works do not relate to a World heritage site, national heritage place, Ramsar wetland, Commonwealth marine area, Great Barrier Reef of coal seam gas and mining. This site has been previous assessed as part of the Environmental Impact Statement with no potential impacts identified as a result of the dairy operations.

5.1.2. WATER ACT, 2007

The *Water Act* 2007 is intended to allow the Commonwealth to coordinate the management of water resources in the Murray-Darling Basin in conjunction with the Basin States. The Act establishes the Murray-Darling Basin Authority as the national regulatory authority. A key requirement of the Act was the implementation of the Murray-Darling Basin Plan which provides for a coordinated approach to water management across the Murray–Darling Basin's four states - South Australia, Victoria, NSW and Queensland - and the Australian Capital Territory. The Plan sets the amount of water that can be extracted annually from the Basin for consumptive use (urban, industrial and agricultural) without having a negative impact on the natural environments of the Basin coming into effect in November 2012.

COMMENT

The application does not propose any change or increase in the total volume of water demand for the operation or require alteration in the total volume of run-off from the site.

The proposed dairy area has considered the environment with regard to surface and groundwater and on the basis that mitigation measures are continued to be employed, no impact to the Murray Darling Basis is expected.

5.1.3. NATIVE TITLE ACT 1993

The *Native Title Act* 1993 provides a national system for the recognition and protection of native title and for its co-existence with the national land management system. The native title is recognised where: the rights and interests are possessed under traditional laws and customs that continue to be acknowledged and observed by the relevant Indigenous Australians, by virtue of those laws and customs, the relevant Indigenous Australians have a connection with the land or waters, the native title rights and interests are recognised by the common law of Australia.

COMMENT

This project is not subject to successful a native title claim.

5.2. STATE LEGISLATION

5.2.1. ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act (EP&A Act)* and its associated regulations provide a framework for assessing environmental impacts and determining planning approvals for developments and activities in NSW. Within the EP&A Act, there are two parts which inflict requirements for planning approvals:

- Part 4 which relates to decision making process by consent authorities. Section 4.15 under Part 4, describes types of impact which must be considered before development approval is granted. It states that consideration must be given for the impact of that development on the environment.
- Part 5 governs the decision-making process by State government (determining) authorities (except for State significant infrastructure) regarding activity approval. In the decision-making process, under Section 5.5 it is the State government agencies' duty to consider environmental impacts; and then under Section 5.7, determine whether the level of impact is sufficient to require the preparation of an Environmental Impact Statement (EIS).

COMMENT

This project is to be determined under Part 4 and will be local development. The provisions of Section 4.15 are addressed below:

Table 5-1 – Table showing project in relation to the EP&A Act clauses

Clause	Description	Project Consistent Yes/No	Explanation
4.15 – (1) a)	*In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application: - the provisions of:*		
i) ii) iii) iiia) iv)	*any environmental planning instrument, and* *any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and* *any development control plan, and* *any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and* *the regulations (to the extent that they prescribe matters for the purposes of this paragraph) that apply to the land to which the development application relates,*	Yes	See **Section 4**.
b)	*The likely impacts of that development, including environmental impacts both on the natural and built environments, and social and economic impacts in the locality*	Yes	See **Section 6**
c)	*The suitability of the site for the development,*		See **Section 3**
d)	*Any submissions made in accordance with this Act or the regulations,*	NA	Noted
e)	*The public interest.*	NA	Noted

Table 5-2 - Table of Integrated Approvals

Act	Sect	Approval	Required	Report location
Coal Mine Subsidence Compensation Act 2017	s22	Approval to alter of erect improvements, or to subdivide land within a mine subsidence district.	No	NA
Fisheries Management Act 1994	s144	Aquaculture permit.	No	NA
	s201	Permit to carry out dredging work.	No	NA
	s205	Permit to cut, remove, damage or destroy marine vegetation on public water land or an aquaculture lease, on the foreshore of any such land or lease.	No	NA
	s219	Permit to: Set a net, netting or other material, or Construct or alter a dam, floodgate, causeway or weir, or Across or within a bay, inlet river or creek or across or around a flat.	No No No No	NA
Heritage Act 1977	s57	Approval in respect of doing or carrying out of an act, matter of thing referred to.	No	NA
Mining Act 1992	s63 or s64	Grant of a mining lease.	No	NA
National Parks and Wildlife Act 1974	s90	Grant of an Aboriginal Heritage Impact Permit.	No	NA
Petroleum (onshore) Act 1991	s16	Grant of a production lease.	No	NA
Protection of the Environment Operations Act 1997	s43(a), 47 & 55	Works relating to the following sections of the including Environment protection licence to authorize carrying out of scheduled development work.	No No	NA
	s43b, 48 &55	Environment protection licence to authorise carrying out of scheduled activities at any premises (excluding any activity described as a “waste activity” but including any activity described as a “waste facility”).	No Yes	No change to current EPA licence is proposed
	s43d, 55 & 122	Environment protection licences to control carrying out of non-scheduled activities for the purposes of regulating water pollution resulting from the activity.	No No No	NA
Roads Act 1993	s138	Erect a structure or carry out a work in, on or over a public road dig up or disturb the surface of a public road remove or interfere with a structure, work or tree on a public road pump water into a public road from any land adjoining the road connect a road (whether public or private) to a classified road.	No No No No No	NA
Rural Fires Act 1997	s100b	In respect of bush fire safety of subdivision of land that could lawfully be used for residential or rural residential purposes or development of land for special fire protection purposes.	No	NA
Water Management Act 2000	s89	Water use approval.	No	NA
	s90	Water management work approval.	No	NA
	s91	Activity approval.	No	NA

Table 5-3 - Table of Integrated Development Approvals

Act/EPI	Sect	Referral & Concurrence Required	Required	Report location
Biodiversity Conservation Act 2016	7.12	Where a development application indicates that a reduction is being sought in the number of biodiversity credits to be retired under the BDAR.	No	NA
Fisheries Management Act 1994	221ZZ	Where the development is likely to significantly affect threatened species, populations or ecological communities, unless the consent authority has obtained the concurrence of the Fisheries Agency Head	No	SNA

**Consideration of requirements under the Fisheries Management Act 1994 have been undertaken as part of this assessment.*

5.2.2. WATER MANAGEMENT ACT, 2000

The objects of the *Water Management Act 2000* are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations and, in particular:

a) to apply the principles of ecologically sustainable development, and

b) to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality, and

c) to recognise and foster the significant social and economic benefits to the State that result from the sustainable and efficient use of water, including:

- *i. benefits to the environment, and*
- *ii. benefits to urban communities, agriculture, fisheries, industry and recreation, and*
- *iii. benefits to culture and heritage, and*
- *iv. benefits to the Aboriginal people in relation to their spiritual, social, customary and economic use of land and water,*

d) to recognise the role of the community, as a partner with government, in resolving issues relating to the management of water sources,

e) to provide for the orderly, efficient and equitable sharing of water from water sources,

f) to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna,

g) to encourage the sharing of responsibility for the sustainable and efficient use of water between the Government and water users,

h) to encourage best practice in the management and use of water.

COMMENT

The *Water Management Act 2000* outlines water licensing within the area covered by water sharing plans and basic landholder rights including harvestable rights dams. The applicant is the holder of surface and ground water licences and approvals for water use and work infrastructure within the Murray catchment and basin. These existing approvals and licences are used to support the existing agricultural and dairy operations. There are no changes proposed to these existing approvals, and details of the approvals held are provided below in **Section 6.2.**

5.2.3. PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

The *Protection of the Environment Operations Act* 1997 (POEO Act) is administered by the NSW Environment Protection Authority (EPA). The objective of this Act is to achieve the protection, restoration and enhancement of the quality of the NSW environment. The Act repealed and consolidated a number of existing Acts to rationalise, simplify and strengthen the regulatory framework for environmental protection in NSW. (NSW EPA, 2020).

The EPA administered licensing for scheduled development works (i.e. development of a site that would require a licence) and premises-based activities (such as intensive livestock). The EPA will issue all licences which will be subject to conditions which will control the air, noise, water and waste impacts of an activity.

COMMENT

The site operates under approved EPA licence 21531 and this application does not propose changes to this licence as there are no changes to the scheduled activity – being the housing areas. The dairy does not accommodate greater than 650 cows within the facility and does not propose an increase in the occupation number of the licenced activity.

5.2.4. STATE ENVIRONMENTAL PLANNING POLICIES

A table has been provided below showing all the State Environmental Planning Policies identified by the NSW Property Planning Report and their relationship to the project.

Table 5-4 - Table of State Environmental Planning Policies

State Environmental Planning Policy		Relevant	Comment
Biodiversity Conservation 2021			
Ch.2	*Vegetation in non-rural areas*	No	No clearing of land required.
Ch.3	*Koala Protection 2020*	No	No change to habitat.
Ch.4	*Koala Protection 2021*	No	No change to feeding trees.
Ch.5	*Murray Lands*	No	Not within the overlay (Cobb HWY boundary)
Building Sustainability Index: BASIX 2004		No	Not Relevant.
Exempt and Complying Development Codes 2021		No	Project is not exempt.
Housing 2021		No	Not Relevant.
Industry and Employment 2021		No	Not Relevant.
Planning Systems 2021		Yes	Concurrences and Referrals.
Primary Production 2021		No	Project is not an artificial waterbody or intensive livestock industry covered under this Planning Policy.
Resilience and Hazards 2021		Yes	An assessment of odour has been undertaken and the project does not constitute a 'potentially hazardous industry' or 'potentially offensive industry'. See **Section 6.7.** Site is not listed as hazardous or contaminated.
Resources and Energy 2021		No	Not Relevant.
Transport and Infrastructure 2021		No	See **Section 6.9**
Design Quality of Residential Apartment Development		No	Not Relevant.

5.3. REGIONAL ENVIRONMENTAL PLANNING POLICIES

Each region and districts future housing, jobs, infrastructure, commercial cultural and education centres plans are provided with a strategic plan and framework through Region and District Plans. These plans will also provide direction on development and land planning.

5.3.1. RIVERINA MURRAY REGIONAL PLAN 2041

The *Riverina Murray Regional Plan 2041* is a 20-year blueprint for the future of the Riverina Murray. This application has considered the goals and directions of the plan in table below

Table 5-5 – Project in consideration of the Murray Regional Plan 2041

Objective	Description	Project Consistent Yes/No	Explanation
Part 1: Environment			
1	*Protect, connect and enhance biodiversity throughout the region*	Yes	The works are not likely to negatively impact biodiversity at or surrounding the site. Biodiversity is further discussed below in **Section 6.4.**.
2	*Manage development impacts within riverine environments*	Yes	Works are not likely to impact the riverine environment.
3	*Increase natural hazard resilience*	Yes	The dairy system seeks modification to manage ongoing climatic variation conditions which aligns with the resilience of the operation to manage natural

Objective	Description	Project Consistent Yes/No	Explanation
			hazards such as droughts, floods and bushfires.
Part 2: Communities and places			
4	*Support Aboriginal aspirations through land use planning*	NA	Not Applicable.
5	*Ensure housing supply, diversity, affordability and resilience.*	NA	Not Applicable.
6	*Support housing in regional cities and their sub-regions*	NA	Not Applicable.
7	*Provide for appropriate rural residential development*	NA	Not Applicable.
8	*Provide for short-term accommodation*	NA	Not Applicable.
9	*Plan for resilient places that respect local character*	NA	Not Applicable.
10	*Improve connections between Murray River communities*	NA	Not Applicable.
11	*Plan for integrated and resilient utility infrastructure*	NA	Not Applicable.
Part 3: Economy			
12	*Strategically plan for rural industries*	Yes	This proposal is located responsibly in a low populated area within a rural region, well away from the general population.
13	*Support the transition to net zero by 2050*	NA	Not Applicable.
14	*Protecting and promoting industrial and manufacturing land*	NA	Not Applicable.
15	*Support the economic vitality of CBDs and main streets*	NA	Not Applicable.
16	*Support the visitor economy*	NA	Not Applicable.
17	*Strategically plan for health and education precincts.*	NA	Not Applicable.
18	*Integrate transport and land use planning*	NA	Not Applicable.

COMMENT

The project is in line with all aims, objectives and planning principles of the Murray Regional Plan 2041.

5.4. LOCAL PLANNING

Local Environment Plans (LEPs) 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. Development Control Plans (DCPs) often provide additional details relating to development standards and character as well as guidance to applicants and planning authorities on how development proposals should give effect to aims of local planning and additional details relating to development standards and character.

5.4.1. MURRAY LOCAL ENVIRONMENTAL PLAN 2011

The table provided below identifies relevant clauses within the LEP, identifies their consistency and provides an explanation where required.

The table provided below identifies the relevant clauses within the LEP, highlights their consistency and provides an explanation where required.

Table 5-6 - *Murray Local Environment Plan* review

Clause	Description	Project Consistent Yes/No	Explanation
2	**The aims of the Murray LEP are:**		
a)	*to encourage sustainable economic growth and development within Murray*	Yes	Project is for an agricultural development consistent with zone and will increase agricultural sustainability on property.
b)	*to encourage sustainable economic growth and development within Murray*	Yes	Project is consistent with this aim and continues primary production and supports additional employment generated as part of previous applications.
c)	*to identify, protect, conserve and enhance Murray's natural assets*	Yes	Project will not impact or remove Murray's natural assets.
d)	*to identify and protect Murray's built and cultural heritage assets for future generations*	Yes	Project does not impact on naturally occurring native vegetation or cultural heritage.
e)	*to allow for the equitable provision of social services and facilities for the community*	NA	Not applicable to this project.
f)	*to encourage and focus growth in the Moama and Mathoura townships,*	Yes	Project continues to support local business which in-turn increases employment opportunities.
g)	*to provide for future tourist and visitor accommodation in a sustainable manner that is compatible with, and will not compromise, the natural resource and heritage values of the surrounding area.*	NA	Not applicable to this project.
2.1	**Land Use Zones**		
2.1	*RU1 – Primary Production*	Yes	Project relates to farm building which is permitted within this zone with consent.
5	**Miscellaneous provisions**		
5.10	*Heritage Conservation.*	Yes	See sections **5.4** - **Indigenous Heritage** and **5.5** - **Non-Indigenous Heritage** Project is not related to and does not impact on heritage item.
5.17	*Artificial Waterbodies in environmentally sensitive areas in areas of operation of irrigation corporations*	Yes	No change to existing approved storage dams within the property.
5.18	*Intensive livestock agriculture*	Yes	See below
7	**Additional Local Provisions**		
7.1	*Essential Services*	Yes	See below
7.2	*Earthworks*	Yes	See below
7.3	*Biodiversity Protection*	NA	Not applicable - No overlay on area.
7.4	*Development of Riverfront areas*	NA	Not applicable – project not river related
7.5	*Riparian Land and Murray River and other watercourses- general principles*	NA	Not applicable – project not river related
7.6	*Additional provisions – Development on river bed and banks of Murray and Wakool Rivers*	NA	Not applicable – project not river related
7.7	*Wetlands*	NA	Not applicable – project not mapped wetland
7.8	*Flood planning*	NA	Not applicable – project not flood liable

LAND USE ZONING

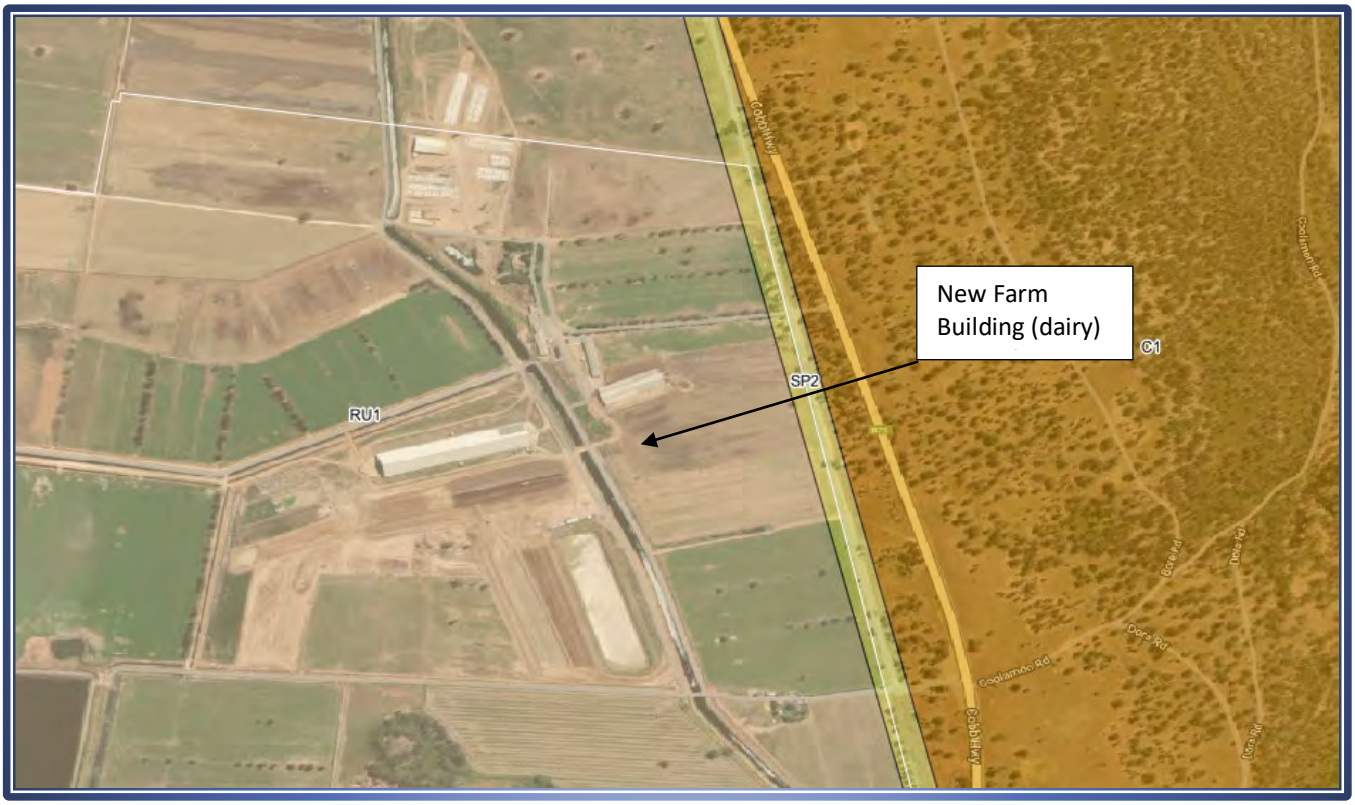


Figure 5-1 - Property with Land Zoning Overlay (Source: NSW Spatial Imagery)

The property and proposed farm building (dairy) is located within one zone being the RU1 – Primary Production overlay shown above in **Figure 4-1**.
Zone RU1 – Primary Production has the following objectives:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*

COMMENT

The development and use of the site and infrastructure within this zone is consistent with the objectives and are permitted with consent. This application is for a Farm Building (Dairy) to support the existing approved Intensive Livestock Agriculture – dairy (restricted) which is defined as:

Farm building which is defined as *a structure the use of which is ancillary to an agricultural use of the landholding on which it is situated and includes a hay shed, stock holding yard, machinery shed, shearing shed, silo, storage tank, outbuilding or the like, but does not include a dwelling.*

As identified above, the property maintains an existing approval (Development and Licence) for an intensive dairy development which in NSW is defined as:

*A **dairy (restricted)** means a dairy that is conducted on a commercial basis where restriction facilities (in addition to milking sheds and holding yards) are present and where cattle have access to grazing for less than 10 hours in any 24 hour period (excluding during any period of drought or similar emergency relief). It may comprise the whole or part of a restriction facility.*

***Intensive livestock agriculture** means the keeping or breeding, for commercial purposes, of cattle, poultry, pigs, goats, horses, sheep or other livestock, and includes any of the following—*

(a) dairies (restricted),
(b) feedlots,
(c) pig farms,
(d) poultry farms,

but does not include extensive agriculture, aquaculture or the operation of facilities for drought or similar emergency relief.

The proposed structure does not fulfill the requirements of a scheduled premises and does not house animals. The dairy area has a maximum total capacity of 650 cows.

CLAUSE 7.3 BIODIVERSITY PROTECTION

The proposed farm building (dairy) is shown below together with the Terrestrial Biodiversity overlay (green shade). It can be seen that the building area is not impacted by or connected to the biodiversity protection overlay.

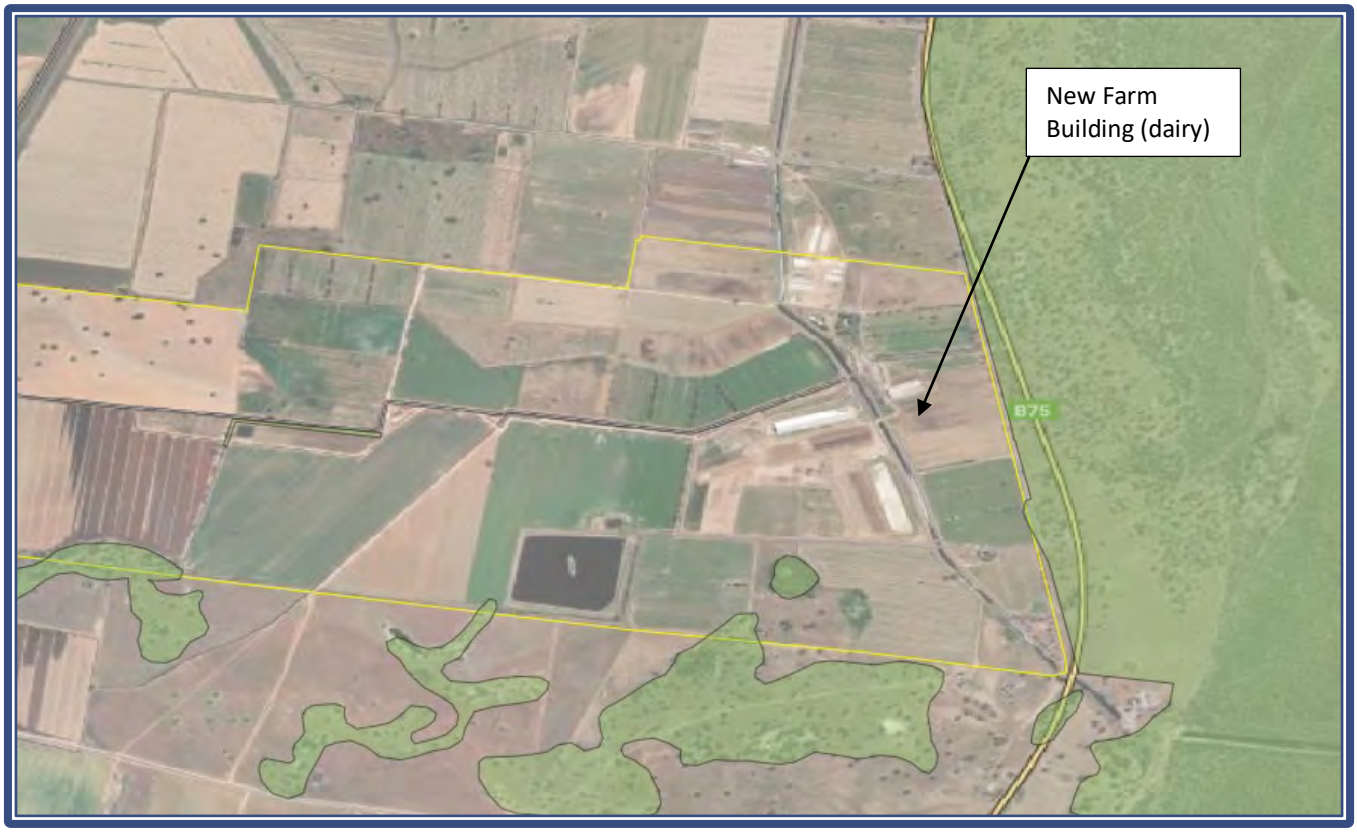


Figure 5-2 - Property shown with the terrestrial Biodiversity Overlay (Source: QGIS with NSW EPI Overlay)

The Murray LEP 2011, has the following objectives with regard to land identified for Biodiversity protection:
(a) protecting native fauna and flora, and
(b) protecting the ecological processes necessary for their continued existence, and
(c) encouraging the conservation and recovery of native fauna and flora and their habitats.

COMMENT

There is no native vegetation removal proposed as part of the proposal and no change will occur to any aquatic environment. As a result, there is unlikely to be an adverse impact to flora, fauna, vegetation and potential habitat and it will not fragment, diminish the biodiversity or habitat on the site.

5.4.2. MURRAY DEVELOPMENT CONTROL PLAN 2012

The purpose of the Development Control Plan (DCP) is to:

- Provide general information and detailed guidelines and controls which related to the decision-making process.
- Provide the land use planning and development controls for the Murray Shire Local government area

Specific sections in the DCP that relate to this project are

Clause	Description	Project Consistent Yes/No	Explanation
	Introduction		
2.4	Rural Development	Yes	The project has been assessed considering the management of environmental values, productive land and soil, ecological values and weeds. See **Section 6** for further assessment.
6	**RU1 – Primary Production – Rural Development**		
6.3	Prescribed Standards for Rural Development		
	Onsite waste management	Yes	Proposed septic will include a LCA and Sec 68 application. On-site waste will be managed in accordance with a dedicated waste management procedures. All effluent and manure are managed on site this is discussed further in **Section 2.3.5** of this report
	Environmental Impacts	Yes	This Statement of Environmental Effects has considered the environmental impacts of the project. See **Section 6** below.

COMMENT

The project is in line with all aims, objectives and planning principles of the *Murray Development Control Plan 2012.*

6. ENVIRONMENTAL ASSESSMENT

6.1. ENVIRONMENTAL SETTING

6.1.1. INTRODUCTION

The descriptions of various environmental aspects of this project in this section are reliant upon a range of background information common to many of the key environmental issues. In this section, the local setting is described, and background information is provided on topography, climate, geological setting, land ownership and land uses of the properties and surrounds. The information presented in this sub-section provides a general overview of the environmental setting of the new dairy and works area with more specific information in relation to particular environmental aspects of the project being presented in the following subsections.

6.1.2. TOPOGRAPHY AND DRAINAGE

The topography of the Riverine Plain ranges from approximately 150ms above sea level in the regions bordering the central Victorian highlands fringing the Great Dividing Range in the south and eastern flanks to approximately 60ms in the lower lying reaches where the Murray River meets the Murrumbidgee (Google Earth 2020). The general pattern of landfall is to the north and west with the main discharge points of the plain entering the Murray River between Barmah and Robinvale.

REGIONAL TOPOGRAPHY AND DRAINAGE

The region between Deniliquin and Moama which incorporates the project site is dominated by the Cadell Tilt. The general area slopes away from the top of the tilt towards the Murray River and its tributaries. From the top of the Cadell Tilt west, the fall is a gentle slope whereas from the edge of the Tilt to the East, the fall is of a steeper nature. The Cobb Hwy generally follows the top of the Cadell Tilt through this area.

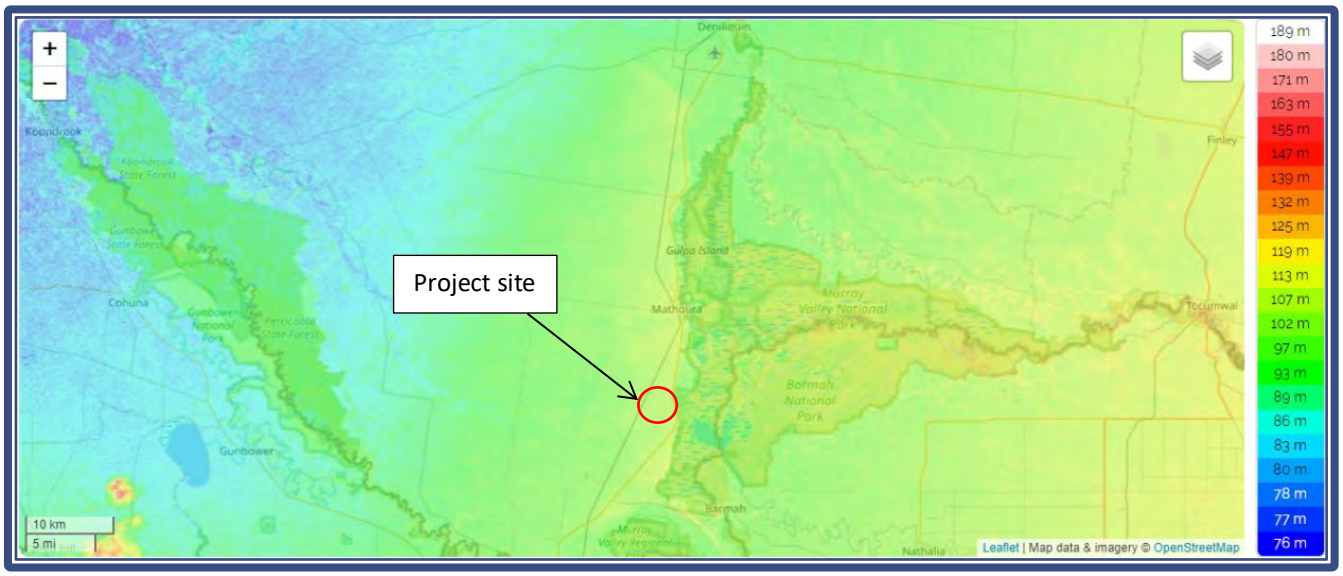


Figure 6-1 - Regional topography Deniliquin to Moama

Source: https://en-au.topographic-map.com/maps/oz/New-South-Wales/

LOCAL TOPOGRAPHY

The local topography of the properties range 6m in elevation from east to west. The elevation in the east area is approximately 105m AHD falling to an elevation of 99m generally towards the Murray River. This covers a length of 16kms.

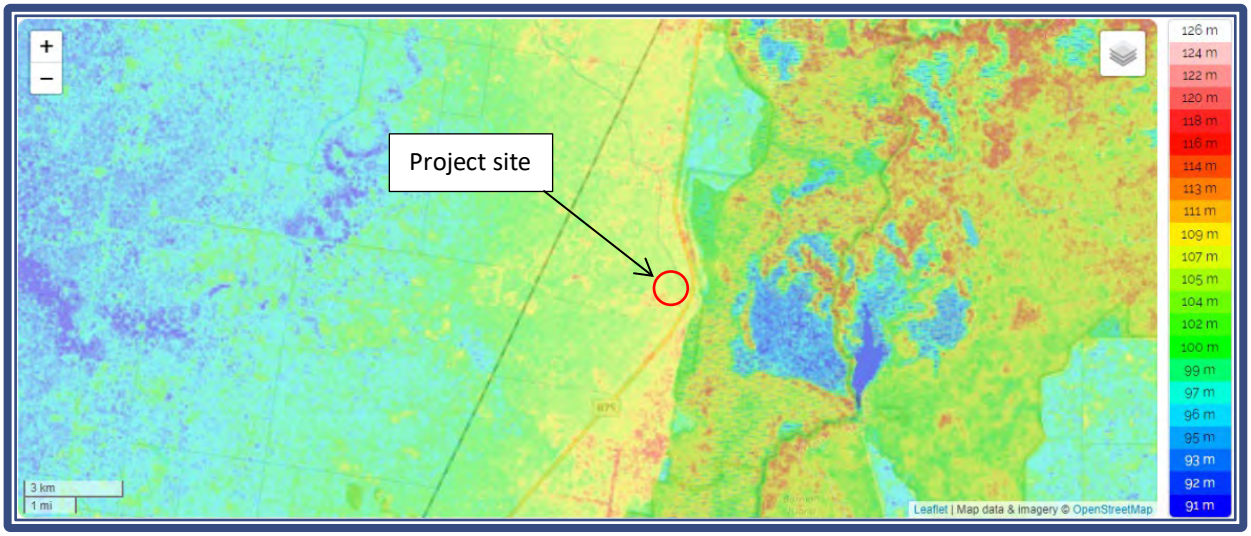


Figure 6-2 - Local site topography

SITE TOPOGRAPHY AND DRAINAGE

The area of the new dairy lies naturally at approximately 105m above sea level. The area of and around the site is predominantly laid out to irrigation but is separated from surrounding areas by Moira Private Irrigation District channel and Cobb highway corridor. The area within the property where the new dairy and existing intensive dairy activities are now carried out is shown below (prior to development) with the existing irrigation layout identifying channels (blue), drains (red) and existing tracks (yellow).

Figure 6 3 – Image showing the intensive dairy and adjoining area, prior to development (Source: PRS EIS, 2020)

As the above image shows, the property has been extensively developed for irrigation, with land forming works undertaken to generate slope and construct channels and drainage systems. The area of the proposed dairy clearly slopes from east to west, being directed to the Moira Private Irrigation District channel. This channel in this location has above ground banks which prevent the flow of surface water travelling further west.

The property currently maintains an irrigation drainage and recycle system which captures the run-off water in the area and recycles it over itself. Should excess flows occur, water is directed to the northern area past the house where it currently is held in a small below ground dam. A new subway under the Moira channel will be constructed shortly to allow this water to be transmitted west into the existing recycle system on the west side of the channel for re-use. This allows the full control and containment of water on the site and, where appropriate, can prevent the escape of all run-off water from the site.

6.1.3. CLIMATE

INTRODUCTION AND DATA SOURCES

Meteorological conditions have the potential to influence a range of project-related activities. An overview of these conditions at the project site and surrounds, with a focus on their potential influencing factors to project related activities has been recorded below.

The climate records utilised in this assessment have been sourced from the on-site weather station, Deniliquin Airport (site 074258) (since 1997) and the Silo data portal (records between 1900 and 2024). The grid point utilised for the Silo search is Lat: -35.95 and Long: 144.85 which is located 10 km to the southwest of the site.

Records available from the on-site weather station have been provided in addition to the regional data however do not provide long-term data for consideration. For future assessment of the daily, weekly and monthly climate at the site relating to operations, the site related weather station will be utilised. This weather station is a Weather Maestro station installed and serviced by Environdata, which includes the following modular systems:

Table 6-1 - Weather station recording conditions

Sensor Type	Identification	Operating Range	Accuracy	Resolution
Wind Speed	WS52	0-75m/s	+/- 0.2 m/s	0.1 m/s
Wind Direction	WD50	0-359 degrees	+/- 1 degree	1 degree
Air Temperature	TA70	-20 to 80 deg C	+/- 0.2 deg C	0.025 Deg C
Relative Humidity	RH70	0 to 100%	+/-2% RH (10% - 90% RH) +/- 4% rh (<10% or <90% RH)	0.1% RH
Rain Gauge	RG50	0-700m/hr	+/- 1% to 200mm/hr +/- 3% to 380mm/hr	0.2mm per tip

The wind speed and wind direction sensors are installed on a 10m high mast in an open environment. The weather station is located at E: 310113, N: 6020661 Zone 55.

CLIMATE RECORDS

The Deniliquin to Moama area can be described as a semi-arid climate under the Koppen climate classification with warm to hot summers and cool winters. Temperature extremes are quite variable across the year and the highest temperature recorded at Deniliquin was 47.2 degrees on the 25th January 2019. The lowest temperature was -5.6 on the 1st July 2017. The average annual rainfall is 258mm with most rainfall falling in August to October.

Table 6-2 - Climate data

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Highest High ^{0}C	47.2	46.6	41.2	39.0	27.9	24.4	23.3	27.6	36.7	37.6	44.1	46.5	47.2
Mean Max ^{0}C	33.3	32.2	28.7	23.5	18.5	15.0	14.4	16.3	20.0	23.8	27.9	30.7	23.7
Mean Min ^{0}C	16.7	16.1	13.5	9.5	6.1	4.2	3.3	4.1	6.0	8.5	12.0	14.3	9.5
Lowest Low ^{0}C	5.7	6.0	3.5	1.0	-2.4	-4.4	-5.6	-5.0	-2.1	-0.6	1.1	4.6	-5.6
Mean rainfall mm	24.7	25.1	25.3	27.8	27.8	30.5	27.9	32.7	32.9	40.6	48.8	29.8	374.3
90th percentile rainfall mm	60.4	63.0	71.5	69.4	76.5	69.2	67.8	70.9	70.3	82.6	72.0	75.7	849.3
Mean rainfall days	4.9	4.4	4.3	5.4	8.1	13.3	14.9	11.5	8.6	7.0	6.9	5.7	95.0
Mean 9am wind speed km/hr	19.5	19.3	17.9	16.4	13.8	14.0	13.7	15.9	17.9	19.6	19.2	19.6	17.2

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Mean 3pm wind speed	20.5	19.2	18.4	17.4	17.7	17.9	18.6	20.3	21.3	21.3	20.3	21.1	19.5
Mean monthly evaporation mm	264.7	215.1	172.6	98.0	54.1	35.0	37.4	58.1	91.5	141.9	192.8	244.1	1605.3

RAINFALL

The average rainfall vs evaporation is shown below which identifies that in all months except June and July, evaporation exceeds rainfall. This shows that in an average year the storage period for effluent is two months. When considering the 90th percentile rainfall and evaporation, the storage period is four months.

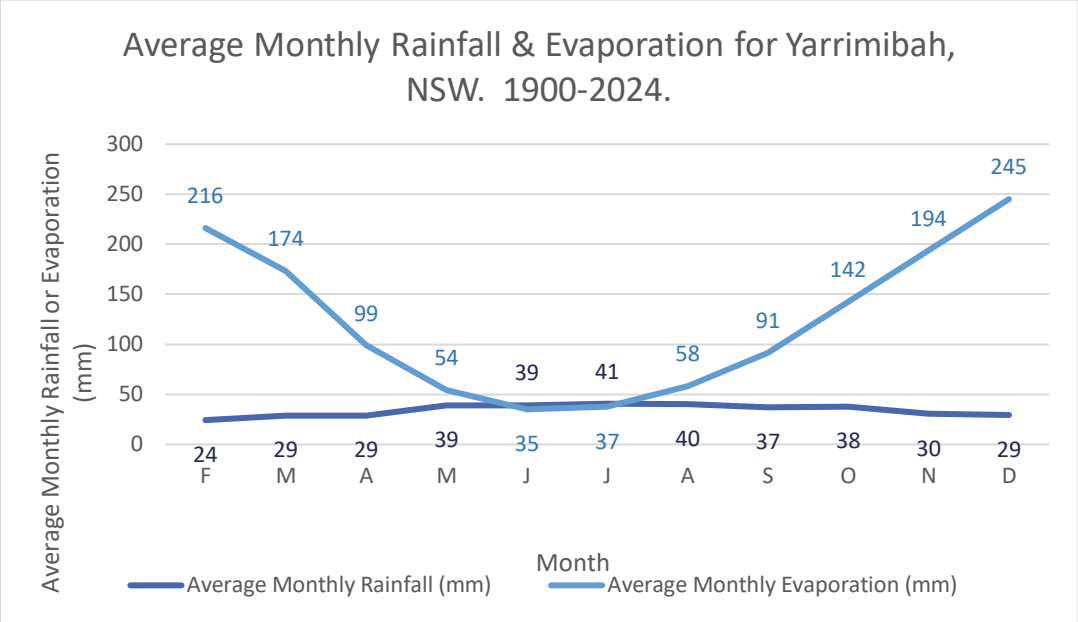
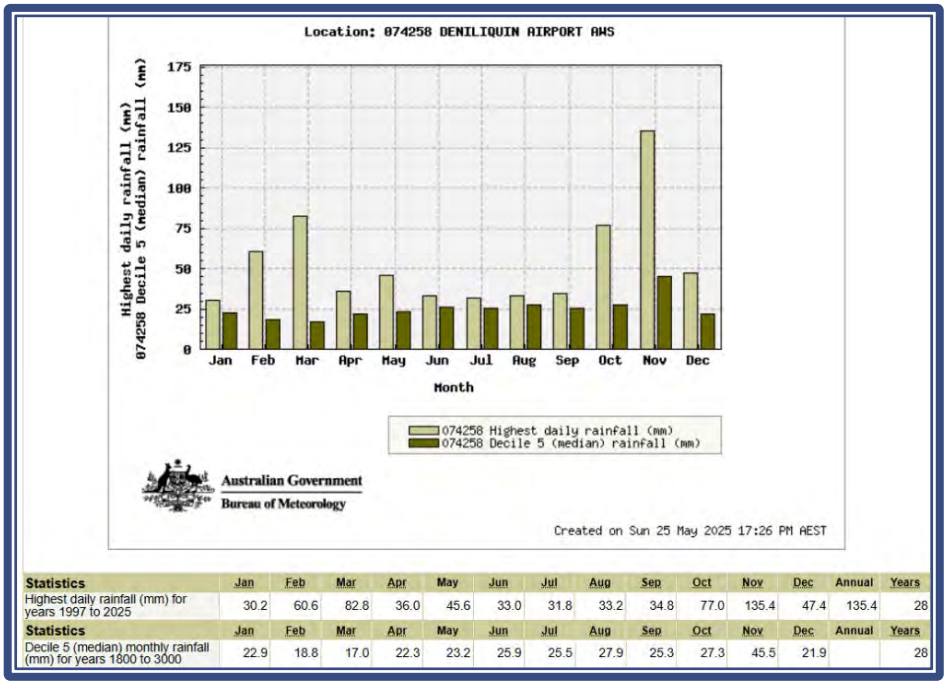


Figure 6-3 – Graph of average monthly rainfall and maximum recorded rainfall (Source: Silo)

The following graph reviews the highest daily rainfall (light) against the median monthly rainfall (dark) to understand the way rainfall occurs at the site. This is a comparison of Deniliquin Airport data over 30 years. The results indicate that rainfall extremes, especially in November and March, often surpass long term median monthly rainfall totals. This is important when considering impacts of rainfall events on areas containing water and run-off.



Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Highest daily rainfall (mm) for years 1997 to 2025	30.2	60.6	82.8	36.0	45.6	33.0	31.8	33.2	34.8	77.0	135.4	47.4	135.4	28
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	22.9	18.8	17.0	22.3	23.2	25.9	25.5	27.9	25.3	27.3	45.5	21.9		28

Figure 6-4 – Deniliquin (Airport) weather station median monthly rainfall vs highest daily rainfall (1997-2024) (Source: BOM)

EVAPORATION

The average annual evaporation over 100 years within the general area of the property equates to 1,605mm. The highest evaporation months are January and December, and the lowest months are June and July. The following graph compares the monthly evaporation against the monthly rainfall which shows evaporation and rainfall are nearly equal throughout the June to July period with all other month's rainfall exceeded by evaporation.

