DEVELOPMENT APPLICATION AND ENVIRONMENTAL IMPACT STATEMENT – EXPANSION OF BEEF CATTLE FEEDLOT FROM 999 HEAD TO 3,200 HEAD

"High Claire"
58 Broughans Road
PINE LODGE NSW 2713

AJ & NA Varley
"Arkoona"
RMB 3095 Lower Finley Road
FINLEY NSW 2713

[November 2024]

RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

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V1R2	07/11/2024	Final for lodgement to ERC	Rod Davis	Rod Davis	Rod Davis

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V1R1	AJ & NA Varley	Electronic	-
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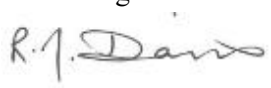
Submission of an environmental impact statement for the expansion of the existing beef cattle feedlot development on the property "High Claire" from 999 head to 3,200 head. Prepared under Part 5 of the Environmental Planning and Assessment Act 1979 for approval of the proposed development.

Environmental Impact Statement prepared by:	
Name:	Rod Davis
Qualifications:	B.Eng (Agricultural), M.Eng (Agricultural), CP Eng, FIEAust, RPEQ, C.Dec,
Address:	7 Prospect Terrace HIGHFIELDS, QLD 4352
Contact details:	rod.davis@rdcengineers.com.au
Description of the infrastructure to which the statement relates:	The expansion and operation of a beef cattle feedlot on the property "High Claire", located at Pine Lodge in the southern Riverina.
Address of the land on which the infrastructure to which the statement relates is to be carried out:	58 Broughans Road Pine Lodge NSW 2714 Lot/Section/Plan no: 130/-/DP756353 Parish of Yalgadoori County of Townsend The land is owned by Andrew James Jessop Varley and Nichole Andrea Varley
Environmental Impact Statement	An environmental impact statement is attached addressing all matters in accordance with Part 5 of the Environmental Planning and Assessment Act 1979 and Schedule 2 of the Environmental Planning and Assessment Regulation 2021. I certify that I have prepared the contents of this environmental impact statement in accordance with the NSW Department of Planning Director General's environmental assessment requirements dated 25 September 2023.
Declaration	The environmental impact statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates. To the best of my knowledge, the information contained in the environmental assessment is not false or misleading.  Rod Davis 7 November 2024

2. List of abbreviations

AADT	Annual Average Daily Traffic
AASS	Actual Acid Sulfate Soils
ABS	Australian Bureau of Statistics
ACS	Animal Care Statement
AHC Act	Australian Heritage Commission Act 1975
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management Systems
ARI	Average Recurrence Interval
AS	Australian Standard
ASM	Acid Sulphate Materials
AUSVETPLAN	Australian Veterinary Emergency Plan
BAM	The Biodiversity Assessment Method 2020
BOD	Biochemical Oxygen Demand
BCA	Biodiversity Conservation Act 2016
BoM	Bureau of Meteorology
BFDB	Bush Fire Design Brief
SDL	Sustainable Diversion Limit
CEC	Cation Exchange Capacity
CEMP	Construction Environmental Management Plan
CL	Crown Lands NSW
CL Act	Crown Lands Management Act 2016
DA	Development Application
DCP	Development Control Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	Department of Planning and Environment
DPI	Department of Primary Industries of the DPE
ERSC	Edward River Shire Council
EAR's	Environmental Assessment Requirements
EPBC	Environment Protection and Biodiversity Conservation Act
EAT	Emerson Aggregate Test
EC	Electrical Conductivity
EHG	Environment and Heritage Group of the DPE
EIS	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
ENCM	Environmental Noise Control Manual
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPA	NSW Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ERC	Edward River Council
ESD	Ecologically Sustainable Development
FMA	Fisheries Management Act 1994
GHG	Greenhouse Gases
HASP	Health and Safety Plan
H:V	Horizontal Units in Proportion to Vertical Units

IGAE	Intergovernmental Agreement on the Environment 1992
INP	Industrial Noise Policy
IPM	Integrated Pest Management
LCU	Landscape Character Unit
LEP	Local Environment Plan
LGA	Local Government Area
LLS	Local Land Service
LLSA	Local Land Services Act 2013
Ltd	Limited
MLA	Meat and Livestock Australia
MDBA	Murray Darling Basin Authority
NES	National Environmental Significance
NFAS	National Feedlot Accreditation Scheme
NLWRA	National Land and Water Resources Audit
NP&W Act	National Parks and Wildlife Act 1974
NSW	New South Wales
OEMP	Operational Environmental Management Plan
OH&S	Occupational Health and Safety
OU	Odour Unit
PASS	Potential Acid Sulfate Soils
PFM	Planning Focus Meeting
PEAA	Protection of the Environment Administration Act 1991
PBP	Planning for Bush Fire Protection 2019
POEO Act	Protection of the Environment Operations Act 1997
POEO (clean air) Regulation	The Protection of the Environment Operations (Clean Air) Regulation 2022
POEO (Noise) Regulation	Protection of the Environment Operations (Noise Control) Regulation 2017
POEO (Waste) Regulation	Protection of the Environment Operations (Waste) Regulation 2014
PVC	Primary Visual Catchment
PVZ	Primary Viewing Zone
Pty	Proprietary
QDAF	Queensland Department of Agriculture and Fisheries
REP	Regional Environmental Plan
TNSW	Transport for New South Wales
RFA	Rural Fires Act 1997
RMRP	Riverina Murray Regional Plan 2041
SCU	Standard Cattle Unit
TAPM	The Air Pollution Model
WA	Wildlife Atlas
WAL	Water Access Licence
WNSW	Water New South Wales
WHSA	Work Health and Safety Act 2011
WSP	Water Sharing Plan

3. Glossary of terms

Aboriginal archaeological site (Aboriginal site)	A place where physical remains or modification of the natural environment indicate past and "traditional" activities by Aboriginal people. Site types include artefact scatters, isolated artefacts, burials, shell middens, scarred trees, quarries and contact site.
Aboriginal scarred tree	Scars are wounds on trees by the deliberate removal of bark or wood by Aborigines for the manufacture of containers, watercraft or shelters. A toehold tree or possum tree also falls under this category as it is a tree which has had small patches of bark chopped out to provide hand and foot holds for climbers after possums or vantage.
Aerobic	Associated with the presence of free oxygen.
Alluvium	Sediment deposited by a stream, consisting of unconsolidated material such as gravel, sand, silt and clay.
Ambient	Surrounding environment.
Anaerobic	A condition in which no free oxygen nitrates are present.
Annual Return	A statement of compliance with the licence conditions and reports the pollutant loads generated by the development.
Applicant	The entity making a formal application for consent of the proposed development. In the case of this EIS, AJ & NA Varley is the applicant.
Aquifer	Geological formation, group of formations, or part of a formulation capable of transmitting and yielding significant quantities of water.
Artefact	An item of human manufacture normally applied only to the products of previous culture. Examples are bone or stone tools, engraving, paintings.
AHD	The standard reference level used to express the relative elevation of various features. A height given in metres AHD is essentially the height above sea level.
Biochemical Oxygen Demand (BOD_5)	The decrease in oxygen content in mg/L of a sample of water in the dark at a certain temperature over a certain period of time, which is caused by the bacterial breakdown of organic matter. The oxygen demand is measured after 5 days (BOD_5) at which time 70% of the final value has usually been reached.
Biodiversity	First coined in 1988 as a contraction of biological diversity; traditionally referring to species richness and species abundance. Biodiversity has been defined subsequently as encompassing biological variety at genetic, species and ecosystem scales (DASETT 1992). The maintenance of biodiversity, at all levels, is acknowledged internationally as a high conservation priority, and is protected by the International Convention on Biological Diversity 1992.
Bunds	An earthwork or wall to contain and control spillages, normally associated with tank farms, fuelling and chemical storage facilities.
Burial Site	Usually a subsurface pit containing human remains and sometimes associated artefacts.
Catchment	The area in which water collects to form the supply of a river stream or drainage area.
Cation exchange capacity	The capacity of soil to hold and exchange cations.
Conservation	The management of natural resources in a way that will benefit both present and future generations.
Construction Environmental Management Plan	An element of an Environmental Management Plan that addresses the control, training and monitoring measures to be implemented during the

	construction phase of a project in order to avoid, minimise or ameliorate potentially adverse impacts identified during environmental assessments.
Contaminants	Polluting substances.
Contaminated Runoff	Any stormwater runoff that is generated from within the controlled drainage area of the complex.
Controlled Drainage Area	A dedicated catchment surrounding those parts of the feedlot complex from which stormwater runoff would constitute an environmental hazard if allowed to flow uncontrolled into the surrounding environment.
Cultural Heritage	Is the legacy of physical artefacts and intangible attributes of Aboriginal or non-Aboriginal society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations.
Cumulative effect	Refers to the accumulation of effects over time.
dB(A)	The most common measurement of environmental noise – measured using a simple sound level meter having an Aweighting filter to simulate the subjective response of the human ear.
Diversity	The abundance in numbers of species in a given location.
Designated Development	Development for which a development application is to be submitted to Council in conjunction with an Environmental Impact Statement (EIS).
Ecologically Sustainable Development	Development that aims to meet the needs of the present generation without compromising the ecological processes on which life depends for the benefit of future generations.
Ecosystem	An interdependent system of interacting plants, animals and other organisms together with the non-living (physical and chemical) components of their surroundings.
Effluent	Effluent means: (a) wastewater from sewage collection or treatment plants; or (b) wastewater from collection or treatment systems that are ancillary to processing industries involving livestock, agriculture, wood, paper or food, being wastewater that is conveyed from the place of generation by means of a pipe canal or other conventional method used in irrigation (but not by means of tanker or truck); or (c) wastewater from collection or treatment systems that are ancillary to intensive livestock, aquaculture or agricultural industries, being wastewater that is released by means of a pipe, canal or other conventional method used in irrigation as part of day-to-day farming operations.
Electrical Conductivity	A measure of the conduction of electricity through water or a water extract (1-part soil to 5 parts water) of soil. Used to determine the soluble salts content.
Emergency response	The reaction by emergency services such as Fire, Police, Ambulance, Rural Fire Brigades, etc, to an emergency.
Emission	The release of constituents into the atmosphere (e.g. gas, steam or noise).
Endangered species	Those plants and animal species likely to become extinct unless action is taken to remove or control the factors that threaten their survival.
Environment	The physical, biological, cultural, economic and social characteristics of an area, region or site.
Environmental Impact Assessment	The orderly and systematic evaluation of a proposal, including alternatives and objectives, and its effects on the environment, including the mitigation and management of those effects.

Environmental management	That part of the overall management system which includes organisational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining environmental policy.
Environment Protection Licence	A licence to undertake an activity listed on Schedule 1 of the Protection of Environment Operations Act 1997. In the case of a beef cattle feedlot, the licence would be issued by EPA.
Feed Bunk	An open trough in which the feed ration is placed, and cattle eat from.
Feed Road	Road used to access feed bunk.
Feedlot Class	There are four feedlot classes defined within the draft policy *Assessment and Management of Odour from Stationary Sources in NSW*: Class One: This represents the highest standard of design, operation, maintenance, pad management and cleaning frequency. Class Two: This is the generally accepted standard for a well-designed, constructed and maintained feedlot, which has a high standard of operation. This is the reference standard for all classes. Class Three: Well-designed, well-constructed and operated with higher standards than Class Four for pad preparation and maintenance and pen cleaning. Well removed from impact locations. Class Four: Generally, a small feedlot in an isolated situation with basic management and development standards, well separated from any residential situations and having fewer than 1000 head of cattle.
Geotechnical	Relating to the form, arrangement and structure of the geology.
Greenhouse Gas	Greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, ozone and some artificial chemicals such as chlorofluorocarbons (CFCs).
Groundwater	Subsurface water contained within the saturated zone.
Habitat	The particular local environment occupied by an organism.
Hydrogeology	The study of subsurface water in its geological context.
Hydrology	Surface water and groundwater and their interaction with earth materials.
Impervious	A material that does not allow another substance to pass through or penetrate it.
Integrated Development	Development that requires development consent and one or more of the approvals listed within section 91 of the Environmental Planning and Assessment Act 1979.
Infiltration	The process of surface water soaking into the soil.
Intergenerational equity	A concept that says that humans 'hold the natural and cultural environment of the Earth in common both with other members of the present generation and with other generations, past and future' .
Integrated Pest Management	An ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of chemical control agents.
Katabatic Drift	Katabatic drainage flow (or valley drainage flow) occurs under light winds and stable meteorological conditions. Air, as it cools at night, falls and tends to move downhill in areas of significant topographic relief. As this air moves it tends to create a bulk movement of air, which can cause winds to blow in areas influenced strongly by topography.
Liquid Waste	Stormwater run-off from the controlled drainage area. Also referred to as effluent. Liquid waste is high in nutrients because it has been in contact with manure and has the potential to pollute surface water and

	groundwater. Liquid waste is valued as a source of nutrients for fertilising crops.
Manure	Manure is the solid waste produced by cattle. Manure is the faeces and urine excreted by the cattle.
Mitigation	Reduce the severity of impact.
National Feedlot Accreditation Scheme	An independently audited quality assurance scheme to develop a Quality System for beef feedlots that impacts positively on product quality and acceptability and for which the lot feeders maintain responsibility.
Native vegetation	Species of vegetation being either trees (including any sapling, shrub or scrub), understorey plants, groundcover (being any herbaceous vegetation) that existed before European settlement.
Operational Environmental Management Plan	The control, training and monitoring measures to be implemented during the operation phase of the development in order to avoid, minimise or ameliorate potentially adverse impacts (being socio-economic, cultural, physical, biological) identified during environmental assessments.
Particulates	These include any solid material suspended in the atmosphere.
Pathogen	An organism capable of eliciting disease symptoms in another organism.
Permeability	The property or capacity of a porous rock, sediment, clay or soil to transmit a fluid.
PM10	Particulate matter less than 10µm in size, the respirable fraction.
Precautionary principle	The principle that if there are threats of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
Rating Background Level (RBL)	The RBL (L90) is defined as the overall single figure background level representing each assessment period (i.e. day/evening/night).
Recycling	The return of waste materials to the production system so that the need for raw materials is reduced.
Register of the National Estate	A list of the National Estate developed under the provisions of the Commonwealth's Australian Heritage Commission Act 1975. The Register of the National Estate now falls under the provisions of the Environment Protection and Biodiversity Conservation Act.
Rehabilitation	The process of restoring the land in a given area to some degree of its natural state, after some process (industry, natural disasters, etc.) has resulted in its damage.
Relic	Any item greater than 50 years of age.
Revegetation	The process of re-establishing a vegetative cover.
Riparian zone	The vegetated corridor along streams and rivers.
Risk	Likelihood of a specific undesirable event occurring within specified period or in specified circumstances. Listed as frequency or probability.
Risk assessment	A process used to determine whether people and the environment are at risk (e.g. health and safety) from exposure to hazardous substances used or produced (mainly in an industrial or work place) so that appropriate control measures or management practices can be introduced to prevent or minimise the risk.
Salinity	The concentration of water-soluble salts, mainly sodium, calcium and magnesium, which may be chlorides, sulphates or carbonates. Measured as conductivity in dS/m, or as dissolved solids in mg/L.
Sorption	General term for the interaction (binding or association) of a solute ion or molecule with a solid. E.g. Subsurface drain - A shallow drain installed in an irrigated field to intercept the rising ground-water level and maintain the water table at an acceptable depth below the land surface.

Sound Power Level	The amount of acoustic energy (per second) emitted by a noise source. Sound Power Level is expressed in decibels (dB) and cannot be directly measured.
Sound Pressure Level (SPL)	The "Noise Level", in decibels (dB), heard by our ears and/or measured with a sound level meter. The sound pressure level generally decreases with increasing distance from a source. Noise levels are often written as dB(A) rather than dB. The "A-weighting" is a correction applied to the measured noise signal to account for the ear's ability to hear sound differently at different frequencies.
Solid Waste	Special wastes (e.g. tyres), General solid (putrescible) (e.g. domestic litter and food waste, animal wastes), General solid (non-putrescible) (e.g. glass, paper, building demolition waste, concrete, sharps). Animal wastes produced within the feedlot include solids excreted by the cattle, solids that have settled from the stormwater runoff in the sedimentation basin, spoilt feed and composted mortalities. Manure is the predominant solid waste generated. Animal solid waste is valued as a source of nutrients for fertilising crops.
SCU	A Standard Cattle Unit is equivalent to an animal with a liveweight of 600kg.
Statutory authority	An authority set up as a requirement of legislation.
Sustainable use	Use of an organism, ecosystem or their renewable resource at a rate within its capacity for renewal.
The Air Pollution Model	TAPM is a three-dimensional meteorological and air pollution model (Hurley P, 2008).
Temperature inversion	An atmospheric state in which the air temperature increases with altitude.
Terrestrial	Of or pertaining to the land as distinct from the water.
Threatened species	Animals and plants that are in danger of extinction or may now be considered extinct but have been seen in the wild in the last 50 years.
Visibility	Measure of extent to which particular components of a project may be visible from surrounding areas.
Visual absorption capacity	An estimation of the capacity of the landscape to visually absorb a project without creating a significant change in visual character or producing a reduction in scenic quality.
Vulnerable species	A species which population is decreasing because of threatening processes, or its population has been seriously depleted and its protection is not secured, or its population, while abundant, is at risk because of threatening processes, or its population is low or localised or depends on limited habitat that is at risk because of threatening processes.
Wastewater	Water which is collected and transported to a treatment area. Wastewater normally includes water from both domestic and industrial use.
Wet-weather storage	A system for temporarily storing wastewater generated during periods when irrigation is not possible, such as during periods of wet-weather, or when evaporation is very low.
Wind climate	A description of the meteorological conditions created by the wind involving measurements of wind speed, direction and frequency of gusts for average, seasonal and annual conditions.

4. Executive summary

Background

AJ & NA Varley own and operate a mixed farming operation across several properties at Pine Lodge including "High Claire", "Arkoona", "Sunnyside", "Killara Rise", "Langunyah" and "Glen Cluan" some 17 km by road west of Finley and 49 km by road east-southeast of Deniliquin in Riverina region of NSW.

AJ & NA Varley primarily engage in dryland and irrigated cropping, beef and lamb production. AJ & NA Varley produce wheat, barley in winter and sorghum and maize in summer under irrigation and dryland farming systems.

Central to the beef production enterprise is the breeding, growing and lot feeding of cattle for the domestic market. Currently the beef supply chain includes breeding and growing of beef cattle and lot feeding of cattle within a feedlot on the property "High Claire".

"High Claire" comprises some 195.19 ha (~482.12 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with lot feeding of beef cattle and lambs.

There has been a beef cattle feedlot on "High Claire" for over twenty years after approval was granted for a 999 head feedlot by the former Conargo Shire (now Edward River Council) in 2004 (DA 293). The capacity of the existing beef cattle development does not exceed 1000 head and an environmental licence from NSW EPA is not required.

Co-located with the beef cattle feedlot is a 4,000 head sheep feedlot which was granted approval in 2006 by the former Conargo Shire (now Edward River Council) in 2004 (DA 352). The capacity of the existing sheep development does not exceed 4000 head and an environmental licence from NSW EPA is not required.

AJ & NA Varley wish to expand the existing beef cattle feedlot from the current approved capacity of 999 head by gaining development approval for intensive livestock agriculture to operate as a 3,200 head beef cattle feedlot on the site. The proposal also involves the ceasation of the sheep feedlot with the existing infrastructure repurposed for the lot feeding of cattle. The proposed development is not proposed to be staged.

Access to the existing development complex is directly off Broughans Road a local controlled road. The haulage routes for heavy vehicles shall be the Riverina Highway to James Road and the Newell Highway via Broughans Road.

Regional Description

The proposed development is located in the Edward River Shire in the Central Murray region near the border between NSW and Victoria. The central River Murray catchment takes in the country on both sides of the River Murray. From Hume Dam in the east, upstream of Albury, to the confluence of the Murray and Darling rivers at Wentworth, in western New South Wales. The central Murray catchment only covers about 3% of the Murray-Darling Basin area but

many of the major rivers of the Basin enter the River Murray in this region. These rivers account for over 50% of the inflow of the Basin.

Major tributaries of the River Murray in the region are the Kiewa, Ovens, Goulburn, Campaspe, Loddon, Wakool and Murrumbidgee Rivers and Broken Creek.

The Central Murray catchment has a population of around 105,000 people is concentrated along the Murray and Edward–Kolety river systems in towns such as Corowa, Moama, Deniliquin, Tocumwal, Holbrook, Finley and Albury. Many of these population centres are closely linked to nearby Victorian communities and services. Many rural villages also service their local and often remote communities.

Land use across the region is predominantly dryland agriculture (cereals and grazing, including pastoral and mixed-farming systems) and irrigated agriculture (cereals, cotton, horticulture and vine fruits).

Alternatives Sites Considered

The proposed development must be appropriately sited to ensure its economic viability and environmental sustainability.

The proposed development is the expansion of an existing beef cattle feedlot. The existing development site was assessed against various criteria, which included factors such as having an adequate area, compatible surrounding land uses, access to transport, access to a local workforce, separation from sensitive receptors and an available water and power supply.

Project Description

The proposed development is a 3,200 head beef cattle feedlot located on the property "High Claire", which is approximately 11.5 km south-west of Finley in Southern New South Wales. The proposed development would occupy a footprint of approximately 160 ha and include the following components in a functional configuration:

- Water supply/storage and reticulation – A reliable and uninterrupted supply of clean water of the required volume to sustain operation is required.
- Pens - Fenced areas are required for housing production cattle (production pens), cattle arriving to or being dispatched from the feedlot (induction/dispatch pens), and sick cattle (hospital pens). Shade structures over the pen area are provided.
- Livestock handling – Infrastructure and facilities are required for the arrival, induction and dispatch of cattle.
- Feed processing and commodity storage - Feed rations are prepared on-site in a facility, with associated commodity storage, handling and ration delivery infrastructure.
- Access and internal roads - Access to the site and the layout of internal road systems are critical to the efficient and safe functioning of the development.
- Administrative/Maintenance Infrastructure - Facilities are required for conducting management, maintenance and administrative functions associated with operation. This includes office, machinery workshop and associated facilities, for example.

- Controlled drainage area - Stormwater runoff from areas such as pens, livestock handling, silage pits has a high organic matter and therefore a high pollution potential. This runoff is controlled within a system that collects and conveys this runoff to a sedimentation basin and holding pond prior to environmentally acceptable utilisation.
- Drainage system - The controlled drainage area contains a system including catch drains, sedimentation system and holding pond for conveying stormwater, allow entrained sediment to 'settle out' and capture and storage of the stormwater from the controlled drainage area until it can be sustainably utilised.
- Effluent and Solid waste management areas – Solids wastes such as manure, mortalities and sludge (from the holding pond) are temporarily stockpiled and processed within the solid waste storage area prior to utilisation on-site or removed off-site. Effluent is stored in the holding pond pending application to the effluent utilisation area or evaporated.
- Effluent and Solid waste utilisation areas – Solid wastes generated are applied to an on-site utilisation area. Any solid wastes not utilised on-site are removed off-site. When available, effluent is shandied with clean water and applied to land via irrigation within a dedicated effluent utilisation area.

Construction

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure. Consequently, there is construction phase per se and no construction related activities.

The subject land currently has existing service infrastructure in the form of electricity, water and communications. The proposed development would not require the extension of these services.

Operation

The proposed development has been designed to accommodate about 3,200 head of beef cattle at a stocking density of 10.1 m^2/head.

The majority of cattle would be steers of *Bos Taurus or Bos Taurus cross* genotypes. Breed composition is expected to change with time as market signals develop.

The proximity of the proposed development to the Southern Riverina and Northern Victoria grazing districts leaves it well positioned for livestock procurement. It is expected that cattle would be sourced locally as far as possible.

Cattle would be transported to the proposed development at about the entry weight of the target market. The cattle would be fed a ration specific to that market type until they reach the exit weight of the respective market when they would be transported from the site to an abattoir in Inverell for processing.

Typically, cattle would enter the feedlot at around 9 to 12 months of age and an average of some 275-300 kg liveweight. The cattle would be fed for approximately 150 days to achieve an average of 550 kg liveweight.

Rations are prepared on-site in a dedicated facility, with associated commodity storage, handling and ration delivery infrastructure.

The ration contains grain, roughage (fibre), and minerals. Roughage is essential in the diet to enable normal rumen activity, and shall be provided by silage, hay or straw commodities. Commercial mineral/vitamin premixes shall be added to the ration.

The location of the proposed development in the southern Riverina leaves it well positioned for grain and commodities procurement.

The majority of grain and hay/straw for the feedlot would be transported from the local region to the site from properties owned by the applicant. A percentage of the annual grain requirement shall be produced on the subject property within the effluent and/or solid waste utilisation areas depending on seasonal conditions.

The proposed development would be maintained and operated as a Class One standard, the highest standards of design, construction and management.

Approvals

Local Planning Matters

The primary local planning instrument applying to the proposed development is the Conargo Local Environmental Plan 2013. Use of land for a beef cattle feedlot according to the Conargo Local Environmental Plan 2013is defined as "Intensive Livestock Agriculture" and is only permitted with consent. The proposed development is located in the Rural Zone - RU1 Primary Production under Conargo LEP 2013. Intensive Livestock keeping establishments are permissible with consent in the RU1-Primary Production zone.

The primary local planning instrument applicable to the subject property is the Conargo Local Environmental Plan 2013. Under this LEP, the land is zoned Rural Zone - RU1 Primary Production and the proposed development falls within the definition of "Intensive Livestock Agriculture". The proposed development meets the objectives associated with this definition and the LEP zoning.

State Planning Matters

There are several State Environmental Planning Policies which apply to the subject land and are relevant to the proposed development. These include:

- State Environmental Planning Policy (Biodiversity and Conservation) 2021
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Primary Production) 2021

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Resources and Energy) 2021
- State Environmental Planning Policy (Transport and Infrastructure) 2021

The proposed development comprises a beef cattle feedlot with a capacity of 3,200 head. Hence, in accordance with Schedule 4 Part 3 SEPP (Primary Production) 2021, this EIS accompanies a development application made to Edward River Shire Council seeking development consent for the establishment and operation of the cattle feedlot. This EIS addresses the policy aims of State Environmental Planning Policy (Primary Production) 2021).

This EIS has been prepared in accordance with the requirements of the EP&A Act and Regulation and provides a detailed description and environmental assessment of the proposed beef cattle feedlot including potential impacts in terms of odour, surface and groundwater and soils and recommends mitigation and management measures to minimise potential adverse impacts.

State Legislation

Protection of the Environment Operations Act 1997 (POEO Act): Under section 48 of the POEO Act, the proposed development requires an Environment Protection Licence (EPL) as it is a scheduled activity.

Roads Act 1993: The proposed development does not involve the construction of a new site entrance. The proposed development would be referred to the Transport for New South Wales in conjunction with the assessment of the EIS by the Department of Planning and Environment (DPE) in accordance with section 75(V) of the EP&A Act.

Biodiversity Conservation Act 2016: The proposed development does not involve the clearing of native vegetation and a BDAR is not required.

Water Management Act 2000: The object of the *Water Management Act 2000* is the sustainable and integrated management of the state's water for the benefit of both present and future generations and is based on the concept of ecologically sustainable development.

The concept of ecologically sustainable development has been considered throughout the planning and design phases of the proposed development. Beef cattle feedlots require a secure and reliable supply of water and of sufficient quality to operate.

The proposed development is located within the NSW Murray Region water sharing plan. The subject land already benefits from a 273ML surface water allocation from Murray Irrigation Limited and a groundwater allocation of 400ML. Pursuant to Clause 32 of the Water Management (General) Regulation 2018 and section 91A (1) of the Water Management Act 2000, when Development Consent is granted for the proposed development, it shall be permissible to use existing surface water entitlements or part thereof for stock intensive use within the proposed development.

Statutory and non-statutory authority consultation

Throughout the planning and EIS preparation process, there has been extensive consultation with various local government and state government agencies. These include:

- Department of Planning and Environment (NSW DPE);
- Edward River Council (ERC);
- NSW Department of Planning and Environment – Department of Primary Industries;
- NSW Department of Planning and Environment – Environment and Heritage;
- Transport for NSW;
- WaterNSW;
- Murray Irrigation Limited;
- Murray Local Land Services (LLS);
- Deniliquin LALC.

Community Consultation

Consultation was also undertaken with the local community who may be impacted by the proposed development. The overall objective of the community consultation program was to inform the community about the proposed development and to ensure clear, transparent, two-way communication by listening, recording and responding to the issues as they arose.

A letter with accompanying proposed development information was distributed to residents living within 5 km of the subject property. The community was encouraged through the letter to make submissions on the proposed development. However, no responses from the community were received.

Issues Identification

Identification of the environmental issues relevant to the proposed development involved a combination of background investigation, research, and consultation. The key issues arising from the consultation process and priority rating are outlined in the table below.

Issue	Sub-Issue	Rating
Air Quality	Odour	High
	Dust	Medium
	GHG	Low
Soils		Medium
Water	Groundwater	Medium
	Surface	Medium
Flooding, Stormwater and Coastal Erosion		Low
Cultural Heritage		Low
Biodiversity		Low
OEH Estate		Low
Waste Generation		Low
Land Capability		Medium
Traffic and Transport		Medium
Noise and Vibration		Low
Visual Amenity		Low
Pest animals and Weeds		Low
Hazards and Risk		Low
Land Use		Low

The issues listed in the above table have been addressed within this EIS and are summarised below.

Environmental issues and assessment of impacts

Air quality

Odour

Odour emissions generated from the proposed development complex are expected to be the primary impact to air quality as a result of the proposed development. An odour impact assessment was undertaken to determine the likely odour impacts to receptors in the local area.

The proposed development has been sited to provide adequate separation distances between the odour and dust generating sources and sensitive receivers.

It is concluded that sufficient separation exists between the proposed development complex and sensitive receptors to limit any adverse impacts and unreasonable interference with the amenity of neighbours as a result of odour.

Dust

The proposed development site is located in a rural area. Air quality in the local area would be considered to be of good quality and is likely to be influenced by dust emissions from current agricultural activities (land cultivation, existing feedlot) and vehicle movements on unsealed roads.

The proposed development in an intensification of the existing development and not a new development in an area previously bereft of intensive livestock facilities.

Dust emissions from the proposed development are unlikely to cause impacts unless receptors are located nearby. The distance emissions generally disperse from the source depend on topographic and climatic factors.

Subsequently, as the separation distance is suitable to mitigate against odour impacts, dust impacts are also not expected by default.

Greenhouses gases

GHG Emissions from the proposed development can be broken into three sources; direct methane emissions to the atmosphere (enteric methane) from the livestock themselves, methane and nitrous oxide emissions resulting from the breakdown of organic matter during solid/liquid waste storage, treatment and handling and utilisation and those resulting from the use of fossil fuels for energy usage.

Potential impacts to air quality from GHG emissions were considered based on the type of infrastructure proposed, construction techniques and machinery to be utilised and management techniques to be employed.

GHG emissions from the proposed development are unlikely to cause impacts due to productivity improvements over extensively grazed systems and the mitigation and management measures proposed.

Soils

A geotechnical assessment of the soils within the proposed development complex site was completed during construction of the existing development. The geotechnical assessment identified that the soils are low plasticity, silty light to medium clays soils with a high degree of dispersion and low shrinkage potential.

Based on recommended suitability criteria from National and QLD state feedlot guidelines, these soils have engineering properties (with the exception of dispersion) that are well suited to the construction and operation of a beef cattle feedlot.

Further, appropriate design and construction measures are proposed to mitigate the high degree of dispersion to ensure that any potential risks to the environment, in particular groundwater are mitigated.

It is concluded that that provided appropriate design and construction measures are implemented, the in-situ soils within the proposed development complex area are suitable for the design and construction of the relevant infrastructure, such as roads, pen foundations, water retaining structures (drains, sedimentation basin, holding dams), building footings, compacted earthworks, feed storage and processing areas, excavations etc.

Water

Groundwater

Activities associated with the operation of the proposed development has the potential to generate impacts to groundwater.

Various mitigation measures have been adopted in the design and siting of the proposed development to prevent or minimise adverse impacts to groundwater. Various mitigation measures shall be implemented to prevent or minimise adverse impacts to groundwater during operation of the proposed development such as:

- The clay lining to prevent soil leachate movement shall be maintained during operations;
- Solid waste stockpiles established within controlled drainage area to prevent contaminated leachate into groundwater resources;
- Clean water runoff external to the controlled drainage area shall be diverted away from the controlled drainage area;
- Effluent and solid utilisation areas are sited and designed to enable the sustainable use of effluent and any solid waste that is utilised on-site; and
- Development and implementation of emergency and contingency plans within the IMP detailing methods to manage spills or other emergencies on site, such as pipe breakages, pond overflows, pump failures etc.

Due to the design, siting and mitigation measures proposed and depth to groundwater (7-10m), no adverse impacts to groundwater quantity or quality are predicted as a result of the proposed development.

Surface water

Activities associated with the operation of the proposed development have the potential to generate impacts to surface waters.

Various mitigation measures have been adopted in the design and siting of the proposed development to prevent or minimise adverse impacts to surface waters. Various mitigation measures shall be implemented to prevent or minimise adverse impacts to surface waters during construction and operation of the proposed development such as:

- The proposed development complex is sited above the height of a 100-year average
- A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling and solid waste storage and processing area which have high organic matter and therefore a high pollution potential;
- Effluent and solid utilisation areas are designed to enable the sustainable use of effluent and any solid waste that is utilised on-site;

- Any facilities to store hazardous materials (e.g. fuel) are designed to meet relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management;
- A holding pond is designed to store runoff from the controlled drainage area without spilling or overtopping at an unacceptable frequency; and
- Buffers to drainage lines and irrigation cannels implemented, thus minimising adverse impacts to preserving bank stability.

Due to the design, siting and mitigation measures proposed, no adverse impacts to surface water quantity or quality are predicted as a result of the proposed development.

Flooding, stormwater and coastal erosion

The proposed development has the potential to generate impacts to the receiving environment from stormwater along with implications of flooding.

Various mitigation measures have been adopted in the design, siting, construction and operation of the proposed development to prevent or minimise these potential impacts such as:

- The proposed development complex is sited above the level of a 100-year average recurrence interval (Q_{100}) flood (1% AEP) of the Murray River;
- A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling and solid waste storage and processing area which have high organic matter and therefore a high pollution potential.
- Effluent and solid waste utilisation areas are sited so that they do not pose an unacceptable risk to surface water quality as a result of flood events.
- Effluent and solid waste utilisation areas are designed to enable the sustainable use of effluent and any solid waste that is utilised on-site.
- A holding pond is designed to store runoff from the controlled drainage area without spilling or overtopping at an unacceptable frequency.
- There are no aspects of the proposed development such as infrastructure on flood plains that shall adversely impact flood behaviour or increase risk to life from flood.

Due to the design, siting and mitigation measures proposed, no adverse impacts to the receiving environment from stormwater and no implications as a consequence of flooding.

Heritage

A heritage assessment was undertaken to identify any Aboriginal and non-aboriginal cultural heritage issues associated with the proposed development, an assessment of the potential impacts to Aboriginal and non-aboriginal cultural heritage as a result of the proposed development, and development of recommendations to minimise, manage and mitigate these potential impacts. The assessment followed a due diligence process in accordance with relevant guidelines.

The Aboriginal Heritage Assessment identified no Aboriginal artefacts within the proposed development site.

The level of human impact, through land disturbance (land clearing, grazing, cultivation, built infrastructure etc.) has substantially affected the most culturally sensitive areas on the subject land. Subsequently, it seems highly unlikely that evidence of previous occupation by Aboriginal people remains within these areas. Measures have been prepared to mitigate any impacts to possible Aboriginal heritage sites and objects.

Subsequently, the proposed development shall not impact on any Aboriginal heritage sites, objects or places, or areas of archaeological potential or Aboriginal sensitivity.

The non-Aboriginal Heritage Assessment and site assessment identified no non-Aboriginal sites on the land on which the development is proposed. Therefore, it is considered that the proposed development would not impact on the non-aboriginal heritage fabric of the land on which the development is proposed.

Biodiversity

A test of significance of potential biodiversity impacts from the proposed development has been undertaken by Hamilton Environmental Services and is presented in Appendix I. The test of significance takes into account other relevant Commonwealth and NSW legislation and environmental planning instruments.

The subject land is not in a declared area of outstanding biodiversity value, the proposed development area is not mapped as *Vulnerable or Sensitive Regulated Land* according to the Section 60F of the *Local Land Services Act 2013*, and is also not mapped as an area of Biodiversity Value, and a BDAR is not triggered on the basis of this mechanism.

As no clearing of native vegetation is proposed, a BDAR is not triggered on the basis of this mechanism.

After likelihood assessment, given the highly disturbed and modified condition of the proposed development area and the poor landscape connectivity of the site, it is considered that none of the threatened flora and fauna species were likely to utilise the proposed development area.

Given that the development will have no impact on any native vegetation – and with no impact on any threatened species or communities - the five parameters of Part 7 Division 1 Section 7.3 of the *Biodiversity Conservation Act 2016* have not been applied to any threatened flora, fauna or communities, and a BDAR is not triggered by this mechanism.

The assessments of significance concluded no threatened species would be significantly affected by the proposal. A Species Impact Statement and/or Referral to the Federal Minister for the Department of Climate Change, Energy, the Environment and Water (DCCEEW) is not required.

Protected and conservation areas

The likely impacts (both indirect and indirect) on any nearby protected areas and conservation areas were assessed.

The proposed development complex shall be sited some 6,300 m from mapped wetlands. Land adjacent to the mapped wetlands shall not be impacted by the proposed development.

Further, the operation of the proposed development will generate effluent and solid waste which can be wholly or partly sustainably utilised on the subject property as outlined in 13.11.

It is expected that, with the implementation of the outlined mitigation measures, the proposed development would not create significant impacts to adjacent or nearby estate.

Waste generation

The operational phase of the proposed development will generate various types of waste streams in very small quantities other than animal wastes (effluent and solid waste (manure) etc).

Effluent and solid waste shall be wholly or partly sustainably utilised on the subject land.

Impacts from waste generation have been considered various management and mitigation measures shall be implemented during the operation phase of the proposed development to minimise impacts from waste generation such as:

- All wastes as far as reasonably practicable managed in a manner which reduces adverse impact to the environment based on the hierarchy of waste materials management (elimination, reduction, reuse or recycling and treatment and disposal);
- All waste to be transported off-site shall be assessed to determine whether the waste requires tracking under the Protection of the Environment Operations (Waste) Regulation 2014;
- No burying of solid waste relating to the operation of the proposed development is to be conducted on the subject land with the exception of mass deaths of beef cattle in such an event;
- All waste that cannot be sustainable utilised on the subject land shall be removed from the subject land by an operator licensed to remove that waste removal and transported to a suitably licensed disposal site;
- Wastes will be stored appropriately for its type. Different waste types will not be mixed to increase the potential for re-use or recycling of waste. Separate waste storage areas will be designated;
- Records or a material register shall be retained detailing the quantity, classification method of transport of waste material removed from the site. The register will record the waste type, quantity, classification, contractor, licence details and details of the licensed receiving facility; and

It is expected that, with the implementation of the outlined mitigation measures, the proposed development would not create significant impacts to the environment from waste generation.

Land capability

The proposed development would produce effluent and solid waste during its operation and would require licensing approvals for utilisation of effluent and solid waste on land. An Environment Protection Licence (EPL) would be required from the Environmental Protection Authority (EPA).

The characteristics of the soils in the proposed solid and liquid waste utilisation areas are well suited for waste application as they are suitable for irrigated cropping, have moderate to high water holding capacity, not prone to waterlogging within the root zone, can withstand cultivation without incurring significant erosion and are deep and well drained. Further, the subject land has been an irrigation property for some time. This suggests that the soils are suitable for irrigation of effluent.

The proposed development and associated effluent and solid utilisation areas have been sited and designed to minimise any adverse impacts to groundwater and surface waters. Various mitigation measures include riparian buffers and sustainable utilisation of applied nutrients.

The proposed development has some 116 ha of land available for the utilisation of solid waste and 32 ha for effluent utilisation. Based on the estimated generation of some 1,780 dm tonnes of stockpiled solid waste per year, some 67% is able to be utilised on-site. The remaining solid waste shall be transported off-site for utilisation on adjoining properties or properties within the local region.

The proposed development incorporates on-site utilisation of effluent waste from the holding pond to land via irrigation. Therefore, a land capability assessment was undertaken to ensure that the utilisation system is sustainable over the long-term. The assessment methodology incorporated a water and nutrient balance approach using the daily time-step model MEDLI.

The assessment determined that a holding pond with a minimum size of 15 ML is required to ensure that that overtopping events occur no more frequently than one in 10 years.

The assessment investigated the soil characteristics and concluded that the soil is capable of absorbing the level of salts and nutrients contained within the effluent. The assessment also confirmed the size of the irrigation area (approximately 16 ha) is adequate to sustainably irrigate effluent.

Overall, the assessment concluded that there is sufficient land available with characteristics suitable for the sustainable application of all the effluent and about 67% of the solid waste and that a minimum holding pond capacity of 15 ML is required to ensure that overtopping of effluent occurs at an acceptable frequency.

Traffic and transport

Increased traffic can create concerns around road maintenance; road safety; and noise and dust. The proposed development requires the transport of cattle to and from the site, transport of feed commodities to the site and transport of staff, suppliers, representatives and service contractors during operation.

The operation of the proposed development would involve additional traffic movements on the local road network equating to about 3.8 vpd and 0.3 vph peak hourly.

The subject land is situated along Broughans Road, which currently experiences traffic movements of a similar nature to the traffic associated with the proposed development.

The primary haulage route shall be Broughans Road into James Road into the Riverina Highway.

Key intersections being the Broughans Road/ James Road; James Road/ Riverina Highway and Broughans Road/ Newell Highway have been assessed. The terrain approaching all intersections is relatively flat with safe intersection site distance. There are no proposed upgrades to the current layout of any intersection.

The expected traffic generated by the proposed development, both light and heavy vehicles is not expected to have adverse impacts on the surrounding local road network with respect to road safety and performance with the following mitigation measures proposed.

- Access for light vehicles and heavy vehicles be maintained via the existing approved subject land entrances off Broughans Road approximately 405 m and 525 m east of the intersection with James Road to provide sufficient sight distances to and from the intersection.
- Advisory signage (Truck crossing or entering) be implemented on each approach to 58 Broughans Road in accordance with AS1742.2 to advise motorists of truck turning movements.
- A Traffic Management Plan and Driver Code of Conduct shall be implemented to ensure heavy vehicles utilise either Haulage Route A, Haulage Route B or Haulage Route C.

Noise and vibration

Activities associated with the operation of the proposed development have the potential to generate noise impacts. Traffic noise on Broughans Road would also be generated from the light vehicle traffic movements associated with the operational phase.

There are several residential (sensitive) receptors in the vicinity of the noise sources of the proposed development. The nearest residential receptor is located approximately 990 m away from the proposed development complex.

Subsequently, due to the large separation distances from the proposed development and sensitive receptors, the topography and landform and lack of certain vibration generating

activities (blasting, jack-hammering, piling), it is predicted that no receptor shall be potentially impacted by vibration as a result of the operation of the proposed development.

Traffic associated with the operational phase such as livestock and feedstuffs movements to and from the development has the potential to result in vibration impacts at residential dwellings adjacent to the local roads Broughans Road and James Road. However, there are no residences within 300 m of the main heavy vehicle haulage routes. Light vehicles shall use Broughans Road during operation and any potential impacts from vibration should be minimal.

Operational activities involve noise generating equipment such as feed storage and processing equipment (electric motors, conveyors, roller mills) and mobile plant (feed trucks, tractors, front-end loaders etc) on-site. Due to the significant distance to the nearest sensitive receptor and as the operational activities of the proposed development being consistent with the activities of the existing cattle feedlot development and agricultural activities on the property, the noise generated from operations of the proposed development is not expected to create a significant impact on the surrounding environment.

As there will be no variation in vehicle types and relatively low increase in traffic volumes using the existing road corridor compared to the volumes currently utilising the Broughans Road, James Road and the Riverina Highway, and setback to the road, any local receptors on the route will not experience a significant increase in total traffic noise above that set out in the NSW Road Noise Policy (Department of Environment, Climate Change and Water NSW (DECCW), 2011).

Visual

The landscape surrounding the subject land is broad level plain on alluvium and comprises relatively flat topography.

There are sensitive receptors on neighbouring land parcels comprising single rural dwellings. The closest residential sensitive receptors are located some 990 m west by south and 1,130m north by east from the proposed development complex. Other receptors are over 1,200 m away. Due to the flat topography and setback, no residential sensitive receptor has direct close views to the proposed development complex.

As a result, the viewpoint assessment indicated that there was expected to be negligible visual impact from the proposed development apart from travellers along Broughans Road and James Road to a lesser extent. However, visual impacts for users along these roads will be temporary.

The proposed development complex will be viewable by road users immediately in front of the existing complex but views further afield will be limited in extent and duration for users along Broughans Road. The proposed development is not expected to be able to be seen from Bowlers Road which is 1.5 km to the south or the Riverina Highway or the Newell Highway.

The assessment deemed that the nature of the proposed development would be consistent with the existing intensive animal development on the subject land. It is considered that the proposed development would assimilate into the local landscape due to the nature of the development and the high visual absorption capacity of the surrounding landscape.

Overall, it is expected that the proposed development would not create any visual impacts to receivers in the surrounding area.

Pest animal and weeds

Pest animals and weeds are a constant risk for the primary producers, as they can have a serious impact on agricultural production and market access.

Pest animals can be defined as native or introduced, wild or feral, non-human species of animal that is currently troublesome locally, or over a wide area, to one or more persons, either by being a health hazard, a general nuisance, or by destroying food, fibre, or natural resources.

An integrated approach to weed and pest animal management shall be implemented based around the important elements of weed hygiene, operational hygiene, prevention of infestations, arresting weed outbreaks using effective reporting and physical or chemical control procedures, documenting weed and pest animal infestations and auditing management programs.

In summary, the proposed development is not expected to impact the surrounding environment including soils, waterways or loss of biodiversity from the introduction and/or spread of pest animals and/or weeds provided the proposed mitigation measures are implemented.

Hazards and risk

There are potential risks to human health and safety, potential risks to animal health and potential risks to the biophysical environment associated with the construction and operation of the proposed development.

The main human risk is the potential for contracting a zoonootic disease (such as Q-fever and Leptospirosis) which may be acquired by workers coming into contact with airborne particles created from tissue, waste and dust from infected animals.

Workplace Health and Safety Management requirements would manage the risks for employees during operation such as general safety for working with machinery and cattle, including methods of managing the potential to acquire a zoonootic disease.

The proposed development also has the potential to impact upon the health of the animals through injury, infections and/or heat stress created from the climatic conditions. Mismanagement of the proposed development would also adversely impact upon the welfare of the animals and thus their productivity.

The proposed development would seek NFAS accreditation once operational. NFAS accreditation incorporates third-party audits of management measures aimed at preserving the welfare of the animals.

The biophysical environment would also be potentially impacted by the proposed development, in particular odour, effluent and solid waste. However, various management and mitigation measures have been proposed to minimise adverse impacts to these biophysical elements.

In summary, the proposed development is not expected to create significant hazards or risks to humans, animals or the biophysical environment provided the management and mitigation measures proposed are implemented.

Land use

Rural land uses dominate the surrounding area and include land used for beef cattle and sheep grazing, dairy farming, beef cattle feedlot and irrigated and dryland cropping and. The area is also scattered with infrastructure that supports these activities such as sheds, silos, livestock handling facilities and rural residences.

The operation of the proposed development would intensify the agricultural activities on the site, with some 3,200 head of cattle to be located within the proposed development at one time.

Noise, odour and traffic have the potential to affect surrounding land users during operation. Measures would be implemented to minimise noise and odour and increases in traffic are not expected to significantly affect receivers.

It is considered that the proposed development is consistent with the surrounding land uses of the area. The operation of the proposed development is not expected to create significant impacts to the surrounding land uses. The implementation of management measures to mitigate air quality, noise, biodiversity, pest animals and weeds would minimise the potential for the proposed development to adversely affect the surrounding environment.

*Bushfire and incident*s

The proposed development area is located within bushfire prone land, including surrounding the development complex where existing habitable buildings are constructed. It should be noted however that the development complex is not located within a fire prone area due to clearing and establishment of infrastructure such as road, pens, sheds and hardstand areas. Buildings in the development complex area are be designed and constructed to protect human life and reduce the impact from a bushfire.

Management measures such as separation distances, fire suppression systems etc are proposed to prevent a fire or explosion in the development complex igniting a bushfire. The impact of an existing bushfire shall be mitigated through the provision of appropriately sized protection zones for habitable assets, fire protection systems and emergency and incident management procedures.

Therefore, the risks associated with the proposed development being damaged by, igniting or contributing to the severity of a bushfire are expected to be appropriately managed.

Potential incidents and adequate precautions have been identified with the operation of the proposed development to manage, resolve and for emergency response.

The recommended mitigation measures would reduce hazards and risk from bushfires and incidents during operation of the proposed development.

Cumulative impact

There are no known proposed developments in the locality surrounding the subject property on which the development is proposed.

Subsequently, there are no cumulative impacts of the proposed development with other developments currently operating or proposed.

Commitments

AJ and NA Varley commit to conducting activities associated with the construction and operation of the proposed development in an environmentally responsible manner; and aim to implement best practice environmental management as part of a program of continuous improvement. This will be achieved by addressing issues systematically, consistent with an environmental management strategy (EMS).

Environmental management during the proposed development would be in accordance with an environmental management strategy (EMS). The EMS would contain a suite of environmental management plans which detail the site specific management measures and procedures to be implemented during construction and operation of the proposed development, as specified in this EIS, for mitigating and managing impacts including noise, air quality, biodiversity, heritage, water resources, land resources, traffic, social, hazards and risks, bushfire and visual.

The EMS would be developed to be consistent with the conditions of the proposed development, Development Consent and other planning approvals, should they be granted. A Operational Environmental Management Plan (OEMP) would form an integral part of the EMS.

Project justification

The assessment of the proposed development undertaken in the development of this EIS has incorporated biophysical, economic and social considerations. The potential biophysical impacts associated with the proposed development include examination of the following impacts:

- Air quality
- Biodiversity and habitat
- Landform and soils (primarily for suitability for waste utilisation and protection of groundwater)
- Groundwater and surface water quantity and quality.

The assessment of the impact of the proposed development on each of the biophysical elements of the environment has concluded that providing management measures and monitoring systems are implemented to mitigate potential impacts, the proposed development would not have a significant impact and is therefore justifiable on environmental grounds.

The economic impact assessment demonstrates that the proposed development would provide both direct and indirect economic benefits to the local and regional economies. Given these benefits, the proposed development is justifiable on economic grounds.

The potential social impacts of the proposed development include consideration of the following key issues:

- Odour;
- Dust;
- Traffic and Transport;
- Noise;
- Amenity;
- Landscape character and visual impact;
- Heritage – Aboriginal and non-aboriginal; and
- Hazard and risks.

The assessments of each of these factors have shown that the proposed development would not have a significant impact provided mitigation measures are implemented, and that the proposed development is justifiable on social grounds.

Part A - Introduction

5. Introduction

AJ & NA Varley own and operate a mixed farming operation across several properties at Pine Lodge including "High Claire", "Arkoona", "Sunnyside", "Killara Rise", "Langunyah" and "Glen Cluan" some 16.5 km by road west of Finley and 49 km by road east-southeast of Deniliquin in Riverina region of NSW.

AJ & NA Varley primarily engage in dryland and irrigated cropping, beef, sheep and wool production. AJ & NA Varley produce wheat, barley in winter and sorghum and maize in summer under irrigation and dryland farming systems.

Central to the beef production enterprise is the breeding, growing and lot feeding of cattle for the domestic market. Currently the beef supply chain includes breeding and growing of beef cattle and lot feeding of cattle within a feedlot on the property "High Claire".

"High Claire" comprises some 195.19 ha (~482.12 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with lot feeding of beef cattle and sheep.

There has been a beef cattle feedlot on "High Claire" for over twenty years after approval was granted for a 999 head feedlot by the former Conargo Shire (now Edward River Council) in 2004 (DA 293). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing beef cattle development does not exceed 1000 head it is not a designated development and an environmental licence from NSW EPA is not required.

Co-located with the beef cattle feedlot is a 4,000 head sheep feedlot which was granted approval in 2006 by the former Conargo Shire (now Edward River Council) in 2004 (DA 352). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing sheep development does not exceed 4000 head it is not a designated development and an environmental licence from NSW EPA is not required.

The existing beef cattle feedlot is known as High Claire. High Claire is used to finish AJ & NA Varley's own cattle for the domestic and export market along with custom feeding. The beef cattle feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

The beef cattle feedlot currently operates for 12 months of the year and employs approximately 2 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

AJ & NA Varley wish to expand the existing beef cattle feedlot from the current approved capacity of 999 head by gaining development approval for intensive livestock agriculture to operate as a 3,200 head beef cattle feedlot on the site. The proposal also involves the ceasation

of the sheep feedlot with the existing infrastructure repurposed for the lot feeding of cattle. The proposed development is not proposed to be staged.

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure.

The increase in the number of head in the development shall be gained by reducing the cattle stocking density and utilising the pens currently used for the sheep feedlot as cattle pens.

The proposed development shall comprise one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Existing infrastructure such as the grain storage and processing and cattle handling facilities have sufficient capacity to cater for the demands of the proposed development.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the property. The proposed development does not propose to reconfigure the existing waste utilisation areas.

The property "High Claire" is within the Edward River Council local government area and relevant environmental planning instrument is the Conargo Local Environmental Plan 2013 (CLEP).

Beef cattle feedlots which exceed 1,000 head capacity are defined as designated development under Schedule 3 (Part 1 section 21a) of the Environmental Planning and Assessment Regulation 2000 and therefore require a full Environmental Impact Statement (EIS) to accompany the development application.

AJ & NA Varley have access to a secure and appropriately licensed water supply provided by groundwater from 400 ML of Lower Murray Shallow Groundwater (under WAL30535: extracted via spearpoint bores and a surface water entitlement from Murray irrigation Limited (MIL) comprising 273 ML of Class C (General Security) irrigation water (landholding E386).

This report has been prepared in support of a Development Application from the Edward River Council for the proposed development and provides an examination of the existing environment, an overview of the design, layout, construction and operation of the proposed development and an environmental assessment.

5.1 Development overview

The proposed development is a beef cattle feedlot with a capacity of 3,200 head. A beef cattle feedlot is an intensive livestock production system in which beef cattle are finished on a grain-based ration in a confined land area with watering and feeding facilities. The proposed development shall include the following components:

- Site office;

- Controlled drainage area incorporating:
  - production pens including feed bunk, water trough and associated infrastructure (fences/aprons etc);
  - induction and hospital pens and associated infrastructure (crush/veterinary facility);
  - cattle lanes and pen catch drains;
  - sedimentation basin;
  - effluent holding pond; and
  - solid waste storage/processing area;
- Feed roads;
- Water storage dam (turkey nest) and tanks;
- Feed storage and feed preparation area (e.g. grain silos, hay pad);
- Feed processing infrastructure;
- Maintenance workshop; and
- Effluent and solid waste utilisation area.

5.2 Proponent details

The proponent for the proposed development is AJ & NA Varley. The details of the proponent is provided in Table 1.

Table 1 – Proposed development – Proponent details

Entity		AJ & NA Varley
ABN:		88 390 323 468
Physical address:		58 Broughans Road, PINE LODGE, NSW 5267
Postal address:		RMB 3095 Lower Finley Road FINLEY NSW 2713
Contact:		Mrs Nichole Varley
Contact details:	Mobile	0427 831 811 (Nichole Varley)

5.3 Environmental impact assessment process

The *Environmental Planning and Assessment Act 1979 No 203* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2021 (*EP&A Regulation) provide a framework for environmental planning in NSW.

Prior to any decision to proceed with a proposed development that may have an impact on the environment, a detailed assessment of the likely impacts of the development must be undertaken. Part 4 of the EP&A Act establishes the processes and matters for consideration by approval authorities when determining the impact of a development and whether the development should be approved.

Development applications are assessed with regard to Part 4 Division 4.3 Sub-division 4.15-Evaluation (cf previous s 79C) of the *Environmental Planning and Assessment Act 1979*.

Cattle feedlots which exceed 1,000 head capacity are defined as designated development under Schedule 3 (Part 1 Designated development section 4) of the *EP&A Regulation* and therefore require a full Environmental Impact Statement (EIS) to accompany the development application. An extract from Schedule 3 is contained in Appendix A.

Further, the proposed development is defined as Integrated Development in Part 4 - Division 4.8 of the *EP&A Act* as development consent and one or more other approvals, such as an Environment protection licence is required to authorise the carrying out of scheduled activities at the site.

5.3.1 Environmental assessment requirements

An EIS in respect of a designated development must be prepared for the purposes of an environmental assessment under s 4.12 (8) of the EP&A Act. "*(8) A development application for State significant development or designated development is to be accompanied by an environmental impact statement prepared by or on behalf of the applicant in the form prescribed by the regulations."*

A written application to the Director-General for the Secretary's Environmental Assessment Requirements (SEARs) was made 29 May 2023. The form of an Environmental Impact Statement (EIS)is determined by the Environmental Planning and Assessment Regulation 2021 [NSW], Division 5 Environmental impact statements as per the Act ss 4.12(8), 5.7(1) and 5.16(2). An EIS must be prepared in accordance with the environmental assessment requirements of the Director-General of the Department of Planning and Environment (DPE).

The Secretary's Environmental Assessment Requirements (SEARs), were issued on 25 September 2023 under Part 4 of the EP&A Act. A copy is presented in Appendix B to this EIS.

5.3.2 Consultation

During the preparation of the EIS consultation with relevant local, State and Commonwealth government authorities, service providers and community groups has been undertaken and

issues that have been raised have been addressed in the EIS. These issues are outlined in section 11.1 of this EIS. A copy of consultation undertaken is enclosed as Appendix B to this EIS.

5.3.3 Environmental assessment and public consultation

This EIS has been prepared in accordance with the environmental assessment requirements of the Director-General which specifically lists the matters to be addressed in the EIS with respect to the proposed development under Section 4.12(8) of the *EP&A Act* and Schedule 3 of the *EP&A Regulation*. The *EP&A Act* requires that the EIS be made publicly available for at least the minimum exhibition period, being not less than 30 days. During the exhibition period, any person (including a public authority) may make a written submission to the Secretary concerning the matter.

5.4 EIS study team

This EIS has been prepared by RDC Engineers Pty Ltd in association with a series of technical specialists. Table 2 lists the EIS components and the study team members. The curriculum vitae of each member of the study team is provided in Appendix D.

Table 2 – Proposed development – Study team

EIS Component	Company	Team Member
Development outline, Community consultation, hazards and risk, visual impact, animal welfare, biosecurity and disease management	RDC Engineers Pty Ltd	Rod Davis BEng (Ag), MEng (Ag) CP Eng, RPEQ, FIE Aust
Air quality and odour	RDC Engineers Pty Ltd	Rod Davis BEng (Ag), MEng (Ag) CP Eng, RPEQ, FIE Aust
Heritage (Aboriginal and Non-Aboriginal)	Talei Holm Archaeologist / Heritage Advisor	Talei Holm Bachelor of Archaeological Practice
Biodiversity	Hamilton Environmental Services	Steve Hamilton (BAppSc(AppBiol), MAppSc (RMIT), PhD (University of Melbourne), BAM accredited Assessor (DPIE/DPE/DCCEEW NSW)
Operational Environmental Management Plan and sub-plans	RDC Engineers Pty Ltd	Rod Davis BEng (Ag), MEng (Ag) CP Eng, RPEQ, FIE Aust Mitch Furness (BAppSci Rural Technology Hons)
Waste management / soil and water	RDC Engineers Pty Ltd	Rod Davis BEng (Ag), MEng (Ag) CP Eng, RPEQ, FIE Aust
Traffic and Transport	RDC Engineers Pty Ltd	Rod Davis BEng (Ag), MEng (Ag) CP Eng, RPEQ, FIE Aust

5.5 Document structure

This EIS has been prepared in accordance with the requirements of the *EP&A Act* and the *EP&A Regulation*. It has also been prepared in accordance with the Secretary's Environmental Assessment requirements (SEARs), issues raised by relevant government agencies and non-government organisations, issues raised by the community and relevant planning and national and/or state guidelines for beef cattle feedlot developments.

The EIS is divided into 10 parts as shown in Table 3. Table 3 outlines the sections within each part and a brief description of each Part.

Table 3 – Document structure

Part	Section	Description
Part A - Introduction	5	Outlines the environmental assessment process, describes the background to the proposed development and provides an outline of the proposed development.
Part B - Location and Context	6	The regional and local context of the subject property, subject property history and land use context of the proposed development site.
Part C – Development Needs and Alternatives	7	The needs and objectives of the proposed development are described in this part.
Part D – Development Description, Statutory Planning Framework and Guidelines	8, 9 and 10	This part provides a detailed description of the proposed development, an overview of the relevant statutory planning requirements including Commonwealth and State legislation, outlines the various licences required for the proposed development and relevant guidelines for developments of this nature.
Part E – Consultation and Issues Identification	11 and 12	This part summarises the issues raised during the consultation with the statutory and other relevant authorities, and the local community. The issues raised during the consultation process are then prioritised for assessment of impacts.
Part F – Environmental Issues and Assessment of Impacts	13 and 14	Part F of the EA provides an overview of the existing environment, an assessment of the likely impacts of the proposed development and the identification of the appropriate mitigation measures to safeguard the environment. This part addresses the biophysical environment which examines impacts on air quality, surface water and groundwater, biodiversity, soils; and the sociocultural environment including hazards and risks, cultural heritage, noise, traffic, planning, land use, energy, visual amenity and waste management. A summary of key planning issues is also addressed.
Part G – Commitments	15	This part outlines the environmental management strategy and provides a consolidated summary of the management measures that would be implemented

		during the construction and operation of the proposed development to manage, mitigate and/or monitor potential impacts identified.
Part H – Justification	16	This part addresses the principles of Ecologically Sustainable Development (ESD) and provides justification for the proposed development.
Part I – References	17	Part J provides a list of literature referenced during preparation of the EIS.
Part J - Appendices	Appendix A	This part provides further detail and supporting information for various sections within the EIS.
	Appendix B	
	Appendix C	
	Appendix D	
	Appendix F	
	Appendix G	
	Appendix H	
	Appendix I	
	Appendix J	
	Appendix K	
	Appendix L	
	Appendix M	
	Appendix N	
	Appendix O	
	Appendix P	
	Appendix Q	
	Appendix R	
	Appendix S	

Part B – Location and Context

6. Location and context

6.1 Regional context

The subject land is located in the southern Riverina region of NSW, approximately 300 km north of Melbourne (VIC) and approximately 700 km south west of Sydney as shown in Figure 1. The southern Riverina is located in the Murray region and Riverina bioregion.

A variety of landscapes within the Murray region supports a diverse range of agricultural industries that place a high value on the reliable water supplies. The region hosts some of the largest irrigation schemes in Australia. Principal rivers in the region are the Murray and Murrumbidgee Rivers and their major tributaries, the Lachlan and Goulburn Rivers, flow from the highlands in the east, westward across the Riverina plain.

The region is dominated by a persistently dry semi-arid climate and characterised by hot summers and cool winters. Seasonal temperatures vary little across the region, although in the north both summer and winter temperatures tend to be higher (Murray–Darling Basin Authority 2023).

Dryland cropping, mixed farming and grazing systems support key agricultural enterprises such as broadacre cropping (cereal, oilseed and pulses), beef and sheep rangeland grazing, intensive cattle, pigs and poultry, and irrigation of dairy pastures, nuts, rice and maize for example. Consequently, agriculture is a vital part of the economy. Intensive animal production is considered a high value use of water.

Tourism based around the river environment and water activities are also economically important to the region. Recreational and tourism activities provide substantial income for main centres, such as Echuca and Yarrawonga. Tourism is also providing increasing economic diversification opportunities for smaller communities. Overall, the Murray region attracts tourists who come to the region for water sports, fishing, camping, bushwalking, house boating, resort stays, golf and enjoyment of locally-produced wine and food (DPI, 2018).

6.2 Local context

The proposed development is located in the Edward River Council in the Southern Riverina district of NSW, approximately 300 km north of Melbourne (VIC) and approximately 700 km southwest of Sydney.

Edward River Council was formed in 2016 by the amalgamation of the Deniliquin Council with the former Conargo Shire. Edward River Council occupies approximately 8,881 km^2 with a population of about 8,450 (2021 census). The Edward River Council includes the townships of Deniliquin and Conargo and several villages including Blighty, Booroorban, Mayrung, Pretty Pine and Wanganella.

The Edward River Council is bound by the LGAs of Berrigan to the east, Jerilderie and Murrumbidgee to the north, Wakool and Hay to the west and Murray to the south. Deniliquin is the main service centre is the largest town in the Riverina behind Albury and Wagga. Edward River Council is the centre of a major pastoral area breeding stud sheep, cattle and dryland and irrigated cropping of cereals such as wheat, rice and canola. The Edwards River traverses through the southern end of the council. Billabong Creek which is a tributary of the Murrumbidgee River runs through Conargo (LG Valuation Services, 2017).

The subject land is in the Pine Lodge region, a prime agricultural region of the central Murray region of NSW. The subject land is approximately 14 km by road west of Finley and 49 km by road east-southeast of Deniliquin New South Wales.

The locality has historically been utilised for a variety of agricultural enterprises, including wool production, beef cattle grazing, dairying and dryland and irrigated broadacre cropping, and a small number of intensive animal industries such as beef cattle feedlots. Agricultural production continues to dominate the current land use practices in the locality.

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY

NOTES:

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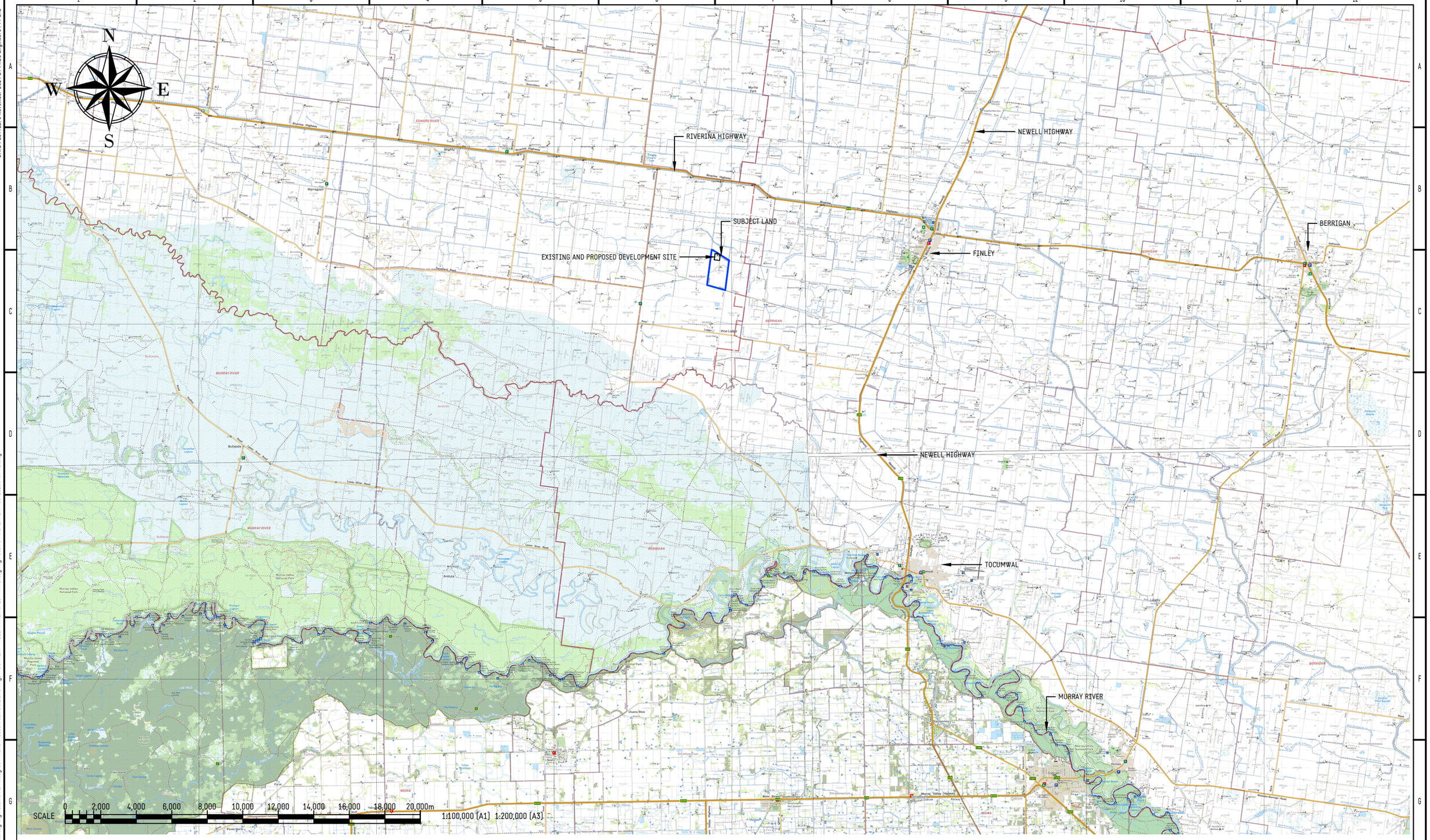
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD	DRAWN	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD	DATE	07/11/2024
						CHECKED	RJD
						DATE	07/11/2024
						APPROVED	RJD
						DATE	07/11/2024

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - REGIONAL CONTEXT PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER	A3	DRAWING NUMBER	REV.
FIGURE 1			F3-107-00-01	B



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY

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CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - LOCAL CONTEXT PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 2		A3	F3-107-00-02	B

6.3 Site description and history

6.3.1 Site location

The proposed development is to be located on a single land parcel which forms the property known as "High Claire".

The property "High Claire" referred to as the subject land is located on Broughans Road, Pine Lodge approximately 14 km by road west southwest of Finley and some 49 km by road east-southeast of Deniliquin and 20 km north-northwest of Tocumwal in the Edward River Council area of New South Wales.

The subject land has primary frontage to Broughans Road (unsealed) of approximately 1.2 km in length and secondary frontage to James Road on the western boundary. Broughans Road intersects with the Newell Highway some 11 km east of the subject land. The subject land is 4.0 km south of the Riverina Highway via James Road.

The subject land has been historically used for irrigated agriculture (cereals, oats, lucerne), dryland agriculture (cereals (sorghum, oats), sheep and beef cattle grazing and intensive feeding of lambs and beef cattle and is located in a rural area which encourages agricultural uses.

Figure 2 is a locality plan highlighting the property in reference to Deniliquin, Finley and Tocumwal, and the main watercourses and drainage lines in the region.

6.3.2 Real property description

The subject land comprises one (1) cadastral portion. The description of the subject land is provided in Table 4. The total area of the subject land is about 195.2 ha (~482.23 acres).

Figure 3 is a cadastral plan highlighting the cadastral parcel that comprises the subject land.