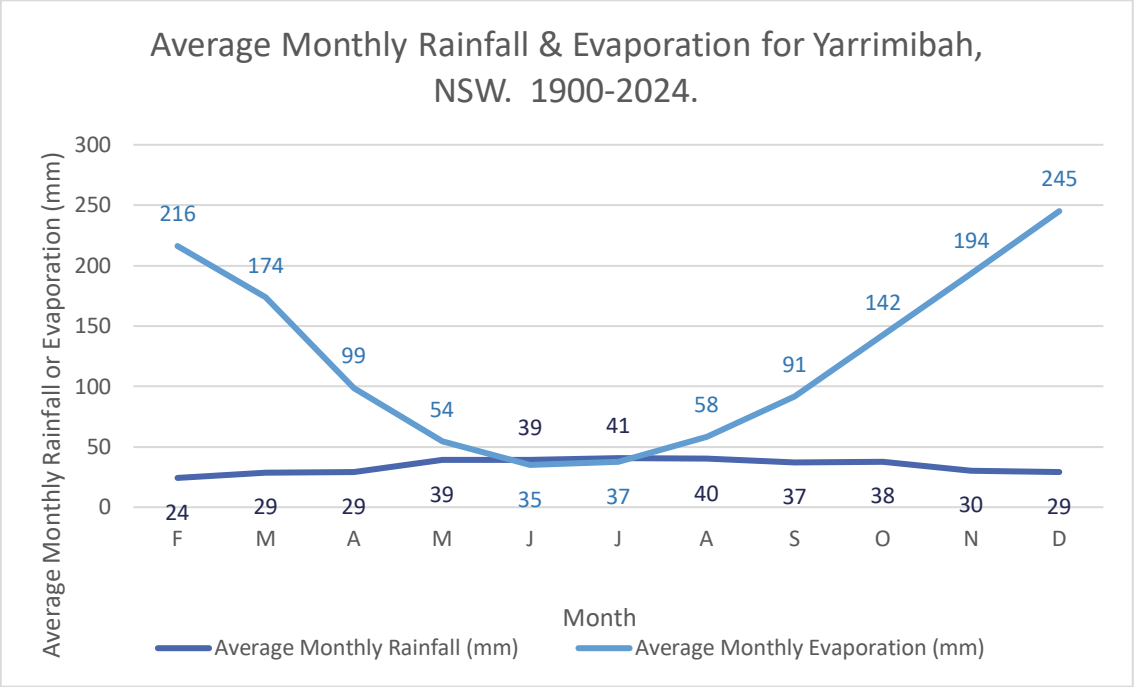


Figure 6-5 – Graph of total monthly evaporation vs rainfall (Source – SILO Data point -35.95, 144.85)

WIND

The annual wind records which are displayed as wind roses for both 9am and 3pm for the Deniliquin (Visitor Centre) weather station have been provided below.

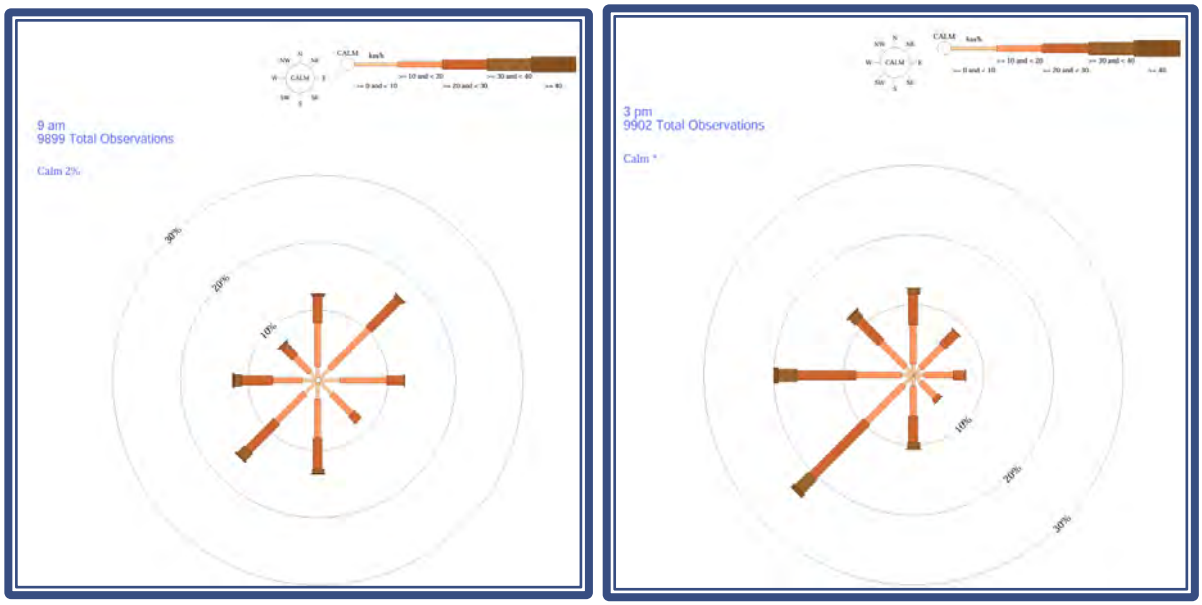


Figure 6-6 - Average annual wind data roses from 9am (left) and 3pm (right) (Source: BOM)

Using regional wind data, wind in the mornings is dominant from E and SE directions and has calm conditions 2% of the times. Most winds are in the 10-20km/hour wind range with some occurrences up to 30km/h from the E and SE. In the afternoon, there are very few occurrences of calm winds. Wind is dominant from the SW, E and S with many observations in the 20-40km/hr range.

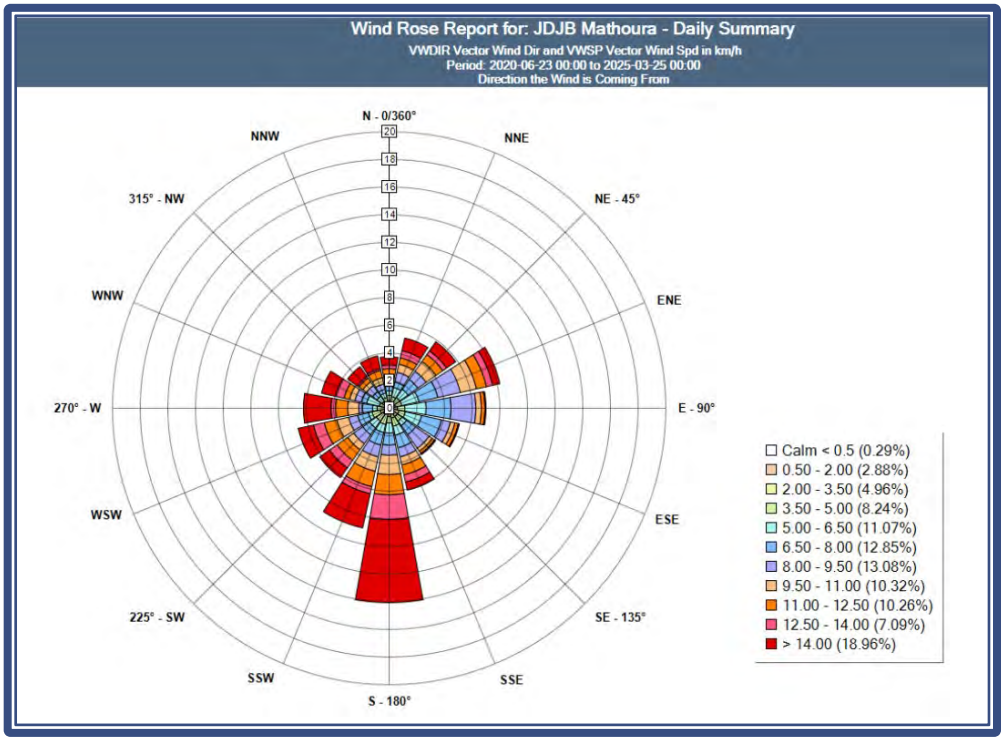


Figure 6-7 – Site wind rose (Source: Moira Station Weather Station – March 2025)

Site specific wind data has been collected by the on-site weather station and is shown below with majority of winds recorded from the south at the site.

Table 6-3 – Wind speed occurrences

Speed m/s	%
0-3	8.10
3.1-6.5	19.31
6.5 - 14	53.63
>14	18.96

Winds at the site are gentle to light more than 80% of the time. High winds greater than 14m/s are experienced 18.96% of the time. This is generally consistent with the regional wind data.

6.1.4. GENERAL PHYSIOGRAPHY AND GEOLOGY

The following section summarises and references the related EIS, (PRS, 2020) replicated for consideration with regard to the proposed site modification works for the new dairy.

GENERAL PHYSIOGRAPHY OF THE RIVERINE PLAIN

The Riverine Plain of South-Eastern Australia includes the fluvial plains of the Murray, Murrumbidgee, Goulburn and Lachlan Rivers together with their tributary streams in Southern NSW and Northern Victoria. The Plain is bordered by the Great Dividing Range in the south and south-east, the Manara and Cocoparra ranges in the north and north-east, and the Mallee in the west - see **Figure 6-9** below. The Riverine Plain is approximately 76,800 km^2. (Betler, Blackburn, Bowler, Lawrence, Newell, Pels, 1965).

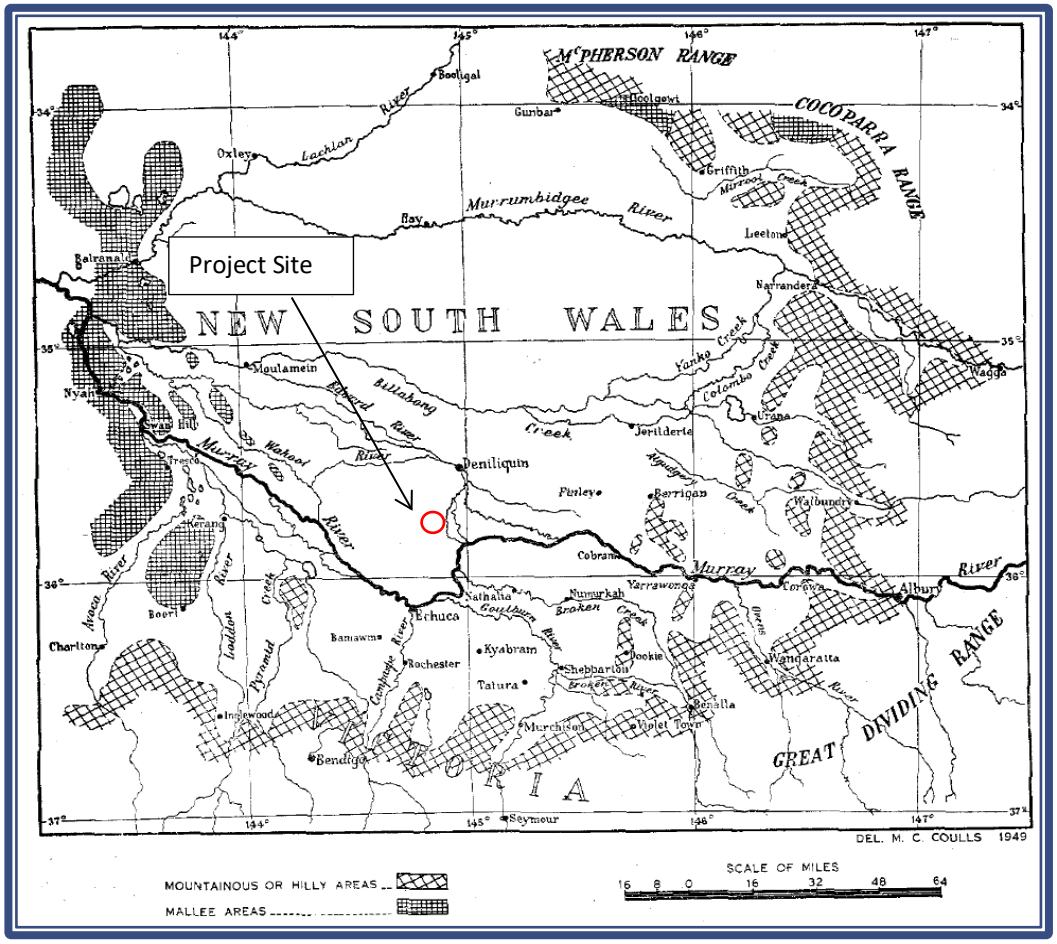


Figure 6-8 - The Riverine Plain of south-eastern Australia and its chief physiographic features (Butler 1950, pg 232.)

The Riverine Plain has built up from alluvial and aeolian sediments deposited over the past 65 million years. Bedrock occurs at the land surface around the southern and eastern rim of the plain while sediments are known to be in excess of 300m in depth in the north-west region near the town of Hay, NSW.

The geomorphic (surface features) of the Riverine Plain have developed from fluvial (action of streams), lacustrine (action of lakes and wetlands) and aeolian (action of wind) activity. These processes have resulted in the current level of soil formation on the plain.

Soils include Red-Brown Earths, transitional Red-Brown Earths and Grey & Brown Clays of medium to heavy texture. Within the top 5m of the soil surface, sands are often found, and the pattern of sand occurrence increases in intensity with proximity to water courses and prior stream beds.

REGIONAL GEOLOGY

Butler et al. (1973) produced a geomorphic map of the Riverine Plain of south-eastern Australia, highlighting the geomorphic units covering the area of the site. As identified below the project site is defined as 'Pls" being Plains with scalds.

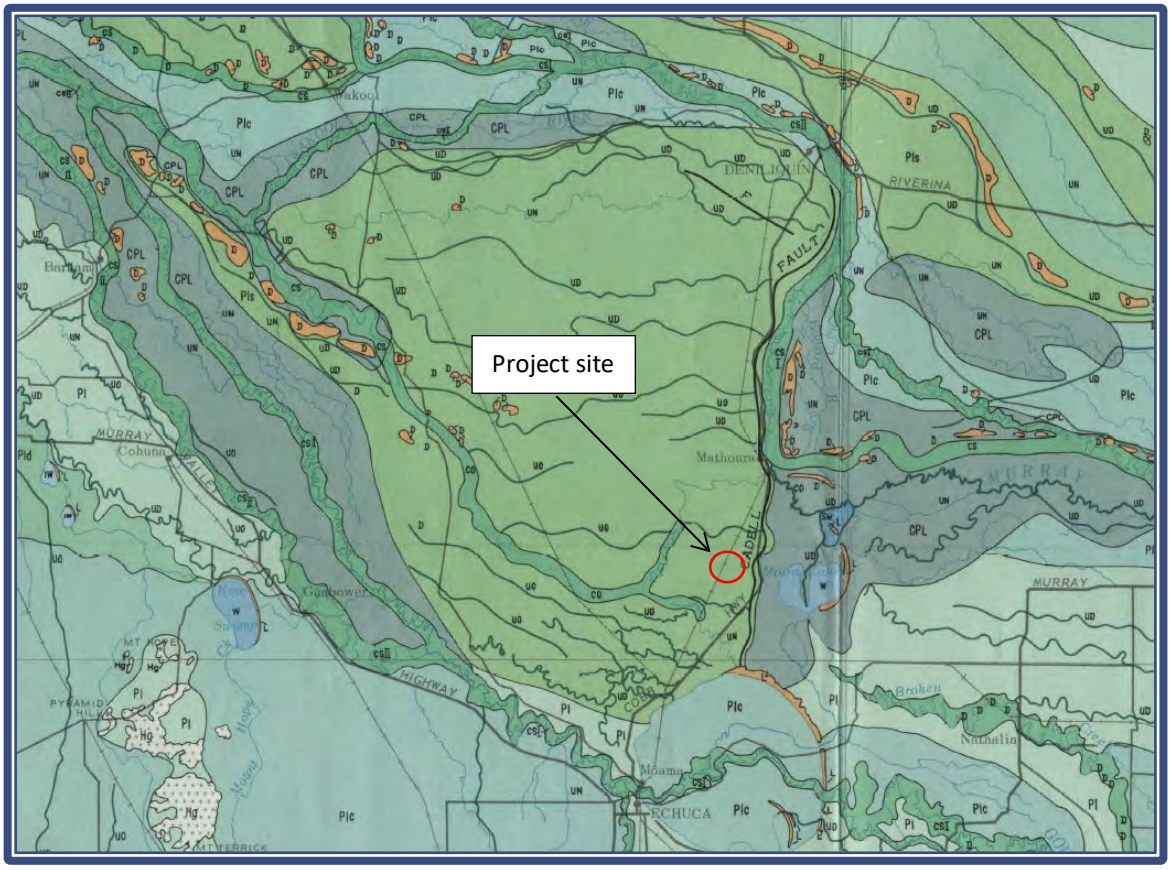


Figure 6-9 - Geomorphic map of the area identifying prior streams, plains and dunes

This site is classified as 'Czss', an abbreviation for 'Cenozoic Shepparton Formation' being poorly consolidated clay, silt sand and gravel with the entire project site being located within this identified geologic area. To the south of the site is a mapped area of 'Qa' or Quaternary alluvial deposits. The image below identifies the site-specific geology.

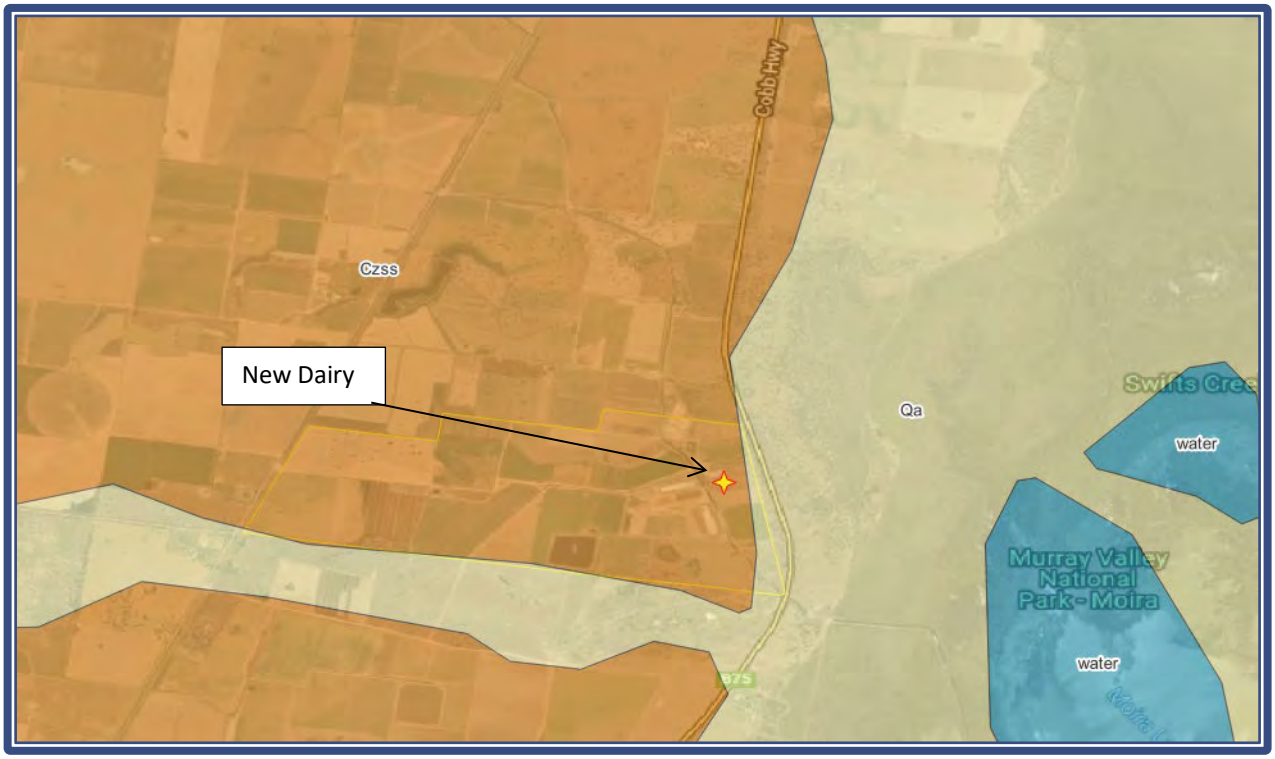


Figure 6-10 - Area geology (Source: QGIS with NSW 1500k Simplified Surface Geology Overlay)

6.1.5. LAND OWNERSHIP, RESIDENCES AND LAND USE

Figure 6-11 shown below represents the area of land owned by the Applicant in relation to the site of the proposed new dairy. The white circle shown indicates a 4km radius of the new dairy site, dark hatched areas are property owned and connected to operation and the light green hatched indicating the property 'Yarrimbah'. The area of vegetation on the opposite side of the Cobb Highway is the Murray Valley National Park.

In summary, the majority land surrounding the project site is owned by the Applicant, with the remaining portions, over 4kms away owned by two small rural holders, Travelling Stock Reserve (TSR), road reserve and National Forest (green outline).

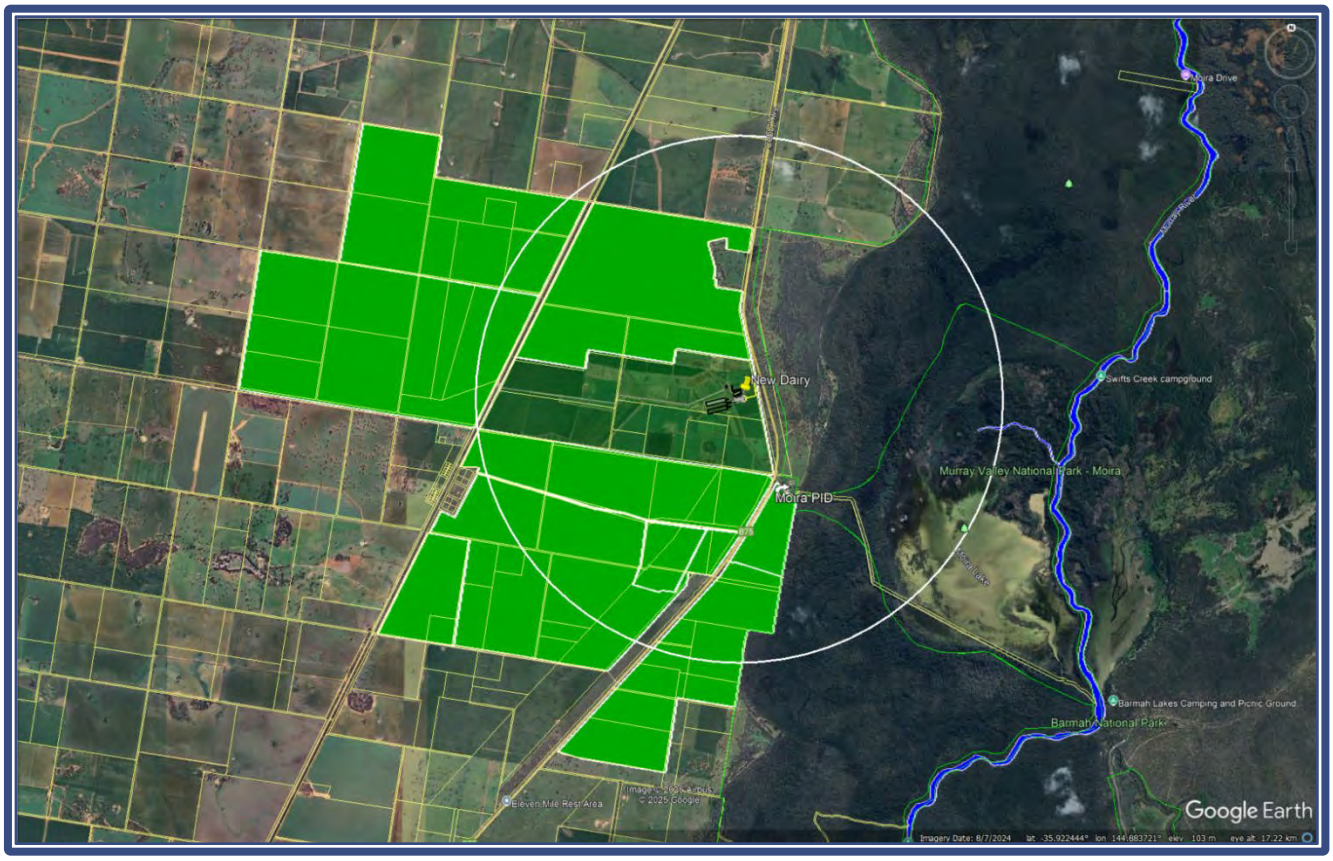


Figure 6-11 – Image identifying project in relation to property ownerships

RESIDENCES

Sensitive receivers, such as residences are identified in relation to the project vicinity below in **Figure 6-12** and further described in **Table 6-4.**

Table 6-4 - Table of receptors

ID	Type	From existing		From new	
		Distance	Direction	Distance	Direction
R1	Yarrimbah House 1*	100m	N	418m	NE
R2	Yarrimbah House 2*	895m	S-SE	635m	S-SE
R3	'Cotswold Park' Staff House*	820m	NE	1,009m,	N-NE
R4	Moira PID Workshop	1,670m	SE	1,410m	S - SE
R5	Rural Residence @ 'Moira'*	2,155m	S	1,955m	S
R6	Rural Residence - 'Cotswold Park' **	1,820m	N - NW	1,570m	N
R7	'Moira' temporary stay buildings*	2,310m	S - SE	2,050m	SE
R8	'Moira' Homestead*	2,370m	S - SE	2,150m	SE
R9	'Moira Downs' House*	3,625m	W	3,800m	W
R10	'Cotswold Park' North house**	2,895m	N - NW	3,105m	N
R11	Rural Residence – Owned by staff member	3,880m	W - SW	4,080m	W-SW
R12	'Moira Downs' House*	3,319m	NW	3,655m	NW
R13	Weekend Camping Hut – no power	4,390m	SW	4,440m	SW

ID	Type	From existing		From new	
		Distance	Direction	Distance	Direction
	Moira State Forest	695m	E	480m	E
	Cobb Hwy	520m	E	345m	E
	Property Boundary*	450m	E	250m	E

* Denotes owned by applicant

** Denotes owned by family

Figure 6-12 – Image identifying project in relation to surrounding area. White circles 1km & 4kms from centre of project area (Source Google Earth)

Note: Green houses are those owned by the applicant, yellow R4 & R13 are part time utilised areas (holiday house and workshop). R6 and R10 are not owned by the applicant but by family members.

6.1.6. SURROUNDING LAND USE

The site being located within a rural area is surrounded by other farming properties. The Moira Private Irrigation District maintains its pump infrastructure and workshop located approx. 1.4km to the southeast of the site. The Cobb Hwy is located to the east being divided from the property boundary by Travelling Stock Reserve. The entrance to the Moira National Park is on the opposite side of the Cobb Hwy located over 800m to the southeast of the site. The park at its closest point is over 480m to the east and the nearest known camping and frequent public use area is over 5.5kms from the property.

The site and surrounds are generally flat with a very low relief within the broader area. There is less than a 10m elevation change in the surrounding area – including considering the Cadell Tilt formation. The broader area is described as the Riverine plain and contains isolated stands of vegetation with some scattered paddock trees.

6.1.7. SERVICE INFRASTRUCTURE

The property is currently serviced by the regional electricity grid which maintains the existing operation with support from an on-site generator to manage power outages. An existing and long-term planned upgrade is in progress on this site which will meet the existing and proposed duty of the site. See Section 2 – Essential Energy for details on this work.

The operation maintains good access to the site for heavy and light vehicles with the entrance upgraded to include BAL as part of the conversion to an intensive dairy - freestall housing system. All heavy vehicles are directed to the site from

Cobb Highway with on-farm light vehicles utilising the main and other property entrances. There are no changes or work proposed to the existing road access to the property.

The property is not connected to the town water or sewage supply and does not require a connection to these services.

6.2. WATER

6.2.1. WATER SUPPLY AND WORK APPROVALS

WATER ACCESS LICENCES

Water supply on the property is supplied from two separate sources being the Lower Murray Groundwater and the NSW Murray Regulated River Water Sources (via the Moira Private Irrigation District (PID)). The applicant has licences of 1,064ML of groundwater, and through the Moira PID 5,500ML of general security surface water and 13ML of stock and domestic. The property is the first property with an irrigation supply on the Moira PID system.

This detail of the property Water Access Licences is as follows:

Table 6-5 - Property Water Access Licenses

WAL	Work Approval	Units	Category	Source
12192	50WA505802 50WA514066 50CA504695	1,064ML	Groundwater	Lower Murray Groundwater
15170		0.00ML	Groundwater	Lower Murray Groundwater
Moira	NA	5,500ML	General Security	Murray Unregulated
PID	NA	13	Domestic and Stock	Murray Unregulated
Total		**6,577ML**		

The above licences are governed by the rules in the *NSW Murray and Lower Darling Regulated Rivers Water Source Water Sharing Plan 2016* and the *Murray Alluvial Groundwater Sources 2020.*

6.2.2. EXISTING SURFACE WATER ENVIRONMENT

The surface water supplied to the property is accessed through the Moira Private Irrigation District irrigation scheme. This scheme accesses water from the Murray River downstream of the Barmah choke through the Moira Creek and via its pumps on the edge of the Cadell tilt. The Moira PID holds 36,362ML of general security water, 1,151ML of stock and domestic water and 521ML of supplementary water. This water is supplied to 94 irrigation farms and 56 stock and domestic points throughout the area. 'Yarrimbah' is the first property located on this scheme and the applicants hold 15% of the general security water within this district. This licensed allocation equates to 0.33% of the total general security water within the Murray Regulated System.

There are no changes proposed to the amount of water owned and the volume of water available for extraction from the surface water source is not proposed to alter as part of this project. There will be no adverse effects on other water users within this water source.

SITE WATER REQUIREMENTS

On-site water use and demand has been considered in the attached Effluent Management Plan which considers the water requirements for the new dairy. This assessment determined the following:

- The site has access to multiple water sources being the Moira Irrigation system, groundwater bores and an on-site approved freshwater storage system. The operation maintains access to at least two available water sources to supply the water demand at all times.
- The Applicant has sufficient licensed water to supply the project and for combining with effluent water for use on the property.
- The freshwater storage meets the winter water storage requirements of the operation.
- There is sufficient capacity within the effluent system to hold a 90th percentile winter storage for both stage 1 and at full capacity.
- The property has sufficient land for effluent and manure utilisation with management.
- Water use does not exceed licensed allowable limits and does not impact adjoining water users.

The existing supply to the property is from both the Murray River system via the Moira PID and there is no change proposed to increase the volume or rate at which water is currently supplied to the property through this system.

CATCHMENTS AND DRAINAGE

This project is located within the Central portion of the Murray River catchment area within the Murray Darling Basin. The area is located between the Hume Dam in the east and the confluence of the Murray and Darling Rivers in the west. This area comprises 3% of the Murray Darling Basin with rivers within this catchment entering the Murray and contributing over 50% of the inflows of the Basin.

The Murray River, which is a major tributary of the Murray-Darling River system, drains much of the Riverina spanning almost 1,200kms. The Murray River in this catchment is regulated containing the Yarrawonga, Torrumbarry, and Mildura Weirs and the Mid Murray Storages. The major tributaries are the Kiewa, Owens, Goulburn, Campaspe, Loddon, Wakool, Murrumbidgee Rivers and the Broken Creek. The major distributaries are the Edward River and the Gunbower Creek.

FLOODING

The site is not subject to flooding or located within a Floodplain Management Plan area. The site is not located on or within 40m of a waterway. As such flooding in relation to the project is not considered to have an environmental impact and will not be discussed further in this document.

6.2.3. EXISTING GROUNDWATER ENVIRONMENT

REGIONAL GROUNDWATER SYSTEM

The Lower Murray Alluvium Area extends between the Billabong Creek in the North to the Murray River in the South and Corowa in the east and Goodnight in the west. The Murray Alluvium is a continuous sequence of unconsolidated sediments which have been deposited over time as valley fill in the upper areas of the catchments. These sediments then grade into the broader valley and floodplain sediments towards the mid to lower end of the catchment. The sedimentary sequence has been classified into three main aquifer units which are based on the deposition period and environment. These are:

- Shepparton Formation – (0m - <70m) shallow formation deposited between the Pliocene to the Pleistocene of the Quaternary Period.
- Calivil Formation (Pliocene Sands) – (40m-140m) overlies the Renmark Group being deposited from the late Miocene to the Pliocene.
- Renmark Group – (140m-350m) basal formation sitting on the pre-Cainozoic basement. Deposited between the early Eocene to the late Miocene and is virtually continuous over the entire basin.

The Calivil and Renmark formations aquifers are deep aquifers being comprised of pale grey to white quartz sand layers with lenses of grey to white clay, peat and coal extending from the bottom of the Shepparton Formation to the bedrock. The Lower Shepparton Formation generally consists of yellow to brown poorly sorted sand and clay sediments at depths between 20 and 50m below the surface. (Alamgir,M, 2011).

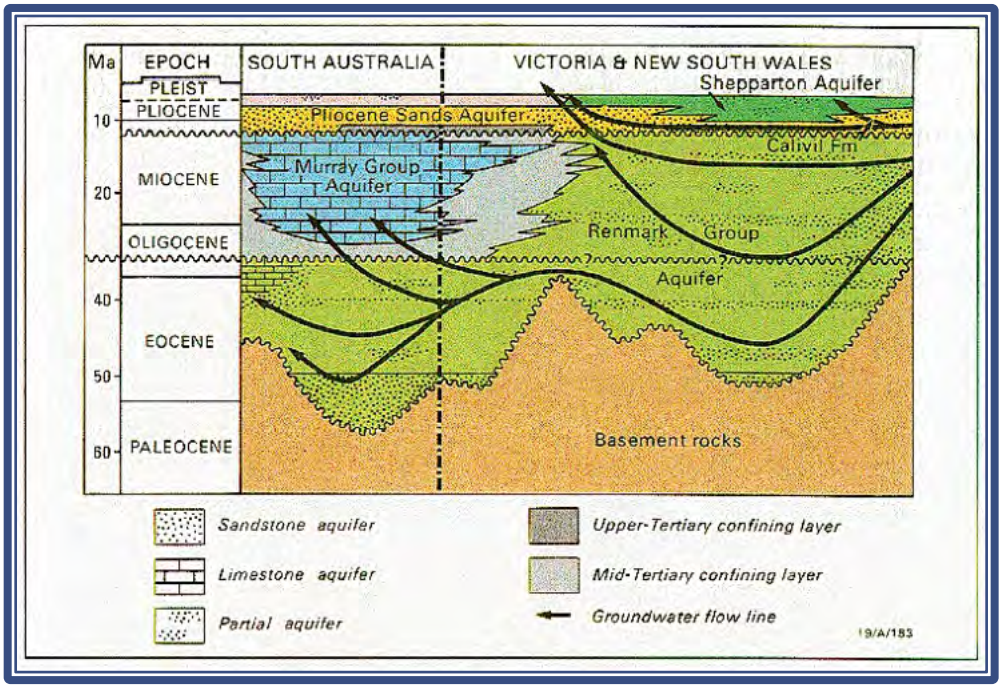


Figure 6-13 - Schematic cross section of the Murray Basin Aquifers (Brown and Stephenson, 1989)

The above cross section depicts the geological formations within the Murray Basin Aquifer. Within this area, the Shepparton Formation is nearing its deepest point with a shallow Calivil Formation below.

A search of groundwater records was undertaken on the WaterNSW's Continuous Monitoring Network which provided detailed historical information on water levels in the area. This search revealed several groundwater bores in the district with the closest monitoring site located 11.4kms to the northeast of the site. The locations of these monitoring bores are identified below in **Figure 6-14**. Groundwater data from these bores indicates that the bores range in total depth from 180 to 290 meters.

According to information on regional groundwater levels sourced from the WaterNSW monitoring sites, the following information is relevant:

- There are 6 monitoring bores within a 35km radius of the site (see below). Of these existing bores, two are continuously monitored and the remaining four bores were monitored until 2018,
- The depth to water table is 34.4m at its deepest and 21.93m at its shallowest,
- The underlying geology varied and included limestone, granite and coal deposits,
- Groundwater has been recorded in all monitoring bores,
- The average standing water level in all bores currently monitored (2 bores) this year is 30.7m, and
- The general trend of water tables in the local area is steady to slightly rising in level by an average of 16cms in depth.

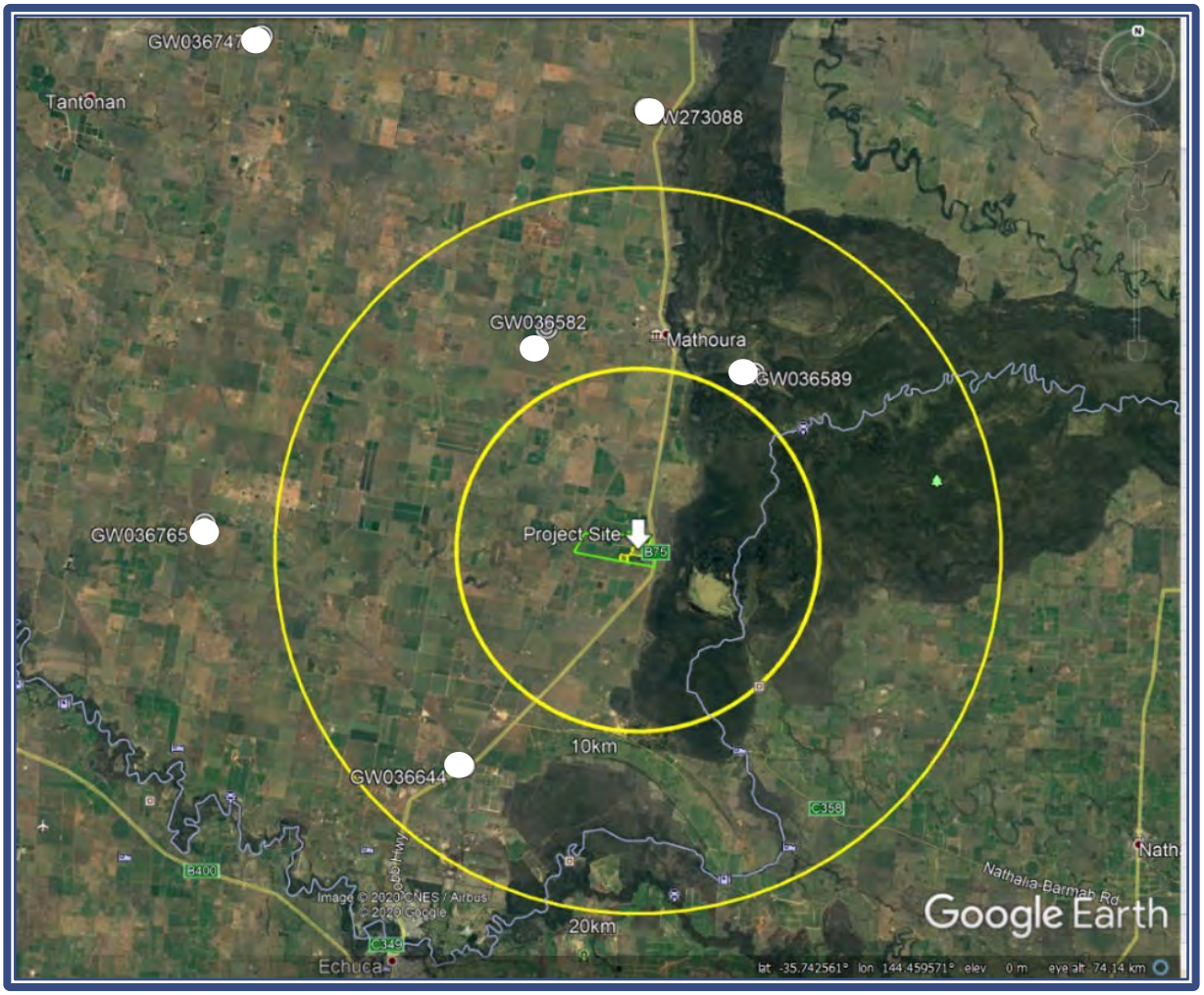


Figure 6-14 – Image identifying piezometer locations surrounding the project areas

The work approvals and licences obtained as part of the intensive dairy facility required a series of on-site groundwater monitoring bores which were installed in line with those approvals. These conditions were triggered as part of the Environmental Protection Licence and the WaterNSW work approval for the storage dam. These bores installed to a depth of 3m below natural surface have been monitored on a quarterly basis since their installation in 2021. No groundwater has been detected in any bore at any time.

This project does not propose any change to groundwater supply to the property including total volume or extraction rates.

The existing supply to the property is from both the Murray River system via the Moira PID and the existing groundwater bore which is proposed to utilise the existing allowable allocation.

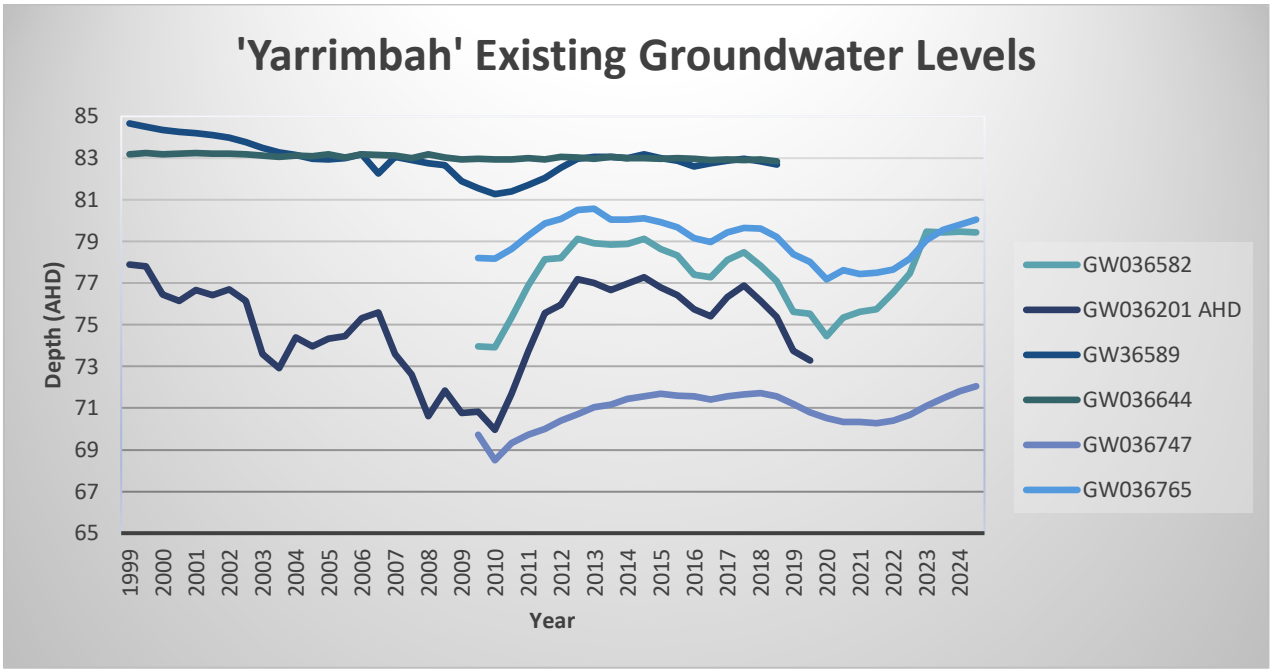


Figure 6-15 – Graph identifying monitoring bore depth to water table in area

GROUNDWATER DEPENDENT ECOSYSTEMS

The EIS undertook a detailed biodiversity assessment which included a review of potential Groundwater Dependent Ecosystems (GDEs). This assessment identified that in Australia there are six types of GDEs (Geoscience Australia, 2024) and within the Murray Alluvium Water Resource Plan area there are several high value, high probability GDEs of ecological value which include wetlands, vegetation and base flow ecosystems. These ecosystems within the wider area are due to the internationally significant RAMSAR and other wetlands which support a large number of threatened species. Generally, the GDE communities with high ecological value have large vegetation patches, are highly connected (eg riparian corridors) and have a high number of threatened species present.