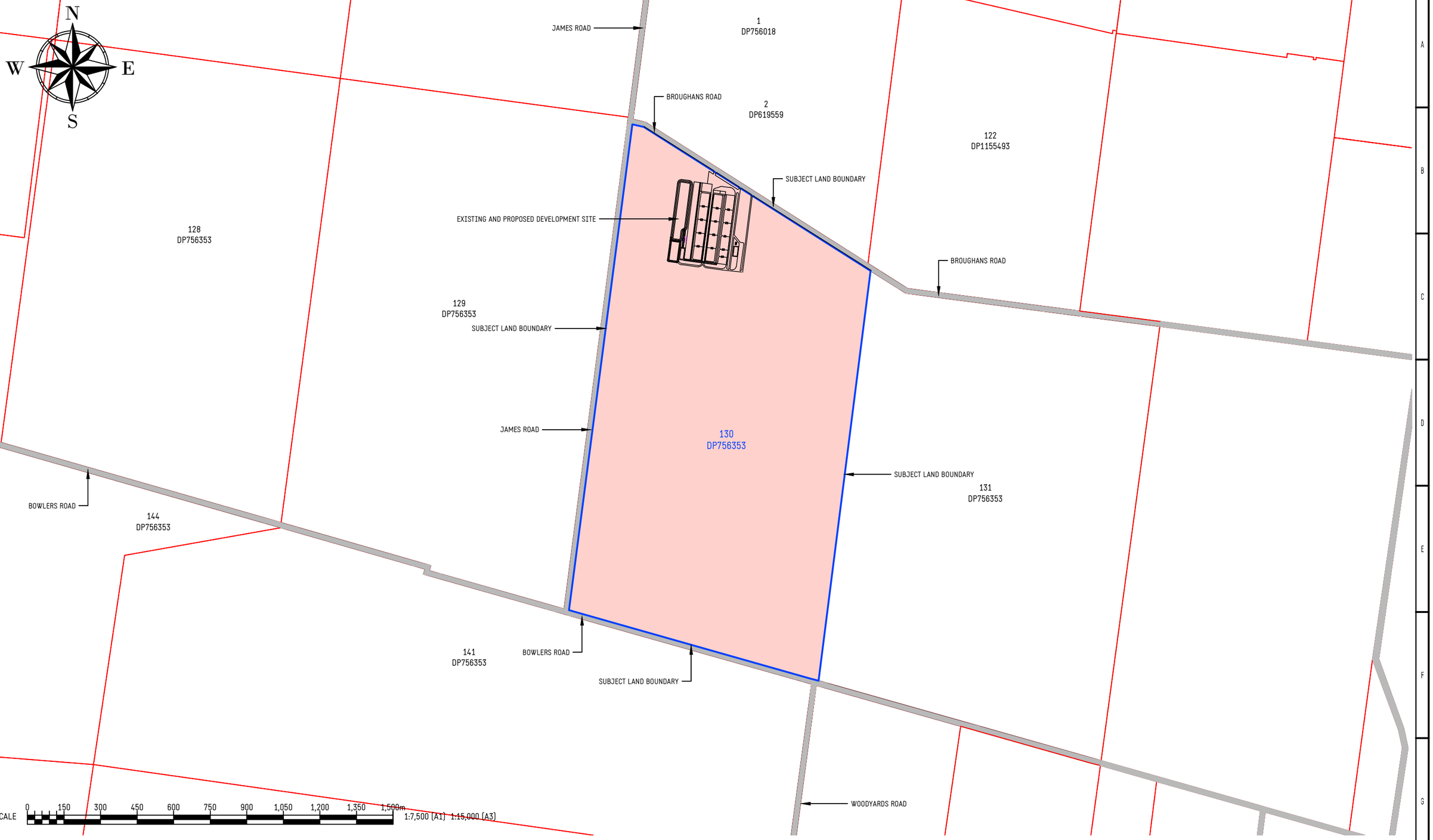
Table 4 – Subject land – Description

Property name	Lot no.	Plan no.	Easements	Area Ha	Local government area
"High Claire"	130	DP756353	-	~195.19	Edward River Shire

All components of the proposed development including production pens, feed storage and processing, controlled drainage area, sedimentation basin/holding pond and associated infrastructure shall be located on the subject land. Effluent and solid waste utilisation areas shall be located on the subject land.

6.3.3 Ownership

The subject land is owned by Andrew James Jessop Barley and Nichole Andrea Varley in freehold land tenure. The certificate of title for the subject land on which the development is proposed is provided in Appendix E.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- SUBJECT LAND AREA
- ROAD RESERVE
- EASEMENT

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DATE	07/11/2024

CLIENT AJ & NA VARLEY
PROJECT PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - CADASTRAL PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 3		A3	F3-107-00-03	B

DATE PLOTTED: 6 November 2024 BY : RDC Engineers PTY LTD
FILE NAME:F3-107 ANVarley High Claire MASTERPLAN-00-20230407 -v8.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N Varley High Claire FL Finley\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

6.3.4 Site history

The alluvial plains adjoining the River Murray were mainly utilised for pastoral purposes until the start of the 19th century when the soils proved ideal for cereals and dryland cropping began to dominate.

The subject land is in a landscape that has experienced significant modification by past land uses. The subject land is located within the Berriquin irrigation district of the Murray Irrigation Area (MIA). The construction of the Berriquin irrigation district commenced in 1935 and the first water in the district was officially delivered in April 1939.

Waterlogging of the landscape was particularly severe in the Berriquin Irrigation District in the 1950's which recorded a series of wet and a major flood in 1956. The Berriquin irrigation district along with all of Murray Irrigation Districts had been developed with no drainage at all.

Following the 1956 flood a plan for surface drainage for most of the Berriquin irrigation district was developed and the construction of the Box Creek stormwater escape channel which followed the course of Box Creek was initiated. The Box Creek Escape channel provides an outlet for stormwater and agricultural drainage from the Berriquin and Denimein irrigation districts and is located some 400 m to the north of the subject land. The Box Creek No 5 channel commences on the centre-west of the subject land and travels in a southwesterly then northwesterly direction to the Box Creek Escape Channel.

The subject land has been used for agricultural pursuits including wool and beef cattle production and dryland and irrigated cropping (wheat, barley, rice, cotton) since first settlement. The majority of remnant vegetation has been cleared on the subject land for agricultural development and the land developed for irrigation. In the mid 2000's a beef cattle feedlot and lamb feedlot were developed.

6.3.5 Current land use

The subject land has been extensively cleared and developed to create a highly modified landscape focused on dryland and irrigated cropping. A beef cattle feedlot with a capacity of 999 head and sheep feedlot with a capacity of 4000 head are currently established on the subject land.

Winter cereals are often grown in rotation with irrigated summer crops using sub-soil moisture stored from irrigation and as a break crop.

Figure 4 is an aerial photograph which illustrates the current land use on the subject land. These include extensive grazing of beef cattle on improved pastures, intensive finishing of beef cattle and seasonal dryland and irrigated cropping. These uses will continue alongside the proposed development.

The subject land has infrastructure improvements to support these land uses, including:

- Homestead and outbuildings;

- Beef cattle feedlot complex;
- Water supply, distribution and infrastructure for irrigation; and
- Stock-proof fencing.

Photograph 1 , Photograph 2, Photograph 3 and Photograph 4 illustrate the current land use of the subject land.

The intensive livestock agriculture developments are located in the northwest of the subject land. An example of the beef cattle feedlot development complex is shown in Photograph 2.

The irrigated cropping areas are sited across the subject land. An example of the irrigated cropped area is shown in Photograph 4.

Although the subject land has been subject to land-forming for agricultural development, there are several areas of mature trees remaining for use as shade for livestock and on those areas less suited to cropping such as along drainage lines.

The native vegetation comprises a mix of mature trees particularly Murray Pine, Yellow Box and Grey Box and ground covers (grasses and herbs) as shown in Photograph 4. The remainder of the subject land is predominantly cropping land with a few scattered remnant paddocks trees.

There are no resource activities currently occurring on the land.

Photograph 1 – Subject land – Current land use – Low intensity beef cattle grazing

Photograph 2 – Subject land – Current land use – Beef cattle feedlot

Photograph 3 – Subject land – Current land use – Irrigated cropping

Photograph 4 – Subject land – Current land use – Remnant vegetation

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA

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DATE	07/11/2024

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE ENVIRONMENTAL IMPACT STATEMENT SUBJECT LAND - AERIAL PLAN

REPORT REFERENCE: FIGURE 4
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-00-04
REV.: B

DATE PLOTTED: 6 November 2024, BY : RDC Engineers PTY LTD
FILE NAME: F3-107 ANVanLeg High Cloire MASTERPLAN-00-20230407 vB.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VanLeg High Cloire FL Finleg\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

6.3.6 Existing services and infrastructure

The subject land on which the development is proposed currently has existing service infrastructure in the form of electricity and communications. Existing water supply is by way of domestic and irrigation bores and/or surface water entitlements. The proposed development does not require the extension and upgrade of electricity services from the existing property overhead supply to service the electricity demand of the proposed development.

Similarly, extensions to existing communications services are also not required. Potable water supply would be from rainwater and supplemented from bore water supply as required.

The subject land currently supports infrastructure for the existing development and other agricultural activities on the land such as shearing shed, homestead, machinery/storage sheds and silos in the centre of the property as shown in Photograph 5 and Photograph 6.

Photograph 5 – Subject land – Existing infrastructure – Commodity shed

Photograph 6 – Subject land – Existing infrastructure – Homestead

Part C – Development Needs and Alternatives

7. Development needs and alternatives

7.1 Objectives and development demand

7.1.1 Development objectives

The primary objective of the proposed development is to consistently supply market or customer requirements with grain-fed beef in terms of quality and quantity to compete with the US product on a global market, with a particular focus on the Asian market.

AJ & NA Varley have formed a strategic alliance with organisations which have considerable experience in the lot feeding industry providing an integrated production and processing system for grain-fed beef. As a result, the proposed development has a number of objectives which are listed below and are focussed on providing sustainable environmental, social and economic outcomes.

- To produce consistent quality grain-fed beef for the domestic and export market using best practice and sustainable animal welfare, environment, food safety and product integrity management systems;
- To provide dedicated feeding programs for cattle to meet specific market requirements;
- To provide a source of employment in the local area;
- To enhance the agri-business operations of AJ & NA Valey by finishing their own cattle using a grain-based ration;
- To provide a local market for feeder cattle as the development would aim to source feeder cattle from local producers;
- To provide a local market for feed commodities (grain/hay/silage etc) as the development would aim to source a major proportion of these commodities from local producers;
- To implement procedures, practices and processes that ensure compliance with the relevant industry standards and legislative, policy and planning requirements; and
- To sustainably utilise effluent and solid wastes.

7.1.2 Development demand

The productivity of Australian beef production has significantly improved over time. The Australian grain fed cattle industry was the primary driver for this change. The main reasons why the cattle feedlot industry has grown over the last 30 years is;

- Because it fulfils the market need to supply a consistent quantity and quality of beef throughout the year (regardless of seasons and climatic variation) and

- Because of the increasing consumer demand for grain fed beef.

Specifically, Australia's variable climate means that pastures are insufficient during seasonal dry periods or drought and finishing cattle on grain enables beef to have a more consistent eating quality. The emergence of markets such as Japan and Korea have also greatly assisted industry growth whilst the exclusion of US beef into world markets due to BSE concerns has ensured that this growth has been sustained.

Currently, cattle numbers in Australian feedlots are at near record levels. Importantly, despite high feeder cattle prices, strong demand for Australian beef overseas continues to encourage lot feeders to maintain cattle numbers on feed. Industry research has shown that demand for beef from Asian has grown consistently over recent years and demand is considered to be in excess of supply.

Additional cattle feedlots are therefore necessary to meet the market demand for the beef products currently being supplied to the domestic and export markets.

The proposed development would implement the highest standards of maintenance and operation to ensure that the development produces safe, wholesome, consistent-quality beef.

7.2 Alternatives considered

7.2.1 Site selection criteria

The proposed development must be appropriately sited to ensure its economic viability and environmental sustainability.

The identification of a location for the proposed development was undertaken over a period of several months. The location selection process involved consideration of regional and local issues. These included:

- Regional issues
    - climatic and seasonal conditions;
    - proximity to road networks, other feedlots or intensive livestock facilities, processing facilities, livestock exchanges and infrastructure services;
    - access to a local workforce for the operation of the feedlot; and
    - access to suitable grain and other feed components feedstuffs.

- Site-specific issues
    - suitable topography for site drainage to minimise construction cost;
    - suitability of in-situ soil for underlying pens, drains, sedimentation basin, holding pond;
    - separation from sensitive receivers for odour, dust, noise or visual amenity;
    - distance to nearest potable water supplies (i.e. artesian, reservoirs, water catchment areas);
    - secure, reliable and adequate supply of water;

- risk of impacts on groundwater and surface water;
- access to construction materials (e.g. clay and gravel);
- absence of cultural heritage sites or artefacts;
- likely impact on threatened or endangered species or ecological communities;
- risk of flood or bushfire;
- site access in respect to traffic and road safety; and
- availability of land and suitability of soil for by-product utilisation.

7.2.2 Alternative site locations

AJ & NA Varley own and operate a number of rural properties in the Pine Lodge area including "High Claire", "Arkoona", "Sunnyside", "Killara Rise", "Langunyah" and "Glen Cluan". Each of these properties was assessed against each criterion outlined in section 7.2.1 in relation to the establishment of the proposed development.

The proposed development would not have been economically viable if a site on an existing property did not meet all the assessment criteria.

7.3 Preferred site location

The preferred location of the proposed development on the property "High Claire" within Edward River Council was selected as the site satisfied both the regional and site-specific selection criteria. The subject land location has the following characteristics:

- The subject land is well serviced by a local and state road network.
- Access to a local workforce for the operation of the proposed development from surrounding properties;
- The subject land is located in close proximity to properties owned by the proponent on which commodities shall be sourced;
- The subject land has an area of some 195 ha currently utilised for beef cattle grazing, dryland and irrigated cropping;
- Due to the size of the property, there are few close neighbouring rural residences, thus mitigating potential impacts from odour, noise, dust and visual amenity. The subject land has a relatively large separation distance to towns such as Finley (~10 km), Deniliquin (~42 km) and Tocumwal (~17 km);
- The subject land has existing licensed water supply of suitable quality and quantity;
- The subject land has an existing power supply available;
- The proposed development site is located out of the 1 in 100-year flood level and comprises suitable low permeability soil suitable for beef cattle feedlot construction;
- The proposed development site and areas for by-product utilisation have no registered cultural heritage sites and have been extensively disturbed from previous agricultural activities thus minimising the potential impact on cultural heritage;
- The proposed development site is not located in a threatened or endangered ecological community; and

- The subject land has suitable areas of land for effluent and solid waste utilisation.

The above characteristics of the subject land demonstrate the suitability of the location for the proposed development.

Part D – Development Description, Statutory Planning Framework and Guidelines

8. Development description

8.1 Development outline

AJ & NA Varley wish to expand the existing beef cattle feedlot on the subject land from 999 head to 3,200 head. The proposed development shall have a maximum capacity of 3,200 head. The proposed development shall be designed and constructed in a manner that will allow flexibility of use with the ability to increase or decrease the number of animals within the development in line with market and economic factors.

The proposed development would occupy a footprint of approximately 160.0 ha and includes the following components in a functional configuration:

- Water Supply/ Storage and Reticulation – A reliable and uninterrupted supply of clean water of the required volume to sustain feedlot operations is required;
- Pens – Fenced areas are required for housing production cattle (production pens), cattle arriving to or being dispatched from the feedlot (induction/dispatch pens), and sick cattle (hospital pens);
- Livestock handling – Infrastructure and facilities are required for the arrival, processing and dispatch of cattle and stabling for horses;
- Feed processing and commodity storage - Feed rations are prepared on-site in a facility, with associated commodity storage, handling and ration delivery infrastructure;
- Access and Internal roads - Access to the site and the layout of internal road systems are critical to the efficient and safe functioning of the feedlot;
- Administrative/Maintenance Infrastructure - Facilities are required for conducting management, maintenance and administrative functions at the feedlot. This includes office, machinery workshop and associated facilities for example;
- Controlled drainage area - Stormwater runoff from areas such as pens, livestock handling, silage pits has a high organic matter and therefore a high pollution potential. This runoff is controlled within a system that collects and conveys this runoff to a sedimentation basin and holding pond prior to environmentally sustainable utilisation;
- Drainage system - The controlled drainage area contains a system including catch drains, sedimentation system and holding pond for conveying stormwater, allow entrained sediment to ‘settle out’ and capture and storage of the stormwater from the controlled drainage area until it can be sustainably utilised;
- Effluent and solid waste management areas – Solids wastes such as manure and mortalities are temporarily stockpiled and processed within the solid waste storage area prior to utilisation on-site or removed off-site. Effluent is stored in the holding pond pending application to the effluent utilisation area; and

- Effluent and solid waste utilisation areas – Solid wastes generated are applied to an on-site utilisation area. There is approximately 148 ha of cropping land on-site suitable for effluent and solid waste utilisation. Any solid wastes not utilised on-site are removed off-site. When available effluent wastes are applied to land via irrigation within a dedicated effluent utilisation area.

Further description of the various elements is provided in sections 8.4 to 8.4.10.

The proposed development shall be maintained and managed as a Class One feedlot. A Class One feedlot has highest standard of design, operation, maintenance, pad management and cleaning frequency. A Class One feedlot is defined in the New South Wales Feedlot Manual (NSW Agriculture, 1997).

8.2 Design philosophy

The design philosophy of the proposed development enables ecological and economic sustainability to be integrated into the design, construction and management (when approved) of the development.

The *National Guidelines for Beef Cattle Feedlots in Australia* (MLA, 2012b), *National Beef Cattle Feedlot Environmental Code of Practice* (MLA, 2012a) and The New South Wales Feedlot Manual (NSW Agriculture, 1997) have been used as the guiding reference for the siting, design and management of the proposed development.

The design, construction and management of the proposed development shall be consistent with relevant legislation, environmental standards, codes of practice and guidelines as outlined in section 9 and consistent with its scale and intensity. The overarching design philosophy is to provide best practice animal welfare and to utilise the latest innovations to ensure optimal production efficiency.

The proposed development would be designed, constructed and maintained as a Class One standard, the highest standards of design, construction and management in accord with the National Guidelines for Beef Cattle Feedlots in Australia.

8.3 Capacity

In NSW, the capacity of beef cattle feedlots is defined in terms of the number of animals or head. The proposed development has been designed to accommodate up to 3,200 head of beef cattle.

The proposed development shall feed beef cattle predominantly for the domestic market. Consequently, cattle are younger in age (weaners) and lighter in weight compared to cattle fed for the export market. The typical specifications for the cattle to be fed are provided in Table 12 in section 8.7.1. All beef cattle fed shall be owned by the applicant.

The term 'Standard Cattle Unit' (SCU) is used in the *National Beef Cattle Feedlot Environmental Code of Practice* (MLA, 2012a) to describe the stocking capacity of a beef cattle feedlot in accordance with the average liveweight of cattle in the facility, rather than the number of head. A standard cattle unit is equivalent to an animal of 600 kg liveweight (MLA, 2012a). This term enables the stocking capacity of beef cattle feedlots to be expressed in line with the weight of cattle turned off from the facility, rather than the number of head. This concept is based on the understanding that manure production increases with cattle liveweight.

Each animal can be converted to a SCU equivalent based on their metabolic liveweight and the following formula:

$$\text{SCU scaling factor} = (\text{Animal liveweight}/600)^{0.75} \quad \text{----------Equation 1}$$

The SCU scaling factor for various average liveweight for beef cattle is provided in Table 5.

Table 5 – Standard Cattle Unit conversion factor

Average liveweight (kg)	SCU Scaling factor
350	0.68
400	0.74
450	0.81
500	0.87
550	0.94
600	1.00
650	1.06
700	1.12

The SCU scaling factor applied to lot fed cattle with an average liveweight of 415 kg (Table 12) can be determined from Equation 1 as follows.

$$\text{SCU scaling factor} = (415/600)^{0.75}$$
$$= 0.76$$

Consequently, the proposed development shall have a total capacity equivalent to 2,427 standard cattle units (SCUs) once fully developed.

8.4 Layout, design and specification

The layout of the proposed development is shown in Figure 5. Figure 5 shows that the proposed development shall be located in the northwest of the subject land.

The layout of the proposed development complex is shown in Figure 6. The proposed development complex has been designed to:

- maximise utilisation of the existing feedlot infrastructure (roads, drainage system etc);

- maximise operational efficiency;
- maximise cattle performance;
- maximise cattle welfare;
- maximise worker health and safety;
- minimise environmental impact;
- minimise waste; and
- minimise capital and operational costs.

A description of the various functional elements of the proposed development is outlined in the following sections.

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA

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CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - DEVELOPMENT LAYOUT

REPORT REFERENCE: FIGURE 5
SUPPLIED DRAWING NUMBER:
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DRAWING NUMBER: F3-107-00-05
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TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - DEVELOPMENT COMPLEX LAYOUT

REPORT REFERENCE: FIGURE 6
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-00-06
REV.: B

8.4.1 Water supply/storage and reticulation

Water for the proposed development will be sourced from licensed groundwater and surface water allocations.

Water shall be pumped from the water supply sources to an existing 2ML turkeys nest water and three (3) 22,500 L water tanks located in the south west corner of the proposed development complex. The total water storage of about 2,067,500 litres will provide about twenty (20) days emergency supply in the event of supply interruption. The location of the existing water storage infrastructure is shown on Figure 6.

Water shall then be reticulated around the proposed development via a gravity and/or a pressurised system.

Water shall be reticulated to the relevant areas of the proposed development using an underground polyethylene pipe network. The reticulation system shall be designed to supply water throughout the proposed development during peak demand periods.

8.4.2 Pens

Pens are required for holding production cattle (production pens), cattle arriving to or being dispatched from the feedlot (induction/dispatch pens), and sick cattle (hospital pens). Apart from pen slope and pen floor permeability, there are no specific design requirements for pen layout and design.

The dimensions of pens depend on the capacity of the pen, stocking density and the amount of feed bunk required.

8.4.2.1 Stocking density

Stocking density will have a significant influence on the environmental performance of the proposed development since it partly determines the average moisture content of the surface of the pen. Every day, beef cattle add moisture to the pen surface by depositing manure (faeces and urine).

The National Feedlot Code of Practice (MLA, 2012a) recommends a maximum stocking density of 25 m^2 per Standard Cattle Unit (SCU) for beef cattle feedlots. Stocking densities higher than 20 m^2 per SCU can lead to increased pen dust loads and require higher capacity for drainage system infrastructure such as sedimentation basins and holding ponds.

The proposed development shall have an average stocking density of ~10.1 m^2/head for the proposed beef cattle production pens for the total capacity of 3,200 head. This equates to a stocking density in the order of about 13.25 m^2/SCU when the SCU scaling factor is applied.

8.4.2.2 Feed bunk

The beef cattle shall be provided with their daily feed requirements and water.

As the feed ration shall generally be processed on-site and fed-out once a day an open feed bunk (trough) system shall be used. Pre-cast 6 m length open feed bunks set in a continuous line are located on the outside, along the entire length of the higher end of the pen with frontage to the feed road.

The feed bunks have a 3 m wide concrete apron that extends into the pen as shown in Figure 7. A concrete apron prevents wearing of the pen surface within this high-use area. The apron slopes away from the bunk to facilitate drainage at the same slope as the pen slope.

8.4.2.3 Pen capacity

The capacity of pens with a stocking density of 10.1 m^2/head is 102head and 217 head.

8.4.2.4 Pen area

Typically, there will be two sizes of feeding pens with an area to accommodate 150 head or 75 head.

The pen areas range in size from about 1,030 m^2 to 2,190 m^2. The nominal bunk length (width) of a pen ranges from 27.5 to 55 m. The depth of each pen is some 40 m depending. Figure 7 shows the layout of a typical feedlot pen.

8.4.2.5 Pen orientation

The orientation of the beef cattle feeding pens has been dictated by the site layout and natural surface topography and built infrastructure. The longitudinal axis of the feed alley and adjoining pen row shall run north – south as shown in Figure 7.

Excessive heat load in feedlot cattle during summer months can result in significant production losses, animal welfare problems and, under extreme conditions, the death of cattle. Shade structures are implemented to reduce the impact of heat wave conditions on cattle.

8.4.2.6 Pen configuration

The proposed development shall have a back-to-back pen configuration. The back-to-back design has two parallel rows of pens separated and serviced by a common feed road. The back-to-back configuration has a central feed alley servicing pens on both sides of the roadway. The feed road shall be located on the higher side or at the 'front' of the pens. Both rows of pens drain away from the feed alley to a cattle lane/catch drain towards the 'back' of the pens, where each row shares a common cattle lane/catch drain, with another row of pens.
Rather than sharing a common cattle lane (and catch drain), the back-to-back design has a separate cattle lane and catch drain as shown in Figure 7.

8.4.2.7 Pen slope

Pen slope is the fall of the pen surface perpendicular to the feed bunk. A pen also has down-slope because of the lateral slope of the catch drain. Hence, as there is a combined pen and drain slope across the site, the maximum pen slope is not perpendicular to the feed bunk. The magnitude of this slope and its angle from perpendicular to the bunk will depend on the relative magnitude of each of the pen and drain slopes.

The existing pens have been constructed with a pen slope of 2.5% which falls to lateral catch drains with a slope in the order of 0.5%. The pens slope from east to west and west to east in the bunk to bunk layout. .

Figure 7 shows the layout of a typical feedlot pen.

8.4.2.8 Water trough

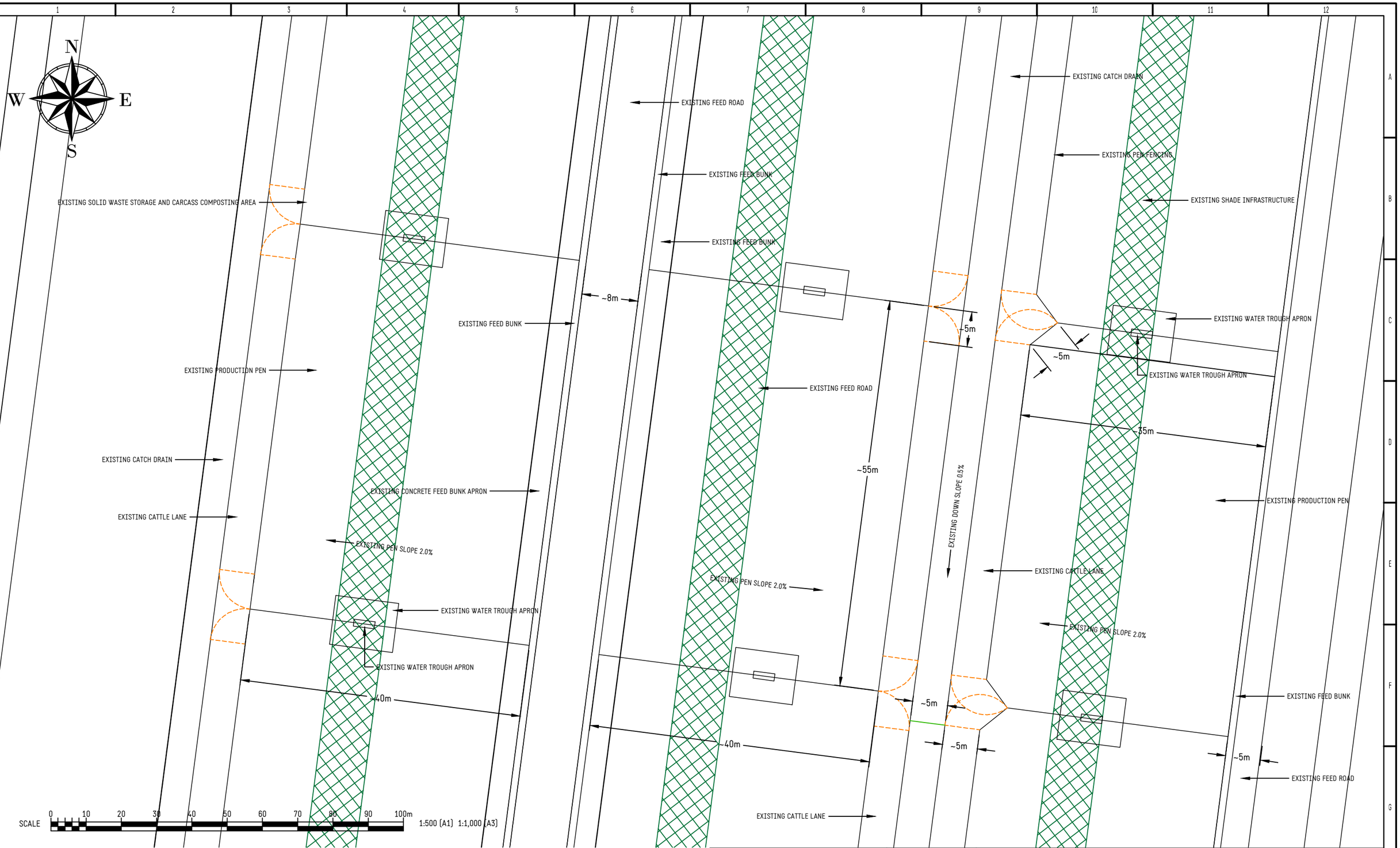
Prefabricated concrete water troughs are installed in the dividing fence lines between two pens near the cattle lane as shown in Figure 7.

Concrete aprons at least 3 m wide are constructed around all water troughs.

8.4.2.9 Shade

Shade structures comprising wooden support structures and woven cloth are installed over all of the existing pens to reduce the impact of heat load conditions on the cattle.

The pen layout orientation in a north-south direction considers the orientation of shade structures such that the pattern of the shade underneath maximises drying of the pen surface, and the local climate and prevailing winds that assist in ventilation and cooling.



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TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - TYPICAL PEN LAYOUT PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER	A3	DRAWING NUMBER	REV.
FIGURE 7			F3-107-00-07	B

8.4.3 Livestock handling

The cattle handling facility servicing the existing development has sufficient capacity to meet the cattle handling requirements for the proposed development. Consequently, no upgrades are proposed.

The location of the existing cattle handling facility on the proposed development site is shown in Figure 6.

8.4.4 Feed processing and commodity storage

The beef cattle in the proposed development require a nutritionally and scientifically formulated grain-based diet to meet production targets.

The rations shall be prepared on-site in a facility, with associated commodity storage, handling and ration delivery infrastructure.

The feed cattle handling facility servicing the existing development has sufficient capacity to meet the cattle handling requirements for the proposed development. Consequently, no upgrades are proposed.

The location of the existing feed preparation and associated commodity storage areas on the proposed development site are shown in Figure 6.

8.4.5 Access and internal roads

Access to the site and the layout of internal road systems are critical to the efficient and safe functioning of the proposed development.

Access to the proposed development shall be from the existing subject land entrance off Broughans Road as shown in Figure 6. The subject land entrance has a compacted gravel entrance from Broughans Road designed to accommodate the number of vehicle movements and type of vehicles servicing the existing agricultural operations on the subject land. The entrance does not require any upgrades.

The existing internal road network connecting the subject land entrance to the existing infrastructure is a well-formed durable gravel surface road that shall provide access and cater for the traffic demands of the proposed development in all weather conditions.

All signs shall be fully contained within the subject land. Sufficient on-site car parking is provided commensurate with the scale and use. Due to the nature of the development and rural character of the site, the provision of a formal car parking area is unnecessary. However, any gravel hardstand areas used as car parking areas such as adjacent to the site office shall be designed in accordance with relevant Australian Standards (e.g. Standards Australia, 2890.1-2004) where relevant.

Sufficient on-site manoeuvring area shall be provided to enable all vehicles to enter and exit the site in the forward direction. The proposed layout of internal roads is shown on Figure 8.

To ensure good traffic flow at the site, heavy vehicles travel to either the grain and commodity storage/processing area or to the cattle handling facility. The cattle handling and feeding systems are managed separately and both operate independently with little operational interference.

The feed road that runs across the northern end of the feeding pens will be constructed to also act as a clean water diversion bank to direct clean water from above the pen area away from the pen area below.

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B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

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DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT AJ & NA VARLEY

PROJECT PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - INTERNAL ROADS AND VEHICLE MANOEUVRING

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 8		A3	F3-107-00-08	B

DATE PLOTTED: 6 November 2024, BY: , RDC Engineers PTY LTD
FILE NAME: F3-107 ANVarLeg High Claire MASTERPLAN-00-20230407 v8.4.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VarLeg High Claire PL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

8.4.6 Administrative/Maintenance infrastructure

The proposed development shall include existing facilities for conducting management, maintenance and administrative functions. This includes administration office, machinery workshop, and associated facilities for example.

The location of the existing administrative infrastructure on the proposed development site is shown in Figure 6.

8.4.7 Lighting

Lighting is desired mainly for the convenience of the operator, for inspecting feed processing, handling cattle and administrative activities. Security and predator control are other advantages. Subsequently, the proposed development requires illumination of a number of elements within the complex. For example:

- Lighting may be required around the cattle handling facilities (receivals/dispatch/processing) to allow for night loading and unloading of cattle.
- Internal and external lighting shall be required within the administrative/maintenance infrastructure for general illumination and safety for night activities.
- Lighting shall be required within the feed storage and processing for illumination for feed preparation activities undertaken outside of daylight hours.

No lighting is proposed around the production pen area or the drainage systems.

Any outdoor lighting installed will comply with Australian Standard AS1158.1.1 (1997 – Road Lighting) and AS4282 (1997 – Control of the Obtrusive Effects of Outdoor Lighting).

8.4.8 Controlled drainage area

Those areas of the proposed development from which stormwater runoff has a high organic matter and therefore a high pollution potential are contained within a controlled drainage area. The proposed development shall have one controlled drainage area as outlined in the following sections. Figure 9 shows the controlled drainage area plan for the proposed development.

Stormwater runoff from areas such as pens, livestock handling, solid waste storage and processing area and silage storage area has a high organic matter and therefore a high pollution potential. This runoff is controlled within a system that collects and conveys this runoff to a sedimentation basin and holding pond prior to environmentally acceptable utilisation.

The controlled drainage area of the proposed development includes the following elements:

- production pens
- cattle handling facilities including receival/dispatch facilities

- hospital facility, treatment and recovery pens
- solid waste storage and processing area
- cattle and vehicle washdown facilities
- cattle lanes
- feed lanes or alleys
- silage pits
- run-off catch drains
- sedimentation system
- holding pond.

The controlled drainage area is divided into three main sub-component areas, each of which has different runoff characteristics. These areas are:

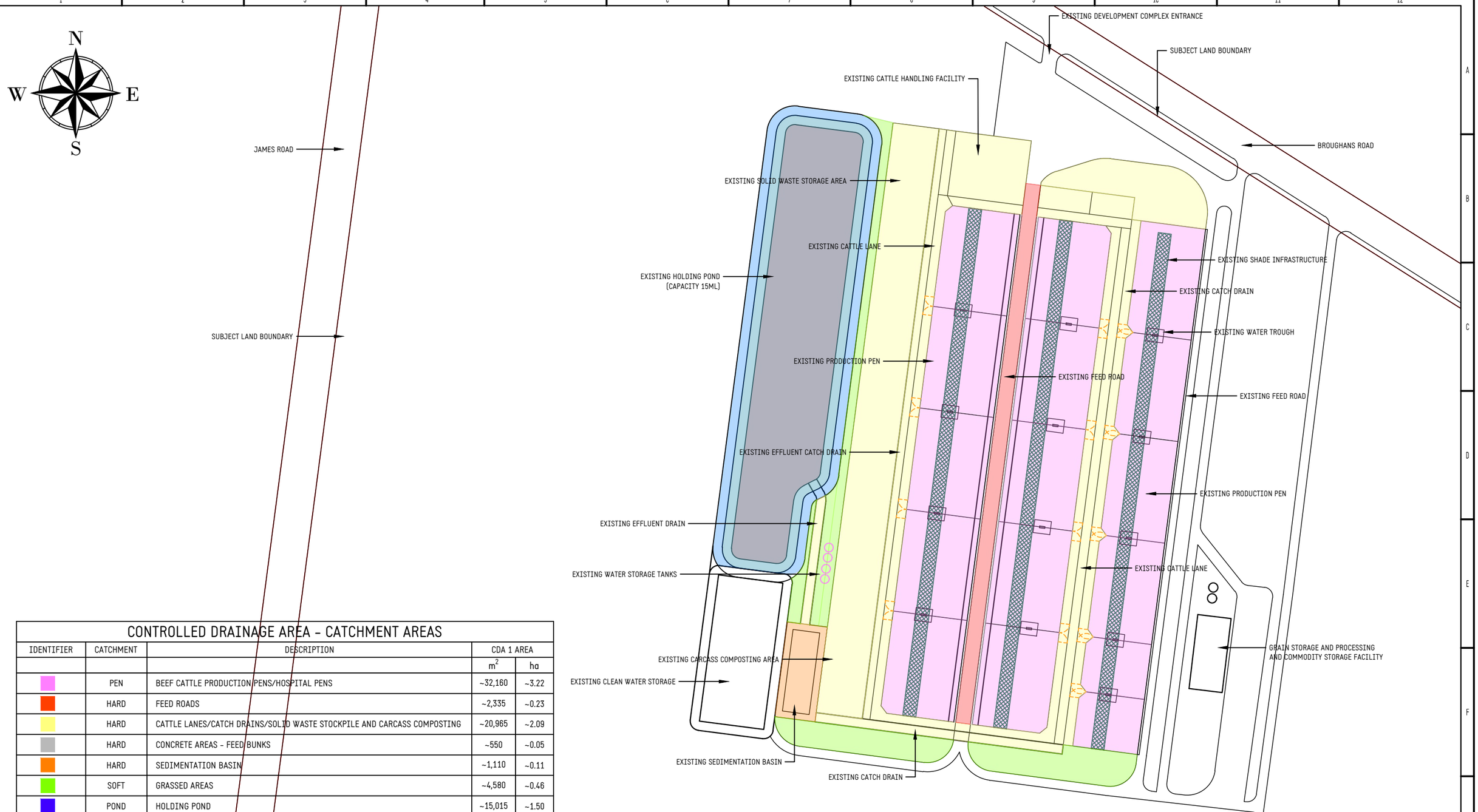
- pen area – areas containing cattle and covered with manure e.g. production pens, holding pens, hospital pens etc.
- hard catchment – areas with a high runoff yield including access roads, feed roads, cattle lanes, catch/main drains, roofed areas, truck wash and solid waste storage/carcass composting area, sedimentation basin etc.
- soft catchment – areas with a low runoff yield such as grassed and other vegetated areas within the controlled drainage area.

The controlled drainage area along with pen, hard and soft areas for the proposed development are shown on Figure 9.

Table 6 summaries the areas of the sub-catchments shown in Figure 9. The sub-component catchment areas are needed to calculate the design volumes for the sedimentation basin and holding pond (sections 8.4.9.1 and 8.4.9.2). Varying runoff coefficients are applied to the different sub-catchments depending on surface characteristics.

Table 6 – Proposed development - Controlled Drainage Area catchment details

		Catchment area
	Runoff coefficient	**Area m^2**
Pens – production pens, holding pens, hospital pens	0.8	~32,160
Hard – feed roads, cattle lanes, catch drains, solid waste stockpile and carcass composting area	0.8	~23,850
Hard – sedimentation basin	0.8	~1,110
Soft – grassed areas	0.4	~4,580
Holding pond – inside crest surface area	1.0	~15,015
Total		~76,715



CONTROLLED DRAINAGE AREA - CATCHMENT AREAS

IDENTIFIER	CATCHMENT	DESCRIPTION	CDA 1 AREA	
			m^2	ha
	PEN	BEEF CATTLE PRODUCTION PENS/HOSPITAL PENS	~32,160	~3.22
	HARD	FEED ROADS	~2,335	~0.23
	HARD	CATTLE LANES/CATCH DRAINS/SOLID WASTE STOCKPILE AND CARCASS COMPOSTING	~20,965	~2.09
	HARD	CONCRETE AREAS - FEED BUNKS	~550	~0.05
	HARD	SEDIMENTATION BASIN	~1,110	~0.11
	SOFT	GRASSED AREAS	~4,580	~0.46
	POND	HOLDING POND	~15,015	~1.50

SCALE 0 20 40 60 80 100 120 140 160 180 200m
1:1,000 (A1) 1:2,000 (A3)

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY

NOTES:
1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2023, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:2,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT AJ & NA VARLEY
PROJECT PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - CONTROLLED DRAINAGE AREA PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 9		A3	F3-107-00-09	B

DATE PLOTTED: 6 November 2024 BY : RDC Engineers PTY LTD
FILE NAME: F3-107 ANVarLeg High Claire MASTERPLAN-00-20230407 -v8.4.dwg
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8.4.9 Drainage system

8.4.9.1 Sedimentation system

The controlled drainage area has an existing dedicated sedimentation basin with an as-constructed capacity of 1,1100 m^3 with a depth of 1.0 m. The sedimentation basin is constructed to drain completely (down to bed level) following a runoff event.

The specifications outlined in The National Guidelines for Beef Cattle feedlots (MLA, 2012b) were used to confirm that the as-constructed capacity of the sedimentation basin is sufficient to accommodate the proposed development. The sedimentation basin design specifications include:

- cater for the peak flow rate from a design storm having an average recurrence interval of 1 in 20 years; using runoff coefficients of 0.8 from production pens, roadways and other hard stand areas and 0.4 for grassed areas within the controlled drainage area;
- include a maximum flow velocity in the sedimentation system of 0.005 m/s;
- have the flow from the sedimentation system should be regulated by a control weir;
- provide embankment freeboard of 0.9 m above the top water level; and
- provide embankment batters of 1V:3H or greater.

The formula for determining the minimum volume of the sedimentation basin that services the controlled drainage area is:

$V = Q_p \times (L/W) \times (\lambda/v)$

Where:

V = sedimentation system volume (m^3);
Q_p = peak inflow for a design storm with an average recurrence interval of 20 years and duration equal to the time of concentration of the catchment (m^3/s);
L/W = length to width ratio, where l is the length in direction of flow;
λ = a scaling factor (2.5 for a basin);
v = flow velocity (m/s), <0.005 m/s

The sedimentation basin has a control outlet designed to temporarily retain stormwater within the sedimentation system. The control outlet regulates the discharge from the sedimentation system into the holding pond allowing the stormwater to drain freely from the entire depth of the settled sediment down to the bed of the basin and safely discharges flows in excess of the design flow.

Table 7 summarises the input parameters used to determine the minimum required volume of the sedimentation basin.

Table 7 – Proposed development – Sedimentation Basin design details

Parameter	Units		National Guidelines
Time of concentration	hours	T_c	0.42
Time of concentration	minutes	T_c	25.23
Rainfall Intensity	mm/hr	$I_{tc,20}$	104.15
Peak flow rate	m^3/s	Q_p	0.81
Lambda		λ	2.5
Length:Breadth ratio at TWL		L/W	2.0
Design flow velocity	m/s	v	0.005
Minimum required volume	m^3	V	811
Volume proposed (minimum)	m^3	V	**1,000**

There are several acceptable methods for determining the time of concentration of a small catchment. The time of concentration (Tc) is the time taken for rain that has fallen in the farthermost part of a catchment to flow to the discharge point. Thus, after Tc, the whole of the catchment is contributing to the discharge and the peak flow (Q) will only occur after this time.

The as-constructed design for the sedimentation basin includes a length to width ratio (L/W) of about 2.5 at top water level, a minimum area of 1,110 m^2 at inside crest level, design side slopes of 1V:3H, a maximum effluent storage depth of around 0.9 m and a freeboard of 0.9 m.

The rainfall intensity was selected from Intensity-Frequency-Duration (IFD) design rainfalls for the site for an average recurrence interval of 20 years and duration equal to the time of concentration of the catchment. The ARI design rainfalls for the site were obtained from the Bureau of Meteorology (BOM, 2024a) and are shown in Table 44 in section 13.1.3.2.

The minimum volume required for the sedimentation basin 1 is 811 m^3 (Table 7) as calculated by the method outlined in the *National Guidelines for Beef Cattle Feedlots in Australia* (MLA, 2012a). The sedimentation basin has an as-constructed volume of 1,100 m^3 and therefore has sufficient capacity.

Photograph 7 – Existing development – Sedimentation basin

8.4.9.2 Holding pond

A holding pond is located at the lower end of the controlled drainage area, immediately below the sedimentation basin as shown in Photograph 8. The holding pond has been designed to temporarily store stormwater runoff (liquid waste) from major storms (design storm method) and/or when extended wet periods prevent irrigation of wastewater so that pond overtopping events are prevented and / or limited to an acceptable frequency.

Photograph 8 – Existing development – Holding pond

Effluent will be irrigated onto cropping land where it will be sustainably utilised by crops and soil to ensure storage capacity is available for future runoff events. The design approach for the design volume of the holding pond during a 1 in 20 year (Average Recurrence Interval); 24-hour duration storm event was calculated in accordance with the NSW Feedlot Manual (NSW Agriculture, 1997).

The design approach outlined in The National Guidelines for Beef Cattle feedlots (MLA, 2012b) was used to confirm that the as-constructed capacity of the holding pond is sufficient to accommodate the proposed development for extended wet periods.

The National Guidelines for Beef Cattle feedlots (MLA, 2012b) states that holding ponds should comply with the following design standard:

- Holding ponds should have sufficient storage capacity so that:
    - Normal holding ponds (i.e. those from which wastewater is routinely extracted for land application) spill no more frequently than an average of one in 10 years.
    - Evaporation ponds (i.e. those from which there is normally no land application of captured wastewater) spill no more frequently than an average of one in 20 years.
- The holding pond should have a weir and bywash capable of discharging the peak flow from the controlled drainage area from a 50-year ARI design storm.
- A minimum freeboard of at least 0.9 m should be provided between the crest of the discharge weir and the crest of the holding pond embankment.
- The holding pond should be underlain by a minimum of 300 mm clay or other suitable compactable soil, or by a synthetic liner able to provide a design permeability of <1 x 10-9 m/s (~0.1 mm/d).

Method 1 – Major storm event

The design volume of the holding pond during a 1 in 20 year (Average Recurrence Interval); 24-hour duration storm event was calculated in accordance with the NSW Feedlot Manual (NSW Agriculture, 1997).

For this approach, the design calculation requires catchment area, 24 hr rainfall at an average recurrence interval of 20 years and runoff coefficients from each catchment area.

The area of each sub-component area was determined from the proposed site layout as outlined in section 8.4.8. These data are shown in Table 8. Initially, an approximate surface area for the holding pond was assumed, then an iterative approach used to determine the holding pond volume and design surface area.

The 1 in 20 year, 24 hr rainfall for the development site was obtained from BoM IFD data as outlined in section 13.1.3.

Runoff coefficients were 0.8 for the feedlot pens and other hard catchment (balance) areas, 0.4 for grassed areas and 1.0 for rainfall falling on the holding pond surface.

The runoff volume in Table 8 is calculated by multiplying the catchment area by the runoff depth. The minimum required holding pond volume is the cumulative total of the runoff volumes for each sub-component catchment area. The minimum holding pond volume required using the Major Storm Event method is 5,698 m^3 (5.70 ML).

Table 8 – Proposed development – Holding pond design - Method 1 (Major storm event)

Parameter	Units	Pen area	Hard area	Soft area	Pond area	Total
Catchment area	m^2	~32,160	~24,960	~4,580	~15,015	~76,715
Rainfall event	mm	91.1	91.1	91.1	91.1	-
Runoff co-efficient		0.8	0.8	0.4	1	-
Runoff depth	mm	72.88	72.88	36.44	91.1	-
Runoff volume	m^3	~2,344	~1,819	~167	~1,368	~5,698
Runoff volume	ML	~2.34	~1.82	0.17	~1.37	~5.70

Method 2 – Annual water balance

The annual water balance method accounts for the cumulative impact of a series of wet weather events such as might be experienced in a wetter-than-average season.

The National Guidelines for Beef Cattle feedlots (MLA, 2012b) annual water balance method requires effluent holding ponds to be able to retain the balance of runoff from the CDA, while making allowances for irrigation in a 90th percentile wet year.

A site-specific small catchment daily-time-step hydrological model (Model for Effluent Disposal via Land Irrigation (MEDLI)) was used to size the holding pond using the annual water balance method (Gardner (1996); Department of Environment and Science (2023)).

The annual water balance was run through a number of times to determine a holding pond capacity that notionally spills at the required frequency (i.e. no more often than an average of one in 10 years). The National Feedlot guidelines state that once a pond has 'spilled' in this type of modelling, the likelihood of another modelled spill occurring within the next few days is quite high; thus, modelled spill events within 30 days of one another should be treated as a single spill for the purpose of annual water balance calculations (MLA, 2012a). Subsequently, any spills within 30 days have been considered as a single spill in the annual water balance calculations. Operationally, it is likely that the feedlot manager would be able to intervene in these circumstances, and possibly avert secondary spills.

The sustainability of the effluent utilisation system is dependent on balanced hydraulic and nutrient loads.

Table 9 shows a monthly summary of the daily-step water balance for the period (1923-2022) for Holding Pond 1 with the modelled scenarios for the existing controlled drainage area.

Table 9 – Proposed development – Holding Pond 1 – Water Balance

	Rainfall	Evaporation	Pond inflow		Pond outflow	
			Rain in	Runoff	Evaporation	Effluent irrigated
	mm	mm	ML	ML	ML	ML
January	33.1	273.9	0.49	0.47	1.10	0.12
February	28.7	219.0	0.44	0.40	0.76	0.08
March	32.8	176.5	0.49	0.50	0.66	0.12
April	30.6	99.0	0.46	0.38	0.50	0.14
May	37.5	54.1	0.56	0.50	0.39	0.04
June	37.2	35.2	0.57	0.64	0.29	0.39
July	38.6	38.1	0.59	0.83	0.33	0.01
August	38.1	58.0	0.57	0.60	0.50	0.21
September	35.9	91.9	0.55	0.43	0.75	0.99
October	42.8	146.4	0.65	0.52	1.09	0.43
November	34.9	201.1	0.53	0.36	1.41	0.35
December	33.8	254.9	0.51	0.40	1.53	0.15
Total	423.9	1650.2	6.4	6.0	9.32	2.70

Table 9 shows that the annual inflow to the pond was estimated by the MEDLI feedlot model to be 12.4 ML which includes rainfall on the pond surface and runoff from the pen, hard and soft catchment areas. Table 9 shows that the annual outflow from the pond was estimated by the MEDLI feedlot model to be 12.0 ML which includes evaporation and irrigation. The balance comprises overtopping, sludge accumulation and seepage.

The volume of Holding Pond 1 over the modelling period is shown in Figure 10. The MEDLI model predicts that a holding pond with a volume of 15.0 ML and a surface area of about 15,015 m^2 (1.50 ha) will restrict any overtopping events to a frequency of less than once every 10 years as shown in Figure 11. In accordance with the National Guidelines for Beef Cattle Feedlots (MLA, 2012), the number of spills within 30 days of one another has been treated as a single spill event for the purpose of these model calculations.

The holding pond shall have a bywash capable of discharging the peak flow from the controlled drainage area from a 50-year ARI design storm.

A minimum freeboard of at least 0.9 m shall be provided between the bywash level and the crest of the holding pond embankment.

During operation, various mitigation measures shall be implemented to mitigate the potential environmental impact of additional overflows within a 30-day period. These measures are outlined in section 8.7.5.1 and included in the Operation Solid and Liquid Waste Management Plan presented in Appendix P.

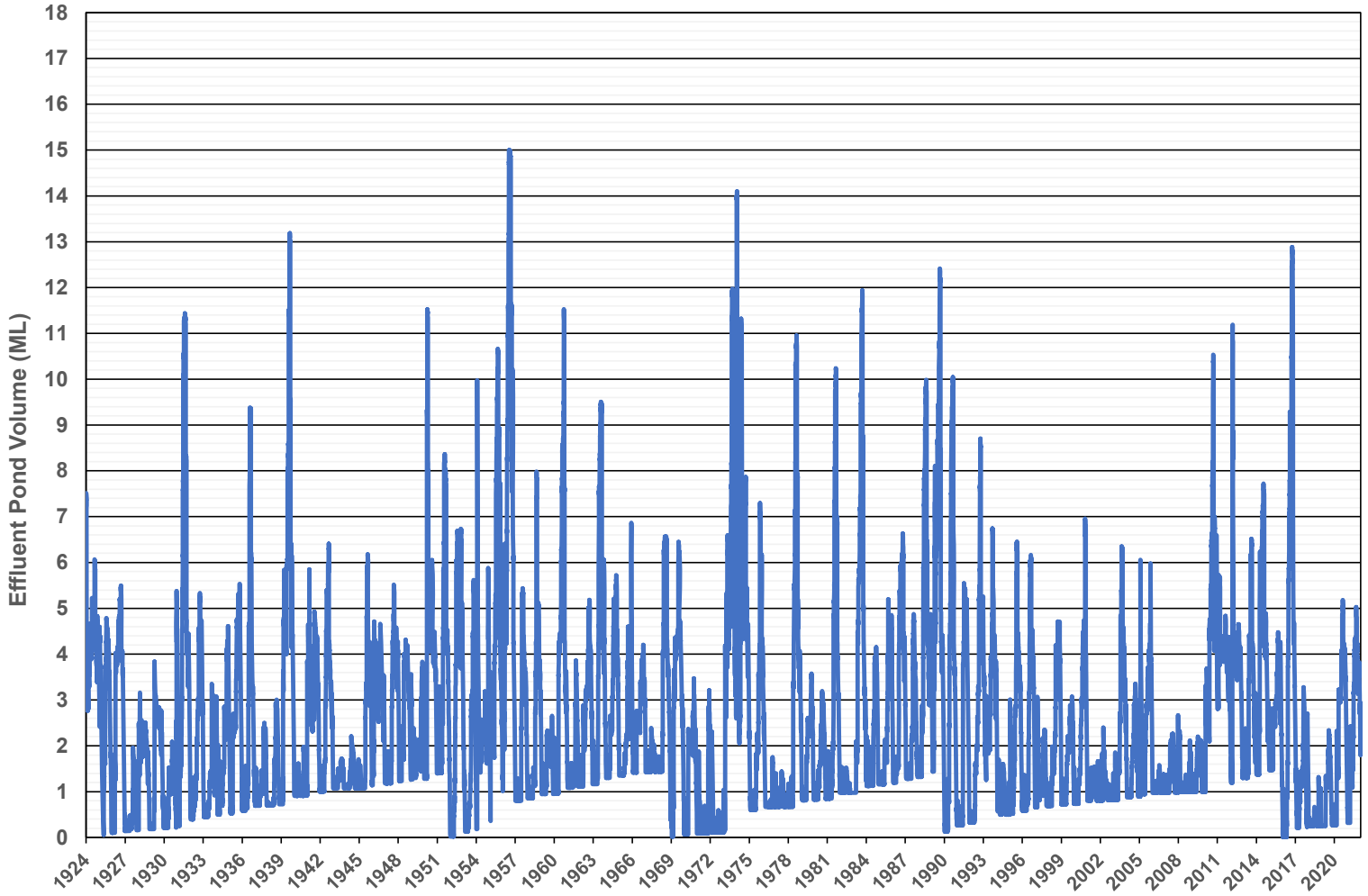

Figure 10 – Proposed development – CDA 1 – Holding Pond 1 volume

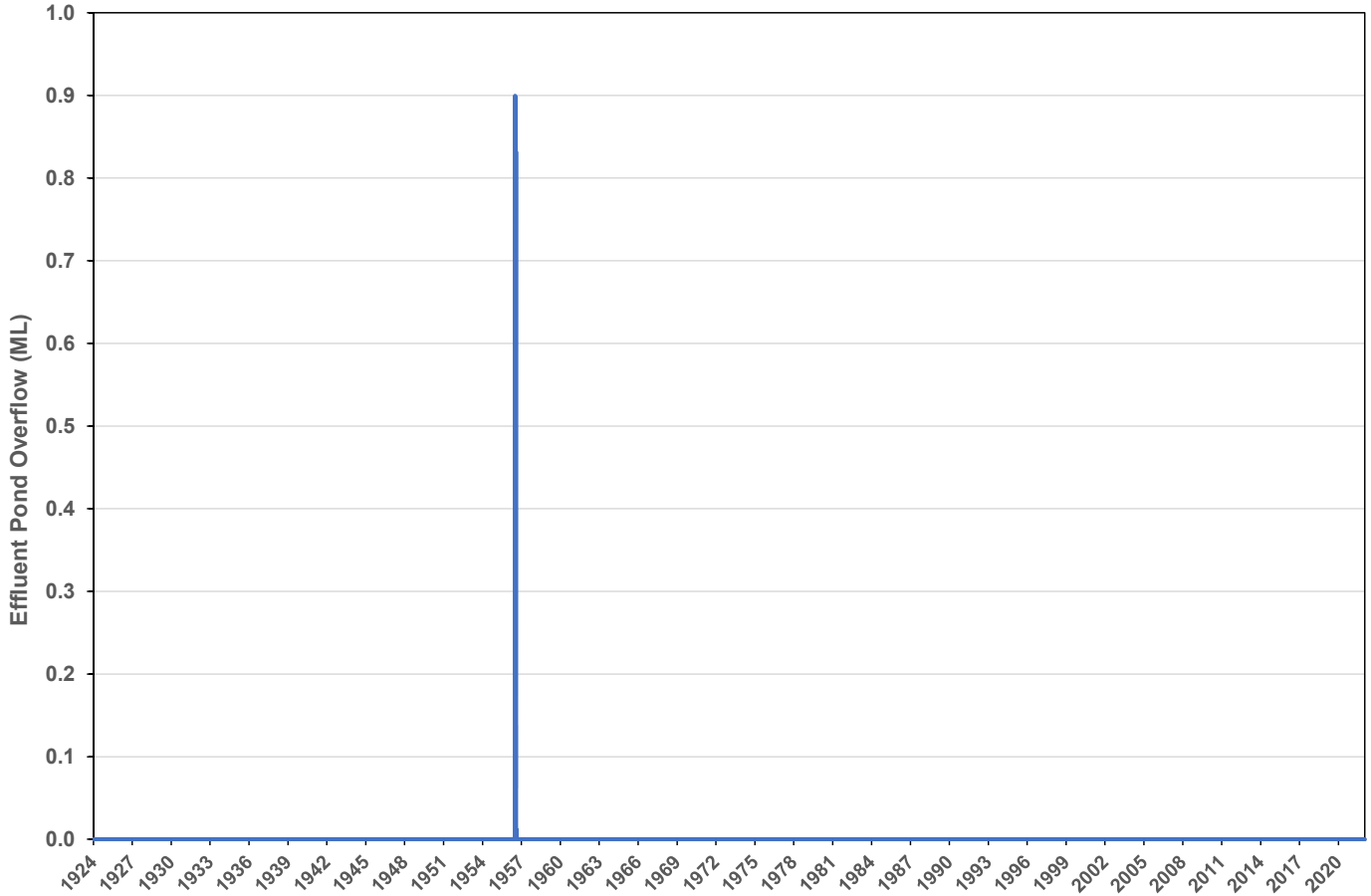

Figure 11 – Proposed development – CDA 1 – Holding Pond 1 overflow

8.4.10 Effluent and Solid waste management system

The utilisation effluent and solid waste is a major consideration in the siting, structure and management of a beef cattle feedlot. The proposed development shall produce significant amounts of putrescible solid and liquid wastes as outlined below.

All other non-putrescible and domestic putrescible solid wastes shall be removed off-site for recycling, recovery or disposal at a suitable facility.

8.4.10.1 Solid wastes

The types of putrescible solid waste generated by the proposed development are outlined in the following sections. All other non-putrescible and domestic putrescible solid wastes shall be removed off-site for recycling, recovery or disposal at a suitable facility. The proposed development is expected to generate negligible quantities of non-putrescible and domestic putrescible solid wastes.

8.4.10.2 Manure

Manure is the solid waste produced by cattle. Manure is the faeces and urine excreted by the cattle. Manure also includes those solids that have settled from the stormwater runoff in the sedimentation basin and which are removed after drying. Manure is the principal solid waste for management.

Manure is the solid waste produced by cattle. Manure is the faeces and urine excreted by the cattle. Since manure includes both faeces and urine, freshly excreted manure has a moisture content of around 90%. However, it usually dries quickly once deposited on the pen surface.

Excreted manure consists of:

- total solids (TS) – the dry matter content of the manure made up of volatile and fixed solid components
- volatile solids (VS) – the organic fraction of TS
- fixed solids (FS) or ash – the inorganic fraction of TS
- moisture – determined from the weight of the material less TS.

Manure also includes those solids that have settled from the stormwater runoff in the sedimentation basin and which are removed after drying. Manure is the major solid waste for management.

8.4.10.3 Waste feed

Typically, in well managed feedlots, very low levels of feed commodities or rations are wasted through spillage or spoilage. However, feed rations in feed bunks may become wet and unpalatable in rainy weather and cattle may go off their feed. Under these circumstances the

ration is spoiled and removed from the bunk and deposited within the pen or taken directly to the solid waste storage area.

8.4.10.4 Mortalities

The mortality rate in the existing beef cattle feedlot is generally about 0.95% expressed as a percentage of cattle throughput. Carcasses are removed from the pens following the daily pen inspection.

Composting shall be the method used for disposal of carcasses as composting yields a product for utilisation and is ecological sustainable when compared to other methods of disposal such as burial and incineration. Most Australian feedlots use composting for managing mortalities (MLA, 2012b).

Whilst carcasses of the estimated numbers of mortalities shall be composted, a contingency plan to manage the disposal of large numbers of unexpected mortalities shall be developed in accordance with relevant guidelines and form part of the proposed developments quality assurance and NFAS standards. Section 8.7.14 outlines the process for the emergency disposal of mass mortalities.

8.4.10.5 Solid waste storage

A solid waste storage area is needed to temporarily store manure after it has been removed from pens. Stockpiling allows pens to be cleaned out as frequently as required, even when spreading machinery is not available, when agricultural land is not ready for the application of manure or when it may not be possible to directly remove it from the site.

The stockpiled manure will commence to decompose anaerobically or aerobically, depending on its moisture content. The stockpiled manure may be actively composted to accelerate the decomposition process and enhance its value. Anaerobic bacteria break down the organic matter, reducing the total dry weight of the manure. The nitrogen content is reduced by its conversion to gaseous forms that are released to the atmosphere during the decomposition process, making it less valuable as an organic fertiliser. The concentration of other less volatile and less soluble nutrients such as phosphorus, increase in the stockpile as the volume of manure decreases. The anaerobic decomposition process generates considerable heat. Temperatures up to 54°C are commonly experienced. The heat generated in well-managed stockpiles may be sufficient to sterilise any weed seeds and a significant proportion of potentially harmful pathogens contained in the manure.

The handling properties of the manure is also enhanced by stockpiling as clumps of manure are broken up and reduced in size.

The composting of mortalities shall be undertaken within the solid waste storage area.

The storage, processing and/or composting of solid wastes shall be undertaken on a suitably designed and constructed area within the controlled drainage area. The main design criteria include:

- Impervious base

- Good drainage
- Provision of sufficient area.

Stockpiling of solid wastes is best undertaken in windrows up to 2 m high rather than in large piles. Windrows are typically constructed by forming solid wastes into a long pile with a triangular cross-section, a base width of 3–4 m and a height of 1.5–2 m. Their long axes should be perpendicular to the slope to promote drainage.

The solid waste storage area has been constructed using the specifications outlined in 'The NSW Feedlot Manual' (NSW Agriculture, 1997). Figure 6 shows the location of the solid waste storage area on the site. The solid waste storage area has a floor slope of 1% to ensure drainage. The existing solid waste storage area has an of about 7,985 m^2 (~0.79 ha).

From section 8.7.4.1.1, BEEFBAL estimates some 1,835 t of solid waste (dry basis) harvested from the pens per year. Based on a scraped manure moisture content of 40%, this translates into some 3,060 t of wet scraped manure per year.

The area of the solid waste storage area was estimated based on the estimated volume of solid waste produced from BEEFBAL (QPIF, 2004) and assuming each solid waste windrow is triangular shaped, with 1 vertical to 4 horizontal batters (1V:4H) and no higher than 2.5 m and a bulk density of solid waste of about 0.6 t/m^3.

With the assumed windrow dimensions some 5,100 m^2 of pad area is required to store and process harvested manure. Additional space for carcass composting and solid waste processing equipment, screening etc, is required. Consequently, the existing solid waste storage area of 7,985 m^2 (~0.79 ha) is sufficient to accommodate the additional manure generated by the expanded development and mortalities.

8.4.10.6 Effluent

Stormwater run-off from the controlled drainage area is described as 'effluent'. Because it has been in contact with manure, the effluent is high in nutrients and has the potential to pollute surface water and groundwater. Effluent shall be collected, temporarily held in the sedimentation basin and then stored in the holding pond until it can be used as outlined in section 8.4.9.

8.4.10.7 Waste utilisation area

Solid waste (e.g. manure, carcass compost, holding pond sludge) is valued as a source of nutrients for fertilising crops or pasture and therefore, shall be applied to land where it can be sustainably utilised by crops or pasture and soil. The application rates depend on factors such as the solid waste chemical characteristics, physical and chemical characteristics of the soils, type of crops grown and climate.

Utilisation of solid wastes will substitute a percentage of the synthetic fertilisers that would otherwise be trucked-in for use in the cropping program on the subject land. Various crops or pasture shall be grown on the solid waste utilisation area. Crops will be harvested for grain and straw to use as feed commodities in the proposed development.

Solid waste shall be applied sustainably to cropping land using a tractor drawn moving bed manure spreader or similar equipment on the subject land or removed off-site to be used as a soil conditioner and organic fertiliser on cropping and pasture operations on adjoining land leased by the proponent or other cropping land in the local region.

Effluent is valued as a source of nutrients for fertilising crops and therefore, shall be applied to land where it can be sustainably utilised by crops and soil. Land is required for the long- term application of water, nutrients, salts and organic loads in the effluent and solid wastes.

The effluent and solid waste utilisation area have been selected and sized to be ecologically sustainable to prevent environmental harm, especially to soils, groundwater and surface water and to avoid impacts to native vegetation and aboriginal heritage.

The effluent utilisation system is a full utilisation system. In this system, the effluent is fully used (thereby no discharges to surface waters), with the area required for irrigation determined by calculating the limiting land area using a water and nutrient balance.

The amount of water, nutrients and organic matter for optimum sustainable production of the cropping system is a function of the crop, the agronomic system employed, and site-specific factors such as climate, topography and soil type.

The methodology for sizing the effluent utilisation area is provided in section 13.11. Figure 12 shows the effluent utilisation area for the proposed development. The amount of land proposed to be irrigated is approximately 16 ha with a reserve area of 16 ha. The details of the irrigation system proposed are discussed in section 13.11.6.

Similarly, solid waste (manure, spoilt feed, sludge) is valued as a source of nutrients for fertilising crops or pasture and therefore, shall be applied to land where it can be sustainably utilised by crops or pasture and soil. The application rates depend on factors such as the solid waste chemical characteristics, physical and chemical characteristics of the soils, type of crops grown and climate. The land area required for solid waste application was determined by calculating the limiting land area using a nutrient balance.

The methodology for sizing the solid waste utilisation area is provided in section 13.11. Figure 12 shows the solid waste utilisation area for the proposed development. The amount of land available on the subject land to be applied with solid wastes is approximately 116 ha. The balance of solid wastes generated by the proposed development will be exported offsite for sustainable use. The details of the application system proposed are discussed in section 13.11.4.

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA

NOTES:

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B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:10,000 (A3)
DRAWN	RJD
DATE	07/11/2024
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DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE ENVIRONMENTAL IMPACT STATEMENT PROPOSED DEVELOPMENT - WASTE UTILISATION AREA

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 12		A3	F3-107-00-12	B

DATE PLOTTED: 6 November 2024, BY: RDC Engineers PTY LTD
FILE NAME: F3-107 ANVanLeg High Cloire MASTERPLAN-00-20230407 vB.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VanLeg High Cloire FL Finleg\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

8.4.10.7.1. Environmental buffers

When planning the effluent utilisation area, consideration of the separation of these areas from neighbours and sensitive environments was considered. The rationale for separating these land uses is to protect the locality's ground and surface waters, other environmental and social values as well the long-term future of the effluent utilisation area.

A buffer distance shall also be applied where the application of effluent takes place within proximity to areas likely to be used by the public at that time. The appropriateness of the applied buffer distance has been determined having consideration for the qualities of the materials being applied, weather conditions and other environmental factors; as well as the anticipated level of public usage or exposure at those times.

The adopted buffer distances between effluent utilisation areas and water resources and public areas are provided in Table 10.

When planning the waste utilisation areas, consideration of the separation of these areas from neighbours and sensitive environments was considered. The rationale for separating these land uses is to protect the locality's ground and surface waters, other environmental and social values as well the long-term future of the waste utilisation areas.

A buffer distance shall also be applied where the application of liquid and/or solid wastes takes place within close proximity to Broughans Road, or other areas likely to be used by the public at that time. The appropriateness of the applied buffer distance has been determined having consideration for the qualities of the materials being applied, weather conditions and other environmental factors; as well as the anticipated level of public usage or exposure at those times.

The buffer zones are the final strategy to provide a margin of safety to the range of impact mitigation designed throughout the system and are not a substitute for effective waste utilisation system design.

The adopted buffer distances between effluent and solid waste utilisation areas and water resources and public areas are provided in Table 10. These buffer distances are based on recommended buffer distances in the NSW Feedlot Guidelines (NSW Agriculture, 1997), the NSW Effluent Guidelines (Department of Environment and Conservation (NSW), 2004) and site-specific assessment. The proposed buffer distances to water resources and public areas are shown on Figure 13.

Table 10 – Proposed development – Proposed buffer distances to water resources and public areas

Sensitive area	Minimum separation distance		Impact of concern/comments
	Effluent	Solid waste	
	m	m	
Irrigation channels	25	25	Protection of water quality and aquatic ecosystems.
Internal drainage lines	25*	25	Protection of water quality for most sensitive water uses of the potentially affected waterbody.
Bore – Domestic supply	50	50	Groundwater quality for domestic human uses protected.
Roads	25*	25	Avoidance of spray drift of effluent containing pathogens offsite.
Public spaces	50*	50	Avoidance of spray drift of effluent containing pathogens offsite.

*Where irrigation gives rise to aerosols.

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA

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CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - WASTE UTILISATION AREA

REPORT REFERENCE: FIGURE 13
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-00-13
REV.: B

DATE PLOTTED: 6 November 2024, BY: RDC Engineers PTY LTD
FILE NAME: F3-107 ANVanLeg High Claire MASTERPLAN-00-20230407 vB.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VanLeg High Claire FL Finleg\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

8.4.11 Utilities

The proposed development will not require any extension and or upgrade of electricity services from the existing property overhead supply to service the electricity demand of facilities such as the office, feed storage and processing, water pumping, lighting and ancillary services etc.

Feed processing is the largest single consumer of electricity within the development and requires require considerable power for conveying and processing grains. Existing infrastructure will meet the energy requirements of the proposed infrastructure.

Communications services to the existing office and ancillary buildings are in place and adequate for the proposed expansion.

The proposed development also requires a reliable source of water to service the water demands of livestock drinking water and sundry uses such as staff amenities. The proposed water supply would be from existing surface water and groundwater allocations. Potable water would be from rainwater and supplemented from groundwater supply as required.

8.5 Separation distances

The proposed development shall be sited and designed to prevent or minimise adverse impacts on the amenity of the surrounding community.

The proposed development is relation to existing residential development, rural-residential development, rural residences and other sensitive land uses is shown on Figure 14.

Section 13 demonstrates that the proposed development has the capability for sustained compliance in relation to air quality and noise and is appropriately separated from incompatible land uses.