Figure 6-16 – Image identifying the Groundwater Dependant Ecosystems within the region (Source: SEED GDE Atlas)

It can be identified from the above mapped GDEs that the new dairy site is not located within an area identified with GDE probability. The nearest area of known GDE is located to the east being the River Red Gum Forests of the Moira National Park. As described above, the sites do not contain any evidence of any identified Communities and as such, the new dairy area and proposed works are unlikely to impact any GDE. The project works will not exceed the depth of 3m, being constructed above ground on a fill pad and do not relate to the extraction of groundwater at any depth. No remnant native vegetation is proposed for removal and as a result, impacts to any GDE are unlikely.

6.2.4. ASSESSMENT

SURFACE WATER IMPACTS

The potential surface water impacts from the project construction and operation activities relate to potential water pollution from activities within the site and irrigation storage and recycle dam and include:

- Local soil erosion during rainfall events within the disturbance area during construction, and
- Surface run-off from rehabilitated areas prior to full stabilization.

As described above, the project site is fully contained within the existing irrigation area. All surface water run-off during construction will be managed with erosion and sediment controls and within the existing irrigation network of the property.

The Effluent Management Plan describes in detail the management of surface water within the project area. In summary, the table below identifies the areas within the area and the characteristics of the run-off.

Table 6-6 - Table identifying project area and run-off management

Area	Area (m^2)	Surface type	Run-off Coefficient	Area (m^2)	Run-off Directed to
Freestall roofs	28,320	Roof	1	28,320	Tanks/dam
Drains & Lanes	27,680	Gravel Lined	0.8	22,144	Pond
Manure Storage Area	11,000	Earthen (bare)	0.8	8,800	Pond
Grassed areas	46,000	Grassed	0.3	13,800	Pond
Concrete Lanes	1,410	Concrete	1.0	1,410	Pond
Effluent Pond	18,000	Water	1	53,000	Pond
New Dairy	3,100	Roof	1	3,100	Tanks/dam
Current dairy	306	Roof	1	306	Tanks/dam
Current dairy yard	720	Concrete	1	720	Pond
Current dairy lane	2200	Earth	0.9	1,980	Pond
Calf shed pad	400	Concrete	1	400	Pond
Maternity shed	4,800	Roof	1	4,800	Irrigation
Maternity loafing north	3,200	Earth	0.8	2,560	Pond
Total Catchment Area	**14.7ha**			**154,140**	
Catchment to ponds	**11ha**			**117,614**	

Due to the extensive drainage network and substantial on farm irrigation systems, it is not envisaged that there will be any local sediment laden surface water carried off site. No run-off water from the site will be pumped into or enter the Moira PID channel system.

OTHER WATER USERS' IMPACTS

As discussed above, the Applicant has sufficient existing water licence which comprises a small proportion of the area's consumptive water pool. Should the applicant look to expand their water portfolio, this is unlikely to impact other water users. All water use is and will continue to operate within the licensed water requirements which will ensure that there will be no impacts to other water users within the surface and groundwater system.

FLOODING IMPACTS

There are no flood impacts relative to the project site as the site is not within a Floodplain Management Plan area, an active floodplain or identified as being subject to flooding being located substantially higher than the regional floodplain.

GROUNDWATER IMPACTS

The existing groundwater levels within the region have been reviewed in relation to the project site and the proposed works. The existing Australian Height Datum (AHD) levels have been replicated below with the inclusion of the sites natural surface, the proposed effluent pond floor and the maximum depth of cut. It can be seen from the image below that there are substantial separation distances between the site and proposed works and the nearest recorded groundwater levels.

The nearest GW Monitoring bore recorded a water level of 82.84mAHD which is nearly 22m below the surface at the site. The proposed depth of cut for the effluent pond is 102.85mAHD and is 20m above the most recent recorded groundwater level. The proposed storage dam floor finished level is 102mAHD at its deepest point and is 19.16m above the groundwater level. Due to the significant separation distances and depth of the groundwater at this site, it is highly unlikely that the project works will impact on the regional groundwater systems.

Despite this separation distance, all surfaces that relate to the permanent storage of effluent, manure or mortalities will be constructed with an impervious compacted clay liner. A monitoring piezometer will be constructed on site to record any groundwater identified within 5m of the surface of the site. Where any groundwater is recorded, tests of the water will be undertaken bi-annually for:

- Standing water level,
- pH,
- Nitrate, as N-NO3-N,
- Electrical conductivity, and
- Ammonia, as N-NH3.

Figure 6-17 – Map identifying existing groundwater monitoring locations

6.2.5. MITIGATION, MANAGEMENT AND MONITORING MEASURES

Mitigation and monitoring measures relating to the construction and operation will be implemented to minimise potential soil impacts. These are shown in the table below.

Table 6-7 - Water mitigation, management and monitoring measures

ID	Potential Impact	Timing	Safeguard
W1	Mobilisation of sediments from the site to streams and waterways.	Pre-Construction	Erosion and sediment control measures are to be implemented and maintained in accordance with the relevant section of managing Urban Stormwater: Soil and Construction Vol 1 (Landcom, 2004)
W2	Mobilisation of sediments from the site to streams and waterways.	Construction	Rehabilitation works are to be undertaken as soon as practicable to stabilise disturbed surface areas.
W3	Mobilisation of sediments from the site to streams and waterways.	Operation	Vegetation cover of embankments is to be maintained to prevent surface erosion and drain failure.
W4	Contamination of surface and groundwater systems.	Construction	Storage and re-fuelling and maintenance of plant and equipment is to be undertaken on constructed compacted manure storage area.
W5	Contamination of surface and groundwater systems.	Pre-Construction	Vehicles are to be washed prior to site entry to prevent requirements for washing on site. Where machines are required to be washed, run-off from washing must be directed to controlled drainage within site.
W6	Contamination of surface and groundwater systems.	Construction	Daily construction plant maintenance checks will be undertaken to ensure that no oil, fuel or other liquids are leaking. Checks are to be undertaken by qualified staff and will be trained in the management of accidental spills.
W7	Contamination of surface and groundwater systems.	Construction	An emergency spill kit will be kept of site with staff aware of location and trained in its application.
W8	Pondage of surface water and/or inadequate site drainage.	Pre-Construction	Site drainage to be inspected prior to construction work commencement. Where required, existing drains are to be utilised, and ESC measures are to be utilised and maintained until site is stabilised.
W9	Pondage of surface water and/or inadequate site drainage.	Construction	ESC measures are to be maintained during the life of the project construction and until the site is stabilised.
W10	Pondage of surface water and/or inadequate site drainage.	Operation	Drainage within the site is to be maintained to ensure all water drains freely to designated area.
W11	Groundwater identified in monitoring bore system	Operation	Review groundwater monitoring plan for contingency plans

6.2.6. CONCLUSION

The water access and supply for the operation is well-established, utilizing the Moira PID channel system and the Lower Murray Groundwater Source, with sufficient entitlements to meet operational needs. The new dairy's water requirements are met without altering the existing system or licenced water held.

Surface water impacts are minimal, with erosion and sediment control measures in place, while groundwater impacts are unlikely due to the depth to the groundwater, site's design and ongoing monitoring.

Mitigation and monitoring measures have been implemented to prevent uncontrolled water releases and ensure the integrity of water and effluent storage systems, thereby safeguarding both surface and groundwater environments.

6.3. SOIL

The initial intensive dairy development assessment undertook an investigation of the sites soils and their suitability for construction of the freestall housing systems and associated effluent management system. This investigation incorporated the area proposed for the new dairy and the earth used (removed from ponds and storage) for the purpose of construction.

That geotechnical investigation is consistent with the Australian Standard *AS1726-2017 – Geotechnical Site Investigations* involved the following activities:

- Site walk to identify proposed testing locations and variations of the site,
- Borehole drilling with supervision from an experienced geotechnical technician,
- Recording of results of drilling and testing of samples by NATA endorsed soil laboratories, and
- Review of results in relation to project activities.

Soil testing was carried out in accordance with Australian Standard *AS1289 – Methods for testing soils for engineering purposes* and include the following tests:

- Particle Size Distribution
- Atterberg Limits
- Linear Shrinkage
- Permeability
- Emerson Class Number
- Exchangeable Sodium Percentage

Further detail regarding the field methodology, including soil sampling methods, soil descriptions, laboratory analysis, and construction requirements to be followed are available in Section 5.3 of that report.

CONSTRUCTION

Soils used in the construction of the existing new dairy pad have utilised the soils assessed and tested at the site in the intensive dairy development investigation, with all works remaining consistent with the required methodology. There are minimal further earthworks remaining to be undertaken at the site, with those works isolated to final grading of the site and completion of the car parking area and access road at the new dairy.

OPERATION

The appended Effluent Management Plan describes the use of effluent and manure in relation to soils and nutrient balancing. In summary, soils outside the new dairy site but within the property need to be considered in terms of their suitability for effluent and manure utilisation. The property, as previously described, is a well laid out irrigation property that has been land formed with slopes suitable for pasture and cropping use. The irrigation areas are connected to drainage and recycle systems which ensure that any run-off of nutrients applied are captured for re-use within the property.

The effluent system connected to the existing dairy operation and the proposed dairy is an existing system. On-going site soils analysis and total nutrient balances are reviewed annually as part of the sites Environment Protection Licence. The operation continues to work very closely with a dairy based agronomist and utilise a very strategic approach to managing crop and land requirements. This important relationship will continue with advice considered and applied for incorporation of the proposed effluent and manure systems.

6.3.1. MITIGATION, MANAGEMENT AND MONITORING MEASURES

Mitigation and monitoring measures relating to the project construction and operation will be implemented to minimise potential soil impacts. These are shown in the table below.

Table 6-8 - Soil mitigation, management and monitoring measures

ID	Potential Impact	Timing	Safeguard
S1	Failure due to dispersive soils	Construction	Soils must be adequately compacted to reduce water ingress and air space for soil to occupy water. Free water will cause clay fines to remain in suspension and be prone to washing or erosion on embankments. Dispersive soils should be avoided for finishing embankments. Topsoil spreading and gypsum

ID	Potential Impact	Timing	Safeguard
			stabilisation are necessary to reduce the chances of occurrence when using dispersive clays.
S2	Erosion due to sodic sub soils	Construction	Topsoil is required to be placed over sodic soils. Where required and identified by Geotech, Gypsum may be used to assist with stabilisation.
S3	Erosion due to sodic sub soils	Operation	Vegetation in the form of grasses should be established on topsoiled embankments.

6.3.2. CONCLUSION

The investigation into the soil suitability for the intensive dairy development and effluent management system followed the Australian Standard AS1726-2017 and included geotechnical testing and soil analysis. The construction of the new dairy pad used the tested soils, with minimal earthworks remaining for final grading and roadwork.

The operation involves ongoing soil analysis and nutrient balancing to ensure effective effluent and manure management. These measures are monitored as part of the site's Environmental Protection Licence. Mitigation measures are in place to address potential soil impacts during construction and operation, including stabilizing dispersive soils and preventing erosion through proper soil compaction, gypsum use, and vegetation establishment.

6.4. BIODIVERSITY

6.4.1. METHODOLOGY

The previous Environmental Impact Statement, (PRS, 2020) for the intensive dairy system, included a detailed assessment to assess and identify potential impacts to biodiversity as part of the construction or operation of the dairy activities at the site. Specifically, the project considered potential impacts to threatened species, populations, communities and biosecurity.

The assessment methodology used for that assessment included :

- Background review including:
  - Database searches of Bionet, EPBC Protected Matters, NSW DPI – Fisheries,
  - BOSET report,
  - Desktop assessment and
  - Review of 2020 Assessment conducted for the EIS.
- Site inspection including:
  - Presence of mature trees with hollows, fissures and/or other suitable roosting/nesting places,
  - Presence of hollow logs/debris and areas of dense leaf litter,
  - The presence of preferred feed tree species,
  - Condition, flow and water quality of drainage lines and bodies of water,
  - Plant Community Type and condition,
  - Presence of fruiting flora species and blossoming flora species, particularly winter flowering species,
  - Vegetation connectivity and proximity to neighbouring areas of vegetation,
  - Presence of caves, hollow trees and/or man-made structures suitable as bat roost sites,
  - Native flora species and vegetation communities present,
  - Opportunistic fauna sightings, and
  - Weed species present and their abundance.
- Five part test considering the presence of habitat, likelihood of occurrence and possible impact to the species.

6.4.2. ASSESSMENT FINDINGS

The desktop searches undertaken (**Appendix 5**), and site inspections reviewed the proposed new dairy area with relation to the NSW Biodiversity Values mapping and any clearing required as part of the project works. Due to the location of the project and construction methodology proposed, no clearing of native vegetation is required, and it has been determined that Biodiversity Development Assessment Report (BDAR) is not required and the NSW 'Five part test' assessment has been applied.

The 'Five part test' has been undertaken following collation of database records, species and community profiles reviewing species known to occur within the area and with the potential to be impacted by the project construction or operation.

In summary the attached searches identified the following:

- No native vegetation of any form requires removal as part of the project works and no dead limbs, fallen timber or logs are proposed for removal within the works site.
- There are thirteen different listed Threatened Ecological Communities within the area. The site is mapped as Not Native – not one of the nine Endangered Ecological Communities (EEC) identified in the desktop search and this mapping is consistent with the site.

Figure 6-18 – Site overview showing mapped Plant Community Type of the project area

- The Protected Matters Search Tool (PMST) identified 12 flora species with the potential to occur within 10km of the property.
- PMST and the Bionet searches identified two amphibians, one insect, eighteen birds, seven aquatic, two reptile, one bat and two mammals with the potential to occur within 10km of the property. A review of those species recorded within the area was undertaken with additional consideration given to those recorded in close proximity. This assessment did not identify any species at risk as a result of the operation on the basis that the mitigation measures are employed. Information on these is provided below.
- Hygiene protocols (for both weeds and pathogens) are proposed at all sites to ensure disturbed areas aren't colonised by exotic species, preventing potential long-term impacts.

Table 6-9 - Table summarising species identified in searches

Scientific Name	Common Name	Level of Threat		Record Source	Record Type	Comment
		NSW Status	C'wlth Status			
Amphibian						
Crinia sloanei	Sloane's Froglet	V	E	P	May occur in area	No ground disturbance proposed within any potential habitat.
Litoria raniformis	Southern Bell Frog	E	V	P	May occur in area	No ground disturbance proposed within any potential habitat.
Insect						
Synemon plana	Golden Sun Moth	E	E	P	May occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Reptile						
Hemiaspis damelii	Grey Snake	E	E	P	May occur in Surrounds	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	P	May occur in Surrounds	Habitat required for this species not identified at site.

Scientific Name	Common Name	Level of Threat		Record Source	Record Type	Comment
		NSW Status	C'wlth Status			
Aves						
Botaurus poiciloptilus	Australasian Bittern	E	E	P, B	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Rostratula australis	Australian Painted Snipe	E	E	P, B	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Neophema chrysostoma	Blue-winged Parrot	V	V	P	Known to occur in Area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Recorded in 10km area	Recorded in 10km area	V	NL	B	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	NL	Listed Migratory	P	Known to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Burhinus grallarius	Bush Stone-curlew	E	NL	B	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Tringa nebularia	Common Greenshank	NL	Listed Migratory	P,B	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Calidris ferruginea	Curlew Sandpiper	E	CE	P,	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Stagonopleura guttata	Diamond Firetail	V	NL	P, B	Known to occur in area	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as part of this application
Stictonetta naevosa	Freckled Duck	V	NL	B	Recorded in 10km area	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as part of this application
Falco hypoleucos	Grey Falcon	E	NL	P	Likely to occur in area	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as part of this application
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern sbsp)	V	NL	B	Recorded in 10km area	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as part of this application
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V	NL	P	Known to occur in area	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as part of this application
Gallinago hardwickii	Lataham's Snipe	NL	Listed Migratory	P,B	Recorded in 10km area	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as part of this application
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	NL	P	May to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Grantiella picta	Painted Honeyeater	V	V	P	Known occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.

Scientific Name	Common Name	Level of Threat		Record Source	Record Type	Comment
		NSW Status	C'wlth Status			
Pedionomus torquatus	Plains-wanderer	E	CE	P	Likely to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Calidris acuminata	Sharp-tailed Sandpiper	NL	Listed Migratory	P	Known to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Aphelocephala leucopsis	Southern Whiteface	V	V	P	Likely to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Circus assimilis	Spotted Harrier	V	NL	B	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Polytelis swainsonii	*Superb Parrot*	V	V	B	Recorded in 10km area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Lathamus discolor	Swift Parrot	E	CE	B	Recorded in 10km area	Project works do not require the removal of vegetation and will not alter the adjoining area that may support this species. No change to the potential nesting, feeding or utilisation area for this species.
Epthianura albifrons	White-fronted Chat	V	NL	B	Likely to occur	Project works do not require the removal of vegetation and will not alter the adjoining area that may support this species. No change to the potential nesting, feeding or utilisation area for this species.
Hirundapus caudacutus	White-throated Needletail	NL	V	P	May occur in area	Project works do not require the removal of vegetation and will not alter the adjoining area that may support this species. No change to the potential nesting, feeding or utilisation area for this species.
Fish						
Galaxias rostratus	Flathead Galaxias	CE	CE	P	Likely to occur in area	The site is not a lake, wetland, backwater or billabong. There is no watercourse or aquatic vegetation within the vicinity.
Maccullochella peelii	Murray Cod	NL	V	P	Known to occur in area	The site is not a lake, wetland, backwater or billabong. There is no watercourse or aquatic vegetation within the vicinity.
Macquaria australasica	Macquarie Perch	E	E	P	May occur in area	The site is not a lake, wetland, backwater or billabong. There is no watercourse or aquatic vegetation within the vicinity.
Bidyanus bidyanus	Silver Perch	V	CE	P	Known to occur in area	The site is not a lake, wetland, backwater or billabong. There is no watercourse or aquatic vegetation within the vicinity.
Craterocephalus fluviatilis	Murray Hardyhead	CE	E	P	May occur in area	The site is not a lake, wetland, backwater or billabong. There is no watercourse or aquatic vegetation within the vicinity.
Maccullochella macquariensis	Trout Cod	V	NL	P	Known to occur in area	The site is not a lake, wetland, backwater or billabong. There is no watercourse or aquatic vegetation within the vicinity.
Mammals						
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	P	May occur in area	Project works do not require the removal of vegetation and will not alter the adjoining area that may support this species. No change to the potential nesting, feeding or utilisation area for this species.
Phascolarctos cinereus	Koala	V	V	P	Known to occur in area	Project works do not require the removal of vegetation and will not alter the adjoining area that may support this species. No change to the potential nesting, feeding or utilisation area for this species.
Bat						
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	P	May occur in area	Project works do not require the removal of vegetation and will not alter the adjoining area that may support this species. No change to the potential nesting, feeding or utilisation area for this species.

Scientific Name	Common Name	Level of Threat		Record Source	Record Type	Comment
		NSW Status	C'wlth Status			
Flora						
Austrostipa wakoolica	A spear-grass	E	E	P	May occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Maireana cheelii	Chariot Wheels	V	V	P	May occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Amphibromus fluitans	Floating Swamp Wallaby-grass	V	V	P	Known to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Pterostylis despectans	Lowly Greenhood		E	P	May occur in surrounds	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Brachyscome muelleroides	Mueller Daisy, Max Mueller's Burr-daisy, Claypan Daisy	V	E	P	Known to occur in surrounds	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Pimelea spinescens	Plains Rice-flower	NL	CE	P	May occur in surrounds	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Swainsona plagiotropis	Red Darling Pea	V	V	P	Likely to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Myriophyllum porcatum	Rigid Water-milfoil	NL	V	P	Likely to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Swainsona murrayana	Slender Darling Pea	V	V	P	Likely to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Senecio behrianus	Stiff Groundsel, Behr's Groundsel		E	P	May occur in surrounds	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Sclerolaena napiformis	Turnip Copperburr	E	E	P	Known to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Lepidium monoplocoides	Winged Peppercress	E	E	P	Likely to occur in area	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.

A Five Part Test has been provided below.

FIVE PART TEST

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The new dairy is proposed within the current irrigation area and adjoining the existing dairy operations footprint. The construction works relating to the dairy and the access, have been nearly completed as part of the existing approval works. The area of the new dairy has not been identified as a utilisation area for any threatened species. There no standing vegetation located within the site and no native remnant vegetation proposed for removal. There are no impacts proposed with relation to surrounding hollow bearing trees, feed trees or fallen timber, therefore, it is unlikely that the modification works or operational change will have an adverse effect on the life cycle of any species or place any species or population at the risk of extinction.

(b) in the case of an endangered ecological community (EEC) or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

There are thirteen threatened ecological communities that have been identified in the searches of the general area. Plant Community Type mapping and a site inspection identified the Plant Community Type as being 'Non-Native' which is not an EEC. No activities proposed will have an adverse effect that will place an EEC at the risk of extinction either locally or otherwise nor will it modify the composition of any EEC.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

A review of the new dairy site and adjoining works area with relation to its potential habitat values for threatened species or an ecological community has determined that the site is unlikely to contain suitable resources or be of value for the species with potential to occur within the area.

The proposed construction works do not propose the removal of standing trees from the site and works will not fragment existing vegetation within the area. The modification of the site will not impact on identified threatened species or and communities within the site or broader area.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).

The site does not lie within and will not affect a declared area of outstanding biodiversity value.

(e) whether the proposed development or activity is or is part of a key threatening process (KTP) or is likely to increase the impact of a key threatening process.

Key Threatening Processes from the EPBC, BC or FM Acts are considered as part of this assessment and one KTP has been identified, this being – "Invasion of native plant communities by exotic perennial grasses" identified as a low potential processes. Management of the site will continue to manage exotic perennial grasses within the area as part of ongoing property management activities.

6.4.3. MANAGEMENT AND MITIGATION

The assessment reviewed the project works in relation to threatened species, populations, communities and biodiversity and has recommended the following mitigation and management measures.

Table 6-10 – Biodiversity mitigation and monitoring measures

	Potential Impact	Timing	Safeguard
B1	Native vegetation accidentally cleared	Pre-construction	No vegetation is proposed for clearing and there are no remnant vegetation areas within the vicinity. All contractors will remain within the works area or adjoining it.
B2	Hollow-bearing tree removal	Pre-construction	No native vegetation or hollow-bearing trees are to be removed as part of the project works.
B3	Weed and pathogen management	Pre-construction	Machinery must be inspected and cleaned prior to entering and leaving the site to ensure that weed seeds and propagules are not imported or spread to unaffected areas.
B4	Vegetation outside site impacted by works	Pre-construction	Erosion and Sediment Controls must be prepared and put in place prior to any soil disturbance occurring to minimise potential water quality impacts during construction.
B5	Site and surrounding areas contaminated due to chemical spill	Pre-construction	Measures to prevent and contain spillage of potential contaminants must be implemented.

	Potential Impact	Timing	Safeguard
B6	Vegetation Clearing	Construction	Only areas of groundcover within the work site are to be removed – all compounds, excavations and access tracks are to be located within the approved existing dairy parking and access areas.
B7	Vegetation impacted by altered drainage or mobile silt	Construction	Construction areas are to be stabilised as soon as practicable (progressively where possible).
B8	Impacts on surrounding Native Vegetation	Construction	Measures to prevent and contain spillage of potential contaminants must be implemented.
B9	Vegetation impacted by chemical spill or contamination	Construction	In the event of a spill or contamination at the site, all works must cease, and the spill management procedure implemented immediately.
B10	Water quality risks	Construction	Any pollution of the waterway or site must be reported to the EPA in accordance with the notification requirements of the Protection of the Environment Operations Act 1997
B11	Indirect impacts	Construction	Construction confined to project area within the current dairy operations footprint. Speed limits are followed throughout property access to site. Erosion and Sediment controls are followed, and vegetation of banks is undertaken as soon as practicable following completion.
B12	Weed proliferation	Construction	Construction related traffic will utilise existing site accesses and internal roads, thus minimising the area of disturbance of the development on farm. A 'come-clean go-clean' practice will be utilised for all vehicles, machinery and operators. Any outbreaks of weeds identified will be managed appropriately (such as through spot spraying) to control weed occurrence and minimise the risk of spread. The management of weeds forms part of the Best Management Practices (BMP) adopted on the farm.
B13	Weed proliferation	Operation	The site will be regularly monitored and maintained to control the growth of weeds. Such practices will occur as part of ongoing farm maintenance operations, which are currently conducted regularly across the properties.

6.4.4. CONCLUSION

A desktop assessment updated from the original EIS has been undertaken on the project area reviewing database searches for threatened species, populations and communities with the potential to occur within the new dairy site and surrounding area (10km). A review of these results to identify their potential requirements was undertaken through on-going site visual inspections and the species likelihood to utilise the site.

The project construction and operation activities are proposed within a significantly modified and disturbed area which is mapped as a 'Non-native' plant community type that is dominated by introduced grasses and an absence of forbes, shrubs and standing vegetation.

Assessments to determine the scale of impact of the project to the listed communities concluded that a significant impact was not likely and therefore an Assessment of Significance or Environment Protection and Biodiversity Conservation Act (EPBC) referral is not required. Similarly, the applicant is not required to voluntarily enter the Biodiversity Offset Scheme.

No threatened flora or fauna species are known to be directly impacted by the project construction or operation. Threatened species considered likely to inhabit or utilise the dairy area were assessed in accordance with the NSW Biodiversity Conservation Act, Fisheries Management Act and Commonwealth EPBC Act as applicable.

Mitigation and management measures are aimed at ensuring that the project works do not impact biodiversity through the spread of weeds and pathogens, and other indirect impacts. With the effective implementation of management and mitigation measures identified in this assessment, risk of impacts to biodiversity is considered negligible.

6.5. INDIGENOUS HERITAGE

6.5.1. METHODOLOGY

The new dairy site and associated areas have been previously assessed as part of the original intensive dairy site application. This assessment was undertaken by McCardle Cultural Heritage Pty Ltd' qualified and suitably experienced Archaeologist.

An updated AHIMS search was undertaken to review any changes to the recorded sites in the vicinity of the new dairy infrastructure with no change to the results since the initial searches and assessment. As the proposed dairy site is located within the footprint inspected, assessed and consulted on previously, no further site inspection was considered to be required. A copy of the updated AHIMs has been provided in **Appendix 6b**. A Due Diligence Assessment of the works is provided in the following section.

6.5.2. ASSESSMENT FINDINGS

This updated assessment has been completed using reference to the attached original Assessment and the below described searches and assessments and utilising the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW,* DECCW. This code of practice is used to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP).

The *National Parks and Wildlife Act 1974* (NPW Act) provides that a person who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later unknowingly harm an object without an AHIP.

STEP 1 – WILL THE ACTIVITY DISTURB THE GROUND SURFACE OR ANY CULTURALLY MODIFIED TREES?

Disturbance of the ground surface is often significant when machinery is used to dig, grade, bulldoze, scrap, plough, or drill the ground surface for the purpose of building a structure or removing vegetation. If an activity will disturb the ground surface, there is a higher likelihood that Aboriginal objects will be harmed.

COMMENT

The project activities have and will disturb the ground surface within existing irrigation area through the undertaking of minor earthworks and construction activities as described in **Section 3**. No culturally modified trees are present in the area and the entire site has been previously modified with all modifications being significant and remaining clear and discernible. ➡ **Proceed to Step 2a - Check the AHIMS database**

STEP 2A – SEARCH THE AHIMS DATABASE AND USE ANY OTHER SOURCES OF INFORMATION WHICH MAY BE AVAILABLE.

A search the AHIMS database must be undertaken to check whether any Aboriginal sites have been recorded in the area of the Project. If the results of the initial AHIMS search indicates that AHIMS contains information about recorded Aboriginal objects in the area of the proposed activity, a copy of these records must be obtained. After obtaining the records from AHIMS of any recorded Aboriginal objects, these objects should be confirmed that they are located in the area where the activity is proposed.

COMMENT

An updated basic AHIMS search has been completed and identified that no previously recorded Aboriginal heritage sites or objects are recorded on the AHIMS database in the disturbance area or related title. ➡ **Proceed to Step 2b – other information sources**

STEP 2B. ARE THERE ANY OTHER SOURCES OF INFORMATION OF WHICH A PERSON IS ALREADY AWARE?

If there are any other sources of information, these need to be used to identify whether or not Aboriginal objects are likely to be present in the area. Other sources of information can include previous studies, reports or surveys which have been commissioned or are otherwise aware of.

COMMENT

Archaeological assessments relating to the local area have been reviewed with the only relative assessment undertaken relating to the project area being the operation EIS Due Diligence Report. ➡ **Proceed to Step 2c – landscape features.**

STEP 2C – ACTIVITIES IN THE AREAS WHERE LANDSCAPE FEATURES INDICATE THE PRESENCE OF ABORIGINAL OBJECTS

Regardless of whether the AHIMS search indicates known Aboriginal objects, consideration of whether Aboriginal objects are likely to be in the area of the proposed activity need to be made having regard to the above-described landscape features.

If after completing steps 2a and 2b it is reasonable to conclude that there are no known Aboriginal objects or a low probability of objects occurring in the area of the proposed activity, you can proceed with caution without applying for an AHIP.

COMMENT

The project area is not located within 200m of any potentially sensitive landscape feature. ➡ **If yes to 2a), 2b) or 2c) - Proceed to Q3 – Avoidance of Harm. Project does not trigger further assessment as all answers to section 2 are 'No'. Therefore ➡ Proceed with caution and with reference to the existing Due Diligence Assessment.**

6.5.3. MANAGEMENT AND MITIGATION MEASURES

All contractors on site should be aware of their obligations under the *NSW National Parks and Wildlife Act 1974.* The following must be followed should any item or object be revealed on the site during project works.

Table 6-11 – Indigenous heritage mitigation and monitoring measures

Potential Impact	Timing	Safeguard
Unexpected finds	Construction	1. All ground surface disturbance in the area of the find(s) will cease immediately following the discovery or potential discovery of a find and a. The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted and ensure that there is no further harm to the object, b. The discoverer of the find(s) will secure the area and prevent equipment or personnel from entering the area except in accordance with this protocol, and c. The site supervisor/project manager will be informed of the find(s). 2. If finds are suspected to be human skeletal remains, then NSW Police and Heritage NSW will be contacted as a matter of priority and the procedure for Unexpected Discovery of Possible Human Skeletal Remains should be followed. 3. Where a discovery is made, with approval from the relevant party, a heritage specialist will be engaged to assess the Aboriginal place or object encountered, a Representative from any Registered Aboriginal Party and Local Aboriginal Land Council for the project may also be engaged to assess the cultural significance of the place or object as part of the obligations of the AHIP assessment process. 4. The following process must be followed: a. Immediately notify the following authorities or personnel of the discovery if not already done so: i. Heritage NSW (Environment Line: 131 555); and ii. Relevant Aboriginal Community Representatives, including the Local Aboriginal Land Council. b. Facilitate, in co-operation by an appropriately qualified person with the appropriate authorities and relevant Aboriginal community representatives: i. The recording and assessment of the finds;
Unexpected finds	Construction	

Potential Impact	Timing	Safeguard
		ii. Fulfilling any legal constraints arising from the find(s). This will include complying with Heritage NSW directions; and iii. The development and conduct of appropriate management strategies. Strategies will depend on consultation with stakeholders, the assessment of the significance of the find(s) and the relevant permits. 5. Re-commencement of ground disturbing works may only resume in the area of the find(s) following compliance with any consequential legal requirements and gaining written approval from Heritage NSW.

6.5.4. CONCLUSION

An assessment utilising the original detailed Aboriginal Cultural Heritage Assessment, prepared by a suitably qualified archaeologist, and reviewed and approved by Heritage NSW included the works area for the new dairy. A further assessment utilising the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* considered recent searches of the AHIMS system and confirmed that that the project works area, consistent with the previous assessment is not located within 200m of any known landscape feature. A search of the AHIMS database showed that there are no recorded sites within the works area at the site or its surroundings.

Works proposed are contained within areas that have been subject to previous significant ground disturbance that remains clear and discernible. The results of both the Aboriginal Cultural Heritage Assessment, and the Due Diligence Assessment both concluded that works should proceed with caution and noted that if any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed project works, the project manager/project co-ordinator/project owner must:

- *Not further harm the object,*
- *Immediately cease all work at the particular location,*
- *Secure the area so as to avoid further harm to the Aboriginal object,*
- *Notify Heritage NSW as soon as practical on 131555, providing any details of the Aboriginal object and its location*
- *Not recommence any work at the particular location unless authorised in writing by the Heritage NSW.*

In the event that skeletal remains are unexpectedly encountered during the activity, work must stop immediately, the area secured to prevent unauthorised access and NSW Police and Heritage NSW contacted.

No works identified or harmed any Aboriginal artifact.

6.6. NON-INDIGENOUS HERITAGE

6.6.1. METHODOLOGY

The methodology utilised to assess the project in relation to non-indigenous heritage replicated that previously undertaken at this site and is as follows:

1. Undertake heritage searches of the related area to confirm no additional items have been listed since application for the intensive dairy.
2. Record results of the searches for future reference.
3. Where searches identify listed item, review item in relation to project activities, and
4. Identify project management and mitigation measures to minimise any identified impacts.

The results of the searches and assessment have been included below.

6.6.2. RESULTS

Searches have been completed on 23 May 2025 of the following available lists and registers:

- National Heritage List (Commonwealth of Australia, 2025),
- Commonwealth Heritage List (Australian Government Dept. of Environment and Energy, 2025),
- NSW State Heritage Register (Heritage, Search for NSW Heritage, 2025),
- State Heritage Inventory (Heritage, Search for NSW Heritage, 2025), and
- *Murray LEP 2012* (New South Wales Government, 2025).

A copy of these searches and results has been included in **Appendix 6A** and further discussed below.

6.6.3. EXISTING ENVIRONMENT AND ASSESSMENT

A search undertaken of the World, Commonwealth, National and State Heritage registers did not identify any listed items at or within the vicinity of the new dairy.

A search undertaken of the *Murray LEP 2011* identifies two listed heritage items within the local area. The identified sites include the Moira Station woolshed (listing I58) and the Moira Station Homestead (listing I57). Additional information was sought on these listings from local Council however there was no additional information available on their listings. The listed sites are shown below to identify their vicinity to the new dairy site.

Figure 6-19 - Project site in relation to Heritage Sites

Both the Moira Woolshed (south-west) and the Moira Homestead (south south-east) are located 2.1km from the new dairy site. The woolshed is currently in a serious state of disrepair with no current use, however the homestead is owned by the Applicant and will continue to be utilised as a residence and part time tourism site.

No works are proposed to be undertaken within the area of these sites and due to separation distances, there are no impacts expected on these buildings as a result of the project.

6.6.4. MITIGATION, MANAGEMENT AND MONITORING MEASURES

Table 6-12 – Non-indigenous heritage mitigation, management and monitoring measures

ID	Potential Impact	Timing	Safeguard
NI1	Damage to unknown heritage item.	Construction	Staff working on site during construction will be instructed to stop work immediately on identification of any suspected heritage artefact.
NI2	Identification of heritage item within construction area.	Construction	If any unexpected archaeological remains are discovered during construction, work will stop immediately in the vicinity of the material/find and specialist advice from a suitably qualified heritage consultant will be sought.

6.6.5. CONCLUSION

The methodology employed to assess the project's impact on non-Indigenous heritage included heritage searches, record-keeping, and impact assessment. Extensive searches were conducted across multiple heritage lists and registers, including the National Heritage List, Commonwealth Heritage List, NSW State Heritage Register, State Heritage Inventory, and the Murray LEP 2011. The results of these searches confirmed that there are no listed heritage items within the immediate vicinity of the operation or directly within the adjoining area that would be impacted by the proposed project activities.

The assessment indicates that the nearest recorded heritage sites are Moira Woolshed (south-west) and Moira Homestead (south-southeast) located 2.1km from the new dairy site. Due to the significant separation distances, no adverse impacts on these sites are expected from the project. Operational activities and construction works will not encroach upon or affect these distant sites. Overall, the assessment confirms that the project will not adversely affect known non-Indigenous heritage sites, and appropriate measures are in place to address any unexpected finds during construction.

6.7. AIR QUALITY AND ODOUR

6.7.1. METHODOLOGY

Air quality is considered in both the construction and operation phase separately. The construction phase of the project considers impacts to air quality in relation to minor dust generating activities. The operation of the project considers the new dairy in relation to dust and potential odour generation.

DUST

Dust generation or particulate matter is the main air quality issue relevant to the construction of the project. Particulate matter refers to a category of airborne particulates, typically less than 30 microns (µm) in diameter and ranging down to 0.1µm. This type of dust is termed Total Suspended Particulates (TSP).

Emissions of particulate matter less than 10µm (termed as PM_{10} and $PM_{2.5}$ in the following subsections) are considered to be an important influence on human health as it has the ability to penetrate the respiratory system and can cause cardiovascular and respiratory diseases, pulmonary and heart diseases as well as reduced lung capacity.

Particles that are too large to remain in suspension in the air are referred to as ‘deposited dust’ and are typically greater than 35µm in diameter. These particles lack the ability to cause significant harm to human health, however they can contribute to reductions in amenity and therefore are considered as part of this section.

A review of the Air Quality Index for the site indicates that there are no recording sites within 40km with the nearest site located at Deniliquin being a significant distance to the north.

ODOUR

A review of the existing intensive dairy Odour Assessment has been undertaken to determine any sensitive receptors that may be impacted by the relocation of a major portion of the milking activities on the new dairy site. Where appropriate, this will assess and recommend management actions including:

- Identify and describe the change to potential sources of odour within the operation,
- Identify potential sensitive receivers in relation to the new dairy site,
- Where relevant, determine appropriate buffer distances for the operation utilising the S factor methodology,
- Describe the control methods proposed to manage potential odour sources, and
- As far as reasonably practical, manage potential odour generation at the site.

6.7.2. EXISTING ENVIRONMENT

BACKGROUND AIR QUALITY

The new dairy as described above is located in a rural area where air quality is generally considered to be of good quality and being influenced mainly by agricultural activities such as ploughing, sowing and harvesting. The site is unlikely to be influenced by emissions from vehicles travelling through the area. The general landscape is flat and subject to occasional dust storms generated from western dry regions which can exceed recommended concentrations of dust in the environment.

The existing operation of the site includes the use of a both freestall and loose housing systems as part of its herd management and nutritional practices. There have been no known or recorded complaints from any source in relation to the current operation. This is consistent with the nearest unowned residence (R11) being located over 4kms from the existing site. (see **Figure 6-22** below for receptor location).

The 'S factor' or Tier 1 assessment of the potential odour buffer distance for the existing operation calculated a distance of between 807m (NSW) and 973m (Victoria) which were considered and applied as part of the intensive dairy assessment.

Table 6-13 - Operation buffer distance calculations

Receptor	Distance	S1		S2		S3		S4		S5		Buffer	
	(m)	N	V	N	V	N	V	N	V	N	V	NSW	VIC
R1	332			0.3	1	1	1	0.9	1	1	-	807	973
R2	625			0.3	1	1	1	0.9	1	1	-	807	973
R3	1,057			0.3	1	1	1	0.9	1	1	-	807	973
R4	1,438			0.3	0.2	1	1	0.9	1	1	-	161	195
R5	1,661			0.3	1	1	1	0.9	1	1	-	807	973
R6	1,832			0.3	1	1	1	0.9	1	1	-	807	973
R7	1,880			0.3	1	1	1	0.9	1	1	-	807	973
R8	1,850			0.3	1	1	1	0.9	1	1	-	807	973
R9	2,618	65	20	0.3	1	1	1	0.9	1	1	-	807	973
R10	2,665			0.3	1	1	1	0.9	1	1	-	807	973
R11	2,785			0.3	1	1	1	0.9	1	1	-	807	973
R12	3,192			0.3	1	1	1	0.9	1	1	-	807	973
R13	3,100			0.3	1	1	1	0.9	1	1	-	807	973
Moira Forest	927			0.05	0.1	1	1	0.9	1	1	-	134	97
Cobb Hwy	620			0.05	0.1	1	1	0.9	1	1	-	134	97
Boundary	505												

REGIONAL SOURCES

These sources may affect air quality on either a local or regional scale. Airborne particulate (dust) sources in the vicinity of the project area includes:

- Mechanical land disturbance from surrounding pastoral properties (eg. clearing of vegetation, tillage),
- Vehicle movement along unsealed roads, tracks and paddocks,
- Livestock movements and overstocking, and
- Burning and incineration of crops in agricultural areas.

SENSITIVE RECEIVERS

As identified in the replicated below, there are eleven rural residences located within 5km of the dairy, a workshop and a camping hut. Of these, ten are owned by the Applicant. The distances from the existing dairy and the proposed dairy are provided in **Table 6-14** below.

Figure 6-20 – Map identifying dairy operations in relation to dwellings. Black outline is buildings, green is property boundary (Source: PRS QGIS)

Table 6-14 – Receptors in the vicinity of the project

ID	Type	From existing		From new	
		Distance	Direction	Distance	Direction
R1	Yarrimbah House 1[1]	100m	N	418m	NE
R2	Yarrimbah House 2[1]	895m	S-SE	635m	S-SE
R3	'Cotswold Park' Staff House[1]	820m	NE	1,009m,	N-NE
R4	Moira PID Workshop[3]	1,670m	SE	1,410m	S - SE
R5	Rural Residence @ 'Moira'[1]	2,155m	S	1,955m	S
R6	Rural Residence - 'Cotswold Park' [2]	1,820m	N - NW	1,570m	N
R7	'Moira' temporary stay buildings[1]	2,310m	S - SE	2,050m	SE
R8	'Moira' Homestead[1]	2,370m	S - SE	2,150m	SE
R9	'Moira Downs' House[1]	3,625m	W	3,800m	W
R10	'Cotswold Park' North house[2]	2,895m	N - NW	3,105m	N
R11	Rural Residence – Owned by staff member	3,880m	W - SW	4,080m	W-SW
R12	'Moira Downs' House[1]	3,319m	NW	3,655m	NW
R13	Weekend Camping Hut – no power[3]	4,390m	SW	4,440m	SW
	Moira State Forest	695m	E	480m	E
	Cobb Hwy	520m	E	345m	E
	Property Boundary[1]	450m	E	250m	E

1 – Owned by Applicant.
2 – Owned by family.
3 – Temporary occupation.

In undertaking a review of the location of the new dairy in relation to the existing dairy on the site, the assessment determined that there are no externally owned dwellings that will have a reduced distance between the sites existing and proposed operation. The Moira PID workshop area, being periodically utilised for occasional attendance, will be 260m closer to the dairy operations, however dwellings not owned will be located between 50m and 210m further away from the current activities.

6.7.3. ASSESSMENT

POTENTIAL SOURCES OF AIR CONTAMINANTS

CONSTRUCTION SOURCES

A wide range of construction activities can generate dust and are usually visible and readily identifiable. The potential sources of airborne particulates from the site have been assessed as being limited to:

- Dust lift off from exposed earthen areas, open areas or finished surfaces prior to occupation or use, or
- Dust lift off from internal roads and tracks resulting from light and heavy vehicle traffic.

The majority of any airborne particulates from the sites are likely to be visible dust. Proposed activities that would generate particulate matter include the following:

- Construction activities (graders, tractor),
- Vehicle movements on unsealed roads, and/or
- Wind erosion from exposed earthworks.

POTENTIAL CONSTRUCTION IMPACTS

IMPACT ON AMENITY

In dry, windy conditions particulates can be lifted from open or disturbed areas resulting in visible dust emissions. Most airborne particulates that originate from these sources are larger than PM_{10} and are associated with nuisance rather than public health problems. The larger particles tend to settle back to the ground within a short range (<300m) from the source. Dust emissions of this type can cause reduced amenity of an area and reduce visibility for road traffic, potentially creating unsafe driving conditions.

The protection of and welfare of the staff, cows and calves within the operation will ensure that the dust from minor construction activities is managed. Based on the short period of time for these works, impacts are unlikely to be generated, however dust management through the use of a water cart can be utilised if necessary.

VEHICLE EMISSIONS

The operation of construction plant and equipment will result in additional exhaust emissions in the area. The number of vehicles, plant and equipment to be used as part of the construction phase is considered to be low and would not substantially increase emissions.

SENSITIVE RECEIVERS IN THE VICINITY OF THE PROJECT

There are no receivers identified as a residence in the receiving environment relevant for the project in relation to dust lift. The Cobb Highway is located within 300m of the east of the existing access road although is separated from the highway by vegetation. Where required, a water truck will be utilised to manage potential dust lift from the track.

POTENTIAL OPERATION IMPACTS

DUST

Dust may be generated through mobilization of soil from internal access roads surrounding the site. It is anticipated that the existing roads surrounding the site will be maintained throughout the life of the operation. During dusty periods, lower speed limits can be enforced to manage dust lift of these areas. It is important to note that minimising dust impacts on the calves and cows within the operation is an important animal welfare consideration and key management strategy.

ODOUR

As shown above, a 'S factor' (Tier 1) assessment has been undertaken in consideration of the existing intensive dairy operation which has calculated the required separation distance in relation to receptors. This assessment nominated a minimum separation distance of between 807 and 973m from the site. All externally owned receptors exceed 1,410m (Moira Workshop) with the nearest externally owned dwelling 1,570m. The existing Odour Assessment and Management Plan completed as part of the intensive dairy development will continue to be utilised with relation to the sites operational activities.

Residents within the close vicinity of the project or identified with the potential for impact by the change in operation have been consulted by the Applicant with all residents understanding and supportive of the project. Residents that have not been identified as being impacted by the operation change or are located outside of the proposed buffer area have not been consulted.

6.7.4. MITIGATION, MANAGEMENT AND MONITORING MEASURES

Mitigation and monitoring measures relating to the project construction and operation will be implemented to minimise potential dust and air quality impacts. These are shown in the table below.

Table 6-15 – Air quality mitigation, management, and monitoring measures

Item No	Potential Impact	Timing	Safeguard
A1	General air quality impacts	Pre-construction	Inductions for all employees will include information on: • Location of project receivers, • Potential sources of dust, • Monitoring of dust during construction activities, • Mitigation measures for managing dust, and • Speed limits onsite and staying on designated roads.
A2	Dust emissions impact on surrounding site	Construction	Monitor wind and weather forecasts (Bureau of Meteorology) and cease non-essential construction operations (i.e. topsoil stripping) during excessively windy conditions. (1)
A3	Dust emissions from open and exposed areas	Construction	Minimise open areas exposed to wind erosion as much as practical and carrying out stabilisation works.
A4	Dust emissions from high traffic areas and roads	Construction	Operate at least one dedicated water truck during dry, windy conditions and when necessary, during the summer months apply to unsealed operational areas (i.e. roads and loading areas).
A5	Dust lift from finished construction site	Construction	After re-establishment of the soil profile (post construction), vegetative cover will be established within 8 months, as part of the progressive rehabilitation program.
A6	Excessive dust from vehicles accessing site	Construction	Adhere to site speed limits and designated roads.
A7	Exhaust emissions	Construction	Construction plant and equipment must be maintained in good working, serviced order.
A8	Excessive exhaust emissions and high machinery work loads	Construction	All plant and equipment must be of adequate size to undertake work proposed.
A9	Odour identified at receptors surrounding site	Operation	Odour management plan to be reviewed and systems put in place.

(1) Shut down periods during excessively windy conditions will be determined following a risk assessment of impact to various sensitive receivers, including employees and animals on site and motorists on adjacent public roads.

6.7.5. CONCLUSION

The air quality assessment for this project addresses both the minor works as part of the construction and the operation phases, with a focus on dust and odour management. During construction, minor dust generation is identified as the primary concern, with control measures to minimize dust within the access tracks and ensure the health and safety of workers and cows and calves within the operational area.

In the operational phase, the focus continues with managing minor dust from access tracks and odour generated by the dairy system. An “S-Factor’ or Tier 1 Odour Assessment was been conducted, which lead to the development of an Odour Management Plan that included identifying sources, sensitive receivers, and appropriate buffer distances using the ‘S factor’ methodology. That assessment has determined that the existing air quality is good, primarily influenced by agricultural activities. The site will maintain existing roads and implement measures to control dust during dry periods.

Overall, the project incorporates comprehensive mitigation, management, and monitoring measures to minimize air quality impacts during both construction and operation, ensuring compliance with environmental standards and maintaining the amenity of the surrounding area.

6.8. NOISE AND VIBRATION

6.8.1. METHODOLOGY

The methodology utilised as part of this assessment is as follows:

- Describe the existing environment in relation to noise,
- Identify the noise and vibration generating activities, and
- Propose mitigation measures to manage project impacts.

The project does not require the undertaking of any vibrating causing machinery as part of its construction or operation. There is no drilling, driving or blasting proposed. As a result, there is no assessment of vibration in the following section.

Noise is considered in two sections being for the construction and operation phases of the project.

6.8.2. EXISTING ENVIRONMENT

The site is located in a rural area dominated by agricultural activities. The broader farming area contains rural residences with the closest residents consulted as part of the planning process. The existing sources of noise in the vicinity of the site are from existing dairy operations, general road traffic noise and farming machinery operation. It is acknowledged that this project is in an agricultural area where there are adverse amenity related impacts possibly occurring from time to time including from noise, heavy vehicle movements and 24-hour farming operations.

No complaints or issues have been raised as part of the original construction or ongoing operation of the site.

CONSTRUCTION

Activities that will generate noise on the site will vary depending on the type of construction activity proposed. As described earlier, the new dairy will be built in a single stage with different activities proposed as part of the build. These are minor earthworks, dairy shed erection and shed fit out and infrastructure connections. In terms of noise generating activities, the earthworks proposed will be the largest potential contributor to noise and will occur over a 1-week period.

6.8.3. ASSESSMENT

CONSTRUCTION

The construction works will be undertaken in a single stage with most of the noise generating equipment operating during the earthworks. During any given period, items of plant operating within the site would operate at maximum power (loudest sound emitting) for only brief periods of time.

It is highly unlikely that any plant utilized as part of the construction activities would be operating at their maximum sound power levels at any one time. Several items of plant would not be on location at the same time due to the type of activities that they perform.

Typical equipment noise levels, presented in **Table 6-16** below have been obtained from:

- AS2436-2010, *Guide to noise and vibration control on construction, demolition and maintenance sites*
- BS 5228-1, *Code of practice for noise and vibration control on construction and open sites. Noise.*
- *Environmental management guidelines for the dairy industry*, NSWDPI, 2008

Table 6-16 - Typical noise levels of construction plant and equipment

Item of Plant	Project stage use	A-weighted sound power levels L_{wa} re: 10^{-12}W		
		Typical Range	Typical (midpoint)	A-weighted SPL dB @ 10m
Tractor	All	95-100	90	76
Mobile Crane	Construction	95-113	104	76
Concrete truck	Construction	107-111	109	76
Concrete pump truck	Construction	103-113	108	80
Excavator	Construction	97-117	105	79
Grader	Construction	105-115	105	82
Trencher	Construction	95-102	97	
Truck – Water cart style	Construction	106-108	107	
Truck (>20 T)	All	107	105	
Vehicle – 4WD style	All	100-111	105	
Loader	All	98-110	105	85
Hand Tools (Grinders etc)	All	96-100	98	74

Item of Plant	Project stage use	A-weighted sound power levels L_{wa} re: 10^{-12}W		
		Typical Range	Typical (midpoint)	A-weighted SPL dB @ 10m
Generator	All	68 - 80	73	71
Feed Mixing	Operation	98	92	76
Cattle bellowing	Operation	70[1]	103[2]	-
Water Pump	Operation	85	81	65

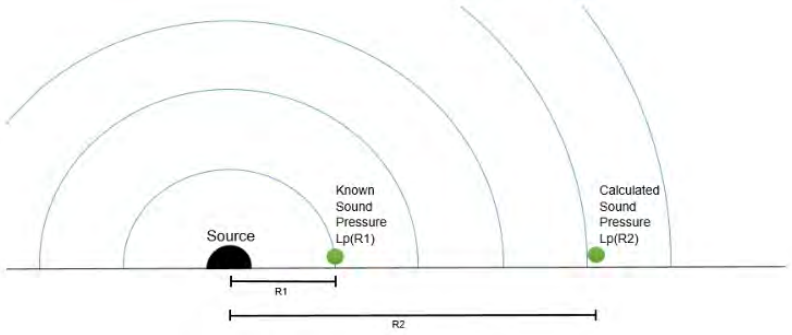
1 - Cattle can generate a sound power level of 70dB(A) (Terra Sciences, 1997).

2 - If all cows bellowed simultaneously the SPL is estimated at 103 dB(A).

A review of the proposed machinery and operation noise has been undertaken in accordance with the above criteria in line with project construction and operation activities. Noise impacts associated with the project were estimated using the Sound Attenuation Equation as follows:

$$\mathbf{Lp(R2) = Lp(R1) - 20\ Log_{10}(R2/R1)}$$

Where:
Lp(R1) = SPL at initial location
LP(R2) – SPL at the receiver
R1 = Distance from the noise source
R2 = Distance from the noise source to the receiver



As previously identified, the nearest externally owned or operated receptor (R4) is located just over 1,410m from the new dairy site. Reviewing the topography which includes several stands of dense vegetation between the site and the receptor, the highest noise emitting equipment the calculated decibel rating at the receptor during construction will be 42dB being below in excess of the industry construction noise limit of 40 dB (A) required by the *NSW Interim Construction Noise Guidelines 2009* for non-Standard working hours. It remains within the limits for standard working hours which are in line with those proposed on this site.

OPERATION

The operation of the new dairy is unlikely to alter from the current noise generating activities. These existing activities include milk tanker pick ups, pump operations, flood washing and general cow activities. The timing of these activities will vary depending on season and meeting best practice cattle welfare requirements, however, milking activities and cow access to the new dairy could commence as early as 2:30AM and finish as late as 9PM pending milking times and cow number. Maintenance activities will only occur during the day period.

To date, there has been no noise complaints received at for relating to the dairy and the site operations maintain a good relationship with their closest neighbours who are either staff working at the Moira workshop, family or employees living in the adjoining houses.

6.8.4. MITIGATION, MANAGEMENT AND MONITORING MEASURES

As identified above, the predicted noise emitting activities for both the construction and operation stages of the project will not exceed the noise generation limits for day time construction. The following mitigation measures are proposed to ensure that the project remains consistent with baseline information utilised during the assessment.

Mitigation and monitoring measures relating to the project construction and operation will be implemented to minimise potential noise impacts. These are shown in the table below.

Table 6-17 – Noise mitigation, management and monitoring measures

ID No	Potential Impact	Timing	Safeguard
N1	**Noise impacts at receptor**	Construction	• Ensure that all machinery is regularly serviced and has appropriate noise abatement devices. All equipment selected for use on site will be regularly monitored to minimise noise emissions with any excessively noisy equipment stood down until issue rectified. • Machines, where practical, will not operate at full power and will be switched off when left for long periods of time. • Machines that are appropriate for undertaking the works are selected and not under or oversized for the works.
N2	**Noise impacts at receptor**	Operation	• Ensure that all machinery is regularly serviced and has appropriate noise abatement devices. All equipment selected for use on site will be regularly monitored to minimise noise emissions with any excessively noisy equipment stood down until issue rectified. • Machines, where practical, will not operate at full power and will be switched off when left for long periods of time. • Machines that are appropriate for undertaking the works are selected and not under or over sized for the works.

6.8.5. CONCLUSION

The site, located in a rural agricultural area, currently experiences noise from dairy operations, road traffic, and farming machinery. The construction phase anticipates various activities such as earthworks and infrastructure development and has been assessed for noise generation using industry standard noise levels and assessment methods. With the closest receptor in excess of 1,000 meters, the nearest dwelling over 1,500 meters away and considering the topography and vegetation, the predicted noise levels during construction are within acceptable limits. Similarly, the operational phase is not expected to deviate significantly from current noise-generating activities.

To ensure compliance with noise generation limits, a set of mitigation, management, and monitoring measures have been proposed. These measures aim to minimize potential noise impacts, ensuring the project's consistency with the baseline information used in the assessment. Through regular servicing of machinery, appropriate selection of equipment, and practical operational practices, the project is poised to maintain noise emissions within acceptable thresholds, thereby safeguarding the amenity of the surrounding environment.

6.9. TRAFFIC AND ACCESS

6.9.1. EXISTING ENVIRONMENT

The road network supplying major access to the project site consists of one road being the Cobb Hwy (shown in red below) carrying traffic from Deniliquin to Moama and Victoria. The property also shares a boundary with the Moama-Deniliquin rail line with access crossing to the Mathoura Line Rd which can be utilised for emergency access and normal farming activities. Properties in the ownership of the applicant are shown outlined in yellow with the project shown in green.

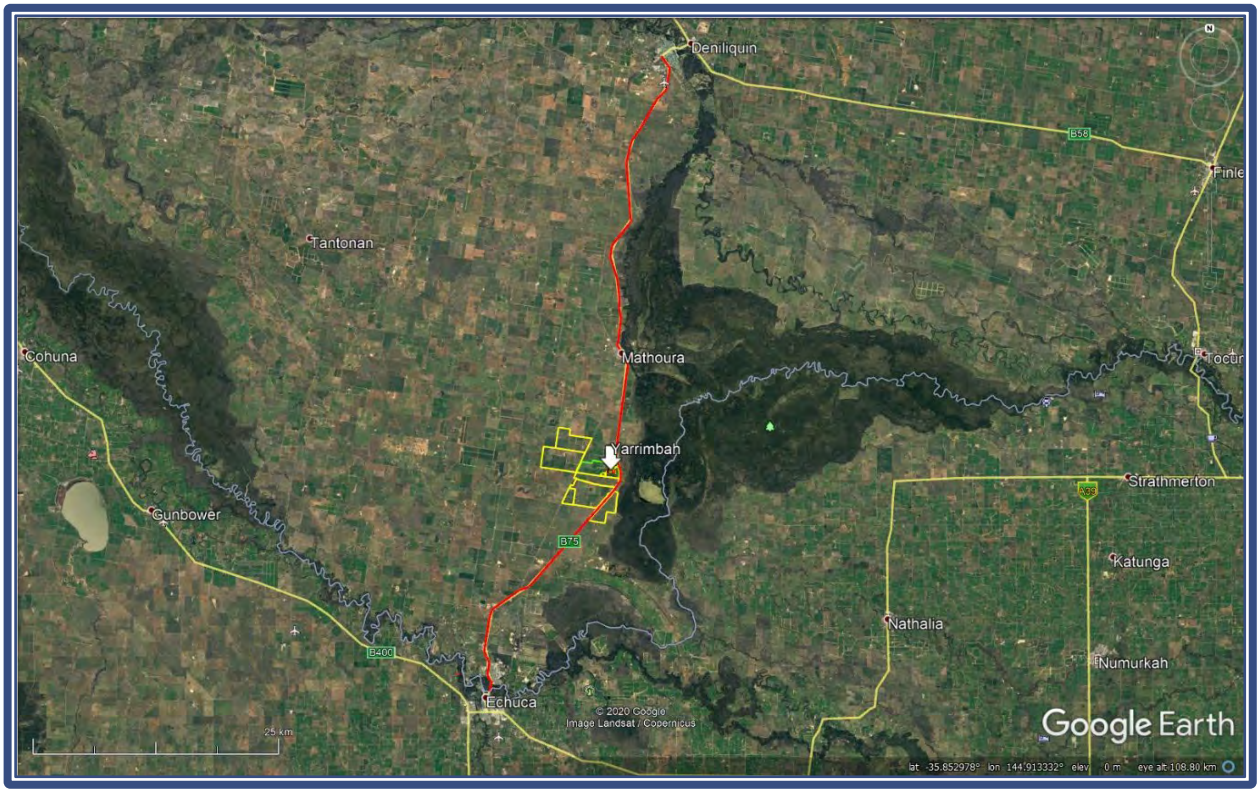


Figure 6-21 - Overview map identifying existing roads and access to the project

The Cobb Hwy is a State-owned Road being classified for the following vehicle use:

- Type 1 A-double
- Modular B-triple
- AB-triple
- Type 1 Rigid truck and 2 dog Trailers

The existing access to the site is located within a 100km/h speed zone and has a minimum 700m long straight view in either direction from the driveway access. The existing driveway entrance which was upgraded as part of the intensive dairy operation with a Basic Access Left is currently utilised for B-double and Type 1 A-double access.

6.9.2. ASSESSMENT

Traffic movements will vary between the construction and operation of the project. A description and assessment of the traffic volume and behaviour has been further described below.

CONSTRUCTION

The construction works proposed for the project will be undertaken in a single stage as described above. There are no additional items of plant and equipment that are proposed for the earthworks as all activities relating to this will be completed with plant owned and held on site.

The delivery trucks for infrastructure and plant and equipment and materials will require two movements per day being an entry and exit from the site. Staff and contractors will minimise vehicle movements wherever possible by vehicle pooling to site.

Table 6-18 – Traffic movements for construction plant and equipment

Class	Phase	Machinery	Number	Daily Vehicle Movements	Project Life Movements
Light	Shed Construction (16 weeks)	Staff and Drivers	4	2	640
	Shed and infrastructure Fit Out (20 weeks)	Staff and Installers	4	2	800
Heavy	Shed Construction	Cranes	2	1	4
	Shed Construction	Boom Lift	2		4
	Shed Construction	Scissor lift	3		4

Class	Phase	Machinery	Number	Daily Vehicle Movements	Project Life Movements
	Shed Construction	Semi Truck (Shed delivery)	6		12
	Shed Construction	Med Rigid Truck (Shed Delivery)	2		4
	Shed Fit Out	Concrete	30	6	60
	Shed Fit Out	Material Delivery (Milk equip)	8		16
Total	**Light**	**All**			**1,440**
	Heavy	**All**			**104**
	Total All	**All**			**1,544**

*Denotes equipment that will be delivered on semi-trailer trucks – oversize but unpiloted.

It is likely that construction of the project will generate up to a total of 1,440 additional light vehicle movements for the period during building construction and fit out. This estimates a maximum average of 8 daily additional light vehicles to and from the site. Due to the construction timeframe, the activities will occur over an estimated 36 week period.

There are estimated to be a total of 104 heavy vehicle movements required over the life of the project. These movements relate to the delivery of materials to site with the major movements being for concrete delivery (57%). It is estimated that there will be a maximum of six heavy vehicle movements in a day relating to the delivery of concrete to site with a very minor increase in heavy vehicle traffic on the Highway. No heavy vehicles are proposed to be over-height and will not exceed 3.5m in width. All deliveries will occur in daylight hours with most before 8AM.

It is estimated that the vehicle movements will be to and from the south of the project site on the Cobb Hwy travelling through the towns of Barmah and Echuca-Moama. Contractors utilised from outside the region will utilise accommodation in Moama although nearly all contractors from the existing operation will be re-engaged – all of whom are local.

OPERATION

The proposed operation of the site will remain unchanged from the current operation. There are no changes proposed to the light or heavy vehicle movements as the new dairy will fulfill the operational requirements of the existing operation.

6.9.3. MITIGATION, MANAGEMENT AND MONITORING MEASURES

Mitigation and monitoring measures relating to the project construction and on-going operation will be implemented to minimise potential impacts traffic. These are shown in the table below.

Table 6-19 – Traffic mitigation, management and monitoring measures

ID No	Potential Impact	Timing	Safeguard
T1	Impacts to road traffic network	Construction	All construction traffic is to utilise the existing well-formed entrance to the property. No additional unauthorised access is permitted as part of the project works.
T2	Increase to traffic volume	Construction	All staff are to carpool wherever possible and it is safe to do so to avoid additional traffic volumes related to the project works.
T3	Road user safety	Construction	Delivery of materials and machinery to site should avoid busy timeframes (8AM-5PM) and school bus scheduling.
T4	Increase in traffic volume	Operation	Where possible, staff will carpool to site where it is practical and safe to do so. Shifts will be scheduled to minimise the requirement for additional traffic and road use.

6.9.4. CONCLUSION

This assessment involved a review of the original Environmental Impact Assessment (PRS, 2020), along with referral assessment comments and potential traffic generation due to proposed modifications. It examined both construction and operational phases, utilizing operation times and construction equipment data to gauge potential impacts.

The existing operation is accessed by light vehicles which mainly transport staff, and heavy vehicles which handle livestock and supplies, following approved routes. The access roads to the dairy system, largely within 100km/h speed zones, were found to be adequate, with no significant historical issues.

The construction phase will see fluctuating traffic movements, with heavy equipment delivered to the site and remaining there until project completion. An estimated 104 heavy vehicle movements are expected over the 36-week construction period.

Operational traffic will be unchanged as the new dairy, replaces the existing dairy production with no change proposed to the number, timing or size of the vehicles connected to the site. The existing access (BAL) will be utilised and remain unchanged.

Mitigation, management, and monitoring measures are recommended to minimize traffic impacts. These include maintaining designated entry routes for heavy vehicles and carpooling for staff. Overall, the assessment concludes that the new dairy construction activity will increase localised traffic on the Cobb Highway without significant adverse impacts on the local road network, provided that the suggested safeguards are implemented. Operational traffic movements and the timing, once the dairy is constructed, will remain unchanged.

6.10. WASTE

6.10.1. METHODOLOGY

Waste and litter management must be recognized due to the impact poor waste management could have on the environmental performance of the construction and operation of the project. This section applies to all activities conducted during the construction and operation of the project.

The strategy identifies a waste hierarchy (shown below) providing guidance on the order of preference of approaches to achieve efficient resource use.

This section proposes to identify potential general waste production during both construction and operation together with the predicted volumes and management of waste produced. The manure and effluent management assessment is not included in this section as it is considered a beneficial by-product. Details on the management of manure and effluent is covered in detail above in **Section 3.3.6 and Appendix 7.**

6.10.2. ASSESSMENT

The strategy of waste and litter management within the business for both construction and operation is as follows:

- To minimize waste production,
- To identify waste types and quantities on site,
- To maximise the beneficial use of production waste material for site construction and rehabilitation activities,
- To identify potential re-use or recycling opportunities and ensure appropriate handling and collection procedures are in place,
- To investigate methods to minimise waste generated by the project and implement reasonable and feasible measures to minimise waste,
- To ensure the disposal of wastes conforms to applicable guidelines or licences,
- To ensure areas where fuels, oils or other potential contaminants are stored and are appropriately bunded, and
- To ensure sewerage disposal does not degrade the wastewater utilisation area.

Areas for temporary waste storage will be located at the vehicle parking area adjoining the new dairy, which once construction is complete, will be utilised for staff and visitor parking during the operation of the project.

WASTE IDENTIFICATION

The waste types that the project is expected to generate can be categorised as construction and operation wastes.

CONSTRUCTION

Construction wastes expected to be generated by the development are likely to consist of:

- General domestic wastes from on-site construction which include lunch wrappers, cans, small boxes etc,
- Routine maintenance consumables including used grease tubes, rags, drums etc, and
- General construction generated waste including off-cuts, used pallets and packaging.

The following table provides detail around which construction phase will generate each waste stream.

Table 6-20 - Construction waste generation by type and phase

Waste Type	General Waste	Routine Maintenance	General Construction Waste	Estimated skip bins (3m x 3m)
Earthworks	Yes	Yes	No	<1
Shed Construction	Yes	Yes	Yes	2
Shed Fit Out	Yes	No	Yes	3

All contractors selected for infrastructure construction activities will be utilising detailed design drawings with materials specifically cut to size or built to match ordered length (eg steel length and gates). As a result, the waste generation from the construction activities is predicted to be minimal. As identified above, the construction wastes from the project area estimated to total less than six - 3m x 3m skip bins. All recycle suitable waste will be removed from the site and recycled through the relevant process.

OPERATION

Wastes will be generated during the project operation however will remain consistent with the current operation as this dairy effectively replaces the existing one in nearly all of its volume and use. The predicted waste types being consistent with the operation include:

- General domestic type waste e.g., lunch wrappers, cans, small boxes etc. There is no predicted change in volume of this type of waste.
- Amenities wastewater. A separate land capability assessment is being undertaken and a Section 68 application will be submitted relating to the proposed septic system.
- Routine maintenance consumables. A minor increase in maintenance will be generated due to the new dairy being a larger capacity dairy. Where possible, oils, filter socks and drums and boxes will be recycled. Where this is not, waste will be disposed of through the correct disposal process.
- Manure and effluent generated within the new dairy area – manure and effluent wastes management is detailed in the preceding sections.
- Silage plastic and forage management waste – There is no change proposed to the existing feed and forage management and there is no plans to utilise feeding in the new dairy.

6.10.3. MITIGATION, MANAGEMENT AND MONITORING MEASURES

Mitigation and monitoring measures relating to the project construction and operation will be implemented to minimise potential impacts from waste. These are shown in the table below.

Table 6-21 – Waste mitigation, management and monitoring measures

ID No	Potential Impact	Timing	Safeguard
W1	Contamination of waste and recycling.	Pre-construction	Construction staff are to undergo site induction including waste management procedures.
W2	Ineffective use of waste systems and storage.	Pre-construction	Waste areas will be clearly identified with clear instructions on the waste separation information.
W3	Site contamination and ineffective waste management.	Construction	Waste is to be disposed of by appropriate measures (Ie not buried on site)
W4	Site contamination and ineffective waste management	Operation	Waste is to be disposed of by appropriate measures (Ie not buried on site)
W5	Excess waste created	Construction	Waste minimisation strategies are to be employed and recycling undertaken where possible.

ID No	Potential Impact	Timing	Safeguard
W6	Disturbance of visual amenity	Construction	All works are to be confined within the project construction footprint. All waste, vehicles, plant and equipment are to be stored in identified laydown area and will be removed from the site at project completion.
W7	Contamination of waterways, streams and land	Operation	Manure and effluent are to be directed and managed through the controlled drainage system. All solids stored prior to use are to be stored within the constructed and drained manure processing area.
W8	Contamination of waterways, streams and land	Operation	Effluent and manure are to only be utilised within paddock areas during suitable times for plant and soil utilisation. Irrigation drainage and recycle areas must ensure that run-off from the site does not leave the property.
W9	Nutrient overload of area	Operation	Ongoing continued soil testing and agronomic advice utilised to review operation application rates, crop types and utilisation of applied waste products.
W10	Adjoining land uses impacted by waste application	Operation	Effluent and manure should only be applied in areas as recommended by the annual nutrient report and with agronomic advice. Where manure is exported, this must be undertaken in line with any agreement or order in place.

6.10.4. CONCLUSION

Effective waste and litter management is essential to maintaining the environmental performance of the new dairy during both construction and operation phases. This assessment outlines a strategy based on the NSW waste hierarchy to guide efficient resource use and minimize waste production. The proposed measures include identifying waste types and quantities, maximizing the beneficial use of waste materials, and exploring recycling opportunities. A separate application relating to the new septic system will be submitted to attend to land capability and management of staff amenity wastewater.

During construction, the expected waste types range from general domestic waste to routine maintenance consumables and general construction waste. The implementation of detailed design drawings and material specifications will help minimize waste generation. The operational phase will similarly generate various waste types, including general domestic waste and maintenance consumables. The existing intensive dairy waste management system will accommodate the additional wastes, with an emphasis on recycling and proper disposal methods.

Mitigation, management, and monitoring measures have been identified to address potential impacts from waste. These measures include staff training, clear identification of waste areas, proper disposal methods, and strategies to minimize waste generation and site contamination. The project also includes specific safeguards for managing manure and effluent to prevent contamination of waterways and land.

By adhering to these measures, the project aims to maintain environmental integrity and uphold the principles of sustainable waste management throughout its lifecycle.

6.11. VISUAL AMENITY

6.11.1. METHODOLOGY

It is noted at the outset that the value placed upon visual amenity and that impacts upon surrounding visual amenity varies from person to person and from location to location. As a result, a visual amenity assessment is, by its nature, highly subjective. Emphasis has therefore been placed on providing a description of the existing visual amenity surrounding the dairy site and the measures that are being undertaken by the Applicant to minimise potential visual amenity-related impacts on surrounding residents and others.

6.11.2. EXISTING ENVIRONMENT

Agriculture is responsible for a significant part of the growth and development of the district and evidence of cleared land and other agricultural activities dominate the existing landscape. Structures such as rural houses, farm sheds, irrigation infrastructure, grain silos and water storage dams are common in the rural environment.

Public vantage points of the property are solely from the Cobb Hwy by passing vehicles. As previously identified, the Cobb Hwy is located at its closest point over 0.5kms from the project site. The area is screened by existing stands of remnant native vegetation between the site and the Highway.

Figure 6-22 - Image showing the view towards the site from the Cobb Hwy (At 1m high)

The existing dairy operation, including the intensive dairy housing sheds are located on the property both between the Cobb Hwy and the Moira PID irrigation channel and west of the Moira channel. The proposed new dairy together will be located close of the Moira PID channel and at a distance of over 350m from the highway screened by the existing vegetation.

Within a 5km radius of the project there is only one residential building not owned by the applicant, and their direct family, being nearly 3.4km from the site. The view from this receptor towards the project site is interrupted by existing infrastructure and several stands of native vegetation.

6.11.3. ASSESSMENT

As identified above, infrastructure such as sheds and irrigation channels and dams are common in this area. There is significant separation distances identified between the proposal and public vantage points and adjoining residences not owned by the Applicant's operation. As a result, it is unlikely that the proposal will impact on the visual amenity of the site either during construction or operation.

6.11.4. MITIGATION, MANAGEMENT AND MONITORING MEASURES

Mitigation and monitoring measures relating to the construction and operation will be implemented to minimise potential visual impacts. These are shown in the table below.

Table 6-22 – Visual impact mitigation, management and monitoring measures

ID No	Potential Impact	Timing	Safeguard
V1	Visual amenity disturbed through construction.	Construction	All works are to be confined within the property area adjoining the site. All waste, vehicles, plant and equipment are to be stored in identified laydown areas and will be removed from the site at construction completion.
V2	Public vantage points impacted from construction activities	Construction	Existing vegetation will be utilised (and remain undisturbed) to provide screening for the works area.

ID No	Potential Impact	Timing	Safeguard
V3	Waste escaping from works site	Construction	All waste will be managed in accordance with waste mitigation measures identified.

6.11.5. CONCLUSION

The assessment of visual amenity for this application recognizes the inherent subjectivity in evaluating visual impacts, as perceptions can vary greatly among individuals and locations. Consequently, the assessment focuses on describing the existing visual landscape and the mitigation measures planned to minimize visual impact on the surrounding residents and areas.

The existing environment is characterized by agricultural activities, with common features such as rural houses, farm sheds, and irrigation infrastructure. The dairy site is well-screened by stands of vegetation and maintains limited visibility from the adjoining highway. There is no visibility of the site from nearby residences.

The assessment concludes that given the significant separation distances and the screening provided by vegetation, the new farm building for the dairy is unlikely to impact visual amenity during construction or operation. Mitigation measures will be implemented to ensure that construction activities are confined and screened, and that the site is maintained in a clean and orderly condition throughout its operation, preserving the visual integrity of the surrounding area.

7. CONCLUSION

The following provides a justification of the project and a summary of the conclusions drawn throughout this report.

7.1. JUSTIFICATION

This Statement of Environmental Effects has reviewed a range of environmental factors that may be affected by the proposed new dairy construction and operation. No native vegetation is proposed for removal and no impacts to threatened species, populations or communities has been identified. Works are proposed within a previously modified environment and away from recorded Aboriginal Heritage items. There are no identified impacts identified on surrounding properties as a result of air and odour, dust, noise, lighting or visual amenity.

The application and proposal align with and supports the existing agricultural use on the site and objectives of the local Primary Production zone. The application also provides the ability for the operation to implement advanced milking techniques and which supports the existing approved intensive dairy operation within the farming system.

7.2. STATUTORY

A review of the project works has been undertaken with relation to Commonwealth, State, Regional and Local planning in NSW. The assessment and related reports have been prepared to address the identified requirements and any matters of concern raised throughout the consultation process.

The project meets the requirements of the RU1 Zone – Primary Production of the Murray Local Environment Plan 2011. review of the project works has been undertaken with relation to Commonwealth, State, Regional and Local planning in NSW. The assessment and related reports have been prepared to address the identified requirements and any matters of concern raised throughout the consultation process.

The project meets the requirements of the RU1 Zone – Primary Production of the *Murray Local Environment Plan 2011*.

7.3. SUMMARY

This Statement of Environmental Effects (SEE) has been prepared in accordance with the provisions of the Environmental Planning and Assessment Act 1979, and the Environmental Planning and Assessment Regulation, 2021 requiring an environmental assessment of the project to be undertaken and provided with the development application.

Consideration of Commonwealth, State and Local planning provisions has also been included in this assessment.

The objectives of the intensive dairy system including the new dairy are to:

- To sustainably increase cow numbers utilising a state of the art dairy freestall housing system that incorporates best management practices for cow welfare and biosecurity. This includes producing a balanced volume and quality milk product.
- To consider and better utilise the built and natural environment within the farming operation.
- To decrease grazing impacts to farming areas and minimise environmental impacts on the farming system.
- To better utilise the existing farming operation system including value adding produce grown and re-using waste products within the system.
- To establish additional employment opportunities within the region including developing opportunities for dairy specific skills.

The construction of the new dairy system will support the existing system to meet the above objectives. This application has reviewed and addressed a range of issues which will can be mitigated through careful management of the construction and operation of the site.

The design and management requirements of the project has considered matters raised by the relevant consent authorities. This assessment identifies that the project should proceed, as it will:

- Support the increase in the operation sustainability for future generations including a stable and dependable production of milk of high quality,
- Reduce pressures on the existing environment from intensive animal grazing including an increase in water use efficiency,
- Result in no long-term impacts on the environment or local community, and
- Satisfy sustainable development principles.

On the basis of the assessments and investigations completed, and with the implementation of the recommended mitigation measures, the project is considered justified.

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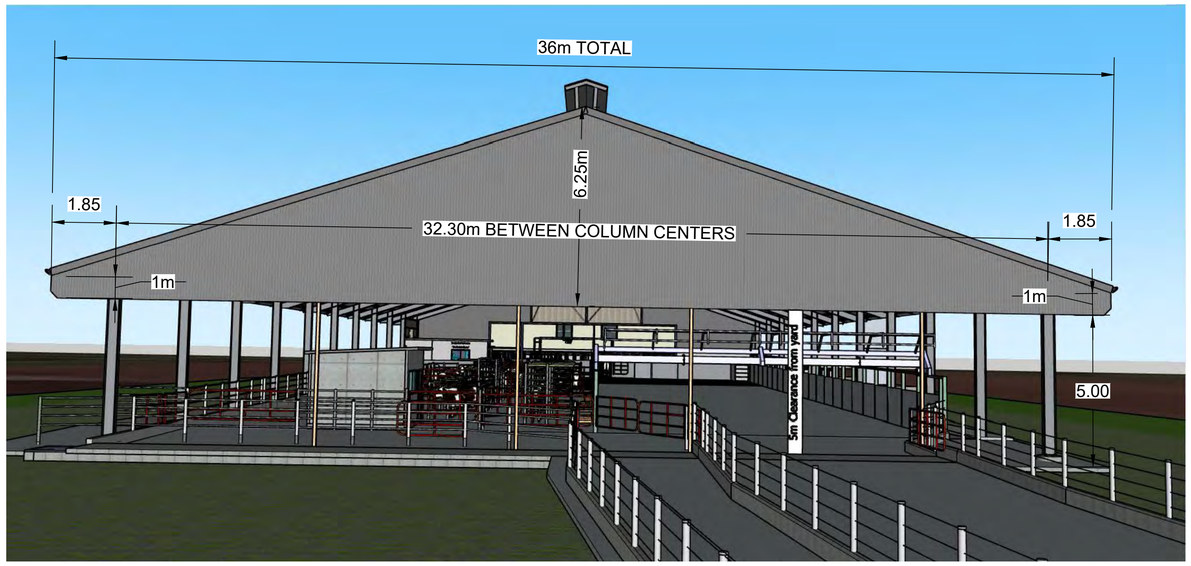
9. APPENDICES

APPENDIX 1 – PROJECT PLANS

Please see page 3 for detailed list of project plans

YARRIMBAH DAIRY SHED
DIMENSIONS
NOT TO SCALE



JC SURVEYS

JC SURVEYS PTY LTD
MOAMA NSW 2731
MOB: 0429 897 289,
Email: chris@jcsurveys.com.au
Web: jcsurveys.com.au
ABN: 54 672 449 955

GENERAL NOTES:
ALL LEVELS ARE IN METERS UNLESS OTHERWISE STATED.

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

LOCATION OF SERVICES 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 CONSTRUCTION.

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.