JAMES ROAD
R1 - 289 JAMES ROAD PINE LODGE
R2 - 399 JAMES ROAD PINE LODGE
~1,715m
~1,245m
~1,130m
TUPPAL ROAD
PROPOSED DEVELOPMENT SITE
R3 - 203 BROUGHANS ROAD PINE LODGE
KELLYS ROAD
SUBJECT LAND BOUNDARY
~990m
~1,210m
R9 - 179 BOWLERS ROAD PINE LODGE
R10 - 442 JAMES ROAD PINE LODGE
BROUGHANS ROAD
BOWLERS ROAD
~2,240m
~1,425m
~2,500m
ID 756353
BROUGHANS ROAD
~1,930m
R4 - 202 BROUGHANS ROAD PINE LODGE
R8 - 164 BOWLERS ROAD PINE LODGE
~2,710m
SUBJECT LAND BOUNDARY
~3,600m
BOWLERS ROAD
R7 - 306 BOWLERS ROAD PINE LODGE
SUBJECT LAND BOUNDARY
R6 - 108 WOODWARDS ROAD PINE LODGE
WOODWARDS ROAD
R5 - 822 PINE LODGE ROAD PINE LODGE

N
W
E
S

SCALE
0 250 500 750 1,000 1,250 1,500 1,750 2,000 2,250 2,500m
1:12,500 (A1) 1:25,000 (A3)

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- RURAL RESIDENTIAL RECEPTOR
- SMALL TOWN RECEPTOR
- STREAM ORDER 1
- STREAM ORDER 2
- STREAM ORDER 3
- STREAM ORDER 4
- STREAM ORDER 5
- STREAM ORDER 6
- STREAM ORDER 7
- STREAM ORDER 8

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PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - SEPARATION TO SENSITIVE RECEPTORS

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 14		A3	F3-107-00-14	B

8.6 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

8.6.1 Drainage system

Runoff from the pen area contains organic and mineralised manure constituents that could pose a significant impact to soil and water resources if they were released, uncontrolled, into the environment.

A low-permeability barrier shall be needed on those areas within the controlled area where the permeability of underlying soil/rock strata exceeds 0.1 mm/day (3.5 cm/year). This barrier shall be created by using a liner made of compacted clay (clay liner).

For a given soil, permeability is related to soil particle composition, moisture content and level of compaction; and there are limits to the permeability that can be achieved at any level of compaction. In-situ and laboratory measurement of permeability is difficult, and relatively inaccurate (MLA, 2012b).

Consequently, cattle feedlot design guidelines provide guidance on specifications for materials and construction methods to be used for clay lining rather than relying on permeability standards.

Table 11 and Appendix F outline the characteristics of suitable clay lining material and provides guidance on the selection of the correct materials for use in the liner. Soils may need to be mixed or engineered to produce a material that meets the specifications.

Table 11 – Specifications for clay liner materials (MLA, 2012b)

Soil characteristic	Acceptability criterion	Test method
Percentage fines	More than 25% passing a 75 µm sieve More than 15% passing a 2 µm sieve	AS 1289 3.6
Liquid Limit	Less than 70	AS 1289 3.1.2
Plasticity Index	More than 15	AS 1289 3.3.1
Emerson Class	Number 5 to 6	AS 1289 3.8.1

The controlled drainage area contains a system including catch drains, sedimentation system and holding pond for conveying stormwater, allow entrained sediment to ‘settle out’ and capture and storage of the stormwater from the controlled drainage area respectively.

Uncontaminated upslope runoff shall be diverted away from the controlled drainage area in order to minimise the quantity of contaminated runoff requiring treatment. An earthen diversion bank shall be constructed upslope of the controlled drainage area (south-west of the feedlot complex) to direct clean stormwater around the feedlot complex into existing drainage lines (Figure 9.

8.6.1.1 Drains

Catch drains are located along bottom of each row of pens. Catch drains flow into a main drain that flows into the sedimentation basin. The catch drains and main drains convey stormwater runoff to the sedimentation basin.

To mitigate the potential for contamination of underground water resources because of leaching of contaminants through permeable, underlying soil, a low-permeability barrier shall be constructed on the floor of the drains.

Hence, the base of the catch and main drain shall be underlain by a minimum of either 300 mm clay or other suitable soil, able to provide a design permeability of $<1 \times 10^{-9}$ m/s (~ 0.1 mm/day) (MLA, 2012b).

As shown in the geotechnical tests presented in Appendix K from the construction of the existing development the material met the permeability requirement of $<1 \times 10^{-9}$ m/s (~ 0.1 mm/day) and was suitably compacted (MLA, 2012b).

8.6.1.2 Sedimentation basin

The sedimentation basin is sited downslope of the pen area. The sedimentation basin shall have a minimum nominal working capacity of 1,100 m^3 (1.1 ML).

The general method of protecting groundwater is to ensure that a low-permeability barrier exists between the stored effluent and any underlying groundwater resources. Hence, the base and embankment of the sedimentation basin shall be underlain by a minimum of either 300 mm clay or other suitable soil, able to provide a design permeability of $<1 \times 10^{-9}$ m/s (~ 0.1 mm/day) (MLA, 2012b).

As shown in the geotechnical tests presented in Appendix K from the construction of the existing development the material met the permeability requirement of $<1 \times 10^{-9}$ m/s (~ 0.1 mm/day) and was suitably compacted (MLA, 2012b).

8.6.1.3 Holding pond

The holding pond would be situated downslope of the sedimentation basin as shown on Figure 9. The holding pond has a nominal working capacity of 15 ML.

The general method of protecting groundwater is to ensure that a low-permeability barrier exists between the stored effluent and any underlying groundwater resources. The holding pond base and embankment shall be underlain by a minimum of either 300 mm clay (or other suitable soil), able to provide a design permeability of $<1 \times 10^{-9}$ m/s (~ 0.1 mm/d) (MLA, 2012b).

As shown in the geotechnical tests presented in Appendix K from the construction of the existing development the material met the permeability requirement of <1 x 10^{-9} m/s (~ 0.1 mm/day) and suitably compacted (MLA, 2012b).

8.6.2 Solid waste storage area

Any groundwater resources underlying the solid waste storage area shall be protected by implementing a low-permeability barrier on the base of the area. Hence, the solid waste storage area shall be underlain by a minimum of either 300 mm clay (or other suitable material), able to provide a design permeability of <1 x 10^{-9} m/s (~ 0.1 mm/day) (MLA, 2012b).

As shown in the geotechnical tests presented in Appendix K from the construction of the existing development the material met the permeability requirement of <1 x 10^{-9} m/s (~ 0.1 mm/day) and suitably compacted (MLA, 2012b).

8.6.3 Decommissioning existing infrastructure

As the proposed expansion site is a brownfield site, there is no infrastructure to be decommissioned. All infrastructure associated with the existing development shall be maintained and utilised.

8.7 Operation

8.7.1 Cattle management

When fully developed, the proposed development shall have about 32,160 m^2 of constructed outdoor beef cattle production pens within the controlled drainage area which equates to a cattle capacity of 3,200 head at an average stocking density of about 10.1 m^2/head.

The proposed development can accommodate some 3,200 head cattle at the design stocking density. The majority of cattle would be steers of *Bos Taurus or Bos Taurus cross* genotypes. Breed composition is expected to change with time as market signals develop. It is expected that cattle would be sourced locally as far as possible from areas such as southern NSW and northern Victoria.

Cattle would be transported to the proposed development at about the entry weight of the target market. The cattle would be fed a ration specific to that market type until they reach the exit weight of the respective market when they would be transported from the site to an abattoir for processing.

Typically, cattle would enter the feedlot at around 9 to 12 months of age and an average of some 275-300 kg liveweight. The cattle would be fed for approximately 150 days to achieve an average of 550 to 575 kg liveweight.

Table 12 – Proposed development – Estimated market type composition

Parameter	Units	Market type Mid Fed
Days on feed	Days	150
Entry weight	kg	280
Exit weight	kg	550
SCU Scale Factor	-	0.75
Net gain (kg)	kg	270
Average daily gain	kg gain/head/day	1.8
Dry matter intake	kg DM/head/day	9.6
Mortality rate (No in/No Out)	%	0.5
Percent in lot	%	100.0

Upon arrival at the feedlot, all cattle shall be counted to ensure that the number, breed and sex of cattle unloaded balances with accompanying documentation. The cattle are inspected for signs of stress and general health and held in holding yards prior to induction. Any cattle with health problems are drafted-off and treated accordingly. All details of arrival cattle are recorded in the feedlot herd management system.

Within 2-3 days of arrival at the feedlot, each animal is inducted whereby the necessary health treatments (e.g. 7 in 1, vitamins, parasite treatments etc) and identification (e.g. ear-tags etc) are applied and cattle weighed.

After induction, cattle are allocated to a production pen ensuring that appropriate stocking densities are maintained, and pen allocation details are recorded in the feedlot herd management system.

All sick or injured cattle are carefully removed from the pens and taken to the hospital facility for treatment according to veterinary advice. If necessary, they are retained in the hospital pens. Once treated cattle recover, they are returned to an appropriate production pen.

Low-stress handling techniques shall be employed to minimise stress, bruising and hide damage.

Excessive noise and movement of cattle within the feeding period is avoided along with handling of cattle during adverse weather conditions (e.g. very hot and humid weather).

Shade shall be provided in all pens to reduce environmental stresses such as temperature and solar radiation on cattle.

Cattle are provided with an adequate supply of feed and water.

After approximately the required days on feed, cattle are individually weighed and drafted according to weight. Cattle in each drafting group are designated a dispatch date.

On the dispatch date, cattle are loaded onto the livestock transport vehicle at a suitable density, the vehicle weighed-out over the weigh bridge and the weight of cattle recorded. The cattle shall then be transported to a processing facility.

Cattle are transported in a manner that protects their welfare, which maximises meat quality and which considers climatic conditions. Transport operators would adhere to the Australian Standards and Guidelines for the Welfare of Animals — Land Transport of Livestock (AHA, 2008).

8.7.1.1 Cattle numbers

The number of cattle turned off from the proposed development is dependent on the following factors:

- intake weight
- days on feed
- average daily gain
- required turnoff weight
- occupancy levels
- mortality rates.

The specifications for the market type are outlined in Table 12. Based on these data the estimated number of incoming and outgoing cattle from the proposed development is shown in Table 13. Total cattle throughput would be approximately 7,321 head of cattle annually.

Table 13 – Proposed development – Estimated cattle throughput

Parameter	Units	Market type Mid Fed
Development capacity	Head	3200
Entry weight	kg	280
Exit weight	kg	550
Days on fed	Days	150
Occupancy	%	95
Mortality rate (No in/No out)	%	0.81
Market type percent in lot	%	100
Head-on-feed	No head per year	3040
Incoming cattle (walked in*)	No head per year	~00
Incoming cattle (transported in)	No head per year	~7,396
Incoming cattle (Total)**	No head per year	~7,396
Outgoing cattle	No head per year	~7,321

*Cattle bred on the subject land.
**Total head into proposed development.

8.7.2 Feed management

The feed ration for the beef cattle shall be prepared on-site in a dedicated facility, with associated commodity storage, handling and ration delivery infrastructure.

As outlined in section 8.4.4, the subject land has existing infrastructure to accommodate the grain storage, feed processing and commodity storage requirements for the proposed development.

The beef cattle shall be fed a predominantly grain based diet. Winter cereals such as wheat and barley shall be the predominant grains used in the ration. The level of each grain in the ration depends on the availability and cost of the grain sourced from the subject land or neighbouring properties owned by the applicant.

The location of the proposed development within the southern Riverina leaves it well positioned for grain and commodities procurement. The applicant has an ability to easily acquire the feed commodities needed to operate a feedlot of this scale in this region.

A typical ration composition is outlined in Table 14. The percentage of each commodity within a ration is dependent on commodity availability and the buying price and therefore the composition often changes seasonally and from year to year. The dry matter content of beef cattle rations is usually formulated to be 70–80%.

Table 14 – Proposed development – Typical ration composition (As-fed)

			Starter	Grower	Finisher
Parameter	**Type**	**Units**	**Value**	**Value**	**Value**
Grain	Winter (barley/wheat)	%	43.0	51.0	62.5
Protein	Whole cottonseed	%	8.0	8.0	10.0
Roughage	Straw (barley/ wheat)	%	6.0	6.0	0.0
	Almonda hulls	%	14.0	14.0	11.0
	Hay (ryegrass)	%	14.0	6.0	0
Supplements	Minerals (dry)	%	3.0	4.0	5.5
Water	-	%	12.0	11.0	11.0

All grain shall be processed on-site through the grain processing facility. The facility consists of storage silos to store grain, a grain movement system and a grain processing system. Grain is processed by dry rolling.

The commodities are loaded into a tractor-drawn feed wagon by front-end loader. The tractor-drawn feed wagon has on-board mixing equipment. The ration is then dispensed into the feed bunks directly from the tractor-drawn feed wagon.

The approximate annual amount of feed commodities required for the proposed development are listed in Table 15. The proposed development shall accommodate up to 3,200 head of cattle and shall require about 6,175 t of grain, 4,675 t of roughage and other commodities annually.

The subject land can produce a small portion of the required commodities. The balance grain requirements shall be sourced locally from adjoining and neighbouring properties owned by the applicant.

Table 15 – Proposed development – Estimated annual commodity usage

Parameter	Type	Units	Value
Grain	Winter (barley/wheat)	t/year	~6,175
Protein	Whole cottonseed	t/year	~1,150
Roughage	Straw (wheat/barley)	t/year	~550
	Almond hulls	t/year	~1,825
	Hay (ryegrass)	t/year	~550
Supplements	Minerals (dry)	t/year	~600

8.7.3 Water management

Water is a vital resource for the proposed development and is also a significant expense. Most of the water used is for cattle to drink; it is also used for cleaning machinery and other general hygiene practices around the feedlot, and in amenities for people working at the development. Water is not used in feed processing as it is a dry based grain processing system.

Water is also lost through evaporation and seepage from open storages.

The proposed development's water supply, storage and reticulation shall be managed to:

- meet the total annual water requirement of the proposed development;
- provide an unrestricted, reliable supply of water to livestock at all times of the year;
- provide water that is clean, fresh and free from contamination for livestock;
- meet the peak water intake requirement for the cattle, especially during the summer period;
- minimise losses and maximise water use efficiency;
- ensure that the quality of the water (which includes temperature, salinity and impurities) does not affect cattle performance or welfare; and
- provide water that is clean, fresh and free from contamination for people.

The water consuming activities within the proposed development other than irrigation of crops are outlined in Table 16.

Table 16 – Proposed development – Water use activities

Activity	Water use
Livestock management	
Drinking water	Yes
Water trough cleaning	Yes
Feed management	
Grain processing	No – Dry rolling only
Vehicle cleaning	Yes
Cattle management	
Cattle washing	No requirement for washing of beef cattle prior to slaughter
Sundry uses	
Potable	Yes
Evaporative losses	
Turkeys Nest storage	Yes
Water troughs	Yes
Dust control/leakages	Yes

8.7.3.1.1. Drinking water

Davis et al (2009) found drinking water to be in the order of 90% of total water consumption in feedlots where cattle are not washed. Hicks et al. (1988) relate ambient temperature, dry matter intake (DMI) and dietary sodium to water intake. Table 17 shows the average monthly predicted water intake per head per day. The average daily intake is 33.2 L/head/day. With about 3,200 head-on-feed at the maximum capacity, this equates to about 36.8 ML/year for drinking water.

Table 17 – Proposed development – Estimated drinking water usage

Month	Mean daily water intake	Market type
		Mid Fed 3,200 head
	L/head/day	ML
January	39.4	3.7
February	39.2	3.7
March	36.8	3.5
April	33.0	3.1
May	29.6	2.8
June	27.1	2.6
July	26.8	2.5
August	28.2	2.7
September	30.3	2.9
October	33.1	3.1
November	36.0	3.4
December	38.2	3.6
Average	33.2	
Total		37.5

The National Guidelines for Beef Cattle Feedlots (MLA, 2012a) state that as a guide, a proposed feedlot would normally need to demonstrate access to approximately 24 ML of high-security water per annum per 1,000 SCU of feedlot capacity. This equates to about 58 ML.

8.7.3.1.2. Sundry uses

The estimated sundry water usage for the proposed development is outlined in Table 18. Potable water usage is based on 4 persons per day at 100 L/person/day. The turkeys nest storage has a surface area at top water level of about 2,750 m^2. Evaporative loss is based on a pan factor of 0.8 and average monthly evaporation taken from SILO data contained Table 42.

Vehicle cleaning is based on washdown of 1 feed vehicle per fortnight using 5,000 L of water for general hygiene based in the same geographical region reported by Davis et al. (2010).

Table 18 – Proposed development – Estimated sundry water usage

Month	Potable	Evaporative losses	Evaporative / Cleaning losses	Vehicle cleaning / dust control
	100 L/person/day	Turkeys Nest	Water Troughs	
	L/month	L/month	L/month	L/month
January	12,400	602,580	23,612	10,000
February	12,400	481,800	23,477	10,000
March	12,400	388,300	23,373	10,000
April	12,400	217,800	23,184	10,000
May	12,400	119,020	23,074	10,000
June	12,400	77,440	23,027	10,000
July	12,400	83,820	23,034	10,000
August	12,400	127,600	23,083	10,000
September	12,400	202,180	23,166	10,000
October	12,400	322,080	23,300	10,000
November	12,400	442,420	23,433	10,000
December	12,400	560,780	23,565	10,000
Total L/year	148,800	3,625,820	279,329	120,000
Total ML/year	0.149	3.63	0.3	0.12

8.7.3.1.3. Total water usage

The total annual water demand for the proposed development is estimated to be 41 ML when at a full capacity of 3,200 head.

The proposed development has 400 ML of groundwater entitlements and 273 ML of surface water entitlements from Mulwala No 17 Murray Irrigation Limited. Therefore, the total water available is 673 ML and able to meet the demands of the proposed development.

8.7.3.1.4. Water supply contingency plan

In the event of severe drought conditions the development would be destocked.

8.7.4 Solid waste management

8.7.4.1 Generation

8.7.4.1.1. Manure

The proposed development shall generate solid waste comprising manure, composted mortalities, and sludge from the holding pond. Manure is the largest of the solid wastes generated.

McGahan and Tucker (2003) recommend using a mass balance approach to estimate the quality and quantity of solid waste generated by beef cattle feedlots. One such method is the predictive model known as BEEFBAL (Department of Agriculture and Fisheries, 2019 (QLD)).

BEEFBAL (V10.01) (Department of Agriculture and Fisheries, 2019 (QLD)) was used to estimate the volume of solid waste generated by the proposed development along with the nutrient composition of the solid waste.

Input data for BEEFBAL was taken from Table 12 and Table 14 for herd data, quantity fed and feed ingredients respectively. The estimated solid waste generated from the proposed development is shown in Table 19.

Table 19 – Proposed development – Estimated manure production

Parameter	Units	Market Type
		Mid Fed
Development capacity	Head	3,200
		t/year
Fresh manure excreted	Dry mass	~2,630
	t DM/SCU/year	1.20
	Wet mass (85%MC)	~17,530
Manure scraped from pad	Dry mass*	~1,835
	Wet mass (40%MC)	~3,060
Manure removed from stockpile	Dry mass	~1,780
	Wet mass (20%MC)	~2,375

*50% dry matter loss on the pad

Losses of total solids from the stockpiled solid waste over time due to organic matter breakdown. Typically, these losses may be up to 40% of the dry matter.

At a moisture content of 20% when spread this equates to some 2,375 t/year of solid waste available for utilisation per year.

8.7.4.1.2. Mortalities

A mortality rate of about 0.95% expressed as a percentage of cattle throughput as outlined in 8.4.10.4 has been used for the proposed development which is consistent with the mortality rate in the existing development.

BEEFBAL (DAF, 2019) was used to estimate the mass of mortalities which was then converted to a dry matter basis based on an average carcass moisture content of 60% (Michell et al, 1989). Table 20 the estimated mass of mortalities generated in the proposed development.

BEEFBAL (DAF, 2019) estimates some 11.7 t of mortalities (dry matter) are produced when the proposed developed is operating at its full capacity. Based on a carcass compost moisture content of 20%, this translates into some 14.8 t of carcass compost available for spreading per year.

Table 20 – Proposed development – Estimated typical mortalities generated

Parameter	Units	Market Type Mid Fed
Development capacity	Head	3,200
		t/year
Mortalities	Dry mass	~11.7
	Wet Mass (60%MC)*	~29.2
Carcass compost removed from stockpile	Dry mass	~11.8
	Wet mass (20%MC)	~14.8

*The fluid content, including water, comprise an average of 60% of the total body weight of a beef animal (Michell et al., 1989).

8.7.4.2 Management

Regular cleaning and maintenance in and around the proposed development shall be undertaken to minimise odour emissions and reduces the risk of any amenity impacts on neighbouring sensitive receptors.

Regular cleaning and maintenance in and around the development complex, in accordance The National Guidelines for Beef Cattle feedlots (MLA, 2012b) specifications minimises odour emissions and reduce the risk of any amenity impacts on neighbouring sensitive receptors. Regular cleaning:

- reduces manure build up within the pens;
- reduces odours emanating from the proposed development; and
- eliminates wet spots in the pens (production/induction/hospital), which reduces fly breeding areas and also reduces odour.

8.7.4.2.1. Pen cleaning and maintenance

Pen cleaning refers to the removal of built up manure from the pens and drains. Small amounts of spoilt feed thrown into the pen during bunk cleaning, is also removed with manure during pen cleaning. Pen cleaning and maintenance is not viewed as a cost, but as a method of minimising potential impacts to the environment and the potential to return income to the proposed development by the sale or sustainable utilisation of the manure harvested from the pens.

The pens shall be regularly cleaned to minimise the depth of manure on the pen surface. Consequently, pen cleaning becomes a major on-going part of operational management. Regular pen cleaning is necessary to:

- promote free pen drainage;
- optimise cattle performance and welfare;
- reduce dags on cattle;
- provide a safe work environment for staff;
- maintain low odour levels;
- minimise dust; and
- minimise pen maintenance costs.

Free drainage of pens is essential in optimising conditions for animals and staff (particularly pen riders), preventing odour nuisance and minimising pen maintenance costs.

Ideally, pen cleaning shall occur when the manure is moist but not wet since moist manure is more easily scraped from the surface. However, regular cleaning may occur even when conditions are not ideal.

As manure is deposited on the pen surface it dries and is compacted by the action of the cattle hooves. It is typically laid down in layers. In some cases, the lowest layer may be an "interface layer" – a compacted mixture of manure and pen surface material (clay/gravel). The interface layer has a low permeability and offers additional production against nutrient leaching through the pen surface (Lott et al. 1994) and shall not be removed during pen cleaning.

As the proposed development shall be designed, constructed and managed in accordance with The National Guidelines for Beef Cattle feedlots (MLA, 2012b) and the National Beef Cattle Feedlot Environmental Code of Practice , 2nd Edition, cleaning and maintenance schedule shall be in accordance with the highest level of management standards.

The machinery to be used for pen and drain cleaning and maintenance activities includes:

- skid steer loader – under fence cleaning and removal of solids from around feed and water troughs;
- front-end loader to remove manure out of the pens/drains and stockpile area;
- rigid tip trucks for removing manure from the pens to the solid waste stockpile / carcass composting area, loading manure and compost for transport to the utilisation areas; and
- front-end loader for mixing and aerating the manure windrows and carcass compost.

8.7.4.2.2. Under-fence cleaning

The removal of manure from under fence lines is important for two reasons. Accumulated manure acts as a fly breeding area and a trap that prevents run-off leaving the pen. Removal of accumulated manure under fence lines shall be undertaken at the same time as pen cleaning.

Table 21 summarises the proposed under-fence cleaning interval for the proposed development.

8.7.4.2.3. Pen maintenance

Pen maintenance will be in accord with The National Guidelines for Beef Cattle feedlots (MLA, 2012b) and the National Beef Cattle Feedlot Environmental Code of Practice, 2nd Edition. General pen maintenance activities shall be conducted after each pen cleaning event and the manure from the pens and under fence lines has been removed. General pen maintenance activities include:

- Depressions/potholes within the pen are filled and compacted
- Elimination of wet spots in the pen surface
- Removal of split feed residues from around feed bunks.

Attention shall be given to the area behind the feed bunk apron, as that area tends to become worn and hollowed out and, if not maintained, retains water, remains boggy and quickly becomes worn.

Table 21 summarises the proposed pen maintenance interval for the proposed development.

8.7.4.2.4. Drain cleaning

To work effectively, drains need to be maintained. Poorly maintained drains such as when vegetation is allowed to grow in them or if manure builds up, restricts the flow of stormwater allowing, manure in the runoff from pens to be deposited in the drains rather than flowing to the sedimentation basin.

Manure in drains is difficult to remove and tends to stay wet, thus creating an odour problem.

When practical, drains shall be cleaned after each rainfall event. Cleaning includes removal of manure and vegetation.

Table 21 summarises the proposed drain cleaning interval for the proposed development.

Table 21 – Proposed development - Pen and drain cleaning and maintenance schedule

Activity	Frequency and / or Action
Removal of spilt feed /feed residues	Weekly
Elimination of wet patches in pens	Weekly
Repairs to potholes in pens	Weekly
Clean water troughs	Weekly
Under fence cleaning	Monthly (or after manure obstructs pen drainage)
Pen cleaning	At intervals not exceeding 10 weeks
Pen surface checks	After runoff events and repaired as required
Diversion banks and drains	After runoff events and repaired as required

8.7.4.2.5. Manure stockpile / processing

The manure collected from the pens shall be stored adjacent to the production pens on the western side of the proposed development, in the solid waste storage area as shown in Figure 6. The solid waste storage area is within the controlled drainage area, and therefore, runoff from the storage area is prevented from flowing uncontrolled into the natural environment.

A solid waste storage area is needed to stockpile harvested manure so that pen cleaning can regularly occur even though it may not be possible to continually spread the manure or remove it from the site. Very few feedlots spread manure directly after pen cleaning, although a number send manure off-site immediately after cleaning if possible. Manure stockpiling and passive or active composting reduces the bulk and sometimes the moisture content of the manure. It also improves the handling properties of the manure by breaking up lumps. The solid waste storage area is also used to store composting mortalities until the compost is cured.

Typically, manure removed from the pens, drains and sedimentation basin will be laid out in windrows with the long axes perpendicular to the area contours to ensure free drainage. Each windrow shall be approximately 2 to 2.5 m in height, with base widths ranging from 16 to 20 m with a triangular cross-section geometry. The top of the windrow shall be shaped to an apex to shed rainfall.

Manure may also be temporarily placed in a stockpile prior to placement in windrows. If this is required, manure shall be added to the stockpile in thin even layers. Each layer shall be dry (25% moisture content) otherwise spontaneous combustion may occur. Following the addition of each layer, the stockpile shall be compacted if the stockpile is to be stacked deeper than about 1.8 m.

The stockpiled manure will decompose anaerobically. Anaerobic bacteria break down the organic matter, reducing the total dry weight of the manure. The nitrogen content is reduced by its conversion to gaseous forms that are released to the atmosphere during the decomposition process. The concentration of other less volatile and less soluble nutrients such as phosphorus, increase in the stockpile as the volume of manure decreases. The anaerobic decomposition process generates considerable heat. Temperatures up to 54°C are commonly experienced. The heat generated in well-managed stockpiles may be sufficient to sterilise any weed seeds and a significant proportion of potentially harmful pathogens contained in the manure.

Manure from the stockpile area shall be removed in line with cropping program demands and placed directly onto the available solid waste utilisation area, as shown in Figure 12, when possible and favourable weather conditions permitting, which would reduce the risk of odours.

8.7.4.2.6. Carcass composting

The average mortality rate in Australian feedlots is around 0.9% expressed as a percentage of cattle throughput. Losses tend to be higher in cattle sourced from saleyards and lower for backgrounded cattle. Most mortalities occur relatively early in the feeding period.

Based on an average mortality of 1%, the expected number of mortalities per year is approximately 75 animals (~31 t of carcasses).

Carcasses are removed from the pens on a daily basis and taken to the cattle handling facility for post-mortem or directly to the solid waste stockpile and carcass composting area. Typically, carcasses shall be lifted and carried using a front-end loader rather than being dragged away, which could result in the discharge of blood and other body fluids.

The majority of carcass mass is moisture and will evaporate, significantly reducing the mass remaining after composting. The mass of carcasses is considered negligible when compared to the mass and nutrient content of manure that will be handled. Carcasses will be composted in separate windrows to the bulk manure windrows.

The construction and management of a carcass compost windrow shall generally comprise the following:

- A bed of at least 300 mm of the material being used as the carbon source (e.g. sawdust or straw) is placed on the base of the composting area. This bed of material absorbs leachate from the carcasses;
- A carcass is placed on the straw or sawdust bed and covered with at least 500 mm of manure on all sides;
- The carcass windrow shall be no more than two levels of carcasses high. The second level of carcasses shall be placed on top of 50 mm of manure covering the first level of carcasses and covered with at least 500 mm of manure;
- The top of the windrow shall be shaped to an apex to shed rainfall;
- The windrow shall be periodically checked, and any exposed carcasses recovered. The carcasses must be covered to facilitate the composting process by adding a carbon source, and to control odours and in deterring vermin from disturbing the windrow;
- Active composting may last for up to 4-8 months. The windrow is every 2-3 months;
- After active composting the composted windrow is left to mature for at least 3-4 months; and
- The carcass composting area are monitored from scavenging animals and livestock.

Since effective aerobic composting of carcasses is a low odour process, the carcass composting area is not expected to be a significant odour source.

8.7.4.2.7. Sedimentation basin

The sedimentation basin has been designed to separate larger solids in the stormwater runoff from the liquid component. Solids should settle in the basin while the liquid drains into the holding pond.

Over time, solids build up in the sedimentation basin and, if not removed, will begin to flow into the holding pond. The sedimentation basin shall be checked for efficacy after each runoff event.

Where practical, the sedimentation basin shall be allowed to dry out prior to removal of sediment.

Typically, sediment shall be removed using a front-end loader or similar equipment.

8.7.4.3 Utilisation

Solid waste shall be applied sustainably to cropping land using a tractor drawn moving bed manure spreader or similar equipment on the subject land or removed off-site to be used as a soil conditioner and organic fertiliser on cropping and pasture operations on adjoining land leased by the applicant or other cropping land owned by the applicant in the local region.

The minimum land area required was determined by a nutrient mass balance on the removal of the nutrients in the solid waste (manure, sludge, carcass compost) by the types of crops to be grown within the solid waste utilisation area.

The typical composition of aged beef cattle feedlot manure is shown in Table 22.

Table 22 – Typical characteristics of cattle feedlot manure (MLA, 2015b)

Parameter		Units	Average	Range
Total Nitrogen	N	%	2.18	1-3
Ammonium Nitrogen	NH_4^+ - N	mg/kg	1,430	0 – 3,800
Nitrate Nitrogen	NO_3^- - N	mg/kg	307	1-1,115
Total Phosphorous	P	%	0.8	0.5 – 1.1
Potassium	K	%	1.9	0.75 – 3.2
Sodium	Na	%	0.3	0.04 – 0.7
Acidity/Alkalinity	pH		7.2	6.3 – 8.7
Electrical Conductivity	EC	dS/m	8.26	0.16 – 17.2

Cereal and sorghum crops shall be grown under dryland and irrigated conditions within the solid waste utilisation area and harvested and reused as grain and roughage in the proposed development's feed ration. The typical crops proposed to be grown on the solid waste utilisation areas are outlined in Table 23. The typical yields are based on on-farm averages over the last few years and supplied by the applicant. The typical nutrient analyses of each crop have been sourced from the Feedlot Assessment Spreadsheet V8.4 (DAF, 2019).

Table 23 – Proposed development – Solid waste utilisation area – Typical crops and yields

Crop	Typical DM yield t/ha	N DM %	P DM %	K DM %
Barley (grain/straw) (Irrigated)	4-6	1.5	0.22	1.5
Maize (silage)	20-25	2.0	0.30	2.4

8.7.4.3.1. Nutrient Limited Application Rates

The *National Guidelines for Beef Cattle Feedlots in Australia* (MLA, 2012a) express a mass balance equation in the form of a Nutrient Limited Application Rate (NLAR) equation. Solid waste is applied to the solid waste utilisation area where the biomass accumulation and the quantities of N and P that are removed from the area through crop growth and the export of harvested material are determined.

The mass balance equation in the form of a nutrient limited application rate (NLAR) equation, denoted as:

$$NLAR = \frac{CR+SS+EL}{NW\ x\ 10^{-3}} \quad \text{.....Equation 2}$$

where:
NLAR = nutrient limited application rate of solid waste (t/ha)
CR = crop requirement for the applied nutrient (kg/ha)
SS = soil storage (kg/ha)
EL = allowable nutrient losses to the environment (kg/ha)
NW = available nutrient concentration in the solid waste feedlot manure (mg/kg).

In the assessment of the NLAR, soil storage (SS) and allowable nutrient losses (EL) are ignored as the intention is to only apply nutrients to match crop requirements. The predicted solid waste nutrient concentrations are summarised in Table 22.

The annual application rate for the nitrogen and phosphorus contained in the solid waste were calculated using the NLAR approach.

The typical crops grown on the solid waste utilisation areas and nutrient analyses are outlined in Table 23.

The NLAR was calculated based on a winter barley crop which was harvested for grain and straw and a maize summer crop harvested for silage. A summer maize crop and winter barley crop could remove about 552 kg/ha N, 84 kg/ha P and 495 kg/ha K as shown in Table 24.

Table 24 – Proposed development – Solid waste utilisation – NLAR summary

Parameter	Units	Code	N	P	K
Crop requirement	kg/ha	CR	552	84	495
Soil storage	kg/ha	SS	0	0	0
Allowable losses	kg/ha	EL	0	0	0
Nutrient concentration	mg/kg	NW	21,800	8,000	19,000
NLAR	t/ha	NLAR	25.3	10.5	26.0
Area required	ha	-	70	169	68

The minimum area required for solid waste utilisation will be the largest calculated for any individual nutrient constituent (MLA 2012a). The minimum area required for uptake of P is 169 ha. The proposed development has an area of about 116 ha available for solid waste utilisation. Consequently, there is insufficient land on-site for sustainable utilisation of all of the solid waste produced. All solid waste not utilised on the subject land shall be removed off-site and applied to cropping land on adjoining and neighbouring properties owned by the applicant.

The rationale for the use of solid waste on the dryland farming area of the subject land is to provide the appropriate agronomic conditions for the growth of crops on this area. Prior to the addition of solid waste to the solid waste utilisation area, soil and manure analysis would be undertaken to establish baseline nutrient levels and the required amount of solid waste for the crops to be grown.

8.7.5 Liquid waste management

8.7.5.1 Holding pond

The holding pond has been designed to store stormwater runoff prior to application to land. The following general maintenance practices shall be implemented:

- Embankments shall be checked for evidence or indications that erosion has or will take place, wet areas indicating seepage etc;
- All fences shall be maintained in satisfactory condition and livestock proof;
- All inlet and outlet pipework, structures and pumps shall be checked regularly to ensure adequate functioning, e.g. flow rates, leaks;
- Tree and shrubs on the embankment shall be removed to ensure the technical integrity of the embankment is maintained and prevent drying out of the embankment core; and
- Grass cover shall be established and regularly mowed to prevent erosion of embankment slopes and a resting site for flies or habitat for other vermin.

Despite the pre-treatment of settling the suspended solids, the stormwater runoff may still contain a proportion of suspended solids entering the holding pond. Subsequently, after several years each holding pond may need to be desludged.

The holding pond shall be desludged when it is apparent that sludge level in the holding pond is causing loss of detention in the holding pond and degeneration of the effectiveness of treatment. Therefore, the following maintenance practices shall be implemented:

- Sludge levels shall be measured annually;
- Sludge levels shall never exceed more than 10% of the holding pond capacity; and
- Clay lining of the holding pond shall be checked after each desludging to ensure its structure and integrity has not been damaged or compromised. Any damage to lining will need to be repaired before liquid waste is reintroduced into the holding pond.

If the holding pond fills during abnormal wet weather and an overflow is imminent or spills, it is generally preferable to irrigate liquid waste onto a wet irrigation area (if practical) rather than allow the pond to spill. Irrigation will assist in dispersing the liquid waste over a large area and provide a greater opportunity for filtering by vegetation and dilution from stormwater.

8.7.5.2 Utilisation

Land has been identified on the subject land as being suitable for application of effluent as shown in Figure 12 along with the proposed buffers to sensitive areas (e.g. watercourses, vegetation communities, drainage lines and property boundaries). The amount of land proposed for irrigation of effluent is approximately 32 ha.

When available, effluent shall be sustainably applied to cropping land using flood irrigation within the dedicated effluent utilisation area on the subject land.

A sustainable effluent irrigation management system will achieve a balance between the use of effluent for irrigation with the nutrient requirements of the crop while protecting the environment from potential pollution. Additionally, the amenity of the surrounding environment and meeting the needs on a social and ecological level are important considerations in sustainability.

Utilisation of effluent will substitute a percentage of the synthetic fertilisers that would otherwise be trucked-in for use in the existing cropping program on the subject property. Various crops shall be grown on the effluent utilisation area with the predominant crop being maize which will be harvested as silage to use as feed commodities in the proposed development.

8.7.6 Hours of operation

The proposed development shall operate 12 hours per day between 6.00 am and 6.00 pm, 7 days per week including public holidays. Operating hours will be applied with any noise limitations and requirements taken into consideration. Staff shall be on-site 24 hours a day, 7 days a week.

Typically, cattle shall be inducted between 7:00 am and 5:00 pm on Tuesday, Wednesday and Thursday between 1:30am to 3:00pm. As far as practical, cattle are transported out of the development to slaughter on Tuesday mornings (6:30am), Wednesday afternoon (4pm) and on Sunday between 12:00 pm and 4:00 pm.

Periodically, heavy vehicle movements do occur outside of normal operating hours (e.g. in summer), as it is desirable to transport cattle either at night or in the early hours of the morning for animal welfare reasons.

As far as practical, delivery of feed commodities occurs between 7:00 am and 5:00 pm on Monday to Friday.

The proposed development will require the flexibility to allow strategic heavy vehicle movements outside of the normal operating hours.

8.7.7 Vehicles and equipment

The anticipated vehicles and equipment required during operation of the proposed development are shown in Table 25. The make and model of vehicles and equipment is based on those currently in use at the existing development and are subject to change.

Table 25 – Proposed development - Typical vehicles and equipment

Activity	Vehicles / Equipment
Livestock transport	Heavy vehicle – Semi-trailer / B-double (permit)
Incoming feed commodities	Semi-trailer/B-Double (permit)
Solid waste processing/removal off-site	Front-end loader/semi-trailer
Pen cleaning	Bobcat / 4wd tractor / front-end loader
Feed processing/Ration delivery	Front-end loader/Tractor drawn mixer wagon
Personnel	Light vehicle

8.7.8 Workforce requirements

The proposed development shall provide employment for four (4) full time personnel when fully developed. This includes staff undertaking administrative, livestock handling, feed storage, preparation and delivery and waste management activities.

One staff member can be accommodated on-site in the subject land homestead. No additional accommodation shall be provided on-site for staff. All staff shall be trained to uphold strong guidelines in animal health and welfare and the environment.

8.7.9 Traffic and access arrangements

All traffic would access the proposed development site from the existing development site entrance off Broughans Road.

The proposed entrance would be sited some 400 m east of James Road/Broughans Road intersection.

An assessment of the impacts to the safety and function of the road network; and the details of any road upgrades required for the development has been completed and presented in the Traffic Impact Assessment provided in Appendix Q.

8.7.10 Hazardous chemical storage

To minimise the risk of environmental harm from liquid spills and leaks, all hazardous chemicals required to be stored on-site shall have a spill containment system appropriate for the nature and pollution risk of that liquid in accordance with relevant guidelines and Australian Standards. Liquids that may be stored during the operation of the proposed development include:

- agricultural chemicals – herbicides, pesticides etc
- cleaning agents
- detergents and their by-products
- engine coolant
- oil, grease, lubricants
- diesel, petrol fuels
- solvents.

All spill containment systems shall be routinely inspected to ensure maintenance of their integrity. A routine inspection and maintenance program shall be tailored to suit the specific installation.

8.7.11 Fire management strategy

A fire is an emergency that causes the greatest concern for personnel. A fire management strategy shall be developed for fire developing from a range of sources. These include bushfires (e.g. planned controlled burning that escapes the original burn zone, embers from a cigarette or unattended campfire, lightning strikes, or deliberate arson), fires originating from the development such as from flammable hazardous material storage, machinery use, electrical faults, maintenance activities or feed storage and processing where hay and/or grain dust is present etc.

The risk of fire is offset by strategies that reduce fire risk. Suitable access and adequate infrastructure to support suppression of fire is provided by way of adequate water supply (storage tanks, irrigation pumps), fire breaks and portable extinguishers.

A grassed fire break shall be maintained around the proposed development outside of the controlled drainage area that will also provide access for fire-fighting vehicles. The grass shall be regularly slashed and a height of no greater than 5 cm maintained.

The water supply storages (Turkey's nest / Tanks) shall be used as fire-fighting water in the event of fire.

8.7.12 Lighting

All outdoor lighting shall me managed in accordance with AS4282 (1997 – Control of the Obtrusive Effects of Outdoor Lighting).

8.7.13 Vermin and disease control measures

Vermin such as flies, rodents (rats/mice), pest birds may become a problem at the proposed development during operation, irritating stock and workers and carrying infectious diseases.

The major nuisance flies in feedlots are house flies, stable flies, bush flies and blowflies. House and stable flies breed in non-compacted solid wastes often under fence lines, in drains and in the sedimentation basin. Blowflies breed in animal carcasses. Bush flies rarely breed in feedlots but can fly in from external breeding sites.

Rodents, such as mice and rats may become a problem at the development complex during operation by consuming and contaminating stored/processed feed, cause structural damage such as undermining feed bunk aprons, chewing holes in silage covers, cabling etc and carry infectious diseases including leptospirosis etc.

Pest birds such as ducks or parrots may become a problem at the development complex during operation by consuming and contaminating the livestock feed, cause structural damage such as chewing communication cabling etc.

Vermin can be difficult to control when populations have become established. Hence, an Integrated Pest Management (IPM) program that incorporates good hygiene, physical methods, biological agents and the focused use of insecticides to prevent and reduce vermin populations shall be implemented, rather than relying on insecticidal control methods alone or control of a large infestation.

The management practices adopted to minimise vermin populations shall include:

- Good hygiene practices are implemented at feed storage and preparation areas and feed bunks such as cleaning up and disposing of spoilt/spilled grains and commodities and rations;
- Ensuring grassed areas are kept short by regular mowing and trimming to reduce fly habitat;
- Ensuring weeds are controlled by physical or chemical means;
- Regular inspection of the development complex for signs of vermin infestation and pressure levels; and
- Timely implementation of appropriate control methods.

8.7.14 Emergency animal disease and mass mortality contingency plans

Emergency animal diseases (EADs) include diseases that are exotic to Australia, new and emerging diseases that are of national significance and include serious outbreaks of prohibited matter, for example foot and mouth disease.

A few serious animal diseases can be transmitted to people (e.g. rabies and bovine spongiform encephalopathy). These are known as zoonoses.

The Department of Primary Industries under the NSW State Emergency Management Plan (EMPLAN) is responsible for the management of an emergency animal disease in New south Wales. Prohibited matter animal diseases are listed in Schedule 2 of the Biosecurity Act 2015.

All emergency animal diseases must be reported to the Local Land Services or the EAD hotline on 1800 675 88 as soon as they are suspected. All development personnel involved in the daily monitoring and handling of livestock should be aware of unusual signs or signs of emergency animal diseases of concern to beef cattle.

AUSVETPLAN Enterprise Manual for beef cattle feedlots and other supporting AUSVET documents provide guidelines on the responsibilities and actions during an EAD outbreak, as required by the relevant government authorities, and the strategies that may be adopted to improve preparedness for, or to handle, a suspected EAD.

Standard operating procedures for each government jurisdiction, agency support plans for the involvement of other areas of emergency management (e.g. police, local government), diagnostic resources and training materials also support the AUSVETPLAN core materials. All these documents can be accessed from the Animal Health Australia website.

If an emergency disease is identified within the proposed development, the requirements of the AUSVETPLAN and any directions from the relevant authority shall be followed as far as relevant to the proposed development.

Emergency animal disease outbreak and / or mass mortality contingency plans will be developed as part of the operational environmental management plan (if development consent is granted). A suitable site for mass burial of mortalities has been identified on the subject property as shown in Figure 12.

The burial pits shall be established in low permeability soils (red sodosol) on a site well removed from surface waters, drainage lines, gullies, groundwater bores and the development complex. The soils in this location are low permeability, thus lining of the pits with clay is unlikely to be required. If lining is required, then the pits shall be lined with at least 600 mm of clay.

The pit shall be located so that all water runoff is directed away from the pit. Use of diversion bunds or trenches may be required. Pits shall be deep but relatively narrow and excavated using an excavator.

The carcass of each animal shall be opened at the time of placing in the pit and the carcass immediately covered by at least 500 mm of soil to reduce odour and exclude flies and vermin.

Each pit shall be progressively filled with carcasses until sufficient pit capacity remains for the pit to be sealed with clay and compacted to a minimum depth of 1 m.

Soil shall be mounded over the top and replenished should the pit subside to below ground level.

The site where mass mortalities are buried shall be recorded for future reference.

Where the mortalities are suspected to be caused by an emergency/infectious disease AUSVETPLAN procedures shall be implemented and disposal managed under the AUSVETPLAN. In this case, advice shall be sought from NSW Department of Primary Industries and/or the Environment Protection Authority.

8.7.15 Environmental management and monitoring

The applicant is committed to conducting activities associated with the operation of the proposed development in an environmentally responsible manner and aim to implement best practice environmental management as part of a program of continuous improvement. This will be achieved by addressing issues systematically and consistent with a range of environmental procedures.

The applicant currently holds accreditation under the Aus-meat National Feedlot Accreditation Scheme (NFAS) for the existing feedlot.

In accordance with the requirements under Part 6 of the EP&A Act, AJ & NA Varley commit to the environmental management and monitoring of the operation of the proposed development. An outline of an environmental management plan (EMP) has been developed for the construction and operation of the proposed development, as shown in section 15.2.1.

A draft Operational Environmental Management Plan (OEMP) and relevant sub-plans has been prepared as part of the assessment process and provided in Appendix P.

Environmental monitoring, including using sustainability indicators to interpret results, is critical to the overall environmental management of the proposed development. It provides a mechanism to assess the effectiveness of strategies chosen to minimise environmental harm and allows adjustment of management practices to prevent those impacts from reaching unacceptable levels.

A preliminary environmental monitoring program for the proposed development has been developed as part of the OEMP. The key environmental parameters to be monitored would include but not limited to:

- Solid and liquid waste management systems e.g. efficacy of collection and storage systems, utilisation performance measures

- Climatic variables that influence solid and liquid waste storage and utilisation systems or odour nuisance e.g. rainfall, evaporation, wind speed, wind direction
- Surface water quality
- Groundwater quality
- Social impacts e.g. Odour, dust and noise complaints.

The OEMP and associated sub-plans provides details and justification for the proposed monitoring program for soil characteristics, composted solid waste quality and quantity, liquid waste quality and quantity, surface and groundwater quality and air quality. The OEMP and sub-plans provide details of the locations of all monitoring sites and the parameters that will be monitored.

Where relevant, the monitoring program aligns with the recommendations in the guidelines 'Development of Indicators of Sustainability for Effluent Reuse in the Intensive Livestock Industries: Piggeries and Cattle Feedlots' (McGahan and Tucker, 2003) and 'Use of Effluent by irrigation' (DEC, 2004). A summary of the proposed parameters to be monitored for various environmental aspects are outlined in the following sections.

8.7.15.1 Solid and liquid waste management systems

Detailed assessment of effluent, solid waste, soil, surface waters and groundwater shall be conducted prior to the commencement of effluent and solid waste application, to identify the size of environmental risks as outlined in section 13.11 and to provide baseline data for future operational monitoring.

8.7.15.2 Effluent

As soon as practicable after commencing operation, liquid waste shall be characterised for various constituents likely to be present to determine irrigation application rates and management of application. The composition of liquid waste depends on such factors as the class of animal being fed and hence ration(s) being used, the cattle drinking water quality, pen cleaning practices, occupancy and stocking density, climatic effects (e.g. rainfall) and the length of time the liquid wastes is stored prior to utilisation. Table 26 provides a summary of the recommended monitoring parameters for effluent. The Effluent and Solid Waste Management Plan contained within the OEMP (Appendix P) provides details of all effluent monitoring sites and the parameters that will be monitored. Additional parameters may also be required by the development's Environment Protection Licence or local council requirements.

Table 26 provide recommended monitoring parameters for effluent.

Table 26 – Proposed development – Recommended liquid waste analysis parameters

Test parameter	Frequency	Justification
pH	3 months	Influences nutrient availability
Total Suspended Solids	3 months	Operational behaviour of treatment system
Total nitrogen or TKN	3 months	Measure of nitrogen applied for mass balance calculations
Ammonium-nitrogen	3 months	Measure of nitrogen available or potentially lost as ammonia volatilisation
Nitrate-nitrogen	3 months	Measure of nitrogen immediately available for plant uptake
Total phosphorus	3 months	Measure of phosphorus applied for mass balance calculations
Exchangeable cations and CEC (potassium, sodium, magnesium, calcium)	3 months	Important implications for soil structure
SAR	3 months	Measure of liquid waste sodicity
Electrical conductivity and chloride	3 months	Measure of solids salinity

TKN = Total Kjeldahl Nitrogen; SAR = sodium absorption ratio

8.7.15.3 Solid waste

As soon as practicable after commencing operation, solid waste shall be characterised for various constituents likely to be present to determine application rates. The composition of solid waste depends on such factors as the class of animal being fed and hence ration(s) being used, the cattle drinking water quality, pen cleaning practices, occupancy and stocking density, climatic effects (e.g. rainfall) and the length of time the solid wastes are stored prior to utilisation. Table 27 provides a summary of the recommended monitoring parameters for solid waste. The Effluent and Solid Waste Management Plan contained within the OEMP (Appendix P) provides details of all solid waste monitoring sites and the parameters that will be monitored. Additional parameters may also be required by the development's Environment Protection Licence or local council requirements.

Table 27 – Proposed development – Recommended solid waste analysis parameters

Test parameter	Frequency	Justification
pH	6 months	Influences nutrient availability
Dry matter	6 months	To calculate nutrient applied
Total nitrogen or TKN	6 months	Measure of nitrogen applied for mass balance calculations
Ammonium-nitrogen	6 months	Measure of nitrogen available or potentially lost as ammonia volatilisation
Nitrate-nitrogen	6 months	Measure of nitrogen immediately available for plant uptake
Total phosphorus	6 months	Measure of phosphorus applied for mass balance calculations
Exchangeable Cations and CEC (potassium, sodium, magnesium, calcium)	6 months	Important implications for soil structure
Organic carbon	6 months	Influences soil stability
Sulfur	6 months	Influences nutrient availability
Moisture Content	6 months	To calculate nutrient applied
Electrical conductivity and chloride	6 months	Measure of solids salinity

TKN = Total Kjeldahl Nitrogen

8.7.15.4 Soils of utilisation area

Soil characteristics and nutrient levels of the solid and liquid utilisation area have been established when designing the requirements for a sustainable solid and liquid utilisation system as described in section 13.11. The initial characterisation of the soil shall be used as a benchmark against which any future operational monitoring results can be measured.

Monitoring soil samples shall be taken in close proximity to the initial site characterisation soil sampling locations.

Table 28 provides a summary of the recommended monitoring parameters for soils of the solid and liquid waste utilisation areas. The Soil and Water Quality Management Plan contained within the OEMP (Appendix P) provides details of all soil monitoring sites and the parameters that will be monitored. Additional parameters may also be required by the development's Environment Protection Licence or local council requirements.

Table 28 – Proposed development – Recommended soil analysis parameters

Soil test parameter	Depth (down profile)	Frequency	Justification
pH		Every 3 years	Influences nutrient availability
EC_{se} (Can measure $EC_{1:5}$ and convert to EC_{se})	0-10cm 20-30 cm 50-60 cm OR base of root zone	Yearly	Measure of soil salinity
Total Nitrogen	0-30 cm 20-30 cm 50-60 cm	Yearly	Measure of nitrogen applied for mass balance calculations
Nitrate-nitrogen	0-10 cm 20-30 cm 50-60 cm	Yearly	Measure of nitrogen available for plant uptake, levels of nitrates at the base of the root zone
Available phosphorus (Colwell)	0-10 cm 50-60 cm	Yearly	Measure of phosphorus available for plant uptake
Phosphorus sorption capacity	0 –60 cm	Yearly	Measure of the soils ability to safely store phosphorus - essential if applying more than plant uptake
Organic carbon	0-10 cm	Yearly	Influences soil stability and consequently soil erosion
Exchangeable cations and CEC (Calcium, sodium, potassium, magnesium).	0-10 cm 50-60 cm	Yearly	Needed to calculate ESP, EKP and Ca: Mg, which have important implications for soil structure
Chloride	0-30 cm 50-60 cm	Yearly	Influences plant functions

EC = electrical conductivity; CEC = cation exchange capacity; ESP = exchangeable sodium percentage; EKP = exchangeable potassium percentage.

8.7.15.5 Climatic variables

Climatic variables, such as rainfall, evaporation, wind speed, wind direction may influence solid and liquid waste storage and utilisation systems or odour nuisance.

Subsequently, installation of an automatic weather station to continuously monitor wind direction and speed, along with other climatic conditions is generally a requirement of the development's Environment Protection Licence. These data can also be useful for complaint validation. Table 29 provides a summary of the recommended climate monitoring parameters. The Air Quality Management Plan contained within the OEMP (Appendix P) provides details of the climate monitoring sites and the parameters that will be monitored. Additional parameters may also be required by the development's Environment Protection Licence.

Table 29 – Proposed Development - Recommended climate analysis parameters

Test parameter	Frequency
Air Temperature	Continuous
Wind Direction	Continuous
Sigma Theta	Continuous
Wind Speed	Continuous
Rainfall	Continuous

8.7.15.6 Groundwater

Groundwater may be monitored if the existing groundwater quality is at risk from the effluent utilisation system. Monitoring any potential impacts on groundwater drinking water supplies may also be required.

Table 30 provides a summary of the recommended key quality monitoring parameters for groundwater. The Soil and Water Quality Management Plan contained within the OEMP (Appendix P) provides details of all groundwater monitoring sites and the parameters that will be monitored. Additional parameters may also be required by the development's Environment Protection Licence or local council requirements.

Table 30 – Proposed development – Recommended groundwater analysis parameters

Test parameter	Frequency	Justification
pH	6 months	Water quality protection
Total Suspended Solids	6 months	Water quality protection
Total nitrogen or TKN	6 months	Water quality protection
Ammonium-nitrogen	6 months	Water quality protection
Nitrate-nitrogen	6 months	Water quality protection
Total phosphorus	6 months	Water quality protection
Exchangeable Cations and CEC (potassium, sodium, magnesium, calcium)	6 months	Water quality protection
SAR	6 months	Water quality protection
Electrical conductivity and chloride	6 months	Water quality protection
Standing Water Level	6 months	Water quality protection

TKN = Total Kjeldahl Nitrogen

Water quality monitoring shall be undertaken in accordance with approved methods for the sampling and analysis of water pollutant in NSW (NSW Environment Protection Authority).

8.7.15.7 Surface water

Surface waters shall be analysed several times before irrigation of liquid waste (upstream and downstream of the liquid waste utilisation areas), following storms and during high flows.

Water monitoring shall provide data that is representative of adjoining surface waters and is able to indicate contributions of any pollutants as a result of the development (compared to contributions of similar pollutants from upstream sources).

Key quality indicators both upstream and downstream of the point where surface runoff discharges from the property shall be measured. Table 31 provides a summary of the recommended monitoring parameters for surface waters. The Soils and Water Quality Management Plan contained within the OEMP (Appendix P) provides details of all surface water monitoring sites and the parameters that will be monitored. Additional parameters may also be required by the development's Environment Protection Licence or local council requirements.

Table 31 – Proposed development – Recommended surface waters analysis parameters

Test parameter	Frequency	Justification
pH	Event	Water quality protection
Total Suspended Solids	Event	Water quality protection
Total nitrogen or TKN	Event	Water quality protection
Ammonium-nitrogen	Event	Water quality protection
Nitrate-nitrogen	Event	Water quality protection
Total phosphorus	Event	Water quality protection
Exchangeable Cations and CEC (potassium, sodium, magnesium, calcium)	Event	Water quality protection
SAR	Event	Water quality protection
Electrical conductivity and chloride	Event	Water quality protection

TKN = Total Kjeldahl Nitrogen

8.7.15.8 Social impacts

8.7.15.9 Community liaison

Open communication between the neighbours and regulators from the inception of the development application through construction and operation can help to identify social impact issues and identify and address these issues to minimise the impact of the development (when approved) on neighbours. Once operational, community liaison practices may include:

- informing neighbours in advance of any unusual events/problems/emergency practices that may cause an unavoidable increase in odour, dust or noise, including practices to mitigate the issue and the expected duration of the issue;
- participation and cooperation in dispute resolution;
- gathering relevant evidence, and identifying and implementing strategies to remedy the issue; and
- informing the complainant of the outcome of any investigations and any actions taken to avoid future associated issues and seeking feedback to ascertain if the issue has been resolved.

8.7.15.10 Handling complaints

The number of complaints received is one measure of the impact of the development (when approved) on community amenity. While this measure is imperfect, it helps to identify when sensitive receptors perceive that the development is unreasonably affecting their enjoyment of life and property. Many community amenity impacts are closely related to weather conditions, so daily weather data can assist in assessing the validity of complaints.

Details of any complaints received, results of investigations, and corrective actions taken shall be recorded in a 'complaints register'. The Operation Environmental Management Plan (Appendix P) outlines the compliant handling process.

Ther have been no recorded complaints against the existing development over the 20 years of operation.

8.8 Animal care statement

The applicants AJ & NA Varley will manage the proposed development to ensure a very high standard of animal welfare and health.

The operation and practices for the proposed development will comply with following national guidelines and standards:

- Model Code of Practice for the Welfare of Animals: Cattle (SCARM, 2004);
- Australian Animal Welfare Standards and Guidelines — Land Transport of Livestock (Animal Health Australia (AHA) 2012);
- Queensland Code of practice for land transport of livestock (QLD) - *Animal Care and Protection Act 2001 (QLD);*
- The Prevention of Cruelty to Animals (Land Transport of Livestock) Standards 2013 No 1 (NSW);
- Prevention of Cruelty to Animals (Land Transport of Livestock) Standards 2013 No 2 (NSW); and
- NFAS Rules and Standards (August 2021) (AUS-MEAT NFAS 01/2021).

9. Relevant statutory planning

The development application and associated EIS for the proposed development will be assessed in accordance with the framework established by the EP&A Act 1979 and the EP&A Regulation 2000.

As part of the assessment, a number of local and State planning instruments and policies are required to be addressed, together with relevant Commonwealth and NSW legislation. This section provides an outline of the environmental planning framework and assesses the proposed development in the context of that framework. It describes how the proposed development will address and / or comply with local planning policies; and state and federal legislation. The applicable policy and / or objects of each piece of legislation is provided, followed by a statement outlining how the development will address and / or comply with the planning policies; and state and federal legislation.

9.1 Local planning matters

9.1.1 Conargo Local Environmental Plan 2013

The primary local planning instrument applying to the proposed development is the Conargo Local Environmental Plan 2013. The framework of the Conargo LEP is derived from the Environmental Planning and Assessment Act 1979 No 203. The particular aims of the Conargo LEP include:

(aa) to protect and promote the use and development of land for arts and cultural activity, including music and other performance arts,

(a) to encourage sustainable economic growth and development in Conargo,

(b) to provide for a range of development opportunities that contribute to the social, economic and environmental resources of the area and support the long-term and economic viability of the local community,

(c) to protect, enhance and conserve agricultural land through the proper management, development and conservation of natural and human-made resources,

(d) to promote the efficient and equitable provision of public services, infrastructure and amenities,

(e) to conserve, protect and enhance the environmental and cultural heritage of Conargo,

(f) to identify, protect, conserve and enhance the natural assets of Conargo.

The proposed development of a beef cattle feedlot retains the existing agricultural use of the land and has been carefully assessed through this EIS in terms of its potential effect on soils, water, heritage, waterways, flora and fauna and surrounding ecosystems. Provided that the management and mitigation measures recommended in this EIS are implemented on the site, the effect of the development upon these valuable resources would be properly managed and, the proposed development shall be consistent with the general aims of Conargo Local Environmental Plan 2013.

9.1.1.1 Development control plans

A review of Deniliquin development control plan (DCP), as amended 26 November 2019, indicates that the proposed development is outside of the geographical scope of the relevant DCP. The Deniliquin DCP applies to the township of Deniliquin only. In assessing an application the Edward River Council must ensure the development would not generate significant impacts and that it is compatible with relevant plans, policies and the objectives and controls of this DCP.

9.1.1.2 Land use definition

Use of land for a beef cattle feedlot according to the Conargo Local Environmental Plan 2013 is defined as an "Intensive Livestock Agriculture" (see definition below).

intensive livestock agriculture *means the keeping or breeding, for commercial purposes, of cattle, poultry, pigs, goats, horses or other livestock that are fed wholly or substantially on externally-sourced feed, and includes any of the following:*
(a) dairies (restricted),
(b) feedlots,
(c) piggeries,
(d) poultry farms,
but does not include extensive agriculture, aquaculture or the operation of facilities for drought or similar emergency relief.

Note – Intensive livestock agriculture is a type of **agriculture.** Agriculture under the Conargo Local Environmental Plan 2013 is defined as –

agriculture *means any of the following:*
(a) aquaculture,
(b) extensive agriculture,
(c) intensive livestock agriculture,
(d) intensive plant agriculture.

9.1.1.3 Zoning

Under the Conargo Local Environmental Plan 2013, the proposed development is located in the Rural Zone - RU1 Primary Production as shown in Figure 15. Intensive livestock keeping establishments are permissible with consent in the RU1-Primary Production zone. The LEP states that the objectives of this zone are:

- 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; and
- To minimise conflict between land uses within this zone and land uses within adjoining zones.

The proposed development would result in the sustainable, productive use of agricultural land on the subject property. An assessment of land capability, including soil types, water resources, vegetation and other physical attributes indicates that the land is suitable for the proposed development. Further, the proposed development provides diversification of primary industry enterprises and systems appropriate for the area.

The proposed development has been assessed in terms of its potential environmental impacts and management and mitigation measures recommended to mitigate potential adverse impacts to an acceptable level.

The proposed development will include the sustainable use of water resources in line with the requirements of the *Water Management Act 2000* and avoids environmentally sensitive areas such that these would be protected and preserved in accordance with relevant LEP and zone objectives.

The proposed development is consistent with the objectives of the RU1 Primary Production zone.

Conargo Local Environmental Plan 2013

Land Zoning Map - Sheet LZN_008

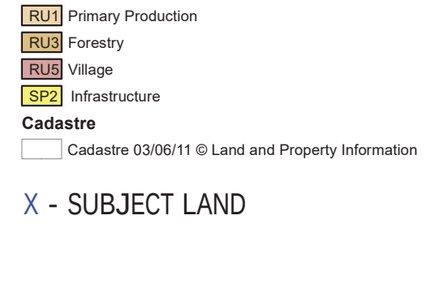
Zone

- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- R5 Large Lot Residential
- RU1 Primary Production
- RU3 Forestry
- RU5 Village
- SP2 Infrastructure

Cadastre

Cadastre 03/06/11 © Land and Property Information

X - SUBJECT LAND



N

0 1 2 3 4 5 6 7 8 Km

Scale: 1:160,000 @ A3

Projection: GDA 1994
MGA Zone 55

Map identification number: 1860_COM_LZN_008_160_20130711

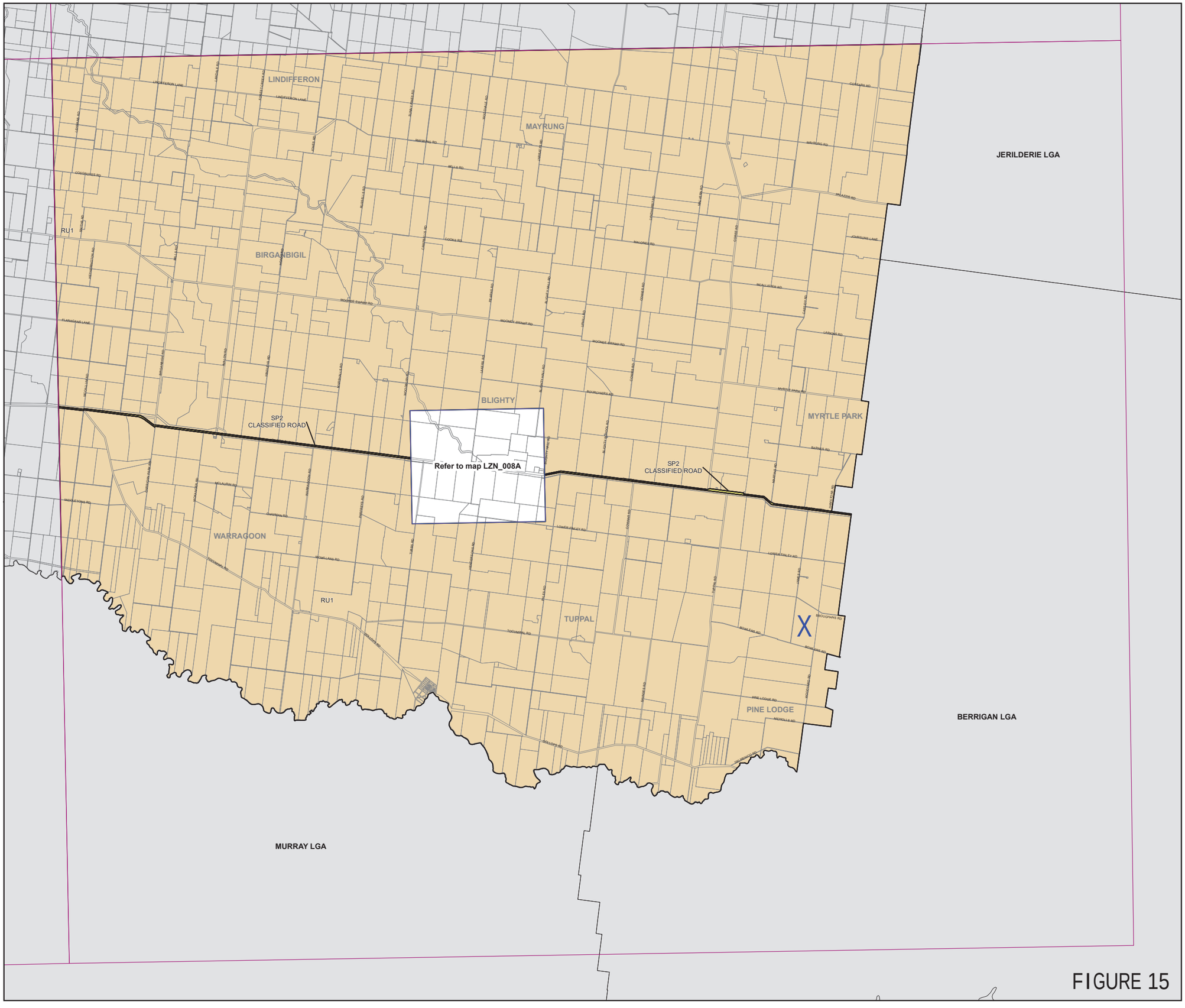


FIGURE 15

9.2 Regional Plans

The applicable regional plan is the Riverina Murray Regional Plan 2041 (RMRP). First published by NSW Department of Planning and Environment in January 2023. The RMRP defines intensive agriculture as including Agriculture activities such as horticulture, irrigated crops, glasshousing, feedlots, poultry farms that rely on high levels of inputs such as labour and capital to increase yield.

The RMRP describes the vision for the region in 2041 as a diversified economy founded on Australia's food bowl, iconic waterways and a network of vibrant connected communities. Agricultural diversification, innovation and value-adding leverages advanced and automated technologies to maximise agribusiness diversification. The expansion of intensive agriculture and food processing has attracted new families to a diverse and expanding economy, with flow-on demand and benefits for population-focused business and services. The proposed development as the expansion of a beef cattle feedlot compliments the RMRP.

9.3 State planning matters

9.3.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* and the *Environmental Planning and Assessment Regulation 2021* provide the framework for environmental planning in NSW and include provisions to ensure that proposals which have the potential to impact the environment are subject to detailed assessment and provide opportunity for public involvement.

The *Environmental Planning and Assessment Act 1979* provides the framework for NSW Planning Legislation. Under this Act, local councils prepare Local Environmental Plans (LEPs) that specify planning controls for specific parcels of land.

The Environmental Planning and Assessment Act 1979 also provides for State Environmental Planning Policies (SEPPs) and Regional Environmental Plans (REPs). Applicable SEPPs are discussed in section 9.3.3.

The objectives of EP&A Act are:

(a) to encourage:
  (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,
  (ii) the promotion and co-ordination of the orderly and economic use and development of land,
  (iii) the protection, provision and co-ordination of communication and utility services,
  (iv) the provision of land for public purposes,
  (v) the provision and co-ordination of community services and facilities, and

(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and
(vii) ecologically sustainable development, and
(viii) the provision and maintenance of affordable housing, and

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

9.3.2 Murray Regional Environmental Plan No 2-Riverine Land (Repealed)

The Murray Regional Environmental Plan No 2–Riverine Land is a former regulatory mechanism that aimed to protect and manage the riverine environment of the Murray region. It was repealed 28 February 2022. The Murray Regional Environmental Plan No 2 – Riverine Land is a repealed State Environmental Planning Policy and has been superseded by the State Environmental Planning Policy (Biodiversity & Conservation) 2021 as part of the Department's initiative to consolidate State Environmental Planning Policies to simplify and provide certainty to the planning system.

9.3.3 State Environmental Planning Polices (SEPPs)

State Environmental Planning Policies (SEPPs) deal with matters of state or regional environmental planning significance.

The NSW Planning Portal Spatial Viewer indicates that the following State Environmental Planning Policies (SEPPS) are applicable to the subject land:

- SEPP (Transport and Infrastructure) 2021;
- SEPP (Primary Production) 2021;
- SEPP (Biodiversity and Conservation) 2021;
- SEPP (Exempt and Complying Development Codes) 2008;
- SEPP (Housing) 2021;
- SEPP (Industry and Employment) 2021;
- SEPP (Planning Systems) 2021;
- SEPP (Resilience and Hazards) 2021;
- SEPP (Resources and Energy) 2021;
- SEPP (Sustainable Buildings) 2022; and
- SEPP No 65—Design Quality of Residential Apartment Development.

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.

The following sections outline SEPPs of relevance to the proposed development.

9.3.3.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The aims of the State Environmental Planning Policy (Transport and Infrastructure) 2021 are to facilitate the effective delivery of infrastructure across the State by:

(a) improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and
(b) providing greater flexibility in the location of infrastructure and service facilities, and
(c) allowing for the efficient development, redevelopment or disposal of surplus government owned land, and
(d) identifying the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development), and
(e) identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development, and
(f) providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing, and
(g) providing opportunities for infrastructure to demonstrate good design outcomes.

SEPP (Transport and Infrastructure) establishes that Transport for NSW is responsible for the administration of transport services , including roads, public transport, and maritime services in New South Wales and must be consulted in circumstances where a proposal is likely to impact the transport network.