REV	DATE	DESCRIPTION

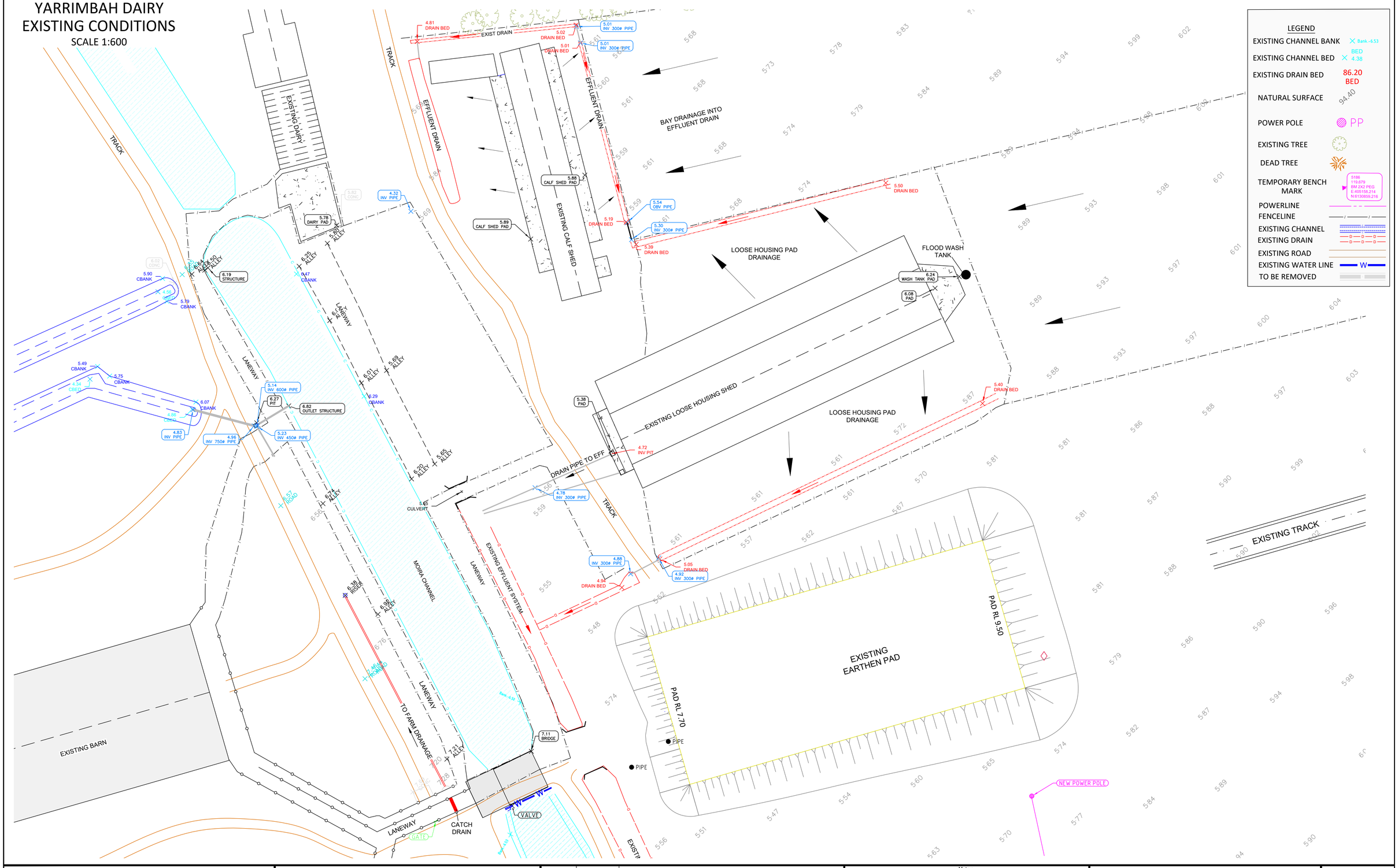
NS GRID	PLAN
CONTOURS	FINAL
SURVEYED BY J.C.H	DRAWN BY J.C.H

CLIENT: RAY SMITH

JOB NAME: YARRIMBAH DAIRY SHED DIMENSIONS
ADDRESS: 2813 COBB HIGHWAY MATHOURA
CROWN ALLOTMENT: LOT 2 DP1077844

DRAWING NUMBER	DATE	SHEET NUMBER
JC0023	26/05/25	1 OF 1

YARRIMBAH DAIRY
EXISTING CONDITIONS
SCALE 1:600



LEGEND

- EXISTING CHANNEL BANK — Bank--6.53
- EXISTING CHANNEL BED — BED 4.38
- EXISTING DRAIN BED — 86.20 BED
- NATURAL SURFACE — 94.40
- POWER POLE — PP
- EXISTING TREE
- DEAD TREE
- TEMPORARY BENCH MARK — 5186, 119.679, BM 2X2 PEG, E:405158.214, N:6130859.216
- POWERLINE
- FENCELINE
- EXISTING CHANNEL
- EXISTING DRAIN
- EXISTING ROAD
- EXISTING WATER LINE — W
- TO BE REMOVED

JC SURVEYS PTY LTD

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Web: jcsurveys.com.au

ABN: 54 672 449 955

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REV	DATE	DESCRIPTION

Meters: 18 0 18 36
1:600

DATUM: SS 4827 - RL 107.927 AHD, GDA94 ZONE 55
ADD 100.00m TO PLAN FOR AHD

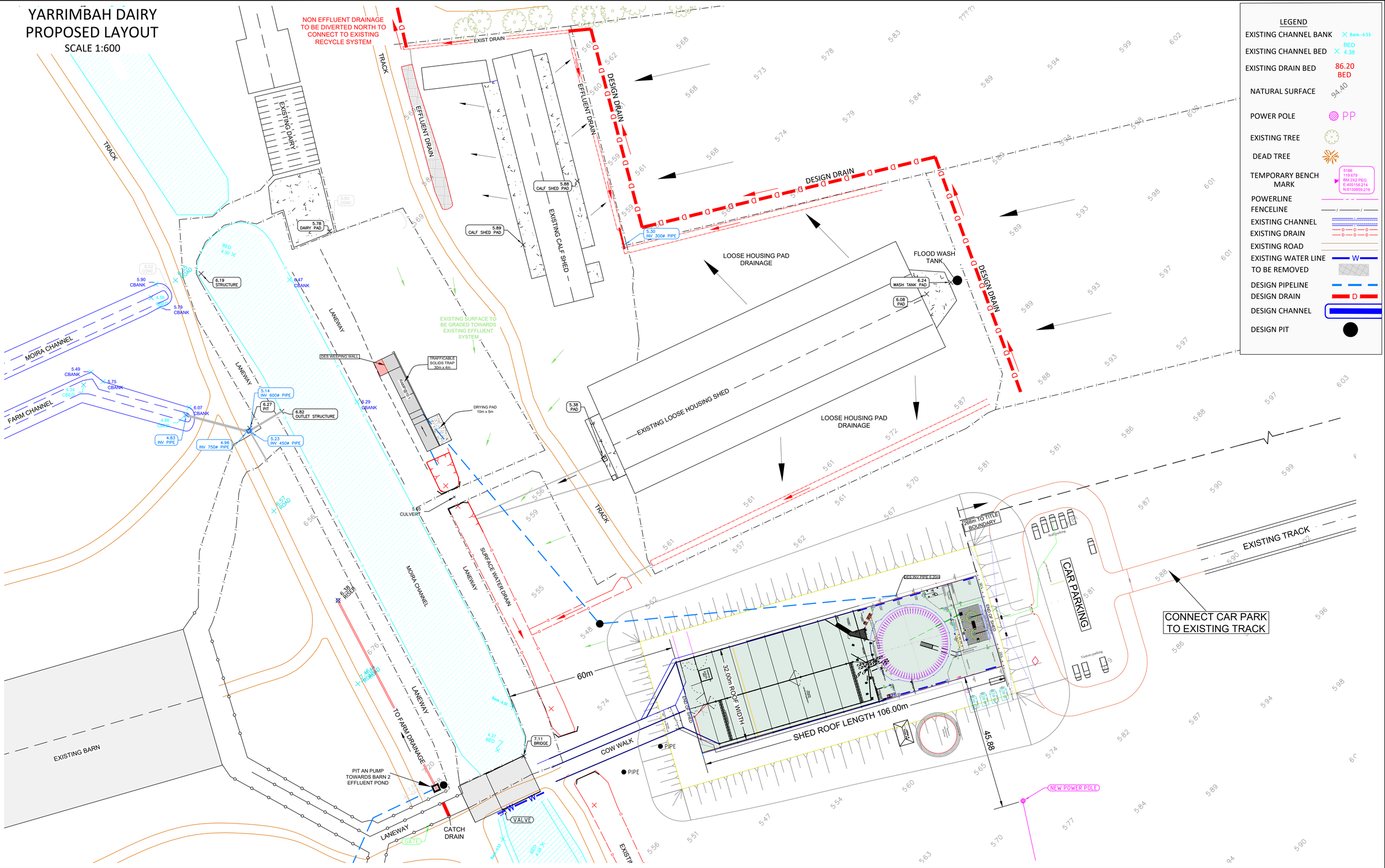
NS GRID	25m x 25m	PLAN
CONTOURS	@ 0.20m	FINAL
SURVEYED BY J.C.H		DRAWN BY J.C.H

CLIENT: RAY SMITH

JOB NAME: YARRIMBAH DAIRY EXISTING CONDITIONS
ADDRESS: 2813 COBB HIGHWAY MATHOURA
CROWN ALLOTMENT: LOT 2 DP1077844

DRAWING NUMBER	DATE	SHEET NUMBER
JC0023	26/05/25	1 OF 1

YARRIMBAH DAIRY
PROPOSED LAYOUT
SCALE 1:600



LEGEND

- EXISTING CHANNEL BANK — Bank -6.53
- EXISTING CHANNEL BED — BED 4.38
- EXISTING DRAIN BED — 86.20 BED
- NATURAL SURFACE — 94.40
- POWER POLE — PP
- EXISTING TREE
- DEAD TREE
- TEMPORARY BENCH MARK — 5186, 119.679, BM 2X2 PEG, E:405158.214, N:6130859.216
- POWERLINE
- FENCELINE
- EXISTING CHANNEL
- EXISTING DRAIN
- EXISTING ROAD
- EXISTING WATER LINE TO BE REMOVED — W
- DESIGN PIPELINE
- DESIGN DRAIN — D
- DESIGN CHANNEL
- DESIGN PIT

JC SURVEYS PTY LTD

MOAMA NSW 2731
MOB: 0429 897 289,
Email: chris@jcsurveys.com.au
Web: jcsurveys.com.au

ABN: 54 672 449 955

GENERAL NOTES:
ALL LEVELS ARE IN METERS UNLESS OTHERWISE STATED.

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

LOCATION OF SERVICES 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 CONSTRUCTION.

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.

REV	DATE	DESCRIPTION

Meters: 18 0 18 36 — 1:600

DATUM: SS 4827 - RL 107.927 AHD, GDA94 ZONE 55
ADD 100.00m TO PLAN FOR AHD

NS GRID	25m x 25m	PLAN	
CONTOURS	@ 0.20m	FINAL	
SURVEYED BY J.C.H		DRAWN BY J.C.H	

CLIENT: RAY SMITH

JOB NAME: YARRIMBAH DAIRY PROPOSED LAYOUT
ADDRESS: 2813 COBB HIGHWAY MATHOURA
CROWN ALLOTMENT: LOT 2 DP1077844

DRAWING NUMBER	DATE	SHEET NUMBER
JC0023	26/05/25	1 OF 1

APPENDIX 2 –TITLE SEARCH AND PLAN

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1077844

SEARCH DATE	TIME	EDITION NO	DATE
10/4/2025	10:37 AM	4	22/9/2018

LAND

LOT 2 IN DEPOSITED PLAN 1077844
AT MATHOURA
LOCAL GOVERNMENT AREA MURRAY RIVER
PARISH OF MOIRA COUNTY OF CADELL
TITLE DIAGRAM DP1077844

FIRST SCHEDULE

RAYMOND ANTHONY SMITH
LEANNE JOY SMITH
AS TENANTS IN COMMON IN EQUAL SHARES (T AB800598)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AB800599 MORTGAGE TO RABOBANK AUSTRALIA LIMITED
3 AC780610 MORTGAGE TO RABOBANK AUSTRALIA LIMITED

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

dda2255000 PRINTED ON 10/4/2025

PLAN FORM 2

Plan Drawing only to appear in this space

SIGNATURES AND SEALS ONLY.
Executed by Weringerong Pty Ltd
ACN 002 688 404 pty
R. J. Smith
Director - Roderick James Smith
M. Y. Smith
Secretary - Nancye Yvonne Smith

CONSENT AND ORDER TO REGISTER

THE NATIONAL AUSTRALIA BANK LIMITED BEING THE REGISTERED PROPRIETOR OF MORTGAGE NO. W 505 884 DOES HEREBY CONSENT TO THE PLAN OF SUBDIVISION OVER THE PROPERTY AND TO THE SAID PLAN OF SUBDIVISION TAKING PRIORITY TO THE SAID MORTGAGE.
DATED THE 11TH MAY 2005

EXECUTED BY NATIONAL AUSTRALIA BANK LIMITED BEING SIGNED, SEALED AND DELIVERED IN VICTORIA BY ITS ATTORNEY ROBERT JOHN STANISLYN UNDER POWER OF ATTORNEY DATED 28/8/1991 (A CERTIFIED COPY OF WHICH IS FILED IN PERMANENT ORDER BOOK 2174 AT PAGE 3) WHO DECLARES THAT HE HOLDS THE OFFICE IN THE BANK INDICATED UNDER HIS SIGNATURE IN THE PRESENCE OF:

National Australia Bank Limited ACN 004 044 937 083-543 Bendigo VIC

MANAGER
NATIONAL AUSTRALIA BANK LIMITED

Signed by RABOBANK AUSTRALIA LIMITED by its attorney Jonathon Lucas Hewitt Senior Manager and Cyril Paul Wong MANAGER who respectively state at the time of executing this instrument they have no notice of the revocation of the Power of Attorney registered number 3/a 82 4390 3 under the authority of which they have executed this instrument.

DEPARTMENT OF LANDS APPROVAL

I ..... (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown hereon have been given.

Signature : .....
Date : .....
File Number : .....
Office : .....

SUBDIVISION CERTIFICATE

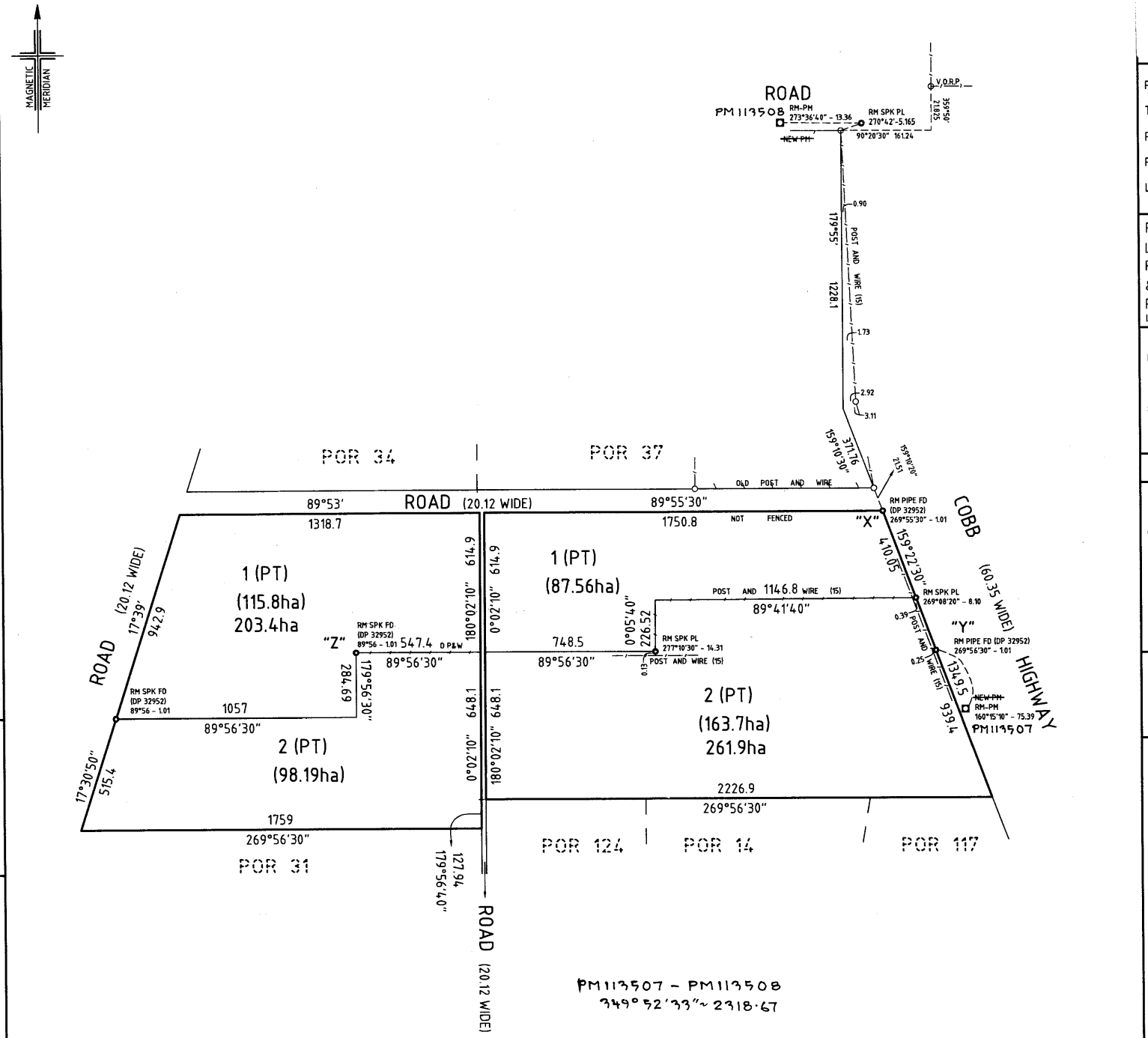
I certify that the provsions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed Subdivision set out herein
*(insert 'subdivision' or 'new road')

*~~Authorised Officer~~/General Manager/~~Accredited Certifier~~
Consent Authority : Murray Shire Council
Date of Endorsement : 22-3-05
Accreditation No. : n/a
Subdivision Certificate No. : 29/03
File no. : 177/01

Note: When the plan is to be lodged electronically in the Land and Property Information it should include a signature in an electronic or digital approved format by the Registrar-General.

† Delete whichever is inapplicable

SURVEYOR'S REFERENCE : 4183



DP1077844

Registered: [redacted] AW 29.06.2005
Title System: TORRENS
Purpose: SUBDIVISION
Ref Map: PARISH (55)
Last Plan: DP 32952

PLAN OF SUBDIVISION OF
LOT 1 IN DP 32952
PART OF PORTIONS 32, 33, 38 & 40
PARISH OF MOIRA
Lengths are in metres. Reduction Ratio 1: 12500

L G A: MURRAY
Locality: MATHOURA
Parish: MOIRA
County: CADELL

This is sheet 1 of my Plan in 1 sheet(s)
(Delete if inapplicable)

Surveying Regulation, 2001

I, MICHAEL ALAN TOLL
of 158 WELSFORD ST, SHEPPARTON 3630
a surveyor registered under the Surveying Act 2002, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying Regulation 2001 and was completed on 3/10/03
The survey relates to Lot 1 (Pt) 87.56ha. The following adoptions are a result of survey:
159°22'30" - 410.05, 89°41'40" - 1146.8 &
Datum Line: "X" - "Y" 0°05'40" - 226.52
Type: ~~Suburban~~ / Country
(Signature) Surveyor registered under the Surveying Act 2002

Plans used in preparation of survey/compilation.
DP 12412
DP 32952

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

* OFFICE USE ONLY

REPORT REVERSE INKJET IMAGE WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

APPENDIX 3 - PROPERTY PLANNING REPORT

Property Report

2813 COBB HIGHWAY MATHOURA 2710

Property Details

Address:	2813 COBB HIGHWAY MATHOURA 2710		
Lot/Section /Plan No:	117/-/DP455183	13/-/DP751153	14/-/DP751153
	2/-/DP1077844	9/-/DP111270	
Council:	MURRAY RIVER COUNCIL		

Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Murray Local Environmental Plan 2011 (pub. 16-12-2011)
Land Zoning	RU1 - Primary Production: (pub. 21-4-2023)
Height Of Building	NA
Floor Space Ratio	NA
Minimum Lot Size	120 ha
Heritage	NA
Land Reservation Acquisition	NA
Foreshore Building Line	NA
Terrestrial Biodiversity	Terrestrial Biodiversity

Detailed planning information

State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Allowable Clearing Area (pub. 21-10-2022)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing) 2021: Land Application (pub. 26-11-2021)
- State Environmental Planning Policy (Industry and Employment) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Planning Systems) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Primary Production) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Primary Production) 2021: Subject Land (pub. 2-12-2021)
- State Environmental Planning Policy (Resilience and Hazards) 2021: Land Application (pub. 2 -12-2021)
- State Environmental Planning Policy (Resources and Energy) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Sustainable Buildings) 2022: Land Application (pub. 29-8-2022)
- State Environmental Planning Policy (Transport and Infrastructure) 2021: Land Application (pub. 2-12-2021)

Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

1.5 m Buffer around Classified Roads	Classified Road Adjacent
Bushfire Prone Land	Vegetation Buffer
	Vegetation Category
Land near Electrical Infrastructure	This property may be located near electrical infrastructure and could be subject to requirements listed under Transport and Infrastructure SEPP 2021 Clause 2.48. Please contact Essential Energy for more information.
Local Aboriginal Land Council	MOAMA
Regional Plan Boundary	Riverina Murray

APPENDIX 4 – CORRESPONDANCE

ESSENTIAL ENERGY

An existing application has been submitted to Essential Energy as part of the existing site work and actions generated as a result of the intensive dairy development. This work has the following Essential Energy reference numbers:

Project Reference Number: ECN-061183
Application Case Number: 00143723
Power Upgrade Design Engineers: Delta Star Design Engineers, Wagga Wagga, NSW

NSW RURAL FIRE SERVICES

A Performance-based design brief consultation process has been ongoing with relation to the proposed farm building under:
Application reference number: 653T.196-PDBD01 and
FRNSW reference number: FRN25/858.
Designer: NDF Engineering – Nabeel Darwish

This application is assessing the Deemed to Satisfy provision relating to static water supply (greater than 60m) and replacement with non-complying on-site hydrants (in lieu of hard suction within 4m of the water supply).

All other objectives under *Planning for Bushfire Prevention*, 2019 are achieved and consistent with the Bushfire Response plan previously submitted (PRS, 2020) and approved for the site.

BRENT WILLIAMS AND ASSOCIATES – BUILDING CLASSIFICATION

A preliminary review of the Building Classification, to allow adequate provisions for fire assessments and requirements has been undertaken. A copy of this letter is provided in the following page.

BW&A
National Building Consultants

bwanational.com.au
P: 1300 363 487
E: admin@bwanational.com.au
ABN 14 064 582 770
Melbourne | Mildura | Swan Hill | Yarra Ranges | Adelaide

13/03/2025

To Whom It May Concern,

I am writing to formally classify a building in accordance with the National Construction Code (NCC) Volume 1, 2022. The details of the building are as follows:

Property Details:

- **Address**: 2813 Cobb Highway, Mathoura, NSW 3710
- **Lot and Plan Numbers**: 117/DP455183, 13/DP751153, 14/DP751153, 2/DP1077844, 9/DP111270
- **Owner**: JDJB Pty Ltd, Care of Ray Smith
- **Proposed Use**: Dairy with fewer than 10 occupants

Building Specifications:

- **Classification:** Class 8
- **Number of Storeys:** 1
- **Total Floor Area:** 3433m²
- **Type of Construction:** Type C
- **Fire Safety Measures:** Fire Hydrant, Fire Extinguishers, Exit Signs, Emergency Lighting, and Door Exit Hardware
- **Rise in Storeys:** 1

Under the NCC, this building will utilise the Farm Building Concession under Part I3. It is my opinion that, subject to the provision of fully detailed documents and the assessment of consultant's documents such as Engineering, Architectural, Fire service plan etc, compliance with the National Construction Code can be achieved.

Yours sincerely,

Brent Williams

BDC0442
BWA National Building Consultants

APPENDIX 5A - BOSET REPORT

Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under the Biodiversity Conservation Regulation 2017 (Cl. 7.2 & 7.3).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report

Date of Report Generation		21/03/2025 1:42 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	**Does the development Footprint intersect with BV mapping?**	no
1.2	Was ALL BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	**Date of expiry of dark purple 90 day mapping**	N/A
1.4	**Is the Biodiversity Values Map threshold exceeded?**	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	**Size of the development or clearing footprint**	105,264.4 sqm
2.2	**Native Vegetation Area Clearing Estimate (NVACE)** (within development/clearing footprint)	7,330.7 sqm
2.3	**Method for determining Minimum Lot Size**	LEP
2.4	**Minimum Lot Size** (10,000sqm = 1ha)	1,200,000 sqm
2.5	**Area Clearing Threshold** (10,000sqm = 1ha)	10,000 sqm
2.6	**Does the estimate exceed the Area Clearing Threshold?** (NVACE results are an estimate and can be reviewed using the Guidance)	no

REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)	**no**

What do I do with this report?

• If the result above indicates the BOS Threshold has been exceeded, your local council may require a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor.

• If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is '"likely to significantly affect threatened species" as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.

• If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.

• If all Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the Interpreting the evaluation report section of the Biodiversity Values Map Threshold Tool User Guide .

Review Options:

• If you believe the Biodiversity Values mapping is incorrect please refer to our BV Map Review webpage for further information.

• If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the Guide for reviewing area clearing threshold results from the BMAT Tool.

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____ Date: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

21/03/2025 01:42 PM

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the Biodiversity Values Map webpage.

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the Biodiversity Values Map Review webpage.

If you need help using this map tool see our Biodiversity Values Map and Threshold Tool User Guide or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map

377.8 0 188.90 377.8 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

21/03/2025 01:42 PM

The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the Biodiversity Values Map viewer for mapping updates is recommended.

APPENDIX 5B - PROTECTED MATTERS SEARCH TOOL REPORT

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 21-Mar-2025

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	7
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	45
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	5
Regional Forest Agreements:	None
Nationally Important Wetlands:	3
EPBC Act Referrals:	7
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	400 - 500km upstream from Ramsar site	In feature area
Barmah forest	Within Ramsar site	In feature area
Gunbower forest	20 - 30km upstream from Ramsar site	In feature area
Hattah-kulkyne lakes	200 - 300km upstream from Ramsar site	In feature area
Nsw central murray state forests	Within Ramsar site	In feature area
Riverland	400 - 500km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	400 - 500km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	Endangered	Species or species habitat may occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only
CRUSTACEAN			
Euastacus armatus Murray Crayfish [81537]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat may occur within area	In buffer area only
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat known to occur within area	In buffer area only
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In feature area
Litoria raniformis Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area
INSECT			
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
PLANT			
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Austrostipa wakoolica](#) [66623]	Endangered	Species or species habitat may occur within area	In buffer area only
[Brachyscome muelleroides](#) Mueller Daisy [15572]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Lepidium monoplocoides](#) Winged Pepper-cress [9190]	Endangered	Species or species habitat likely to occur within area	In feature area
[Maireana cheelii](#) Chariot Wheels [8008]	Vulnerable	Species or species habitat may occur within area	In feature area
[Myriophyllum porcatum](#) Ridged Water-milfoil [19919]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Pimelea spinescens subsp. spinescens](#) Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
[Pterostylis despectans](#) Lowly Greenhood [6272]	Endangered	Species or species habitat may occur within area	In buffer area only
[Sclerolaena napiformis](#) Turnip Copperburr [11742]	Endangered	Species or species habitat known to occur within area	In feature area
[Senecio behrianus](#) Stiff Groundsel, Behr's Groundsel [14030]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Swainsona murrayana			
Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Swainsona plagiotropis			
Red Darling-pea, Red Swainson-pea [10804]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Aprasia parapulchella			
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hemiaspis damelii			
Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Breeding known to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Barmah	National Park	VIC	In buffer area only
Murray Valley	Regional Park	NSW	In buffer area only
Murray Valley	National Park	NSW	In feature area
River Murray Reserve	Natural Features Reserve	VIC	In buffer area only
Top Island	Reference Area	VIC	In buffer area only

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Barmah-Millewa Forest	VIC	In buffer area only
Broken Creek	VIC	In buffer area only
Millewa Forest	NSW	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Millewa Forest SDLAM Project	2023/09517		Completed	In buffer area only
Controlled action				
Ecological thinning trial in NSW River Red Gum Forests	2013/6713	Controlled Action	Post-Approval	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
The Modified Operation of the Goulburn Murray Irrigation District	2009/5123	Controlled Action	Post-Approval	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Rehabilitation of Moira Lake Wetland System Stage 3	2009/4975	Referral Decision	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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APPENDIX 5C - SEARCH RESULTS SUMMARY

Bionet Search Criteria:

Criteria 1	Result	Criteria 2	Result
Date:	28/54/2024	Area:	10km x 10km
North	-35.40	South	-36.60
East	145.40	West	145.60

Search Results:

Ecological Communities

	Common Name	NSW Status	C'wealth Status
1	*Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions (Bionet).*	E3	-
2a	*Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions (Bionet)*	E3	-
2b	*Buloke (Allocasuarina luehmannii) Woodlands of the Riverina and Murray-Darling Depression Bioregions (PMST & Bionet)*	-	E
3a	*Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Bionet & PMST)*	-	E
3b	*Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Bionet)*	E3	-
4a	*Weeping Myall Woodlands (PMST & Bionet)*	-	E
4b	*Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (Bionet).*	E3	-
5	*Natural Grasslands of the Murray Valley Plains (PMST)*	-	CE
6	*Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions (Bionet).*	E3	-
8b	*White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*	-	CE
9	*Mallee Bird Community*	-	E

Species

Class	Scientific Name	Common Name	NSW status	Comm. status	Records	Comments
Flora	*Austrostipa wakoolica*	A spear-grass	E	E	1	Project works do not require the removal of vegetation and will not alter the area that may support this species. Project works and access to site will not impact or reduce area of this species as site is already cleared.
Aves	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V	V	1	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as works relate only to retrospective approval of a walkway and pontoon and no further works are required as part of this application
Aves	*Stagonopleura guttata*	Diamond Firetail	V	V	1	Habitat not typical of species requirements. No records of species at site or within local area. Project works or actions will not impact on species requirements.
Aves	*Petroica phoenicea*	Flame Robin	V	NL	7	Site does not fulfil species requirements and is not typical of the species. No change proposed to area that the species would utilise as works relate only to retrospective approval of a walkway and pontoon and no further works are required as part of this application
Aves	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V	NL	14	No change proposed to area that the species would utilise as works relate only to retrospective approval of a walkway and pontoon and no further works are required as part of this application

APPENDIX 6A – HERITAGE SEARCHES

WORLD HERITAGE LIST

Nil results

COMMONWEALTH HERITAGE LIST

Nil results

NATIONAL HERITAGE LIST

Item	Address	Suburb	LGA
Echuca Wharf	52 Murray Esp	Echuca	Murray

NSW STATE HERITAGE REGISTER

PART 1 – HERITAGE ITEMS

SECTION 1 – ABORIGINAL PLACES LISTED UNDER THE NATIONAL PARKS AND WILDLIFE ACT

ABORIGINAL PLACE NAME	LOCAL GOVERNMENT AREA	LOCAL ABORIGINAL LAND COUNCIL	LATITUDE	LONDITUDE	GASETTAL DATE AND PAGE NUMBERS	COMMENTS
Algeboia	Murray	Moama	-35.96	144.8980	10/26/1990 p. 9558	Located within Murray Valley Park

SECTION 2 ITEMS LISTED UNDER THE NSW HERITAGE ACT

Item	Address	Suburb	LGA	SHR
Echuca Rail/Road Bridge	Echuca Rd	Moama	Murray	00600
Echuca Warf	Murray River	Moama	Murray	00600
Moama Historic Precinct	Hunt St	Moama	Murray	00600
Coonamit Bridge over Wakool River	Main Rd 386	Swan Hill	Wakool	01464
Barham Bridge over Murray River	Main Road 319	Barham	Wakool	01456
Murray Downs Homestead	Moulamein Highway	Wakool	Wakool	01438
Swan Hill-Murray River Road Bridge	Main Rd 67	Swan Hill (East)	Wakool	01481
Tooleybuc Bridge over Murray River	Main Road 222	Tooleybuc	Wakool	01482

SECTION 3 ITEMS LISTED BY LOCAL GOVERNMENT AND STATE AGENCIES

LOCALITY	ITEM NAME	ADDRESS	PROPERTY DESCRIPTION	SIGNIFICANCE	ITEM NO
Barmah	Bridge over Murray River	Main Road	Main Road 391	State	NA
Bullatale	McLaurin Cemetery	Millewa Road	Within Murray Valley National Park	Local	I65
Burraboi	Werai Station	Rangemore Road	Lot 1, DP 756342	Local	I62
Cornalla	Cornalla Station	Dudleys Road	Lot 211, DP 848121	Local	I59
Echuca	Echuca Wharf	Murray Esplanade	Murray River	State	I9
Echuca/Moama	Echuca–Moama road and former rail bridge	Cobb Highway over Murray River	Public road	State	I10
Mathoura	St Andrews Uniting Church	Corner Burnes and Morris Streets	Lot 1, Section 74, DP 758686	Local	I30
Mathoura	Timber residence	13A Burnes Street	Lot 5, DP 114978	Local	I42
Mathoura	Murray Shire Council (offices and hall)	21–25 Conargo Street	Lot 7, Section 65, DP 758686	Local	I31
Mathoura	Timber residence	27 Conargo Street	Lot 3, Section 65, DP 758656	Local	I43
Mathoura	Catholic Convent	Corner Livingstone and Frome Streets	Lot 10, Section 37, DP 758686	Local	I32

LOCALITY	ITEM NAME	ADDRESS	PROPERTY DESCRIPTION	SIGNIFICANCE	ITEM NO
Mathoura	Soldiers Memorial Gardens	Corner Livingstone and Lawrence Streets	Lot 10, Section 40, DP 758686	Local	I34
Mathoura	Anglican Church	Corner Livingstone and Stephen Streets	Lot 51, DP 1072403	Local	I41
Mathoura	Timber residence	6 Livingstone Street	Lot 9, Section 97, DP 758686	Local	I45
Mathoura	Concrete shop and house	18 Livingstone Street	Lot 2, DP 312113	Local	I39
Mathoura	Brick residence/bed and breakfast; (former Charleston's Hotel)	20 Livingstone Street	Lot 1, DP 312113	Local	I40
Mathoura	Shops	25b Livingstone Street	Lot 2, DP 541436	Local	I38
Mathoura	Pastoral Hotel	26 Livingstone Street	Lot 8, Section 40, DP 758686	Local	I37
Mathoura	Brick shop and residence (butchery)	27a Livingstone Street	Lot 6, Section 39, DP 758686	Local	I36
Mathoura	Supermarket (former bakery)	29b Livingstone Street	Lot 1, DP 1163845	Local	I35
Mathoura	Timber residence	35b Livingstone Street	Lot 1, DP 1096894	Local	I44
Mathoura	St Brigid's Catholic Church	38 Livingstone Street	Lot 9, Section 37, DP 758686	Local	I33
Mathoura	Timber residence	51 Moama Street	Lot 5, Section 29, DP 758686	Local	I47
Mathoura	Timber residence	53 Moama Street	Lot 4, Section 29, DP 758686	Local	I46
Mathoura	Mathoura Station	Station Road	Lot 2, DP 756272	Local	I63
Mathoura	D&M Railway Tower – water tank and railway precinct	Conargo St (btw Lawrence and Morris)	Railway	Local	NA
Mathoura	Gulpa Creek Cutting	Gulpa Creek	Gulpa Creek	State	NA
Mathoura	Post Office and Official residence	Mathoura St – Cnr of Lawrence St	NA	State	NA
Moama	Fig trees	Berry Street	Lot 4, Section 56, DP 758686	Local	I27
Moama	Residence	2 Berry Street	Lot 3, Section 56, DP 758686	Local	I11
Moama	Timber residence	13 Berry Street	Lot 4, Section 50, DP 758686	Local	I26
Moama	Maiden's Punt	Chanter Street	Lot 7021, DP 1123285	Local	I29
Moama	Residence (former post office)	2–4 Chanter Street	Lot 1, DP 654519	Local	I1
Moama	Residence and outbuildings (former police station)	10–12 Chanter Street	Lot 4, Section 30, DP 758686	Local	I2
Moama	Former river captain's cottage	54 Chanter Street	Lot 4, Section 18, DP 758686	Local	I7
Moama	Former Moama Telegraph Station	60 Chanter Street	Lot 8, Section 18, DP 758686	Local	I14
Moama	Residence	72 Chanter Street	Lot 3, DP 577291	Local	I8
Moama	Portal entry (former Maiden's Inn Hotel)	100 Chanter Street	Lot 1, Section 1, DP 758686	Local	I13
Moama	Cranford House	Cobb Highway	Lot 1, DP 537724	Local	I25
Moama	Timber residence	11 Echuca Street	Lot 71, DP 623922	Local	I18
Moama	Timber residence	23 Echuca Street	Lot 21, DP 700038	Local	I17
Moama	Group of cottages	31–33 Echuca Street	Lot 1, DP 922312; Lot 2, DP 667846	Local	I16
Moama	Residence	38 Echuca Street	Lot 1, DP 712717	Local	I15

LOCALITY	ITEM NAME	ADDRESS	PROPERTY DESCRIPTION	SIGNIFICANCE	ITEM NO
Moama	Timber residence	33 Francis Street	Lot 9, DP 330	Local	I19
Moama	Moama slipway and barges	Hunt Street	Lots 256 and 257, DP 726664	Local	I5
Moama	Courthouse group	Corner Maiden and Francis Streets	Lots 6–8, Section 65, DP 758686	Local	I3
Moama	Anglican Church	31–35 Maiden Street	Lot 1, DP 528484	Local	I20
Moama	Brick residence (former bank)	7 Meninya Street	Lot 1, DP 216216	Local	I21
Moama	Boiling down works	Perricoota Road	Lot 1, DP 1088592	Local	I64
Moama	Perricoota Wool Shed	Perricoota Road	Lot 1, DP 521201	Local	I66
Moama	Mile Tree 311	Perricoota Road (Dead Horse Point)	Lot 73, DP 751159	Local	I6
Moama	La Bella Sombre tree, horse trough and obelisk	Shaw Street	Lot 1, DP 1075441	Local	I28
Moama	Shop and residence (former bank)	9–11 Shaw Street	Lot 1, DP 716265	Local	I22
Moama	"Killarney", residence	8 Simms Street	Lot 1, DP 514180	Local	I4
Moama	Timber residence	12 Simms Street	Lot 3, Section 29, DP 758686	Local	I12
Moama	Timber residence	15 Simms Street	Lot 1, DP 504342	Local	I23
Moama	Courthouse Group	Maiden St	Maiden St	Local	NA
Moama	Echuca-Moama Bridge	Cobb Hwy	Cobb Hwy	State	NA
Moama	Historic Precinct	Hunt St	NA	Local	NA
Moira	Moira Station	Cobb Highway	Lot 1, DP 1062036	Local	I57
Moira	Moira Station woolshed	Cobb Highway	Lot 2, DP 1062036	Local	I58
Moama	Police Station	27 Maiden St	NA	State	NA
Tantonan	Tantonan weighbridge	Bunaloo Street	Lot 87, DP 751161	Local	I56
Thule	Thule Station	Lower Thule Road	Lot 75, DP 751156	Local	I61
Thyra	"Fairfield", residence	Thyra Road	Lot 1, DP 133845	Local	I50
Thyra	"Minerva", residence and outbuildings	Thyra Road	Lot 1, DP 23013	Local	I49
Thyra	Uniting Church and cairn memorial	Thyra Road	Lot 1, DP 923053	Local	I48
Womboota	Brick residence	Moira Street	Lot 2, Section 12, DP 759106	Local	I55
Womboota	Catholic Church	Moira Street	Lot 10, Section 6, DP 759106	Local	I52
Womboota	Uniting Church	Moira Street	Lot 1, Section 12, DP 759106	Local	I54
Womboota	Womboota Public Hall	Moira Street	Lot 1, Section 22, DP 759106	Local	I51
Womboota	Perricoota Station	Perricoota Road	Lot 3, DP 751155	Local	I60
Womboota	Former Womboota School	Perricoota Rd	Lot 81, DP751150	Local	I53
Barham	Barham Koondrook Bridge over Murray River	Main Road 319		State	I2
Barham	Barham War Memorial Hall	15 Murray St	Part Lots 5 and 6, Section 4, DP 758053; Part Lot 157, DP 1049554	Local	I1
Cunninyeuk	Gee Gee Bridge over Wakool River	Nacurrie Road North, Noorong State Forest	Adjacent to Lot 50, DP 756533	State	I3
Koraleigh	Koraleigh Uniting Church	17 Eagles Lane	Lot 8, Section 1, DP 15133	Local	I4
Moulamein	The Old Courthouse and footbridge	Via Jebb Street	Part Lot 109 and Lot 110, DP 39558	Local	I5
Murrabit	Gonn Crossing Bridge over Murray River	Murrabit Road	Adjacent to Lot 1, DP 608956	Local	I6

LOCALITY	ITEM NAME	ADDRESS	PROPERTY DESCRIPTION	SIGNIFICANCE	ITEM NO
Murray Downs	Murray Downs Homestead	MR 467 Swan Hill-Kyalite Road	Lot 2, DP 1067731	State	I7
Nyah	Nyah Bridge over Murray River	Speewa Road	Adjacent to Lot 1, DP 135141	Local	I9
Speewa	Speewa Ferry, Murray River	Speewa Ferry Road	Adjacent to Lot 3, DP 317039	Local	I10
Swan Hill	Coonamit Bridge over Wakool River	MR 386	Adjacent to Lot 1, DP 653213	State	I12
Swan Hill	Swan Hill Bridge over Murray River	MR 467	Adjacent to Lot 65, DP 756603	State	I11
Tooleybuc	Tooleybuc Bridge over Murray River		Adjacent to Lot 1, DP 585209	State	I13

PART 2 – HERITAGE CONSERVATION AREAS

SUBURB	ITEM NAME	ADDRESS	PROPERTY DESCRIPTION	SIGNIFICANCE	ITEM NO
Mathoura	D&M Railway Tower, water tank and railway precinct (including former railway station site)	Conargo St between Lawrence and Morris Streets	Railway reserve	Local	C2
Moama	Moama historic precinct	Hunt St	Multiple	State	C1

PART 3 – ARCHAEOLOGICAL SITES

SUBURB	ITEM NAME	ADDRESS	PROPERTY DESCRIPTION	SIGNIFICANCE	ITEM NO

APPENDIX 6B - ABORIGINAL HERITAGE INFORMATION MANAGEMENT SEARCH (AHIMS)

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Smith Dairy

Client Service ID : 986905

Progressive Rural Solutions

PO Box 74

Deniliquin New South Wales 2710

Attention: Rebecca Moodie

Email: rebecca@prsltd.com.au

Date: 19 March 2025

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -35.9223, 144.8867 - Lat, Long To : -35.914, 144.9021, conducted by Rebecca Moodie on 19 March 2025.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

APPENDIX 7 – EFFLUENT MANAGEMENT PLAN

Effluent Management Plan

Proposed New Dairy

'Yarrimbah' 2813 Cobb Hwy, Mathoura, NSW

May 2025

Progressive Rural Solutions www.prsltd.com.au

Document Information Record

Project Details

Client name:	RA & LJ Smith
Project:	Construction and Operation of a new dairy connected to existing intensive (restricted) dairy freestall housing system on 'Yarrimbah', Mathoura NSW
Project No:	384-0

Document Control

Document Title	Effluent Management Plan for the construction and operation of a new diary connected to restricted dairy (freestall) system on 'Yarrimbah', Mathoura NSW		
File Name:	J384 – EfMP – V2R4		
Revision:	V2R4		
Author	Clare Fitzpatrick	**Position:**	Director
Signature:		**Date:**	23/05/2025
Reviewed by:	Clare Fitzpatrick	**Position:**	Director
Signature:		**Date:**	23/05/2025
Approved by:	Ray Smith	**Position:**	Owner
Signature:		**Date:**	23/05/2025

Revision history

Version	Issue date	Reason for issue	Author	Reviewed by	Approved by
V1R4	16/06/2020	Initial Document	Clare Fitzpatrick	NA	NA
V2V1	28/02/2024	Draft	Clare Fitzpatrick	M Fitzpatrick	Clare Fitzpatrick
V2R2	27/03/2025	Draft	Clare Fitzpatrick	Rebecca Moodie	Clare Fitzpatrick
V2R3	11/05/2025	Draft for client review	Clare Fitzpatrick	Client	Clare Fitzpatrick
V2R4	23/05/2025	Final	Clare Fitzpatrick	Clare Fitzpatrick	Owner

Distribution

Version	Recipient	Lodgement	Copies
V1R4	Murray River Council for lodgement	Electronic	1
V1R4	WaterNSW	Electronic	1
V1R4	Environment Protection Authority	Electronic	1
V1R4	Client/Contractor for construction	Electronic & Hard	1
V2R3	Updated Plan for Client for review	Electronic	1
V2R4	Murray River Council for lodgement	Electronic	1
V2R4	Environment Protection Authority	Electronic	1
V2R4	Client/Contractor	Electronic & Hard	1

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Related Documents

Type	Author	Name	Date
Environmental Impact Statement-Intensive Dairy Development	Progressive Rural Solutions	J128-EIS-V1R4	17/11/2020
Statement of Environmental Effects – New Dairy	Progressive Rural Solutions	J384-SEE-V1R4	23/05/2025
Odour Assessment and Management Plan	Progressive Rural Solutions	J128-OMP-V1R4	17/11/2020
Land Use Conflict Risk Assessment	Progressive Rural Solutions	J128-LUCRA-V1R4	17/11/2020
Bushfire Response	Progressive Rural Solutions	J128-BMP-V1R4	24/12/2020
Approval	Murray River Council	DA 10.2020.356.1	24/02/2021
Licence	NSW EPA	EPL-21531	01/06/2021
Licence	WaterNSW	50WA505802	09/03/2021

Related Plans

Plan Number	Revision	Plan Title	Prepared by	Date
J0023	FINAL	Yarrimbah dairy existing conditions	JC Surveys Pty Ltd	26/05/2025
J0023	FINAL	Yarrimbah dairy proposed layout	JC Surveys Pty Ltd	26/05/2025
J0023	FINAL	Yarrimbah dairy shed dimensions	JC Surveys Pty Ltd	26/05/2025
J0023	FINAL			
J0023	FINAL			

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CONTENTS

FIGURES

TABLES

1. INTRODUCTION

1.1. PURPOSE

The purpose of this report is to:

- Describe the new dairy in relation to the existing effluent management system,
- Identify and detail the project:
    - Water use requirements,
    - Manure generation within the system,
    - Catchment areas and their integration with the system,
- Detail any changes required to the existing or proposed effluent management system,
- Identify system nutrients and their utilisation requirements, and
- Provide management requirements and considerations.

This Effluent Management Plan (EfMP) has been developed in conjunction with information gained from the designers and property owner and manager taking into account specific variables and management strategies relevant to the property. Site soils, hydrology, design plans and planning overlays relevant to the property have been used in developing this report.

Should any changes occur in relation to the described farm management practices, catchment areas, water use, significant herd number changes or long-term strategies, this plan should be updated and reviewed to reflect the current operating systems and processes.

1.2. OBJECTIVES

This assessment reviews the current and proposed effluent system taking into account the new dairy and the varied management practices to ensure that the operation has sufficient assets (water/land/resources) to operate the revised system at the proposed capacity. This assessment will include a water and nutrient balance to ensure that the proposed system will meet industry compliance under the relevant State legislation and planning policies.

1.3. PERSONNEL UNDERTAKING THIS REVIEW

Clare Fitzpatrick is qualified effluent designer and holds a Diploma in Applied Science in Agriculture among other qualifications. Clare was a key contributor to the *National Guidelines for Dairy Feedpads and Contained Housing* and the *NSW Dairy Development and Environment Guidelines*, 2024. Clare regularly works with both landholder and industry groups on Effluent and Intensive Diary development and management throughout Australia.

This review has been undertaken based on extensive ongoing involvement with the sites management and includes a review and assessment of the natural and built forms within project sites and surrounds.

1.4. BACKGROUND

The Smith Family has undertaken an extension of their existing dairy operation, transitioning from a 790 head loose housing system to a 2,112-cow dairy freestall housing system where cows occupy permanently year-round only being away from the area whilst milking. The freestall housing system has recently been fully completed which incorporates a new effluent pond system and connection with the existing irrigation area for the important re-use of the effluent generated within the system.

The current dairy, loose housing maternity and hospital system and calf sheds are separated from the freestall system however this proposal will link those systems and their management together. No change is proposed to the location of siting of the existing commodities area.

The two freestall housing areas and existing effluent pond system are located on the west side of the Moira irrigation channel system. The freestall housed cows currently cross the Moira channel via a bridge travelling along the channel bank to the existing dairy which is located on the east side of the channel. The existing calf shed, and loose housing maternity shed is also located on the east side of the channel. Some cows also remain within the grazing system which are milked within the current dairy. This will continue with the new dairy.

The operation proposes to continue to utilise the existing milking shed at a very reduced capacity with its purpose to separate fresh and sick cows from the main milking herd. The existing loose housing area will also be used in a reduced management component being utilised for cows unsuited to the freestall system, sick or maternity cows. No change is proposed to the existing calf shed.

The proposed dairy will be constructed as a fully covered shed which will facilitate the milking of cows and include areas with yard and veterinary facilities, a small office for the management of data collection, staff amenities and supporting infrastructure for the milking plant and equipment. The yard area has been designed to house a maximum of 600 cows at any one time.

All works are proposed to occur within the existing highly modified and long-term farmed environment being located within existing irrigation bays. Earthworks at the location of the dairy have been completed as a result of other site management activities within the operation during and connecting to the freestall system. An Environmental Impact Study has previously been completed relating to the existing freestall and effluent system and a separate Statement of Environmental Effects completed on the proposed dairy to review the potential impacts relating to the project works.

The images below provide an overview of the existing site with connecting works and the proposed works relating to the new dairy.

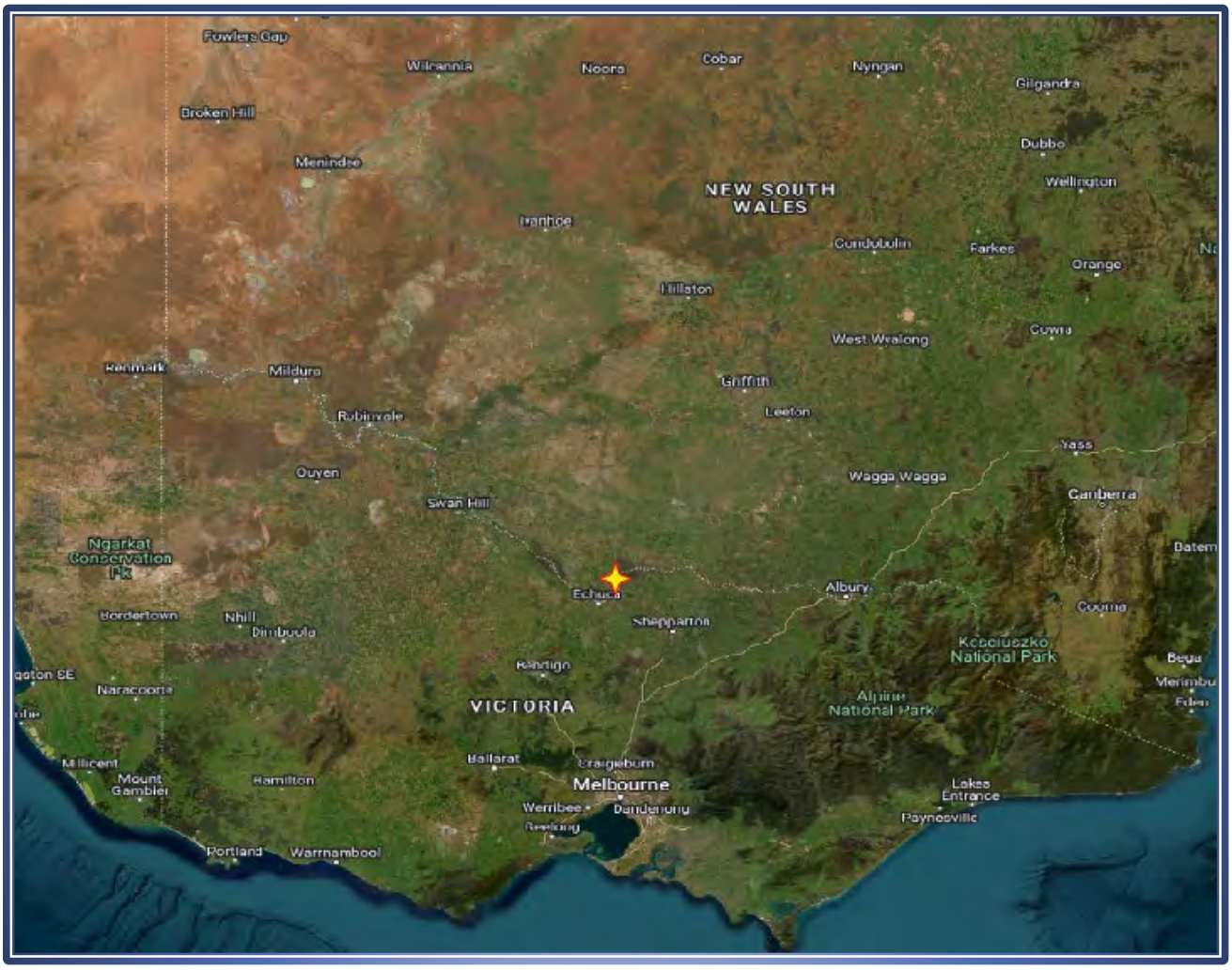

Figure 1-1 - Map showing location of Dairy Operation within the State

Figure 1-2 – Map showing location of the Dairy Operation within the region

Figure 1-3 - Overview of area showing existing and proposed works (Source: PRS QGIS)

Figure 1-4 - Plan of proposed dairy – east elevation (Source: P Shultz design plans)

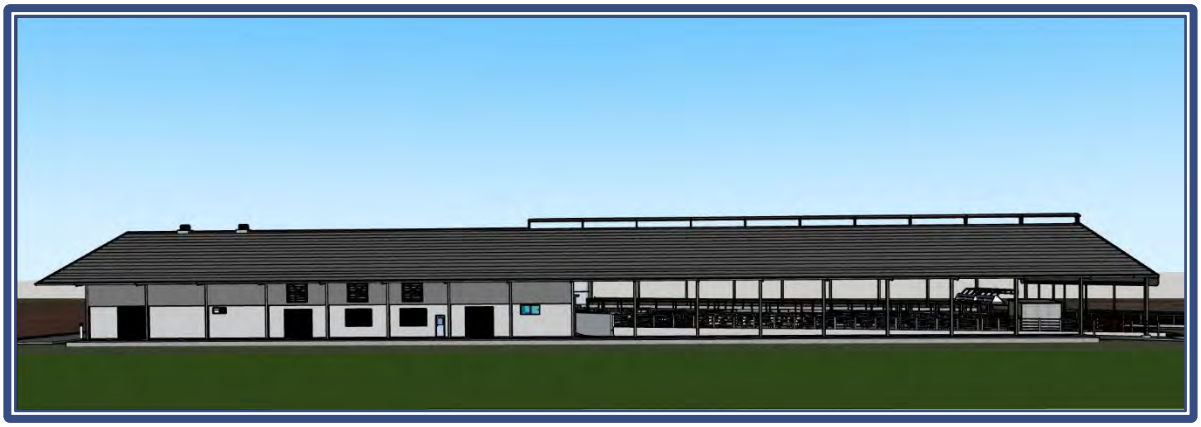

Figure 1-5 - Plan of proposed dairy- north elevation (Source: P Shultz design plans)

1.1. APPLICATIONS AND APPROVALS HISTORY

The following table nominates the existing approvals within the operation and surrounds to support the operation.

Table 1-1 – Approvals

Approval Type	Reference	Date Approved
Development Application	DA10.2020.356.1	24 March 2020
Environmental Protection Licence	21531	1 June 2021
Groundwater	WAL12192	1/11/2006
	WAL15170	25/01/2008
Work Approval (Bore and Storages)	50WA505802	17/05/2007
Combined Work and Use Approval (Groundwater)	50WA504695	01/11/2006

2. SITE DETAILS

2.1. SITE LOCATION

The project is located in the New South Wales Riverina region and the Murray River Council Local Government Area. The project site is located on the property known as 'Yarrimbah' which adjoins the Cobb Hwy between Moama and Mathoura.

The location of the proposed dairy is within the properties existing irrigation area, interconnecting significant dairy infrastructure on the property, including the existing dairy. The new dairy site is to the east of the Moira Private Irrigation District's (PID) main supply channel and the freestall housing areas. The nearby existing effluent systems connect the dairy on each side of the Moira channel and the main effluent management system and ponds are located west of the freestall housing areas.

The application related project infrastructure and works will be undertaken on Lot 2 DP1077844 with the remaining portions of the property incorporated for housing, effluent and manure application which will be utilised to grow feed as part of the project operation.

The location of the property is shown in the following figures and tables within this section.

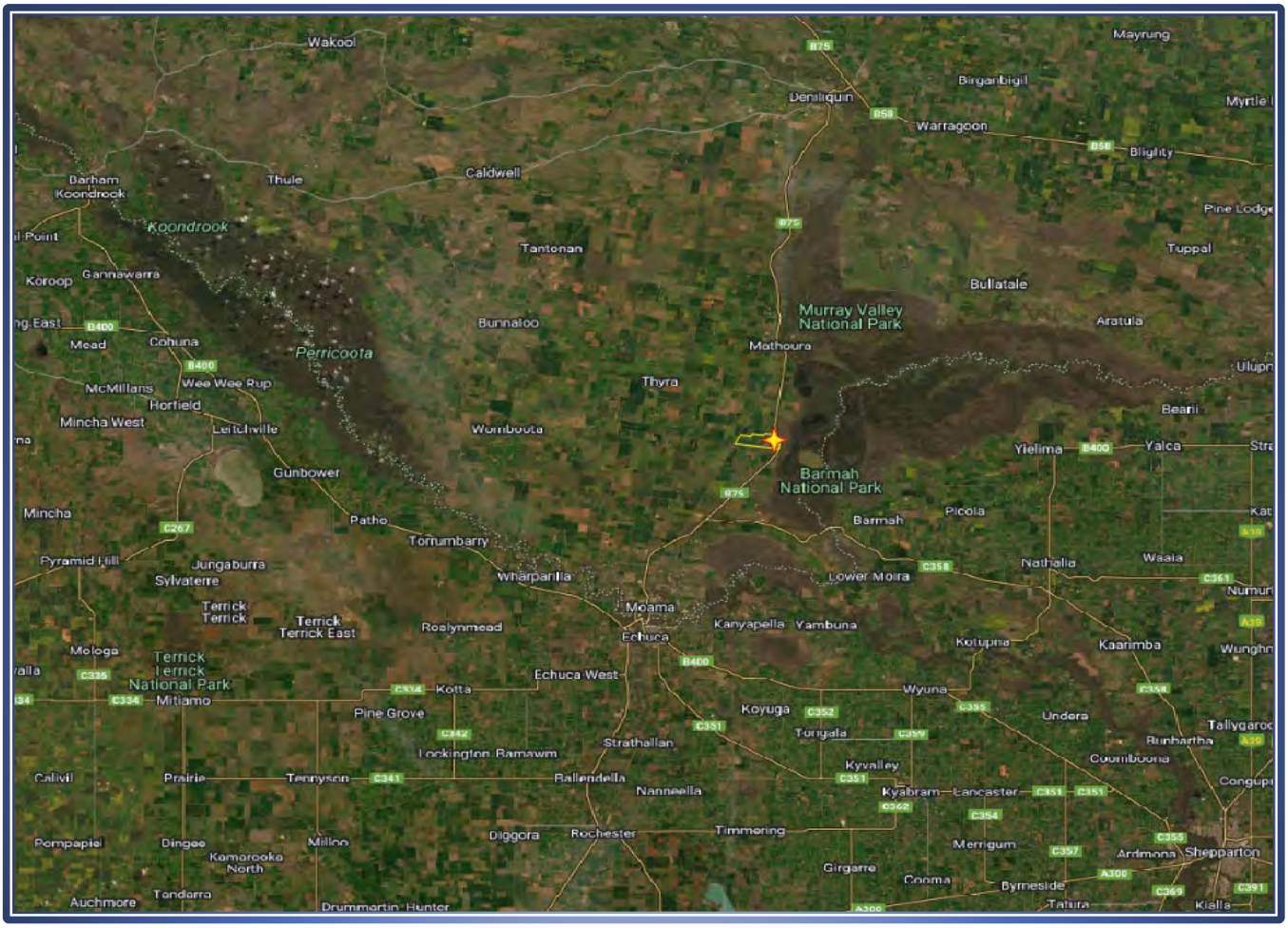

Figure 2-1 - Map showing location of the Dairy Operation within the region

Figure 2-2 - Map identifying the existing site and proposed location of the New Dairy (Source: PRS QGIS)

2.2. SITE ZONING AND OVERLAYS

The land details of the project are summarised as follows:

Table 2-1 - Land details of the project

Details	Specific related to project site
Lot number	2
Deposited Plan	1077844
Parish	Moira
County	Cadell
Local Shire	Murray River Council
LEP Zone	Zone RU1 – Primary Production
Catchment Area	Murray
IBRA Sub-region	Riverina – Murray Fans
Mitchell Landscapes	Murray Scalded Plains
Local Aboriginal Land Council	Moama Local Aboriginal Land Council
Floodplain Management Plan	Nil
Land Stature	Freehold
Area of project works	Approx. 1.6ha
Area of this property	Approx. 573ha
GPS Reference	MGA Zone 55 E:3101145 N:6023126

Other property and connected Lot & DP numbers in relation to the project are:

Table 2-2 - Property identification details

Property Name	Lot	DP	Parish	County	Total Area (ha)	Irrigation Area (ha)
Yarrimbah	2	1077844	Moira	Cadell	573	394
	31	751153				
	124	751153				
	12	751153				
	14	751153				
	13	751143				
	117	455183				

A review of overlays in the attached property planning report identifies the following:

Table 2-3 - Property specific overlays

Overlay	Identified on site		Adjoining Property?
	On Site	On Property	
Crown Land	X	X	Yes
Bushfire Prone Land (non-EPI)	Yes	Yes	Yes
Heritage	X	X	Yes
Flood Planning	X	X	X
Landslide Risk	X	X	X
Acid Sulphate Soils	X	X	X
Aboriginal Cultural Heritage Sensitive Landscape?	X	X	Yes
Aboriginal Site Recorded	X	X	Yes
Drinking Water Catchment	X	X	X
Groundwater Vulnerability	X	X	X
Mineral and Land Resource	X	X	X
Obstacle Limitation Surface	X	X	X
Riparian Lands and Watercourses	X	X	X
Salinity	X	X	X
Scenic Protection Land	X	X	X
Terrestrial Biodiversity	X	Yes	Yes
Wetlands	X	X	Yes
Environmentally Sensitive Land	X	X	X

The table above identifies that the project site is subject to a single overlay being the Bushfire Prone Land (Non-EPI). No other overlay relating to the site is identified that may impact the project planning or operation. The property has an identified Terrestrial Biodiversity overlay present on the remnant stands of native vegetation that are located on the southern boundary of the property. The site is zoned RU-1 – Primary Production.

The adjoining areas within the Moira Forest (being within a separate catchment area) are identified as Crown Land, with recorded Aboriginal sites and a sensitive landscape within this area. The Moira Forest area is also subject to inundation and is a mapped wetland area. This area is not directly adjoining the property and there is no connection between the project site or proposed effluent application areas. The areas are separated by natural and built environment including the top of the Cadell Tilt, the Cobb Hwy and the Moira Private Irrigation Channel system.

2.3. SITE DESCRIPTION AND INFRASTRUCTURE

The new dairy site, that is the subject of this review, has been utilised for irrigated pasture and cropping since the Moira Private Irrigation District's (PID) inception more than 50 years ago. Historically, there has been two irrigation fields at the location, which are supplied from the Moira PID channel via a pumped pipe and riser system. Each field is connected to the existing on-farm irrigation drainage which runs parallel to the Moira irrigation channel and is connected to the dedicated area recycle point. Since construction of the freestall housing systems, the area has been utilised for access through to the site from the property entrance and more recently, excess earth from the effluent ponds and irrigation storage dam have been placed on the site for the pad for the dairy.

The new dairy location is surrounded by the existing Moira channel to the west, including a bridge over the channel, irrigation fields and a recycle system to the south, irrigation field and existing access to the site from the east, being separated from the Cobb Highway by farming area, and the existing loose housing system to the north.

The existing dairy, calf sheds, and commodities areas, though not part of the application, are included in the effluent management plan and situated north and northwest of the new dairy site.

Power supply upgrades to the property are currently underway with existing power lines and substations in progress of being installed. This installation included the power requirements for the new dairy. Existing water supply to the site has also been installed and commissioned which has taken into account the requirements for the new dairy as part of its supply to the freestall housing system.

Figure 2-3 - Site overview including proposed works (Source: PRS QGIS)

Figure 2-4 - Photo showing existing infrastructure layout at the property (Source: PRS)

The groundcover on the site during periodic assessments has consisted of either bare earth or of introduced species such as grazing oats and pasture species. There is no standing vegetation on the site where works have been completed.

Assessments undertaken as part of the original freestall housing system included consideration and assessment of this area and no objects or artifacts were identified as part of this detailed assessment process.

2.4. SITE SURROUNDS

The site being located within a rural area is surrounded by other farming properties. The Moira Private Irrigation District maintains its pump infrastructure and workshop located approx. 1km to the southeast of the site. The Cobb Hwy is located to the east being divided from the property boundary by Travelling Stock Reserve and significant vegetation. The entrance to the Moira National Park is on the opposite side of the Cobb Hwy located over 450m to the east at its closest point to the site. The nearest known camping and frequent public use area is over 5.5kms from the property.

The site and surrounds are generally flat with a very low relief within the broader area. There is less than a 10m elevation change in the surrounding area – including considering the Cadell Tilt formation. The broader area is described as the Riverine plain and contains isolated stands of vegetation with some scattered paddock trees.

2.5. SITE CLIMATE

Meteorological conditions have the potential to influence a range of project-related activities. An overview of these conditions at the project site and surrounds, with a focus on their potential influencing factors to project related activities has been recorded below.

The climate records utilised in this assessment have been sourced from the on-site weather station, Deniliquin Airport (site 074258) (since 1997) and the Silo data portal (records between 1900 and 2024). The grid point utilised for the Silo search is Lat: -35.95 and Long: 144.85 which is located 10 km to the southwest of the site.

Records available from the on-site weather station have been provided in addition to the regional data however do not provide long-term data for consideration. For future assessment of the daily, weekly and monthly climate at the site relating to operations, the site related weather station will be utilised. This weather station is a Weather Maestro station installed and serviced by Environdata, which includes the following modular systems:

Table 2-4 - Weather station recording conditions

Sensor Type	Identification	Operating Range	Accuracy	Resolution
Wind Speed	WS52	0-75m/s	+/- 0.2 m/s	0.1 m/s
Wind Direction	WD50	0-359 degrees	+/- 1 degree	1 degree
Air Temperature	TA70	-20 to 80 deg C	+/- 0.2 deg C	0.025 Deg C
Relative Humidity	RH70	0 to 100%	+/-2% RH (10% - 90% RH) +/- 4% rh (<10% or <90% RH)	0.1% RH
Rain Gauge	RG50	0-700m/hr	+/- 1% to 200mm/hr +/- 3% to 380mm/hr	0.2mm per tip

The wind speed and wind direction sensors are installed on a 10m high mast in an open environment. The weather station is located at E: 310113, N: 6020661 Zone 55.

CLIMATE RECORDS

The Deniliquin to Moama area can be described as a semi-arid climate under the Koppen climate classification with warm to hot summers and cool winters. Temperature extremes are quite variable across the year and the highest temperature recorded at Deniliquin was 47.2 degrees on the 25th January 2019. The lowest temperature was -5.6 on the 1st July 2017. The average annual rainfall is 258mm with most rainfall falling in August to October.

Table 2-5 - Climate Data

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Highest High	47.2	46.6	41.2	39.0	27.0	24.4	23.3	27.6	36.7	37.6	44.0	46.5	47.2
Mean Max	33.4	32.1	28.6	23.6	18.6	15.0	14.4	16.2	19.9	23.9	28.0	30.7	23.7
Mean Min	16.7	16.2	13.5	9.6	6.2	4.0	3.5	4.0	5.9	8.5	12.0	14.4	9.5
Lowest Low	5.7	6.0	3.5	1.0	-2.0	-4.4	-5.6	-5.0	-2.1	-0.6	1.1	5.0	-5.6
Mean rainfall mm	24.7	25.1	25.3	27.8	27.8	30.5	27.9	32.7	32.9	40.6	48.8	29.8	374.3

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Mean rainfall days	4.9	4.4	4.3	5.4	8.1	13.3	14.9	11.5	8.6	7.0	6.9	5.7	95.0
Mean 9am wind speed km/hr	19.5	19.3	17.9	16.4	13.8	14.0	13.7	15.9	17.9	19.6	19.2	19.6	17.2
Mean 3pm wind speed	20.5	19.2	18.4	17.4	17.7	17.9	18.6	20.3	21.3	21.3	20.3	21.1	19.5
Monthly Evaporation	264.7	215.1	172.6	98.0	54.1	35.0	37.4	58.1	91.5	141.9	192.8	244.1	1605.3

WIND RECORDS

The annual wind records which are displayed as wind roses for both 9am and 3pm for the Deniliquin (Visitor Centre) weather station have been provided below.

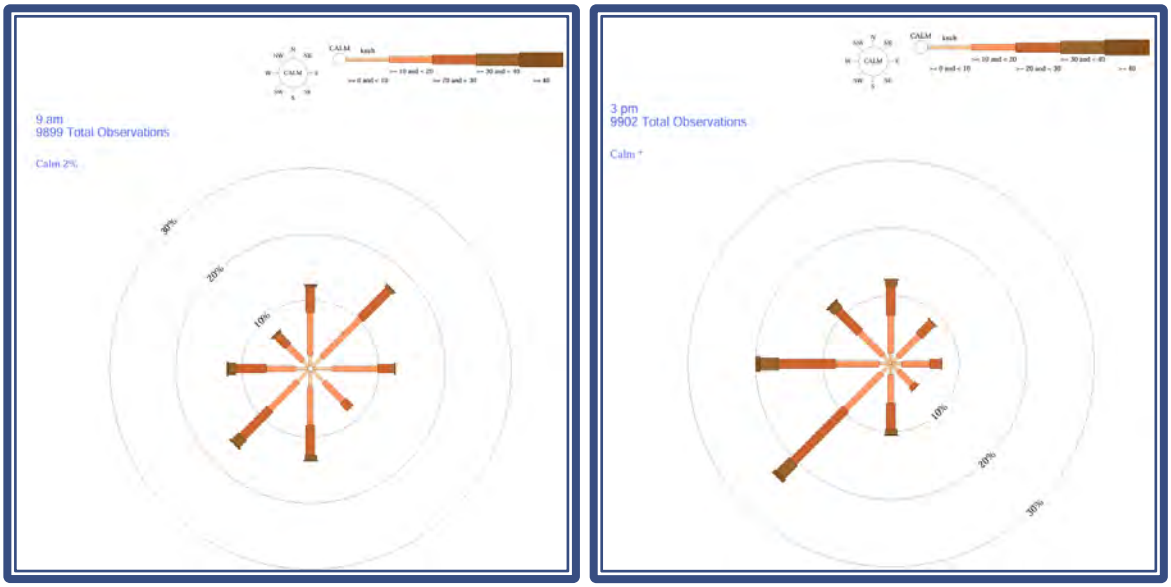

Figure 2-5 - Average annual wind data roses from 9am (left) and 3pm (right) (Source: BOM)

Using regional wind data, wind in the mornings is dominant from E and SE directions and has calm conditions 2% of the times. Most winds are in the 10-20km/hour wind range with some occurrences up to 30km/h from the E and SE. In the afternoon, there are very few occurrences of calm winds. Wind is dominant from the SW, E and S with many observations in the 20-40km/hr range.

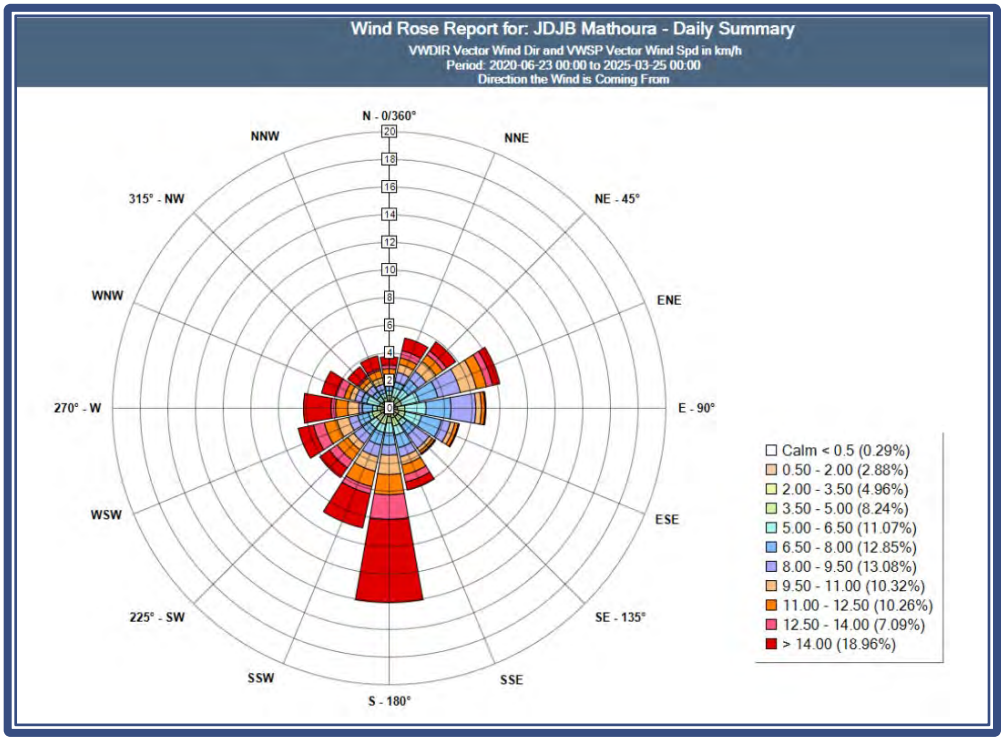

Figure 2-6 - Site wind rose (Source: Moira Station Weather Station – March 2025)

Site specific wind data has been collected by the on-site weather station and is shown above with majority of winds recorded from the south at the site.

Table 2-6 - Wind speed occurrences

Speed m/s	%
0-3	8.10
3.1-6.5	19.31
6.5 - 14	53.63
>14	18.96

Winds at the site are gentle to light more than 80% of the time. High winds greater than 14m/s are experienced 18.96% of the time. This is generally consistent with the regional wind data.

RAINFALL

The average rainfall vs evaporation is shown below which identifies that in all months except June and July, evaporation exceeds rainfall. This shows that in an average year the storage period for effluent is two months. When considering the 90th percentile rainfall and evaporation, the storage period is four months.

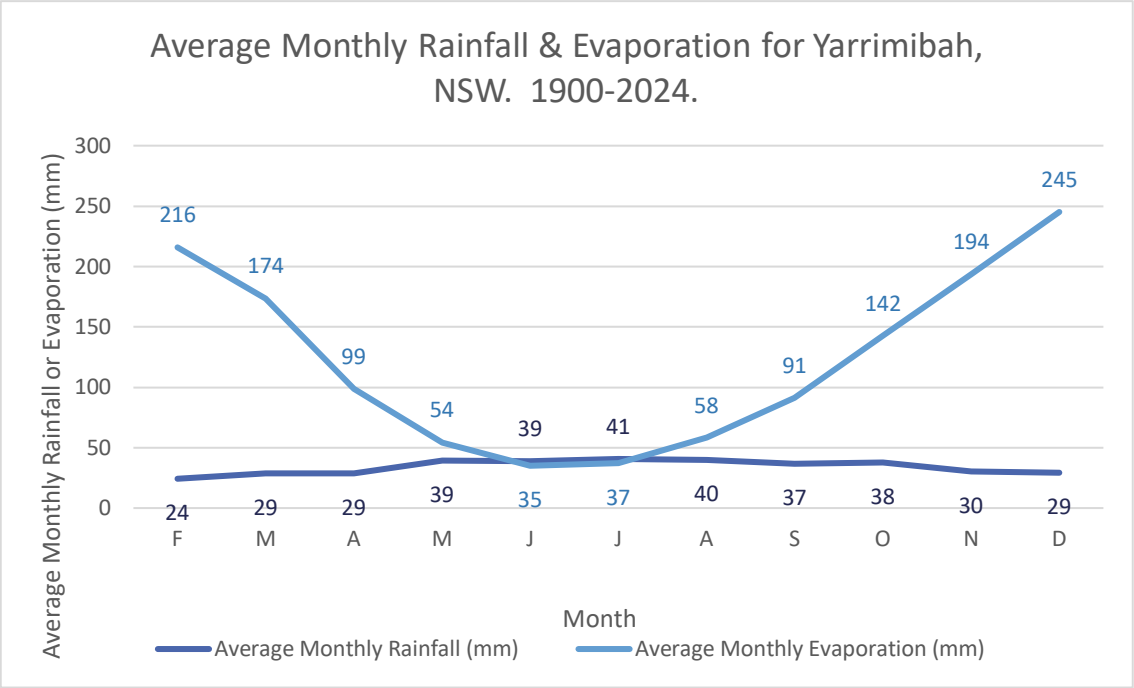

Figure 2-7 - Graph of total monthly evaporation vs rainfall (Source – SILO Data point -35.95, 144.85)

The 90th percentile rainfall vs 10th percentile evaporation is shown below which identifies that in the months of May and August evaporation and rainfall are equal and in the months of June and July rainfall exceeds evaporation. This shows that in a 90th percentile year, the storage period for effluent should include a maximum of four months.

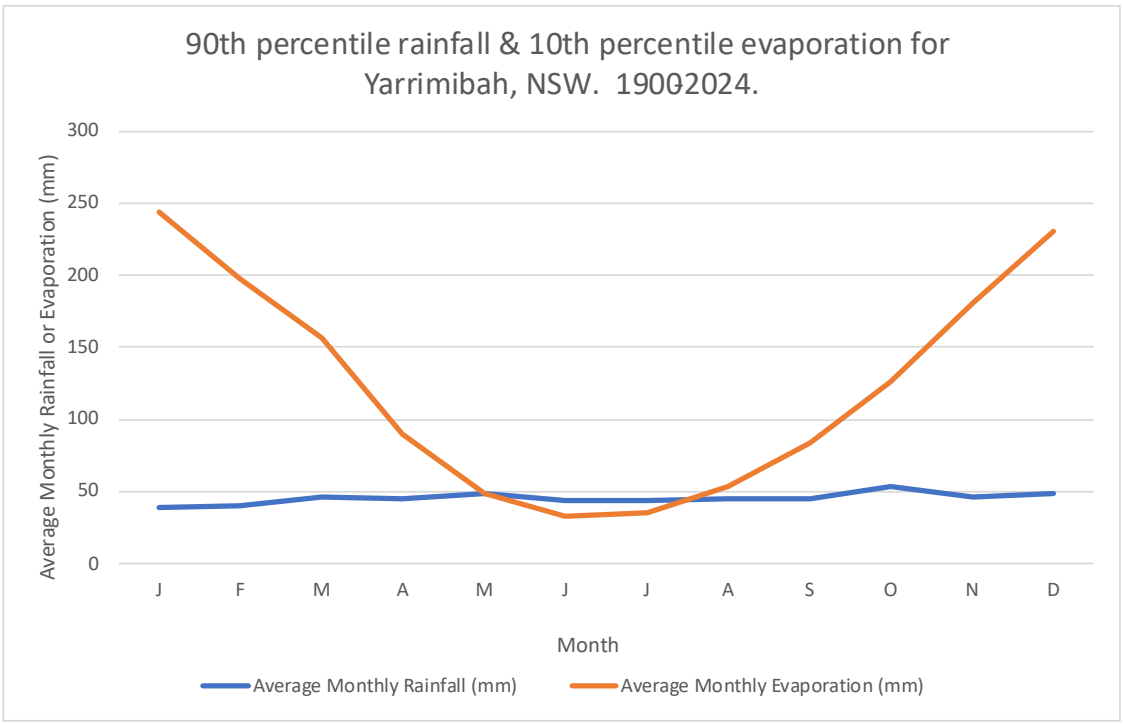

Figure 2-8 - Rainfall vs evaporation at site in 90th percentile year (Source – SILO Data point

3. PROJECT DESCRIPTION

3.1. EFFLUENT SYSTEM AND MANAGEMENT

The existing effluent treatment and storage system has been constructed and operated as part of the freestall housing system collectively since its approval in 2021. At the time of the intensive dairy designated development application, a detailed assessment of total water balance and effluent generation calculations were undertaken. This did not include the existing dairy, calf shed and loose housing system as they were not at that time connected to the proposed effluent system and relied on a totally separate management system.

The existing system calculations were based on two flood washed freestall housing sheds with 100% occupation of 1,056 cows in each area. The manure generation calculations considered all manure across 24 hours noting that this was in excess of the actual occupation.

This updated assessment considers the following areas and effluent generated at:

- Existing two x 1,056 cow freestall housing sheds at correct occupation times which are budgeted at 23 hours and 40 minutes within the housing system, laneway and dairy yard and 20 minutes a day on the dairy platform. Effluent management from within the housing system will remain unchanged and be directed to the existing approved solids collection ditch system. Laneway flood wash will continue to be captured and combined with the new dairy yard wash volume and conveyed in a transmission pit on the west side of the Moira channel.
- New dairy which will be used for the milking of all freestall cows (2,112 cows) plus remaining pasture-based cows (180). Effluent within the new dairy will be managed in two ways.
    - Yard wash from the lead up and yard area of the dairy will be floodwashed into the laneway transmission pit on the west side of the Moira channel. A budget of 40 minutes per milking occupation time has been included in this calculation.
    - Platform and pit wash along with all services cleaning will be conveyed to a small pit and directed to the Trafficable Solids Trap (TST) on the east side of the Moira channel.
- Existing maternity/loose housing area with an occupation rate of 200 cows and a contribution of effluent from floodwashed and 4 hours manure contribution to the system will be directed to the TST on the east side of the Moira channel.
- Existing dairy use for 200 cows assuming milking twice daily and yard wash once daily. Plant wash and vat wash volumes reflective of internal used milk. All effluent and water directed to the TST on east side of Moira channel.
- Existing calf shed water use is captured and directed to the TST on the east side of the Moira Channel.

A connecting pipeline below the Moira Irrigation channel will transmit the liquid (green water) from the TST to the existing effluent storage pond system. The solids from the TST and spent bedding (calf shed and loose housing shed) is consolidated with the existing effluent solids management system on the property.

The transmission pit that captures and conveys the flood wash from the new dairy yard and the existing floodwashed laneway from the freestall housing areas to the dairy will capture and pump water from the pit to the effluent pond system connected to bottom of freestall shed 2.

Surface water run-off from shed roofs, embankment batters, tractor laneways and irrigation areas are all captured and transmitted into either water tanks, freshwater dams or the irrigation recycle system.

3.2. WATER USE INFLOW REQUIREMENTS

The dairy and housing systems requires three separate water inflows to the system. This water is required for:

- Drinking,
- Cooling, and
- Wash systems for effluent management.

These are further described below:

3.2.1. COW DRINKING REQUIREMENT

Lactating dairy cows can drink over 200L of water per day (Dairy Australia, 2019). A maximum drinking volume of 240L/cow per day has been utilised with a % decrease based on season. This volume has been applied per specialist advice and current operational experience.

Non-lactating cows drinking water requirements have been based on 7.1L of water per kg of dry matter consumed. Using the system requirements have been estimated as follows:

Table 3-1 - Estimated cow drinking water requirements

Month	L/Cow/Day	Freestall 1 Daily Requirement (ML)	Freestall 2 Daily Requirement (ML)	Maternity Daily (ML)	Total System Requirement (ML)
Jan	240	7.9	15.7	0.57	24.1
Feb	240	7.1	14.2	0.52	21.8
Mar	216	7.1	14.1	0.52	21.7
Apr	192	6.1	12.2	0.44	18.7
May	192	6.3	12.6	0.46	19.3
June	168	5.3	10.6	0.39	16.4
July	168	5.5	11.0	0.40	16.9
Aug	168	5.5	11.0	0.40	16.9
Sep	180	5.7	11.4	0.42	17.5
Oct	204	6.7	13.4	0.49	20.5
Nov	228	7.2	14.4	0.53	22.2
Dec	240	7.9	15.7	0.57	24.1
Total	**203 (Avg)**	**78.2**	**78.2**	**5.7**	**240.2**

The above calculations identify that the operation requires an estimated total of 78.2ML of drinking water per freestall system annually and 5.7ML in the maternity area for a total annual budget of 240.2ML at full capacity.

3.2.2. COOLING SYSTEM REQUIREMENT

A misting system incorporating cooling fans is utilised as part of the housing system operation and is currently estimated at using up to 50,000L/shed/day when in use. A total water use for this system has been provided below based on an estimated percentage of total volume utilised in a month.

Table 3-2 - Estimated cooling system water requirements

Month	% of days utilised	Total Daily Requirements /shed (L)	Monthly Requirement Freestall 1 (ML)	Monthly Requirement Freestall 2 (ML)	Monthly Requirement Maternity (ML)	Total Monthly Requirement (ML)
Jan	100%	50,000	1.6	1.6	0	3.1
Feb	100%	50,000	1.4	1.4	0	2.8
Mar	80%	40,000	1.2	1.2	0	2.5
Apr	30%	15,000	0.5	0.5	0	0.9
May	20%	10,000	0.3	0.3	0	0.6
June	0%	-	0.0	0.0	0	0.0
July	0%	-	0.0	0.0	0	0.0
Aug	0%	-	0.0	0.0	0	0.0
Sep	30%	15,000	0.5	0.5	0	0.9
Oct	60%	30,000	0.9	0.9	0	1.9
Nov	100%	50,000	1.5	1.5	0	3.0
Dec	100%	50,000	1.6	1.6	0	3.1
Total		**310,000**	**9.4**	**9.4**	**0.0**	**18.8**

The above calculations identify that the total estimated water required for cooling per freestall housing area is 9.4ML - a total of 18.8ML at full capacity. The maternity housing system is not currently equipped with an operational cooling system.