Schedule 3 of the policy also includes development for the purposes of (Column 1) commercial premises, (Column 2) 20,000m^2 in site area or (if the site area is less than the gross floor area) gross floor area, Column 3 5,000m^2 in site area or (if the site area is less than the gross floor area) gross floor area.

The proposed development is not considered a commercial premises for the reasons:

NSW Planning and Environment LEP practice note planning system PN 11-003 issued 10 March 2011 defines a commercial premises as " commercial premises is a new group term including 'retail,' 'office' and 'business premises.' This provides an efficient term to describe the mix of uses in centres" . PN 11-003 refers to The Standard Instrument (Local Environmental Plans) Amendment Order 2011 for further definitions of retail, office and business premises.
The activity is not considered a business premises as the activity in question is defined as agriculture, specifically, intensive livestock agriculture. Intensive livestock agriculture includes a feedlot as per the Standard Instrument (Local Environmental Plans) Amendment Order 2011definition. The proposed development is for a 3,200 head feedlot.

The Standard Instrument also defines commercial premises as including an office premises. The office premises definition in the Standard Instrument is not considered to include such activities as a feedlot office as any office onsite would not have dealing with any members of the public except where such dealing is a minor activity (by appointment) and a feedlot office is ancillary to the main purpose for which the building or place is used. Additionally, the existing onsite office for the currently approved 999 head feedlot will remain unchanged in

nature and extent. The operation of the existing office involves minor dealings with the public and is ancillary to the main purpose for which the place is used, that is lot feeding of cattle.

The proposed development has a gross floor area greater than 5,000 m². However, does not have direct access to an arterial road (Riverina Highway / Newell Highway), or a road connecting with an arterial road within 90 m of the alignment of an arterial road. The proposed development shall be referred to Transport for New South Wales as part of the assessment process.

9.3.3.2 State Environmental Planning Policy (Primary Production) 2021

State Environmental Planning Policy (Primary Production) 2021 aims to require development consent for cattle feedlots above a defined capacity and to ensure that the consent authority takes into account certain criteria such as the potential for odour, water pollution and soil degradation in determining applications for such development.

The specific aims of SEPP (Primary Production) 2021 are:

(a) to facilitate the orderly economic use and development of lands for primary production,
(b) to reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources,
(c) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
(d) to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts,
(e) to encourage sustainable agriculture, including sustainable aquaculture,
(f) to require consideration of the effects of all proposed development in the State on oyster aquaculture,
(g) to identify aquaculture that is to be treated as designated development using a well-defined and concise development assessment regime based on environment risks associated with site and operational factors.

The NSW Department of Primary Industries is undertaking a mapping program across NSW to assist state and local government, other organisations and industries to recognise and value State Significant Agricultural Land (SSAL). A review of the SSAL Mapping portal indicates that the subject land is mapped as SSAL as shown as cyan shading on Figure 16.

Figure 16 – Subject land – Preliminary draft SSAL map

The mapping indicates that the subject land is mapped as SSAL mapped land. However, the proposed development is considered a compatible land use with SSAL mapped lands for the following reasons:

- The development is existing and is an agricultural use;
- The commodities produced and consumed are generated and disposed of in the local area;
- The waste products generated onsite are reused onsite or on nearby lands to improve the productivity of the surrounding landscape in terms of nutrients and carbon
- The activity is not considered to be beyond remediation with all infrastructure including waste storage areas fully remediated upon ceasing activity.

The proposed development comprises a beef cattle feedlot with a capacity exceeding 50 head. Hence, in accordance with Part 2.4 Livestock Industries section 2.17 *Development on land in Western Division for purpose of intensive livestock agriculture that exceeds stock capacity threshold* of SEPP (Primary Production) 2021, this EIS accompanies a development application made to Edward River Council seeking development consent for the establishment and operation of the cattle feedlot. This EIS addresses the policy aims of SEPP (Primary Production).

This EIS has been prepared in accordance with the requirements of the EP&A Act and Regulation and provides a detailed description and environmental assessment of the proposed beef cattle feedlot including potential impacts in terms of odour, surface and groundwater and soils and recommends mitigation and management measures to minimise potential adverse impacts. These issues are addressed in section 13. The proposed feedlot development will seek accreditation under the National Feedlot Accreditation Scheme (NFAS). The NFAS scheme addresses all relevant animal welfare matters through a Quality Assurance scheme subject to both off-site and field audits.

This EIS demonstrates that the proposed development is suitably sited and designed and will be managed to meet the aims of the SEPP (Primary Production). Land use conflicts have been mitigated through careful selection of the site and minimising the impacts on biodiversity. The main waste products of the proposed development are solid (manure/split feed/carcasses) and effluent which will be sustainably utilised on-site as an alternative to inorganic fertilisers. The proposed development will not produce hazardous waste products. While all feedlot developments produce some odour, at this development, odour impact will be minimised through appropriate siting (separation distances between the site, the closest sensitive residences and other areas with sensitive land uses), good design (pen layout, drainage) and management (pen cleaning, solid and liquid wastes), thus minimising amenity conflicts with residential receptors.

9.3.3.3 State Environmental Planning Policy (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) consolidates, transfers and repeals provisions of the following 11 SEPPs (or deemed SEPPs):

(1) SEPP (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP)
(2) SEPP (Koala Habitat Protection) 2020 (Koala SEPP 2020)
(3) SEPP (Koala Habitat Protection) 2021 (Koala SEPP 2021)
(4) Murray Regional Environmental Plan No 2—Riverine Land (Murray REP)
(5) SEPP No 19—Bushland in Urban Areas (SEPP 19)
(6) SEPP No 50—Canal Estate Development (SEPP 50)
(7) SEPP (Sydney Drinking Water Catchment) 2011 (Sydney Drinking Water SEPP)
(8) Sydney Regional Environmental Plan No 20 – Hawkesbury – Nepean River (No 2 – 1997)
(9) (Hawkesbury–Nepean River SREP)
(10) Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour
(11) Catchment SREP)
(12) Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment
(13) (Georges River REP)
(14) Willandra Lakes Regional Environmental Plan No 1 – World Heritage Property (Willandra)
(15) Lakes REP).

SEPP Biodiversity and Conservation 2021 addresses the clearing of vegetation in non rural areas.

2.6 Clearing that requires permit or approval

(1) A person must not clear vegetation in a non-rural area of the State to which Part 2.3 applies without the authority conferred by a permit granted by the council under that Part.
(2) A person must not clear native vegetation in a non-rural area of the State that exceeds the biodiversity offsets scheme threshold without the authority conferred by an approval granted by the Native Vegetation Panel under Part 2.4.
(3) Subsection (2) does not apply to clearing on biodiversity certified land under the Biodiversity Conservation Act 2016, Part 8.
(4) Clearing of vegetation is not authorised under this section unless the conditions to which the authorisation is subject are complied with.
(5) Subsection (4) extends to a condition that imposes an obligation on the person who clears the vegetation that must be complied with before or after the clearing is carried out.
(6) For the purposes of the Act, section 4.3, clearing vegetation that requires a permit or approval under this Chapter is prohibited if the clearing is not carried out in accordance with the permit or approval.

The proposed development does not require the clearing of native vegetation resulting in compliance with the provisions of the SEPP as outlined in the assessment provided in Appendix I.

9.3.3.4 State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

The State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 aims to provide streamlined assessment processes for development that complies with specified development standards by –

(a) providing exempt and complying development codes that have State-wide application; and
(b) identifying, in the exempt development codes, types of development that are of minimal environmental impact that may be carried out without the need for development consent; and
(c) identifying, in the complying development codes, types of complying development that may be carried out in accordance with a complying development certificate as defined in the Act; and
(d) enabling the progressive extension of the types of development in this Policy, and
(e) providing transitional arrangements for the introduction of the State-wide codes, including the amendment of other environmental planning instruments.

Division 1 General Exempt Development Code of the SEPP lists the following relevant items for this development:

Part 2 Exempt Development Codes

- Subdivision 16 Farm buildings (other than stock holding yards, grain silos and grain bunkers);
- Subdivision 16A Stock holding yards not used for sale of stock;
- Subdivision 16B Grain silos and grain bunkers.

The proposed development includes development that is not exempt under provisions of the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. Consequently, development approval is not subject to streamlined assessment processes.

9.3.3.5 State Environmental Planning Policy (Housing) 2021

The principles of the State Environmental Planning Policy (Housing) 2021 include –

(a) enabling the development of diverse housing types, including purpose-built rental housing,
(b) encouraging the development of housing that will meet the needs of more vulnerable members of the community, including very low to moderate income households, seniors and people with a disability,
(c) ensuring new housing development provides residents with a reasonable level of amenity,
(d) promoting the planning and delivery of housing in locations where it will make good use of existing and planned infrastructure and services,
(e) minimising adverse climate and environmental impacts of new housing development,
(f) reinforcing the importance of designing housing in a way that reflects and enhances its locality,
(g) supporting short-term rental accommodation as a home-sharing activity and contributor to local economies, while managing the social and environmental impacts from this use,
(h) mitigating the loss of existing affordable rental housing.

Provisions of this SEPP will not be enacted as the proposed development does not involve new housing.

9.3.3.6 State Environmental Planning Policy (Industry and Employment) 2021

The SEPP (Industry and Employment) 2021 is listed as applicable to the land on which the development is proposed. This SEPP aims to protect and enhance the land within the Western Sydney Employment Area for employment purposes. However, it is not considered relevant as the subject land is not included in section 2.2 of the SEPP which describes the land to which the SEPP applies.

9.3.3.7 State Environmental Planning Policy (Resilience and Hazards) 2021

State Environmental Planning Policy Resilience and Hazards aims to amend the definitions of hazardous and offensive industries where used in environmental planning instruments and to ensure that the consent authority has sufficient information to assess whether the development is hazardous or offensive and to ensure that any measures proposed to be employed to reduce the impact of the development are taken into account.

The State Environmental Planning Policy (Resilience and Hazards) 2021 consolidates, transfers and repeals provisions of the following 3 SEPPs:

1. SEPP (Coastal Management) 2018;
2. SEPP 33 – Hazardous and Offensive Development; and
3. SEPP 55 – Remediation of Land

As the proposed development is not located with a Coastal management area the only chapters of relevance in the SEPP (Resilience and Hazards) 2021 are Chapter 3 Hazardous and Offensive Development and Chapter 4 Remediation of Land.

SEPP Resilience and Hazards applies to proposed developments falling under the definition of "potentially hazardous" industry or "potentially offensive" industry. A beef cattle feedlot is a "potentially offensive" industry as when in operation if no measures to reduce or minimise its impact on the locality have been implemented, a polluting discharge (for example, odour, solid/liquid waste management) may be emitted in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.

The specific aims of Chapter 3 of SEPP Hazardous and Offensive Developments (Resilience and Hazards) 2021 are:

(a) to amend the definitions of hazardous and offensive industries where used in environmental planning instruments, and
(b) to render ineffective a provision of any environmental planning instrument that prohibits development for the purpose of a storage facility on the ground that the facility is hazardous or offensive if it is not a hazardous or offensive storage establishment as defined in this Policy, and
(c) to require development consent for hazardous or offensive development proposed to be carried out in the Western Division, and
(d) to ensure that in determining whether a development is a hazardous or offensive industry, any measures proposed to be employed to reduce the impact of the development are taken into account, and
(e) to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact, and
(f) to require the advertising of applications to carry out any such development.

A development considered potentially hazardous and requires a Preliminary Hazard Analysis (PHA) if the storage or transport of dangerous goods exceeds screening thresholds specified in SEPP (Resilience and Hazards) 2021. A preliminary risk screening assessment for the proposed development in accordance with section 3.11 of SEPP (Resilience and Hazards) 2021 was undertaken and confirms that dangerous goods stored on site do not exceed screening thresholds specified in SEPP (Resilience and Hazards) 2021 The preliminary risk screening assessment report is provided in Appendix N.

Therefore, the proposed development is not considered to be a potentially hazardous industry.

Under SEPP Resilience and Hazards the permissibility of potentially offensive industry developments is linked to safety and pollution control performance. The SEPP aims to ensure the merit of proposed developments is properly assessed before being determined. It aims to ensure that developments can only proceed if they are suitably sited and can demonstrate that they will be built and operated with an adequate level of safety.

This EIS demonstrates that the proposed development is suitably sited, designed and managed. The main waste products of the proposed development are solid (manure/split feed/carcasses) and liquid (effluent). However, these can be sustainably utilised on-site as an alternative to inorganic fertilisers. The proposed development will not produce hazardous waste products. While all feedlot developments produce some odour, at this development, odour impact will be minimised through appropriate siting (separation distances between the site, the closest sensitive residences and other areas with sensitive land uses), good design (pen layout, drainage) and management (pen cleaning, solid and liquid wastes). Hence, nuisance odours are not expected at nearby sensitive residences or other surrounding areas with sensitive land uses.

Chapter 4 of the SEPP (Resilience and Hazards) 2021 relates to the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected and requires councils to be notified of all remediation proposals.

The subject land has historically been used for agricultural activities being beef cattle grazing, dryland and irrigated cropping and intensive livestock agriculture and is land categorised in Clause 4.6 (4) of SEPP (Resilience and Hazards) 2021. Based on the site history and no potential sources of contamination related to previous or current land uses on the subject land as outlined in section 13.2.3, no additional site investigation is deemed warranted.

The proposed development satisfies the aims and provisions of SEPP (Resilience and Hazards) 2021.

9.3.3.8 State Environmental Planning Policy (Planning Systems) 2021

The State Environmental Planning Policy (Planning Systems) 2021 aims to streamline and consolidate various planning policies to ensure a more efficient and consistent approach to environmental planning across the state.

This Policy has several chapters including:

- Chapter 2 - State and Regional Development;
- Chapter 3 – Aboriginal Land; and
- Chapter 4 – Concurrences and Consents

The proposed development does not have an estimated development cost of more than $30 million. Consequently, for the purpose of intensive livestock agriculture the proposed development is not State Significant Development.

The proposed development being a beef cattle feedlot is not State significant infrastructure and critical State significant infrastructure as defined under Schedule 3, 4 or 5 of the SEPP (Planning Systems) 2021.

The proposed development being a beef cattle feedlot does not meet the criteria for Regionally Significant Development is accordance with Schedule 6 of the SEPP (Planning Systems) 2021.

The subject land on which the development is proposed is not owned by an Aboriginal Land Councils. Consequently, Chapter 3 of the SEPP (Planning Systems) 2021 does not apply.

The proposed development is subject to the provisions outlined in Chapter 4 of the SEPP (Planning Systems) 2021.

9.3.3.9 State Environmental Planning Policy (Sustainable Buildings) 2022

The State Environmental Planning Policy (Sustainable Buildings) 2022 encourages the design and construction of more sustainable buildings across NSW.

The aims of this Policy are as follows –

(a) to encourage the design and delivery of sustainable buildings,
(b) to ensure consistent assessment of the sustainability of buildings,
(c) to record accurate data about the sustainability of buildings, to enable improvements to be monitored,
(d) to monitor the embodied emissions of materials used in construction of buildings,
(e) to minimise the consumption of energy,
(f) to reduce greenhouse gas emissions,
(g) to minimise the consumption of mains-supplied potable water,
(h) to ensure good thermal performance of buildings.

As no new buildings will be constructed as part of the proposed development the provisions of the SEPP (Sustainable Building) 2022 are not relevant.

9.3.3.10 State Environmental Planning Policy (Resources and Energy) 2021

The State Environmental Planning Policy (Resources and Energy) 2021 recognises the importance to NSW of mining, petroleum production and extractive industries –

(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and
(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and

(c) to promote the development of significant mineral resources, and
(d) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources, and
(e) to establish a gateway assessment process for certain mining and petroleum (oil and gas) development—
  (i) to recognise the importance of agricultural resources, and
  (ii) to ensure protection of strategic agricultural land and water resources, and
  (iii) to ensure a balanced use of land by potentially competing industries, and
  (iv) to provide for the sustainable growth of mining, petroleum and agricultural industries.

The proposed development is for Intensive livestock agriculture (beef cattle feedlot) and does not comprise a mining, petroleum production or extractive industry and is not located within close proximity to a mining, petroleum production and extractive industry activity. Consequently, SEPP (Resources and Energy) is not relevant.

9.4 State legislation

9.4.1 Crown Land Management Act 2016

The Crown Land Management Act 2016 *(CL Act)* an Act to make provision for the ownership, use and management of the Crown land of New South Wales; to repeal certain legislation consequentially; and for other purposes. The subject land on which the development is proposed does not include Crown Land as outlined in section 6.3.2 and Figure 3.

9.4.2 Dams Safety Act 2015

The Dams Safety Act 2015 is an act of the New South Wales Parliament that aims to ensure that any risks that may arise in relation to dams (including any risks to public safety and to environmental and economic assets) are of a level that is acceptable to the community, promote transparency in regulating dams safety, encourage proper and efficient management in matters relating to dams safety, and encourage the application of risk management and the principles of cost-benefit analysis in relation to dams safety. The act establishes Dams Safety, an independent regulator responsible for ensuring the safety of declared dams.

Dams are man-made structures that store liquids (usually water). They come in many forms and sizes, including water supply dams, irrigation, tailings and industrial dams, and stormwater detention & retarding dams.

Dams Safety NSW 'declares' dams that can potentially endanger life downstream, cause major damage or loss to infrastructure, the environment or have major health and social impacts. Each dam is given a consequence category that reflects this potential.

According to Part 2 Section 4 of the Dams Safety Regulation 2019 this includes:

- a dam with a wall that is more than 15 metres high;

- an existing or proposed dam that Dams Safety NSW is reasonably satisfied would endanger the life of a person, or result in a major or catastrophic level of severity of damage or loss if it failed;
- dams that were 'prescribed' under the old Dams Safety Act (1978) became declared dams under the new Act.

The proposed development will utilise the existing water supply storage dam for storage of clean water for use in the proposed development and existing effluent storage dam(s) in which effluent is temporarily held pending irrigation to land when available. The existing water storge structures do not meet the criteria for a declared dam as the wall is not greater than 15 m or endanger the life of a person, or result in a major or catastrophic level of severity of damage or loss if it failed due to their capacity and construction below existing ground.

9.4.3 Fisheries Management Act 1994

The *Fisheries Management Act 1994* is administered by NSW Fisheries. The *Fisheries Management Act 1994* includes provisions for licensing, regulating commercial and recreational fishing activities, and the protection of threatened species and their habitats.

The objects of the *Fisheries Management Act 1994* are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. In particular, the objects of this act include:

a) to conserve fish stocks and key fish habitats,
b) to conserve threatened species, populations and ecological communities of fish and marine vegetation,
c) to promote ecologically sustainable development, including the conservation of biological diversity, and, consistently with those objects:
d) to promote viable commercial fishing and aquaculture industries,
e) to promote quality recreational fishing opportunities,
f) to appropriately share fisheries resources between the users of those resources,
g) to provide social and economic benefits for the wider community of New South Wales,
h) to recognise the spiritual, social and customary significance to Aboriginal persons of fisheries resources and to protect, and promote the continuation of, Aboriginal cultural fishing.

Part 7 of the *Fisheries Management Act 1994* deals with the protection of aquatic ecosystems. Permits are required to be obtained for certain works, including the following:

- dredging or reclamation work;
- cutting, removing, damaging or destroying marine vegetation on public water land or an aquaculture lease, or on the foreshore of any such land or lease; and
- setting a net, netting or other material, constructing or altering a dam, floodgate, causeway or weir, or creating an obstruction across or within a bay, inlet, river or creek, or across or around a flat.

The proposed development does not involve works within an aquatic ecosystem. Further, no threatened species, populations and ecological communities of fish and/or marine vegetation within adjoining watercourses would be adversely affected as a result of the proposed development as discussed in section 13.4.

9.4.4 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 aims to conserve the natural and cultural heritage of the state of NSW, foster public appreciation, understanding and enjoyment of its natural and cultural heritage, and manage any lands reserved for the purposes of conserving and fostering public appreciation and enjoyment of its natural and/or cultural heritage. The act defines national parks as areas of land reserved for the purpose of protecting habitats, ecosystems, biological diversity, landforms, landscapes, and natural features, including wilderness. The act also establishes the National Parks and Wildlife Service (NPWS), which is responsible for the management of national parks and other protected areas in New South Wales.

The *National Parks and Wildlife Act 1974* (*NP&W Act*) governs the establishment, preservation and management of national parks, historic sites and certain other areas, and the protection of certain fauna, native plants and Aboriginal relics.

The objects of the *NP&W Act* include:

(1) (a) the conservation of nature, including, but not limited to, the conservation of:
- (i) habitat, ecosystems and ecosystem processes, and
- (ii) biological diversity at the community, species and genetic levels, and
- (iii) landforms of significance, including geological features and processes, and
- (iv) landscapes and natural features of significance including wilderness and wild rivers,

(b) the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including, but not limited to:
- (i) places, objects and features of significance to Aboriginal people, and
- (ii) places of social value to the people of New South Wales, and
- (iii) places of historic, architectural or scientific significance,

(c) fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation,

(d) providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation.

(2) The objects of this Act are to be achieved by applying the principles of ecologically sustainable development.

(3) In carrying out functions under this Act, the Minister, the Director-General and the Service are to give effect to the following:
(a) the objects of this Act,
(b) the public interest in the protection of the values for which land is reserved under this Act and the appropriate management of those lands.

The NP&W Act is relevant to the protection of Aboriginal artefacts and the protection of native flora and fauna. Part 6 of the *NP&W Act* identifies certain aboriginal objects to be crown property and offences relating to Aboriginal objects, including disturbing land to discover an artefact. Section 87(1) of the *NP&W Act* requires a permit to be obtained to remove any

artefacts, while section 90 (1) of the *NP&W Act* requires consent from the Director-General of the Department of Planning, Industry and Environment to knowingly destroy, deface or damage a relic or Aboriginal place.

Part 7, Part 8, Part 8a and Part 9 are relevant to the protection of fauna; native plants and threatened species, populations and ecological communities, and their habitats, and critical habitat respectively.

An assessment of the impact of the proposed development on aboriginal heritage and flora and fauna is included in sections 13.7.2 and 13.8. This assessment concluded that there are unlikely to be significant impacts on recorded Aboriginal sites and therefore recommends that no section 90 consent is required for the proposed development.

9.4.5 Local Land Services Act 2013

The Local Land Services Act 2013 aims to improve the delivery of agricultural production, biosecurity, natural resource management and emergency management services to farmers, landholders and communities.

The objects of this Act are as follows:

(a) to establish a statutory corporation (to be known as Local Land Services) with responsibility for management and delivery of local land services in the social, economic and environmental interests of the State in accordance with any State priorities for local land services,
(b) to establish a governance framework to provide for the proper and efficient management and delivery of local land services,
(c) to establish local boards for the purpose of devolving operational management and planning functions to regional levels to facilitate targeted local delivery of programs and services to meet community, client and customer needs,
(d) to require decisions taken at a regional level to take account of State priorities for local land services,
(e) to ensure the proper management of natural resources in the social, economic and environmental interests of the State, consistently with the principles of ecologically sustainable development (described in section 6 (2) of the *Protection of the Environment Administration Act 1991*),
(f) to apply sound scientific knowledge to achieve a fully functioning and productive landscape,
(g) to encourage collaboration and shared responsibility by involving communities, industries and non-government organisations in making the best use of local knowledge and expertise in relation to the provision of local land services,
(h) to establish mechanisms for the charging of rates, levies and contributions on landholders and fees for services,
(i) to provide a framework for financial assistance and incentives to landholders, including, but not limited to, incentives that promote land and biodiversity conservation.

The Local Land Services Regulation 2014 is a regulation made under the Local Land Services Act 2013. The regulation provides for the establishment of local land services, which is a statutory corporation responsible for management and delivery of local land services.

The subject land is in the Murray Local Land Services area.

9.4.6 Biodiversity Conservation Act 2016

The aim of the *Biodiversity Conservation Act 2016* is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development (described in section 6 (2) of the *Protection of the Environment Administration Act 1991*), and in particular:

(a) to conserve biodiversity at bioregional and State scales, and
(b) to maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations, and
(c) to improve, share and use knowledge, including local and traditional Aboriginal ecological knowledge, about biodiversity conservation, and
(d) to support biodiversity conservation in the context of a changing climate, and
(e) to support collating and sharing data, and monitoring and reporting on the status of biodiversity and the effectiveness of conservation actions, and
(f) to assess the extinction risk of species and ecological communities, and identify key threatening processes, through an independent and rigorous scientific process, and
(g) to regulate human interactions with wildlife by applying a risk-based approach, and
(h) to support conservation and threat abatement action to slow the rate of biodiversity loss and conserve threatened species and ecological communities in nature, and
(i) to support and guide prioritised and strategic investment in biodiversity conservation, and
(j) to encourage and enable landholders to enter into voluntary agreements over land for the conservation of biodiversity, and
(k) to establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity, and
(l) to establish a scientific method for assessing the likely impacts on biodiversity values of proposed development and land use change, for calculating measures to offset those impacts and for assessing improvements in biodiversity values, and
(m) to establish market-based conservation mechanisms through which the biodiversity impacts of development and land use change can be offset at landscape and site scales, and
(n) to support public consultation and participation in biodiversity conservation and decision-making about biodiversity conservation, and
(o) to make expert advice and knowledge available to assist the Minister in the administration of this Act.

The areas proposed for effluent and solid waste utilisation are existing cropped areas currently used for agricultural activities and no clearing of vegetation is proposed.

A Test of Significance report by Hamilton Environmental Services (2024) has concluded that the property where the development is proposed is not in a declared area of outstanding

biodiversity value, the proposed development area is not mapped as *Vulnerable or Sensitive Regulated Land* according to the Section 60F of the *Local Land Services Act 2013*, and is also not mapped as an area of Biodiversity Value and a biodiversity assessment report (BDAR) is not triggered on the basis of this mechanism.

Further, the minimum lot size according to the *Conargo Local Environmental Plan 2013* is 40 ha, and that the Area Clearing Threshold required to enter the Biodiversity Offset Scheme (BOS) and BDAR to be completed, is 1.0 ha (Hamilton Environmental Services, 2024).

As there is no native vegetation to be removed with the development, the total native vegetation loss is less than the clearance threshold of 1 ha, and a BDAR is not triggered by this mechanism.

Consequently, as the proposed development does not require consent under Part 4 of the *Environmental Planning and Assessment Act 1979* and does not involve clearing of native vegetation greater than 1ha, a BDAR is not required.

Buffers distances have been proposed to ensure that there is no impact from effluent and solid waste utilisation on existing native vegetation on the subject land.

9.4.7 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* is administered by the EPA and prohibits any person from causing pollution of waters or air, and provides penalties for pollution offences relating to water, air and noise.

The objects of the *Protection of the Environment Operations Act 1997* are as follows:

(a) to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development,
(b) to provide increased opportunities for public involvement and participation in environment protection,
(c) to ensure that the community has access to relevant and meaningful information about pollution,
(d) to reduce risks to human health and prevent the degradation of the environment by the use of mechanisms that promote the following:
    (i) pollution prevention and cleaner production,
    (ii) the reduction to harmless levels of the discharge of substances likely to cause harm to the environment,
    (iii) the elimination of harmful wastes,
    (iv) the reduction in the use of materials and the re-use or recycling of materials,
    (v) the making of progressive environmental improvements, including the reduction of pollution at source,
    (vi) the monitoring and reporting of environmental quality on a regular basis
(e) to rationalise, simplify and strengthen the regulatory framework for environment protection,
(f) to improve the efficiency of administration of the environment protection legislation,
(g) to assist in the achievement of the objectives of the Waste Avoidance and Resource Recovery Act 2001.

The *POEO Act* requires the submission of an Environmental Impact Statement (EIS) for feedlots with a capacity greater than 1,000 head. The *POEO Act* provides a regulatory framework for the regulation of all activities listed in Schedule 1 to the Act (scheduled activities) that have the potential to impact on the environment.

Under Schedule 1 of the *POEO Act*, livestock intensive industries are defined as scheduled activities if the following thresholds are exceeded:

- *feedlots that are intended to accommodate in a confinement area and rear or fatten (wholly or substantially) on prepared or manufactured feed more than 1,000 head of cattle, 4,000 sheep or 400 horses (excluding facilities for drought or similar emergency relief)*

The proposed development exceeds the threshold of feeding more than 1,000 head of cattle under Schedule 1 of the *POEO Act* definition. Section 48 of the Protection of the Environment Operations Act 1997 pertains to licensing requirements for scheduled activities (premises-based). The section applies to scheduled activities where Schedule 1 indicates that a license is required for premises at which the activity is carried on.

The proposed development has the potential to impact water and air quality. Development siting, design and sufficient erosion and sediment controls, along with appropriate drainage management, will mitigate potential sediment impacts to surface water, groundwater and air as far as practicable as outlined in sections 13.1, 13.3, 13.4 and 13.5.

9.4.8 Roads Act 1993

The *Roads Act 1993*, commenced on 1 July 1993 and superseded the roads provisions of the Crown and Other Roads Act 1990, the State Roads Act 1986, the Local Government Act 1919, the Public Gates Act 1901 the Width of Roads and Lanes Act 1902 and the Traffic Safety (Lights and Hoardings) Act 1951.

The *Roads Act 1993* sets out procedures for carrying out of certain activities on roads, provides a classification of roads, establishes procedures for opening and closing public roads and the authorities responsible for roads i.e. the Transport for New South Wales (TfNSW), the council of a local government area etc.

Section 138 of the *Roads Act 1993* requires the consent of the appropriate roads' authority for the following works:

- erecting a structure or carrying out a work in, on or over a public road, or
- digging up or disturbing the surface of a public road, or
- removing or interfering with a structure, work or tree on a public road, or
- pumping water into a public road from any land adjoining the road, or
- connecting a road (whether public or private) to a classified road.

The local council is the roads authority for all public roads within its local government area, except for any freeway, crown public road, or any public road declared to be under the control of some other authority.

Whilst, the proposed development is accessed from Broughans Road a local controlled road, the development application would be referred to Transport for NSW in conjunction with the assessment of the EIS by the Edward River Council in accordance with Division 4.3 of the Environmental Planning and Assessment Act 1979.

9.4.9 Rural Fires Act 1997

The *Rural Fires Act 1997* was established to make provision for the prevention, mitigation and suppression of rural fires.

The objects of the *Rural Fires Act 1997* are to provide:

a) for the prevention, mitigation and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts, and
b) for the co-ordination of bush firefighting and bush fire prevention throughout the State, and
c) for the protection of persons from injury or death, and property from damage, arising from fires, and
d) for the protection of the environment by requiring certain activities referred to in paragraphs (a)–(c) to be carried out having regard to the principles of ecologically sustainable development described in section 6 (2) of the Protection of the Environment Administration Act 1991.

Section 63(2) of the *Rural Fires Act 1997* imposes a duty on the owner or occupier of land to take the notified steps, being any steps advised by the Bush Fire Co-ordinating Committee or any steps in a bush fire risk management plan, to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bush fires on or from that land.

Division 8 of the *Rural Fires Act 1997* relates to development of bush fire prone land and for bush fire hazard reduction. Section 100B(3) requires a bush fire safety authority to be obtained prior to developing bushfire prone land for the following types of development:

- subdivision that could lawfully be used for residential or rural residential purposes; or
- development for special fire protection purposes, which include schools, childcare centres, hospitals, hotel, motel or other tourist accommodation, homes or other establishments for mentally incapacitated persons, housing for older people or people with disabilities, group, homes, retirement villages or other purposes prescribed by the regulations.

The proposed development does not involve subdivision for residential or rural residential purposes or development for special fire protection purposes.

A firebreak will be maintained around the proposed development infrastructure. All weather access roads will provide access for firefighting and the firebreak will provide access around the proposed development. Water from on-site clean water storages will provide an adequate supply for fire-fighting purposes. The proposed development site (and suitable firebreak distance from infrastructure) will be cleared of vegetation and other readily flammable materials stored in accordance with relevant Australian standards.

9.4.10 Heritage Act 1977

The purpose of the *Heritage Act 1977* is to conserve the environmental heritage of New South Wales. Environmental heritage means those places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance.

State heritage significance is defined as, in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

Local heritage significance is defined as, in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

The objects of the *Heritage Act 1977* are as follows:

(a) to promote an understanding of the State's heritage,
(b) to encourage the conservation of the State's heritage,
(c) to provide for the identification and registration of items of State heritage significance,
(d) to provide for the interim protection of items of State heritage significance,
(e) to encourage the adaptive reuse of items of State heritage significance,
(f) to constitute the Heritage Council of New South Wales and confer on it functions relating to the State's heritage,
(g) to assist owners with the conservation of items of State heritage significance.

There are no known items of heritage significance under the *Heritage Act 1977* on the subject land on which the development is proposed as outlined in section 13.7.

9.4.11 Water Management Act 2000

Water in NSW is managed under several acts including the *Water Management Act 2000, Water Management Amendment Act 2014 and* the *Water Act 1912*.

The *Water Act 1912* is being progressively phased out and replaced by the *Water Management Act 2000.* However, some provisions are still in force.

The object of the *Water Management Act 2000* is the sustainable and integrated management of the state's water for the benefit of both present and future generations and is based on the concept of ecologically sustainable development.

The *Water Management Act 2000* recognises:

- the fundamental health of our rivers and groundwater systems and associated wetlands, floodplains, estuaries has to be protected
- the management of water must be integrated with other natural resources such as vegetation, soils and land
- to be properly effective, water management must be a shared responsibility between the government and the community
- water management decisions must involve consideration of environmental, social, economic, cultural and heritage aspects
- to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality
- social and economic benefits to the state will 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,
- to recognise the role of the community, as a partner with government, in resolving issues relating to the management of water sources,
- to provide for the orderly, efficient and equitable sharing of water from water sources,
- 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,
- to encourage the sharing of responsibility for the sustainable and efficient use of water between the Government and water users,
- to encourage best practice in the management and use of water.

As a result, the *Water Management Act 2000* recognises the need to allocate and provide water for the environmental health of our rivers and groundwater systems, while also providing licence holders with more secure access to water and greater opportunities to trade water through the separation of water licences from land. The main tool the Act provides for managing the state's water resources are water sharing plans.

The watercourses and groundwater in the vicinity of the proposed development will be protected through appropriate design and management practices, including vegetated buffers, controlled drainage area, a low permeability base for the controlled drainage area as outlined in section 8.4.8 and 8.6.1.

A controlled activity approval is required for controlled activities on waterfront land. 'Waterfront land' means the bed of any river, lake or estuary, and the land within 40 metres of the river banks, lake shore or estuary mean high water mark.

There is no waterfront land on the subject land as outlined in section 13.4. The access to the proposed development complex will be via an existing road network. Consequently, a controlled activity approval is not required in accordance with s.91 of the *Water Management Act 2000.*

9.4.12 Waste Avoidance and Resource Recovery Act 2001

The *NSW Waste Avoidance and Resource Recovery Act 2001* reflects the importance the community places on minimising waste and maximising resources.

The objects of the *NSW Waste Avoidance and Resource Recovery Act 2001* are as follows:

a) to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development;
b) to ensure that resource management options are considered against a hierarchy of the following order:
   i) avoidance of unnecessary resource consumption,
   ii) resource recovery (including reuse, reprocessing, recycling and energy recovery), and
   iii) disposal,
c) to provide for the continual reduction in waste generation;
d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste;
e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste;
f) to ensure the efficient funding of waste and resource management planning, programs and service delivery;
g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis;
h) to assist in the achievement of the objectives of the *Protection of the Environment Operations Act 1997*.

The waste hierarchy is a set of priorities for the efficient use of resources; this underpins the objectives of the Act.

The waste hierarchy is:

1) **avoidance** including action to reduce the amount of waste generated by households, industry and all levels of government;
2) **resource recovery** including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources; and
3) **disposal** including management of all disposal options in the most environmentally responsible manner.

The proposed development does not involve construction as existing infrastructure shall be utilised.

The proposed development involves the use of various resources within the operation phase. The proposed development shall adopt various strategies to ensure the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development. Section 13.16 outlines the various resource management options and strategies for the proposed development.

9.4.13 Capital investment value

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

Consequently, the capital investment value is zero.

9.5 Commonwealth matters

9.5.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (*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 (NES). Approval from the Commonwealth is in addition to any approvals under NSW legislation.

The objectives of the *EPBC Act* are to:

- provide for the protection of the environment, especially matters of national environmental significance;
- promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- conserve Australian biodiversity;
- provide a streamlined national environmental assessment and approvals process;
- enhance the protection and management of important natural and cultural places
- control the international movement of plants and animals (wildlife), wildlife specimens and products made or derived from wildlife
- to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and
- to promote the use of indigenous people's knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

Approval under the *EPBC Act* is triggered by a proposed development which has the potential to have a significant impact on a matter of NES or by a proposed development which has the

potential to have a significant impact on the environment which involves the Commonwealth. The EPBC Act lists nine matters of NES which must be addressed when assessing the impact of a proposed development.

The nine matters of NES are:

- world heritage properties;
- national heritage places;
- wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed);
- nationally threatened species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

The *EPBC Act* also identifies approval requirements involving Commonwealth land and activities undertaken by Commonwealth agencies.

The proposed development does not involve Commonwealth land and is not an activity proposed by a Commonwealth agency, and therefore, the relevance of the EPBC Act relates to matters of NES.

Under section 68 of the *EPBC Act*, a proposal must be referred to the Commonwealth Minister for Environment and Heritage if the applicant believes an approval under the EPBC Act is required.

The Commonwealth Minister for the Environment and Heritage would subsequently decide whether the proposal requires approval under the *EPBC Act*.

An assessment of the proposed development in relation to the listed matters of NES is provided below. A search of the Department of Environment and Heritage (DEH) EPBC Online Database was undertaken for the subject land and a 5 km buffer, the results of which are included in Appendix O.

9.5.1.1 World heritage properties

There are no declared world heritage properties on the subject land or within a 5 km buffer. Consequently, there are no declared world heritage properties in proximity to the proposed development, or that would potentially be affected by the proposed development
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9.5.1.2 National heritage places

There are no declared national heritage properties on the subject land or within a 5 km buffer. Consequently, there are no declared national heritage properties in proximity to the proposed development, or that would potentially be affected by the proposed development.

9.5.1.3 Wetlands of international importance (Ramsar wetlands)

The MNES search results returned the following Wetlands of International Importance (Ramsar Wetlands) and proximity to the subject land.

- Banrock station wetland complex 400 - 500km upstream;
- Hattah-Kulkyne lakes 200 - 300km upstream;
- NSW Central Murray state forests (including Ramsar Wetlands) 10 - 20km down-stream;
- Riverland 400 - 500km;
- The Coorong, and lakes Alexandrina and Albert wetland 500 - 600km upstream

The Environmental Planning and Assessment Regulation 2021 Schedule 3, Part 1 Definitions describes an environmentally sensitive area of State significance to include *(d) a declared Ramsar wetland or declared World Heritage property within the meaning of the Environment Protection and Biodiversity Conservation Act 1999 of the Commonwealth.* The closest Ramsar wetland to the subject land is the NSW Central Murray State Forests which is located some 22 km southwest of the subject land as shown in Figure 17. The NSW Central Murray Forests Ramsar Wetlands are located on the floodplain of the Murray River in south-central NSW. It comprises three geographically discrete but interrelated units: Murray Valley National Park and Murray Valley Regional Park (formally the Millewa Forest), Werai Forests, and Koondrook - Perricoota Forests. It is dominated by River Red Gum forest and woodland, wet grasslands and marshes as well as having significant areas of box woodland and sandhill communities. The site includes high quality areas of riparian herblands, riverine forest and woodland, and plains woodland. Plains woodland, whilst not part of the floodplain, is important in providing refuge areas for terrestrial fauna during flood events.

The Ramsar wetlands site described as the Barmah Forest is immediately adjacent to the Central Murray Forest site and lies to the south of it.

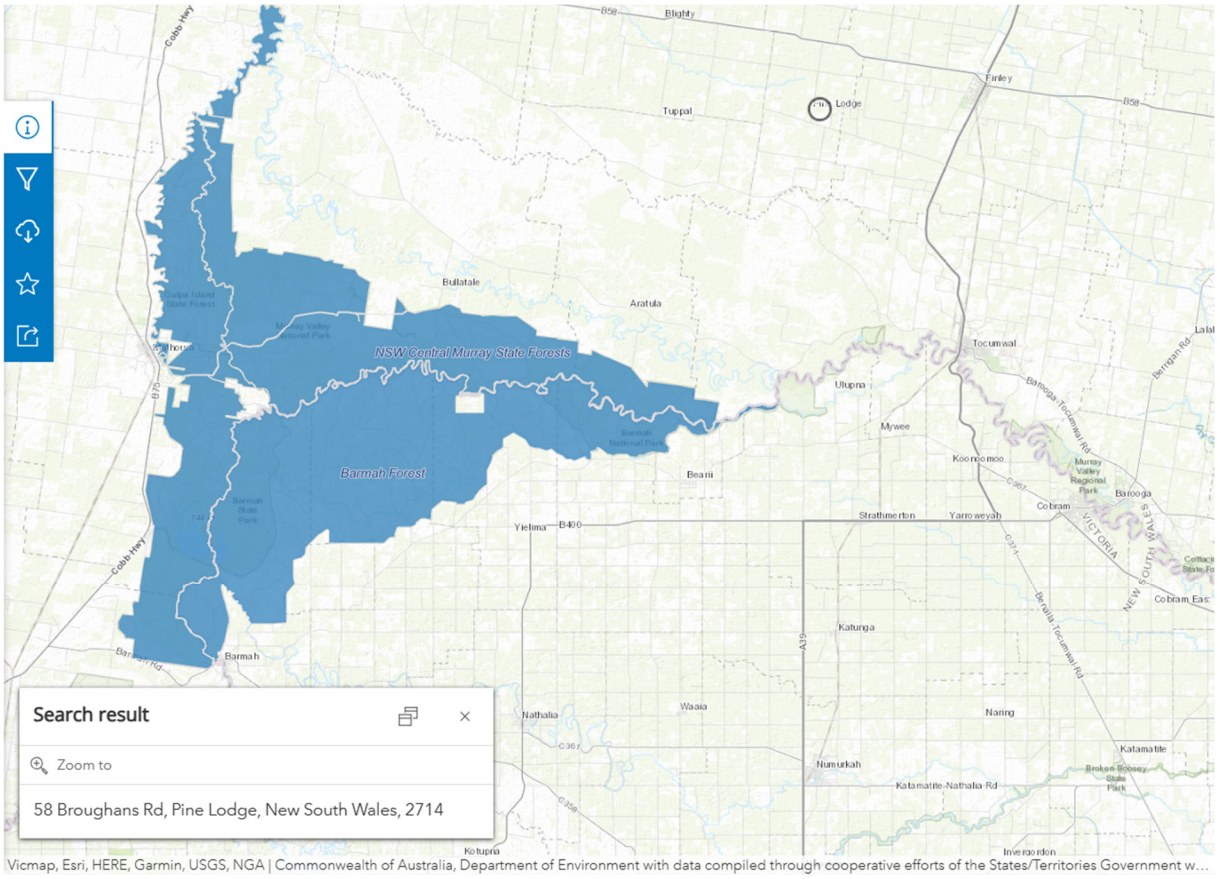

Figure 17 – Subject land – Proximity to RAMSAR wetlands (DCCEEW, 2015)

9.5.1.4 Nationally threatened species and ecological communities

A search for Commonwealth-listed threatened ecological communities (EC's) has returned 5 listed EC's and that may occur in, or relate to, a buffer of 5 km surrounding the subject land.

The 5 listed threatened ecological communities that are likely to occur within or surrounding the subject land are;

- Buloke Woodlands of the Riverina and Murray Darling Depression Bioregions
- Grey Box (*Eucalyptus microcarpa*) and Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
- Natural Grasslands of the Murray Valley Plains
- Weeping Myall Woodlands
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The Natural Grasslands of the Murray Valley Plains and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland EC's are critically endangered.

The proposed development is not sited in areas of native vegetation and no native vegetation is not proposed to be cleared as part of the proposed development as outlined in section 13.8.

Consequently, the proposed development is unlikely to have any adverse impacts on endangered ecological communities.

A search for Commonwealth-listed threatened species within a 5 km buffer area of the subject land has returned 36 listed species.

Four of these species are birds listed as critically endangered. These are the Regent Honeyeater (*Anthochaera phrygia*), Curlew Sandpiper (*Calidris ferruginea*), Swift Parrot (*Lathamus discolor)* and Plains-wanderer *(Pedionomus torquatus)* which may occur within the search area to forage or feed. One of these species is a fish listed as critically endangered known as the Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow (*Galaxias rostratus*).

The Curlew Sandpiper is a migratory shorebird. The proposed development will not affect the life cycle of this critically endangered species therefore there will be no decline in a population. The proposed development site does not provide suitable habitat for the Curlew Sandpiper breeding. Consequently, the proposed development will not affect the life cycle of these bird species and there will be no decline in a population.

The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany.

The Swift Parrot is a slim, medium-sized parrot mostly bright green in colour with a dark blue patch on the crown. Swift Parrots are migratory birds and are found in dry sclerophyll forests and woodlands. Their favourite food is the nectar found on the outer canopy of flowering eucalypts. Coastal regions tend to support larger numbers of birds when inland habitats are subjected to drought (Saunders & Tzaros 2011).

The Plains-wanderer small, quail-like bird with brownish plumage that provides wonderful camouflage which frequents native grasslands. Plains-wanderers are confined to native grasslands, where they have very specific requirements. To support the species, the structure of these grasslands needs to have short grass (<5cm tall) growing in patches or clumps (50 % vegetative cover), with areas of bare soil between the clumps, and small amounts of vegetative litter on the ground.

The proposed development is unlikely to have any adverse impacts on critically endangered species as the land has been previously cleared and is predominantly irrigated and dryland cropping land or improved pasture with no native grasslands. Further, no remnant vegetation is proposed to be impacted by the proposed development. No remnant vegetation on the subject land is proposed to be disturbed or cleared as part of the proposed development.

9.5.1.5 Migratory species

A search for migratory species within a 5 km buffer area of the subject land has returned 9 listed migratory species.

One of these species, the Curlew Sandpiper is a migratory wetlands bird species listed as critically endangered and may occur within the search area to forage or feed. The Curlew Sandpiper is listed as Critically endangered under the *Threatened Species Act 1995*.

The Curlew Sandpiper is a shorebird that mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters.

As the subject land is not located in a coastal area or contain habitat favoured by the Curlew Sandpiper, it is unlikely that the Curlew Sandpiper will occur within the area or species habitat will occur on the subject land.

The proposed development will not disturb or clear any watercourses, drainage features or vegetation of ecological significance. Consequently, the proposed development will have no adverse impacts on the Curlew Sandpiper.

9.5.1.6 Commonwealth marine areas

There are no Commonwealth marine areas in proximity to the proposed development, or that would potentially be affected by the proposed development.

9.5.1.7 The Great Barrier Reef Marine Park (GBRMP)

The proposed development is not located in the Great Barrier Reef Marine Park or in an area that drains into the GBRMP. Therefore, the GBRMP would not be affected by the proposed development.

9.5.1.8 Nuclear actions

The proposed development would not involve a nuclear action, as defined under the EPBC Act 1999.

9.5.1.9 A water resource, in relation to coal seam gas development and large coal mining development

The proposed development is not a coal seam gas or large coal mining development.

9.5.1.10 Actions prescribed by the regulations

The proposed development would not involve actions as prescribed by the *EPBC Regulations 2000*.

This EIS includes an assessment of measures designed to protect the environment, promote the conservation and ecologically sustainable use of natural resources, promote biodiversity conservation and provide for the protection and conservation of heritage.

The proposed development is not expected to impact on matters of NES, and as a consequence the EPBC Act is not triggered and referral to, and approval from, the Commonwealth Minister for Environment and Heritage is not required.

9.5.1.11 EPBC Act Referrals

The EPBC Protected Matters Report includes an extra information section that lists EPBC Act referrals for the subject land and a 5 km buffer area. This report has identified three EPBC Act referrals all being a non controlled action referral. The non controlled action refers to improving rabbit bio control, INDIGO Central Submarine Telecommunications Cable and the INDIGO Marine Cable Route Survey. The assessment status is listed as completed for all three.

There are no controlled actions listed. Consequently, the development application will not be referred to the Minister responsible for the EPBC 1999 Act under section 68 of the EPBC Act 1999.

9.5.2 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Heritage Protection Act) is the principal Commonwealth legislation protecting Indigenous heritage. The Act complements state/territory legislation and is intended to support state/territory laws and processes.

Under the Heritage Protection Act the responsible Minister can make temporary or long-term declarations to protect areas and objects of significance under threat of injury or desecration. The Heritage Protection Act also encourages heritage protection through mediated negotiation and agreement between land users, developers and Indigenous people.

The subject land does not contain any indigenous heritage areas or objects of significance as outlined in section 13.7 and the Aboriginal and non-Aboriginal cultural heritage Aboriginal Due Diligence report presented in Appendix K.

9.6 Conclusion

This EIS has been prepared pursuant to the provisions of the *EP&A Act* and the EPIs created under the *EP&A Act*, together with relevant NSW legislation. The EIS has also taken into account the Commonwealth EPBC Act 1999.

Under the *Environmental Planning and Assessment Act 1979*, local Councils prepare Local Environmental Plans (LEPs) that specify planning controls for specific parcels of land. The subject property on which the development is proposed is located in the Edward River Council. The proposed development is located in the Rural Zone - RU1 Primary Production under Conargo Local Environmental Plan 2013. Intensive livestock keeping establishments are permissible with consent in the RU1 - Primary Production zone. Consent from the Edward River Council is required to construct and operate the proposed development.

Under Schedule 3, Clause 21 of the *EP & A Regulation 2000*, beef cattle feedlots that will accommodate more than a 1000 head in a confinement area and rear or fatten them (wholly or substantially) on prepared or manufactured feed are considered a designated development and an EIS must be submitted with the development application.

The proposed beef cattle feedlot development is considered an Integrated Designated Development due its scale (3,200 head). As part of the integrated assessment process the Edward River Council must refer the development application and EIS the relevant state agencies for assessment and feedback.

Livestock intensive activities are scheduled activities under Schedule 1 of the *Protection of the Environment Act 1997*. The proposed development will require an environment protection licence to operate. This will be sought once development consent is granted.

The proposed development requires a secure, reliable source of water. The subject land on which the development is proposed has existing groundwater and surface water entitlements of sufficient quantity and quality for the proposed development.

9.7 Summary of licence, approvals and permits

Table 32 contains a summary of the licences, approvals and permits that are likely to be required for the proposed development.

Table 32 – Proposed development – Summary of licences, approvals and permits

Legislation	Authorisation	Consent or Approval Authority
EP&A Act 1979	Development Consent	Edward River Council
POEO Act 1997	EPL for Livestock intensive activities – Cattle Feedlot	EPA
Roads Act 1993	Section 138 permit for road and intersection improvements*	Edward River Council / TfNSW
Water Management Act 2000	Licencing of monitoring bores**	WaterNSW
Work Health and Safety Act 2011	Licensing of dangerous goods (e.g. diesel, gas)	WorkCover SNW

* If required

** EPA licence conditions may require additional groundwater monitoring bores (piezometers) upstream and downstream of the proposed development complex site. An application shall be made for a groundwater licence for these monitoring bores prior to their installation.

10. Relevant guidelines

The Australian beef cattle lot feeding industry and various states including NSW have prepared codes of practice, guidelines and reference manuals to be used as a resource for guiding the siting, design and preventing adverse impacts on the environment for beef cattle developments.

It should be emphasised that these guidelines, code of practice and reference manuals do not override or replace federal, state or local government legislation, regulation, plans or policies.

The aim of these reference documents is to ensure that those planning to construct a beef cattle feedlot, or operate one, comply with all relevant regulatory requirements.

The following guidelines have been used to plan and design the proposed development and provide best practice methods for siting, design, operation and management (in the event development consent is granted) of the proposed development.

10.1 State guidelines

The following state documents have been used as a resource when preparing this EIS. These guidelines provide a broad framework of generally acceptable principles for establishing and operating feedlots within NSW.

- *NSW Feedlot Manual* (NSW Agriculture, 1997). The NSW Feedlot Manual contains information on the establishment and operation of feedlots in NSW including the starting a feedlot, feedlot operation, financial aspects and technical issues.
- EIS Guideline for Cattle Feedlots (Department of Urban Affairs and Planning, 1996). The EIS Guideline identifies some important factors to be considered when preparing an EIS for cattle feedlots.
- Effluent Guidelines, Use of Effluent by Irrigation (Department of Environment and Conservation (NSW), 2004). This guideline encourages the beneficial use of effluent where it is safe and practicable to do so and where it provides the best environmental outcome.
- *Assessment and Management of Odour from Stationary Sources in NSW – Technical Framework* (DEC 2006a). The NSW Odour Assessment Framework promotes ongoing environmental improvement and best management practices to prevent or minimise odours. While recognising the changing needs of industry and society, it also promotes sustainable land-use planning and management to avoid odours and associated conflicts.
- *Assessment and Management of Odour from Stationary Sources in NSW – Technical Notes (DEC 2006b)*. The NSW Odour Assessment Notes provide guidance on classifying odour sources, odour assessment criteria, odour sampling and analysis and dispersion modelling.
- *Guidelines for development adjoining land and water managed by Department of Environment, Climate Change and Water (DECCW 2010)*. This guideline outlines the issues to be considered by councils and other planning authorities when assessing

development applications that may impact on land and water bodies managed by the current Department of the Climate Change, Energy, the Environment and Water (DCCEEW).

- *Reference Manual for the Establishment and Operation of Beef Cattle Feedlots in Queensland (Skerman, 2000)*. The QLD Feedlot Manual contains information on the establishment and operation of feedlots in QLD including the key site selection parameters, the major design components of a feedlot and feedlot construction techniques.
- Planning Guidelines, Intensive Livestock Agriculture Development (*Department of Planning and Environment, 2019*). These guidelines assist applicants and planning authorities to understand the assessment requirements for intensive livestock developments, such as feedlots and identify appropriate levels of assessment and relevant approvals.

10.2 National guidelines

The Australian beef cattle lot feeding industry considers that the protection of the environment is essential for ecologically and economically sustainable agricultural production. To this end the industry has been pro-active developing and adopting appropriate guidelines and codes of practice for best practice siting, design, construction and operation for beef cattle feedlots. The following documents have been used as a resource when preparing this EIS. These documents provide a framework of acceptable principles for the establishment and operation of feedlots in Australia.

- *The National Guidelines for Beef Cattle Feedlots in Australia (MLA, 2012a)* contains information on the establishment and operation of feedlots including the major design components of a feedlot, key site selection parameters, development application and approval process, and feedlot construction.
- *The National Beef Cattle Feedlot Environmental Code of Practice (MLA, 2012b)* addresses the environmentally relevant aspects of the site, design, construction and operation of a beef cattle feedlot. It defines a series of outcomes that should prevent or minimise adverse impacts on environmental values.
- *The Beef Cattle Feedlots: Design and Construction (MLA, 2015a)* handbook provides a reference document that outlines current best practice design and construction of feedlot facilities including site selection and layout, site infrastructure, site earthworks, cattle handling, shade structures, pen design and layout, feed storage, preparation and delivery, water supply and usage, cattle washing, runoff control and storage, feedlot construction.
- *The Beef Cattle Feedlots: Waste Management and Utilisation (MLA, 2015b)* handbook provides a reference document that outlines current best practice for waste management and utilisation including types of wastes, waste storage and processing and utilisation.

Part E – Consultation and issues identification

11. Consultation

Throughout the planning and EIS preparation process, there has been extensive consultation with various local government and state government agencies. These include:

- Edward River Council (ERC);
- Department of Planning and Environment (DPE);
- Department of Regional NSW – Department of Primary Industries – Agriculture (DPI);
- WaterNSW;
- NSW Environment Protection Authority (EPA);
- Transport for NSW;
- NSW Rural Fire Service'
- Murray Irrigation Limited;
- Environment and Heritage Group of the DPE; and
- Deniliquin Local Aboriginal Land Council.

11.1 Formal consent process

This EIS has been prepared in accordance with section 4.12 Application (cf previous s 78A) of the EP&A Act and with the requirements in Part 8 Division 5 Environmental impact statements—the Act, ss 4.12(8), 5.7(1) and 5.16(2) of the EP&A Regulation made for the purposes of this section. Section 4.12 Application of the EP&A Act ensures that the potential environmental effect of the proposed development is properly assessed and considered in the decision-making process.

There are three main elements to the legislative scheme which regulates planning and development in NSW. These are:

- the Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act), which sets out the major concepts and principles, including Part 4 which deals with development applications;
- the Environmental Planning and Assessment Regulation 2021 (NSW) (EP&A Regulation), which contains many of the details for the various processes set out under the Act, and;
- environmental planning instruments (EPIs), i.e., LEPs and SEPPs, which set out when development consent is required, and which often nominate the consent authority for specific types of development.

Before preparing this EIS, a written application was made to the Director-General for the environmental assessment requirements with respect to the proposed statement as required under Schedule 2 Part 2 Clause Part 4 of the EP&A Regulation.

Each of the matters raised by the Director-General for consideration in the EIS is outlined in Table 33, together with the relevant section of the EIS which addresses that matter. A copy of the Director-General's Requirements is provided in Appendix B.2.

Table 33 – Proposed development – Director-General's requirements

Aspect	Reference in EIS
strategic and statutory context	
• a detailed justification for the proposal and suitability of the site for the development	section 7 section 13
• a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies	section 9 section 13
• a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out.	section 9.7
• a description of how the proposed expansion integrates with existing on-site operations	section 8
• a description of any amendments to and/ or additional licence(s) or approval(s) required to carry out the proposed development.	section 9.7
waste management	
• details of waste handling including, transport, identification, receipt, stockpiling and quality control including off-site reuse and disposal;	section 8.7.4 section 8.7.5 section 13.10
• detail of waste management including manure and disposal of dead cattle for the proposal, including in the event of a mass mortality event	section 13.11
• the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Sustainable Materials Strategy 2041.	section 13.10 Appendix P
animal welfare, bio-security and disease management	
• details of how the proposed development would comply with relevant codes of practice and guidelines	section 8
• a heat load assessment in accordance with Department of Primary Industries guidelines	Appendix S
• details of all pest, weed and disease control measures	section 13.17.3 section 13.17.6 section 8.7.14
• a detailed description of the contingency measures that would be implemented for the mass disposal of livestock in the event of disease outbreak.	section 8.7.14
Air quality	

• a description of all potential sources of air and odour emissions during operation, including consideration of cumulative impacts associated with existing on-site operations	section 13.1
• an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines	section 13.1.5
• a description and appraisal of air quality impact mitigation and monitoring measures.	section 13.1.6 Appendix G
Noise and vibration	
• a description of all potential noise sources during operation, including road traffic noise and consideration of cumulative impacts associated with existing on-site operations	section 13.12 section 13.13 Appendix Q
• a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines	section 13.13.4
• a description and appraisal of noise and vibration mitigation and monitoring measures.	section 13.13.7
Soil and water	
• a description of local soils, topography, drainage and landscapes	section 13.2 section 13.3 section 13.4 section 13.5 section 13.10 section 13.11
• details of water usage for the proposed expansion including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000	section 13.3.1.5 section 13.4.1.5
• an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment	section 13.6.1.1
• details of any changes to sediment and erosion controls	section 15.2.1
• details of increases and/or changes to the site water balance	section 8.7.3
• a contingency plan for water supply in the event of drought conditions	section 8.7.3
• an assessment of potential impacts on the quality and quantity of surface and groundwater resources	section 13.2.4 section 13.3.2 section 13.4.2
• assessment of the site's capacity to sustain an increase in solid waste and effluent irrigation and an assessment of potential impacts to any nearby terrestrial waterways and groundwater	section 8.4 section 8.6 section 8.7 section 13.11
• details of how the proposed expansion integrates with existing on-site stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts	section 8.7.15 section 13.3.3 section 13.4.3
• a description and appraisal of impact mitigation and monitoring measures.	section 13.3.3 Appendix F Appendix H

	Appendix K Appendix L Appendix M Appendix O Appendix P
traffic and transport	
• details of road transport routes and access to the site	section 8.7.9 section 13.12.2 Appendix Q
• details of road traffic volumes, including consideration of cumulative impacts associated with existing on-site operations	Appendix Q
• an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.	Appendix Q
biodiversity	
• including a description of any potential vegetation clearing needed to undertake the proposal and any impacts on flora and fauna.	section 13.8 Appendix J

In addition to the above, the EIS must include the general requirements for an EIS as stated in Division 5 Environmental impact statements sections 190 and 192 of the Environmental Planning and Assessment Regulation 2021. These requirements are outlined in Table 34.

Table 34 – Proposed Development - General EIS requirements

Aspect	Document Reference
• A summary of the environmental impact statement	**Executive Summary**
• A statement of the objectives of the development	**section 7.1.1**
• An analysis of any feasible alternatives to the carrying out of the development, having regard to its objectives, including the consequences of not carrying out the development.	**section 7.2**
• Description of the proposal, including construction, operation and staging	**section 8**
• A general description of the environment likely to be affected by the development together with a detailed description of those aspects of the environment that are likely to be significantly affected	**section 13**
• The likely impact on the environment of the development with particular focus on the key assessment requirements listed in Table 33.	**section 13**
• A description of the measures proposed to mitigate any adverse effects of the development on the environment compiled into a single section.	**section 15**
• a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out	**section 9.4.7**
• Justification for carrying out of the development in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development.	**section 16.5**
• declaration by the person by whom the statement is prepared to the effect that: • the statement has been prepared in accordance with Schedule, and • the statement contains all available information that is relevant to the environmental assessment of the development to which the statement relates, and • (iii) that the information contained in the statement is neither false nor misleading.	**section 1**
• A draft Statement of Commitments for environmental mitigation, management and monitoring for the development	**section 15**

A copy of the NSW Department of Planning and Environment response is provided in.

11.2 Consultation with stakeholders and other relevant authorities

11.2.1 Local government

11.2.1.1 Edward River Council

Edward River Council were contacted on the 27 April 2023; 26 September 2023 and 7 December 2023 regarding the expansion of the existing beef cattle feedlot.

A response was received from Edward River Council on the 15 May 2023 advising that as the application will be designated development, the SEARS will outline what is to be included in the EIS.

A summary of the specific issues raised by the Edward River Council and how they are adequately addressed within the EIS are provided in Table 33 and Table 34. The details of the consultation process are provided in Appendix B.2.

11.2.2 Other relevant authorities

11.2.2.1 Environment Protection Authority (EPA)

The NSW EPA (Griffith) provided their response within the SEARs applicants package.

A summary of the specific issues raised by the NSW EPA and how they are adequately addressed within the EIS are provided in Table 35. The details of the consultation process are provided in Appendix B.3.

Table 35 – Proposed Development – NSW EPA EIS requirements

Aspect	Document Reference
• Details on the potential environmental impacts such as odour, noise, dust, waste and contamination, including cumulative impacts and detail mitigation measures, including monitoring, that is proposed to be implemented to prevent or minimise these impacts;	section 13.1.5 section 13.1.6 Appendix G
• Details on an odour impact assessment completed in accordance with the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2022) and Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (2006);	section 13.1.5 section 13.1.6 Appendix G
• Details on the proposed construction and management of the wastewater collection and treatment system, including a demonstration that surface water, groundwater and soils will be protected from adverse impacts;	section 13.2.4 section 13.3.2 section 13.4.2 section 8.4 section 8.6 section 13.2.4 section 13.3.2 section 13.4.2 section 8.4
Details of the management of the waste produced by the feedlot; and	section 8.4.10
• Details of the management of mortalities at the feedlot.	section 8.4.10.4 section 8.7.4.1.2 section 8.7.4.2.6

11.2.2.2 Water NSW

Water NSW were contacted on the 7th of December 2023 regarding the expansion of the existing feedlot. A summary of the specific issues raised by Water NSW and how they are adequately addressed within the EIS are provided in Table 36. The details of the consultation process with Water NSW are provided in Appendix B.4.

Table 36 – Proposed Development – Water NSW EIS requirements

Issue	EIS section
• Annual volumes of surface water and groundwater proposed to be taken by the activity (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan.	section 8.7.3
• Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project).	section 13.3 and 13.4
• Assessment of the impact and approvals (Works and Use Approvals under the WMA 2000) required for the taking or storage of water.	section 13.3 and 13.4
• The identification of an adequate and secure water supply for the life of the project.	Appendix H
• Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.	section 13.3 and 13.4, Appendix H
• A detailed and consolidated site water balance.	section 8.7.3
• Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.	section 13.3 and 13.4
• Full technical details and data of all surface and groundwater modelling.	Not relevant
• Proposed surface and groundwater monitoring activities and methodologies.	Appendix P
• Proposed management and disposal of produced or incidental water.	Not relevant
• WaterNSW is responsible for the management and licensing of flood work approvals. If the proposal is for an earthwork, embankment or levee, wherever situated or proposed to be constructed that is reasonably likely to affect the flow of water to or from a river or lake then the assessment is required to address potential impacts detailed further in attachment A.	Not relevant
• Clear identification of "waterfront land" (as defined in the WMA 2000) and an assessment of impacts of works and activities on waterfront land. • (Works on waterfront land may be subject to Controlled Activity Approval (CAA) under the Water Management Act 2000.)	Appendix R
• Details of the final landform of the site, including final void management (where relevant) and rehabilitation measures.	Not relevant
• Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.	Not relevant
• Consideration of relevant policies and guidelines.	section 9
• A statement of where each element of the SEARs is addressed in the EIS (i.e. in the form of a table).	Table 36

11.2.2.3 Murray Irrigation

Murray Irrigation were contacted on the 7th of December 2023 regarding the proposed beef cattle feedlot at 58 Broughans Road Pine Lodge. Murray Irrigation confirmed in an email dated 7th of February 2024 that it foresees no matters of interest with both the existing feedlotting activity and the proposed expanded feedlot.

The details of the consultation process with Murray Irrigation are provided in Appendix B.5.

11.2.2.4 NSW Rural Fire Service

The NSW Rural Fire Service were contacted on the 7th of December 2023 regarding the proposed expansion of the beef cattle feedlot at 58 Broughans Road Pine Lodge. The Department provided the following summary of matters that should be addressed in any EIS response for the proposed development. The details of the consultation process with the NSW Rural Fire Service are provided in Appendix B.6.

In recognition of the potential for the development to increase the level of bush fire risk within the landscape and be impacted upon during a bush fire event, the following matters should be addressed in the environmental assessment:

- the aim and objectives of Planning for Bush Fire Protection 2019
- identification of potential ignition sources during construction and operation of the development
- storage of fuels and other hazardous materials
- proposed bush fire protection measures for the development, including vegetation management and fire suppression capabilities
- operational access for fire fighting appliance to the site; and
- emergency and evacuation planning

The enclosed EIS addresses all matters raised by the NSW Rural Fire Service.

11.2.2.5 Department of Primary Industries – DPI Agriculture

The NSW Department of Primary Industries – DPI Agriculture were contacted on the 7th of December 2023 regarding the proposed beef cattle feedlot at 58 Broughans Road Pine Lodge. The Department of Primary Industries provided the following summary of matters that should be addressed in any EIS response for the proposed beef cattle feedlot. A summary of the specific issues raised by DPI Agriculture and how they are adequately addressed within the EIS are provided in Table 37. The details of the consultation process with DPI Agriculture are provided in Appendix B.7.

Table 37 – Proposed Development – NSW DPI Agriculture EIS requirements

Issue	EIS section
• assessment of the soils, using land and soil capability mapping, BSAL, draft mapped SSAL (https://nswdpi.mysocialpinpoint.com/ssal/map#/) to indicate that the site selection is appropriate for the proposed land use and also avoids where feasible strategic agricultural land and key water resources/sensitive land.	section 9.3.3.2
• assessment of impacts on neighbouring sensitive receivers from an odour, visual, noise and dust perspective. Measures to mitigate impacts would include site selection, access points, screening, and, in particular, calculated buffers to sensitive receivers to avoid odour impacts.	section 13.1.5 section 13.1.6 Appendix G
• An overview of the relevant planning framework, including SEPP(primary production) and Guidelines	section 9.3.3.2
• stocking density and effluent disposal to be considered in terms of environmental, land use and water resource impacts.	section 8.4.2.1 section 8 Appendix L
• industry best practice management to be applied, including shade cover.	section 8.4.2.9
• stock water quality and supply arrangements year round / industry best practice management to be applied.	section 8.7.3 Appendix P
• hospital pen arrangements / industry best practice management to be applied.	section 8 Appendix P
• The Managing Biosecurity Risks in Land Use Planning and Development Guide outlines steps to be considered to ensure biosecurity is appropriately addressed during the planning and assessment of development proposals / industry standards to be applied.	section 8.7.13 section 13.15 Appendix P

The development application matters mentioned above will be addressed in the EIS in accord with the principles practices as outlined in the are based on the National guidelines for beef cattle feedlots in Australia, 3rd edition (MLA, 2012a).

11.2.2.6 Transport for NSW (TfNSW)

TfNSW were contacted on the 7th of December 2023 regarding the proposed expansion of the beef cattle feedlot at 58 Broughans Road, Pine Lodge. TfNSW responded via email on the 21st of December 2023 requesting a meeting.

A video meeting was held on the 2nd of May 2024 with TfNSW officers (Cam O'Kane (Development Services Case Officer Community and Place) and Maurice Morgan (Team Leader Development Services).

TfNSW advised that the only location that would be of interest would be the intersection of the Riverina Highway and James Road, and only if the development would create an increase in the traffic at that intersection.

Since any increase in traffic at that intersection due to the development will be negligible, and well within the intersection capacity, there is no need for the developer's designer to make further contact with RMS.

TfNSW suggested that traffic management and safety on the road network may be assisted by measures such as the introduction of a code of conduct for heavy vehicle operators.

A summary of the specific issues raised by TfNSW and how they are adequately addressed within the EIS are provided in Table 38. The details of the consultation process are provided in Appendix B.8.

Table 38 – Proposed Development – TfNSW EIS requirements

Issue	EIS section
Identified Haulage Route	Traffic Impact assessment Appendix Q
Heavy vehicle movements along Broughans Road	Traffic Impact assessment Appendix Q
Swept path analysis of the Riverina Highway/James Road intersection	Traffic Impact assessment presented in Appendix Q

11.2.2.7 Department of Planning and Environment - Biodiversity and Conservation Division

The NSW Department of Planning and Environment – Biodiversity and Conservation Division (BCD) were contacted on the 7th of December 2023 regarding the proposed expansion of the beef cattle feedlot at 58 Broughans Road, Pine Lodge. A summary of the specific issues raised by the BCD and how they are adequately addressed within the EIS are provided in Table 39. The details of the consultation process are provided in Appendix B.9.

Table 39 – Proposed Development – Department of Planning and Environment - Biodiversity and Conservation Division

Issue	EIS section
BCD considers that the proposed development presents a low flood risk. The applicant should consider conducting a flood impact and risk assessment determine the actual flood risk to inform the proposal and any future development of the site. However, as the level of flood risk is low, we do not consider this a requirement.	Appendix I
Parts of the subject land are likely to support threatened ecological communities and habitat for threatened species. BCD understands that proposed development does not intend to reconfigure or increase the footprint of the existing development. The EIS should include evidence to demonstrate the proposed development and land use will not impact on threatened species and communities	Appendix I

BCD further states that if impacts cannot be avoided, further detailed assessment in accord with Attachment A should be provided. The EIS will describe all site design and management strategies that will mitigate impacts to the immediate environment.

11.2.2.8 Deniliquin Local Aboriginal Land Council

The Deniliquin Local Aboriginal Land Council via Anthony Jones was contacted by Talei Holm (Consulting Archaeologist) with respect to briefing the relevant Aboriginal people of the land on which the development is proposed about the proposed development.

The details of the consultation process with the local Aboriginal community are provided in the Aboriginal Due Diligence Report (Holm, 2023) presented in Appendix J.

11.2.3 Communications

The overall objective of the community consultation program was to secure broad community support and acceptance in order to gain and protect our "social licence to operate" through clear, open and transparent communication and understanding and addressing community issues as they arose.

This objective was achieved through the following activities:

- Dissemination of information about the proposed development and the development approval process to key stakeholders and the surrounding community;
- Raising community awareness and understanding of the proposed development and the associated planning process;
- Providing stakeholders and members of the community with adequate opportunities through the consultation process to communicate feedback and voice concerns;
- Accurately reporting of community and stakeholder issues and views;
- Building community confidence in the EIS and approval process;
- Facilitating information exchange from the onset between the proponents and the community to enable joint understanding of issues raised;
- Conforming to relevant NSW and Commonwealth legislation; and
- Working co-operatively with the relevant authorities.

11.2.3.1 Community stakeholder identification

The key community stakeholders were identified as those who may be affected positively or negatively by the proposed development. The key community stakeholders of concern are those residents or landholders geographically located within a radius of 3 km of the proposed development. Figure 18 shows the geographic area of community consultation.

RURAL DWELLING - 179 BOWLERS ROAD PINE LODGE
JAMES ROAD
RURAL DWELLING - 299 JAMES ROAD PINE LODGE
RURAL DWELLING - 299 JAMES ROAD PINE LODGE
TUPPAL ROAD
PROPOSED DEVELOPMENT SITE
RURAL DWELLNIG - 203 BROUGHANS ROAD PINE LODGE
KELLYS ROAD
SUBJECT LAND BOUNDARY
BROUGHANS ROAD
RURAL DWELLING - 442 JAMES ROAD PINE LODGE
BOWLERS ROAD
LOT 1 DP756353
JAMES ROAD
BROUGHANS ROAD
RURAL DWELLING - 202 BROUGHANS ROAD PINE LODGE
SUBJECT LAND BOUNDARY
BOWLERS ROAD
RURAL DWELLING - 306 BOWLERS ROAD PINE LODGE
SUBJECT LAND BOUNDARY
RURAL DWELLING - 108 WOODWARDS ROAD PINE LODGE
WOODWARDS ROAD

N
W
E
S

SCALE

0 250 500 750 1,000 1,250 1,500 1,750 2,000 2,250 2,500m
1:12,500 (A1) 1:25,000 (A3)

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- RURAL DWELLING
- STREAM ORDER 1
- STREAM ORDER 2
- STREAM ORDER 3
- STREAM ORDER 4
- STREAM ORDER 5
- STREAM ORDER 6
- STREAM ORDER 7
- STREAM ORDER 8

NOTES:
1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2019, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
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4. HORIZONTAL DATUM - MGA2020 UTM ZONE 55.

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RPEQ

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED	SCALE	1:20,000 (A3)
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD	DRAWN	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD	DATE	07/11/2024
						CHECKED	RJD
						DATE	07/11/2024
						APPROVED	RJD
						DATE	07/11/2024

CLIENT AJ & NA VARLEY
PROJECT PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - COMMUNITY CONSULTATION AREA

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 18		A3	F3-107-00-18	B

11.2.3.2 Community consultation methodology

The primary aim of the community involvement process was to provide information to the residents or landholders about the proposed development, and approval process and obtain responses which would be addressed during the preparation of the EIS.

A letter and information on the proposed development was distributed to residents and landholders living within 3 km of the proposed development. A copy of this letter, proposed development information and distribution area is attached in Appendix C.

The community was encouraged through the letter to make submissions on the proposed development. There were no responses received from the local community as a result of the consultation program.

12. Identification and prioritisation of issues

12.1 Overview and methodology

Identification of the environmental issues relevant to the proposed development involved a combination of background investigation, research, and consultation including the following:

- Consultation with stakeholders and other relevant statutory authorities (section 11.2);
- Reference to the relevant legislation and planning instruments (section 9);
- Reference to The Director-General's requirements (section 11.1 and Appendix B); and
- Review of environmental guidelines for beef cattle feedlots (section 10).

12.2 The issues and prioritisation

The key issues identified were assessed for their significance and rated to determine their priority for assessment.

As with all environmental assessments, the assessment of issues needs to recognise that the higher the significance of a particular attribute and the potential for adverse environmental impact, the higher the degree of analysis required. Thus, the higher the risk or level of concern of the issue, the higher priority for assessment. Subsequently, a priority level has been placed on each issue, either being low, medium or high, which considers the potential for impact and the level of concern for this issue.

A summary of the issues and their priority rating is shown in Table 40.

Table 40 – Proposed development – Issues for consideration

Issue	Sub-Issue	Rating	Justification
Air Quality	Odour	High	Beef cattle feedlots are a known source of odour and can result in adverse impacts to sensitive receivers.
	Dust	Medium	Dust generation during construction and operation may result in adverse impacts to sensitive receivers.
	GHG	Low	Despite the inputs required to produce grain fed beef, beef cattle feedlots actually produce significantly less GHG emissions than grass fed cattle. Australian life cycle research concludes that grain fed cattle produce 38% less CO_2 equivalent emissions per kg of beef production compared to grass fed cattle (Peters et al., 2009)
Soils		High	The proposed development has the potential to adversely impact the physical or chemical properties of soils, at or in the vicinity of the proposed development site through the release of contaminants commonly found in effluent and/or solid waste streams and erosion.
Water	Groundwater	Medium	The operation of the proposed development above vulnerable groundwater resources or in salinity hazard areas may adversely impact on those resources. Further, unregulated use of groundwater may result in impacts to resource levels.
	Surface	Medium	The operation of the proposed development may adversely impact on surface water resources. Further, unregulated use of surface water may result in impacts to resource levels.
Flooding, Stormwater and Coastal erosion		Low	The proposed development has the potential to generate impacts to the receiving environment from stormwater along with implications of flooding.
Cultural Heritage		Low	The operation of the proposed development may have adverse impacts on culture heritage, through disturbance to Aboriginal or non-Aboriginal sites and artefacts.
Biodiversity		High	The proposed development has the potential to have adverse impacts on biodiversity values by loss and modification of native vegetation and habitat.
Waste Generation		Low	The construction and operation of the proposed development shall produce varying levels of inorganic and organic waste that may adversely impact on the environment if inappropriate mitigation measures are not implemented.
Land Capability		High	The proposed development would produce solid and liquid waste during its operation. The characteristics of the soils in the proposed utilisation areas will impact on the suitability of the land for sustainable utilisation.
Traffic and Transport		Medium	The proposed development shall result in an increase in traffic on the local road network.
Noise and Vibration		Low	Significant distances to sensitive receivers and as the operational activities of the proposed development are

			consistent with the activities of the existing agricultural activities of the surrounding area, the noise generated from the proposed development is not expected to create a significant impact on the surrounding environment.
Visual Amenity		Low	Significant distances to sensitive receivers along with surrounding topography, landforms and vegetation, provide visual screening of the proposed development from sensitive receivers.
Pest animals and weeds		Low	Pest animals and noxious weeds have the potential to become established and/or proliferate as a result of the proposed development.
Hazards and Risk		Low	The proposed development has the potential to have adverse impacts to human health and safety, animal health and the biophysical environment.
Bushfire and Incident Management		Medium	Uncontrolled bushfire has the potential to impact on human safety and animal welfare and damage to infrastructure.
Land Use		Low	Incompatible developments may lead to land use conflicts and adversely impact community values. The proposed development is consistent with the surrounding land uses of the area.
Air Quality	Odour	High	Beef cattle feedlots are a known source of odour and can result in adverse impacts to sensitive receivers.
	Dust	Medium	Dust generation during construction and operation may result in adverse impacts to sensitive receivers.
	GHG	Low	Despite the inputs required to produce grain fed beef, beef cattle feedlots actually produce significantly less GHG emissions than grass fed cattle. Australian life cycle research concludes that grain fed cattle produce 38% less CO_2 equivalent emissions per kg of beef production compared to grass fed cattle (Peters et al., 2009)
Soils		High	The proposed development has the potential to adversely impact the physical or chemical properties of soils, at or in the vicinity of the proposed development site through the release of contaminants commonly found in effluent and/or solid waste streams and erosion.
Water	Groundwater	Medium	The operation of the proposed development above vulnerable groundwater resources or in salinity hazard areas may adversely impact on those resources. Further, unregulated use of groundwater may result in impacts to resource levels.
	Surface	Medium	The operation of the proposed development may adversely impact on surface water resources. Further, unregulated use of surface water may result in impacts to resource levels.
Flooding, Stormwater and Coastal erosion		Low	The proposed development has the potential to generate impacts to the receiving environment from stormwater along with implications of flooding.

Cultural Heritage		Low	The operation of the proposed development may have adverse impacts on culture heritage, through disturbance to Aboriginal or non-Aboriginal sites and artefacts.
Biodiversity		Low	The proposed development has the potential to have adverse impacts on biodiversity values by loss and modification of native vegetation and habitat.
Waste Generation		Low	The construction and operation of the proposed development shall produce varying levels of inorganic and organic waste that may adversely impact on the environment if inappropriate mitigation measures are not implemented.
Land Capability		High	The proposed development would produce solid and liquid waste during its operation. The characteristics of the soils in the proposed utilisation areas will impact on the suitability of the land for sustainable utilisation.
Traffic and Transport		Medium	The proposed development shall result in an increase in traffic on the local road network.
Noise and Vibration		Low	Significant distances to sensitive receivers and as the operational activities of the proposed development are consistent with the activities of the existing agricultural activities of the surrounding area, the noise generated from the proposed development is not expected to create a significant impact on the surrounding environment.
Visual Amenity		Low	Significant distances to sensitive receivers along with surrounding topography, landforms and vegetation, provide visual screening of the proposed development from sensitive receivers.
Pest animals and weeds		Low	Pest animals and noxious weeds have the potential to become established and/or proliferate as a result of the proposed development.
Hazards and Risk		Low	The proposed development has the potential to have adverse impacts to human health and safety, animal health and the biophysical environment.
Bushfire and Incident Management		Medium	Uncontrolled bushfire has the potential to impact on human safety and animal welfare and damage to infrastructure.
Land Use		Low	Incompatible developments may lead to land use conflicts and adversely impact community values. The proposed development is consistent with the surrounding land uses of the area.
Air Quality	Odour	High	Beef cattle feedlots are a known source of odour and can result in adverse impacts to sensitive receivers.
	Dust	Medium	Dust generation during construction and operation may result in adverse impacts to sensitive receivers.
	GHG	Low	Despite the inputs required to produce grain fed beef, beef cattle feedlots actually produce significantly less GHG emissions than grass fed cattle. Australian life cycle research concludes that grain fed cattle produce 38% less

			CO_2 equivalent emissions per kg of beef production compared to grass fed cattle (Peters et al., 2009)
Soils		High	The proposed development has the potential to adversely impact the physical or chemical properties of soils, at or in the vicinity of the proposed development site through the release of contaminants commonly found in effluent and/or solid waste streams and erosion.
Water	Groundwater	Medium	The operation of the proposed development above vulnerable groundwater resources or in salinity hazard areas may adversely impact on those resources. Further, unregulated use of groundwater may result in impacts to resource levels.
	Surface	Medium	The operation of the proposed development may adversely impact on surface water resources. Further, unregulated use of surface water may result in impacts to resource levels.
Flooding, Stormwater and Coastal erosion		Low	The proposed development has the potential to generate impacts to the receiving environment from stormwater along with implications of flooding.
Cultural Heritage		Low	The operation of the proposed development may have adverse impacts on culture heritage, through disturbance to Aboriginal or non-Aboriginal sites and artefacts.
Biodiversity		High	The proposed development has the potential to have adverse impacts on biodiversity values by loss and modification of native vegetation and habitat.
Waste Generation		Low	The construction and operation of the proposed development shall produce varying levels of inorganic and organic waste that may adversely impact on the environment if inappropriate mitigation measures are not implemented.
Land Capability		High	The proposed development would produce solid and liquid waste during its operation. The characteristics of the soils in the proposed utilisation areas will impact on the suitability of the land for sustainable utilisation.
Traffic and Transport		Medium	The proposed development shall result in an increase in traffic on the local road network.
Noise and Vibration		Low	Significant distances to sensitive receivers and as the operational activities of the proposed development are consistent with the activities of the existing agricultural activities of the surrounding area, the noise generated from the proposed development is not expected to create a significant impact on the surrounding environment.
Visual Amenity		Low	Significant distances to sensitive receivers along with surrounding topography, landforms and vegetation, provide visual screening of the proposed development from sensitive receivers.

Biosecurity	Low	Pest animals and noxious weeds have the potential to become established and/or proliferate as a result of the proposed development.
Hazards and Risk	Low	The proposed development has the potential to have adverse impacts to human health and safety, animal health and the biophysical environment.
Bushfire and Incident Management	Medium	Uncontrolled bushfire has the potential to impact on human safety and animal welfare and damage to infrastructure.

Part F – Environmental issues and assessment of impacts

13. Environmental issues and assessment of impacts

13.1 Air quality

13.1.1 Introduction

This section discusses the potential impacts on air quality and the emissions of greenhouse gases (GHG) associated with the proposed development; including mitigation measures when practicable.

The main emissions of concern are odour and dust, and to a lesser extent GHG emissions associated with the livestock, vehicles, feed processing operations.

The main impacts on air quality in regard to the proposed development include:

- odours from the surface of pens, feed storage, solid waste and liquid waste storage, handling and utilisation
- impacts of dust from operations associated with construction and operation such as bulk earthworks, movement of cattle within the pens, vehicle movement etc
- vehicle exhaust emissions
- livestock and manure GHG emissions.

Potential impacts to air associated with the proposed development are expected to be minimal based on the implementation of a number of mitigation measures, the location of the proposed development and the absence of nearby residential facilities will limit any adverse impacts.

There are limited potential sources of particulate emissions from the existing environment as the environment is considered undisturbed. Existing particulate emissions include primarily vehicle emissions from local traffic, smoke from bushfires and wind-blown dust.

This section of the EIS includes a summary of this assessment as well as addressing other relevant matters relating to air quality such as climate, meteorology, dust and greenhouse gases.

13.1.2 Air quality guidelines

The *Protection of the Environment Operations Act 1997* (*POEO Act*) and associated regulation The Protection of the Environment Operations (Clean Air) Regulation 2022 provides the statutory framework for managing air emissions in NSW.

In addition, other guidelines have been used for assessing impacts of the proposed development on air quality. The following sources have been used:

- Local Government Air Quality Training Toolkit (DECC, 2013)
- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2022)
- Development of an Odour Emissions Model for Australian Feedlots, Part F: Emissions Estimation and Model Application, Project No. B.FL T.0369 Final Report (Omerod et al. 2014)
- Development of an Odour Emissions Model for Australian Feedlots, Part C: Feedlot Odour Sampling and Testing Techniques Project No. B.FL T.0369 Final Report (Omerod, 2014)
- Guideline: Odour Impact Assessment from Developments (DEHP, 2013).

13.1.3 Existing environment

13.1.3.1 Climate

The closest meteorological station with climatic data to the subject land is the Bureau of Meteorology (BoM) station at Finley Post Office located about 11 km east of the subject land. The Finley Post Office (Site number: 074042) (BoM, 2024a) has been recording rainfall since 1897.

A summary of the rainfall data from the Finley Post Office (Site number: 074042) (BoM, 2024a) is provided in Table 41.

The closest meteorological station to the subject land with climatic data is the Deniliquin Airport (Site number: 074258) located some 46 km to the west north-west. However, this station has only been collecting climate data since 1997 (BoM, 2024b). These data may not be representative of the long term climate of the subject land.

Long-term daily interpolated climate data for the area (Latitude -35.65S, Longitude 145.45E) were derived from the Department of Science, Information Technology and Innovation (DSITIA) Silo Data Drill database (DSITIA, 2024). The Data Drill accesses data on a 5 km grid derived by interpolation from point observations by the Bureau of Meteorology station records. The data in the Data Drill are all synthetic; there are no original meteorological station data left in the calculated grid fields (Jeffrey et al. 2001). The data are supplied as an individual file of interpolated daily rainfall, maximum and minimum temperature, potential evapotranspiration and radiation at the nominated point location for the period 01/01/1924 to 31/12/2023 (DSITIA, 2024). A summary of the data used is included in Table 42.

The climate of the region is between the tropical and temperate climatic zones. Under the Köppen-Geiger climate classification system this climate is classified as steppe (BSk), and experiences dry hot summers and wet cool winters.

Rainfall varies with time of year due to the latitude of the region (-35.7^0) and tends to be winter dominant. Rainfall patterns are linked to cold fronts and associated low pressure systems. These

systems peak between the months of April and October (the 'cool season') when the lows in the Southern Ocean tend to move closest to Australia.

Table 41 shows that the long-term average rainfall recorded at Finley Post Office for the period 1897 to 2024 was 432 mm with approximately 55% falling in the five months between May and October. Monthly rainfall over the autumn and winter months averages around 40 mm per month. The lowest rainfall totals are between December and March (Table 41).

Table 42 shows that the average annual rainfall interpolated by SILO for the period 1924 to 2023 is approximately 424 mm/year slightly less than that measured by BoM at the Finley Post Office site. The annual evaporation is approximately 1,650 mm/year. The region has nett deficit rainfall with rainfall less than the evaporation and transpiration rates.

There is a large degree of variability in rainfall between years and there has been a drying climate with lower average annual rainfall over the last 30 years.

The climatic influence on temperatures results in warm to hot summers and cool winters, regularly reaching single digit temperature. Table 42 shows that the mean maximum temperature interpolated by SILO for the period 1924 to 2023 is 31.7^{0}C in January and a mean minimum temperature of about 3.3^{0}C for July.

Relative humidity in the area is higher during the winter months when temperatures are lower. Average relative humidity 9 am readings range from 39% in July to 40% in November.

Table 41 – Rainfall data from Finley Post Office (1897-2024) (BoM, 2024a)

	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall														
Mean rainfall	mm	33.9	26.6	33.2	28.7	39.2	42.1	39.0	39.7	38.2	40.4	34.9	33.4	432.0
Median rainfall	mm	22.9	16.6	22.1	23.2	28.4	36.0	31.9	37.4	33.1	33.2	26.9	22.8	421.4
Lowest rainfall	mm	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.6	2.8	0.0	0.0	0.0	161.3
90% years at least rainfall	mm	0.8	0.0	1.2	1.4	6.2	11.2	11.7	9.7	9.2	4.9	3.4	1.5	270.3
10% years at least rainfall	mm	75.7	72.1	79.3	62.5	85.0	77.8	74.9	70.6	69.5	81.4	73.2	78.0	596.3
Highest rainfall	mm	257.8	144.3	202.0	111.4	148.9	116.0	94.8	113.0	139.1	200.9	158.5	206.1	898.3

Table 42 – Climatic data derived for SILO (1924-2023) (DSITIA, 2024)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall													
Mean rainfall (mm)	33.1	28.7	32.8	30.6	37.5	37.2	38.6	38.1	35.9	42.8	34.9	33.8	423.9
Median rainfall (mm)	21.7	16.6	22.8	25.6	28.8	34.0	32.9	35.5	32.1	33.4	30.2	23.4	421.5
Lowest rainfall (mm)	0	0	0	0	0	0.2	1.7	1.1	3.9	0	0.4	0	180.4
90% years at least rainfall (mm)	1.0	0.4	1.1	3.0	7.7	11.2	13.1	9.5	7.5	8.4	6.5	2.4	249.5
10% years at least rainfall (mm)	66.4	74.6	75.6	66.5	78.3	69.1	71.6	64.5	63.5	84.9	71.2	80.9	584.2
Highest rainfall (mm)	247.2	144.3	189.4	112.2	127.3	106.8	97.7	108.1	130	202.5	138.2	180.1	836.8
Temperature, Humidity and Pan evaporation													
Mean pan evaporation (mm)	273.9	219.0	176.5	99.0	54.1	35.2	38.1	58.0	91.9	146.4	201.1	254.9	1650.2
Mean maximum temperature (deg C)	31.7	31.4	28.0	22.7	18.0	14.5	14.1	15.6	18.8	22.6	26.5	29.7	22.8
Mean minimum temperature (deg C)	15.9	16.0	13.4	9.4	6.5	4.1	3.3	4.2	5.9	8.6	11.4	14.0	9.4
Relative Humidity (%)	43.5	46.3	46.2	46.0	48.0	48.7	45.5	42.1	40.1	40.0	39.8	41.4	44.0

13.1.3.2 Design rainfalls

Annual Exceedance Probability (AEP) and Intensity-Frequency-Duration (IFD) design rainfalls for the proposed development site were obtained from the Bureau of Meteorology (BoM, 2024c; BoM, 2024d). The rainfall total accumulated over a given duration and probability that it will be exceeded in any one year (AEP) is provided in Table 43. Rainfall intensity for durations and average recurrence interval are shown in Table 44. The probability that a given rainfall total accumulated over a given duration will be exceeded in any one year when the ARI is expressed in years, is given by the relationship:

$$AEP = 1 - \exp\left(\frac{-1}{ARI}\right)$$

Consequently, a one in 20-year, 24-hour storm event correlates to an AEP of 5%.

Table 43 – Proposed development site – AEP design rainfalls (BoM, 2024c)

Duration	Annual Exceedance Probability						
	63.2%	**50%**	**20%**	**10%**	**5%**	**2%**	**1%**
5 min	61.3	70.6	101.0	123.0	146.0	178.0	203.0
10 min	46.2	53.2	76.2	92.7	109	133	151
15 min	37.6	43.3	62.1	75.5	89.2	108	123
30 min	25	28.8	41.3	50.3	59.5	72.4	82.8
1 hour	15.8	18.2	26.1	31.9	37.8	46	52.7
2 hours	9.8	11.2	16.1	19.6	23.2	28.3	32.4
3 hours	7.4	8.5	12.1	14.7	17.3	21.0	24.1
6 hours	4.5	5.2	7.3	8.9	10.5	12.6	14.4
12 hours	2.7	3.1	4.5	5.4	6.3	7.6	8.6
24 hours	1.6	1.9	2.7	3.2	**3.8**	4.5	5.1
48 hours	0.9	1.1	1.5	1.9	2.2	2.7	3.0
72 hours	0.7	0.8	1.1	1.4	1.6	1.9	2.2

*Design storm event (mm/hr)

Table 44 – Proposed development site – ARI design rainfalls (ARI) (BoM, 2024d)

Duration	Annual Return Interval						
	1	**2**	**5**	**10**	**20**	**50**	**100**
5 mins	47.2	63	88.5	105	126	156	179
6 mins	43.9	58.6	82.1	97.3	117	144	166
10 mins	35.5	47.4	66.1	78.2	93.9	115	133
20 mins	25.7	34	47.3	55.8	66.7	81.9	93.9
30 mins	20.6	27.3	37.8	44.5	53.1	65	74.5
1 hour	13.6	18	24.6	28.9	34.4	41.9	47.9
2 hours	8.58	11.3	15.4	18	21.3	25.9	29.5
3 hours	6.5	8.55	11.6	13.5	15.9	19.3	21.9
6 hours	4.01	5.25	7.04	8.16	9.6	11.6	13.1
12 hours	2.47	3.23	4.29	4.94	5.78	6.94	7.84
24 hours	1.52	1.97	2.59	2.97	**3.46***	4.11	4.64
48 hours	0.904	1.17	1.51	1.72	1.99	2.35	2.64
72 hours	0.65	0.83	1.07	1.21	1.39	1.64	1.83

*Design storm event (mm/hr)

13.1.3.3 Wind direction and frequency

The wind direction, frequency and intensity at the site are influenced by several factors including the local terrain and land use. On a relatively small scale, winds would be largely affected by the local topography. At larger scales, winds are affected by synoptic scale winds, which are modified by sea breezes near the coast in the daytime in summer (also to a certain extent in the winter) and by a complex pattern of regional drainage flows that develop overnight.

As no meteorological data exists for the proposed development site, data was obtained from the closest meteorological record station that holds wind direction statistics to the subject land. However, the closest station is the Deniliquin Airport (1997-2024) (BoM, 2024a) which is located approximately 46 km west north-west of the subject land. Given the distance and terrain, these data can be used to provide a general indication of wind speed and direction at the proposed development site.

However, a more representative local wind speed and direction data was obtained using the meteorological model – The Air Pollution Model (TAPM) (Version 4).

TAPM, developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is a prognostic model which is used to predict three-dimensional meteorological data and air pollution concentrations. A detailed description of the TAPM model can be found in Hurley (2008).

TAPM software allows users to generate synthetic observations by referencing in-built databases (e.g. terrain information, synoptic scale meteorological observations, vegetation and soil type etc.) which are subsequently used in generating site-specific hourly meteorological observations.

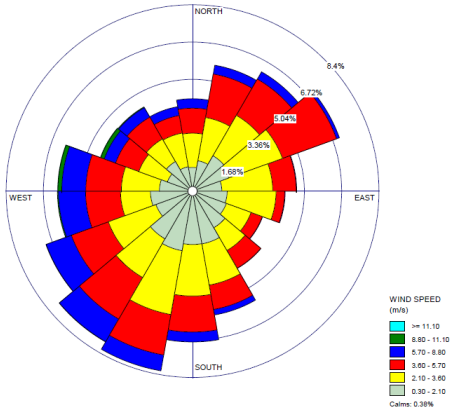
The modelling was centred on the closest grid point to the proposed development site being 35°39.0'S; 145° 27.0'E and was configured with a 30 x 30 grid. In total, five domains were set up with grid spacings of 30km, 10 km, 3 km, 1 km and 0.3 km. Five (5) years data were modelled from 2018 to 2022. This setup is consistent with good practice and the guidance detailed in the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2022).

Wind speed and direction information obtained from TAPM modelling is presented in the form of wind roses. Wind roses are a way of presenting a summary of wind speed and directional data for a particular time and location and show the frequency of occurrence of winds by direction and strength.

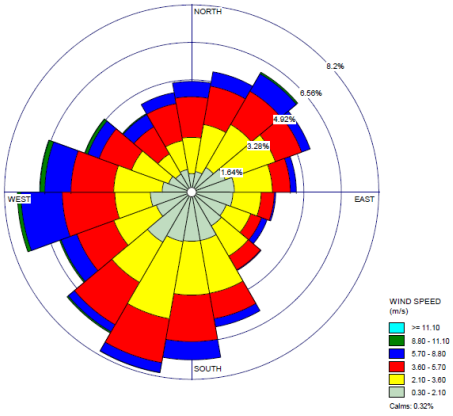
The annual wind roses developed for the proposed development site from TAPM in years 2017 to 2021 inclusive are shown in Figure 19. All years modelled result in similar wind directions. Each bar shown on the wind rose represents winds blowing from that direction. The length of the bar represents the frequency of occurrence of winds from that direction, and the colour and width of the bar sections correspond to wind speed categories as outlined in the legend.

The composite wind rose developed for the proposed development site from TAPM in all five years (2017 to 2021) is shown in Figure 20. Figure 20 shows that wind direction is predominantly from the south through to the west sector with light to moderate wind speeds (2.1 – 5.7 m/s) observed for most of the year.

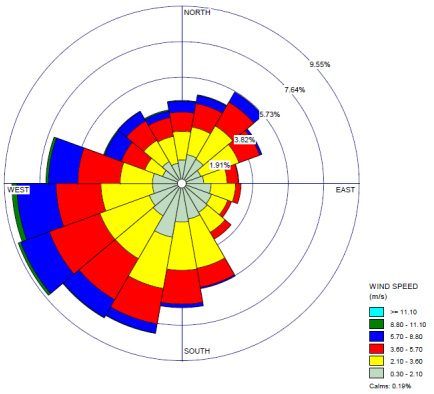
Analyses of the TAPM data shows that about 35% of the winds blow from ±40° from the general direction of southeast.



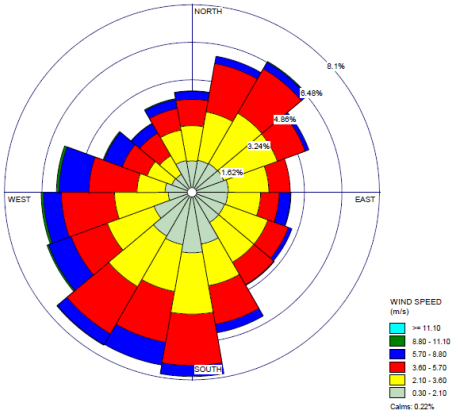
2017



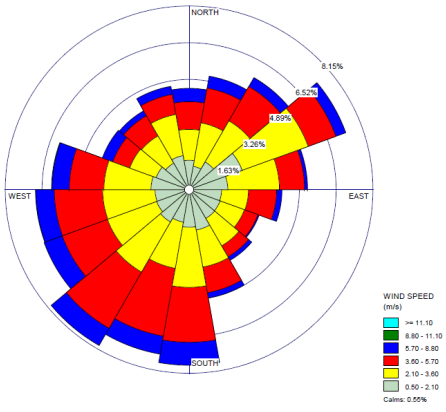
2018



2019



2020



2021

Figure 19 – Proposed development site – Annual windroses (TAPM)

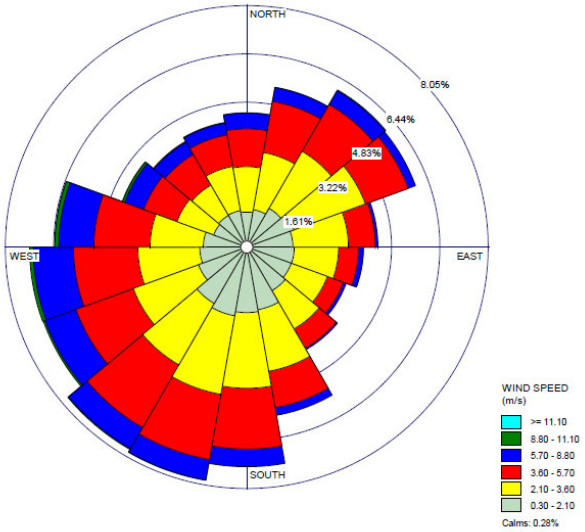


Figure 20 – Proposed development site – Composite annual windrose (TAPM 2017-2021)

13.1.3.4 Sensitive receptors

The proposed development is located within the Central River Murray Catchment, a well developed agricultural landscape with rural farms and villages distributed across the plains. The nearest communities to the proposed development are Finley some 11 km to the East by North and Tocumwal some 20 km to the Southeast by South of the proposed development site.

The nearest potentially affected sensitive receptors have been identified from examination of aerial imagery (Google Earth™) and a site inspection and are shown in Figure 14.

Figure 14 shows that the closest sensitive receptor is a rural residence located some 990 m to the West by South and 1,130 m to the North by East of the proposed development complex. It is important to note that the existing separation distances have been determined from the edge of the proposed development complex in the direction of the receptor.

13.1.3.5 Existing emission sources

As requested by the Director Generals requirements (Appendix B), the air quality assessment should account for cumulative impacts associated with existing emission sources as well as currently approved developments linked to the receiving environment.

There are no existing odour or dust emission sources, nor any currently approved developments linked to the receiving environment in the locality of the proposed development. Subsequently, there are no cumulative effects of the proposed development with any existing development or emission source.

13.1.4 Air quality impacts

13.1.4.1 Odour

The Australian feedlot industry expanded significantly about 25 years ago and is currently experiencing further expansion. Many aspects of the siting, design, construction, management and monitoring of Australian feedlots have improved substantially in the past 25 years. Overall, these factors have led to a significant improvement in environmental performance. The improvements include:

- Significant investment in research into environmental aspects of feedlots, including recent odour studies (Atenzi et al, 2014, Nicholas et al, 2014, Omerod et al, 2014).
- The introduction of best practice guidelines to provide industry with tools to design and manage feedlots, including environmental aspects such as pen and manure management (MLA, 2012a, 2012b).
- The adoption of National Feedlot Guidelines and Code of Practice by industry and regulators (MLA, 2012a, 2012b).
- The adoption of the National Feedlot Accreditation Scheme (NFAS) (AUS-MEAT, 2022).
- Major improvements in feedlot nutrition, feed management and feed processing that have minimised manure production.

Odour is considered the key potential air quality impact of the proposed development and is important from a community amenity perspective. Various design and management measures can be implemented to minimise the generation of odour, but it is not possible to completely eliminate this nuisance source.

The accepted solution to limit any adverse impacts and unreasonable interference with the amenity of neighbours is to provide an adequate buffer between the nuisance source and the sensitive receptor. Experience with cattle feedlots is that, if the buffer distance is adequate for odour, then dust and noise nuisance is unlikely to occur.

For an intensive beef cattle feedlot development, there are two possible approaches to determining the appropriate buffer distance between the facility and sensitive receptors. These approaches
are either:

1. A conservative assessment using a simple formula
2. A detailed assessment using odour dispersion modelling.

This two-level approach is recognised in both the National Feedlot Guidelines (MLA 2012b) and the NSW technical framework for odour assessment. The simple formula approach is sufficient to broadly identify whether the proposed development complex site is suitable or if further assessment of odour impact is necessary or worthwhile. In NSW, this is described as a Level 1 assessment and is completed using the S-Factor formula.

13.1.4.2 Odour objectives

The objective of the assessment was to determine the potential odour impact from the proposed development in accordance with:

- Technical Framework - Assessment and management of odour from stationary sources in NSW, Sydney: DECC (Department of Environment and Conservation (NSW), 2006a)
- Technical Notes: assessment and management of odour from stationary sources in NSW (Department of Environment and Conservation (NSW), 2006b).

13.1.4.3 Odour generation processes

Simplistically, odour at a beef cattle feedlot is generated when organic matter breaks down anaerobically in the presence of water. The predominant organic matter generated is solid waste including manure, animal carcasses and spilt feed. Water generally comes from rainfall but can also come from the water reticulation system via leaks, overflows, cleaning of water troughs and the moisture added to the pen surface via manure (faeces and urine).

Subsequently, the pen area, manure stockpile and processing area, sedimentation basin and holding pond are the principle sources of odour at the proposed development.

Australian research (Atenzi et al, 2014, Nicholas et al, 2014, Omerod et al, 2014), has shown that very little odour is emitted from dry pens or any other dry organic material. However, when the pen manure is wetted due to rainfall or spilt water, the odour emission rate can increase 100-fold. This means that even small wet patches in pens can contribute large amounts of odour.

13.1.4.4 Odour control processes

The basic principles of odour control at beef cattle feedlots are to:

- Minimise the amount of organic matter available for decomposition.
- Minimise the amount of water that mixes with organic matter.
- Maximise the rate of drying of wet organic matter.

13.1.4.5 Assessment methodology

The assessment has been performed in line with the Technical Notes (Department of Environment and Conservation (NSW), 2006b) and the Technical Framework (Department of Environment and Conservation (NSW), 2006a).

The framework refers to Level 1, 2 and 3 assessments which range from screening level techniques (Level 1) to refined dispersion modelling techniques using site specific input data (Level 3).

The Level 1 odour impact assessment was undertaken by RDC Engineers Pty Ltd. The Level 1 odour impact assessment report is presented in Appendix G. The methodology used included:

- The Level 1 beef cattle feedlot technique detailed in the Technical Notes - as it is most appropriate for assessing beef cattle feedlots with suitable separation distances. Level 1 odour assessments for beef cattle feedlots use a simple method to determine the separation distance between the proposed development and the nearest receptor.
- The National Guidelines for Beef Cattle Feedlots in Australia (3rd Edition) (MLA, 2012b) – which is the most recently published beef cattle feedlot guideline.

13.1.4.6 Dust

The proposed development site is located in a rural area. Air quality in the local area would be considered to be of good quality and is unlikely to be influenced by dust emissions from current agricultural activities (irrigated and dryland cropping, dairying, sheep and beef cattle grazing).

The introduction of a development such as a beef cattle feedlot in areas previously bereft of intensive livestock facilities would have the potential to reduce local air quality from dust emissions. However, the propose development is the expansion of an existing development.

Dust emissions from the proposed development are unlikely to cause impacts unless receptors are located nearby. The distance emissions generally disperse from the source depend on topographic and climatic factors. Further, as outlined in the Level 1 odour impact assessment if the buffer is suitable to mitigate against odour impacts, dust impacts are also not expected by default.

13.1.4.7 Greenhouse gases

Greenhouse gases (GHGs) are a natural part of the atmosphere, they act to absorb and re-emit infrared radiation from the sun, trapping heat and warming the Earth's atmosphere, a process similar to that occurring in a greenhouse. However, human activities are increasing the concentrations of these heat-absorbing gases, which allows the atmosphere to warm up, resulting in global warming thus the name Greenhouse Gas. The most significant greenhouse gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x) and various forms of fluorocarbons.

Methane is a colourless, odourless gas released into the atmosphere from many human-related activities and natural sources such as wetlands, oceans, freshwater, fossil-fuel production, livestock, landfills, and is the main constituent of natural gas. Methane is the second most abundant greenhouse gas (GHG) after carbon dioxide (CO_2), accounting for about 14 per cent of global emissions (Global Methane Initiative, 2011).

Global warming potential (GWP) indicates the amount of heat trapped per mass of gas and the time the gas remains in the atmosphere. It is expressed relative to carbon dioxide which has a GWP of 1. GWP is used to convert the impact of different greenhouse gases into a single metric, carbon dioxide-equivalent (CO_2-e). Methane is more efficient at trapping heat than carbon dioxide and therefore has a current GWP of 25 (Lines-Kelly, 2014).

The digestive processes of ruminants (cattle, sheep, camels, deer etc), rice cultivation, animal manures, biomass burning, and waste decomposition in landfills are some of the major sources of agricultural methane emissions.

Nitrous oxide is also produced from urine deposited by livestock on soils and from manure and liquid waste during storage and treatment (Eckard, et al, 2010). Of the dietary nitrogen consumed by ruminants, less than 30% is utilised for production, with the majority (over 70%) being excreted. Agriculture generated about 15% of Australia's total direct greenhouse gas (GHG) emissions in 2010 (DCCEE 2012) with beef cattle including feedlot cattle contributing the largest proportion of these emissions at around 7%.

Hence, the introduction of a development such as a beef cattle feedlot has the potential to impact on local area GHG emissions.

13.1.4.8 Assessment of impacts

Potential air quality impacts from the project have been assessed by:

- identifying the nearest sensitive receptors describing existing air quality and defining the prevailing wind direction
- reviewing legislative requirements and ambient air quality goals
- identifying mitigation measures to assist with the management of the potential air quality impacts from the proposed development.

13.1.5 Air quality assessment

13.1.5.1 Odour

A Level 1 odour impact assessment for the proposed development in accordance with section 7 of the Technical Notes (Department of Environment and Conservation (NSW), 2006b) and The National Guidelines for Beef Cattle Feedlots in Australia (3rd Edition) (MLA, 2012b) was undertaken and presented in Appendix G.

The Level 1 odour impact assessment for the proposed development concludes that the existing separation distances exceed the minimum separation calculated by the NSW Level 1 requirements and the requirements of The National Guidelines for Beef Cattle Feedlots in Australia (3rd Edition) (MLA, 2012b) for the proposed development with a capacity of 3,200 head (2,427 SCUs) at 13.25 m^2/SCU.

As the proposed development can demonstrate a clear 'pass' at Level 1 odour impact assessment and there are no special risk factors such as katabatic drift or a populated area located just outside the calculated separation distance, there is no need to undertake Level 2 or 3 assessment.

13.1.5.2 Dust

Potential impacts to air quality from dust emissions were considered at a local level based on the type of infrastructure proposed, construction techniques to be employed, temporal duration of construction, operational occurrences of dust and the spatial extent of the individual sensitive receptors.

The proposed development does not involve any construction activities. Consequently, there are no potential for impacts to air quality caused by the generation of dust during bulk earthworks involved in creating the design surface, access roads, infrastructure areas etc.

Once operational there is also potential for dust generation, particularly during prolonged dry periods. Dust arises from:

- movement of cattle within the pens. Dust problems are likely to develop when the water evaporated from the pen surface exceeds the water added by rainfall and manure;
- feed storage and processing;
- movement of vehicles around the development complex in particular, trucks delivering ration to the cattle;
- storage and processing of solid wastes; and
- land application of solid wastes.

Less obvious is the time of day when dust is generated. Observations of feedlots in the United States and Australia have found that increased dust levels develop during the late afternoon and dusk when temperatures drop and cattle become more active (Skerman, 2000). When temperatures drop, cattle that have been resting during the heat of the day become active and apart from feeding and drinking, younger cattle tend to become playful. This creates considerable dust that 'hangs' in the cool still evening air. However, it is considered that the potential for dust can be minimised by the implementation of measures outlined in section 13.1.6.

Dispersion conditions (separation from sensitive receptors) adequate for managing off-site odour impacts are usually also adequate for managing off-site dust impacts (DECC, 2013). Subsequently, due to separation from sensitive receptors combined with the mitigation and management measures proposed, dust is not expected to impact on air quality of the local area.

13.1.5.3 Greenhouse gases

Beef cattle produce methane (CH_4) as a by-product of their anaerobic digestive process (enteric fermentation) as the rumen breaks down cellulose in grasses and other forages to obtain energy and nutrients for growth. Most of the methane (enteric methane) that accumulates in the rumen is expelled via the mouth through belching and breathing. About 2% of total emission is also produced in the intestine and emitted through the rectum as flatulence.

Methane emissions from beef cattle have been estimated at about 200g per head per day (Charmley et al 2011). Subsequently, the longer an animal takes to get to market and the more often a cow does not get bred, then that animal is producing methane with very little beef being marketed in return (Charmley et al., 2008). Consequently, this methane intensity, is markedly higher for extensive grazing systems than cattle raised in more intensive grain-based feedlot production systems.

Cattle manure contains in the order of 16 to 24 kg nitrogen per tonne. Nitrogen can occur as organic nitrogen, ammonium and nitrate with a range of transformations possible after deposition to land (Wiedemann et al. 2013).

Energy is fundamental to the proposed development. Indirect sources arise mainly from the transport of cattle in and out of the development, commodity delivery and solid waste removal. Energy is used directly in the construction of the proposed development – through plant and equipment fuel usage and in the operation of the proposed development for the production of beef – feed processing, feed delivery, water supply, office etc.

In GHG terms, grain finishing beef cattle has a number of key differences from grass finishing; GHG emissions from enteric methane are lower (Dong et al. 2006) while emissions from manure management may be higher (Department of the Environment, 2015) though to date the Australian inventory has not based estimates of manure emissions on Australian research.

GHG Emissions from the proposed development can be broken into three sources; direct methane emissions to the atmosphere (enteric methane) from the livestock themselves, methane and nitrous oxide emissions resulting from the breakdown of organic matter during solid/liquid waste storage, treatment and handling and utilisation and those resulting from the use of fossil fuels for energy usage.

Potential impacts to air quality from GHG emissions were considered based on the type of infrastructure proposed, construction techniques and machinery to be utilised and management techniques to be employed.

GHG emissions from the proposed development are unlikely to cause impacts due to productivity improvements over extensively grazed systems and the mitigation and management measures proposed.

13.1.6 Mitigation and management measures

As discussed in 13.1.4.8, a number of air quality impacts were identified. The implementation of the following management and mitigation measures would minimise potential odour sources and the identified impacts to air quality as a result of the proposed development.

13.1.6.1 Odour

13.1.6.2 Design and siting

The implementation of the following management and mitigation measures would minimise identified potential odour impacts to air quality as a result of the proposed development:

- Provision of adequate separation distances between the proposed development and sensitive receptors as shown in Figure 14;
- The pens are designed with adequate slope to maximise drainage and encourage rapid drying of the pen surface after rainfall;
- Proposed grain treatment process maximises digestibility and minimises the amount of starch in faeces;
- Sedimentation basin designed to maximise the removal of solids and drain free of water after a runoff event;

- Design and siting of water troughs so that excess water released during trough cleaning or from a broken float valve does not enter the pen area, thus minimising wet areas in pens;
- The catch and main drains designed with adequate and uniform slope to maximise drainage and encourage rapid drying after rainfall; and
- Design of shade structures that optimise pen drying by moving cattle (and their excretions) around the pen as the shade moves.

13.1.6.3 Operation

The implementation of the following management and mitigation measures would minimise identified potential odour impacts to air quality as a result of the proposed development:

- Ensure the air quality and meteorological monitoring network is maintained and results are routinely analysed, assessed and reported;
- Minimisation of wet areas in pens by fixing leaks from water troughs;
- Utilising the best animal production genetics - Improved production traits such as growth rate and carcass weight will contribute significantly to reducing emissions intensity;
- Maximise feed energy by eliminating parasites and nutrient deficiencies;
- Generating and maintaining best practice management for solid and liquid waste storage, processing and utilisation;
- Frequent removal of manure from the pens/drains and under-fences;
- Elimination of wet areas within the pens;
- Sedimentation basin control weir maintained in operational order to ensure that complete drainage occurs;
- Remove solids from the sedimentation basin as soon as practical;
- Manure stockpiles are not turned to release emissions generated from the anaerobic decomposition process;
- Controlled aeration of solid waste composting windrows;
- Dewatering of the holding pond by irrigation to crops or pastures as soon as possible after rainfall;
- Receiving, reporting and responding to any complaints in relation to air quality through the 24-hour community response line;
- Report the results of any air quality monitoring in accordance with the conditions of the Development Approval; and
- Ensure that all employees and contractors are given adequate training in environmental awareness, legal responsibilities, and air quality control methods.

13.1.6.4 Dust

As it is not practical to remove dust from the air, management and mitigation measures shall be directed towards preventing dust from being created as outlined in the following sections.

13.1.6.5 Design and siting

The implementation of the following management and mitigation measures would minimise identified potential dust impacts to air quality as a result of the proposed development:

- Provision of adequate separation distances between the proposed development and sensitive receivers as shown in Figure 14; and
- Provision of vegetative screen around proposed development as a wind break and vegetative filter.

13.1.6.6 Operation

The implementation of the following management and mitigation measures shall minimise identified potential dust impacts to air quality as a result of the operation of the development:

- Adapting the cattle stocking density in pens to maintain manure on pen surface at 25-35% moisture content to minimise dust generation. For example, stocking density may change from lighter rates in winter to heavy rates in summer;
- Daily application of small amounts (<5mm) of water to the pen surface during the early evening hours when the heat load on the cattle is reduced during excessively dry periods;
- Setting and enforcing speed limits on internal road network;
- Dust suppression measures, such as watering access and feed roads and solid waste stockpiles as required;
- Any operations involving the movement of dusty materials such as hay processing, grain movement, solid waste turning and spreading shall be timed and managed where possible when materials have adequate moisture content;
- Ceasing dust generating activities such as hay processing, pen cleaning, solid waste stockpiling, screening, spreading during periods of high wind, shall be implemented;
- Minimising the accumulation of manure in pens and cattle lanes by cleaning more frequently that Class 1 requirements;
- Application of solid wastes to land when wind conditions and dispersion conditions are favourable;
- Ensure the air quality and meteorological monitoring network is maintained and results are routinely analysed, assessed and reported;
- Receiving, reporting and responding to any complaints in relation to air quality through the 24-hour community response line;
- Report the results of any air quality monitoring in accordance with the conditions of the Development Approval; and
- Ensure that all employees and contractors are given adequate training in environmental awareness, legal responsibilities, and air quality control methods.

13.1.6.7 Greenhouse gas emissions

13.1.6.8 Design

The implementation of the following management and mitigation measures at the design stage of the proposed development shall minimise identified potential GHG impacts to air quality as a result of the proposed development:

- The pens designed with adequate slope to maximise drainage and encourage rapid drying of the pen surface after rainfall;
- Proposed grain treatment process maximises digestibility and minimises the amount of starch in faeces;
- Sedimentation basin designed to maximise the removal of solids and drain free of water after a runoff event; and
- Appropriately sized effluent and solid waste utilisation area for sustainable application of nutrients.

13.1.6.9 Operation

The implementation of the following management and mitigation measures shall minimise identified potential GHG impacts to air quality as a result of the operation of the development:

- Sourcing livestock from as close to the development as practical as well as on-site production to minimise fugitive emissions during transport;
- Utilising the best animal production genetics - Improved production traits such as growth rate and carcass weight will contribute significantly to reducing emissions intensity;
- Rations formulated to minimise enteric methane emissions;
- Maximise feed energy by eliminating parasites and nutrient deficiencies;
- Use of appropriately sized plant and equipment for respective processes;
- Generating and maintaining best practice management for solid and liquid waste storage, processing and utilisation;
- Frequent removal of manure from the pens/drains and under-fences;
- Elimination of wet areas within the pens;
- Sedimentation basin control weir maintained in operational order to ensure that complete drainage occurs;
- Remove solids from the sedimentation basin as soon as practical;
- Manure stockpiles are not turned to release emissions generated from the anaerobic decomposition process;
- Controlled aeration of solid waste composting windrows;
- Dewatering of the holding pond by irrigation to crops or pastures should occur as soon as possible after rainfall;
- Utilisation of effluent and solid wastes on-site to minimise inorganic fertiliser requirements;

- Matching fertiliser to plant nutrient requirements to maximise crop growth;
- Sourcing feed commodities from as close to the development as practical as well as on-site production to minimise fugitive emissions during transport;
- Where practical, solid wastes incorporated directly into the soil;
- Incorporate energy and GHG awareness into training of managers and supervisors;
- Routine service and maintenance of mobile equipment used on-site to ensure efficient operation;
- Continuous improvement of GHG intensity of production by identifying and controlling energy intensive processes;
- Regular reviews and monitoring of GHG emissions and energy usage; and
- Ongoing research into cleaner technologies and energy minimisation practices, leading to implementation where practicable.

13.1.7 Conclusion

Odour emissions generated from the proposed development are expected to be the primary impact to air quality as a result of the proposed development. A Level 1 odour impact assessment was undertaken against the Technical Notes (Department of Environment and Conservation (NSW), 2006b) and The National Guidelines for Beef Cattle Feedlots in Australia, 3rd Edition to determine the likely odour impacts to sensitive receptors in the local area.

The proposed development has been sited to provide adequate separation distances between the odour and dust generating sources and sensitive receivers as shown in Figure 14.

It is concluded that sufficient separation exists between the proposed development complex and sensitive receptors to limit any adverse impacts and unreasonable interference with the amenity of neighbours as a result of odour. Further, as the separation distance is suitable to mitigate against odour impacts, dust impacts are also not expected by default.

Other issues relating to air quality such as greenhouse gases are not expected to create significant air quality impacts to the local area.

Management measures outlined in section 13.1.6 shall be implemented as part of the proposed developments and Operational Environmental Management Plan (OEMP), as detailed in section 15.2.1, to manage these issues.

13.2 Geology, landform and soils

13.2.1 Geology

The subject land is located in part of an extensive alluvial plain within the Murray Basin. The Murray Basin extends over 300 000 km of inland southeastern Australia, is flanked by subdued mountain ranges, and forms a low-lying saucer-shaped basin with thin flat-lying Cainozoic sediments.

This basin was formed by massive land subsidence during the Tertiary period and began to fill with sediments. The dominant sediments in the area were deposited by an older river system ('prior stream' system) in the Quaternary period (from approximately 1.6 million years ago to recent geological times) (Brown and Stephenson, 1991).

The subject land is located wholly within the Shepparton Formation as mapped on the Deniliquin 1:250,000 geological sheet. The Shepparton Formation comprises extensive plains traversed by leveed stream traces. The Deniliquin 1:250 000 geological sheet area is within the eastern part of the Murray Basin, but well away from the Basin margin and from the complex bedrock structural and topographic features which characterise the central part of the Basin.

The deposits within the Shepparton Formation are mainly derived from rivers and streams but also include aeolian (i.e. windblown) deposits. These aeolian deposits consists of fine calcareous soil material which spread over much of Northern Victoria and southern NSW during drier climatic periods. These deposits vary from about 50 to 125 metres in depth across much of the alluvial plains and cover the older alluvial (Tertiary) and marine (Ordovician) sediments.

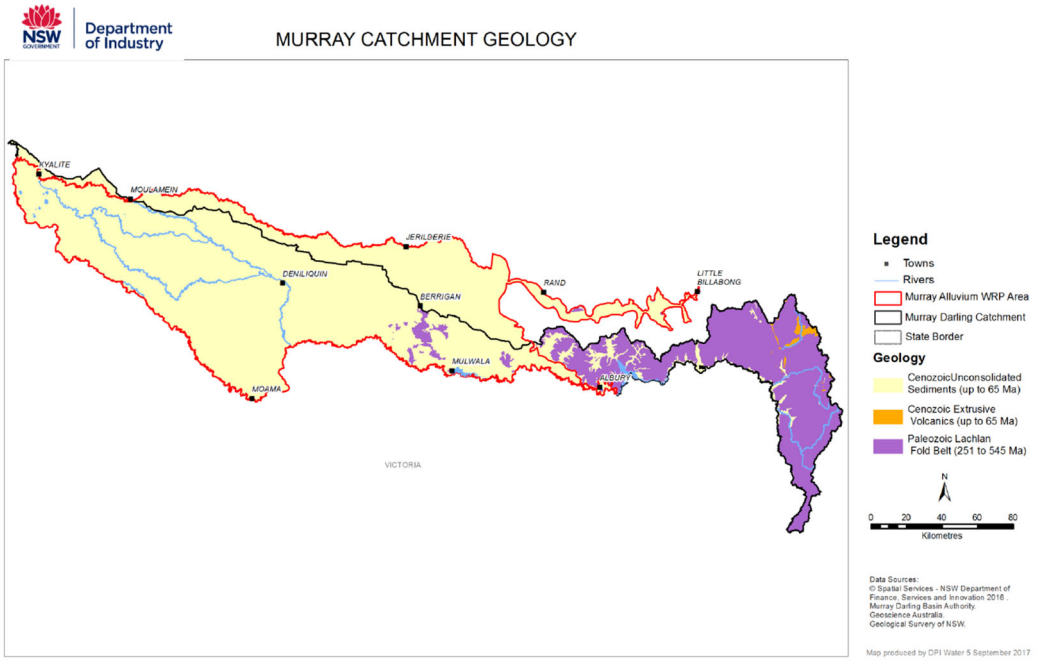


Figure 21 – Geological formations of the Murray catchment (DOI, 2019

13.2.2 Landform

The Riverina covers the alluvial fans of the Lachlan, Murrumbidgee and Murray Rivers west of the Great Dividing Range and extends down the Murray. The lower tract of the river is a floodplain with overflow lakes. Discharge from past and present streams control patterns of sediment deposition, soils, landscapes and vegetation.

The subject land is in the Murray fan. The characteristic landform of the Murray fan is a relatively confined broad level low gradient alluvial fan constrained by sediments from northern Victorian rivers, the Murrumbidgee fan and the Cadell fault. The Murray fan is well confined and has more active anabranch channels where it is forced to flow around the obstacle of the Cadell fault near Echuca Meandering channels, floodplains, source bordering dunes, overflow lakes and swamps.

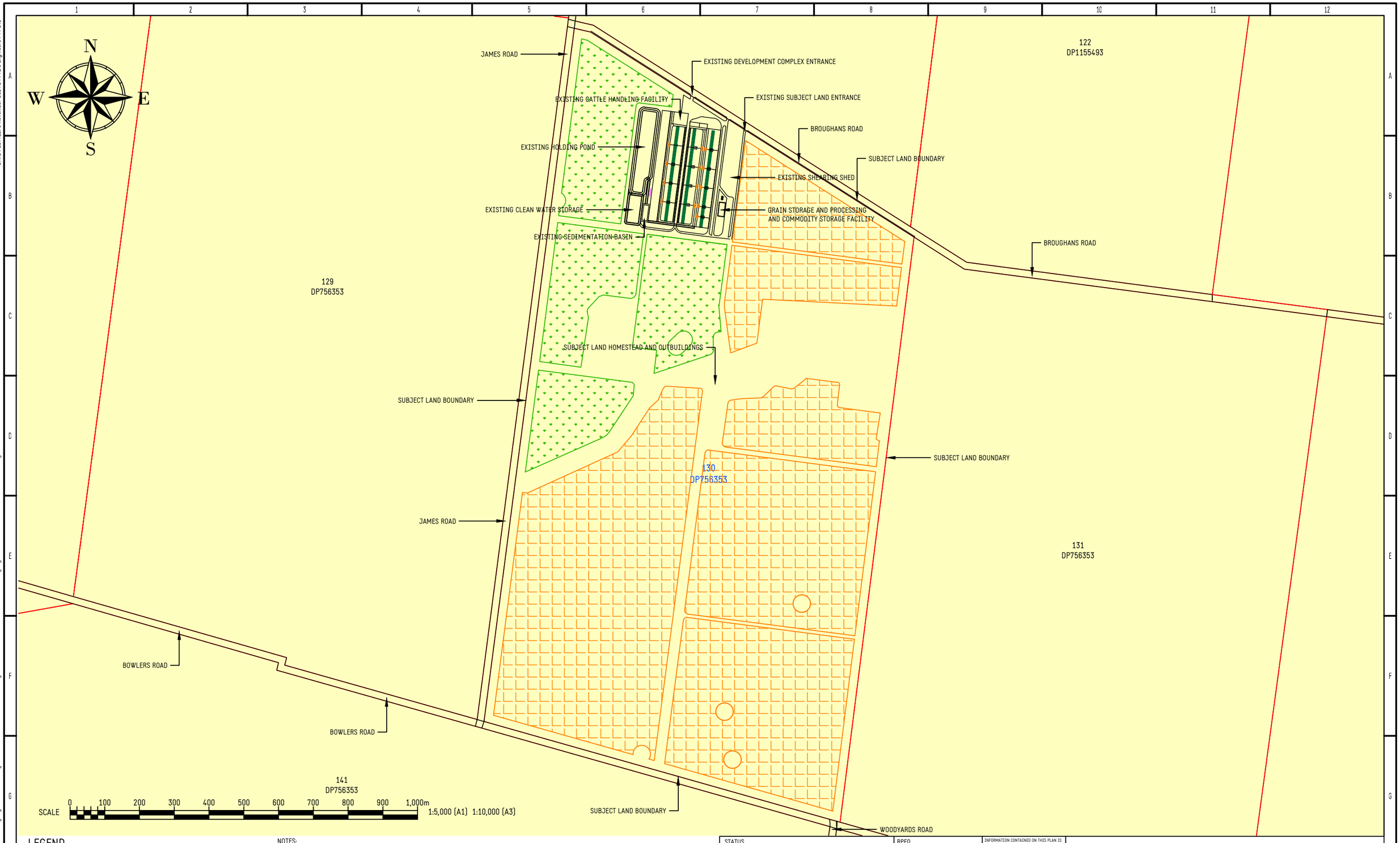
The subject land is described as an elevated floodplain of the Murray Fans where flooding is rarely recorded. The local geomorphology is described as alluvial, mainly fertile silt and clay soils.

13.2.3 Soils

13.2.3.1 Soil type

A broadscale soil assessment through a review of the eSPADE v2.2 mapping (NSW Department of Planning and Environment, 2022) shows the soil type across the subject land is described as an alluvial soil type that is Red and Brown Sub-plastic Chromosols and Sodosols (Red-brown Earths/transitional Red-brown Earths) as shown on Figure 22 (DECCW, 2010). The soils would be classified as a Chromosols or Sodosols according to the Australian Soil Classification (Isbell, 2002).

Chromosols and Sodosols are texture contrast soils with a sandy or loamy surface horizon overlying a clay textured B horizon. The loamy or sandy surface soil is more than 0.1 m deep, changing abruptly to clay subsoil. The surface soil may have a weakly developed bleached zone in the lower part, while the subsoil is relatively dense to well structured and may be subplastic. For sodosols, the subsoil (B) horizon is not strongly acid (pH greater than 5.5) and is slightly to moderately sodic in the upper 20 cm. The structure of the subsoil may range from massive to strongly structured. Based on soil chemical analyses presented in section 13.11, the soils are best described as Sodosols.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- SOIL TYPE - WAIT-A-WHILE (WAL)

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:10,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - SOIL LANDSCAPE OVERLAY

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 22		A3	F3-107-00-22	B

DATE PLOTTED: 6 November 2024, BY : RDC Engineers PTY LTD
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N Varley High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: F3-107 ANVarLeg High Claire MASTERPLAN-00-20230407-v8.dwg

13.2.3.2 Acid sulfate soils

Soils and sediments containing iron sulphides, most commonly pyrite, are called acid sulphate soils (ASS). ASS which have not been oxidised by exposure to air are known as potential acid sulfate soils (PASS). When exposed to air due to drainage or disturbance, these soils produce sulphuric acid, often releasing toxic quantities of iron, aluminium and heavy metals and are known as Actual Acid Sulfate soils (AASS). ASS are harmless when left in a waterlogged, undisturbed environment.

ASS commonly occur on coastal wetlands as layers of Holocene marine muds and sands deposited in protected low-energy environments such as barrier estuaries and coastal lakes. In similar environments, they are still being formed. In New South Wales, ASS frequently occur in low-lying and groundwater dependent wetlands, backswamps, former seashores, estuaries, salt marshes and tidal flats, although they are not limited to coastal regions. Due to their estuarine origin, ASS are usually found at elevations less than 5 m above sea level. ASS also underlie floodplains and levees.

When PASS are exposed to air (that is, no longer in a waterlogged anaerobic state), the iron sulphides in the soil react with oxygen and water to produce a variety of iron compounds and sulphuric acid. These compounds may contaminate land and adjacent waterways. Following significant rainfall, such contamination may cause red spot disease in fish and destroy aquatic flora and fauna, including highly visible fish kills (Ahern et al. 1998).

The subject land is located within the Central Murray catchment area in the Southern Basin Catchment of the Murray Darling Basin area of the Riverina Murray Region, approximately 250 km from the coast at an elevation of 105-106 m AHD as shown on Figure 1 and Figure 40 respectively. There has been little history of acid generation from regolith material within this region.

There is no Potential Acid Sulfate Soil (PASS) mapping available over the subject land. The subject land is not mapped as potential Acid Sulphate Soil Risk Mapping (eSPADE v2.2 - NSW Environment and Heritage).

As estuaries, wetlands and shallow groundwater conditions do not occur within the subject land, and the physiography and geology are not conducive to the presence of ASS it is unlikely that the proposed development area will contain PASS. Further, the proposed development does not involve excavating and filling of soil.

13.2.3.3 Geotechnical assessment

A geotechnical assessment that focused on the suitability of the soils for construction of the existing development complex was undertaken during construction. The geotechnical assessment was undertaken to determine the suitability of the site for the proposed development complex.

An assessment of the capability of the land on which effluent and solid waste utilisation is proposed was also undertaken. This assessment is provided in section 13.11.

13.2.3.3.1. Methodology

The geotechnical assessment involved the following steps:

- Field work - a series of soil compaction tests were taken at various locations across the proposed development complex site. The fieldwork was undertaken in May 2005;
- Soil analysis – Soil samples were forwarded to a NATA accredited laboratory for testing for a range of engineering properties.

13.2.3.3.2. Subsurface conditions

The soils were assessed for various engineering properties as presented in Table 45. The test results are attached in Appendix L.

In general terms, the investigation confirmed the presence of suitable material for construction of the development. The suitability of material for construction was assessed on the basis of its geotechnical qualities.

Table 45 – Proposed development complex - Geotechnical soil results

Sample	Sample Depth	Description	Liquid Limit	Plastic Limit	Plasticity Index	LS	MDD	EAT	% passing 75µm
	m		%	%	%	%	kg/m^3		
1	0.175	Silty Clay	53	16	37	15	1.70	2	86

The geotechnical test results confirm the presence of low plasticity silty clay. This material is well suited as an underlying material for the construction of the proposed development complex as it is well graded, has low permeability when compacted, good shearing strength and workability. A brief discussion of the geotechnical test results follows.

13.2.3.4 Dispersion

The soils are Class 2 Emerson soils which have low aggregate stability with high to very high dispersion.

Dispersive soils are susceptible to tunnelling ("piping failure") of water-retaining earth embankments, such as dams and ponds. However, by compacting dispersive soils in layers at the optimum moisture content (good moisture control during earthworks), they can be successfully used in water-retaining earth embankments.

13.2.3.5 Atterberg limits and soil plasticity

Atterberg Limit (Liquid Limit, Plastic Limit and Plasticity Index) and Linear Shrinkage tests were undertaken to assess the plasticity and shrinkage potential of the soils within the proposed development complex site.

The moisture content at which the soil has a small plasticity, is defined as the Plastic Limit. The Plastic Limit of the soils was in the range of 16%, indicating that the clay soils at the site have low to medium plasticity.

The moisture content at which a soil passes from a plastic to a liquid state is defined as the Liquid Limit. It is directly proportional to the compressibility of a soil and hence its ability to support a load and its trafficability when wet. The Liquid Limit of the soils was in the range of 53%, indicating that the clay soils at the site has medium plasticity.

These soils comply with MLA, (2012b) and Skerman (2000) requirements for clay lining material, by having a Liquid Limit <70. From a plasticity index perspective, all soils meet the criteria for clay lining material from Skerman (2000) with a PI > 10%.

The Linear Shrinkage results were in the range of 15%.

The plasticity results indicate that the soils have a low shrink / swell capacity with wet and dry cycles, thus reducing the potential for shrinkage cracks.

13.2.3.6 Soil compaction

Soil compaction refers to the process of obtaining increased density of soil in a fill by reduction of its pore space by the expulsion of air. Compaction tests (maximum dry density and optimum moisture content) were undertaken as part of the assessment of the suitability of the soils for the proposed development complex. The standard maximum dry density (MDD) results was 1.70 t/m^3 and the optimum moisture content (OMC) from 19.5%. These results are typical of silty clay soils.

The bearing capacity of any soil usually increases with increasing dry density and decreasing moisture content. High density assures high shear strength and greater imperviousness.

13.2.4 Assessment of impacts

The proposed development complex has the potential to impact the environmental values of the soils, groundwater and surface water at or in the vicinity of the site through the release of contaminants commonly found in liquid and/or solid waste streams.

The in-situ soils may need to be mixed or engineered to produce a material that ensures that any significant risks to the environment, in particular groundwater are mitigated.

Contamination of groundwater has been shown to occur wherever three main components exist; a potential source of contamination, an underlying aquifer, and a pathway for transfer between the two. This pathway can be either indirectly through the soil or directly through man-made structures which intersect the water table, such as drains, sedimentation basins and holding pond.

13.2.4.1 Engineering properties

The engineering characteristics of the in-situ soils determine the suitability of these materials for construction of the engineering works on the site.

Soil materials for construction purposes were site won.

The key engineering properties include permeability (for protecting groundwater), strength (for trafficability) and shrink-swell potential (for cracks/foundation movement etc).

The key engineering properties of representative in-situ soil samples were assessed by testing remoulded specimens in a laboratory with NATA accreditation for those tests undertaken. The geotechnical assessment identified few constraints with the engineering properties of the in-situ soils as discussed in the following sections.

13.2.4.2 Soil dispersion

The soils within the proposed development complex are dispersive and therefore water should not be allowed to pond on within the site. Dispersive soils that have been successfully used for construction of water retaining structures employ the following techniques:

- The addition of an appropriate percentage of gypsum (calcium sulphate) to the soil during construction;
- Stipulation of an appropriate construction specification for bulk earthworks with respect to both compaction and moisture content;
- Controls and verification during construction to ensure the adopted construction specification and design is followed.

13.2.4.3 Soil plasticity

The silty clay soils encountered typically have low plasticity and low linear shrinkage. Therefore, these soils have low shrink/ swell capacity movements with variations in moisture content, reduces potential for shrinkage cracks. Therefore there are no constraints with using this material as a subgrade for the proposed development.

13.2.4.4 Compaction and moisture content

The soils were adequately compacted during construction of the existing development. Repair or maintenance earthworks is not expected to be a significant constraint to the proposed development due to the implementation of appropriate specifications to earthwork design and procedures.

13.2.4.5 Soil permeability

Due to the grading and classification of the in-situ soils, the design permeability (1×10^{-9} m/s) has been achieved on compaction at or close to the optimum moisture content as shown in the test results in Appendix L. The soils have a permeability of 7×10^{-10} m/s.

13.2.4.6 Acid sulfate soils

The subject land is located at an elevation between 104 m to 108 m AHD. The proposed development complex is sited at an elevation between 105 m and 106 m AHD.

As the subject land is not located in a coastal lowlands region (<10m AHD), it is therefore very unlikely that ASS would be found within the proposed development complex. Further, groundwater levels are estimated to be greater than 20 m below the surface (based on depth to groundwater on the alluvial plains) and there is no soil disturbance proposed. Consequently, it is unlikely that ASS would be exposed or drained.

The effluent and solid waste utilisation area of the proposed development does not involve disturbance to soils (other than conventional cultivation operations).

13.2.5 Mitigation measures

13.2.5.1 Engineering properties

The implementation of the following management and mitigation measures shall mitigate identified potential issues associated with the engineering properties of the in-situ material during operation of the proposed development.

13.2.5.2 Dispersive soils

To ensure the dispersivity impact is mitigated as far as possible, the following techniques shall be employed:

- Stipulation of an appropriate construction specification for repair and maintenance earthworks with respect to both compaction, moisture content and placement, such as, placed in thinner layers and at a moisture content on the wet side (+2% - 0%) of optimum moisture content; and
- Controls and verification during operation to ensure the adopted construction specification and design is followed.

13.2.5.3 General

- Topsoil is maintained on fill and cut embankments;
- Suitable material won from a borrow area shall be used to repair the subgrade of pens. This material, at the correct moisture content, shall be placed in progressive layers of uniform loose thickness of not more than 200 mm before compaction, preferably by rolling;
- Filling shall be compacted to a field dry density of at least 98% maximum dry density as determined by AS 1289 5.1.1 (Standard Compaction). The material shall be compacted at a moisture content of within (+2% - 0%) of OMC as determined by AS 1289.5.1.1 (Standard Compaction); and
- Clay lining of the catch drains, cattle lanes and production pens is maintained.

13.2.5.4 Acid sulfate soils

As discussed in section 13.2.4.6, there are no soils to be disturbed as the proposed development shall utilise existing built infrastructure. Consequently, ASS are unlikely to be disturbed. The following management and mitigation measures shall be implemented to prevent, control, abate or minimise the potential impacts from the disturbance of ASS during repairs and maintenance of the development complex:

- A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling, solid waste storage and processing area and silage storage area which have high organic matter and therefore a high pollution potential; and
- Runoff external to the controlled drainage area is diverted away from the controlled drainage area.

13.2.6 Conclusion

A geotechnical assessment of the soils within the proposed development complex site was completed during construction of the existing development. The geotechnical assessment identified that the soils are low plasticity, silty light to medium clays soils with a high degree of dispersion and low shrinkage potential.

Based on recommended suitability criteria from National and QLD state feedlot guidelines, these soils have engineering properties (with the exception of dispersion) that are well suited to the construction and operation of a beef cattle feedlot.

Further, appropriate design and construction measures are proposed to mitigate the high degree of dispersion to ensure that any potential risks to the environment, in particular groundwater are mitigated.

It is concluded that that provided appropriate design and construction measures are implemented, the in-situ soils within the proposed development complex area are suitable for the design and construction of the relevant infrastructure, such as roads, pen foundations, water retaining structures (drains, sedimentation basin, holding dams), building footings, compacted earthworks, feed storage and processing areas, excavations etc.

13.3 Groundwater

The River Murray cuts a wide and deep course through the central catchment of the Murray-Darling drainage basin as its flows westward.

Groundwater in the central catchment is mainly found in the extensive alluvial groundwater systems on the NSW side of the River Murray as shown in Figure 23. Surface water and groundwater systems in the catchment are connected. The process of loss or gain of water from the groundwater system varies for streams along the course of the river.