3.2.3. FLOODWASH

Dairy systems located within the irrigation areas, will typically use additional water through the dairy and housing areas throughout the irrigation season. This management style is considered a good practice to ensure ongoing clean areas within the dairy, housing system, flushes effluent pond systems through the summer period and allows for utilisation of nutrients during high crop growth periods. This practice has little impact on the effluent system as it is not undertaken within the storage period and the risk of spill or overtopping is almost non-existent.

Flood wash systems use large volumes of water to move manure and spent bedding in the system. This volume forms a significant part of the effluent storage volume (relevant in winter) and as a result, the management relating to water use in winter has been considered below.

The flood wash water systems contributing to the effluent pond has been estimated as follows:

Table 3-3 - Current and estimated flood wash water requirements

Wash Area	Single Wash (L)	2 Daily Washes (L)	Total Daily Requirement (ML)	Total Annual Requirement (ML)
Lane to dairy	8,000	16,000	0.02	5.8
Dairy (new)	96,000	192,000	0.19	70.1
Dairy (current)	-	-	0	0*
Freestall 1	120,000	240,000	0.24	87.6
Freestall 2	120,000	240,000	0.24	87.6
Calf Shed	3,300		0.003	1.2
Maternity	30,000	60,000	0.06	21.9
Total (L)	**377,300**	**748,000**	**0.75**	**274.22**

*** Note:** Current dairy uses different method for cleaning which is accounted for in the dairy water use calculations.

The calculations provided above identify that the volume of water for flood washing per freestall area will be 0.24ML per day when using two flood washes. Other flood washing of the laneways, new dairy and existing maternity system have also been considered and including these values, a total flood wash volume of 0.75ML/day is required daily and 274.2ML annually.

3.2.4. DAIRY WATER USE

Areas and equipment within the dairy are washed using fresh water. These activities include washing of the rotary platform with water during milking, pre-wetting concrete prior to milking, hand hose washing during milking to ensure the areas are clean and full washing of the milking platform and pit area following milking.

Additional fresh water is also used for vat washing post milk tanker collection, plant washing of the milking machines and for the plate cooler which cools the milk as it is being collected prior to entering the vat. Plate cooler water is recycled through the flood wash system and is not included in the calculations as the volume is included in the flood wash volume.

Current water use in the existing dairy is 50ML annually including the yard and platform washes and services cleaning.

The following table considers the water use required for both dairies in their new format, which allows for the following cow numbers to utilise each dairy:

- 200 maternity or fresh cows and hospital cows to utilise the current dairy as a separate milking area. Milk to go to calves.
- 2,112 cows from the freestall housing areas and 180 cows from the remaining pasture area to utilise the new dairy. Milk to be exported off farm to supplier.

Table 3-4 - Estimated dairy wash water requirements

Dairy Area	New Dairy			Current Dairy			Combined
	L/Day	L/Month	ML/year	L/day	L/Month	ML/Year	Total ML/year
Platform	48,000	1,460,000	17.52	31,800	967,250	11.61	29.13
Yard Area	6,600	200,750	2.41	28,980	881,475	10.58	12.99
Services							
Vat	4,100	124,708	1.50	370	11,254	0.14	1.63
Plant	7,200	219,000	2.63	3,600	109,500	1.31	3.94
Total	**0**		**24.1ML**			**23.6ML**	**47.69ML**

The above table shows that the new dairy (excluding floodwashed yards) will utilise 24.1ML annually. The existing dairy operating at reduced numbers and cleaning requirements will utilise 23.6ML (including yard wash) annually for a combined total water use of 47.69ML per year. This is slightly less than the existing water uses for milking operations through the dairy.

3.2.5. TOTAL SYSTEM INPUTS

A Summary of the total water inflows required in the system is as follows:

Table 3-5 - Total water system inputs

Month	Drinking Water (ML)	Cooling Requirement (ML)	New Dairy Shed (ML)	Current Dairy Shed (ML	Flood wash (ML)	Total per operation
Jan	24.14	3.10	2.04	2.01	23.29	54.58
Feb	21.81	2.80	1.85	1.81	21.04	49.30
Mar	21.73	2.48	2.04	2.01	23.29	51.55
Apr	18.69	0.90	1.98	1.94	22.54	46.05
May	19.31	0.62	2.04	2.01	23.29	47.27
June	16.35	-	1.98	1.94	22.54	42.81
July	16.90	-	2.04	2.01	23.29	44.24
Aug	16.90	-	2.04	2.01	23.29	44.24
Sep	17.52	0.90	1.98	1.94	22.54	44.88
Oct	20.52	1.86	2.04	2.01	23.29	49.72
Nov	22.20	3.00	1.98	1.94	22.54	51.65
Dec	24.14	3.10	2.04	2.01	23.29	54.58
Total	**240.2**	**18.8**	**24.1**	**23.6**	**274.2**	**580.9**

From the above calculations it is identified that the annual water requirement for the system inclusive of the housing and dairy areas is 580.9ML at full capacity. The highest requirement is 54.6ML in January and December and the lowest 42.8ML in June.

The Moira PID system, being one of the sources of water supply to the dairy system, can provide water throughout the irrigation season starting in August and ending in May. Access to groundwater is available year-round. Both supply systems are subject to total volumetric licensing limits. The site also includes a licenced off-river irrigation storage dam which maintains a capacity of up to 170ML.

To enable 100% reliability of water to the operation, two sources of water are accessible at all times. This is via the channel and groundwater system throughout summer+ and a freshwater storage and groundwater in winter. These supply systems are utilised for the supply of water to the entire intensive dairy system with a significant and high-pressured pump system connecting all systems together.

The winter period from Mid May to Mid August, being the time that the irrigation system is closed, has a total water use of 130.3ML which is less than the total storage capacity over the winter period. The required system inflows are also within the total volume of allocated groundwater of 1,064ML or the Moira PID allocation connected to the property of more than 5,000ML demonstrating that there is sufficient capacity within the existing allocated systems and on site storage systems to provide water into the system.

3.3. MANURE GENERATION

The characteristic of manure and effluent is described in the *Effluent and Manure Management Database for the Australian Dairy Industry* as:

Total excreta (faeces + urine) (kg/day) -= [milk (kg/day) x 0.616] +46.2

The cow production within this operation is aiming for milk production of up to 40l/cow per day.

Utilising the above formular, the total excreta can be calculated as:

Table 3-6 - Total system excreta (faeces + urine)

Herd Area	Cow/Day (kg)	Per 24 hours (kg)	Per month (kg)	Per Year (kg)	Per Year (t)
Freestall 1	70.8	74,807	2,281,615	27,304,570	27,305
Freestall 2	70.8	74,807	2,281,615	27,304,570	27,305
Maternity	64.7	12,936	394,548	4,734,576	4,735
Pasture*	65.9	11,864	361,857	4,342,283	4,342
Total		**174,414**	**5,319,634**	**63,685,998**	**63,686**

*** Note:** Values in this row are showing total volumes however pasture-based cows are *not* subject to 24 hours of excreta collection.

It is important to identify the different understand the volume, components and related management methods of the excreta. Specifically, the proportions of dry matter and urine within the effluent stream have been calculated using the following formula:

Total Dry Matter (kg/day) = [milk (kg.day) x 0.0874] + 5.6

Urine per day (kg/day) = Total excreta (kg/day) – Total Dry Matter (kg/day)

Table 3-7 - Excreta Capture Areas and Volumes

Area		Time @ Area	Total Cow/Day (kg)	Dry matter Cow/day (kg)	Urine Cow/Day (kg)	Solids	Liquid
Freestall 1	Freestall	22H	64.9	37.2	27.8	Solids Ditch 1-4	Storage Pond
	Dairy yard	1H:40M	4.9	2.8	2.1	Pit to Solids ditch 5-8	Storage Pond
	Rotary	20M	1.0	0.6	0.4	TSS	Storage Pond
Freestall 2	Freestall	22H	64.9	37.2	27.8	Solids Ditch 5-8	Storage Pond
	Dairy yard	1H:40M	4.9	2.8	2.1	Pit to Solids Ditch 5-8	Storage Pond
	Rotary	20M	1.0	0.6	0.4	TSS	Storage Pond
Maternity	Bedding area	17H45M	23.9	23.5	0.4	Solids storage Paddock	NA
	Feed lane	5H	6.7	6.6	0.1	TSS	Storage Pond
	Dairy Yard	45M	1.0	1.0	0.0	TSS	Storage Pond
	Rotary	30M	0.7	0.7	0.0	TSS	Storage Pond
Pasture	Yard	1H30M	4.1	2.1	2.0	TSS	Storage Pond
	Rotary	20M	0.9	0.5	0.5	TSS	Storage Pond
Calf Shed	Calf sheds wash	24H	-	-	-	TSS	Effluent Storage Pond
	Calf Bedding	24H	-	-	-	Solids storage/paddock	NA

The above table identifies the area within the operation; the time spent in that area and calculates the total excreta and its division between dry matter and urine within the system throughout the day. The solids and liquid management method for each system are also identified. This information forms the basis and sizing of the management structures (pits/traps/ponds).

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The key management areas within the system are as follows:

- ***Solids collection ditches*** which take all solids from the freestall system, new dairy yard and floodwashed laneway. The budgeted total solids removal from this system is 80%.
- ***Trafficable Solids Trap*** which captures all solids from the new dairy pit and platform, current dairy, calf sheds and maternity system. The budgeted solids removal from this system is 50%.
- ***Effluent storage pond*** with sizing budgeted on a 90th percentile wet year and a four-month storage period. This pond will be typically an anaerobic storage pond system.
- ***Transmission pits*** (with no storage or solids removal) to:
    - capture and convey all effluent from the new dairy yard/laneway to the end of freestall shed 2 (to the solids collection ditch), and
    - convey effluent liquid from the trafficable solids trap to the effluent storage ponds.
- ***Solids removal from spent bedding***, TST and solids collection ditches

Table 3-8 - Effluent Volumes by area

Area	Daily Fresh Input (L)	Total Excreta (Kg)	Primary Treatment	Daily Effluent Capture from Areas								
				Solids Separation (%)	Total Solids (kg/day)	Removed Total Solids (kg/day)	Total Solids to Ponds (kg/day)	Urine to Ponds (L/day)	Total to Ponds (L/day)	Total to Ponds (ML/day)	Annual (ML)	Solids (T)
Freestall 1	240000	68,573	Solids Collection Ditch	80%	39,262.08	31,409.66	7,852.42	29,311.04	277,163.46	0.28	101.16	11,465
Freestall 2	240000	68,573	Solids Collection Ditch	80%	39,262.08	31,409.66	7,852.42	29,311.04	277,163.46	0.28	101.16	11,465
New Dairy Yard	192000	11,090	Pump pit to solids collection ditch	80%	6,302.64	5,042.12	1,260.53	4,787.17	198,047.70	0.20	72.29	1,840
Lane (Shed to New Dairy)	16000											-
New Dairy Rotary	65900	2,288	TSS	50%	1,299.15	649.58	649.58	988.45	67,538.03	0.07	24.65	237
Current Dairy Yard	0	202	TSS	50%	198.88	99.44	99.44	3.25	102.69	0.00	0.04	36
Current Dairy Rotary	64750	135	TSS	50%	132.58	66.29	66.29	2.17	64,818.46	0.06	23.66	24
Maternity Feed Lane	60000	1,348	TSS	50%	1,325.83	662.92	662.92	21.67	60,684.58	0.06	22.15	242
Maternity Bedding	0	2,392	Solids Storage	100%	2,118.02	2,118.02	-	273.79	273.79	0.0003	0.10	773
Maternity External	0	2,392	TSS	100%	2,118.02	2,118.02	-	273.79	273.79	0.0003	0.10	773
Calf Shed	3300	-	TSS	50%	0	-	-	-	3,300.00	0.0033	1.20	-
Total	**881,950**	**156,992**	**-**		**92,019**	**73,576**	**18,444**	**64,972**	**949,366**	**0.95**	**346.52**	**26,855**

In summary, the system when undertaking solids separation will produce:

- 57,302t of effluent captured annually of which this is divided into:
    - 33,587t of total solids and
    - 24ML of urine
- Utilising the solids separation from a solids collection ditch and a trafficable solids trap, there is 73,576t of solids removed (as deposited) annually. This is divided into:
    - 5,748t for freestall 1 for a 6-month period
    - 6,789t for freestall 2 including the laneway and new dairy yard for a 4-month period
- Total contribution from the effluent system ponds of 347ML not including rainfall, evaporation or losses to atmosphere.

3.4. CATCHMENT AREAS

The intensive dairy system housing area and effluent ponds have been incorporated into an existing fully contained 42ha irrigation area on the west side of the Moira PID channel. The milking, calf and maternity area are located within a contained irrigation area on the east side of the Moira channel and will now be connected to the west side effluent system. These areas can be divided into the following catchment areas that are subject to rainfall and run-off management:

Table 3-9 - Catchment areas reviewed

Area	Area (m^2)	Surface type	Run-off Coefficient	Area (m^2)	Run-off Directed to
Freestall roofs	28,320	Roof	1	28,320	Tanks/dam
Drains & Lanes	27,680	Gravel Lined	0.8	22,144	Pond
Manure Storage Area	11,000	Earthen (bare)	0.8	8,800	Pond
Grassed areas	46,000	Grassed	0.3	13,800	Pond
Concrete Lanes	1,410	Concrete	1.0	1,410	Pond
Effluent Pond	18,000	Water	1	53,000	Pond
New Dairy	3,100	Roof	1	3,100	Tanks/dam
Current dairy	306	Roof	1	306	Tanks/dam
Current dairy yard	720	Concrete	1	720	Pond
Current dairy lane	2200	Earth	0.9	1,980	Pond
Calf shed pad	400	Concrete	1	400	Pond
Maternity shed	4,800	Roof	1	4,800	Irrigation
Maternity loafing north	3,200	Earth	0.8	2,560	Pond
Total Catchment Area	**14.7ha**			**154,140**	
Catchment to ponds	**11ha**			**117,614**	

The remaining catchment areas within the site are captured, controlled and directed outside of the controlled drainage area and follows its current drainage direction to the existing irrigation recycle system.

The above table shows that a total area of 117,614m^2 contribute rainfall to the effluent pond (excluding water surfaces). These catchment areas form an important contribution to the winter storage calculations of the effluent pond.

4. EFFLUENT TREATMENT

This section describes the treatment systems proposed as part of the operation.

4.1. EFFLUENT CAPTURE SYSTEM

Effluent is captured from the above catchment areas in several ways. These are described as follows:

4.1.1. FREESTALL HOUSING SYSTEM

Excreta (manure and urine) in the freestall housing system is collected on concrete lanes within the housing areas or laneways. These are flood washed with controlled flood wash systems where a specific volume of water (Appendix 2) is used to move all excreta from within the housing system and convey it via a drain at the end of each lane and deposit it into a catch drain at the end of the lanes.

The drain conveys effluent (excreta and wash water) through one of several valves directing it to the current solids collection ditch through a large pipeline.

4.1.2. MATERNITY HOUSING SYSTEM

The maternity housing system is a loose housing system with a pack bedding system. A central concrete feedpad laneway system within the housing area is floodwashed twice daily picking up the estimated 5 hours of excreta per cow deposited within this area. The housing system includes outside earthen loafing areas which are subject to rainfall catchment which is captured in earthen drains from both the north and the south loafing areas.

Effluent from the floodwash lane is captured at the western end of the housing area in a concrete drain and small pit. Run-off from the earthen loafing areas is captured and conveyed with the floodwash run-off to the effluent system. The effluent system connected to this area will be updated to connected to the proposed trafficable solids trap.

4.1.3. CALF SHED

The calf shed wash area is washed by handheld hoses daily. Wash water and the small volume of excreta is directed to controlled drains and will be combined with the drain from the northern earthen loafing areas of the maternity area and conveyed to the proposed trafficable solids trap. **See right photo**.

4.1.4. CONCRETE LANEWAY SYSTEM

The concrete laneway system where cows travel between the freestall housing system and the dairy is floodwashed following each milking. Effluent and rainfall run-off from this system is captured (with the new dairy yard wash effluent) in a drainage system in the laneway and conveyed to a new pump pit. All effluent from this area is pumped in a pipeline to the end of the freestall shed 2. These works are in progress as part of the existing system.

4.1.5. EARTHEN LANEWAY SYSTEM

The earthen laneway system links cow access from the freestalls concrete access lane to the current dairy, current dairy to the maternity system and will link the new and the current dairy together. All run-off from this laneway is captured and directed to the effluent system. This will be updated to connect to the proposed trafficable solids trap.

4.1.6. CURRENT DAIRY

The current dairy yard, platform and pit and all services are connected to the existing effluent system. All excreta and washdown water, including that from the yard blaster system, is captured into existing drainage management pits and pipes that drain to the effluent system. This will be updated to connect to the proposed trafficable solids trap.

Figure 4-1 - Existing dairy yard area (Source: PRS)

4.1.7. NEW DAIRY

The new dairy yard will be floodwashed on the southern side, being the main cow entry and exit area. The yarding area on the north side will be hand washed as required. All wash water from this area will be conveyed over the bridge and combined with the concrete laneway system effluent stream.

The platform and pit area combined with all services will be connected to the existing effluent system. All excreta and washdown water will be captured into a drainage management pit and pipe connecting to the proposed trafficable solids trap.

4.2. SOLIDS REMOVAL SYSTEM

As described above there are multiple catchment, separation and conveyance systems that manage effluent within this site. There are two separate methods proposed for the removal of solids within the effluent system. These are Trafficable Solids Trap and a Solids Collection Ditch.

4.2.1. TRAFFICABLE SOLIDS TRAP

The main portion of the effluent on the east side of the Moira channel system (dairies, maternity housing and calf washdown) will be directed to and combined in the proposed Trafficable Solids Trap (TST). Solids will be separated using a TST system with a weeping wall with the liquid component conveyed to the rear of the freestall solids collection ditch system. Solids removed and collected in this system will be removed within the trap, regularly cleaned out and stored on the adjoining concrete storage area and removed for application to land.

The volumes of solids and effluent that are estimated to be managed through the TST are as follows:

Table 4-1 - Trafficable Solids Trap contribution volumes

Area	Volume (7 days)	Volume (14 days)	Contingency
Housing	0	0	0
Existing Dairy	37,726	39,777	35,675
Maternity & Calf Housing	71,609	83,207	30,000
New Dairy (platform only)	40,510	48,070	32,950
Total	**149,839**	**171,054**	**98,625**

Utilising the above calculations, the following trafficable solids trap is proposed. It should be noted however that the sump in this system will consist of two separate sumps which will include a secondary circular sump that facilitates effluent flows under the Moira Channel, connecting into the existing effluent storage pond system.

The trafficable solids trap proposed is shown diagrammatically below:

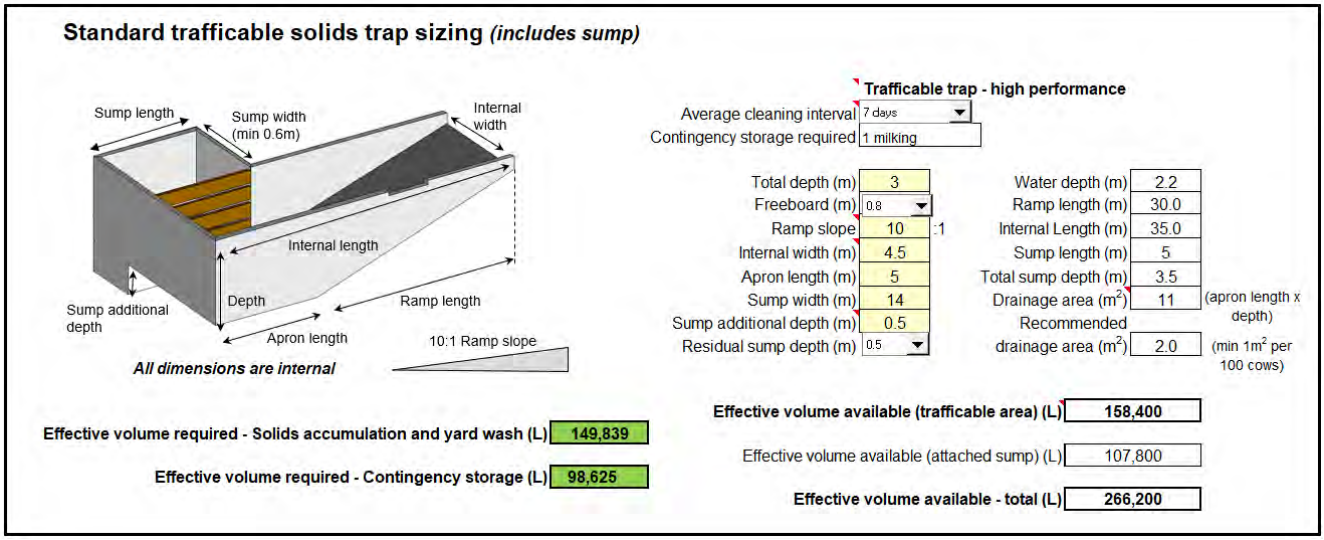


Figure 4-2 - Trafficable Solids Trap Sizing (Effluent Toolkit V 12.3.2)

As identified in the above table and diagram, the TST and associated sump meet the storage requirements for a 7 day rotation removal period.

4.2.2. SOLIDS COLLECTION DITCH

A review of the existing system operation activities has been completed specifically focussing on the solids removal within the system. This review confirmed that effluent from each housing system is directed to a single solids collection ditch per housing area in rotation. Effluent is separated from the storage pond by a weeping wall at the lower end of the ditch which prevents solids from leaving the ditch and allows liquid to flow into the storage pond system. **Figure 4-3** below shows this system in operation.

Figure 4-3 - Existing sedimentation ditches (Source: PRS)

The above system currently captures the freestall housing system lanes, cow access lanes to the dairy and will incorporate the new dairy yard effluent. Effluent from the housing areas is transmitted to the existing solids collection ditch system via gravity and the laneway and yard system will be soon transmitted via a pump pit system. The existing ditches have been sized to capture and store effluent from all cows on the site based on a 6 month rotation however on-site management confirms that it currently takes on average up to 8 months to fill each ditch to design capacity.

The existing ditches have the following dimensions:

Table 4-2 - Sedimentation ditch summary

Ditch	Length (m)	Width (m)	Depth (m)	Area (m^2)	Capacity (ML)
1	160	35	2.3	5,600	10
2	181	35	2.3	6,335	11.3
3	201	35	2.3	7,035	12.6
4	222	35	2.3	7,770	14
5	169	35	2.3	5,915	10.5
6	191	35	2.3	6,685	11.9
7	213	35	2.3	7,455	13.3
8	234	35	2.3	8,190	14.7
Total	**1,571**	**35**	**2.3**	**54,985**	**98.3**

When each ditch reaches its design capacity, solids within the ditch settle with any remaining liquid draining from the lower area allowing solids within the ditch to continue to dry. During this time, the solids collected will settle and reduce in volume. Experience at the site shows that this time is around 8 months collection time per ditch and 6 months drying time with a loss of approximately 35% of the solids volume.

Solids when removed are dry and are transported through the property for application to land at application rates relevant to the crop requirements. These application rates are reviewed annually as part of the EPA licence held at the site.

The effluent Toolkit developed by Agriculture Victoria in conjunction with Dairy Australia, V12.3.2, Feb 2022 has been utilised to calculate the effluent pond size requirements against the proposed design and operation. The results are shown below and are divided by stage to ensure compliance at all times. All calculations have been reviewed against the *Effluent and Manure Management Database for the Australian Dairy Industry*, December 2008.

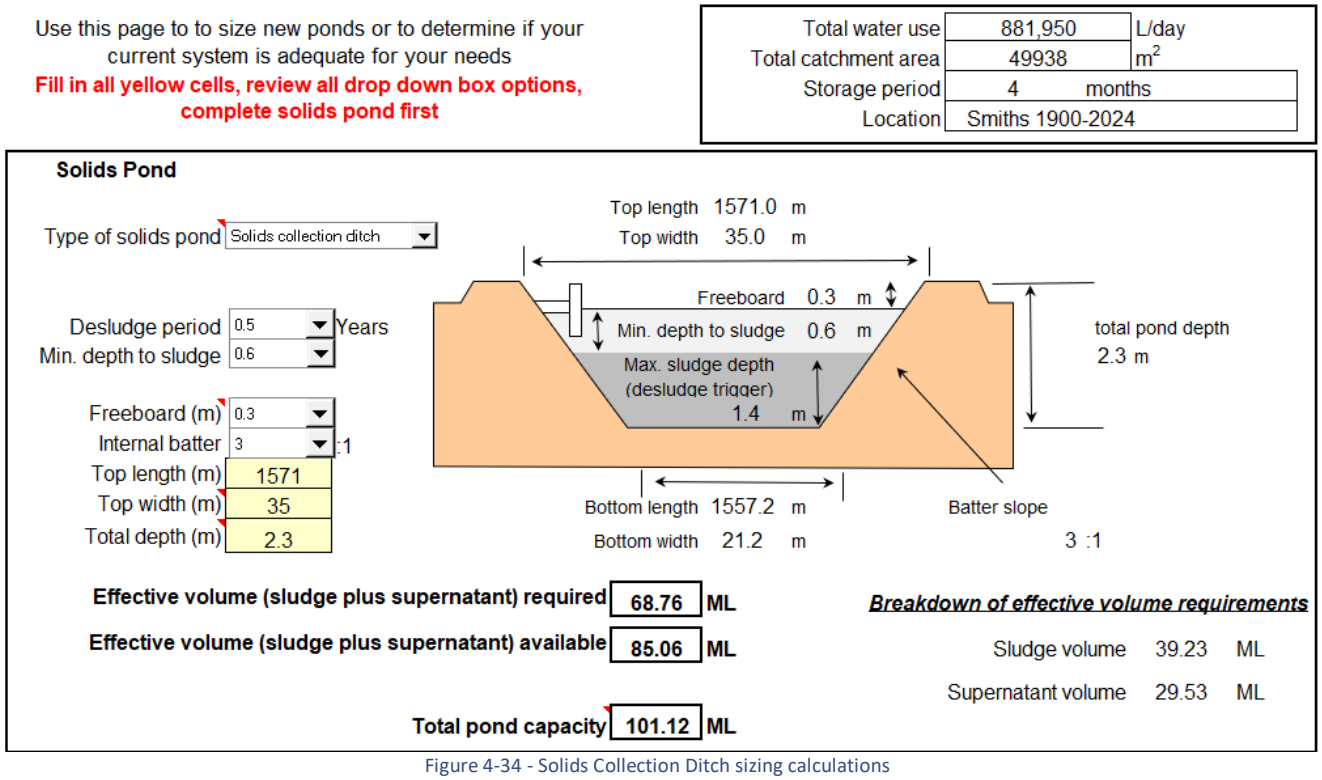


Figure 4-34 - Solids Collection Ditch sizing calculations

The above calculations indicate that the required pond capacity, using a 6 month storage period in rotation is 68.76ML. The existing system has a total capacity of 101.12ML or an effective volume of 85.06ML.

The total solids collection ditch capacity exceeds any requirement for the above conservative calculations and meets the required volume for storage. The solids collection ditches are proposed on a 6 month clean out period. This allows for matching double crop rotations on irrigation and application to dryland prior to sowing periods. This is important as incorporating solids applied is good practice for nutrient benefit and preventing surface run-off. Current operation practice shows that an 8 month fill period is a consistent contribution timeframe.

4.3. EFFLUENT STORAGE POND

The effluent storage ponds require an average winter storage period of two months (see **Figure 2-7**) and a four-month period (see **Figure 2-8**) to allow for a 90th percentile year. During this storage period, a 90th percentile rainfall volume of 182mm is used as a basis to estimate the volume of additional inflows into the system. This equates to a volume of 13.2ML to consider in the effluent treatment system and storage period.

The pond sizing for the effluent storage includes consideration of:

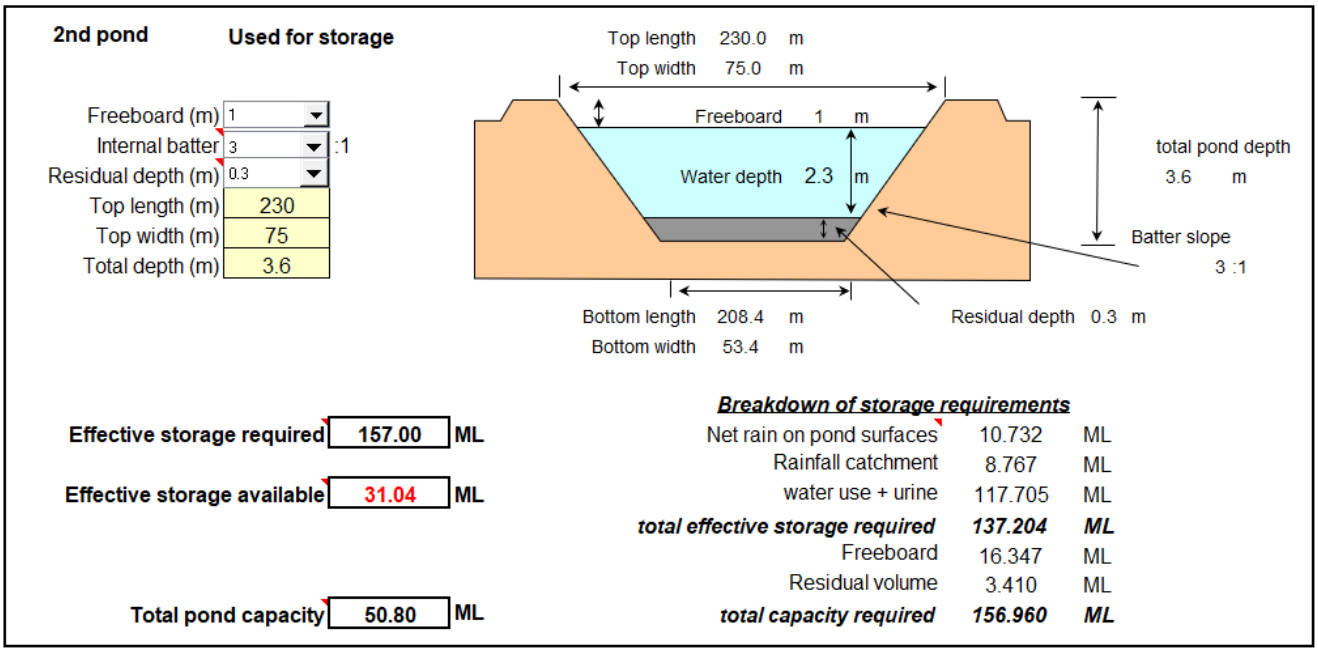
- net rain on pond surfaces
- rainfall catchment areas
- water use + urine contribution
- removes the residual volume and
- allows for freeboard of 1m within the storage ponds.

The existing effluent pond system constructed as part of the intensive dairy system approval has the following capacity:

Table 4-33 - Effluent pond sizing dimensions

Pond	Length (m)	Width (m)	Area[1] (m^2)	Volume (ML)
Drain	366	25	26,760	4.5
Storage Pond 1	230	75	17,250	51
Irrigation Storage Dam	340	380	varies	308
Total				**363.5**

The effluent Toolkit developed by Agriculture Victoria in conjunction with Dairy Australia, V12.3.2, Feb 2022 has been utilised to calculate the effluent pond size requirements against the proposed design and operation. The results are shown below and are divided by stage to ensure compliance at all times. All calculations have been reviewed against the *Effluent and Manure Management Database for the Australian Dairy Industry*, December 2008.



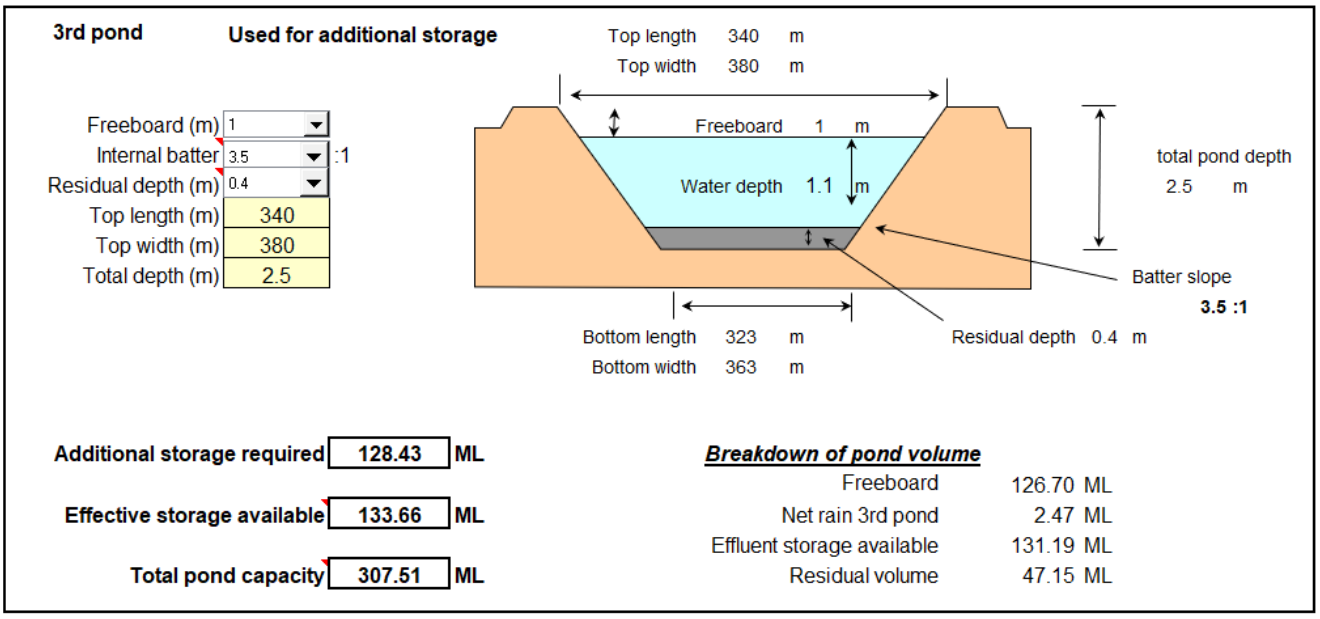


Figure 4-45 - Effluent storage pond calculations

Utilising the above factors, the following results are confirmed:

- The total storage requirement is 157ML and the existing storages combined have 164ML available.
- The total requirement for overflow to the storage is 128ML with 133ML available.
- The storage requirements are met by the site pond and the irrigation storage dam.
- The storage size has been adjusted by length/width to gain the correct storage size and surface area.
- Pond 1 must be cleaned out annually.
- The storage must be empty entering into the winter storage period.

5. EFFLUENT IRRIGATION AND NUTRIENT UTILISATION

Effluent and manure produced from dairy systems provides an important farm system resource and saves on significant fertiliser costs within the operation. Best management practices which optimise water, nutrients, and organic matter assist with the avoidance of site contamination (ground and surface waters), reduction of odour, nutrient overloading and large pond sizing and ponding.

This section proposes to identify, the limiting land area for effluent water use and nutrient balancing. This section is provided as a guide only and paddock specific soil tests should be undertaken in conjunction with effluent system tests for future nutrient balances. The total nutrient balances within the system are reviewed annually in line with the existing Environment Protection Licence and operation conditions to reflect this requirement.

An updated nutrient generation calculation and an assessment of the available utilisation areas has been completed as part of this assessment. This includes calculating the total Nitrogen, Phosphorus and Potassium generated within the system and the effluent components where the nutrients are held. The application areas and volumes are then reviewed to ensure that the available area is sufficient to manage ongoing nutrient loadings.

The following cow numbers and contributing factors for nutrient generation budgeted for are as follows:

Table 5-1 - Cow nutrient contribution information

Factor	Freestall 1	Freestall 2	Pasture	Maternity	Total
Cows	1,056	1,056	180	200	2,492
Daily Production (L)	41	41	32	20*	-
Lactation Length	365	365	365	-	-
Feed Waste Collected to effluent	0	0	0	1.08	1.08

The following nutrient values and formulars have been used to calculate the nutrient volumes within the system:

Table 5-2 - Nutrient volumes and formulas for volumes

Result	Unit	Nitrogen	Phosphorus	Potassium
Nutrient in feed waste	%	2.40	0.34	1.24
Nutrient excreted/cow/day	g	[(DP x 2.08)+346]	[(DP x 0378)+50.4]	[(DP x 1.476)+154.1]
Nutrient Volume in Sludge	%	20	30	10
De sludge Period	/year	0.5	0.5	0.5
Nutrients in liquid	%	50	60	90
Nutrients lost	%	30	10	0

Using the above information and formulas, the following total nutrients and their form have been calculated.

Table 5-3 - Nutrient volumes for budget in kg/year

Nutrient	Total	Sludge	Liquid	Lost
Nitrogen	399,085	79,817	199,543	119,726
Phosphorus	70,284	17,065	38,150	15,068
Potassium	185,662	18,566	167,096	0

The liquid application requirement is calculated by dividing the total nutrient generated by the highest sustainable application rate for the cropping system. For annual cropping systems, this is as follows:

Table 5-4 - Crop requirements and nutrient utilisation budget in kg/year

Nutrient	Typical Single Crop	Typical Double Crop	Value used in budget	Area Required for use
Nitrogen	400	460	460	434
Phosphorus	80	80	80	477
Potassium	300	360	360	464

The above table identifies that the total area required to utilise the liquid effluent at full production will be 477ha. This area includes a double cropping program or a slightly increased area where a single cropping program is proposed. The use of liquid effluent within the system will reduce the use of synthetic fertilisers as a result of the effluent application.

Manure and spent bedding, where generated from within the system, will require utilisation within the operation. This manure is generated within the maternity area scrapings, used bedding in the form of reprocessed dry manure, calf bedding and solids removed from the solids collection ditch within the effluent system. The solids application requirement is calculated by dividing the total nutrient generated by the highest sustainable application rate for the cropping system. For annual cropping systems, this is as follows:

Table 5-55 - Crop requirements and nutrient utilisation budget in kg/year

Nutrient	Typical Single Crop	Typical Double Crop	Value used in budget	Area Required for use
Nitrogen	400	NA	400	200
Phosphorus	80	NA	80	213
Potassium	300	NA	300	62

The above table identifies that the total area required to utilise the liquid effluent at full production will be 213ha annually. This does not include a double cropping program as the application of solids is typically undertaken on dryland cropping areas that do not support double cropping programs. Like the liquid effluent, the use of manure solids within the system will reduce the use of synthetic fertilisers as a result of their application to land and cropping systems. This manure will be utilised across all owned properties in conjunction with required buffer distances, soil and manure tests. No manure will be spread during times where they could cause an impact to the environment or adjoining residences.

6. MANAGEMENT CONSIDERATIONS & CONTINGENCY

With any system, there is a potential for error or component failure. Typically, the major contributing factors to failure are equipment failure or onerous management – particularly timeframe management. The system design incorporates several components to ensure that in the case of equipment failure, there is capacity and a bypass system that can allow autonomous outflow to the effluent pond and controlled drainage. All contingency systems contain outflows on farm without the need for an external release off farm.

Contingencies at this site are designed to be managed in multiple ways. This includes the following:

Flood wash pit on west side of Moira channel

This pit captures all wash water from the new dairy yard system and laneways between Freestall sheds 1 and 2 to the dairy. It also captures rainfall on the laneway surface area. All water from these areas is captured and conveyed into a pump pit on the north side of the laneway and west side of the Moira channel. Effluent is pumped from this pit into the end of Freestall shed 2 and combined with the outflow from this shed into the solids collection ditch system. This pit pump system has full pump redundancy and is connected to the generator back up system on the property in the case of failure.

Should a total failure of all pumps or power fail to the pumps, this pit also includes an overtopping connection to the drain that runs north and connects to the drain which conveys the effluent from the trafficable solids trap into the effluent storage pond system.

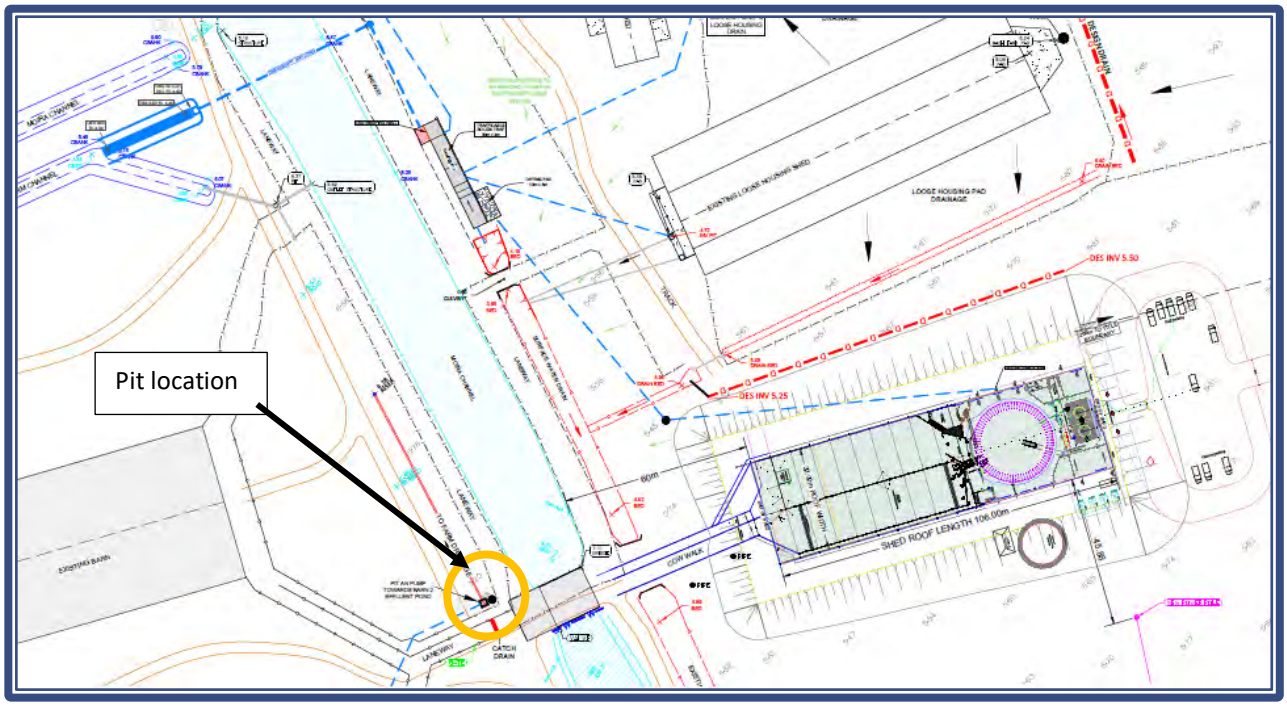


Figure 6-1 - Image showing flood wash pit and contingency management outfall

Trafficable solids trap on east side of Moira channel

The trafficable solids trap (TST) captures effluent and wash water from the new dairy platform and pit, maternity housing flood wash lane, calf shed wash down and the current dairy. Surface water run-off from the maternity loafing areas, calf shed concrete, earthen laneways to the current dairy and the current dairy uncovered yard is also captured and managed through the TSS. All effluent enters the TST and solids settle behind a weeping wall with the liquid component entering a sump and pump pit before being conveyed to the west side of the Moira channel, entering an existing drain flowing into the existing effluent storage pond system.