The Murray Alluvium is a continuous sequence of unconsolidated sediments deposited as valley fill in the upper areas of the catchment and grades into broader valley and floodplain sediments in the mid catchment. The Murray Alluvium comprises three sources being the Upper Murray Alluvium, Lower Murray Alluvium and Billabong Creek Alluvium.

The Upper Murray Alluvium is made up of the valley infill alluvial sediments associated with the Murray River between Hume Dam and Corowa. West of Corowa the valley widens and the landscape changes to alluvial floodplains where the elevation is less than 150 m above sea level. The alluvial fan of the Lower Murray Alluvium occurs from Corowa to Kyalite and is made up of Cenozoic alluvial sediments (NSW Department of Industries, 2019).

The subject land is located within the Lower Murray Alluvium area.

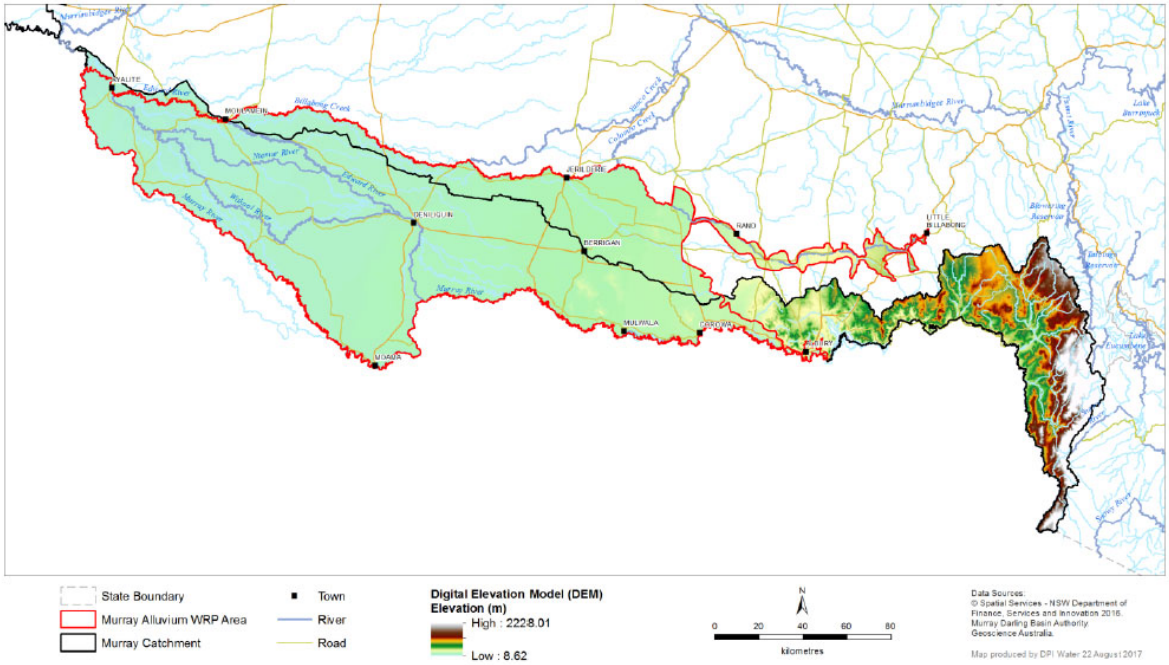


Figure 23 – Murray Alluvium – Location (NSW Department of Industries, 2019)

13.3.1 Existing environment

13.3.1.1 Lower Murray Alluvium

The Lower Murray groundwater sources are located within the Murray River catchment. The water sources are bounded by Billabong Creek to the north and the Murray River to the south and laterally extends from Murray River and Edwards River confluence from the west to Corowa in the east as shown in Figure 24.

The Lower Murray Alluvium is broadly divided into two main regional aquifer systems: a shallow aquifer system up to approximately 70 m deep (correlating to the Shepparton Formation), and a deeper aquifer system approximately 350 m deep that incorporates the Calivil Formation and the Renmark Group. These systems provide high yielding and good quality

groundwater supplies for irrigation, stock and domestic and town water supply as well as other uses.

The alluvium includes three main geological units of Cenozoic age: (i) the shallow Shepparton Formation, (ii) the intermediate depth Calivil Formation, and (iii) the deep Renmark Group. These Cenozoic sediments are comprised of clay, silt, sand and gravel and are deposited as floodplains and infilled valley deposits along the present river channels as well as palaeo valleys from the historical pathways of the rivers and creeks (Taylor et al, 2021).

Shallow aquifers of the Lower Murray Alluvium are also considered to be in hydraulic connection to major rivers, creeks, irrigation channels and other water bodies. They consist of unconsolidated alluvial sediments generally yellow to brown poorly sorted sand and clay sediments that extend to a depth of between 20 and 50 metres below the ground surface (Alamgir, 2011).

The deep aquifer system of the Lower Murray Alluvium is not considered hydraulically connected to surface waters in a resource management sense. The Lower Murray (deep) Groundwater Source consists of unconsolidated sediments of the Shepparton Formation, Calivil Formation and the Renmark Group greater than 20 m down to its base (bedrock).

The Calivil and Renmark Formations aquifers are composed 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 down to the bedrock.

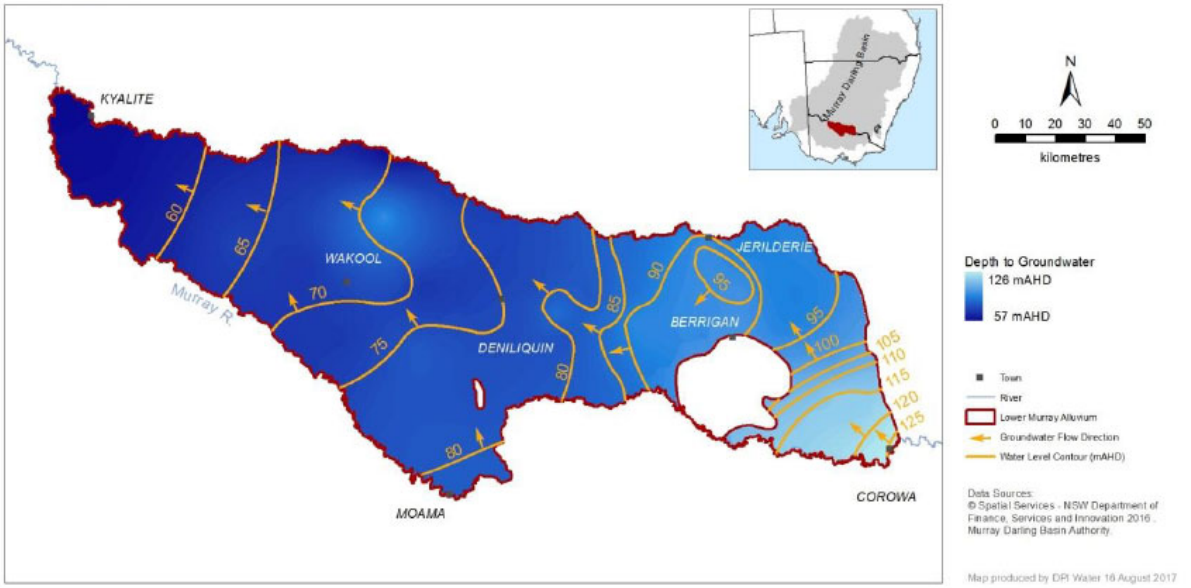


Figure 24 – Lower Murray Alluvium – Location and groundwater flow direction (NSW Department of Industries, 2019)

13.3.1.2 Murray Alluvium Water Resource Plan

The management of the Lower Murray Alluvium water source is regulated by the Murray Alluvium Water Resource Plan a water sharing plan established under NSW legislation (Water

Management Act 2000). The Murray Alluvium Water Resource Plan area is shown in Figure 25. The Murray Alluvium Water Resource Plan defines the Lower Murray Groundwater Source as all water contained in the unconsolidated alluvial aquifers of the Calivil and Renmark Formations, and the Shepparton Formation deeper than 12 metres (within the defined area). The Lower Murray deep aquifers extend down to the bedrock to a maximum depth of 350 metres below the ground surface. This covers groundwater within the alluvial deposits in NSW of the upper and lower Murray River and Billabong Creek.

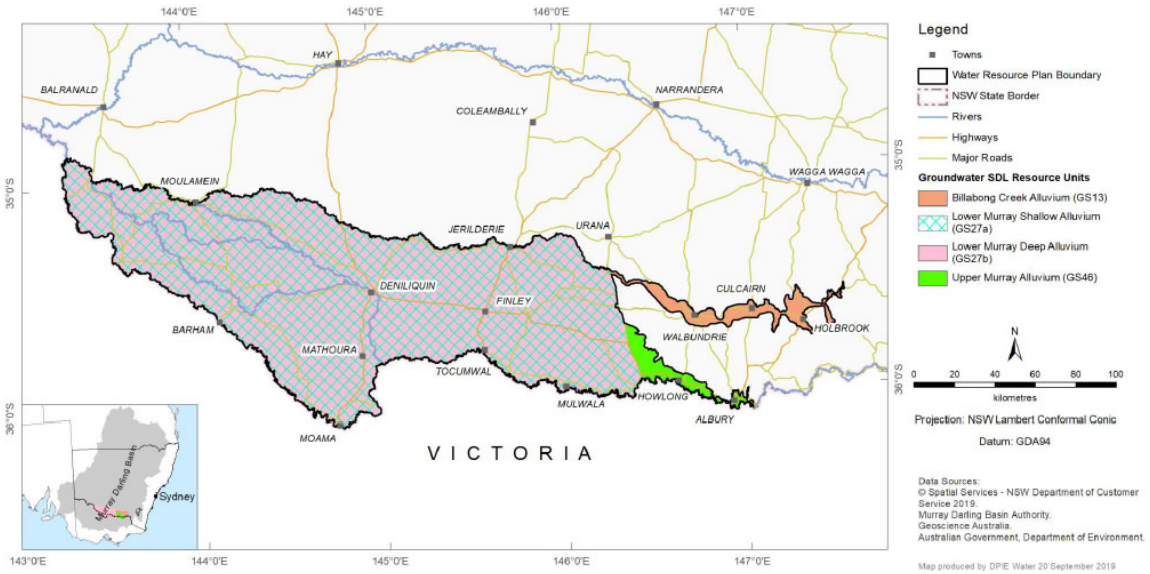


Figure 25 – Murray Alluvium Water Resource Plan Area (NSW Department of Planning, Industry and Environment, 2019)

13.3.1.3 Groundwater monitoring

NSW Water monitors groundwater level and quality through its network of groundwater monitoring bores across New South Wales. There are three monitoring bores located nearby to the subject land and proposed development which have been monitoring groundwater levels since 2007. Driller's logs are not available for these monitoring bores.

GW036876.2.2 is located at 17497 Riverina Highway west of the James Road intersection and some 4 km north of the subject land as shown in Figure 32. The bore hydrograph data is presented in Figure 26.

GW036586.3.3 is located at 2694 Tocumwal Road and some 8.5 km west southwest of the subject land as shown in Figure 32. The bore hydrograph data is presented in Figure 27.

GW036283.3.3 is located at 1205 Tuppal Road Tocumwal 2714 some 9.5 km south of the subject land as shown in Figure 32. The bore hydrograph data is presented in Figure 28.

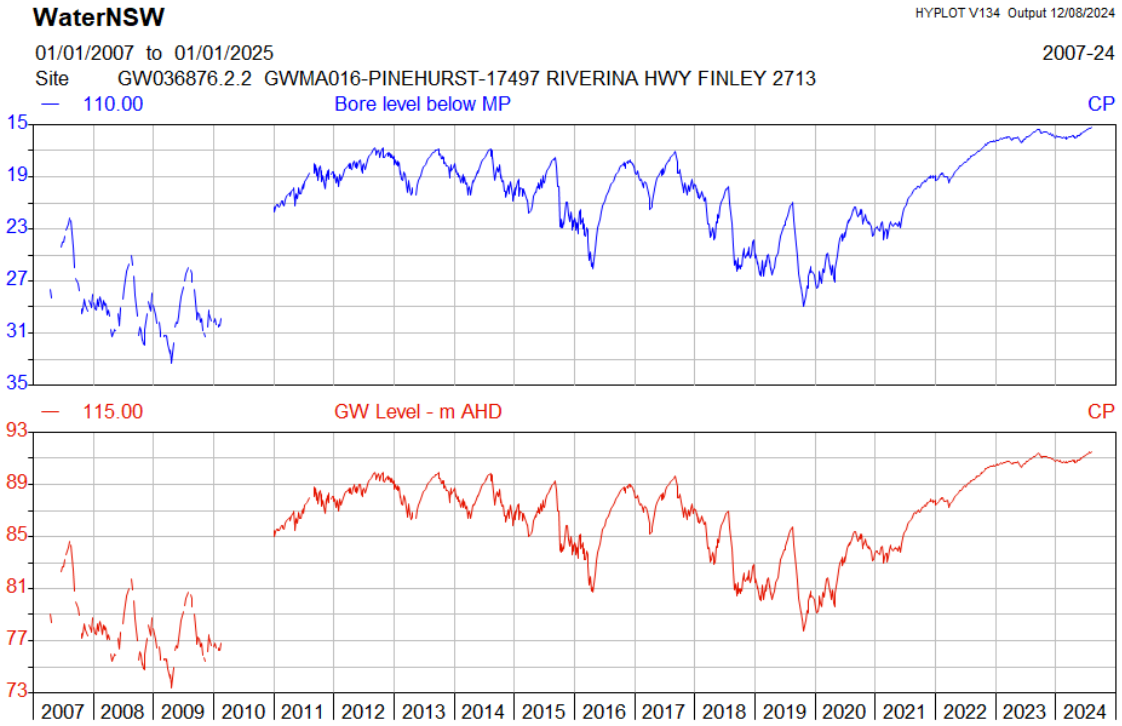


Figure 26 – Groundwater observation bore – GWMA16 – GW036876.2.2 – Groundwater and bore water level

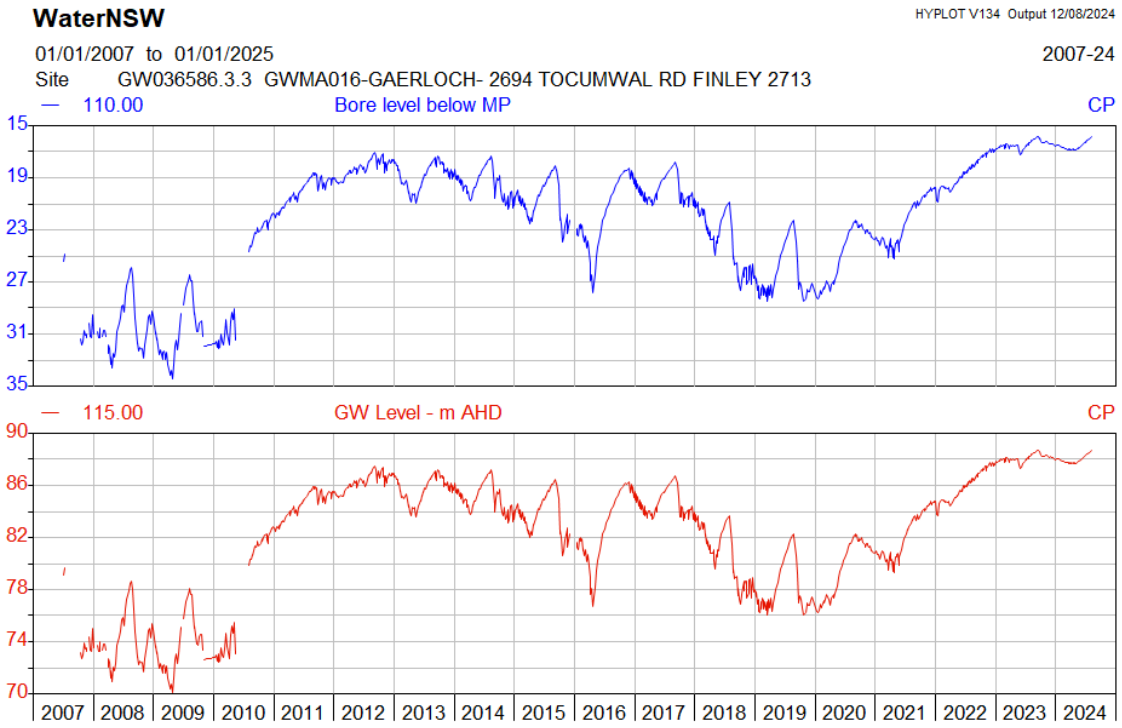


Figure 27 – Groundwater observation bore – GWMA16 – GW036586.3.3 – Groundwater and bore water level

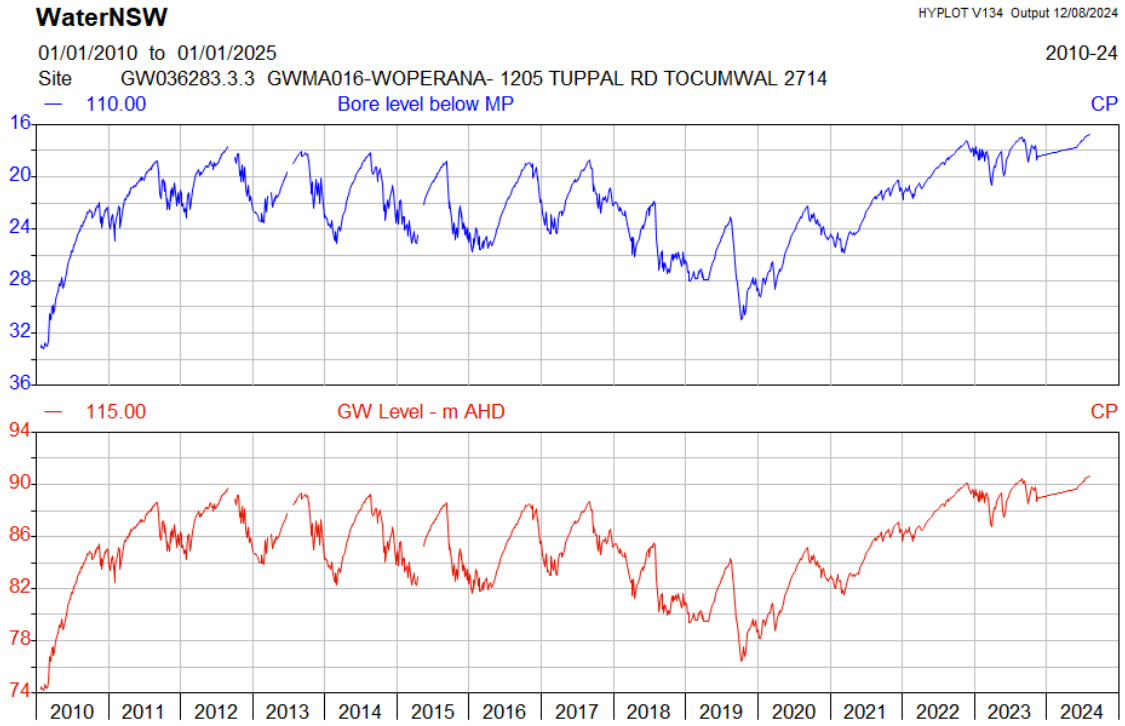


Figure 28 – Groundwater observation bore – GWMA16 – GW036283.3.3 – Groundwater and bore water level

Review of Figure 26, Figure 27 and Figure 28 shows the seasonal nature of the groundwater levels. The hydrograph suggests the bores are monitoring the shallow Shepparton formation, which is predominantly recharged by rainfall and irrigation leakage. Generally the water levels in the bores range between 15-30 m below ground level since monitoring commenced in 2007 with recharge occurring in winter/spring and drawdown (assumed due to irrigation extraction) occurring throughout the summer/autumn. The impacts to groundwater levels due to dry and wet winter/spring periods and above average rainfall since 2021 (2015 and 2016; 2019 and 2020 and 2021) are clearly seen.

13.3.1.4 Existing bores

The subject land is located within an established irrigation area with the aquifers supporting considerable consumptive use. As such, there are numerous bores in the local area. There are groundwater work records both within and nearby to the subject land (within ~500 m of the subject land boundary) and details of these bores are given in Table 2 and Figure 6.

The shallow and deep alluvial aquifers are the main groundwater resource for the region. They usually consist of sand, gravel and clay sediments in units of varying thicknesses. Locally, the alluvial aquifers are classified as being “shallow” (when less than 20 m deep) or “deep” (when deeper than 20 m). The dominant recharge process into the alluvium is direct rainfall infiltration, leakage from irrigation activity including canals and leakage from the Murray River and its anabranches. DOI (2019).

Bore logs were obtained from bores on the subject land and within 1,000 m of the subject land. NSW Water hold records for groundwater bores in the Murray Basin Alluvium in the WaterNSW Water Information Hub. A search of the NSW Groundwater database was undertaken for data on the location, casing details, strata logs, aquifer details, water levels (by date) and water analysis (lab and field) for all registered groundwater works on the subject land. Five existing sub-artesian groundwater bores have been installed and registered on the subject land as shown in Table 46. There is one registered bore on a neighbouring property to the west within 1,000 m of the subject land. The bore log for each existing registered bore is provided in Appendix H. One of these bores is a monitoring bore (piezometer) as part of the existing development. Figure 32 shows the location of the groundwater bores in relation to the location of the proposed development and natural and manmade drainage lines.

Table 46 – Subject land – Registered bores

Groundwater works	Location			Status	Depth
	Easting* mE	Northing* mS	Lot on Plan		m
GW503638	359230	6053513	130/DP756353	Monitoring	7
GW501806	359046	6053244	130/DP756353	Test bore	9
GW505116	359002	6053006	130/DP756353	Stock	20
GW503502	359339	6053112	130/DP756353	Irrigation	9
GW503710	359052	6053230	130/DP756353	Stock, Industrial, Domestic, Irrigation	9
GW505453**	357998	6053800	129/DP756353	Stock, Domestic	40-43

*UTM Zone 55; ** Neighbouring land

Examination of the strata listed on the bore log for each groundwater works reveals that the topsoil is typically a red sandy loam ranging in depth from 0.1 to 0.5 m which overlies 4-5m of sandy medium to hard clay. The depth of each bore ranges from 7 to 43 m but typically 9 m on the subject land.

The strata at greater depths is typically characterised by layers of sandy red brown to grey brown clay. The standing water level is typically 3-8 m. From information outlined on the bore logs, these boreholes, tap the alluvial aquifers with screens commencing at around a depth of 6-8 m.

Due to the impermeable insitu clay material under the proposed development complex area and depth above the aquifer, it is unlikely that the proposed development shall have adverse impacts to the quality of groundwater resources in the area.

13.3.1.5 Quantity

The applicant has a water access licence (WAL30535; Works approval 50CA511670) for 400 unit shares which authorises the use of groundwater from the Lower Murray Shallow Groundwater Source on the subject land for any purpose. A copy of WAL 30535 is provided in Appendix H.

As outlined in section 8.7.3.1.3, the total annual water demand for the proposed development is estimated to be 41 ML when at a full capacity of 3,200 head.

The existing groundwater entitlement is sufficient to meet the demands of the proposed development. As the proposed development has a licensed allocation for groundwater use, it is unlikely that the proposed development shall have adverse impacts to the quantity of groundwater resources in the area.

13.3.1.6 Quality

As outlined previously it has been shown that the Lower Murray Alluvium shallow and deep aquifers and the associated surface waterways are intimately related DOI (2019). Therefore, the Murray River (NSW) Water Quality and River Flow Objectives water quality objectives and trigger values for surface waters of the catchment may be used as surrogate quality measures for groundwater.

The Lower Murray Alluvium shallow aquifer quality is generally in good to very good condition (DECCW, 2010a).

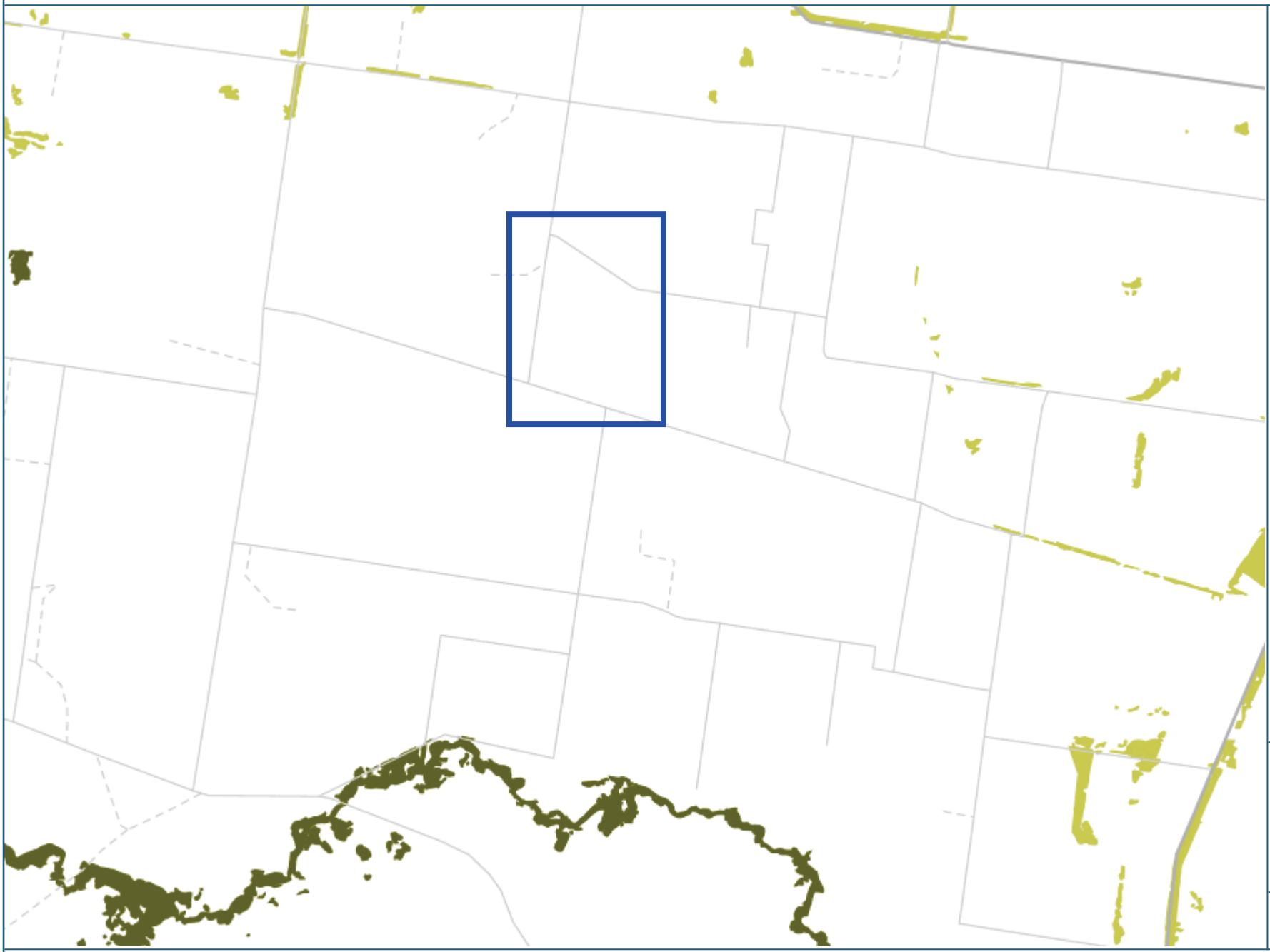
13.3.1.7 Groundwater Dependent Ecosystems

A search of the Bureau of Meteorology's (BOM) Groundwater Dependent Ecosystem Atlas (Bureau of Meteorology, 2024) indicates that there are no Groundwater Dependent Ecosystems in the vicinity of the subject land as shown on Figure 29, Figure 30 and Figure 31.

Australian Government
Bureau of Meteorology

Groundwater Dependent Ecosystems Atlas

High Claire



Terrestrial GDE (no data)

No ecosystems analysed

Terrestrial GDE

- Known GDE (regional study)
- High potential GDE (regional study)
- Moderate potential GDE (regional study)
- Low potential GDE (regional study)
- Unclassified potential GDE (regional study)
- High potential GDE (national assessment)
- Moderate potential GDE (national assessment)
- Low potential GDE (national assessment)
- Unclassified potential GDE (national assessment)

N

1:87,872

Kilometres 2

Data Source: Bureau of Meteorology, Geoscience Australia and State/Territory lead water agencies. Refer to metadata for further information: Click here

SUBJECT LAND

Australian Albers GDA94

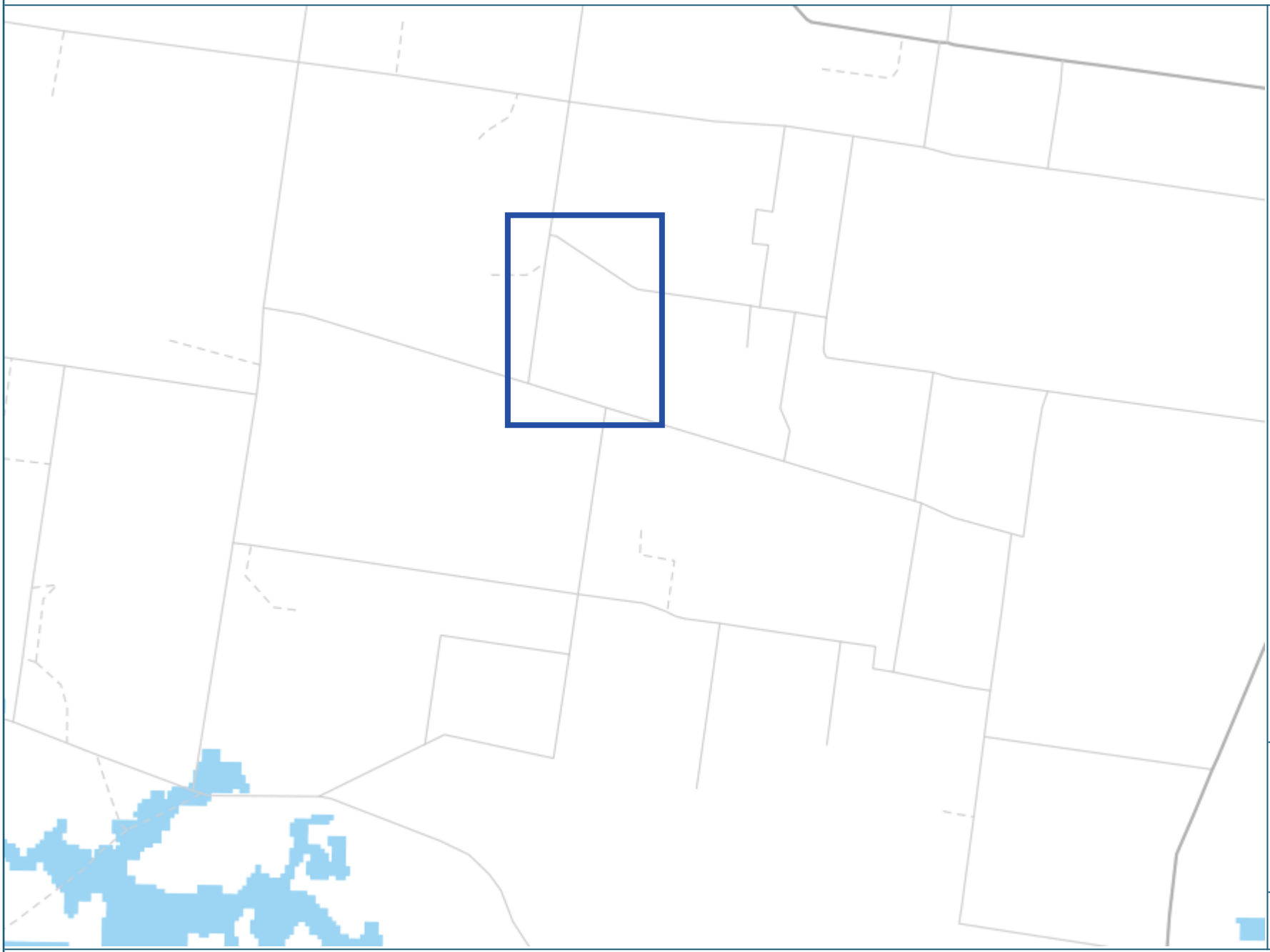
FIGURE 29

Date: 11 August, 2024

Australian Government
Bureau of Meteorology

Groundwater Dependent Ecosystems Atlas

High Claire



Aquatic GDE

- Known GDE (regional study)
- High potential GDE (regional study)
- Moderate potential GDE (regional study)
- Low potential GDE (regional study)
- Unclassified potential GDE (regional study)
- High potential GDE (national assessment)
- Moderate potential GDE (national assessment)
- Low potential GDE (national assessment)
- Unclassified potential GDE (national assessment)

Islands

- Islands

N

1:87,872

Kilometres 2

Data Source: Bureau of Meteorology, Geoscience Australia and State/Territory lead water agencies. Refer to metadata for further information: Click here

SUBJECT LAND

Australian Albers GDA94

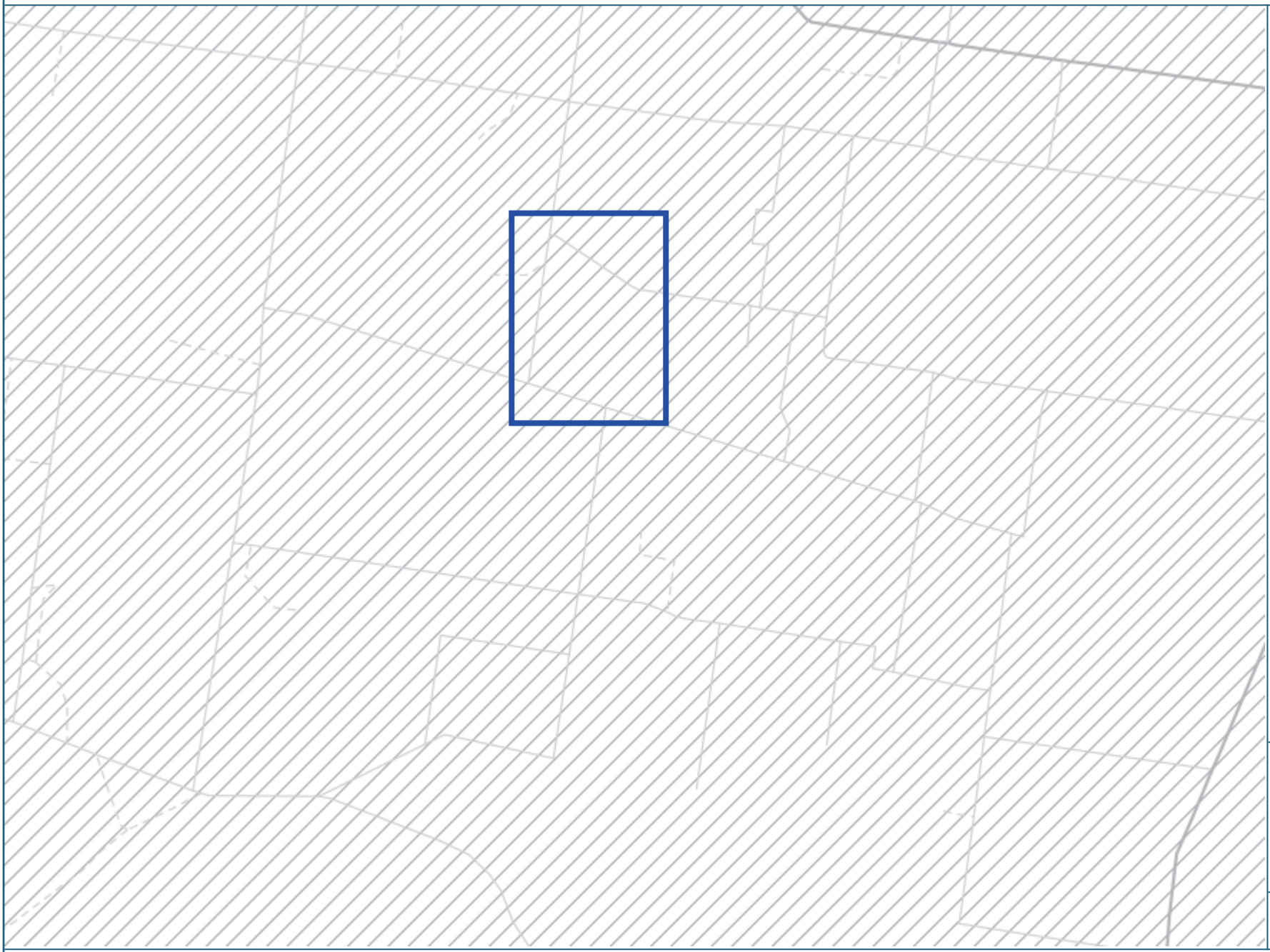
FIGURE 30

Date: 11 August, 2024

Australian Government
Bureau of Meteorology

Groundwater Dependent Ecosystems Atlas

High Claire



Subterranean GDE

- Known GDE (regional study)
- High potential GDE (regional study)
- Moderate potential GDE (regional study)
- Low potential GDE (regional study)
- Unclassified potential GDE (regional study)

Subterranean GDE (no data)

- No ecosystems analysed

Islands

- Islands

Mainland

- Mainland

N

1:87,872

Kilometres 2

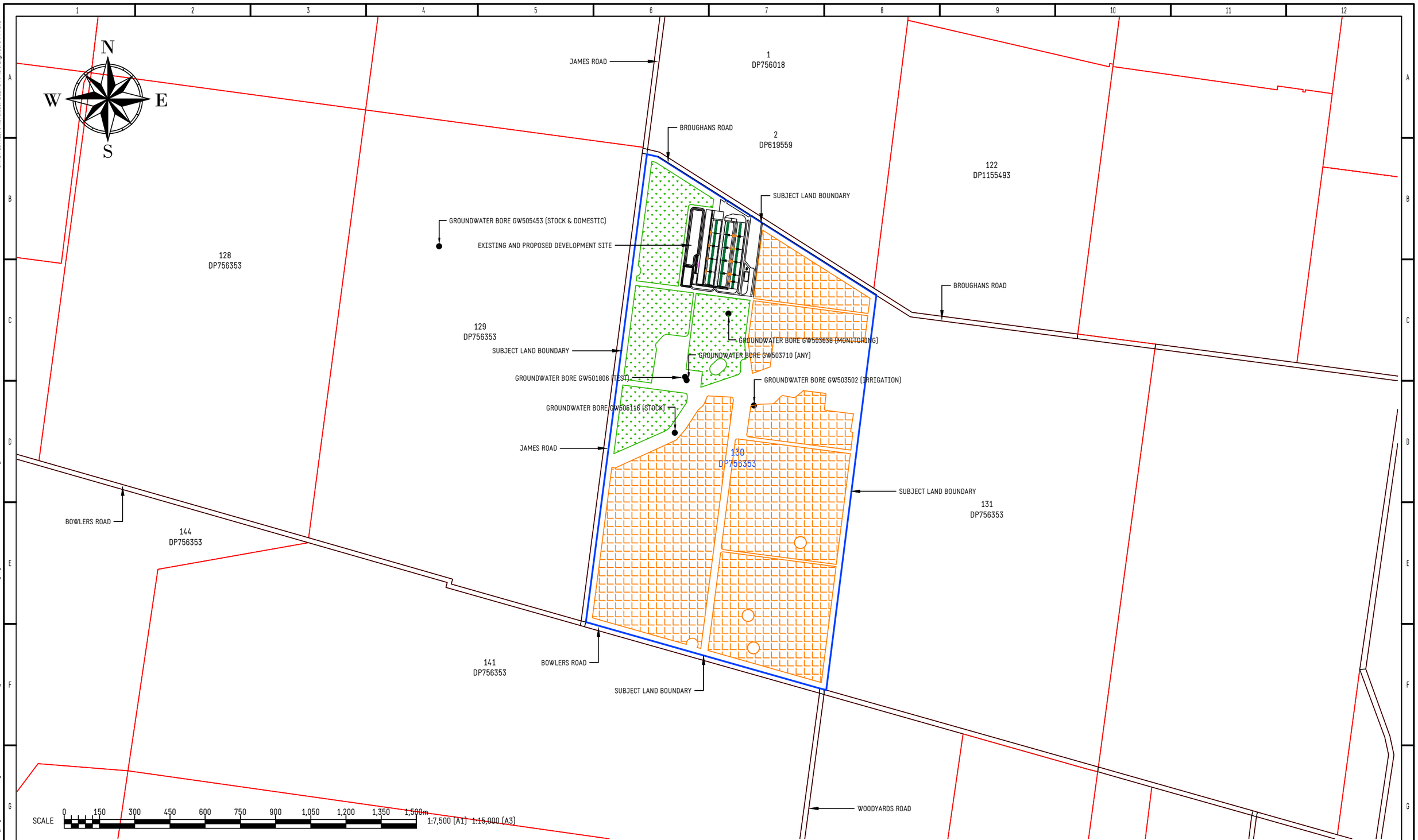
Data Source: Bureau of Meteorology, Geoscience Australia and State/Territory lead water agencies. Refer to metadata for further information: Click here

SUBJECT LAND

Australian Albers GDA94

FIGURE 31

Date: 11 August, 2024



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- GROUNDWATER BORE

NOTES:

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:15,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - GROUNDWATER BORES

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 32		A3	F3-107-00-32	B

DATE PLOTTED: 6 November 2024 BY : RDC Engineers PTY LTD

FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N Varley High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: F3-107 ANVarley High Claire MASTERPLAN-00-20230407 v8.dwg

13.3.2 Assessment of impacts

13.3.2.1 Design and siting

Inappropriate design, siting and operation of the proposed development above vulnerable groundwater resources or in salinity hazard areas may adversely impact on those resources unless suitable measures can be put in place to protect those resources.

The proposed development is a brownfield site and controls are already implemented to prevent adverse impacts to groundwater.

13.3.2.2 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.3.2.3 Operation

The following activities associated with the operation of the proposed development have the potential to adversely impact on groundwater:

- Leachate of effluent through the clay liner underlying the controlled drainage area as a result of integrity failure or exceedance of design criteria;
- Spills or leaks of hazardous chemicals or substances stored or used on-site such as fuels, chemicals etc;
- Inappropriate storage of solid wastes such as outside of the controlled drainage area; and
- Inappropriate utilisation of effluent and solid waste on-site such as high application rates and ponding of effluent.

13.3.3 Mitigation measures

13.3.3.1 Design and siting

The implementation of the following management and mitigation measures minimise identified impacts to groundwater as a result of the proposed development:

- Geotechnical investigation conducted to determine those areas within the controlled drainage area where the permeability of underlying soil/rock strata exceeds the design permeability, thus requiring lining to prevent soil leachate movement;
- The clay liner shall be capable of remaining effective when subject to the physical effects of livestock, machinery and water flow;

- Runoff external to the controlled drainage area is diverted away from the controlled drainage area;
- Effluent and solid waste utilisation areas are sited so that they do not pose an unacceptable risk to groundwater quality as a result of leaching;
- Effluent and solid waste utilisation areas are designed to enable the sustainable use of liquid waste and any solid waste that is utilised on-site; and
- Facilities to store hazardous materials are designed to meet relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management.

13.3.3.2 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.3.3.3 Operation

The implementation of the following management and mitigation measures minimise identified impacts to groundwater during operation of the proposed development:

- An Operational Environmental Management Plan (OEMP) and an Irrigation Management Plan (IMP) would be prepared for the operation of the proposed development. The IMP would detail the management and monitoring requirements for effluent treatment and utilisation. Further details on this plan are provided in section 13.11. The following measures would also be employed as part of these plans to minimise impacts to groundwater;
- Development and implementation of emergency and contingency plans within the IMP detailing methods to manage spills or other emergencies on site, such as pipe breakages, holding pond overflows, pump failures etc;
- Sustainable use of groundwater in accordance with allocation and entitlements under the Murray Alluvium water resource plan. This water resource plan is the prevailing management plan for the groundwater resources in the Murray Alluvium water resource plan (WRP) area;
- Solid waste stockpiles established within controlled drainage area to prevent contaminated leachate into groundwater resources;
- The land application of effluent and solid waste is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site;
- Soil condition is monitored according to licence conditions and soil tests are used where there is potential for deterioration of soil condition;

- Application rate of effluent waste is controlled to ensure that excessive ponding does not occur;
- The liner of all elements of the controlled drainage area such as drains, sedimentation basin, flow control structures etc is maintained to ensure the integrity and ongoing compliance with specified design criteria;
- Maintenance and monitoring of existing groundwater within groundwater monitoring bores (piezometers) downstream of the proposed development complex site; and
- Effluent shall be stored, treated and sustainably applied to land on-site by irrigation when available. Section 13.11 details the measures which would be used to manage and treat effluent generated by the proposed development.

13.3.4 Conclusion

Activities associated with the operation of the proposed development have the potential to generate impacts to groundwater.

Various mitigation measures have been adopted in the design and siting of the proposed development to prevent or minimise adverse impacts to groundwater. Various mitigation measures shall be implemented to prevent or minimise adverse impacts to groundwater during construction and operation of the proposed development.

Due to the design, siting and mitigation measures proposed and strata characteristics to groundwater (impermeable clay liner), no adverse impacts to groundwater quantity or quality are predicted as a result of the proposed development.

13.4 Surface water

13.4.1 Existing environment

13.4.1.1 Murray-Darling Basin

The Murray–Darling Basin is one of the world's largest drainage systems. It has a catchment over a million square kilometres and covers parts of Queensland, New South Wales, Victoria and South Australia. The Basin is Australia's most significant agricultural region, accounting for 70% of irrigated agriculture and more than 40% of the gross value of agricultural production nationally. Most of the Basin is arid or semi-arid, and most of its flow comes from a small region near the headwaters of the River Murray.

The subject land is located in the NSW Murray basin within the Central River Murray (NSW) catchment. The Central River Murray catchment takes in the country on both sides of the River Murray and is mainly a broad floodplain that contains an intricate network of creeks, floodrunners and billabongs. Sand hills and natural levees associated with some waterways give some relief to an otherwise flat landscape. Principal streams of the Central Murray catchment include the Kiewa, Ovens, Goulburn, Campaspe, Loddon, Wakool and Murrumbidgee rivers, Broken Creek and the distributaries Edward River and Gunbower Creek.

The Murray River system and its floodplain are the main topographic features of the Central River Murray catchment. From its headwaters near Mt. Kosciusko, at around 1,430 m above sea level, the Murray River flows westerly through steep-sided valleys into the Hume Dam near Albury. Downstream of Hume Dam near Albury, the river flows in a general northwesterly direction to its confluence with the Darling River at Wentworth, in western New South Wales

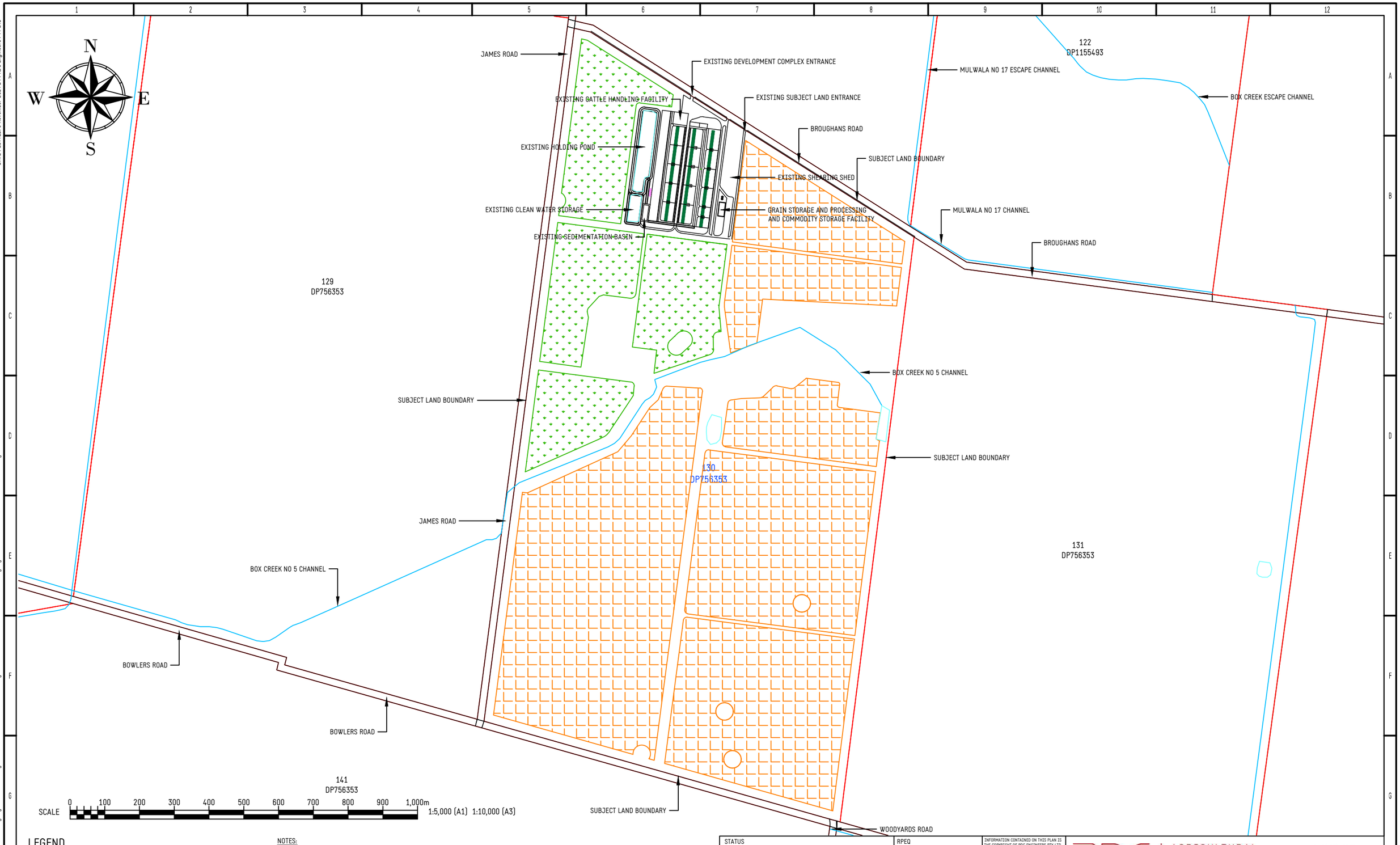
At a regional scale, the subject land is in the Edward River catchment. The Edward River, also known as the Kyalite River, is an anabranch of the Murray River and is part of the Murray–Darling basin. It flows through the western Riverina region in south-western New South Wales, Australia. The river originates at Picnic Point, east of Mathoura, due to the bottleneck created by the Cadell Fault in the Murray River. From there, it flows generally north through river red gum forest, reaching Deniliquin, and then continues westward through Moulamein. The Edward River is joined by six minor tributaries before it reaches its confluence with the Wakool River and re-enters the Murray River near Wakool Junction, close to Kyalite.

At a local scale, the proposed development is located within the Box Creek Escape Canal sub-catchment of the Edward/Kolety-Wakool River system catchment. The Edward/Kolety-Wakool River enters the Murray River system immediately south of Balranald. Flows in the River Murray system vary widely depending on a range of factors, including rainfall, inflows, evaporation, and demand for water for human use.

The surface water environment in the surrounding area is dominated by the Murray River located some 16 km to the south of the site, and the irrigation distribution channels: Tuppal Channel, Box Creek No 5 Channel and Mulwala No 17 Channel. The Box Creek Escape Channel ultimately enters the Edward River. The Edward River flows westwards to ultimately become the Murray River.

At a local scale, surface water is predominately comprised of ephemeral waterways. This is a resultant of the size of the contributing watercourse catchment area, rainfall pattern experienced in the region and no base flow resulting from groundwater expression.

There are no creeks or streams within or adjoining the subject land and the entire property is currently developed for surface irrigation, ensuring there is access to on-property drainage. There are no waterbodies on the site apart from surface irrigation infrastructure such as on-farm supply channels and irrigation tail water reuse channels. The existing on-farm irrigation supply channels and on-farm drainage infrastructure will remain, ultimately discharging to the Murray Irrigation Ltd drainage network.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA

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A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

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DATE	07/11/2024

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CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - HYDROLINES OVERLAY

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 33		A3	F3-107-00-33	B

DATE PLOTTED: 6 November 2024, BY: RDC Engineers PTY LTD
FILE NAME: F3-107 ANVarLeg High Claire MASTERPLAN-00-20230407 -v8.4.wg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VarLeg High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

13.4.1.2 Water sharing plan

Water resources in the River Murray are shared between NSW, Victoria, and South Australia under the Murray Darling Basin Agreement. The Agreement is administered by the Murray Darling Basin Authority, on behalf of states. In simple terms, NSW and Victoria share the physical Murray system and resources upstream of the South Australian border.
NSW manages its share of Murray resource in accordance with the Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources 2016 a water sharing plan established under NSW legislation (Water Management Act 2000).

As there are no watercourses within or adjoining the subject land and the land is not subject to floodplain flows, the subject land does not benefit from any high security or general security water access licences or floodplain harvesting licences directly under the NSW Murray Regulated River source.

13.4.1.3 Murray Irrigation Limited

Murray Irrigation Limited (MIL) is an unlisted, public company which was formed in March 1995, when the NSW Government privatised the irrigation system in the NSW Murray Valley by handing over the control and operation of the system to the irrigators it served. NSW irrigators are shareholders of MIL.

MIL is licensed to operate by the NSW Government, with general security entitlements to the NSW Murray Regulated River resource. The system provides vital water supplies to more than 740,000 hectares of farmland and provides or underpins the town water supplies of the townships of Berrigan, Finley, Wakool, Bunnaloo and Deniliquin.

The water entitlements held by MIL are derived from WAL9426 under the Water Management Act 2000.

13.4.1.4 Quantity

The applicant has a regulated Murray Irrigation Limited (MIL) entitlement, comprising 273 megalitres of Class C (General Security) irrigation water (landholding E386). A copy of the entitlement is provided in Appendix H.

As outlined in section 8.7.3.1.3, the total annual water demand for the proposed development is estimated to be 41 ML when at a full capacity of 3,200 head.

The existing surface water entitlement is sufficient to meet the demands of the proposed development.

13.4.1.5 Quality

The Sustainable Rivers Audit 2 (Murray–Darling Basin Authority, 2012) is the most comprehensive assessment of river health undertaken for the Murray Darling Basin and reported the overall ecosystem health of the central River Murray valley was poor. In this report,

the central Murray region extends to the junction of the Murray and Darling rivers at Wentworth.

Flow regulation had severely affected species abundance and diversity of fish, with the health of the fish community being rated very poor. The macroinvertebrate community was also rated poor condition. Riverine vegetation was rated good condition in riparian and floodplain environments. The physical form of the river was rated moderate condition but elevated sediment loads since European settlement has resulted in sedimentation within the river channel and there was evidence of channel simplification. Flow seasonality and variability was rated poor in the valley, especially in the middle and lower zones of the valley, where river flows are impacted by seasonality of supply for urban centres and irrigation Murray–Darling Basin Authority, 2012).

13.4.2 Assessment of impacts

13.4.2.1 Design and siting

Inappropriate design and siting of the proposed development may adversely impact surface waters external to the development site such as changes to hydrology including drainage patterns, surface runoff yield, flow regimes and groundwater.

The proposed development is a brownfield site and controls are already implemented to prevent adverse impacts to surface water.

13.4.2.2 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.4.2.3 Operation

The following activities associated with the operation of the proposed development have the potential to adversely impact on surface waters:

- Uncontrolled release of effluent from the controlled drainage area as a result of overflows, integrity failure or exceedance of design criteria;
- Spills or leaks of hazardous chemicals or substances stored or used on-site such as fuels, chemicals etc;
- Surface runoff from the inappropriate application of effluent to land impacting water chemistry, clarity, nutrient and toxicants, for example;
- Inappropriate storage of solid wastes such as outside of the controlled drainage area; and
- On-site utilisation of effluent and solid waste.

13.4.3 Mitigation measures

13.4.3.1 Design and siting

The implementation of the following management and mitigation measures minimise identified impacts to surface water as a result of the proposed development:

- The proposed development shall be sited above the height of a 100-year average recurrence interval (Q_{100}) flood level;
- Access roads are not sited on flood prone land and therefore the hydrology of the area is not impacted;
- A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling, solid waste storage and processing area and silage storage area which have high organic matter and therefore a high pollution potential;
- Runoff external to the controlled drainage area is diverted away from the controlled drainage area;
- Effluent and solid waste utilisation areas are sited so that they do not pose an unacceptable risk to surface water quality as a result of flood events;
- Effluent and solid waste utilisation areas are designed to enable the sustainable use of waste that is utilised on-site;
- Any facilities to store hazardous materials are designed to meet relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management;
- Elements of the controlled drainage area are designed to capture contaminated runoff from within those areas which have high organic matter and therefore a high pollution potential and safely divert it to a sedimentation system as discussed in section 8.4.9;
- A sedimentation system is designed to provide flow velocities less than 0.005 m/s, and discharge to a holding pond as discussed in section 8.4.9.1;
- A holding pond is designed to store runoff from the controlled drainage area without spilling or overtopping at an unacceptable frequency as discussed in section 8.4.9.2;
- Appropriately designed weirs and by-washes are used to discharge excess runoff during overtopping or spill events in the sedimentation system and holding pond; and

13.4.3.2 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.4.3.3 Operation

The implementation of the following management and mitigation measures minimise identified impacts to surface water during operation of the proposed development:

- An Operational Environmental Management Plan (OEMP) and an Irrigation Management Plan (IMP) would be prepared for the operation of the proposed development. The IMP would detail the management and monitoring requirements for wastewater treatment and irrigation. Further details on this plan are provided in section 15.2.1. The following measures would also be employed as part of these plans to minimise impacts to surface water:

    - Development and implementation of emergency and contingency plans within the IMP detailing methods to manage spills or other emergencies on site, such as pipe breakages, pond overflows, pump failures etc;
    - Maintenance of buffer zones around drainage lines and riparian zones to prevent contamination of surface waters;
    - Solid waste stockpiles would be established within controlled drainage area to prevent contaminated runoff into clean water areas;
    - Sustainable use of surface water in accordance with entitlements;
    - The land application of effluent and solid waste is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site;
    - Soil condition is monitored periodically, and soil tests are used where there is potential for deterioration of soil condition;
    - Application rates of effluent waste is controlled to ensure that excessive runoff does not occur;
    - All elements of the controlled drainage area such as drains, sedimentation basin, flow control structures etc are cleaned and maintained to ensure their integrity and ongoing compliance with specified design criteria;
    - Effluent shall be stored, treated and sustainably applied to land on-site by irrigation. section 8.7.5 details the measures which would be used to manage effluent generated by the proposed development; and
    - Design discharge events from the holding pond shall be directed to a cropped area. As the design discharge events are at a frequency of one in 10 years the concentration of nutrients shall be sustainably adsorbed and utilised by subsequent crops in between events.

13.4.4 Conclusion

Activities associated with the operation of the proposed development have the potential to generate impacts to surface waters.

Various mitigation measures have been adopted in the design and siting of the proposed development to prevent or minimise adverse impacts to surface waters. Various mitigation measures shall be implemented to prevent or minimise adverse impacts to surface waters during operation of the proposed development.

Due to the design, siting and mitigation measures proposed, no adverse impacts to surface water quantity or quality are predicted as a result of the proposed development.

13.5 Wetlands

Wetlands are distinctive ecosystems and a critical part of the environment and deliver many ecosystem services such as coastal protection, water and food supply, reducing the impacts of floods, absorb pollutants, improve water quality. They provide habitat for animals and plants and many contain a wide diversity of life.

Broadly, wetlands are areas of land that are wet by surface water or groundwater, or both, for long enough periods that the plants and animals in them are adapted to, and depend on, moist conditions for at least part of their lifecycle. They are neither just land, nor just water and can be both at the same time, or seasonally aquatic, or terrestrial. They include areas that are inundated cyclically, intermittently or permanently with fresh, brackish or saline water, which is generally still or slow moving.

New South Wales has unique and diverse wetlands from seagrass beds, lagoon estuaries and billabongs, to lakes, floodplains, swamps and marshes which are rich in ecological and cultural values and form an integral part of the natural environment of the state.

The responsibility for the protection, conservation and management of wetlands in New South Wales is shared between various government agencies. The Department of Biodiversity, Conservation and Attractions is responsible for managing wetlands under the Ramsar Convention.

The conservation of wetlands is guided by the NSW Wetlands Policy, the Ramsar Convention and state and national programs. The Department of Planning, Industry and Environment is the lead agency for managing most wetlands.

The Department of Planning, Industry and Environment coordinates mapping of New South Wales wetlands. Wetlands within NSW have been mapped digitally at a scale of 1:100,000-250,000 using a combination of classification of spectral classes of Landsat MSS and TM imagery and ancillary wetland information to create information classes of broad wetland groups (floodplain wetlands, freshwater lakes, saline lakes, reservoirs, estuarine wetlands and coastal lagoons and lakes) (Kingsford, et al, 2004). These data are provided in the NSW Wetlands dataset.

The Directory of Important Wetlands in Australia dataset contains wetlands cited in the "A Directory of Important Wetlands in Australia" Third Edition (Environment Australia, 2001), plus various additions for wetlands listed after 2001.

The Ramsar Wetlands of NSW dataset contains the boundaries of wetlands designated under the Ramsar Convention in NSW.

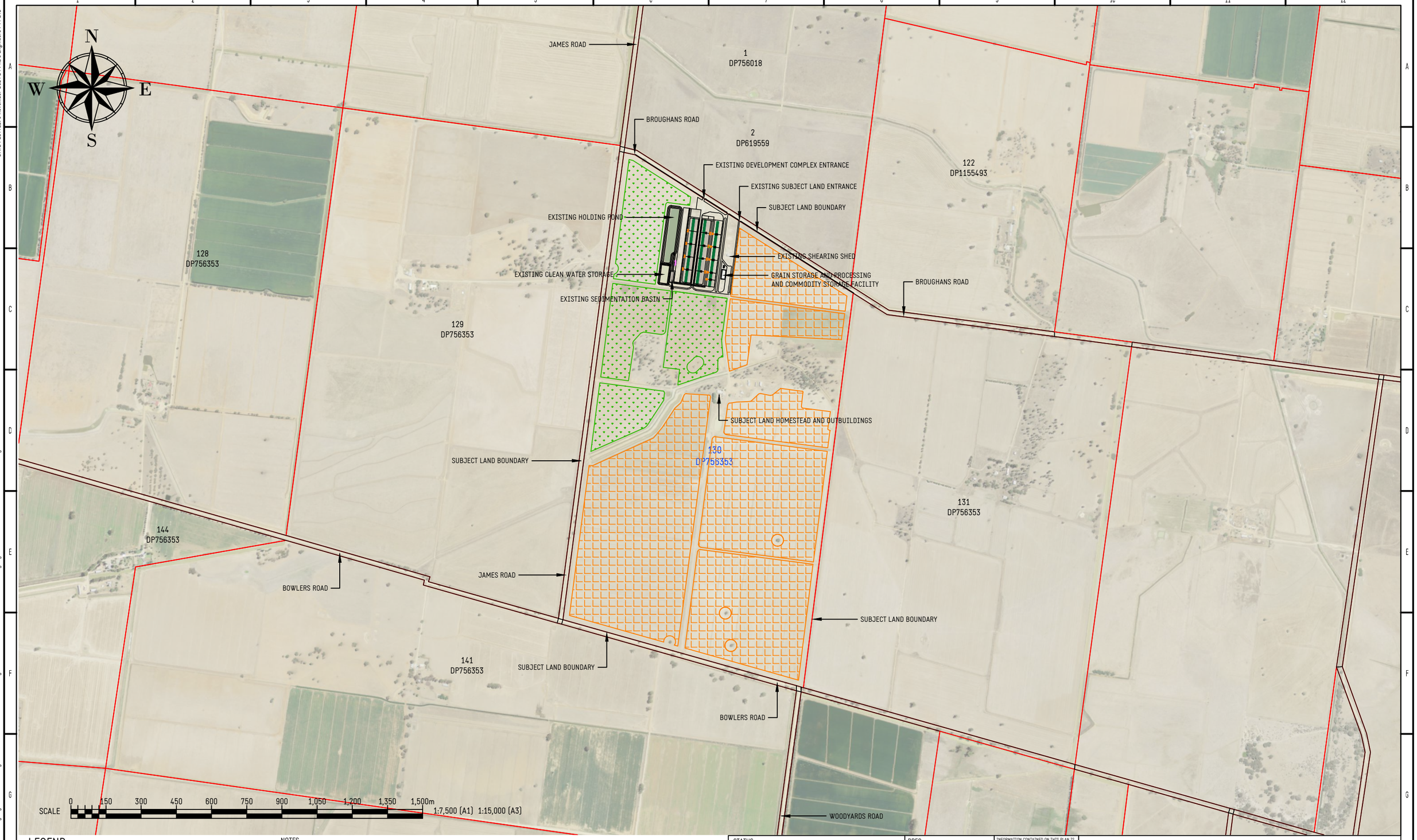
The NSW Wetlands, Directory of Important Wetlands in Australia and Ramsar Wetlands of NSW datasets were obtained from the SEED Open Data portal in ESRI shapefile format. An

overlay of the subject land, NSW wetlands, Important Wetlands in Australia, Ramsar Wetlands of NSW and the proposed development was prepared and is shown in Figure 34.

Figure 34 confirms that there are no floodplain wetlands mapped on and adjacent to the subject land under the NSW Wetlands mapping. The closest Ramsar Wetland to the subject land is the NSW Central Murray State Forests which is located some 22 km southwest of the subject land as shown in Figure 17.

Consequently, the proposed development will not be located within or adjacent to any wetlands. The proposed development infrastructure shall be sited over 7 km from the closest mapped geomorphic wetland and over 22 km from a Ramsar Wetland.

The proposed development is not expected to have an impact on mapped NSW Wetlands as described above.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- NSW WETLANDS

NOTES:

1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2023, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
2. TOPOGRAPHIC INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES NSW TOPOGRAPHIC MAPS 2023, PROVIDED BY THE NSW DEPARTMENT OF CUSTOMER SERVICES SPATIAL SERVICES AND ACCURACY IS LIMITED.
3. INFORMATION MAY HAVE BEEN CAPTURED AT DIFFERENT ACCURACIES AND SCALES. IMAGERY OBTAINED FROM NSW DEPARTMENT OF LANDS.
4. HORIZONTAL DATUM - MGA2020 UTM ZONE 55.

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STATUS: FOR APPROVAL
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RPEQ

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:15,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - PROTECTED AND CONSERVATION AREAS

REPORT REFERENCE: FIGURE 34
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-00-34
REV.: B

13.6 Flooding, stormwater and coastal erosion

13.6.1 Existing environment

13.6.1.1 Flooding

The climate and topography of the region results in some degree of flooding in all streams during heavy or prolonged rain events.

Flooding may be influenced by floods from two sources (or a combination of these sources):

- Riverine flooding caused by high flows in the major river (Murray) or its tributaries. These flood events inundate the riverine plains a complex distributary channel system some 7 km to the south of the subject land. These events only result from rainfall over a significant portion of the respective river basin catchment.

- Local catchment flooding due to rainfall over the local catchment draining to drainage infrastructure (e.g. bridges, culverts, causeways etc) in isolation of regional flooding behaviour.

The southern Murray-Darling Basin currently has 10 localised floodplain management plans developed under the Water Act and 2 declared floodplains as shown in Figure 35. There are five localised FMP within the Murray River Valley. The closest localised FMP is the Tuppal and Bullatale Creeks - Floodplain Management Plan area located some 5 km south of the subject land. Tuppal and Bullatale Creeks are anabranches of the Murray River. The subject land is not located within the Tuppal and Bulltale Creeks Floodplain Management Plan area as shown in Figure 36.

A flood study, entitled Edward River at Deniliquin Flood Study. Final, has been carried out for the Deniliquin Local Government Area (LGA) in accordance with the NSW Government's Flood Policy (Deniliquin Shire Council, 2014). The Edward River at Deniliquin Flood Study includes data depicting the extent of known flooding at the town of Deniliquin. Deniliquin is located approximately 40 km west-northwest of the subject land.

Tuppal Creek is approximately 5 km south of the subject land and the subject land is not subject to riverine flooding and is not included in the flood planning area in the Conargo Local Environmental Plan 2013 – Flood Planning Maps, Berrigan Shire Local Environment Plan 2013 – Flood Planning Maps or within the Tuppal and Bulltale Creeks - Floodplain Management Plan area.

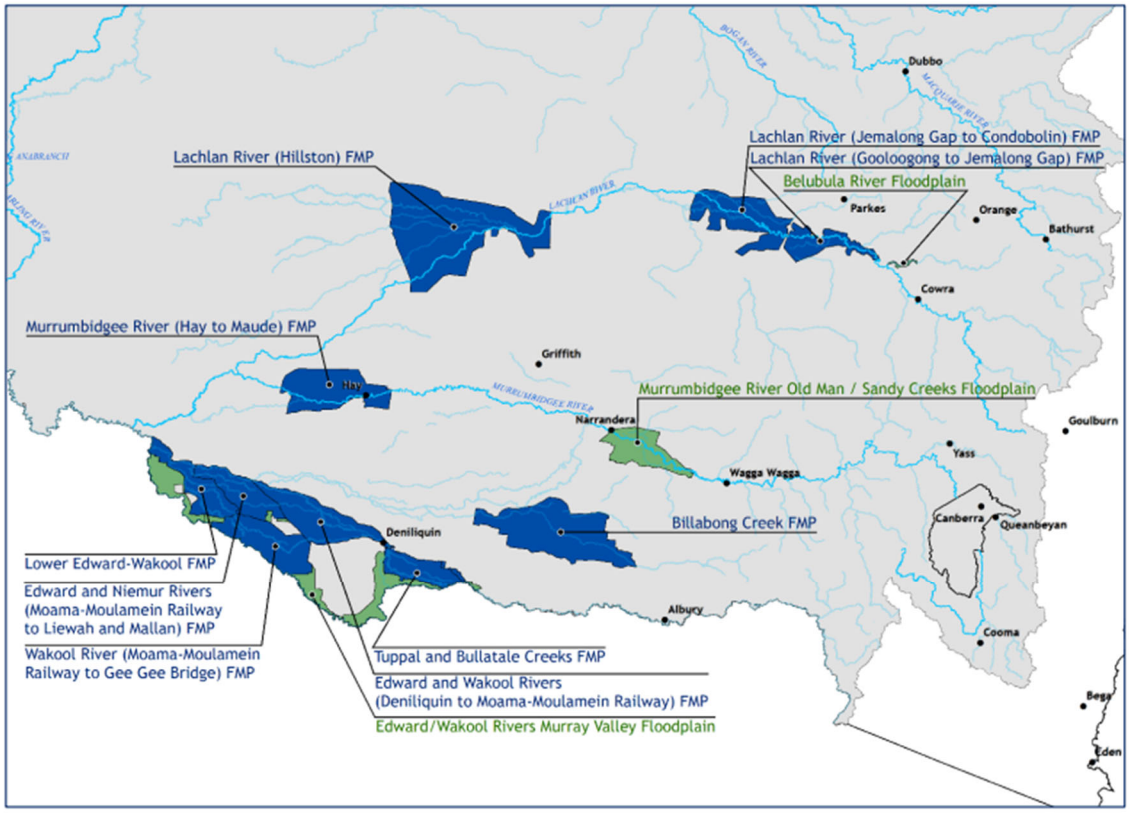


Figure 1. The southern Murray-Darling Basin has 10 localised floodplain management plans developed under the Water Act, along with 2 declared floodplains.

Figure 35 – Southern Murray Darling Basin – Existing flood plan management plans

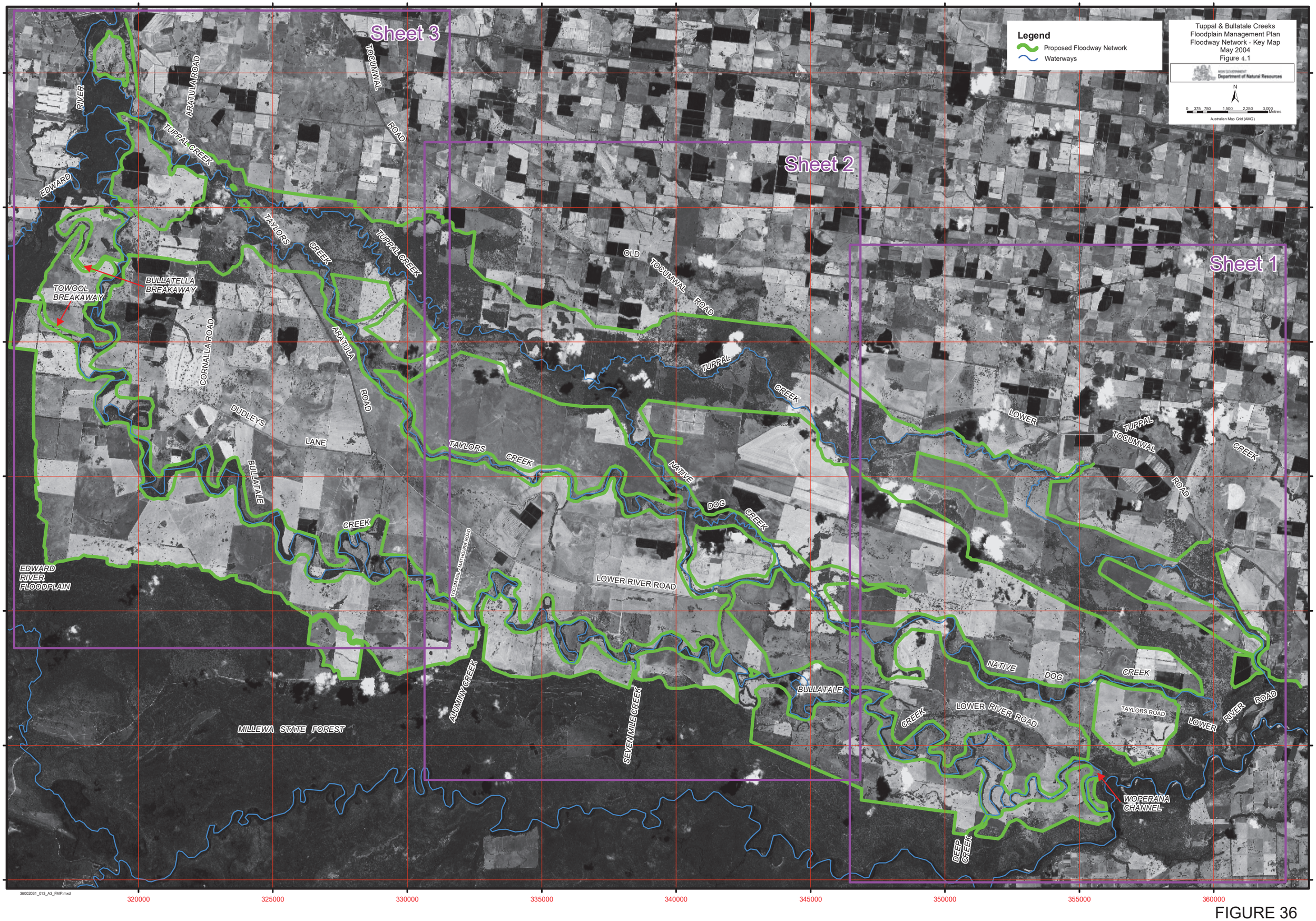

Sheet 3
Sheet 2
Sheet 1
Legend
Proposed Floodway Network
Waterways
Tuppal & Bullatale Creeks
Floodplain Management Plan
Floodway Network - Key Map
May 2004
Figure 4.1
Department of Natural Resources
N
0 375 750 1,500 2,250 3,000 Metres
Australian Map Grid (AMG)
320000
325000
330000
335000
340000
345000
350000
355000
360000
6060000
6055000
6050000
6045000
6040000
6035000
6030000
EDWARD RIVER
TUPPAL CREEK
ARATULA ROAD
TOCUMWAL ROAD
TAYLORS CREEK
TUPPAL CREEK
OLD TOCUMWAL ROAD
TOWOOL BREAKAWAY
BULLATELLA BREAKAWAY
CORNALLA ROAD
ARATULA ROAD
DUDLEYS LANE
BULLATALE CREEK
TAYLORS CREEK
TUPPAL CREEK
NATIVE DOG CREEK
LOWER TUPPAL TOCUMWAL ROAD
EDWARD RIVER FLOODPLAIN
TOCUMWAL-MATHOURA ROAD
LOWER RIVER ROAD
ALUMINY CREEK
SEVEN MILE CREEK
BULLATALE CREEK
MILLEWA STATE FOREST
NATIVE DOG CREEK
LOWER RIVER ROAD
TAYLORS ROAD
LOWER RIVER ROAD
WOPERANA CHANNEL
DEEP CREEK
36002031_013_A3_FMP.mxd

FIGURE 36

13.6.1.2 Stormwater

The subject property has many stormwater catchment areas, which eventually discharge to natural drainage lines and eventually the Edward-Kolety River or to land (infiltration/evaporation). There is an existing stormwater system due to the existence of irrigation channels and tailwater pond.

Whilst there is no riverine flood threat, localised stormwater flooding may occur. The subject land is located within the Berriquin irrigation district and due to the flatness of the area there is excellent man-made surface water drainage infrastructure servicing the district such as the Box Creek Escape system. This drainage network is extensive, draining a large part of the Berriquin irrigation district with discharge to the Edward River approximately half-way between Deniliquin and Moulamein. Part of the Box Creek Escape system, the Box Creek No 5 channel traverses the subject land and serves to remove stormwater from the irrigation areas.

The subject land has a whole farm for drainage and irrigation recycle system as shown in Figure 37.

Topography within the proposed development site is generally flat with a slight fall to sloping to the north. Stormwater is collected in the Box Creek No. 5 Channel tailwater dam to the eastern side of the property.

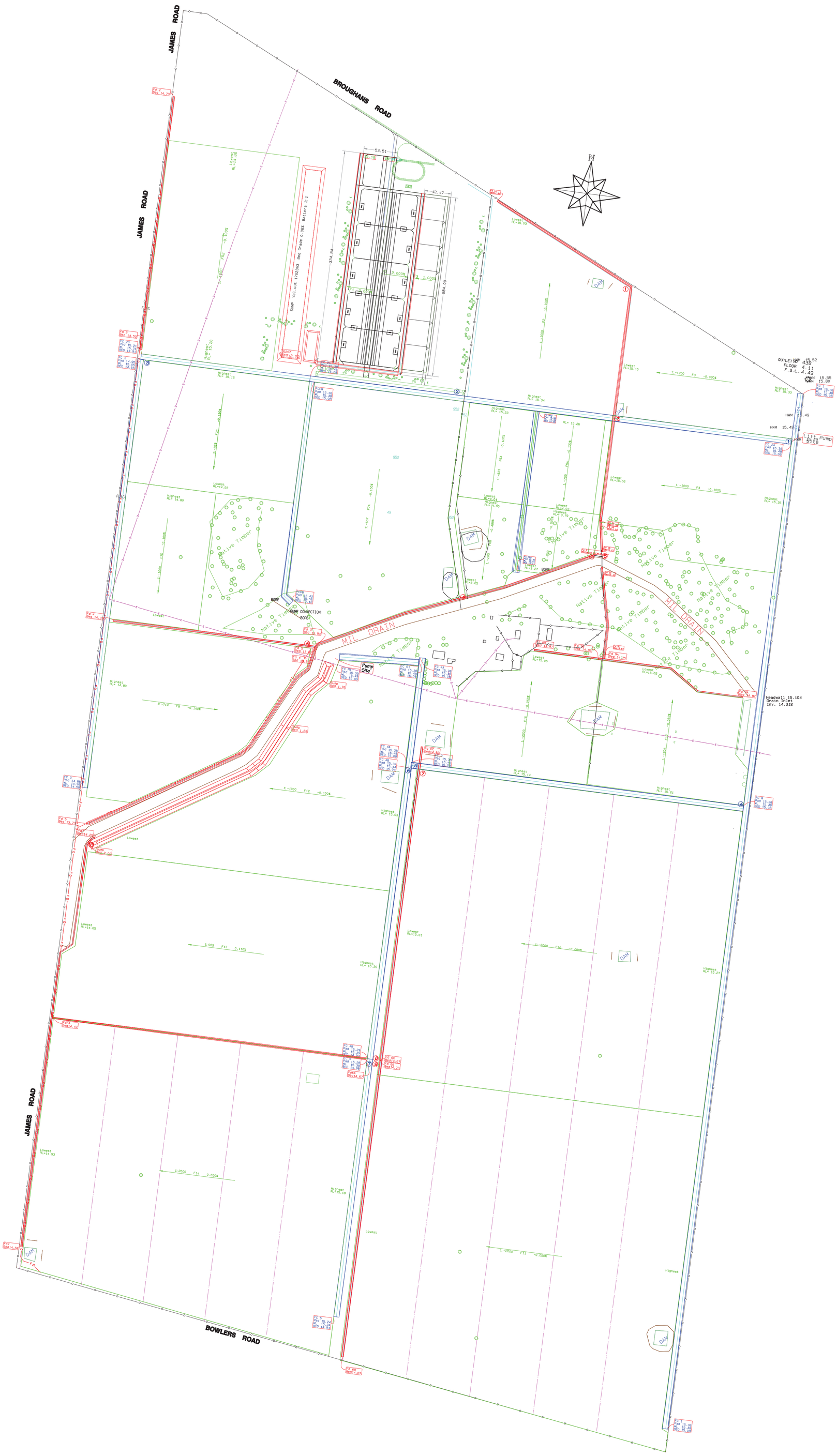

JAMES ROAD
BROUGHANS ROAD
JAMES ROAD
JAMES ROAD
BOWLERS ROAD
N
53.51
42.47
334.84
284.00
Swale Vol.cut 1762cm3 Bed Grade 0.06% Batters 3:1
SUMP
Bed12.00
Native Timber
DAM
BORE
PUMP CONNECTION
MTL DRAIN
Pump Site
OUTLET
FLOOR 4.11
F.S.L. 4.49
HWM 15.52
HWM 15.55
15.80
HWM 15.49
HWM 15.49
Lift Pump
Headwall 15.104
Drain Inlet
Inv. 14.912
Highest
Lowest
1:-1000 F12 -0.100%
1:909 F13 0.110%
1:2000 F14 0.050%
1:-2000 F10 -0.050%
1:-2000 F11 -0.050%

FIGURE 37

13.6.1.3 Coastal erosion

The subject land on which the proposed development shall be sited, is located in an inland area of NSW some 260 km from the coastline (the Melbourne City area) and not adjacent to the NSW coastline as shown in Figure 1. The subject land is located at an elevation between 104 m to 108 m AHD.

Subsequently, the proposed development shall not be impacted by any potential effects of coastal processes and coastal hazards or sea level rise nor shall the proposed development impact on these processes.

The subject land is not impacted by any coastal zone management plan.

Hence, no further consideration of the potential effects of coastal processes and coastal hazards are considered in this EIS.

13.6.2 Assessment of impacts

13.6.2.1 Flooding

Inappropriate design and siting of the proposed development may adversely impact flood prone land or on flood behaviour resulting in:

- detrimental increases in the potential flood affectation of other development or properties;
- cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses;
- risk to life; and
- unsustainable social and economic costs to the community.

The proposed development complex which comprises the built environment of production pens, cattle handling infrastructure, feed storage and preparation infrastructure etc is located at an elevation of some 11-15 m higher than the recorded AHD data points in the Edward River at Deniliquin (Deniliquin Shire Council, 2014).

There is no infrastructure proposed on flood prone land, including the access road from the site entrance to the proposed development complex. Further, the stormwater runoff from the controlled drainage area shall be contained and sustainably utilised on-site via irrigation to land.

The access road level shall be at existing natural surface level and shall not form a levee or impediment to flood levels, velocities or flow distributions. The road shall be compacted and surfaced with gravel. It is concluded that the access road would not adversely affect the environment or cause avoidable erosion, siltation during flood events due to small footprint, vegetative buffers exist on each side of the access road and construction material.

The effluent and solid waste utilisation area is not located on flood prone land. No built infrastructure such as levees, buildings, banks or channels are proposed as part of the utilisation system.

The management of the effluent and solid waste utilisation areas shall be consistent with existing farm practices and sustainable nutrient application (Refer section 13.11) and therefore it is concluded that the utilisation areas shall not adversely affect the environment or cause avoidable erosion or siltation.

The proposed development is consistent with the flood hazard of the land and shall not adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties as the proposed feedlot site and associated waste reuse areas are not located on flood prone land.

Further, it is concluded that there is no risk to life from flood, nor unsustainable social and economic costs to the community, as a consequence of flooding as a result of the proposed development due to the location and nature of the proposed works.

Due to the regional location and siting of the proposed development at some 11-15 m AHD higher than the largest recorded flood level and the subject land not being located within a floodplain management area, a sensitivity analysis of the potential impacts of an increase in rainfall intensity, rainfall runoff and sea level rise is not deemed warranted and not provided.

13.6.2.2 Stormwater

There are no construction activities per se as existing infrastructure shall be used.

During the operational phase the main pollutants of concern will be those associated with livestock manure.

Build-up of pollutants from vehicles such as hydrocarbons and combustion derivatives, lubricating oil, rubber and heavy metals such as lead, zinc, copper, cadmium, chromium, and nickel on road surfaces is predicted to be negligible and are unlikely to disperse in rainfall events.

The stormwater runoff shall be retained in the controlled drainage system and sustainably utilised on-site. The controlled drainage and treatment system is outlined in section 8.6.1 and 8.7.5 and the predicted stormwater runoff discharge quality sustainably utilised on-site is outlined in section 13.10.6.4.1.

The recommended mitigation measures for the management of stormwater during construction and operation are outlined in section 13.6.3.

13.6.3 Mitigation measures

13.6.3.1 Flooding

The implementation of the following typical flood management and mitigation measures for the purpose of minimising identified impacts from flooding or to flood behaviour and stormwater as a result of the proposed development are not considered directly applicable but will be followed:

- The proposed development is sited above the height of a 100-year average recurrence interval (Q_{100}) flood level;
- Effluent and solid waste utilisation areas are sited so that they do not pose an unacceptable risk to surface water quality as a result of flood events; and
- Effluent and solid waste utilisation areas are designed to enable the sustainable use of effluent and any solid waste that is utilised on-site.

13.6.3.2 Stormwater

The implementation of the following management and mitigation measures minimise identified impacts from stormwater as a result of the proposed development:

- A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling, solid waste storage and processing area and silage storage area which have high organic matter and therefore a high pollution potential;
- Runoff external to the controlled drainage area is diverted away from the controlled drainage area to existing natural drainage lines;
- Elements of the controlled drainage area are designed to capture contaminated runoff from within those areas which have high organic matter and therefore a high pollution potential and safely divert it to a sedimentation system as discussed in section 8.4.9;
- A sedimentation system is designed to provide flow velocities less than 0.005 m/s, and discharge to a holding pond as discussed in section 8.4.9.1;
- A holding pond is designed to store runoff from the controlled drainage area without spilling or overtopping at an unacceptable frequency as discussed in section 8.4.9.2;
- Appropriately designed weirs and by-washes are used to discharge excess runoff during overtopping or spill events in the sedimentation system and holding pond; and
- Vehicles are maintained to minimise leaks of hydrocarbons, lubricating oil etc.

13.6.4 Conclusion

The subject land is not subject to riverine flooding due to its location in the landscape. The proposed development has the potential to generate impacts to the receiving environment from localised stormwater.

The subject land is well serviced by man-made surface water drainage infrastructure servicing the district such as the Box Creek Escape system. Part of the Box Creek Escape system, the Box Creek No 5 channel traverses the subject land and serves to remove stormwater from the irrigation areas.

There are no aspects of the proposed development that shall adversely impact riverine flood behaviour or increase risk to life from flood events.

Similarly, various mitigation measures have been adopted in the design and operation of the development to mitigate any potential impacts from stormwater. For example, erosion and sediment control techniques based upon effective use of construction practices, structural controls and vegetative measures shall be implemented along with a controlled drainage system.

Due to the design, siting and mitigation measures proposed, there is no adverse impacts to the receiving environment from stormwater and riverine flooding.

13.7 Heritage

13.7.1 Introduction

An assessment of potential Aboriginal and non-aboriginal heritage impacts from the proposed development has been undertaken.

13.7.2 Aboriginal

13.7.2.1 Assessment methodology

The assessment of Aboriginal Heritage involved identification of heritage places and cultural values in the proposed development area, an assessment of the potential impacts to Aboriginal heritage as a result of the proposed development, and development of recommendations to minimise, manage and mitigate these potential impacts. The assessment followed a due diligence process and involved the following:

- An aboriginal site search of the NSW Environment and Heritage Aboriginal Heritage information Management System (AHIMS). The possible existence of previously recorded Aboriginal Cultural Heritage Sites within a wider regional area, surrounding the proposed development were examined to develop an awareness and predictive model of what site types may be within the proposed development site;
- Assessment of Landscape – Assess the subject land for the presence of potentially culturally significant landscapes, based primarily on topography, nature and level of disturbance, nature of soils, proximity to water;
- Walkover of the site to assess the potential for Aboriginal cultural heritage significance; and
- Identification and provision of management measures on future Aboriginal cultural heritage issues within the proposed development area.

The following guidelines and documents were used as advisory documents and guidelines for the assessment:

- Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010a);
- Due Diligence Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010b);
- Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (Office of Environment and Heritage (NSW), 2011);
- Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010c); and
- Aboriginal Cultural Heritage: Standards and Guidelines Kit (NSW National Parks and Wildlife Service, 1997).

An aboriginal due diligence assessment has been undertaken and is presented in Appendix K.

13.7.2.2 Existing environment

A search of the NSW AHIMS register indicated that there are no recorded sites on the proposed development site or within a 10 km radius of the subject land. This may reflect the lack of survey on the subject land rather than a lack of aboriginal history on the subject land. A copy of the search results are provided in Appendix B of the Aboriginal Due Diligence Assessment (Appendix J).

The proposed development site does not contain landscape features such as rock outcrops, caves, rock shelters and or rock carvings, estuarine or coastal dunes, sand hills, waterholes and or natural springs, wetlands and/or floodplains that are considered likely to contain Aboriginal objects.

The magnitude and extent of previous disturbance when cleared from woodland to open grazing area affects the likelihood of discovering intact heritage deposits, with significant deposits more likely to be found in undisturbed areas.

Remnant woodland within the wider subject land area may contain artefacts; however, these areas will not be disturbed.

Although the proposed development site has previously been extensively cleared and developed, all reasonable and practical measures shall be undertaken to ensure the activity does not harm any Aboriginal heritage.

A precautionary approach shall be applied to the assessment of risk to Aboriginal heritage to ensure that all aspects of potential risk is considered, and appropriate steps are applied to avoid or minimise damage to Aboriginal heritage.

13.7.2.3 Assessment of impacts

In accordance with the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (Office of Environment and Heritage (NSW), 2011), the principles of ecologically sustainable development (ESD) were considered in assessing the likely harm of the proposed development to Aboriginal objects.

The proposed development could potentially directly and indirectly impact the Aboriginal cultural heritage of the site and local area. Potential negative direct and indirect impacts may result from the destruction of the sites via ground disturbance or indirect physical affects (e.g. dust deposition) or aesthetic affects.

The proposed development does not involve disturbance of the land surface as the development complex site and effluent and solid waste utilisation areas are highly disturbed areas.

As the proposed activities for the proposed development would not involve significant ground disturbance, impacts may be limited to minor surface disturbance and no significant alteration of the landscape context. The potential indirect impacts to archaeological sites could include the following:

- deposition of dust generated by activities;
- accidental disturbance by peripheral activities; and
- inappropriate visitation including the unauthorised removal of Aboriginal objects.

There are no known Aboriginal cultural heritage sites identified during the due diligence assessment.

The degree of past disturbance from land clearing, drainage works, removal of native vegetation and soil disturbance for pastoralism and cropping, means that in-situ subsurface cultural deposits are not likely.

The proposed development area does not contain culturally sensitive landforms such as lunettes or source-bordering sand dunes where subsurface Aboriginal cultural deposits (e.g. burials) have been recorded previously.

No Aboriginal archaeological sites, objects or places, or areas of archaeological potential or Aboriginal sensitivity have been recorded within the subject land.

The site inspection conducted confirmed extensive disturbance from agricultural development and associated ongoing agricultural activities, and it is therefore considered highly unlikely that evidence of previous occupation by Aboriginal people remains within the subject land.

13.7.2.4 Mitigation measures

This section presents proposed strategies for the management of cultural heritage values within the subject land that may be subject to direct impacts by the proposed development.

Based on the known and predicted Aboriginal heritage values within the proposed development area, it is concluded that impacts to Aboriginal heritage as a result of the proposed development can be effectively managed or mitigated through the following actions and strategies:

- An aboriginal due diligence assessment by suitably qualified and experienced personnel has been completed as part of the environmental impact statement;
- Erosion and sediment control works be undertaken in accordance with the requirements of the development approval and in consideration of other Aboriginal cultural heritage management measures; and
- Any new Aboriginal heritage sites identified during the operation of the proposed development shall be registered with the NSW Office of Environment and Heritage (via Aboriginal site Impact Recording Form on AHIMS) in consultation with the Aboriginal community;

13.7.3 Non-Aboriginal

Under the *Heritage Act 1977*, items of "environmental heritage" include places, buildings, works, relics, moveable objects and precincts identified as significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values.

13.7.3.1 Assessment methodology

The non-Aboriginal heritage assessment of the proposed development involved a desktop review of known heritage sites and objects in the subject land and immediate surrounds, an assessment of the potential impacts to non-Aboriginal heritage as a result of the proposed development, and development of recommendations to minimise, manage and mitigate these potential impacts. The assessment involved the following:

- Previously identified heritage items in the proposed development area through a search of heritage registers including:
    - National Heritage List;
    - Commonwealth Heritage List;
    - State Heritage Register (HHIMS); and
    - State Heritage Inventory.
- Site survey to assess the potential for heritage significance and any locally significant heritage sites, historic items of significance.

13.7.3.2 Existing environment

The subject land is not listed on the National Heritage List. Further, there are no listed historic heritage places owned or controlled by the Australian Government as listed on the Commonwealth Heritage List within 5 km of the subject land as outlined in section 9.5.1.2 and shown on the EPBC Act Protected Matters Report presented in Appendix J.

A search of the Historic Heritage Information Management System (HHIMS) register for post-contact heritage items and places managed by the Environment and Heritage Group (EHG) within the Department of Planning and Environment (DPE) was conducted to assess the broader historic heritage environment, including heritage items in the vicinity of the proposed development that could also be affected by the proposed development.

HHIMS is a catalogue of post-contact heritage items and places managed by EHG, such as collections of heritage items and individual buildings, most of which are located in national parks and reserves. HHIMS aids in the protection and management of these sites by maintaining and providing information concerning the nature, current status and location of sites.

A search of the State Heritage Inventory was undertaken for the Edward River Shire Council area. There are no items listed by the heritage council under the NSW Heritage Act or by the Edward River Shire council and state government agencies on the land on which the development is proposed.

No items of historic heritage are located on the subject land as evidenced by:

- A search of Schedule 5. Environmental Heritage, of Conargo Local Environment Plan (LEP) 2013. (View - NSW legislation – accessed 1 December 2023); and
- A search of the State Heritage Inventory as specified in Division 2 section 21 of the NSW Heritage Act – (State Heritage Inventory | NSW Environment and Heritage – accessed 23 March 2024) returned no records in the rural areas of the Edward River local government area. All records were located in the township of Deniliquin,

The Listed Items in Schedule 5 Environmental Heritage of the Conargo Local Environmental Plan 2013 are outlined in Table 47. There are no Listed Items on or adjoining the subject land. The closest Listed Item is the Blighty Hotel on the Riverina highway some 15 km northwest of the subject land.

Table 47 – Conargo Local Environmental Plan – Listed Items

Item name	Address	Suburb	LGA
Birganbigil School of Arts site	Moonee Swamp Road	Birganbigil	Edward River
Blighty Hotel	Riverina Highway	Blighty	Edward River
Royal Mail Hotel	Cobb Highway	Booroorban	Edward River
Conargo Church	Carathool Road	Conargo	Edward River
Former Cobb & Co stable and change station	Carathool Road	Conargo	Edward River
Conargo Hotel	Conargo Road	Conargo	Edward River
Conargo Store	Conargo Road	Conargo	Edward River
Pretty Pine Hotel	Pretty Pine	Cobb Highway	Edward River
Black Swamp	Wanganella	Cobb Highway	Edward River
Peppin Marino Monument	Wanganella	Cobb Highway	Edward River
Former Cobb and Co stop	Lang Street	Wanganella	Edward River
Former School	Lang Street	Wanganella	Edward River

13.7.3.3 Field assessment

An assessment of the potential heritage sensitivity of the proposed development site was undertaken during an inspection of the subject land.

As shown in Photograph 1 to Photograph 3 inclusive, there is no evidence of historic heritage on the proposed development site. Consequently, the proposed development will not impact on a place or area of local or State heritage significance.

13.7.3.4 Assessment of impacts

No non-Aboriginal archaeological sites, objects or places, or areas of archaeological potential or non-Aboriginal sensitivity, were identified within the proposed development site. The results of the field assessment confirmed extensive disturbance from agricultural development including vegetation clearing, grazing, irrigated cropping and built infrastructure. It is therefore considered highly unlikely that items or places of heritage significance remain (if any existed) within the proposed development site.

The proposed development site does not involve the disturbance, demolition or removal of any known sites of heritage significance.

13.7.3.5 Mitigation measures

The following mitigation measures have been implemented to minimise potential impacts on non-Aboriginal Heritage.

- The proposed development has been sited, designed and constructed to avoid disturbance of heritage sites;
- There are no construction activities proposed; and
- Should previously unidentified heritage sites/objects be found during operation activities, work will immediately cease, and the sites will be reported to the Feedlot Manager who will arrange for the appropriate assessment to be undertaken.

13.7.4 Conclusion

The Aboriginal Heritage Assessment identified no Aboriginal artefacts within the proposed development site.

The level of human impact, through land disturbance (land clearing, grazing, cultivation, built infrastructure etc.) has substantially affected the most culturally sensitive areas on the subject property. Subsequently, it seems highly unlikely that evidence of previous occupation by Aboriginal people remains within these areas. Measures have been prepared to mitigate any impacts to possible Aboriginal heritage sites and objects.

Subsequently, the proposed development shall not impact on any Aboriginal heritage sites, objects or places, or areas of archaeological potential or Aboriginal sensitivity.

The non-Aboriginal Heritage Assessment and site assessment identified no non-Aboriginal sites on the land on which the development is proposed. Therefore, it is considered that the proposed development would not impact on the non-aboriginal heritage fabric of the land on which the development is proposed.

13.8 Biodiversity (Flora and Fauna)

13.8.1 Introduction

An assessment of potential biodiversity impacts from the proposed development has been undertaken by Hamilton Environmental Services and is presented in Appendix I. The purpose of this assessment was to examine the likelihood of the proposal having a significant effect on any threatened species, populations or ecological communities listed under the *NSW Threatened Species Conservation Act 1995* (TSC Act).

This report recognises the relevant requirements of the EP&A Act 1979 as amended by the *NSW Environmental Planning and Assessment Amendment Act 1997*. Assessment has also made with regard to those threatened entities listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Threatened biodiversity listed under the TSC Act and EPBC Act of potential relevance to the subject land was initially identified from database searches and followed by field assessment to validate the likelihood of occurrence analysis and preliminary vegetation typing and boundary definition. Key constraints were identified and mapped. Impact avoidance, minimisation and mitigation principles were applied, as required by the Biodiversity Assessment Method 2020 (DPIE, 2020).

13.8.2 Existing environment

13.8.2.1 Bioregions and subregions

Biogeographically, at a regional scale, the subject land is situated within the Riverina bioregion within the Murray Local Land Services region and Edward River Shire Council.

The Riverina Bioregion is an ancient riverine plain and alluvial fans composed of unconsolidated sediments with evidence of former stream channels. Vegetation ranges from river red gums, along river channels, black box forests, box woodlands to saltbush on the plains. There are several threatened species of both plant and animal in this bioregion. Several significant wetlands occur in the Riverina bioregion, including NSW Central Murray Forests and Fivebough and Tuckerbil Swamps, and these support many waterbirds, including migratory species (Eardley 1999).

On a local scale, the proposed development is located in the Murray Fans sub-region. The Murray Fans sub-region can be broken down into various vegetation profiles based on the landform of the locality. The Murray Fans subregion profiles can be grouped as Floodplains, Plains and Sand Ridges and Wetlands.

The subject land is located within the plains and sand ridges profile and is described as a plains profile. The geology of the plains profile is alluvial, soil loam to clay loam. The ecological vegetation class is plains woodland. It is described as Open woodland on the plains dominated by Grey Box and/or Black Box, understorey grassy and herb-rich with a scattered shrub layer. The common tree species of the plains profile is Lightwood (*Acacia implexa)*, Buloke (*Allocasuarina luehmannii)*, Black Box (*Eucalyptus largiflorens),* Grey Box *(Eucalyptus microcarpa*. Shrubs include Gold-dust Wattle (*Acacia acinacea);* Mallee Wattle (*Acacia montana),* Golden Wattle (*Acacia pycnantha),* Sweet Bursaria (*Bursaria spinosa)* and Berrigan *(Eremophila longifolia)* (Goulburn Broken CMA, 2024).

13.8.2.2 Rivers, streams, estuaries and wetlands

There are no natural watercourses occur within, or adjacent to the development site. The nearest natural watercourse are as follows:

- Tuppal Creek, Native Dog Creek approximately 5 km and 15 km respectively to the south;
- Murray River approximately18 km to the south;
- Billabong Creek and Wangamong Creek over 30 km to the north;
- Edward River over 40 km to the west.

No important local wetlands, national wetlands (i.e. as listed in The Directory of Important Wetlands of Australia (Environment Australia 2001)) or international wetlands (e.g. Ramsar listed) are located within the vicinity of the subject land as outlined in section 13.5.

The proposed development will not result in any impacts on these waterways or wetlands.

13.8.2.3 Native vegetation

The subject land has largely been cleared of native vegetation, except for a series of patches of mature White Cypress-pine woodland in the north-central section of the property, and a small number of scattered mature Grey Box as paddock trees (within land still used for grazing and cropping).

13.8.2.4 Plant community types

Native vegetation within the subject land does not readily translate to any plant community type (PCT) as the residual/remnant native vegetation is limited to a series of patches of trees and scattered paddock trees.

While the assessed site is mapped as former NSW Plant Community Type (PCT) 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, based on the remaining native vegetation (extant remnant tree blocks and scattered remnant paddock trees) on the property and surrounds, it is more likely that the former PCT is PCT 80 - Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion (from Environment and Heritage 2012 and NSW DCCEEW 2024d).

13.8.2.5 Threatened species

A desktop assessment was undertaken to identify threatened flora and fauna species, populations and ecological communities listed under the NSW *Biodiversity Conservation Act 2016 (BC Act)* the NSW *National Parks and Wildlife Act 1974* (NPW Act) and the NSW *Fisheries Management Act 1994* (FM Act), in addition to MNES listed under the EPBC Act that may be affected by the proposed development. Biodiversity databases pertaining to the proposed development area and locality (i.e. within 5 km of the proposed development site) were reviewed.

The results of the database searches are summarised below with further detail provided in Appendix I. Table 48, Table 49 and Table 50 show the results of searches and the status of each species identified as locally occurring, under the *Biodiversity Conservation Act 2016 (BC Act)* and the Environment Protection and Biodiversity Conservation (EPBC) Act.

Database search results indicated two critically endangered ecological communities are likely to occur within 5 km of the development area, specifically Natural Grasslands of the Murray Valley Plains and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The protected matters search presented in Appendix O identified the existence of five threatened ecological communities, ten flora species and 23 fauna species as listed under the EPBC Act as potentially occurring in the vicinity of the proposed development.

Table 48 – Listed Threatened Ecological Communities in the region

Name	Status Biodiversity and Conservation Act NSW	Status EPBC Commonwealth
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Endangered
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Endangered
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Critically Endangered
Weeping Myall Woodlands	Endangered	Endangered
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Critically Endangered

No endangered or critically endangered ecological communities were identified on the subject land during the field assessment by Harrison Ecological Services, 2024 (Appendix I).

Table 49 – Threatened flora species recorded in the region

Scientific Name	Common Name	Status BC Act NSW	Status EPBC
Amphibromus fluitans	River Swamp Wallaby-Grass, Swamp Wallaby-grass	Vulnerable	Vulnerable
Austrostipa wakoolica	Yetman Wattle	Endangered	Endangered
Brachyscome muelleroides	Mueller Daisy	Vulnerable	Vulnerable
Lepidium aschersonii	Spiny Peppercress	Vulnerable	Vulnerable
Lepidium monoplocoides	Winged Pepper-cress	Endangered	Endangered
Maireana cheelii	Chariot Wheels	Vulnerable	Vulnerable
Sclerolaena napiformis	Turnip Copperburr	Endangered	Endangered
Senecio macrocarpus	Large-fruit Fireweed	Not listed	Vulnerable
Swainsona murrayana	Slender Darling-pea	Vulnerable	Vulnerable
Swainsona plagiotropis	Red Darling-pea, Red Swainson-pea	Vulnerable	Vulnerable

Database search results indicate that 23 threatened fauna species (17 birds, three mammals, two Amphibians and one reptile) listed under the EPBC Act as potentially occurring within 5 km of the vicinity of the proposed development site.

Table 50 – Threatened fauna species recorded in the region

Scientific Name	Common Name	Status BC Act NSW	Status EPBC
Amphibians			
Crinia sloanei	Sloane's Froglet	Endangered	Endangered
Litoria raniformis	Growling Grass Frog	Vulnerable	Vulnerable
Litoria raniformis	Southern Bell Frog	Endangered	Vulnerable
Reptiles			
Aprasia parapulchella	Pink-tailed Worm-lizard	Vulnerable	Vulnerable
Birds			
Anthochaera phrygia	Regent Honeyeater	Critically endangered	Critically endangered
Aphelocephala leucopsis	Southern Whiteface	Vulnerable-	Vulnerable-
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered
Calidris ferruginea	Curlew Sandpiper	Endangered	Critically endangered
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	Vulnerable	Vulnerable
Falco hypoleucos	Grey Falcon	Vulnerable	Vulnerable
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Vulnerable
Lathamus discolor	Swift Parrot	Endangered	Critically Endangered
Lophochroa leadbeateri	Major Mitchell's Cockatoo	Vulnerable	Endangered
Melanodryas cucullata	South-eastern Hooded Robin, Hooded In feature area Robin	Endangered	Endangered
Neophema chrysostoma	Blue-winged Parrot	Vulnerable	Vulnerable
Pedionomus torquatus	Plains-wanderer	Endangered	Critically Endangered
Pezoporus occidentalis	Night Parrot	Extinct	Endangered
Polytelis swainsonii	Superb Parrot	Vulnerable	Vulnerable
Rostratula australis	Australian Painted Snipe	Endangered	Endangered
Stagonopleura guttata	Diamond Firetail	Vulnerable	Vulnerable
Mammal			
Nyctophilus corbeni	Corben's Long-eared Bat, Long-eared Bat	Vulnerable	Vulnerable
Phascolarctos cinereus	Koala	Endangered	Endangered
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable
Fish			
Galaxias rostratus	Flathead Galaxias	Not listed	Critically Endangered

The field assessment did not identify or observe any rare or threatened species (Hamilton Environmental Services, 2024).

The subject land has largely been cleared of native vegetation, except for a series of patches of mature White Cypress-pine woodland in the north-central section of the property, and a small number of scattered mature hollow-bearing Grey Box.

The existing beef cattle feedlot is located in the north-western corner of the subject land, and an existing dwelling and garden area is located in the centre of the property, amidst the White Cypress-pine woodland patches; most of the paddocks have established irrigation bays and there are servicing irrigation channels across the property, and at the time of assessment, the majority of these paddocks had been sown to crop.

13.8.2.6 Biodiversity values map

The Biodiversity Values Map is one of the Biodiversity Offsets Scheme thresholds. The Biodiversity Values Map identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. The scheme automatically applies to proposals on land mapped on the Biodiversity Values Map.

Prepared by the Department of Planning and Environment (DPE) under Part 7 of the Biodiversity Conservation Act 2016 (BC Act), the Biodiversity Values Map includes a range of mapping layers.

A review of the Biodiversity Values Mapping tool indicates that the subject land does not contain any land with high biodiversity value that may be sensitive to impacts from development and clearing as shown in Figure 38.

Figure 38 – Subject land – Biodiversity Values Map and Threshold Tool

13.8.2.7 Biodiversity Offsets Scheme thresholds

The scheme applies to proposals that exceed the area-clearing threshold. The area clearing threshold varies according to the relevant minimum lot size at the proposal site (shown in the lot size maps made under local environment plans) or the actual lot size (where there is no minimum lot size provided for in the relevant local environmental plan). If there are multiple relevant minimum lot sizes, the smallest one applies.

The generation of a Biodiversity Offset Scheme Entry Threshold Report (BOSET Report) (NSW DCCEEW, 2024) reveals that the minimum lot size according to the Conargo Local Environmental Plan 2013 is 40 ha, and that the Area Clearing Threshold required to enter the Biodiversity Offset Scheme (BOS), and for a Biodiversity Development Assessment Report (BDAR) to be completed, is 1.0 ha.

Therefore, for development to avoid entering the BOS and requiring a BDAR to be undertaken, native vegetation clearance must be < 1 ha.

As there is no native vegetation to be removed with the development, the total native vegetation loss is less than the clearance threshold of 1 ha, and a BDAR is not triggered by this mechanism (Hamilton Environmental Services, 2024).

The proposed development is in compliance with all criteria for NSW Environment and Heritage Biodiversity Offsets Scheme.

13.8.3 Assessment of impacts

13.8.3.1 Direct impacts

The subject land has largely been cleared of native vegetation for grazing and irrigated and dryland cropping purposes. The impact of this action is that little remnant vegetation remains with only several small patches of mature White Cypress-pine woodland in the north-central section of the property, and a small number of scattered mature hollow-bearing Grey Box.

The proposed development shall have no direct impacts on any mapped vegetation as no clearing of remnant vegetation is proposed or required and buffers for paddock trees within the effluent and solid waste utilisation have been allowed.

13.8.3.2 Indirect impacts

Indirect impacts on the existing mapped vegetation is not expected as a result of the construction and/or operation.

A range of indirect impacts that could occur as a result of the proposed development include:

- Increased spreading of weed propagules;
- Erosion or sedimentation in areas adjoining construction and operational activities;
- Increased noise, dust and light from construction and operational activities; and
- Increased edge effects for surrounding vegetated areas.

Practices employed by the operators of the feedlot will ensure that these possible impacts to the existing remnant vegetation are minimised or prevented.

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.8.3.3 Biodiversity Conservation Act 2016 considerations

State legislation requires consideration of threatened species of fauna and flora, endangered populations and endangered ecological communities under the Biodiversity Conservation Act 2016, the Environmental Planning & Assessment Act, 1979 (EP& A Act) and the Fisheries Management Act 1994) (FMA). Where it is considered that threatened species, endangered populations or endangered ecological communities occur or are likely to occur, then a Seven Part Test of Significance (section 7.3 of the EP&A Act, 1979) must be applied.

It is considered that no threatened species, endangered populations or endangered ecological communities are likely to occur in the area proposed to be cleared, therefore a seven-part test of significance has not been undertaken. Refer to the test of significance report presented in Appendix I.

13.8.3.4 EPBC considerations

The proposed development area does not contain any threatened species listed under the EPBC Act as occurring in the region.

13.8.3.5 Koala Habitat Protection

Koala habitat protection is contained in two chapters of State Environmental Planning Policy (Biodiversity and Conservation) 2021 as outlined below:

- **Chapter 3 'Koala habitat protection 2020'** applies to rural zoned land (RU1 Primary Production, RU2 Rural Landscape and RU3 Forestry) in 74 local government areas (LGAs).
- **Chapter 4 'Koala habitat protection 2021'** applies to the remaining zones in 74 LGAs, and to all zones in Metropolitan Sydney (Blue Mountains, Campbelltown, Hawkesbury, Ku-ring-gai, Liverpool, Northern Beaches, Hornsby, Wollondilly) and the Central Coast.

Chapter 3 of the Koala habitat protection of State Environmental Planning Policy (Biodiversity and Conservation) 2021 applies to the subject land as it is Zone RU1 Primary Production.

Chapter 3 describes the steps that must be followed to determine the koala assessment pathway.

Step 1 of Chapter 3 Is the land potential koala habitat?

1. Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies, the council must be satisfied as to whether or not the land is a potential koala habitat.
2. The council may be satisfied as to whether or not land is a potential koala habitat only on information obtained by it, or by the applicant, from a person who is qualified and experienced in tree identification.
3. If the council is satisfied—
   (a) that the land is not a potential koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or
   (b) that the land is a potential koala habitat, it must comply with section 3.7.

The proposed development site qualifies as 'potential Koala habitat' under the terms of State Environmental Planning Policy (Koala Habitat Protection) 2021 as:

- the proposed development is located within local government area listed in Schedule 2 Local government areas—Chapter 4 of State Environmental Planning Policy (Biodiversity and Conservation) 2021
- The land is in relation to which a development application has been made; and

- The development application applies to the whole, or only part, of the land—
  (i) has an area of more than 1 hectare, or
  (ii) has, together with adjoining land in the same ownership, an area of more than 1 hectare

Step 2 Is the land core koala habitat?

- Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies that it is satisfied is a potential koala habitat, it must satisfy itself as to whether or not the land is a core koala habitat.

- The council may be satisfied as to whether or not land is a core koala habitat only on information obtained by it, or by the applicant, from a person with appropriate qualifications and experience in biological science and fauna survey and management.

- If the council is satisfied—
  (a) that the land is not a core koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or
  (b) that the land is a core koala habitat, it must comply with section 3.8.

Step 3 Can development consent be granted in relation to core koala habitat?

- Before granting consent to a development application for consent to carry out development on land to which this Part applies that it is satisfied is a core koala habitat, there must be a plan of management prepared in accordance with Part 3 that applies to the land.
- The council's determination of the development application must not be inconsistent with the plan of management.

Schedule 3 of State Environmental Planning Policy (Biodiversity and Conservation) 2021 lists koala use tree species for all regions in NSW that koala inhabit. The Riverina koala management area is relevant in this instance.

The subject land on which the for the development is proposed contains two areas of remnant vegetation between 260 m and 305 m south and south-east of the existing development complex.

The field assessment by Hamilton Environmental Services (2024) identifies these areas as containing White Cypress-pine (*Callitris glaucophylla*) woodland. The White Cypress-pine is listed as a koala use tree species in the State Environmental Planning Policy (Biodiversity and Conservation) 2021.

The proposed development will not result in an adverse effect on the life cycle of the Koala as the proposed development is greater than 250 m from the nearest possible koala habitat onsite. There is no new or additional infrastructure that will be interfering with the remnant vegetation onsite. The proposed development will not require the removal of any remnant vegetation

onsite. Although there is designated Koala use tree species present as woodland White Cypress pine (*Callitris glaucophylla)* and scattered paddock trees that being Western Grey Box (*Eucalyptus microcarpa*) no evidence had been located to indicate that the proposed development site is of any significant importance to the Koala. The subject land owners or field assessment have not identified the existence of any koalas onsite even though there is vegetation onsite that may be considered koala habitat.

In accord with Step 1 of Chapter 3 of the SEPP (Biodiversity and Conservation) 2021 the applicant recommends to the Edward River Shire Council that the subject land includes potential koala habitat but that the proposed development includes no current or proposed uses that would impact or interfere with both the mapped vegetation community and any koalas that may frequent the vegetation community. The proposed development complies with Step 1 of Chapter 3 by not interfering with any koala communities that may exist in the mapped vegetation. The Council should be satisfied that the development footprint has no impact on the koala communities that may be present and should therefore consider the intent of the relevant SEPP complied with.

13.8.4 Mitigation measures

Impacts to biodiversity have been considered throughout the site selection and design process. Where possible, impacts to species and habitat of conservation significance have been avoided.

Management and mitigation measures would be implemented to minimise impacts on biodiversity during the construction and operation stages of the proposed development. These include:

- Protection of the existing white Cypress-pine woodland and scattered mature hollow-bearing Grey Box paddock trees;
- Clearing restricted to those areas required for infrastructure and firebreaks;
- Communications protocols for employee and contractor education;
- Provisions to limit heavy vehicle speeds and for signage along access roads;
- Methods and communication tools to monitor road strike and mortality of wildlife; and
- Any areas to be rehabilitated with species of local providence.

13.8.5 Conclusion

A test of significance of potential biodiversity impacts from the proposed development has been undertaken by Hamilton Environmental Services and is presented in Appendix I. The test of significance takes into account other relevant Commonwealth and NSW legislation and environmental planning instruments.

The subject land is not in a declared area of outstanding biodiversity value, the proposed development area is not mapped as *Vulnerable or Sensitive Regulated Land* according to the Section 60F of the *Local Land Services Act 2013*, and is also not mapped as an area of Biodiversity Value, and a BDAR is not triggered on the basis of this mechanism.

As no clearing of native vegetation is proposed, a BDAR is not triggered on the basis of this mechanism.

After likelihood assessment, given the highly disturbed and modified condition of the proposed development area and the poor landscape connectivity of the site, it is considered that none of the threatened flora and fauna species were likely to utilise the proposed development area.

Given that the development will have no impact on any native vegetation – and with no impact on any threatened species or communities - the five parameters of Part 7 Division 1 Section 7.3 of the *Biodiversity Conservation Act 2016* have not been applied to any threatened flora, fauna or communities, and a BDAR is not triggered by this mechanism.

The assessments of significance concluded no threatened species would be significantly affected by the proposal. A Species Impact Statement and/or Referral to the Federal Minister for the Department of Climate Change, Energy, the Environment and Water (DCCEEW) is not required.

Further, recommendations and environmental safeguards have been provided to minimise impacts to biodiversity.

13.9 Protected and conservation areas

13.9.1 Introduction

Protected areas are areas specially set aside under law for the protection and conservation of biodiversity and/or natural or cultural heritage values within them. Protected areas of land and water in original or close to original natural condition are the cornerstone of nature conservation efforts in NSW.

For the terrestrial environment, nearly all of such land is in the state's public reserve system. This is a substantial network of protected areas that:

- conserves representative areas of the full range of habitats and ecosystems, plant and animal species, and significant geological features and landforms in NSW;
- protects areas of significant cultural heritage; and
- provides opportunities for recreation and education.

As well as the protected area system, NSW also conserves the environment through other measures. Conservation of natural values across the whole is increasingly being focused on public and privately owned areas outside the reserve system such as:

- Conservation agreements;
- Wildlife refuges;
- Incentive property vegetation plans;
- Nature Conservation Trust agreements; and
- BioBanking agreements / Stewardship sites; etc

Conservation reserves are managed and protected under the *National Parks and Wildlife Act 1974*. Flora reserves are managed by the Forestry Corporation under the *Forestry Act 2012*. State parks which cover significant natural areas of bush and wetlands are managed by various trusts under the *Crown Lands Act 1989*. Travelling stock routes (TSRs) are managed as a trust by Local Land Services or leaseholders by private landholders under the Crowns Land Act 1989.

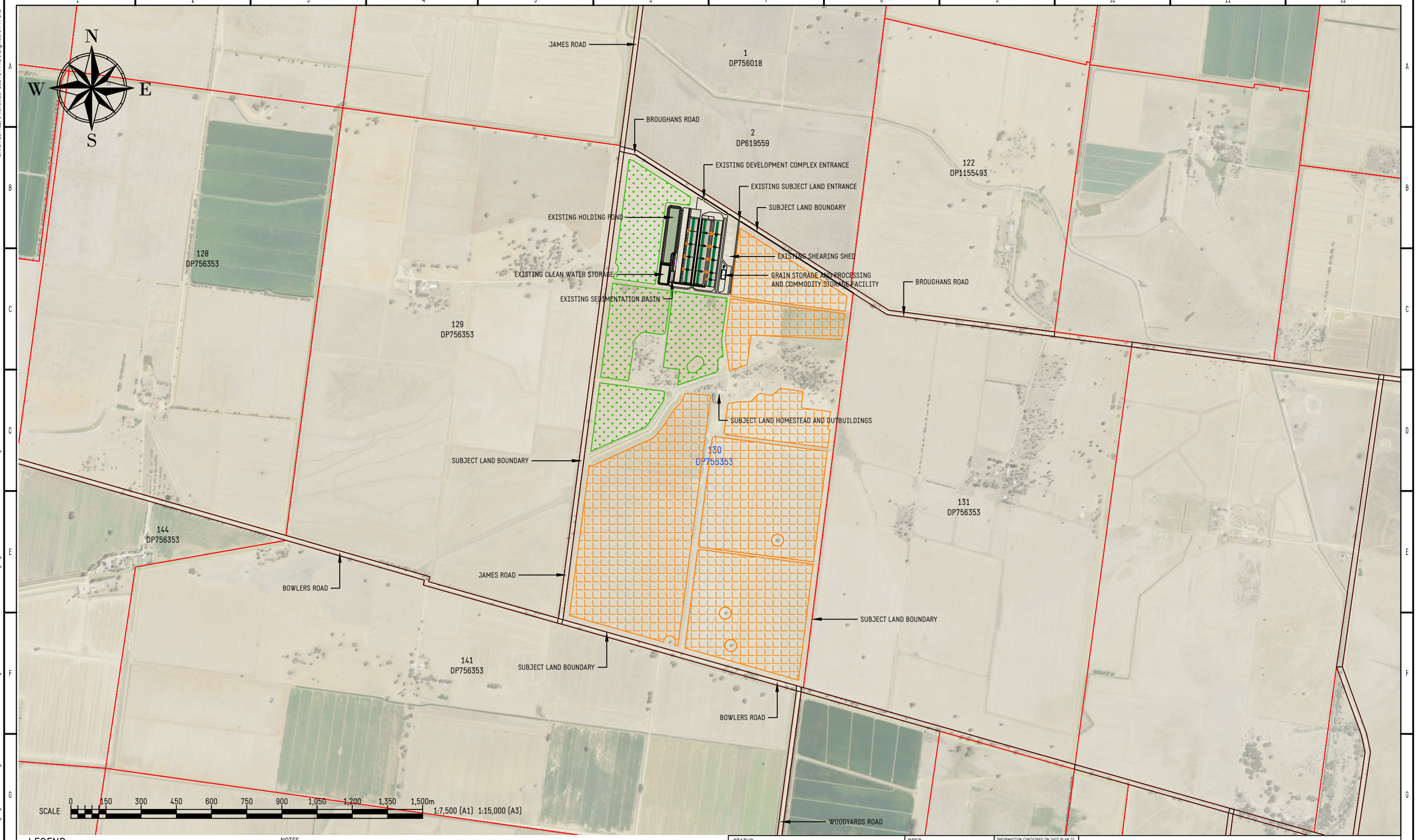
13.9.2 Existing environment

An overlay of National Parks, NSW State Forests, Flora Reserves and Timber Reserves relating to the subject land was obtained from the SEED NSW Government's central resource for Sharing and Enabling Environmental Data Open Data portal and shown in Figure 39.

As shown in Figure 39, there are no State Forests, Flora Reserves and Timber Reserves within the subject land. The closest conservation estate to the subject land is the Murray Valley National Park and the Murray Valley Regional Park which are located some 15 km to 35 km to the south and southwest.

All drainage from the proposed development site flows north-west to Box Creek Escape Channel and then to the Edward River, away from either National Park.

The subject land does not contain any other conservation areas managed outside of the reserve system such as conservation agreements; wildlife refuges, Nature Conservation Trust agreements, biobanking agreements or stewardship sites.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- CONSERVATION RESERVE
- PROTECTED AREA

NOTES:

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STATUS

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

RPEQ

REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:15,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

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CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - PROTECTED AND CONSERVATION AREAS

REPORT REFERENCE: FIGURE 39
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-00-39
REV.: B

13.9.3 Assessment of impacts

13.9.3.1 Stormwater runoff

Due to the separation of the subject land from protected and conservation areas and being located in a different catchment, it is considered that stormwater flow regimes on protected and conservation areas shall not be affected by the proposed development.

13.9.3.2 Wastewater

As outlined in section 8.4.8, 8.4.9, 8.4.10 and Figure 12 the proposed development shall be sited, designed, constructed and operated to ensure that wastewater is sustainably utilised on-site and on land sufficiently separated from protected and conservation areas. Subsequently, no adverse impacts on protected and conservation areas are likely due to wastewater utilisation from the proposed development.

13.9.3.3 Management implications relating to pests, weeds and edge effects

As outlined in section 13.15, an integrated approach to weed and pest animal management shall be implemented based around the important elements of weed hygiene, operational hygiene, prevention of infestations, arresting weed outbreaks using effective reporting and physical or chemical control procedures, documenting weed and pest animal infestations and auditing management programs.

Subsequently, the proposed development is not expected to impact the soils, waterways and loss of biodiversity of the closest protected and conservation areas from the introduction and/or spread of pest animals and/or weeds provided the mitigation measures outlined in section 13.15.4 are implemented.

No activities or infrastructure are proposed as part of the proposed development that shall impede DCCEEW access for management purposes of the closest protected and conservation areas.

13.9.3.4 Fire and the location of asset protection zones

As outlined in section 8.7.11, a fire management strategy shall be developed for fire developing from a range of sources. These include bushfires (e.g. planned controlled burning that escapes the original burn zone, embers from a cigarette or unattended campfire, lightning strikes, or deliberate arson) and fires originating from the proposed development such as from flammable chemical storage, machinery use, electrical faults, maintenance activities or feed storage and processing where hay and/or grain dust is present etc.

Appropriate fire management measures shall be implemented within the proposed development complex such as fire breaks. Further, there is no expectation that DCCEEW change its fire management regime for the closest protected and conservation areas.

13.9.3.5 Boundary encroachments and access through DCCEEW land

No activities associated with the proposed development shall occur on protected and conservation areas. All access to the proposed development shall be via the site entrance on Broughans Road as shown in Figure 5.

13.9.3.6 Visual, odour, noise, vibration, air quality and amenity impacts

As outlined in sections 13.1, 13.13 and 13.14, and shown in Figure 14, the proposed development complex is not located on land adjacent to protected and conservation areas and is sufficiently separated such that no reduction of amenity on protected and conservation areas shall result.

13.9.3.7 Threats to ecological connectivity and groundwater dependent ecosystems

As outlined in sections 13.8, and shown in Figure 14, there is no clearing associated with the proposed development and therefore connectivity, linkages or refuge hole for any native vegetation and other flora and fauna habitats will not be affected. The closest protected and conservation areas shall remain unaffected by the proposed development.

13.9.3.8 Cultural heritage

As outlined in sections 8 and Figure 14, no impacts to any Aboriginal heritage values on the closest protected and conservation areas shall result due to the proposed development.

13.9.4 Mitigation measures

The implementation of the following management and mitigation measures shall mitigate identified potential issues associated with impacts to adjacent or nearby DPE estate:

- Provision of adequate separation distances between the proposed development and protected and conservation areas as shown in Figure 14;
- A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling, solid waste storage and processing area which have high organic matter and therefore a high pollution potential shall be maintained;
- Runoff external to the controlled drainage area is diverted away from the controlled drainage area to existing natural drainage lines away from protected and conservation areas;
- Elements of the controlled drainage area are designed to capture contaminated stormwater runoff from within the development complex and safely divert it to a sedimentation system as discussed in section 8.4.9;
- A sedimentation system is designed to provide flow velocities less than 0.005 m/s, and discharge to a holding pond as discussed in section 8.4.9.1;
- A holding pond is designed to store runoff from the controlled drainage area without spilling or overtopping at an unacceptable frequency as discussed in section 8.4.9.2;

- Timely control of initial weed populations around the proposed development, such as, around sheds and buildings, along roadsides, cattle receival facilities/holding yards, along fence lines, drainage structures, in tree plantings etc. Weeds in these areas experience little competition and can produce large quantities of seed;
- Control of weeds around the proposed development also reduces any potential fire hazard. Control shall be achieved by regular mowing or herbicide application. Knockdown or residual herbicides (or a combination of the two) shall be used depending on whether the weeds have emerged, the time of year and the weeds present;
- Prior to importing livestock and /or feed commodities (grains, roughages) from known weed infestation areas, confirmation from the supplier the weed status of materials and vehicles;
- A pest management program shall be implemented to control animal pest species already present, using acceptable methods as well as identify potential pest species, their likely distribution and methods to prevent their spread;
- Wild dog, feral pig, fox and vermin pest species populations near the proposed development shall be monitored;
- Established pest animals shall be controlled, and their spread prevented;
- Mice and rat populations will be mitigated:
    - primarily through the solid waste management schedule outlined in Table 21 (i.e. minimise feed wastage and spillage to minimise likelihood of attracting vermin);
    - implementing a baiting program if the vermin population reaches a nuisance level; and
- Human waste shall be managed appropriately and in accordance with any relevant statutory requirements.

13.9.5 Conclusion

The proposed development complex shall be sited at least 15 km from protected and conservation areas. Consequently, protected and conservation areas shall not be impacted by the proposed development.

It is expected that, with the implementation of the outlined mitigation measures, the proposed development would not create significant impacts to the closest protected and conservation areas.

13.10 Waste materials

The objectives of the Waste Avoidance and Resource Recovery Act 2001 (WARR Act) are to encourage the most efficient use of resources, to reduce environmental harm, and to provide for the continual reduction in waste generation in line with the principles of Ecologically Sustainable Development (ESD). To meet the objectives of the Act, waste management options are considered against a hierarchy, comprising:

- Avoiding unnecessary resource consumption
- Recovering resources through the re-use and recycling of waste
- Disposal (as a last resort).

The approach taken on waste management for the proposed development will be consistent with the waste management hierarchy outlined above.

Waste management and reuse strategies will be considered and implemented where practical and cost-effective. On-site reuse opportunities will be maximised, with efforts made to implement reuse and recycling initiatives.

13.10.1 Waste sources

As the proposed development will utilise existing infrastructure, there will be no waste generated as a result of construction activities.

Operation of the proposed development will involve the generation of various types of waste streams. All wastes generated on-site will be classified in accordance with the NSW DECC Waste Classification Guidelines (2014), which classifies wastes into the following streams:

- Special (e.g. tyres);
- General solid (putrescible) (e.g. general litter and food waste);
- General solid (non-putrescible) (e.g. glass, paper, building demolition waste, concrete, veterinary sharps);
- Restricted solid (currently no wastes pre-classified as restricted by EPA);
- Liquid (e.g. oil, fuels, animal wastes, effluent); and
- Hazardous (e.g. lead-acid batteries).

Table 51 lists the waste generating aspects of the proposed development and identifies the range of solid, hazardous, special and liquid wastes that are likely to be generated by various activities. It also outlines the proposed reuse, recycling or disposal method.

During operation of the proposed development various wastes shall be generated as outlined in Table 51. Each type of waste has been classified in accordance with the EPA's Waste Classification Guidelines (NSW Environment Protection Authority (EPA), 2014).

Table 51 – Proposed development – Operation potential waste streams

Waste Aspect	Types	Classification	Proposed Reuse/Recycling /Disposal Method
Operation phase			
	Tyres	Special waste	On-site reuse e.g. silage cover weight.
	Batteries	Hazardous waste	Off-site disposal at an approved facility
	Oils, grease	Liquid waste	Off-site disposal at an approved facility
	Drained oil filters, oil drums and other drums	General solid waste (non-putrescible)	Off-site recycling
	Oil rags, oil-absorbent materials	General solid waste (non-putrescible)	Off-site disposal at an approved facility
	Sewage	Liquid waste	On-site disposal via approved treatment and disposal.
	Wastewater from controlled drainage area	Liquid waste	Beneficial reuse on-site to designated land areas
	Animal wastes (manure/carcass compost)	General solid waste (putrescible)	Beneficial reuse on-site to designated land areas
Office Waste			
	Domestic waste generated by workers	General solid waste (putrescible)	Beneficial reuse on-site to designated land areas
	Glass bottles and Aluminium cans	General solid waste (non-putrescible)	Off-site recycling
	Ink cartridges	General solid waste (non-putrescible)	Off-site recycling
	Paper, plastic and cardboard	General solid waste (non-putrescible)	Off-site recycling

No restricted solid waste shall be generated during the operation of the development.

During operation effluent and solid waste shall be produced. Effluent and the predominant organic solid waste sources have been outlined in section 8.7.4 and 8.7.5 respectively. In addition, to these a small quantity of in-organic solid wastes such as product packaging, paper etc shall be generated.

13.10.2 Waste storage

All waste will be removed progressively with the minimum amount feasible stored on-site. Waste not removed immediately will be stored in designated areas within the proposed development complex site in proprietary storage facilities until it is reused or removed.

Various components of the waste stream shall be kept separate. All organic waste such as food scraps and other similar material is considered general solid waste (putrescibles and non-putrescible). This material will be separated on site and retained in enclosed 'Sulo' or front-lift bins to prevent rainfall ingress and leachate egress.

Storage receptacles shall be located at the head of stormwater catchment areas in areas away from flow paths to minimise stormwater impacts.

Recyclable material such as ferrous and non-ferrous metals, timber, paper, cardboard, and comingled waste shall also be kept separate in a designated area for later disposal at the appropriate recycling facility.

Waste oils, hazardous chemicals and/or hazardous waste (e.g. lead-acid batteries) required to be stored on-site shall have a spill containment system appropriate for the nature and pollution risk of that liquid in accordance with relevant guidelines and Australian Standards. An emergency response spill kit shall be located adjacent to the spill containment system.

13.10.3 Waste transport and tracking

Section 143 of the *Protection of the Environment Operations Act 1997* requires waste to be transported to a place that can lawfully accept it.

All waste shall be transported in accordance with local council and EPA regulations for the type and volume of waste transported.

All loads of waste removed from the proposed development site will be covered to prevent spillage.

Licensed waste contractors will be made responsible for collection and appropriate disposal of waste as required.

Records or a material register shall be retained detailing the quantity, classification method of transport of waste material removed from the site. The register will record the waste type, quantity, classification, contractor, licence details and details of the licensed receiving facility.

Hazardous waste such as lead-acid batteries shall be transported in bunded compartments on service vehicles or by licensed waste contractors.

Further, the transport of some wastes presents a high risk to the environment. These wastes must be tracked when transported into, within or out of NSW. Tracking requirements for waste

being transported solely within NSW and between NSW and other states and territories are legislated under the Protection of the Environment Operations (Waste) Regulation 2014.

13.10.4 Waste disposal

Where excess material requires disposal, the preferred hierarchy of disposal options is:

1. Re-use on site;
2. Re-use off-site;
3. Recycle at an off-site facility; and
4. Disposed to landfill.

Each excess material type will be assessed against the above hierarchy. Disposal to landfill, will be the last option if Options 1 to 3 are not feasible.

Prior to being disposed, waste shall be classified in accordance with the NSW Waste Classification Guidelines (EPA, 2014) and POEO (Waste) Regulation 2014, including resource recovery general exemptions.

The EPA grants resource recovery orders and resource recovery exemptions where the application of a waste material to land, its use as a fuel, or use in connection with a process of thermal treatment is a bona-fide, fit-for-purpose, re-use opportunity rather than a means of waste disposal. Recovery General Exemptions enable the use of these waste materials outside some of the requirements of the waste regulatory framework, such as the need to hold an environment protection licence.

13.10.5 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.10.6 Operation

13.10.6.1 Special waste

Waste tyres shall be generated from the operation of the proposed development. The tyres would be damaged tyres (uneconomical to repair) taken from rubber-tyred plant and equipment on-site, such as tractors, feed wagons etc. It is anticipated that these tyres would be utilised on-site to weigh down silage covers, for example.

All requirements under the Protection of the Environment Operations (Waste) Regulation 2014 for tracking loads of waste tyres greater than 20 tyres, or 200 kg within NSW or interstate shall be met if any tyres and removed off-site.

13.10.6.2 Solid waste (putrescible)

As outlined in section 8.7.4, it is expected that approximately 1,835 tonnes of solid waste on a dry matter basis would be scraped from the production pens each year during the operation of the proposed development. This translates into some 2,375 tonne (20%DB) of dry matter available for utilisation after stockpiling.

13.10.6.3 Solid waste (non-putrescible)

The operation of the proposed development shall generate negligible quantities of non-putrescible solid waste. These wastes shall be classified in accordance with the EPA's Waste Classification Guideline (NSW Environment Protection Authority (EPA), 2014).

Non-putrescible solid waste shall include paper, cardboard etc. from office/administrative and shall be placed into bins for collection by a waste contractor and transported to a recycling facility in NSW.

All veterinary waste (sharps) from animal medication shall be placed in a sharps container that complies with 'AS/NZS 4261:1994 - Reusable containers for the collection of sharp items used in human and animal medical application'. The sharps container shall be a rigid-walled, puncture-proof and sealable receptacle intended for the collection and disposal of sharps.

Once full, the sharps container shall be dropped off at nominated collection sites, such as the Finley Health Service or the Deniliquin Health Service or Drop Box or Supervised collection sites.

Other types of non-putrescible solid waste such as metal, polyethylene materials (fence post offcuts, rails, water pipeline) etc shall be stored on-site and used in repairs/maintenance of infrastructure.

13.10.6.4 Effluent

The volume of effluent generated from the operation of the proposed development is dependent on the runoff from the controlled drainage area and thus is dependent on climatic factors such as rainfall and evaporation and pen surface conditions (manure depth).

A water balance approach using a daily time-step hydrologic model was used to estimate the volume of liquid waste generated. The water balance methodology is outlined in Appendix M and section 13.11.5.

The average annual volume of effluent generated from stormwater runoff off the controlled drainage area of the proposed development complex site was estimated to be about 6.0 ML.

13.10.6.4.1. Effluent characteristics

Effluent from beef cattle feedlots is a rather concentrated wastewater with high levels of nitrogen and phosphorus and considerable colour. The concentrations of both inorganic and organic nutrients are high. Salinity (EC) can also be quite high.

Table 52 shows the typical composition of beef cattle feedlot effluent based on data from MLA (2016b). These data were collected from holding ponds and evaporation ponds at various cattle feedlots.

Table 52 – Typical effluent characteristics (MLA, 2016b)

Parameter	Units	Avg.	Min.	Max.
pH	-	8	7	10
Total nitrogen	mg/L	220	25	1,025
Total Kjeldahl nitrogen	mg/L	218	23	1,025
Ammonia nitrogen	mg/L	89	0.1	670
Nitrate nitrogen	mg/L	2.3	0.1	68.8
Nitrite nitrogen	mg/L	0.5	0	5.1
Total phosphorus	mg/L	71	2	387
Phosphate-P	mg/L	17	1.5	133
Potassium	mg/L	665	1.2	9100
Total dissolved solids	mg/L	4,915	1,002	18,644
Calcium	mg/L	126	13	597
Chloride	mg/L	1,261	95	12,839
Magnesium	mg/L	118	2	805
Sodium	mg/L	494	12	6,700
Sulphate	mg/L	74	1	378
EC	dS/m	7.8	0.1	37.8

DEC (2004) provides a classification of liquid waste (effluent) as low, medium or high strength according to its concentration of nitrogen, phosphorus, BOD_5, TDS and other potential contaminants. This is shown in Table 3.1 of DEC (2004) and reproduced in Table 53 .

Table 53 – Classification of effluent for environmental management (DEC, 2004)

Constituent	Strength (average concentration mg/L)[1]		
	Low	Medium	High
Total Nitrogen	<50	50-100	>100
Total phosphorus	<10	10-20	>20
BOD	<40	40-1,500	>1,500
TDS	<600	600-1,000	>1,000-2,500
Other pollutants (eg. metals, pesticides)	Effluent with more than five times the ANZECC and ARMCANZ (2000) long-term water quality trigger values for irrigation waters must be considered high strength for the purpose of establishing a strength class for runoff and discharge controls and will require close examination to ensure soil is not contaminated.		
Grease and Oil	Effluent with more than 1,500 mg/L of grease and oil must be considered high strength and irrigation rates and practices must be managed to ensure soil and vegetation is not damaged.		

[1] Average concentration established from a minimum of 12 representative samples, collected at regular intervals over a year.

Based on Table 52 and Table 53 liquid waste from the proposed development is classified as high strength as defined by DEC (2004).

13.10.6.5 Sewage

There is no sewer reticulation to the subject land. Each of the existing dwellings on the subject land has a domestic wastewater treatment system.

All relevant approvals for liquid waste (sewage) are in place and will be maintained for the life of the development.

13.10.6.6 Hazardous waste

A small quantity of spent lead-acid batteries (5-6) shall be generated per year during the operation of the proposed development. Spent lead-acid batteries shall be destined for recycling.

The spent batteries shall be stored on-site in accordance with Australian Standards where relevant, in particular AS 3780:2008 The storage and handling of corrosive substances (Standards Australia, 2008). Once a quantity of batteries required for economical shipment is reached, an appropriately licensed waste contractor shall transport the waste and in compliance with any exemption granted by the EPA in relation to the transportation and tracking of such waste.

No batteries shall be disposed of at landfill sites.

13.10.7 Assessment of impacts

Waste generated as a result of the proposed development will range from organic waste to general office waste, as outlined in Table 51. The mismanagement of these waste streams has the potential to result in the following impacts:

- Excessive waste being directed to landfill;
- Various types of waste being generated and stored onsite, with the potential for misclassification; and
- Various wastes being inappropriately disposed or handled on site resulting in possible contamination of land and groundwater.

13.10.7.1 Construction

The proposed development shall utilise existing built infrastructure and there are construction activities per se.

13.10.7.2 Operation

During operation effluent and solid waste shall be produced predominantly from the livestock themselves. The effluent and solid waste sources have been outlined in section 8.7.4 and 8.7.5 respectively and shall be sustainably utilised on-site or off-site on adjoining properties.

Low levels of solid wastes (non-putrescible) such as product packaging, paper etc shall be generated and removed from the site and recycled or otherwise disposed of at approved facilities.

Sewage waste shall be disposed of in existing on-site sewage treatment system.

As the predominant waste streams generated on-site are to be sustainably utilised and other sources are generated at low levels and are to be recycled, no adverse impact is predicted as a consequence of waste generation of the proposed development.

Subsequently, as there is a secure and adequate water supply available to meet predicted operational needs no adverse impact is predicted as a consequence of the meeting of proposed development water needs.