This system is not as yet constructed, however when complete will maintain a backup pump for water conveyance under the Moira channel in the case that gravity flows fail. In addition to this, the sump at the TSS is designed to include an overtopping level to prevent backflows into the new dairy and direct flows into the irrigation recycle system to the south of the new dairy. Water in this area is captured and recycled over the irrigation system.

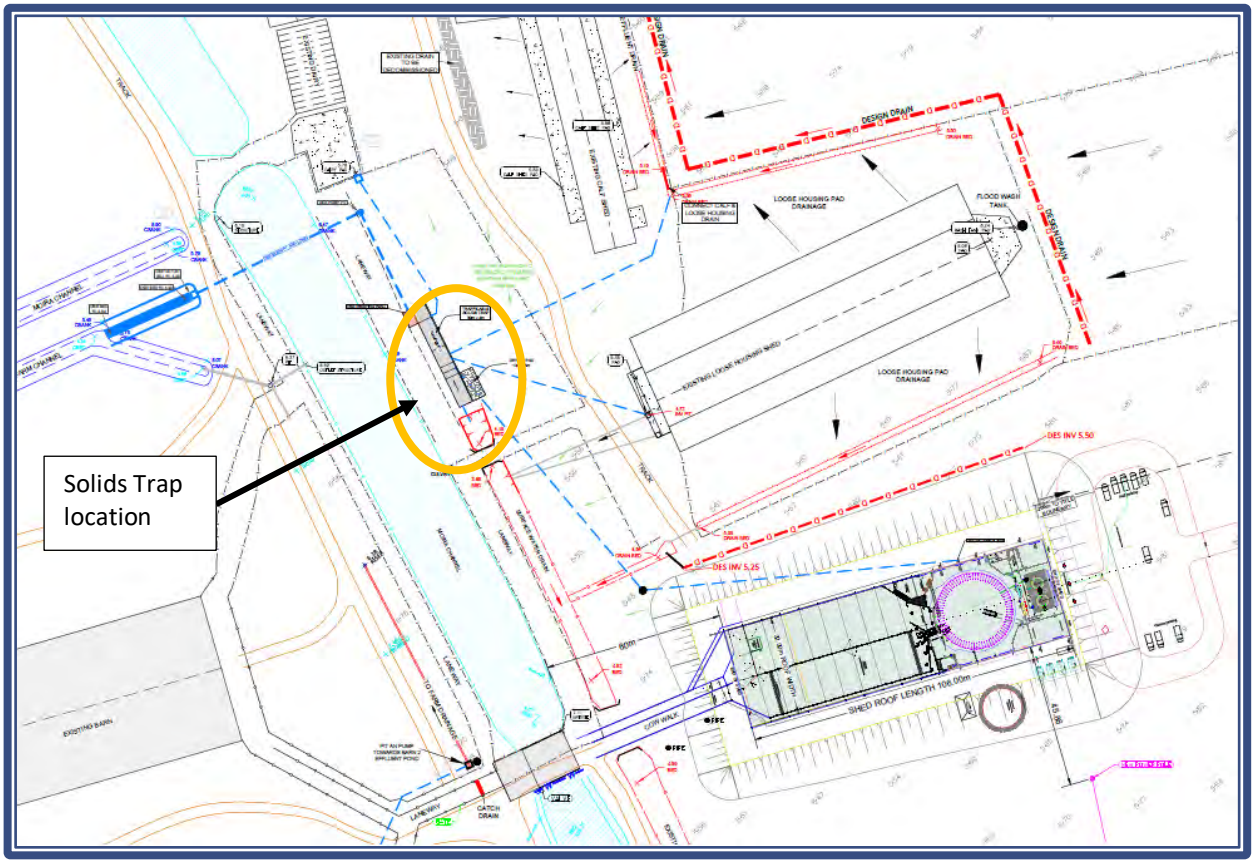


Figure 6-2 - Image showing trafficable solids trap and contingency management

Solids Collection Ditches

The solids collection ditches are located to the west of the freestall housing system areas. These capture and retain all solids generated from the housing system, concrete floodwashed laneway and will include the new dairy yard. All effluent is directed rotationally to one of the solids collection ditches where solids are retained through the use of a weeping wall at the lowest end of each ditch. Each housing system takes around 8 months to fill a solids ditch to capacity. Once full, each ditch is left to drain and the dry solids, once they have been in place for around 12-18 months are removed by mechanical means. Solids are tested and applied to land within the property ownership at rates reflective of crop requirements.

There is sufficient solids collection ditch space within the system for ongoing rotations to allow clean out of the ditches at a time reflective of a direct application. Should an extremely wet winter occur, solids may need to be applied at a higher moisture content or removed from the solids collection ponds and stored on the dedicated manure storage area and allowed to drain prior to application.

Effluent Storage

The effluent storage system is connected to the rear of the solids collection ditches and is pumped to the existing storage dam on the property for longer term storage over winter where required. This storage has sufficient capacity to manage in excess of a 90th percentile rainfall winter storage period and considers 100% freshwater usage within the system.

If the storage dam should enter overload there is a connected further 150ML irrigation storage dam on the adjoining owned irrigation property that could be used to contain excess volumes.

The following list provides additional recommendations for the ongoing management of the system:

Table 6-1 - Management recommendations

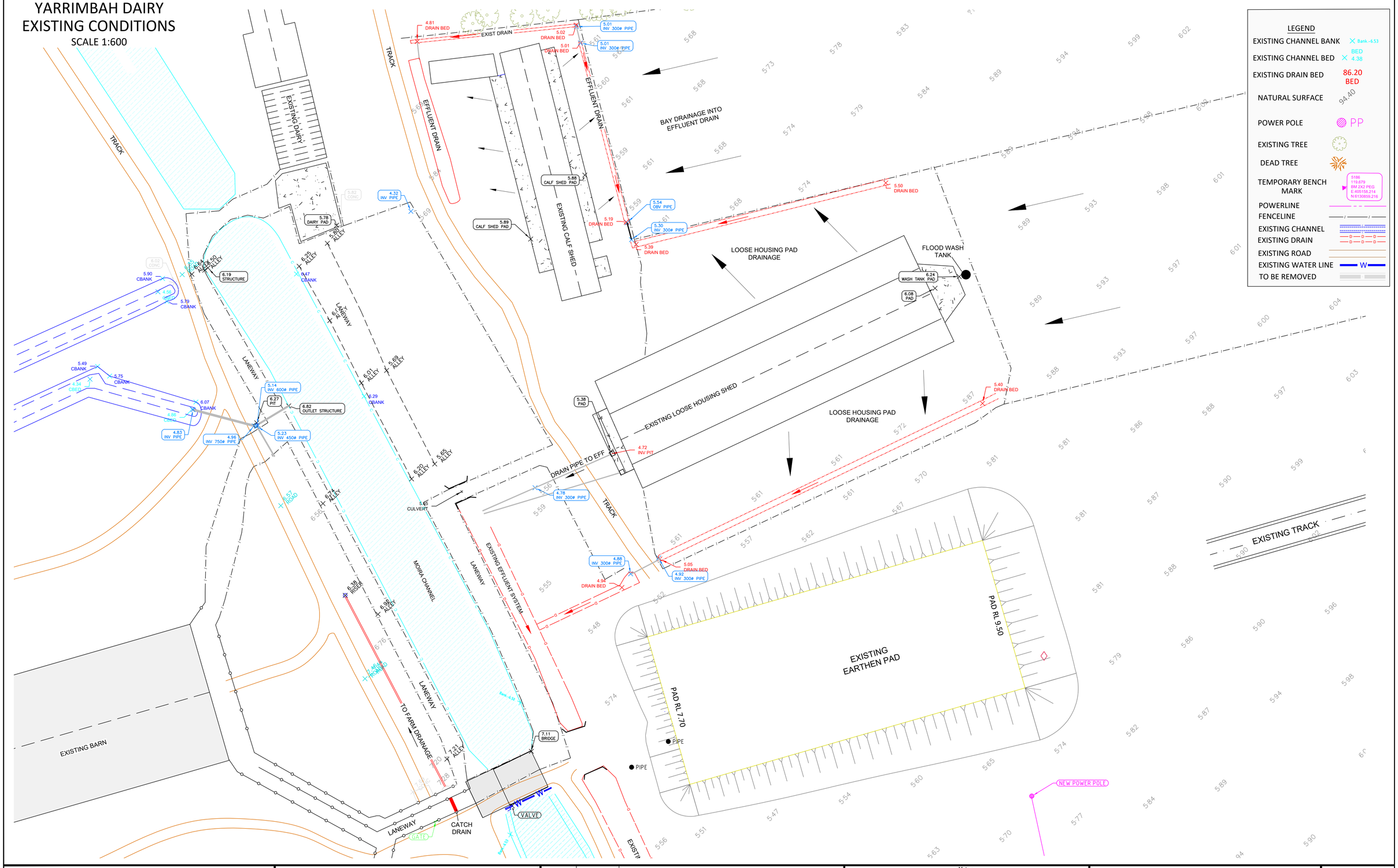
No.	Recommendation
1	Trafficable solids trap when installed should be cleaned out weekly.
2	Solids collection ditches adjoining the effluent storage system should be cleaned out rotationally and solids applied to land as soon as possible following removal. Solids should not be stored long-term on paddocks.

No.	Recommendation
3	Solids stockpiling for materials not proposed to be immediately applied to land must be undertaken either on the concrete pad adjoining the trafficable solids trap or on the compacted manure storage area with drainage directed to the storage pond.
4	All manure stored must be located on impervious surface or compacted manure storage area unless it is delivered to paddock prior to spreading.
5	Manure will be applied directly to areas where soil tests for N, P and K have been reviewed and are within acceptable application limits for crop utilisation. Manure should only be utilised with the following buffer distances: - 250m from any domestic bore, - 100m from any adjoining rural residence 50m from any natural drainage line, - 50m from any road or rail line, - 50m from the dairy shed and freestall housing area, and - 10m from any boundary.
6	Effluent water (liquid) from the pond should be integrated into the final irrigation prior to winter storage to ensure maximum winter storage space.
7	The irrigation storage dam (pond 3) must have sufficient 'air space' to allow for effluent water to be stored in winter (130ML).
8	Effluent water should be tested prior to application following storage period and in conjunction with paddock and crop soil tests in alignment with the EPL.
9	No uncontrolled liquid effluent or run-off laden effluent water is to leave the property.
10	Effluent must not be pumped into the Moira PID irrigation channel for disposal
11	Milk must not be introduced to the effluent system. Should milk require disposal, it should be incorporated with irrigation water at a rate of 1:10 and utilised on suitable paddocks
12	Shock and infrequent loadings to the effluent system should be avoided.
13	Drains and pipelines controlling effluent and site catchment water should be inspected regularly to ensure they are operating as designed.
14	A list of service technicians and where possible, spare parts for machinery should be kept on site at all times.
15	Effluent and manure storage areas should be inspected regularly to ensure there are no cracks or faults with the system leading to uncontrolled flows.
16	Ensure the effluent and manure processing machinery is safe to use and staff controlling and working within the vicinity are trained in its operation and safe work practices.
17	Never work alone around any effluent pond.
18	Maintain access restrictions around effluent ponds and processing areas.
19	Drains and channels that are utilised for both effluent conveyance and irrigation should be maintained in a clean and flushed state once the application has completed. The farm irrigation supply channel that conveys effluent from the trafficable solids trap under the Moira channel, must divert all effluent into the effluent storage pond system (not the solids collection ditch) when irrigation is not occurring.

7. APPENDICES

APPENDIX 1 - PROJECT DESIGN PLAN

YARRIMBAH DAIRY
EXISTING CONDITIONS
SCALE 1:600



LEGEND

- EXISTING CHANNEL BANK — Bank~6.53
- EXISTING CHANNEL BED — BED 4.38
- EXISTING DRAIN BED — 86.20 BED
- NATURAL SURFACE — 94.40
- POWER POLE — PP
- EXISTING TREE
- DEAD TREE
- TEMPORARY BENCH MARK — 5186, 119.679, BM 2X2 PEG, E:405158.214, N:6130859.216
- POWERLINE
- FENCELINE
- EXISTING CHANNEL
- EXISTING DRAIN
- EXISTING ROAD
- EXISTING WATER LINE — W
- TO BE REMOVED

JC SURVEYS PTY LTD

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MOB: 0429 897 289,
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Web: jcsurveys.com.au

ABN: 54 672 449 955

GENERAL NOTES:
ALL LEVELS ARE IN METERS UNLESS OTHERWISE STATED.

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

LOCATION OF SERVICES 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 CONSTRUCTION.

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.

REV	DATE	DESCRIPTION

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DATUM: SS 4827 - RL 107.927 AHD, GDA94 ZONE 55
ADD 100.00m TO PLAN FOR AHD

NS GRID	25m x 25m	PLAN
CONTOURS	@ 0.20m	FINAL
SURVEYED BY J.C.H		DRAWN BY J.C.H

CLIENT: RAY SMITH

JOB NAME: YARRIMBAH DAIRY EXISTING CONDITIONS
ADDRESS: 2813 COBB HIGHWAY MATHOURA
CROWN ALLOTMENT: LOT 2 DP1077844

DRAWING NUMBER	DATE	SHEET NUMBER
JC0023	26/05/25	1 OF 1

YARRIMBAH DAIRY
PROPOSED LAYOUT
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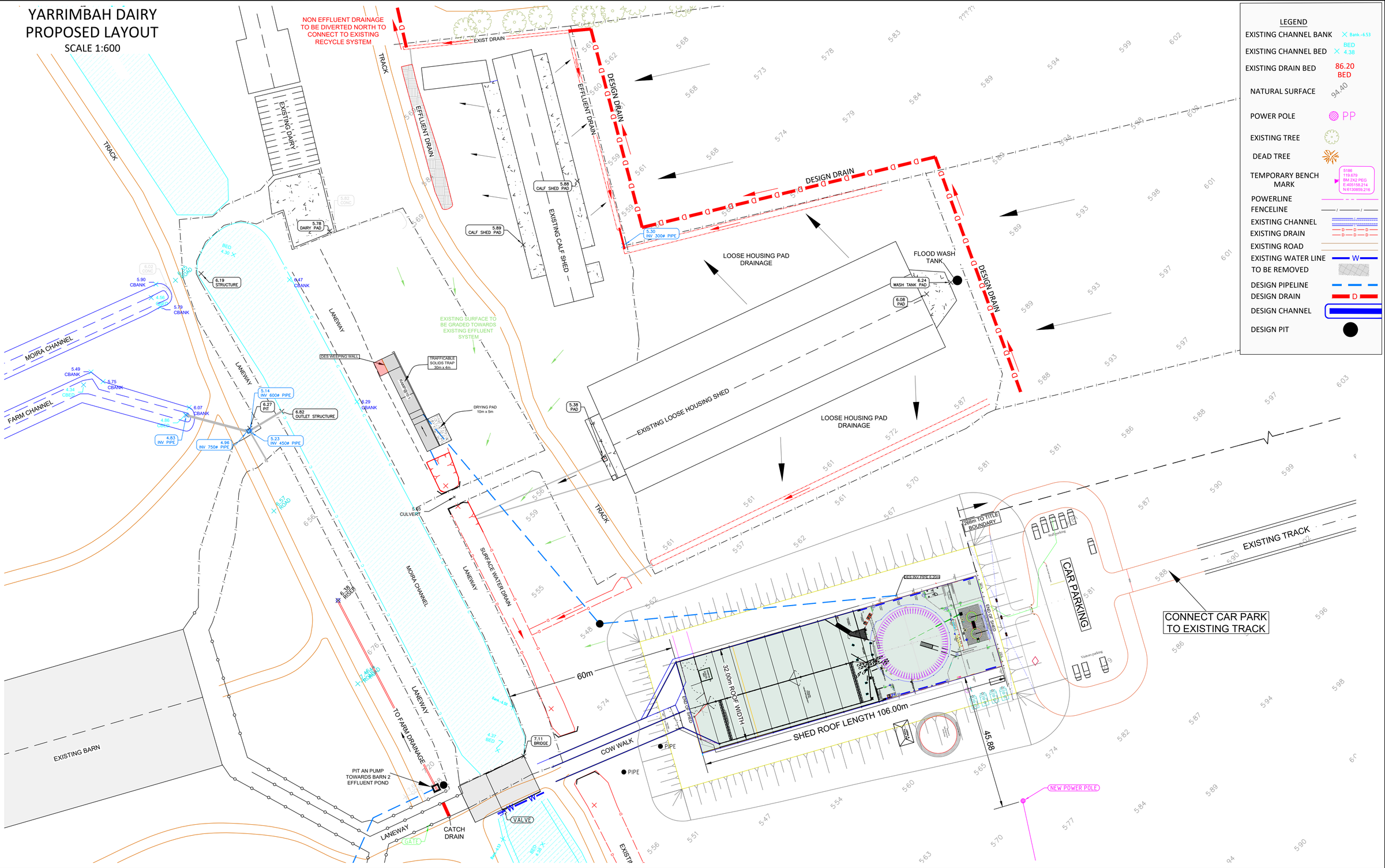

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- EXISTING ROAD
- EXISTING WATER LINE TO BE REMOVED — W
- DESIGN PIPELINE
- DESIGN DRAIN — D
- DESIGN CHANNEL
- DESIGN PIT

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CROWN ALLOTMENT: LOT 2 DP1077844

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YARRIMBAH DAIRY
EFFLUENT PLANS SHEET 1
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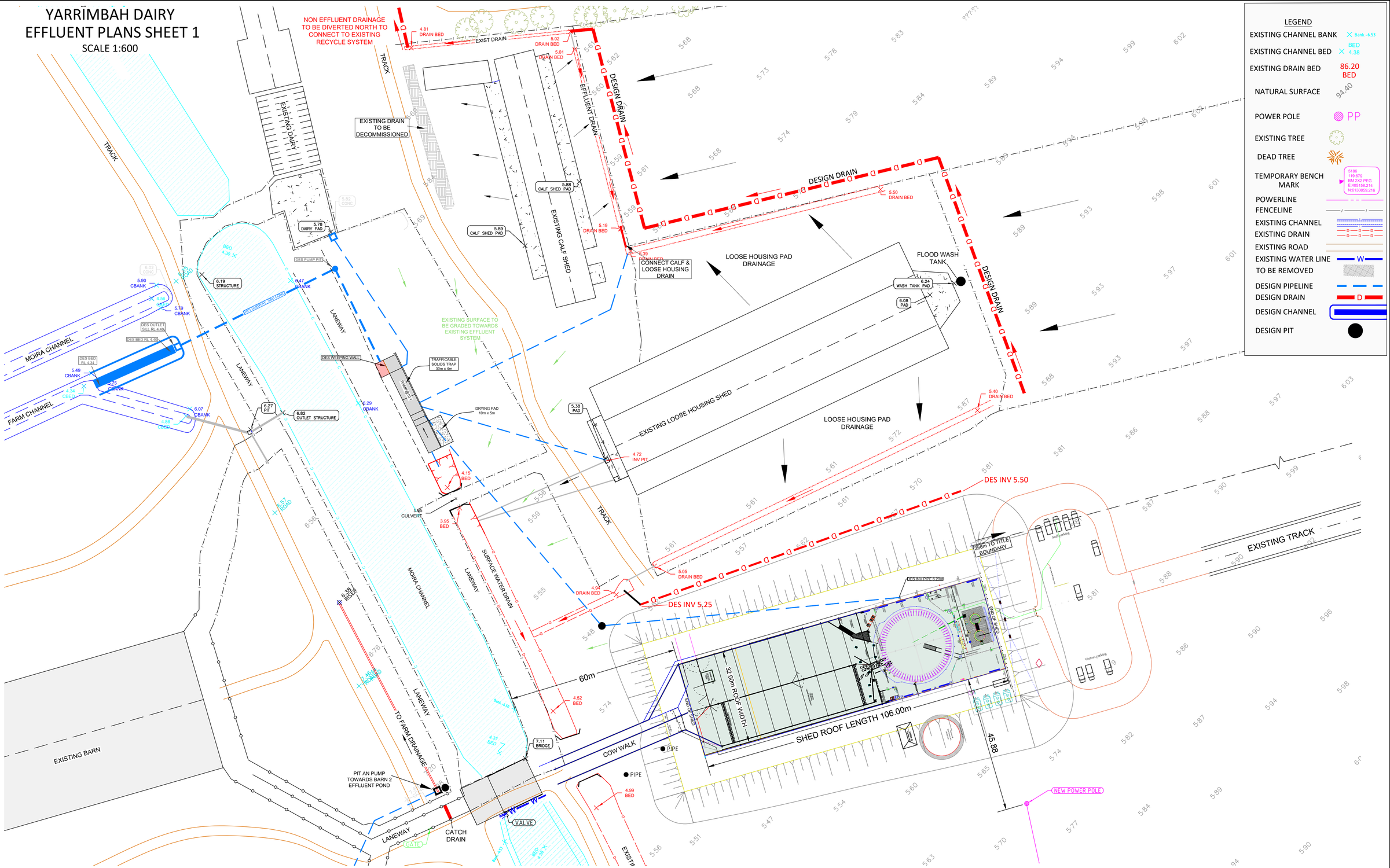

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- DESIGN PIPELINE
- DESIGN DRAIN — D
- DESIGN CHANNEL
- DESIGN PIT

Meters
18 0 18 36
1:600

DATUM: SS 4827 - RL 107.927 AHD, GDA94 ZONE 55
ADD 100.00m TO PLAN FOR AHD

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CONTOURS @ 0.20m	FINAL
SURVEYED BY J.C.H	DRAWN BY J.C.H

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JOB NAME: YARRIMBAH DAIRY PROPOSED LAYOUT
ADDRESS: 2813 COBB HIGHWAY MATHOURA
CROWN ALLOTMENT: LOT 2 DP1077844

DRAWING NUMBER	DATE	SHEET NUMBER
JC0023	26/05/25	1 OF 2

YARRIMBAH DAIRY PAD
EFFLUENT PLANS SHEET 2
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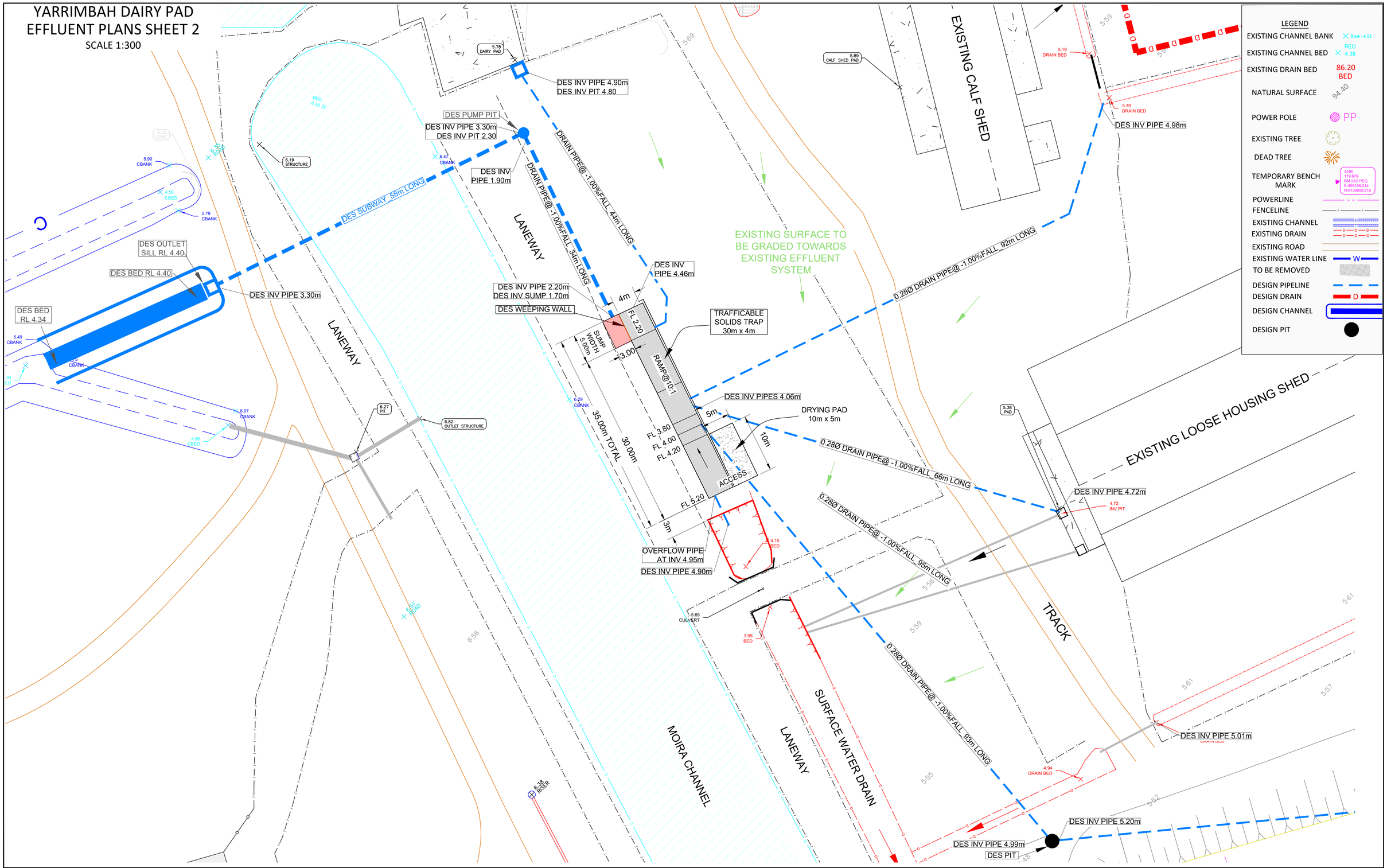

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- DESIGN PIT

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

LOCATION OF SERVICES 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 CONSTRUCTION.

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.

REV	DATE	DESCRIPTION

Meters
9 0 9 18
1:300

DATUM: SS 4827 - RL 107.927 AHD, GDA94 ZONE 55
ADD 100.00m TO PLAN FOR AHD

NS GRID	25m x 25m	PLAN	
CONTOURS	@ 0.20m	FINAL	
SURVEYED BY J.C.H		DRAWN BY J.C.H	

CLIENT: RAY SMITH

JOB NAME: YARRIMBAH DAIRY EFFLEUENT CONNECTIONS
ADDRESS: 2813 COBB HIGHWAY MATHOURA
CROWN ALLOTMENT: LOT 2 DP1077844

DRAWING NUMBER	DATE	SHEET NUMBER
JC0023	26/05/25	2 OF 2

APPENDIX 2 - DAIRY FLOODWASH

Version 2.7, April 2008, DPIF, 2008

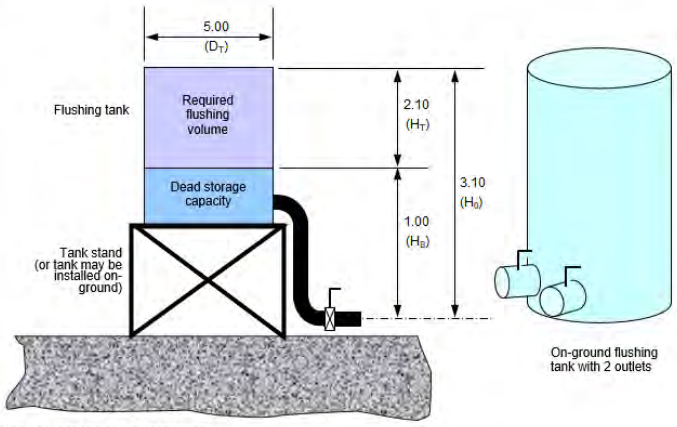
7.1.1. EXISTING FREESTALL FLOODWASH CALCULATOR

Note: the existing freestall housing areas each utilise a 140,000L flood wash tank that uses a calculated flood wash cycle per lane. There are 6 lanes within the sheds each with separate single wash programs.

Yard flood washing facilities

Yard characteristics			
Yard width		5.00	m
Yard length		270.00	m
Yard slope		1.00	%
Yard surface roughness (Manning's n)	n	0.020	
Target yard flow conditions			
Minimum flow depth		50	mm
Flow velocity (at minimum flow depth, above)		0.67	m/s
Flowrate (at minimum flow depth, above)		167	L/s
Minimum flow velocity		1.00	m/s
Flow depth (at minimum flow velocity, above)		92	mm
Flowrate (at minimum flow velocity, above)		458	L/s
Required yard flow conditions (based on Manning's equation)			
Required flow depth		92	mm
Required flow velocity		1.00	m/s
Required flowrate		458	L/s
Flushing Volume			
Flushing volume for 10 second yard contact time		4,576	L
Flushing volume for one third yard length contact time		41,181	L
Contact time for one third yard length contact time		90.00	seconds
Required flushing volume		41,181	L
Required flushing time		90.00	seconds
Flushing volume per metre of yard width		8,236	$L.m^{-1}$
Flushing tank details			
Flushing tank diameter	D_T	5.00	m
Tank storage height (for required flushing volume)	H_T	2.10	m
Final flushing head over tank outlet	H_B	1.00	m
Initial head over tank outlet	H_0	3.10	m
Tank outlet valves and piping			
Number of outlet valves	N	1	valves
Outlet valve and pipe diameter	D_2	0.450	m
Length of pipe from tank to outlet	L	15	m
Hazen-Williams roughness coefficient	C	142	
Headloss co-efficient	k	1.25	
Max pipe friction headloss		0.49	m
Max pipe outlet loss		1.45	m
Total headloss		1.94	m
Time to discharge required flushing volume (numerical calcula		60.00	seconds

Client name: R & L Smith
Client locality: Yarrimbah - Mathoura
Analysis identification: Barn Flush Lane



Note: All dimensions in metres (m)

Max flushing flowrate	0.759	$m^3.s^{-1}$
Flushing flowrate after end of required flushing time	0.473	$m^3.s^{-1}$
Required flushing flowrate	***0.458***	$m^3.s^{-1}$
Max yard flow velocity	1.24	$m.s^{-1}$
Required yard flow velocity	***1.00***	$m.s^{-1}$
Max yard flow depth	123	mm
Required yard flow depth	***92***	mm

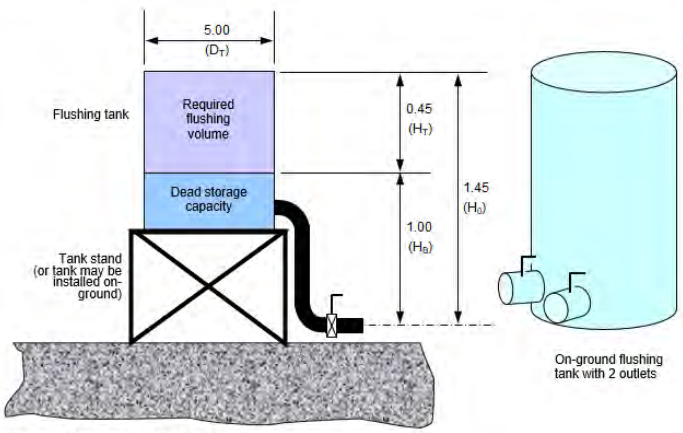
7.1.2. EXISTING LANE FLOODWASH CALCULATOR

The existing lane wash calculator is connected to the freestall flood wash tanks. This system uses a calculated flood wash cycle following each milking.

Yard flood washing facilities

Yard characteristics			
Yard width		5.00	m
Yard length		80.00	m
Yard slope		1.50	%
Yard surface roughness (Manning's n)	n	0.020	
Target yard flow conditions			
Minimum flow depth		50	mm
Flow velocity (at minimum flow depth, above)		0.82	m/s
Flowrate (at minimum flow depth, above)		205	L/s
Minimum flow velocity		1.00	m/s
Flow depth (at minimum flow velocity, above)		67	mm
Flowrate (at minimum flow velocity, above)		332	L/s
Required yard flow conditions (based on Manning's equation)			
Required flow depth		67	mm
Required flow velocity		1.00	m/s
Required flowrate		332	L/s
Flushing Volume			
Flushing volume for 10 second yard contact time		3,325	L
Flushing volume for one third yard length contact time		8,867	L
Contact time for one third yard length contact time		26.67	seconds
Required flushing volume		8,867	L
Required flushing time		26.67	seconds
Flushing volume per metre of yard width		1,773	$L.m^{-1}$
Flushing tank details			
Flushing tank diameter	D_T	5.00	m
Tank storage height (for required flushing volume)	H_T	0.45	m
Final flushing head over tank outlet	H_s	1.00	m
Initial head over tank outlet	H_o	1.45	m
Tank outlet valves and piping			
Number of outlet valves	N	1	valves
Outlet valve and pipe diameter	D_2	0.450	m
Length of pipe from tank to outlet	L	15	m
Hazen-Williams roughness coefficient	C	142	
Headloss co-efficient	k	1.25	
Max pipe friction headloss		0.24	m
Max pipe outlet loss		0.67	m
Total headloss		0.91	m
Time to discharge required flushing volume *(numerical calcula*		18.70	seconds

Client name: R & L Smith
Client locality: Yarrimbah - Mathoura
Analysis identification: Lane (Barn to Dairy)



Note: All dimensions in metres (m)

Max flushing flowrate	0.518	$m^3.s^{-1}$
Flushing flowrate after end of required flushing time	0.428	$m^3.s^{-1}$
Required flushing flowrate	***0.332***	$m^3.s^{-1}$
Max yard flow velocity	1.20	$m.s^{-1}$
Required yard flow velocity	***1.00***	$m.s^{-1}$
Max yard flow depth	86	mm
Required yard flow depth	***67***	*mm*

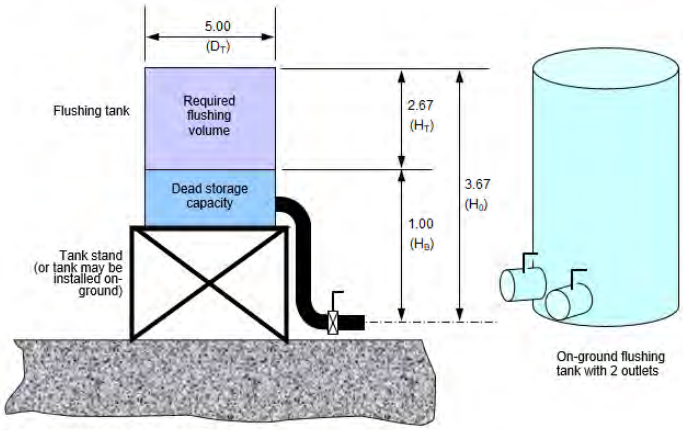
7.1.3. NEW DAIRY FLOODWASH CALCULATOR

The new dairy will include a floodwash system. The below is based on manufacturers information supplied.

Yard flood washing facilities

Yard characteristics			
Yard width		16.00	m
Yard length		150.00	m
Yard slope		1.50	%
Yard surface roughness (Manning's n)	n	0.020	
Target yard flow conditions			
Minimum flow depth		50	mm
Flow velocity (at minimum flow depth, above)		0.83	m/s
Flowrate (at minimum flow depth, above)		662	L/s
Minimum flow velocity		1.00	m/s
Flow depth (at minimum flow velocity, above)		66	mm
Flowrate (at minimum flow velocity, above)		1,050	L/s
Required yard flow conditions (based on Manning's equation)			
Required flow depth		66	mm
Required flow velocity		1.00	m/s
Required flowrate		1,050	L/s
Flushing Volume			
Flushing volume for 10 second yard contact time		10,503	L
Flushing volume for one third yard length contact time		52,517	L
Contact time for one third yard length contact time		50.00	seconds
Required flushing volume		52,517	L
Required flushing time		50.00	seconds
Flushing volume per metre of yard width		3,282	$L.m^{-1}$
Flushing tank details			
Flushing tank diameter	D_T	5.00	m
Tank storage height (for required flushing volume)	H_T	2.67	m
Final flushing head over tank outlet	H_B	1.00	m
Initial head over tank outlet	H_0	3.67	m
Tank outlet valves and piping			
Number of outlet valves	N	3	valves
Outlet valve and pipe diameter	D_2	0.450	m
Length of pipe from tank to outlet	L	15	m
Hazen-Williams roughness coefficient	C	142	
Headloss co-efficient	k	1.25	
Max pipe friction headloss		0.57	m
Max pipe outlet loss		1.73	m
Total headloss		2.30	m
Time to discharge required flushing volume (numerical calcula		27.80	seconds

Client name: R & L Smith
Client locality: Yarrimbah - Mathoura
Analysis identification: Lane (Barn to Dairy)



Note: All dimensions in metres (m)

Max flushing flowrate	2.481	$m^3.s^{-1}$
Flushing flowrate after end of required flushing time	1.285	$m^3.s^{-1}$
Required flushing flowrate	***1.050***	$m^3.s^{-1}$
Max yard flow velocity	1.41	$m.s^{-1}$
Required yard flow velocity	***1.00***	$m.s^{-1}$
Max yard flow depth	110	mm
Required yard flow depth	***66***	*mm*

DOCUMENT END

APPENDIX 8 – NSW DAIRY ENVIRONMENTAL GUIDELINES CHECKLIST

Appendix 2: Development application (DA) checklist for consultation

Applicant details RA & LJ Smith	tick
Site description (including plans) and assessment	✓
real property description	☑
• land tenure	☑
• land area	☑
• cadastral plan	☑
land zoning and zoning of the surrounding land	☑
climatic data	☑
• mean/median monthly rainfall	☑
• monthly decile 9 (90th percentile) rainfall	☑
• rainfall intensity data (1-in-20-year 24-hour storm)	☑
• mean monthly evaporation	☑
• mean monthly maximum and minimum temperatures	☑
• seasonal wind speed and direction	☑
soil description for the dairy facility site (including applicable physical properties), effluent/manure ponds and reuse areas (including chemical properties and texture)	☑
description of groundwater resources and geology of the site	☑
• groundwater depth	☑
• depth and type of soil or rocks overlying groundwater	☑
• assessment of the suitability of groundwater for use in dairy	☑
• details of any licences or allocations held	☑
• description of surface water resources on the property or in the vicinity of the property (show designated watercourses and other waterbodies on a map)	☑
details of any bores on the subject property	☑
assessment of the suitability of surface waters for use in dairy	☑
details of any licences held	☑
description of the current vegetation of the site and the extent of any proposed clearing and offsets	☑
identification of any items, sites or places of cultural heritage significance	☑
Description of the proposed dairy operation	
total stock numbers	☑
• herd composition	☑
• expected mortalities	☑
description of housing and layout plans (if using/building)	☑
water requirements for drinking, cooling, cleaning, feed rations, dust control and shandying with effluent for irrigation	☑
bedding requirements and bedding sources	☑
feed requirements, sources and storage areas	☑
staff numbers	☑

Environmental impact assessment	
community amenity – particularly odour, dust, noise, traffic and visual. Determine suitable separation distances to sensitive receptors. Evaluate measures for minimising and addressing amenity nuisance including ongoing consultation with neighbours.	✔
pro-active complaints management	✔
surface waters – quality and quantity needed, potential impacts to water quality and any likely effects on other potential users for example, Storm Water Management Plans, Floodplains Management Plans, and Irrigation Whole Farm Plans	✔
groundwater – quality and quantity needed, potential impacts to water quality and any likely effects on other potential users	✔
vegetation – identify any clearing needed and the likely effects of this on rare and threatened species and communities. Detail any proposed offsets for example, Flora and Fauna Assessment.	✔
protection of items, sites or places of cultural heritage significance for example, Aboriginal cultural heritage assessment reflective of the development type and activities.	✔
evaluation of proposed effects on soils of reuse areas e.g. Land Capability Assessment and Soil Management Plan, Salinity Management Plans	✔
summary of design and management features to minimise adverse environmental impacts	✔
proposed environmental monitoring and reporting	✔
Environmental management plan (EMP) – an EMP focuses on the general management of the whole farm, considering the environment and associated risks. It should:	✔
• document design features and management practices	✔
• identify risks and mitigation strategies (including biosecurity risks)	✔
• include a nutrient management plan for reuse areas that provides a nutrient balance (nutrients applied in effluent or manure, nutrients removed by crop harvest and allowable losses) and proposed management of the reuse areas	✔
• include ongoing monitoring to ensure impacts are minimised	✔
• detail processes for ensuring continual review and improvement.	✔
Erosion and Sediment Construction Management Plan addressing construction components to be monitored and managed	✔
Plans showing or describing:	
topographic details – relief, watercourses and drainage lines, and flood levels	✔
recent aerial photograph/s – showing subject property and location of nearby residences	✔
farm plan – showing current land uses; proposed sites for dairy complex, mortalities composting or burial site, reuse areas; property entry point and on-farm roads; on-farm bores; buffers; the location of dams and watercourses; and the location of any soil conservation or drainage works	✔
dairy facility layout plan – including the location of manure management areas and/or effluent treatment facilities and the mortalities management area	✔
Pollution Incident Response Management Plan (PIRMP) for NSW licenced producers	✔
hygiene practices, for example frequency of hosing, flushing, or bedding top-up and replacement	✔
professionally designed Manure and Effluent Management Plans including: • estimation of manure production and mass balance estimate of the nutrients in manure and effluent • design of effluent collection, pretreatment and treatment system • sizing and proposed management of the reuse areas, including location; area (ha); buffers and other measures to protect runoff quality, amenity and health: reuse method and timing; and nutrient balance (nutrients applied in manure or effluent, nutrients that will be removed by crop harvest and allowable losses). • details of off-site reuse, including a product disclosure statement.	✔
description of mortalities management or disposal, including plan for managing a mass mortality event	✔
traffic – calculate heavy vehicle and car numbers, describe the routes that will be used including site access (consider road safety), and outline parking provisions. Negotiate with applicable state and local governments regarding road upgrading and maintenance responsibilities, e.g. traffic management plans.	✔

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