13.10.8 Mitigation measures

Impacts from waste generation have been considered throughout the design process. Management and mitigation measures would be implemented to minimise impacts from waste generation during the operation stage of the proposed development. These include:

- Ensure that all wastes (includes but not limited to liquid, air emissions, and solid material) generated by the proposed development, as far as reasonably practicable managed in a manner which reduces adverse impact to the environment. This approach is based on the hierarchy of waste materials management (elimination, reduction, reuse or recycling and treatment and disposal.);

- All waste to be transported off-site shall be assessed to determine whether the waste requires tracking under the Protection of the Environment Operations (Waste) Regulation 2014;
- All waste requiring tracking shall only be transported after all necessary documentation such as consignment authorisation and transport certificates have been obtained from the relevant authorities;
- Ensure procedures are implemented to minimise any adverse environmental impacts associated with the storage, management and disposal of waste materials;
- Inspections of the waste management areas would be constructed on a weekly basis to ensure that correct waste management practices are being followed, in that all waste materials are appropriately separated and stored;
- No burying of waste relating to the operation of the proposed development is to be conducted on the subject property with the exception of mass deaths of beef cattle if required;
- No burning of waste relating to the operation of the proposed development is to be conducted on the subject land;
- All waste that cannot be sustainable utilised on the subject land shall be removed from the subject land by an operator licensed to remove that waste removal and transported to a suitably licensed disposal site;
- Putrescible domestic waste will be stored in a protected area away from vermin and inclement weather;
- Wastes will be stored appropriately for its type. Different waste types will not be mixed to increase the potential for re-use or recycling of waste. Separate waste storage areas will be designated;
- Quantities of waste stored onsite will be kept to a minimum. Maximum volume of each waste stored will be consistent with regulations and guidelines;
- All sampling and classification results shall be retained for the life of the proposed development in accordance with EPA's Waste Classification Guidelines;
- All waste shall be transported in accordance with local council and EPA regulations for the type and volume of waste transported;
- All loads of waste removed from the proposed development will be covered to prevent spillage;
- Licensed waste contractors will be made responsible for collection and appropriate disposal of regulated waste as required;
- Solid waste storage and processing areas shall be contained in the controlled drainage area;
- Records or a material register shall be retained detailing the quantity, classification method of transport of waste material removed from the site. The register will record the waste type, quantity, classification, contractor, licence details and details of the licensed receiving facility.

13.10.9 Conclusion

The operation of the proposed development shall generate a small quantity of in-organic solid wastes such as product packaging, paper etc. Further, the operation of the proposed development shall significant levels of organic solid and liquid waste which can be wholly or partly sustainably utilised on the subject property as outlined in 13.11.

It is expected that, with the implementation of the outlined mitigation measures, the proposed development would not create significant impacts to the environment from waste generation.

13.11 Land capability for waste utilisation

13.11.1 Introduction

The proposed development would produce effluent and solid waste during its operation and would require licensing approvals for utilisation of effluent and solid waste onto land. An Environment Protection Licence (EPL) would be required from the Environmental Protection Authority (EPA) as outlined in section 9.7.

The characteristics of the waste utilisation areas and their location relative to residences, surface waters, and groundwater need to be known. Assessment of these characteristics will identify the constraints to effluent and solid waste utilisation and assist with adopting and implementation of mitigation measures. The key factors governing the suitability of a site for effluent and solid waste utilisation are:

- Topography;
- Soil considerations;
- Proximity of surface and groundwater; and
- Proximity of residences.

This section provides a review of the areas proposed for effluent and solid waste utilisation based on topography, soil, groundwater and surface water characteristics, together with an assessment of the suitability of the effluent utilisation area for irrigation.

13.11.2 Existing environment

13.11.2.1 Climate

Beef cattle feedlots can be located in a wide range of climates. However, climatic factors impact on a diverse range of issues. These include:

- heat and cold stress and animal welfare;
- water requirements (drinking, cattle washing);
- animal productivity and feed conversion;

- odour;
- dust;
- noise;
- drainage; and
- waste management and utilisation.

The National Guidelines for Beef Cattle Feedlots in Australia (MLA, 2012a) and New South Wales Feedlot Manual (NSW Agriculture, 1997) recommends that feedlots be sited in areas of less than 750 mm rainfall.

The climatic characteristics are important factor in the design of the liquid waste utilisation area system and the storage requirements for wet weather. The regional climate, and annual water deficit (the difference between rainfall and evaporation) are used to determine the irrigation requirement and the wet-weather storage capacity.

The annual water deficit is a useful guide to determining the irrigation requirement. However, during periods when the evaporation is lower than the rainfall, this does not necessarily mean that irrigation will not occur. For example, a large amount of rainfall could fall over a very short period of time, that is, it may be intense storm bursts with extended dry periods in between when irrigation can occur.

Therefore, a more detailed analysis using a water balance approach at the daily scale is more effective in determining the irrigation requirement and the optimal wet-weather storage capacity. The water balance methodology is outlined in section 13.11.5.1.

Daily climatic data for the proposed development site was obtained from SILO. SILO is an enhanced climate database hosted by the Queensland Department of Science, Information Technology and Innovation (DSITI). SILO contains Australian climate data from 1889 to date. A data drill was undertaken for the location of the proposed development complex site. The data drill accesses daily time series of data interpolated from point observations by the Bureau of Meteorology.

Table 42 presents data sourced from SILO from 1924-2023. The data indicates that the area has a summer dominant rainfall pattern with an annual average of some 424 mm with average monthly maximum temperatures range from a maximum of 31.7ºC in January (summer) to a minimum of 3.3ºC in July (winter).

13.11.2.2 Topography

The subject land is described in the Blighty (7926-N) 1:50,000 topographic map sheet. The subject land is also addressed in the Murray Basin Hydrogeological Mat (1:250 000) Map Series ‘Deniliquin’ NSW and Victoria. Williams and Woolley (1992) The topography at a regional scale is generally flat with gentle slopes and intermittent rises. Elevations range from 75 m to 125 m AHD. The subject land is within the eastern part of the Murray Basin, but well away from the eastern basin margin and from the complex bedrock structural and topographic features which characterise the central part of the basin. The subject land is on the eastern

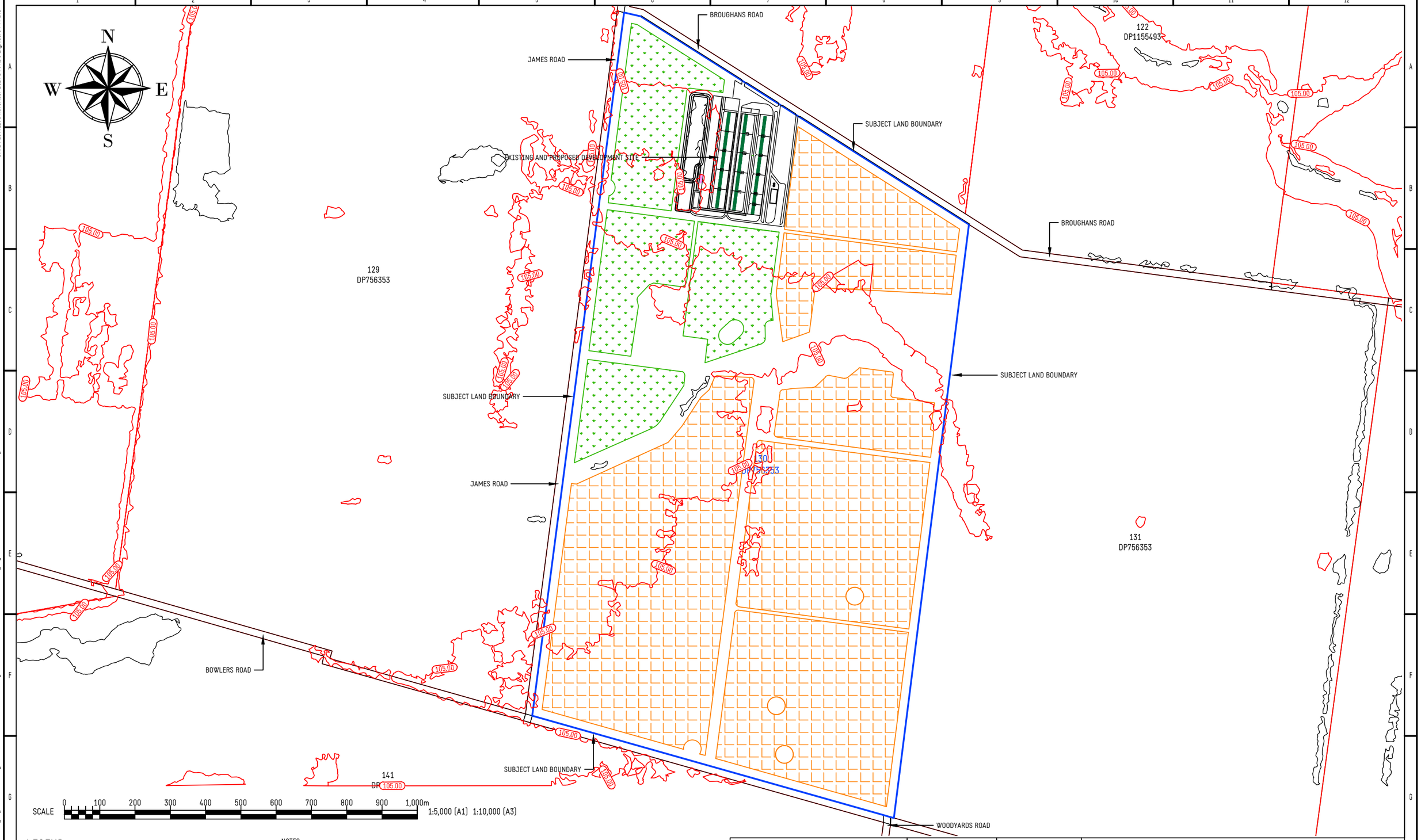
margins of the plains with slopes in the order of 1% with intermittent small rises on a local scale.

Site drainage is in a south-westerly and north westerly direction towards the Box Creek Escape Channel.

The proposed development infrastructure shall be located geographically to the north-west of the subject land where the topography has been modified to develop the design grades of the existing beef cattle feedlot development. The proposed development complex site is inherently well drained due to the impermeable, predominantly clay soils and design gradients.

The proposed effluent utilisation area is located in the northwest corner of the subject land on relatively flat land having been developed for surface irrigation as shown on Figure 40. The solid waste utilisation areas are located across the subject land where the land is relatively flat having been developed for surface irrigation as shown on Figure 40.

The subject land has largely retained its historical topography. There has been modification to the natural landform in the northwest corner of the subject land as a result of groundworks for the establishment of the existing beef cattle feedlot development and landforming for the establishment of irrigation supply and drainage channels and levelling of fields for irrigation.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- EXISTING GROUND CONTOUR - MAJOR (0.5m)
- EXISTING GROUND CONTOUR - MINOR (0.25m)

NOTES:

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A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:10,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - TOPOGRAPHIC PLAN

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 40		A3	F3-107-00-40	B

DATE PLOTTED: 6 November 2024 BY : RDC Engineers PTY LTD
FILE NAME: F3-107 ANVorley High Claire MASTERPLAN-00-20230407 -v8.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N Vorley High Claire FL Finley\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

13.11.2.3 Soil characteristics

The characteristics of the soils in the proposed effluent and solid waste utilisation areas will impact on the suitability of the land for waste utilisation.

As the effluent and solid waste from the proposed development shall be high in nutrients and possibly salts, it is important that the physical and chemical properties of the soil are assessed to determine the management requirements for protecting against soil degradation which could result in:

- degraded soil structure;
- restricted plant growth;
- erosion;
- salinity; and
- release of contaminants to surface or groundwaters.

The New South Wales Feedlot Manual (NSW Agriculture, 1997) contains a table regarding soil suitability and is reproduced in Table 54.

Table 54 – Soil suitability for feedlot components (Table 3.1 NSW DPI, 1997)

Component	Minimum desirable soil requirements
Effluent irrigation area (Liquid waste utilisation area)	Deep well drained soil, suitable for irrigation pasture production and at least an occasional irrigated crop, moderate to high water holding capacity, not prone to waterlogging within the root zone.
Manure application area (Solid waste utilisation area)	Soils well suited to improved pasture or dryland cropping; able to withstand cultivation without incurring significant erosion or major soil structural degradation; not prone to surface waterlogging or frequent inundation.

Soil testing is conducted on the cropping soils of the subject land on a routine basis for agronomic purposes. A copy of the latest soil analyses results from March 2023 are presented in Table 55.

From an agronomic perspective, the soils on-farm are suited to crop or pasture production. The top soil properties indicate that the soils could benefit from the addition of effluent and manure. Nitrate-nitrogen levels are low to optimal in the top 0-10cm and ammonium nitrogen optimal. Available Phosphorus levels range from low to adequate. Available potassium levels are optimal to high in the surface. None of the elements are present at levels considered to be excessive. Organic matter levels are low to moderate for the soil type. The soils are non-saline and non-sodic 0-20cm. They are moderately to slightly acidic, with available calcium levels sub-optimal as a percentage of total exchangeable cations.

Table 55 – Subject land – Soil analysis results

Parameter	Units	Depth (cm)		
		0-10	10-20	20-30
pH (1:5 Water)		5.76	6.4	7.44
Conductivity	dS/m	0.066	0.065	0.09
Organic matter	%	2.96	2.49	1.21
Total nitrogen	%	0.13	0.11	0.08
Nitrate nitrogen	mg/kg	7.3	4.7	3.2
Ammonium nitrogen	mg/kg	1.6	3.1	0.8
Total Phosphorus	mg/kg	496	368	213
Phosphorus – Bray 1	mg/kg	47	26	13
Potassium	mg/kg	2,619	2,492	140
Calcium	mg/kg	1,110	1,283	1,703
Magnesium	mg/kg	1,817	1,839	2,939
Sodium	mg/kg	133	155	383
Cation Exchange Capacity	cmol+/kg	8.99	10.30	14.73
Exchangeable Sodium	cmol+/kg	0.39	0.31	1.13
Exchangeable Potassium	cmol+/kg	1.00	0.95	0.98
Exchangeable Calcium	cmol+/kg	4.44	5.19	6.74
Exchangeable Magnesium	cmol+/kg	2.95	3.57	5.82
ESP (%)	%	4.3	4.9	7.7
Ca/Mg Ratio	-	1.5	1.5	1.2
Bulk density	t/m^3	1.05	1.19	1.19

13.11.3 Soil suitability assessment

The key soil properties which govern the suitability of a site for effluent and solid waste utilisation are soil sodicity, soil salinity, saturated hydraulic conductivity, available water holding capacity, pH, cation exchange and dispersion.

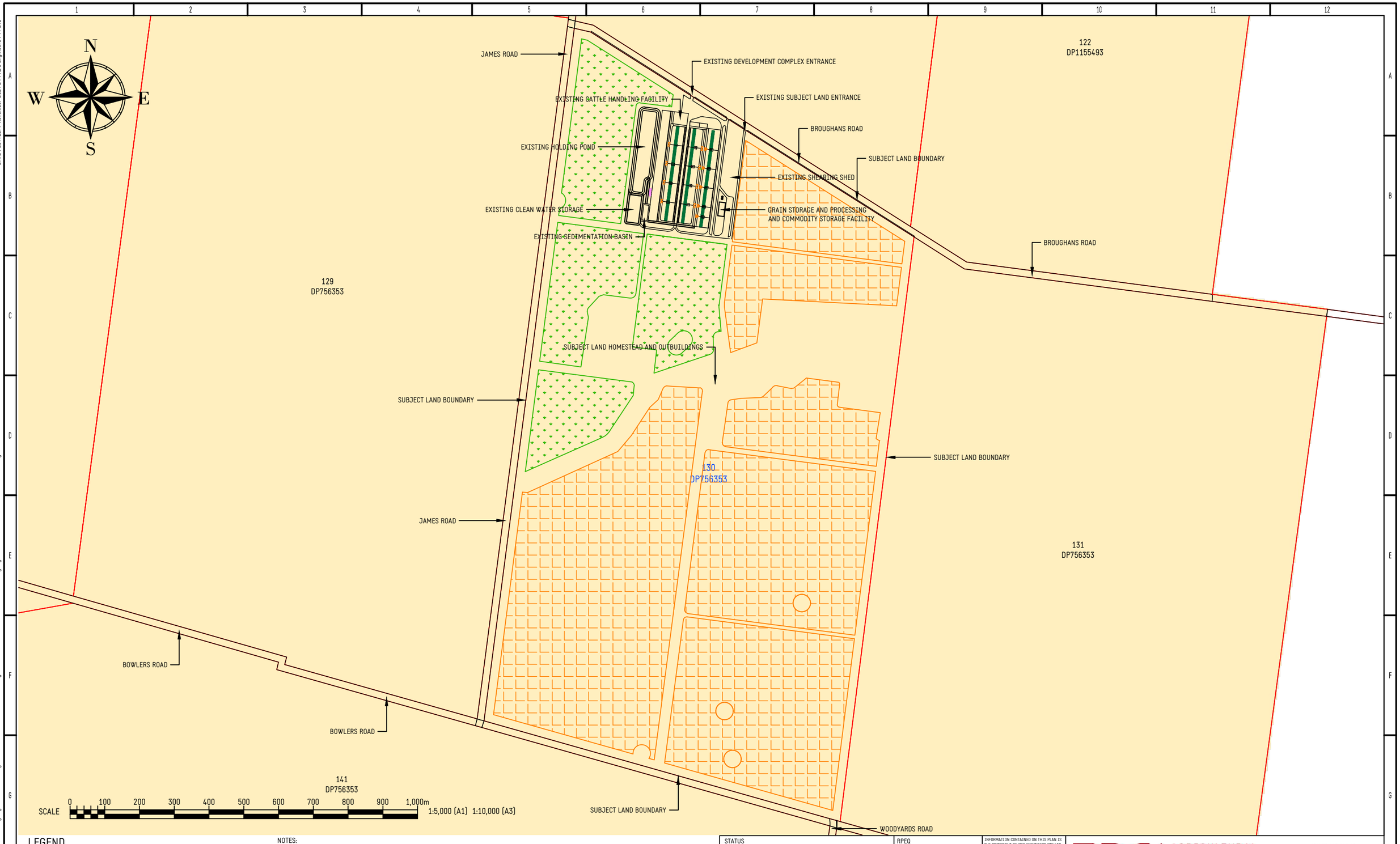
13.11.3.1 Land and soil capability

The land and soil capability (LSC) assessment scheme has been developed for NSW. Land capability is the inherent physical capacity of the land to sustain a range of land uses and management practices in the long term without degradation to soil, land, air and water resources. The LSC assessment scheme uses the biophysical features of the land and soil including landform position, slope gradient, drainage, climate, soil type and soil characteristics to derive detailed rating tables for a range of land and soil hazards. These hazards include water erosion, wind erosion, soil structure decline, soil acidification, salinity, waterlogging, shallow soils and mass movement. Each hazard is given a rating between 1 (best, highest capability land) and 8 (worst, lowest capability land). The final LSC class of the land is based on the most limiting hazard

Land and soil capability mapping as per the SEED mapping portal NSW and presented as Figure 41 indicates that the soils onsite are mapped as Class 3 – moderate limitations (NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2024).

Land Suitability Class 3 general definition: high capability land, land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation.

Class 3 land has limitations that must be managed to prevent soil and land degradation. However, the limitations can be overcome by a range of widely available and readily implemented land management practices. The primary issue is land degradation due to wind and water erosion. Therefore minimising soil disturbance (minimum tillage), maintaining stubble cover and good organic matter levels are important mitigation measures. Minimum tillage, stubble retention practices are already implemented in the cropping program on the subject land.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA
- LAND AND SOIL CAPABILITY - 3 (MODERATE LIMITATIONS)

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CLIENT AJ & NA VARLEY

PROJECT PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - LAND AND SOIL CAPABILITY OVERLAY

REPORT REFERENCE FIGURE 41 | SUPPLIED DRAWING NUMBER | A3 | DRAWING NUMBER F3-107-00-41 | REV. B

DATE PLOTTED: 7 November 2024, BY: : RDC Engineers PTY LTD
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13.11.3.2 Soil texture and particle size distribution

Particle size distribution describes the relative amounts of gravel, sand, silt and clay within the soil. These are the building blocks for the soil and can have a large effect on the soil properties. There is also an approximate relationship between field texture and particle size distribution, as shown in Figure 42.

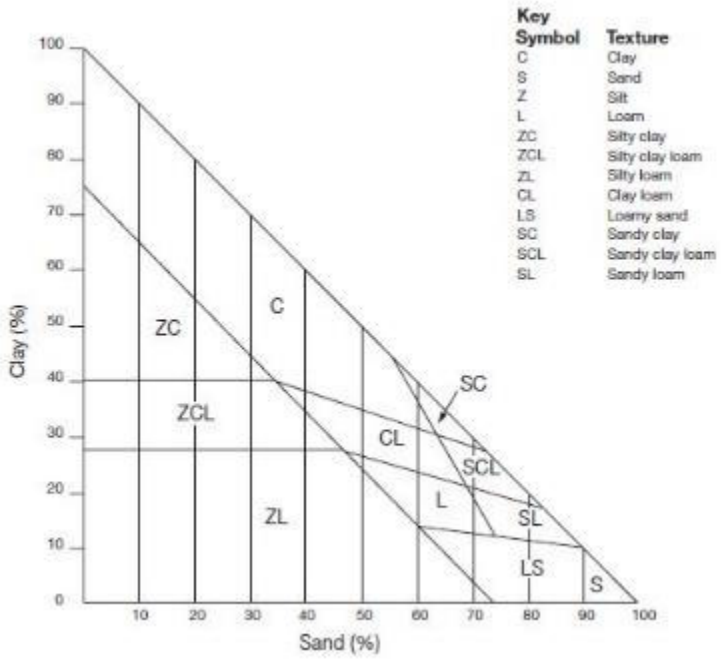


Figure 42 – Soil texture triangle (Hazelton and Murphy, 2007)

The soils have been classified as having a silty clay texture. The soils of the subject land cropping areas are characterised by some 14% (sand) and some 86% clay/silt particles as shown in the soil test results in Appendix L.

13.11.3.3 Aggregate stability

Aggregate stability refers to the stability of soil structural units (aggregates) when immersed in water. Instability may be indicated by slaking or clay dispersion. A soil with low aggregate stability is likely to be compact and poorly structured.

The aggregate stability results indicate that the soils have a high degree of dispersion with Emerson Aggregate Test results of Class 2. Class 2 soils disperse on wetting and readily form a crust. This characteristic is currently managed by increasing organic matter in the surface and by applying gypsum.

13.11.3.4 pH (1:5 Water)

The pH of the soils ranges from neutral to mildly alkaline (pH 5.76) in the surface and are moderately acidic to moderately to strongly alkaline (pH 6.3-7.6) in the subsoil (Hazelton and Murphy, 2007). These results are typical values expected for the medium clay soils encountered.

Soil pH is considered acceptable for pasture and crop growth and should not affect the availability of nutrients, toxic elements and chemical species to plant roots.

13.11.3.5 Total nitrogen

Total nitrogen results from the soils show total N ranges from 0.13% (1300 mg/kg) in the surface (0-10cm) to 0.08% (800 mg/kg) at 20-30cm. These values are considered low (Hazelton and Murphy, 2007). This indicates that Nitrogen is not accumulating in the soil profile and crops will require additional nitrogen.

13.11.3.6 Phosphorus

The available phosphorus concentrations range from 47 mg/kg in the surface (0-10cm) to 13 mg/kg at 20-30cm. Suggested upper limits by Skerman (2000) in the surface soil are 85 mg/kg for a soil with a clay percentage greater than 30 (when pH >7.0). The phosphorus results are low to moderate (Hazelton and Murphy, 2007).

13.11.3.7 Exchangeable cations

Cation exchange capacity (CEC) is the measure of the total capacity of a soil to hold exchangeable cations. It provides a buffering effect to changes in pH, available nutrients, calcium levels and soil structural changes. The major cations are calcium (Ca^{2+}), magnesium ($Mg^{2+)}$, potassium (K^{+}), sodium (Na^{+}) and aluminium (AL^{3+}). In most soils, Ca^{2+}, Mg^{2+}, Na^{+} and K^{+} comprise the bulk of the cations in exchangeable form. The CEC is a major controlling agent of stability of soil structure, nutrient availability for plant growth and soil pH (Hazelton and Murphy, 2007).

The CEC is considered low in the surface (8.99 cmol+/kg) to moderate (14.73 cmol+/kg) a reflection of the sandy clay loam surface and medium clay subsoil. In general, high CEC soils generally have greater water holding capacity than low CEC soils. The CEC levels indicates good natural fertility and suggests nutrients can be supplied to the soil solution at a rate suitable for plant extraction.

The exchangeable calcium levels in the topsoil (10cm) and at 20-30cm are considered moderate (5-10 cmol+/kg). Similarly, the exchangeable magnesium levels are considered high (3-6 cmol+/kg). This suggests that the soils are not strongly leached, and that plant growth would not be limited as a result.

The exchangeable sodium levels in the topsoil (10cm) and 20-30cm are considered moderate to high. The exchangeable potassium levels in the topsoil (10cm) and 20-30cm are considered high. It is likely a plant response to the application of potassium is unlikely.

13.11.3.8 Salinity

Salinity refers to the total dissolved salts in a liquid or in a soil solution. Salts are mostly added to the soil through soil formation, hydrologic processes and rainfall (DNR, 1997). However, irrigation, especially with liquid waste can add significant quantities of salt to the soil. Electrical conductivity ($EC_{1:5}$) and chloride levels were examined in the results from the soil sampling in the irrigation areas to establish current salinity levels.

The current $EC_{1:5}$ levels in the soils indicate non-saline soils with very low (0.066 dS/m) at 0-10cm to (0.09 dS/cm) at 20-30cm. Crops that are moderately sensitive to salinity are not affected.

The NSW State of Environment overall salinity hazard assessment 2020 mapping indicates that the local landscape in which the subject land is located is considered to be high risk salinity hazard as shown on Figure 43.

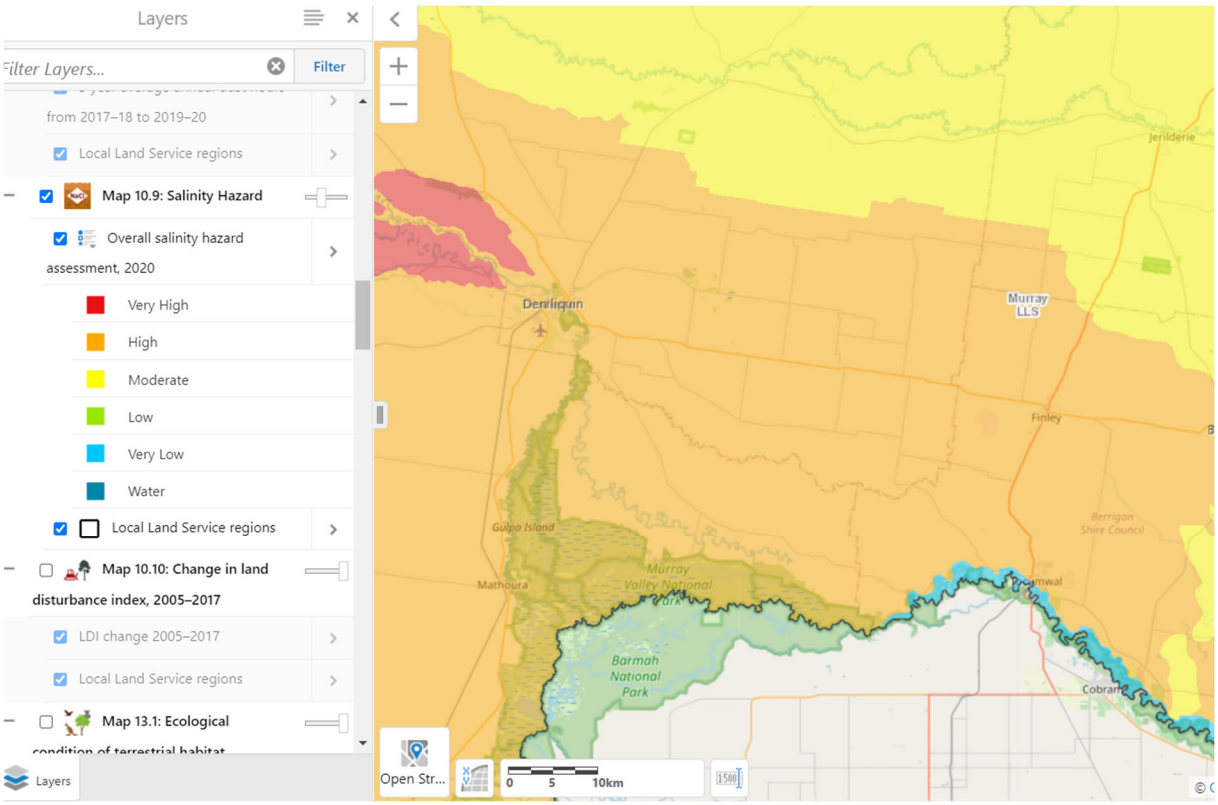


Figure 43 – Subject land – Salinity hazard assessment (NSW State of Environment, 2020)

Annual monitoring of soil and groundwater salinity shall identify any trends in soil salinity and potential accumulation of salts in the soils as a result of salts applied in the effluent.

13.11.3.9 Sodicity

Soil sodicity occurs when the ratio of exchangeable sodium ions to other exchangeable cations is sufficient to influence the swelling and dispersion behaviour of soils (Rengasamy and Churchman, 1999). A sodic soil surface can reduce water infiltration and is prone to hardsetting, while a strongly sodic subsoil reduces internal drainage, restricts plant rooting depth and may accumulate salts and nutrients.

The exchangeable sodium percentage (ESP) is often used as an indicator of soil sodicity. A soil is considered non sodic if ESP is less than 6, sodic if ESP is between 6 and 14 and strongly sodic if ESP is greater than 14 (Hazelton and Murphy, 2007).

The ESP results for the soil ranges from 4.3 % at 0-10cm in the surface to 7.7% at 20-30cm. This indicates these soils are generally non sodic in the surface to slightly sodic at depth with increasing sodicity which is typical for these clay soil types under natural conditions.

13.11.3.10 Surface water and groundwater

The proposed development is required to be sited, designed, constructed and operated to prevent or minimise adverse impacts on groundwater and surface waters external to the developments' controlled drainage area and external to effluent and solid waste utilisation areas (MLA, 2012a, NSW Agriculture, 1997).

Potential impacts on current and future groundwater users and downstream surface water users and resources need to be considered. These risks can be minimised by ensuring:

- careful selection of suitable sites for effluent and solid waste utilisation;
- selection of areas where the presence of one or more impervious geological strata (for example, a thick layer of compacted clay) above the groundwater aquifer can prevent deep percolation from reaching the aquifer;
- irrigation of effluent in close proximity to surface waters is well designed and managed;
- annual application rates would be based on annual soil tests and not exceed nutrient recommendations for a particular crop, soil type or yield goal;
- application of effluent would occur over the crop growing period with timing and application rates based on soil moisture deficit levels and in accordance with an Irrigation Management Plan;
- the plant/soil mantle within and down-gradient of the effluent utilisation area is capable of immobilising any potential contaminants in the effluent; and
- an adequate buffer zone between effluent and solid waste utilisation areas and surface water and groundwater bores used as a domestic water source.

The proposed development and associated effluent and solid utilisation areas have been sited and designed to minimise any adverse impacts to groundwater and surface waters. section 8.4 outlines the siting and design considerations to minimise any adverse impacts to groundwater and surface waters. Further, sections 13.3 and 13.4 outline the potential risks and mitigation measures proposed to minimise adverse impacts to groundwater and surface waters.

Review of strata log details for various groundwater bores on the subject property identifies the presence of one or more impervious geological strata such as compacted clay bands above the groundwater aquifer. These layers shall minimise deep percolation from reaching the aquifer.

The groundwater bores strata log details have shown that the aquifer to be relatively shallow groundwater at approximately 3-8 m.

13.11.4 Solid waste utilisation

The subject land has existing dryland and irrigated cropping areas. Solid waste (manure, sludge, carcass compost) shall be sustainably applied to the cropping areas as a soil conditioner and fertiliser.

The subject land has an area of at least 116 ha of land suitable for solid waste utilisation as shown on Figure 12.

The minimum land area required was determined by a nutrient mass balance on the removal of the nutrients in the solid waste (manure, sludge, carcass compost) by the types of crops to be grown within the solid waste utilisation area.

The typical composition of aged beef cattle feedlot manure is shown in Table 56.

Table 56 – Typical characteristics of cattle feedlot manure (MLA, 2015b)

Parameter		Units	Average	Range
Total Nitrogen	N	%	2.18	1-3
Ammonium Nitrogen	NH_4^+ - N	mg/kg	1,430	0 – 3,800
Nitrate Nitrogen	NO_3^- - N	mg/kg	307	1-1,115
Total Phosphorous	P	%	0.8	0.5 – 1.1
Potassium	K	%	1.9	0.75 – 3.2
Sodium	Na	%	0.3	0.04 – 0.7
Acidity/Alkalinity	pH		7.2	6.3 – 8.7
Electrical Conductivity	EC	dS/m	8.26	0.16 – 17.2

Summer and winter grain crops shall be grown under irrigated conditions within the solid waste utilisation area and harvested and reused as grain, straw or silage in the proposed development's feed ration. The typical crops proposed to be grown on the solid waste utilisation areas are outlined in Table 57. The typical nutrient analyses of each crop has been sourced from plant tissue results provided by the applicant.

Table 57 – Proposed development – Solid waste utilisation area – Typical crops and yields

Crop	Typical DM yield t/ha	N DM %	P DM %	K DM %
Barley (grain)	4-6	1.6	0.29	0.44
Barley (grain)	3.2	0.7	0.07	4.2
Maize (silage)	20-25	2.0	0.30	1.5

13.11.4.1 Nutrient Limited Application Rates

The *National Guidelines for Beef Cattle Feedlots in Australia* (MLA, 2012a) express a mass balance equation in the form of a Nutrient Limited Application Rate (NLAR) equation. Solid waste is applied to the solid waste utilisation area where the biomass accumulation and the quantities of N and P that are removed from the area through crop growth and the export of harvested material are determined.

The mass balance equation in the form of a nutrient limited application rate (NLAR) equation, denoted as:

$$NLAR = \frac{CR+SS+EL}{NW\ x\ 10^{-3}} \text{.....Equation 2}$$

where:
NLAR = nutrient limited application rate of solid waste (t/ha)
CR = crop requirement for the applied nutrient (kg/ha)
SS = soil storage (kg/ha)
EL = allowable nutrient losses to the environment (kg/ha)
NW = available nutrient concentration in the solid waste feedlot manure (mg/kg).

In the assessment of the NLAR, soil storage (SS) and allowable nutrient losses (EL) are ignored as the intention is to only apply nutrients to match crop requirements. The predicted solid waste nutrient concentrations are summarised in Table 56.

The annual application rate for the nitrogen and phosphorus contained in the solid waste were calculated using the NLAR approach.

The typical crops grown on the solid waste utilisation areas and nutrient analyses are outlined in Table 57.

The NLAR was calculated based on a winter barley crop which was harvested for grain and straw and a summer maize crop harvested for silage. This cropping program could remove about 180 kg/ha of Nitrogen, 27 kg/ha of Phosphorus and 216 kg/ha of Potassium as shown in Table 58.

Table 58 – Proposed development – Solid waste utilisation – NLAR summary

Parameter	Units	Code	Nitrogen	Phosphorus	Potassium
Crop requirement	kg/ha	CR	552.4	84.2	493.9
Soil storage	kg/ha	SS	0	0	0
Allowable losses	kg/ha	EL	0	0	0
Nutrient concentration	mg/kg	NW	21800	8000	19000
NLAR	t/ha	NLAR	25.3	10.5	25.99
Area required	ha	-	70	169	68

The minimum area required for solid waste utilisation will be the largest calculated for any individual nutrient constituent (MLA 2012a). The minimum area required for uptake of P is 169 ha. The proposed development has an area of 116 ha available for solid waste utilisation. Consequently, there is insufficient land on-site for sustainable utilisation of all of the phosphorus in the solid waste produced.

The rationale for the use of solid waste on the dryland farming area of the subject land is to provide the appropriate agronomic conditions for the growth of crops on this area. Prior to the addition of solid waste to the solid waste utilisation area, soil and manure analysis would be undertaken to establish baseline nutrient levels and the required amount of solid waste for the crops to be grown.

The remainder of solid waste generated from the proposed development would be composted in windrows before being sold and transported off-site. For clarity, all solid waste generated by the proposed development shall be stored, processed and stockpiled in the dedicated solid waste storage and processing area within the controlled drainage area. This applies to solid waste that is destined for both on-site and off-site utilisation.

The solid waste removed off-site is intended to be used as a soil conditioner and organic fertiliser from cropping operations on other properties in QLD owned by the proponent.

13.11.5 Effluent utilisation

A sustainable effluent utilisation system will achieve a balance between the use of effluent for irrigation with the nutrient requirements of the crop while protecting the environment from potential pollution. Additionally, the amenity of the surrounding environment and meeting the needs on a social and ecological level are important considerations in sustainability.

There are a number of commercially available tools to assist with water and nutrient balance calculations. The model used in this assessment was the Model for Effluent Disposal via Land Irrigation (MEDLI) (Department of Environment and Science (DES) 2023) . MEDLI is a Windows® based computer model for designing and analysing effluent reuse systems for intensive rural industries, agri-industrial processors (e.g. abattoirs), sewage treatment plants and other effluent producers using land irrigation. MEDLI was developed jointly by the CRC for Waste Management and Pollution Control, the Queensland Department of Natural Resources and the Queensland Department of Primary Industries in the mid 1990's (Gardner et al, 1996) and has been upgraded since that time.

The MEDLI feedlot module simulates runoff from the controlled drainage area of the proposed development on a daily basis.

A summary of the MEDLI assessment is provided in the following sections. The full MEDLI report is provided in Appendix M.

13.11.5.1 Water balance

Table 59 shows the water balance of the holding pond calculated over the 100-year modelling period using climate data from Table 42 and Red sodosol soil type . Table 59 shows that there is some 6.0 ML/year on average of effluent runoff from the controlled drainage area into the holding pond. The existing capacity of the holding pond is 15 ML. The existing holding pond with a capacity of 15 ML will ensure that that overtopping events occur no more frequently than one in 10 years as shown in Figure 10 and Figure 11.

The location of the holding pond within the proposed development complex is shown in Figure 9.

Table 59 – Proposed development – Holding pond water balance

Water Movement	Units	Scenario 1 Clean water + Effluent
Runoff inflow	ML/year	6.01
Rain	ML/year	6.42
TOTAL IN	ML/year	12.43
Evaporation	ML/year	6.11
Seepage (estimated at 0.1 mm/d)	ML/year	0.16
Sludge accumulated	ML/year	0.07
Irrigation	ML/year	6.16
Overtopping	ML/year	0.00
TOTAL OUT	ML/year	12.50
Overtopping Events (no. per 10 yrs)		0
Percentage of reuse	%	97

13.11.5.2 Nutrient

Effluent typically has 100 – 350 mg/L of nitrogen, i.e. 300 mm of irrigation will provide 300-1,050 kg/ha/year of nitrogen. Most crops and pastures have a limit to the amount of nitrogen that can be taken up by plants, therefore, often the main issue is to manage the amount of nitrogen, not the amount of water.

Table 60 shows the water and nutrient balance of the effluent utilisation area over the 100-year modelling period for a utilisation area of 16 ha. Table 60 shows that there is some 629 mm/year (Scenario 1) on average of irrigation water (effluent and shandying clean water) applied to land.

Table 60 – Proposed development – Effluent utilisation area water and nutrient mass balance

Parameter	Units	Scenario 1 Clean water + liquid waste
Water Balance		
Rainfall	mm/year	423.9
Irrigation	mm/year	574.6
Soil evaporation	mm/year	560.3
Transpiration	mm/year	395.9
Irrigation runoff	mm/year	0.0
Drainage	mm/year	41.4
Crop yield (2 crops)	kg DM/ha/year	15,400
Nutrient Application and Losses		
N applied in irrigation	kg/ha/year	150
N volatilised	kg/ha/year	10
N removed by crop	kg/ha/year	170
N Leached	kg/ha/year	0.721
P applied in effluent	kg/ha/year	10
P removed by crop	kg/ha/year	20
P leached	kg/ha/year	0.0058
Change in adsorbed P	kg/ha/year	3.5
Average phosphate-P concentration in rootzone	mg/L	0.02
Nutrient Concentration in Deep Drainage		
Nitrogen	mg/L	1.74
Phosphorus	mg/L	0.01
Salt		
Average salinity of infiltrated water	dS/m	0.10
Average salinity at base of root zone	dS/m	2.88
Reduction in crop yield due to salinity	-	0.0

NB: All data are means over 100-year simulation period.

13.11.5.3 Nitrogen

The behaviour of nitrogen in plant-soil systems is complex and includes additions and losses to the system as well as transformations of the forms of nitrogen. The capacity of an irrigation system to use nitrogen can be maintained and restored over time as the removal of nitrogen

from effluent largely depends on biological processes. To calculate the nitrogen balance nitrogen inputs are compared with nitrogen losses.

Table 60 shows that about 150 kg/ha/year of nitrogen would be available for crop uptake after some losses on nitrogen as a result of volatilisation with Scenario 1. The crop would remove some 170 kg/ha/year of nitrogen per year with Scenario 1.

Subsequently, the plant uptake of nitrogen is in excess of the nitrogen added in irrigation. The nitrogen deficit and this will need to be met by existing soil reserves and/or additional applications of nitrogen.

Therefore, the irrigation area is considered to be sustainable with respect to nitrogen as required by relevant guidelines.

13.11.5.4 Phosphorus

Phosphorus (P) is removed from the wastewater through biological, chemical and physical processes in the soil. The existing P sorption capacity of the soil and the P uptake by plants to be grown determines how much P can be introduced before the site is saturated.

Table 60 shows that about 10 kg/ha/year of phosphorus would be applied through irrigation of effluent with Scenario 1. The crop would remove some 10 kg/ha/year phosphorus with the remaining phosphorus adsorbed by the soil and no phosphorus leached.

Subsequently, the majority of phosphorus added in irrigation will be removed by crop uptake. The balance is assimilated into the soil store with an average decrease of adsorbed phosphorus from 0.0320 to 0.0285 tonnes/ha/year. The phosphorus concentration in the root zone is 0.02 mg/L which is considered acceptable.

Therefore, the irrigation area is considered to be sustainable with respect to phosphorus as required by relevant guidelines.

13.11.5.5 Salinity

The quantity of salt in the effluent is important to ensure irrigation does not result in soil degradation by increasing soil salinity. The main requirement for salinity control in irrigation systems is to ensure there is adequate leaching to prevent salt accumulation in the soil.

The proposed crops for the irrigation area are summer crops (maize – forage) and winter crops (barley – grain and hay). These crops are currently grown on the subject land. These species are moderately sensitive to moderately tolerant to salinity levels.

The long-term nutrient balance modelling predicts that with this salinity content (of the irrigation water) there would be no reduction in crop yield due to salinity because the crops are moderately salt tolerant.

To ensure that effluent to be used in irrigation has sustainable levels of salt, the effluent and clean water used for dilution would be tested on an annual basis and clean water would be added (shandied).

13.11.6 Irrigation system

13.11.6.1 Wet-weather storage

Due to the variation in climate and weather patterns, there will be periods of wet weather when irrigation is not possible. Therefore, to prevent discharge of effluent from the site, during periods of wet weather the effluent shall be temporarily held in the holding pond (as a (balancing or wet-weather storage) until conditions are suitable for irrigation.

As discussed in section 13.11.5.1, a water balance approach has been used to size the holding pond such that an acceptable overtopping frequency is achieved.

13.11.6.2 "Clean" runoff diversion

As shown in Figure 12, the proposed irrigation area is located on an existing irrigated field. Banks formed by supply channels ensures any upslope runoff does not enter the irrigated area. This will ensure that water management in the irrigation area is well controlled and reduces the possibility of contaminated stormwater runoff from leaving the site.

13.11.6.3 Application method

Application of effluent to land shall be via surface irrigation as is currently used for irrigation on the subject land.

The topography of the subject land is relatively flat (slope less than 0.1%), Consequently, surface irrigation (flood irrigation) has been developed. Each irrigation field has been graded to a uniform slope so that problems associated with poor drainage and ponding are avoided.

13.11.6.4 Stormwater runoff considerations

One of the key objectives of managing the irrigation system is to protect the environment from harm caused by contaminants in the effluent. Therefore, to ensure that surface drainage from the irrigation area does not contaminate surface waters a range of strategies for managing stormwater runoff have been implemented. These include:

- Provision of well-maintained grassed buffers to surface waters and drainage lines;
- Scheduling of irrigation to meet the moisture demand;
- Capture of stormwater runoff in the tailwater collection system and recirculated through the irrigation system.

13.11.6.5 Wet-weather discharge

Wet-weather discharge from a site is defined as the discharge of effluent from the subject land boundary.

Whilst, the holding pond has been designed with an acceptable overtopping frequency in accordance with relevant guidelines, wet-weather discharge may occur particularly during periods of extended wet weather.

Therefore, during wet weather if discharge from the holding pond is necessary, it shall be engineered and managed to occur in a controlled and organised manner. Ideally, during wet weather, a steady discharge at a uniform depth across the irrigation area shall be considered.

13.11.6.6 Irrigation system management

13.11.6.7 Dilution

To more effectively use the nutrient value of the liquid waste, the liquid waste shall be shandied with clean irrigation water.

13.11.6.8 Scheduling

Irrigation scheduling of effluent is dependent on three main factors:

- the quality of the effluent and nutrient requirements of the crops being irrigated;
- the moisture content of the soil and the amount of water needed to water the root zone; and
- weather considerations – wind rainfall and temperature.

Irrigation would occur only on suitable, selected areas within the proposed effluent utilisation area in any year. Irrigation scheduling would be closely supervised by the Farm Manager. The irrigation schedule would be established to sustainably manage the application of effluent and holding pond volume. Effluent would be irrigated primarily during the months of October to April, with irrigation in the colder months wetter months being based on rainfall, soil moisture and crop requirements. More detailed irrigation scheduling would be included in the Irrigation Management Plan (IMP) which would be prepared upon approval of the proposed development.

13.11.7 Mitigation measures

Sustainable management of effluent utilisation will involve measures which include the operation, monitoring, and reporting for the systems. Annual review of the performance of the irrigation management system from data collected on operation and environmental performance will assist with identifying areas of risk and potential improvements to the system. Elements of the measures are outlined below.

13.11.7.1 Irrigation management plan

Irrigation management is an important factor in ensuring the sustainability of the effluent utilisation area. The operation would employ best management measures to ensure long term sustainability of the operation. An Irrigation Management Plan (IMP) for the effluent utilisation area shall be prepared and implemented for the operation of the proposed development.

The Irrigation Management Plan (IMP) would provide measures to identify potential environmental impacts from the proposed development and provide measures to minimise these impacts.

13.11.7.2 Monitoring and reporting

The most important aspect of meeting environmental requirements as well as satisfying licence conditions is monitoring of the effluent and solid waste utilisation system. Annual reporting is a statutory requirement of the EPL.

Monitoring of the effluent irrigation system can be broken down into operational and environmental performance.

13.11.7.3 Operational monitoring

On the operational side, data needs to be collected to assist with day to day decisions regarding:

- irrigation scheduling;
- system management during irrigation to prevent over watering; and
- maintenance of the irrigation system, i.e. regular checking for leaks, blockages, pressure testing etc.

To keep track of operational activities as they occur and of the nutrient balance for the site records shall be kept such as volume irrigated, crop type, mass harvested and removed, stocking rates where applicable.

13.11.7.4 Environmental performance monitoring

The systematic collection of data to quantify the levels of potential pollutants in the receiving environment shall be undertaken to monitor environmental performance. These data provide essential information regarding environmental performance and non-conformances trigger the review of management strategies to ensure that environmental objectives are met.

To ensure that remedial action can be taken early, a suite of sampling and records are recommended as outlined in section 8.7.15. In summary, these include:

- volume of effluent stored and applied;
- effluent quality monitoring;
- soil monitoring;
- groundwater monitoring; and
- climate – rainfall.

Monitoring would be undertaken in accordance with the requirements outlined in the EPL and using techniques outlined in EPA guidelines.

13.11.8 Conclusion

The proposed development shall generate substantial volumes of effluent and solid waste. Effluent would be collected in the controlled drainage area and drain into the sedimentation basin and then into the holding pond. Solid waste shall be scraped from the pen surface and stockpiled in a dedicated storage area within the controlled drainage area.

The characteristics of the waste utilisation areas and their location relative to residences, surface waters, and groundwater have been assessed to identify the constraints to solid and liquid waste utilisation and assist with adopting and implementation of mitigation measures. The key factors governing the suitability of a site for solid and liquid waste utilisation are:

- Topography;
- Soil considerations;
- Proximity of surface and groundwater; and
- Proximity of residences.

It is concluded that topography of the utilisation areas is well-suited to the method of application proposed. The effluent utilisation area has well-graded, uniform slope and effluent shall be applied via surface irrigation.

The characteristics of the soils in the proposed solid and liquid waste utilisation areas are well suited for waste application as they are suitable for irrigated cropping, have moderate to high water holding capacity, not prone to waterlogging within the root zone, can withstand cultivation without incurring significant erosion and are deep well drained. Further, the subject land has been an irrigation property for some time.

The proposed development and associated effluent and solid utilisation areas have been sited and designed to minimise any adverse impacts to groundwater and surface waters. Various mitigation measures include riparian buffers and sustainable utilisation of applied nutrients.

The proposed development has some 116 ha of land available for the utilisation of solid waste. Based on the estimated generation of some 1,780 tonnes (dm) of solid waste per year, some 67% is able to be utilised on-site. The remaining solid waste shall be transported off-site for utilisation on adjoining properties.

The proposed development incorporates on-site utilisation of effluent from the holding pond to land via irrigation. Therefore, a land capability assessment was undertaken to ensure that the utilisation system is sustainable over the long-term. The assessment methodology incorporated a water and nutrient balance approach using the daily time-step model MEDLI.

A sustainable effluent utilisation system will achieve a balance between the use of effluent for irrigation with the nutrient requirements of the crop while protecting the environment from potential pollution. Additionally, the amenity of the surrounding environment and meeting the needs on a social and ecological level are important considerations in sustainability.

The assessment determined that the existing holding pond with a capacity of 15 ML is required to ensure that that overtopping events occur no more frequently than one in 10 years.

The effluent would be shandied with clean water and pumped from the holding onto the effluent utilisation area.

The assessment investigated the soil characteristics and concluded that the soil is capable of absorbing the level of salts and nutrients contained within the liquid waste. The assessment also confirmed the size of the irrigation area (approximately 16 ha) is adequate to sustainably irrigate the effluent.

Overall, the assessment concluded that there is sufficient land available with characteristics suitable for the sustainable application of all the effluent and a proportion of solid waste and that a minimum holding pond capacity of 15 ML is required to ensure that overtopping of liquid waste occurs at an acceptable frequency.

13.12 Traffic and transport

13.12.1 Introduction

An assessment of traffic impacts of the proposed development has been undertaken by RDC engineers Pty Ltd, 2024.

The purpose of this report was to determine the potential traffic impacts resulting from the proposed development and to recommend treatments to mitigate these impacts. The Traffic Impact Assessment is presented in Appendix Q.

The SEARs for the proposed development require an assessment of traffic and transport, including:

- details of road transport routes and access to the site;
- details of road traffic volumes, including consideration of cumulative impacts associated with existing on-site operations;
- an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.

A full summary of the SEARs requirements (including agency responses) are included within Appendix B.

The traffic and transport assessment was undertaken in accordance with the following regulations, methods and guidance documents:

- Austroads Guide to Traffic Management;
  - Part 3: Traffic Studies and Analysis;
  - Part 5: Road Management;
  - Part 6: Intersections, Interchanges and Crossings;
  - Part 12: Traffic Impacts of Development.
- NSW Road Noise Policy; and
- Queensland Government, Transport Noise Management Code of Practice.

The curriculum vitae for each personnel who participated in the Traffic Impact Assessment are provided in Appendix D.

13.12.2 Existing environment

The proposed development is located approximately 14 km by road west southwest of Finley and some 49 km by road east-southeast of Deniliquin and 20 km north-northwest of Tocumwal on the NSW/Victorian border.

Subsequently, an existing local and state road network services these townships and rural properties from both NSW and Victoria as shown in Figure 1 and Figure 44.

The subject land is accessed via Broughans Road from the west via James Road or the east via the Newell Highway.

The principal haulage route to the proposed development by light and heavy vehicles is via the Riverina Highway to James Road to Broughans Road.

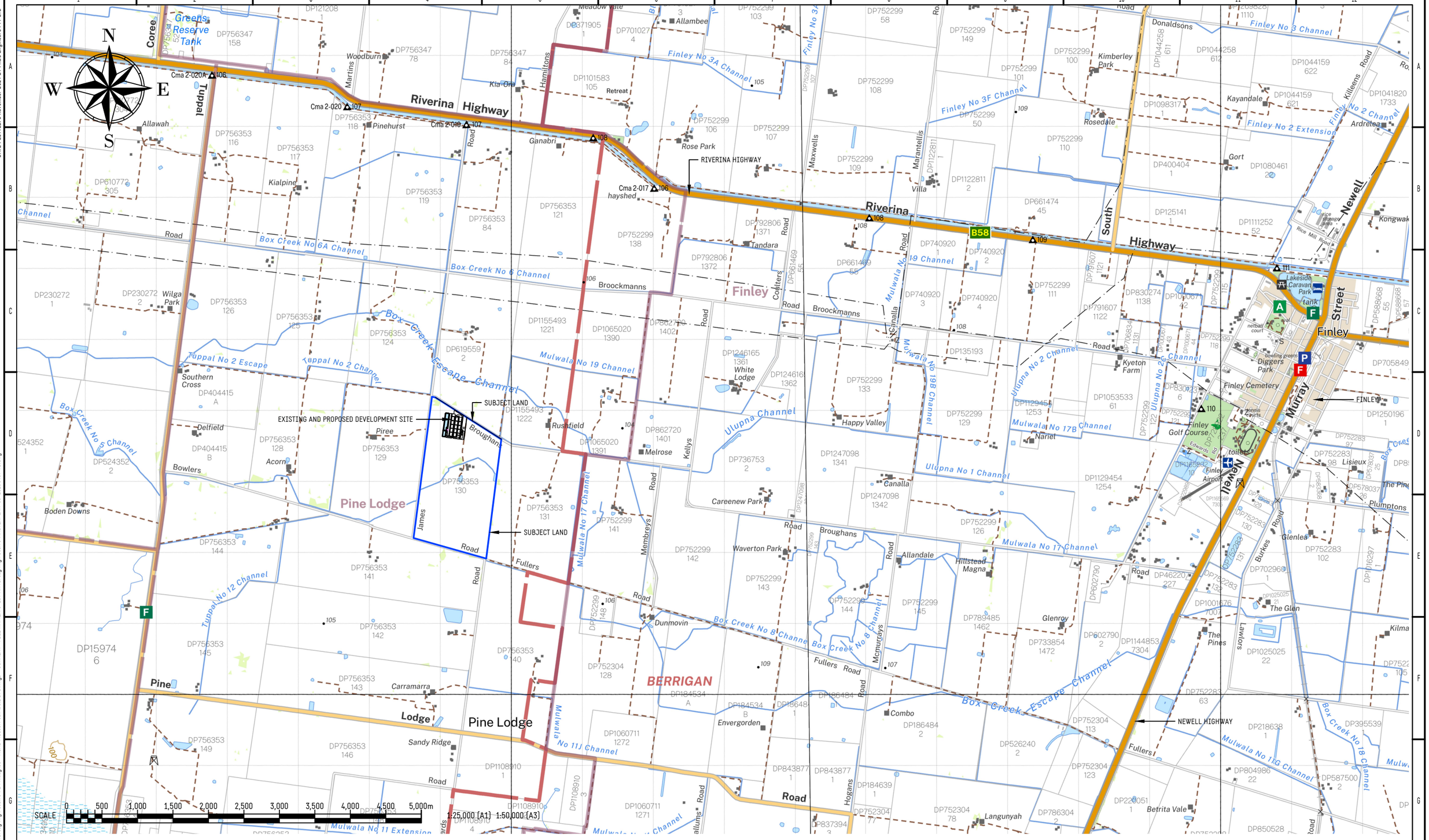
Local access to the proposed development from the south is provided via Bowlers Road onto James Road to Broughans Road or Broughans Road from the east.

Typically, local roads such as Lower Finley Road, Tuppal Road, Woodyards Road will not be used by heavy vehicles generated by the proposed development.

Broughans Road is two-lane, two-way undivided local road about 11.6 km long. Broughans Road provides connection from James Road (CH0 km) to the Newell Highway (CH11.6 km) some 2 km south of Finley. Broughans Road is unsealed from James Road (CH 0 km) to the northern abutment to the culvert crossing over Ulupna Channel (CH 3.9 km) and is bitumen sealed from the southern abutment to the Newell Highway (CH11.6 km).

James Road is two-lane, two-way undivided local road about 5.9 km long. James Road provides connection from the Riverina Highway (CH0 km) to Bowlers Road (CH5.9 km). James Road is sealed for its entire length. Broughans Road intersects with James Road at CH3.9 km. James Road terminates at the intersection with Bowlers Road and runs generally in a north south direction from the Riverina Highway.

The Riverina Highway (Road Number 0000020) and Newell highway (Road Number 0000017) are both classified (State) roads.



LEGEND

- SUBJECT LAND BOUNDARY
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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:50,000 (A3)
DRAWN	RJD
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CLIENT AJ & NA VARLEY

PROJECT PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE ENVIRONMENTAL IMPACT STATEMENT
SUBJECT LAND - EXISTING ROAD NETWORK

REPORT REFERENCE FIGURE 44 | SUPPLIED DRAWING NUMBER | A3 | DRAWING NUMBER F3-107-00-44 | REV. B

DATE PLOTTED: 6 November 2024, BY : RDC Engineers PTY LTD

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13.12.3 Traffic movements and road capacity

13.12.3.1 Traffic generation

13.12.3.1.1. Existing operations

The subject land is currently used for lot feeding of cattle and dryland and irrigated cropping. The existing traffic generation for the subject land site comprises the following:

- Several residential dwellings;
- Beef cattle feedlot (999 head);
- Sheep feedlot (4,000 head); and
- Cropping operations – irrigated and dryland winter and summer cropping (grain / hay / silage).

The type and configuration of vehicles currently utilising the existing development comprise light and heavy vehicles as outlined in section 13.12.3.1.1. James Road and Broughans Road are not approved as a Type 1 Road Train or B-double route. Heavy vehicles in B-double configuration regularly access the existing development under permit.

The estimated existing traffic movements generated by the existing intensive livestock operations on the subject land is some 3vpd comprising 1.24 heavy vehicle movements.

A detailed breakdown of existing traffic movements is provided in the Traffic Impact Assessment (Appendix Q).

13.12.3.1.2. Construction traffic

As discussed in section 8.6, the proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure. Consequently, there is construction phase per se and no construction traffic generated by the proposed development.

13.12.3.1.3. Operational traffic

As discussed in section 8.7, the operation of the proposed development would require frequent deliveries of cattle and feed commodities. Both cattle and feed commodity heavy vehicles would enter the proposed development site via the existing site entrance on Broughans Road.

The trucks would unload their cargo or load their cargo within the receivals/dispatch area in the case of livestock transport vehicles or at the feed storage/processing area in the case of feed commodities. There would be sufficient space within these areas to enable these vehicles to turn around and travel back to the office/weighbridge then along the access road and exit the proposed development site onto Broughans Road in a forward direction.

It is expected that cattle would be delivered to the site in B-double vehicles and feed commodities in either semi-trailers or B-double vehicles.

Additionally, any solid wastes generated from the operation of the proposed development and not utilised on-site would be transported off-site to adjoining land owned by the applicant. The solid wastes shall be stockpiled in the solid waste stockpile area within the controlled drainage area. Internal road network would be used.

It is estimated that the operation of the proposed development would generate on an average daily traffic basis approximately 0.5 livestock transport vehicle movements and some 1.9 vehicle movements for transporting feed commodities.

As discussed in section 8.7.8, it is expected that approximately 4 staff would be employed during the operation of the proposed development. It has been estimated that there would be some 3.8 light vehicle movements (inbound and outbound trips) by development personnel on an average daily traffic basis with 1 staff living on-site in the existing dwelling.

A detailed breakdown of existing traffic movements is provided in the Traffic Impact Assessment (Appendix Q).

13.12.4 Potential traffic impacts

13.12.4.1 Site access

The proposed development shall continue to utilise the entrance that is currently used to access the subject land off Broughans Road as shown in Figure 8. The existing entrance can accommodate the number and type of vehicles servicing the proposed development and therefore does not need to be upgraded. An internal road connects the subject land entrance to the proposed development complex site.

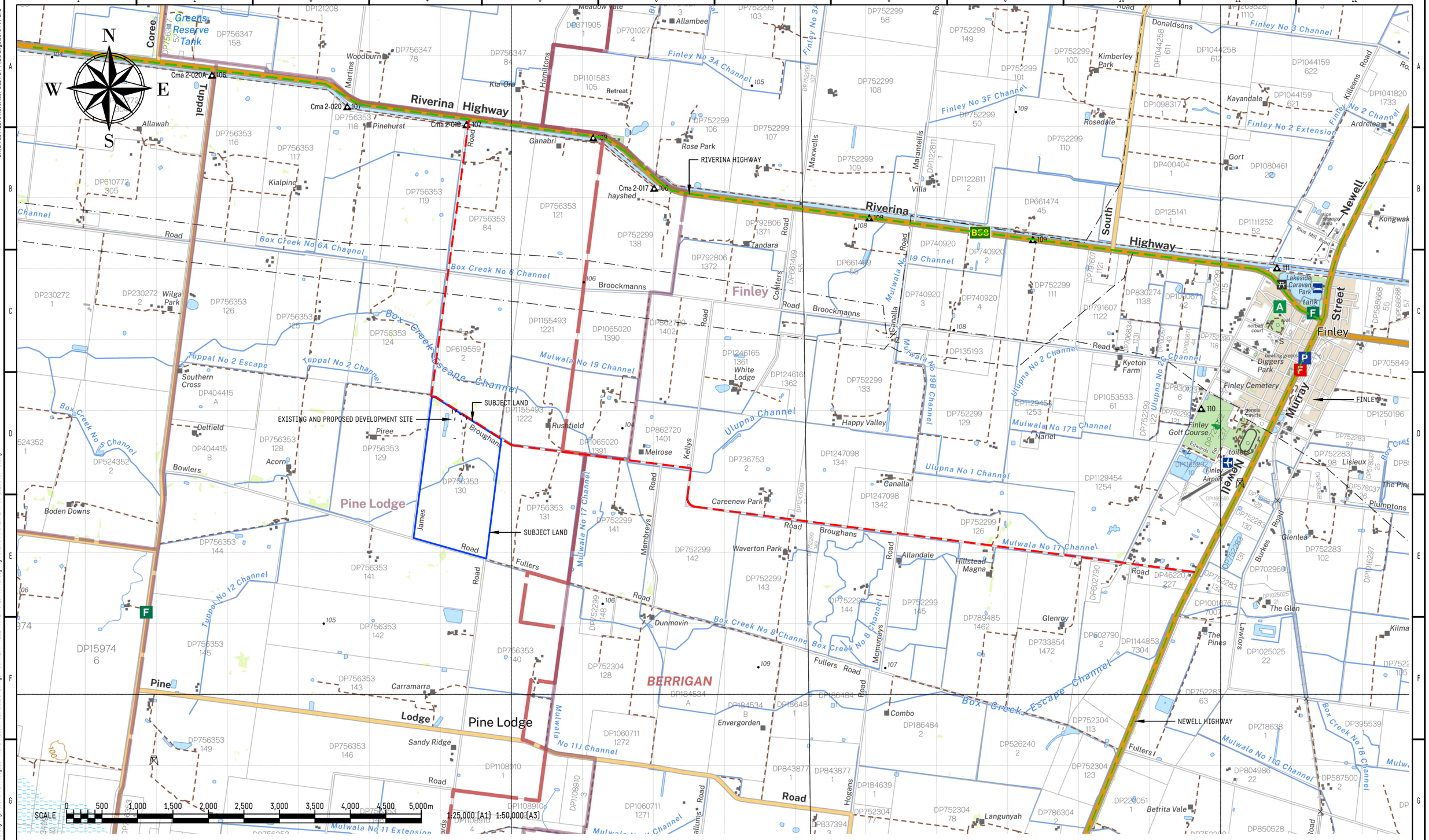
13.12.4.2 Haulage routes

The proposed development shall have several heavy vehicle haulage routes to/from the proposed development site as outlined below.

Haulage Route A will be used by regional heavy vehicles travelling from/to the proposed development site. Heavy vehicles shall travel via the Riverina Highway to James Road to Broughans Road with vehicles entering the development site using the existing entrance onto Broughans Road. Haulage Route A is used by light vehicles, and heavy vehicles in semi-trailer and B-double (under permit) configuration primarily transporting livestock and commodities such as protein (whole cottonseed), roughage (almond hulls), and supplements to the proposed development.

Haulage Route B will be used by regional heavy vehicles travelling from/to the proposed development site from the southeast. Heavy vehicles shall travel via the Newell Highway to Broughans Road with vehicles entering the development site using the existing entrance onto Broughans Road. Haulage Route B is used by light vehicles, and heavy vehicles in semi-trailer and B-double (under permit) configuration primarily transporting livestock and commodities such as grain, protein (canola)), and supplements to the proposed development.

Haulage Route C will be used by heavy vehicles travelling from local properties owned by the applicant to/from the proposed development site. Vehicles travelling from/to these areas shall use the local roads such as Bowlers Road, James Road, Broughans Road (east), Lower Finley Road using the proposed entrance onto Broughans Road. Route B is used by light vehicles, and heavy vehicles in semi-trailer configuration primarily transporting commodities such as grain and straw to the proposed development.



LEGEND

- SUBJECT LAND BOUNDARY
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- HAULAGE ROUTE - LOCAL ROADS
- HAULAGE ROUTE - REGIONAL /STATE ROADS

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CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - HAULAGE ROUTES

REPORT REFERENCE: FIGURE 45 | SUPPLIED DRAWING NUMBER: | A3 | DRAWING NUMBER: F3-107-00-45 | REV.: B

DATE PLOTTED: 6 November 2024, BY : ROC Engineers PTY LTD

FILE PATH: C:\ROC Engineers\RDCE - Projects\F3-107 A and N Varley High Claire FL Finley\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: F3-107 ANVarley High Claire MASTERPLAN-00-20230407 -v8.dwg

13.12.4.3 Construction

As discussed in section 8.6, the proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure. Consequently, there is construction phase per se and no construction traffic generated by the proposed development and therefore no adverse impacts associated with construction.

13.12.4.4 Operational

Operating hours will be applied with any conditions of approval taken into consideration. Staff shall be on-site 24 hours a day, 7 days a week.

Typically, cattle shall be inducted between 7:00 am and 5:00 pm on Tuesday, Wednesday and Thursday between 1:30am to 3:00pm. As far as practical, cattle are transported out of the development to slaughter on Tuesday mornings (6:30am), Wednesday afternoon (4pm) and on Sunday between 12:00 pm and 4:00 pm.

The livestock and commodity deliveries to and from the site would occur between 6:30 am and 5 pm and are expected to be spread over this period to avoid congestion on the site as feed commodities are being unloaded at the feed storage and processing area. Additionally, livestock transport vehicles to and from the site would be scheduled to avoid queuing as cattle are being loaded into the receivals area and inducted into the proposed development.

The calculations for the traffic impact assessment have been based on daily totals of the operation of the proposed development. The majority of operational traffic would be in the form of heavy vehicles transporting cattle and feed commodities.

It is expected that there would be a maximum of 6.7 movements per day for the operational activities of the proposed development based on site personnel of 4 full-time equivalents. This is an additional 3.8 movements per day when compared to the existing development.

13.12.5 Road safety

All heavy vehicles entering the proposed development would access via the site entrance on Broughans Road. Heavy vehicles would then unload/load at the relevant area. Thereafter, the vehicle would turn around utilising the available space, capable of supporting B-double, and exit the site in a forward direction via the access road and exit point on Broughans Road.

In relation to the Riverina Highway / James Road intersection, adequate sight distance is available looking to and from the west for left turning traffic entering from James Road.

Possible improvements to increase driver awareness would be the installation of additional advanced warning road users of traffic entering the site off Broughans Road. This would assist with increasing awareness of the possibility of entering traffic and reduce the risk of collision. This signage should be compliant with AS1742 and AS1906.

13.12.6 Mitigation of impacts

Management and mitigation measures would be implemented to minimise impacts to local and regional road network during the operation phase of the proposed development. These include:

- Access for light vehicles and heavy vehicles be maintained via the existing approved subject land entrances off Broughans Road approximately 405 m and 525 m east of the intersection with James Road to provide sufficient sight distances to and from the intersection.
- Advisory signage (Truck crossing or entering) be implemented on each approach to 58 Broughans Road in accordance with AS1742.2 to advise motorists of truck turning movements.
- A Traffic Management Plan and Driver Code of Conduct shall be implemented to ensure heavy vehicles utilise either Haulage Route A, Haulage Route B or Haulage Route C.

13.12.7 Conclusion

The operation of the proposed development would generate additional traffic movements on the local and regional road network. The site is accessed from Broughans Road.

No upgrades are recommended under proposed additional traffic within the sealed and unsealed sections of Broughan Road, James Road and the Riverina and Newell highways as these roads meet the minimum standard commensurate with existing and proposed traffic volumes. No intersection upgrades to the local or state controlled road network would be warranted due to the low additional volume of development traffic.

13.13 Noise and vibration

13.13.1 Introduction

This section discusses the potential impacts from noise and vibration associated with the proposed development; including mitigation measures when practicable.

The sources of noise emissions from the proposed development include:

- Plant and machinery used to construct the proposed development
- Feed storage and processing equipment (electric motors, conveyors, roller mills) and mobile plant (feed trucks, tractors, front-end loaders etc) during operation of the proposed development.
- Livestock
- Livestock, feed commodity and solid waste transport vehicles both on-site and off-site.

Potential noise impacts are expected to be minimal based on the implementation of a number of mitigation measures, the location of the proposed development and the absence of nearby residential receptors will limit any adverse impacts.

There are no construction activities per se.

The sources of vibration from the operation of the proposed development include:

- Feed processing equipment such as the grain movement and milling system
- Livestock, feed commodity and solid waste transport vehicles.

No blasting, impact pile driving, or jack hammers shall be used during operation.

13.13.2 Noise and vibration assessment guidelines

The Protection of the Environment Operations Act 1997 (POEO Act) and associated regulation Protection of the Environment Operations (Noise Control) Regulation 2017 provides the statutory framework for managing noise and vibration pollution in NSW.

In addition, potential noise and vibration impacts associated with the proposed construction and operational activities are assessed in accordance with the following guidelines:

- Noise Policy for Industry (2017) for the assessment of the operational noise of the proposed development;
- NSW Road Noise Policy (Department of Environment, Climate Change and Water NSW (DECCW), 2011) aims to identify the strategies that address the issue of road traffic noise from: existing roads; new road projects; road redevelopment projects and new traffic-generating developments. The Road Noise Policy also defines criteria to be used in assessing the impact of such noise;

- NSW Environment Protection Authority Draft Construction Noise Guideline (2020) sets out a framework for the management of construction noise that ensures all feasible and reasonable mitigation measures are used to manage impacts;
- NSW *Assessing Vibration: a technical guideline* (DECC 2006) for the assessment of the vibration from the proposed development; and

EPA guidelines not applicable to the development include:

- Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects (2007)

The *Protection of the Environment Operations Act 1997* (*POEO Act*) and associated regulation *Protection of the Environment Operations (Noise Control) Regulation 2017* provides the statutory framework for managing noise and vibration pollution in NSW.

In addition, potential noise and vibration impacts associated with the proposed construction and operational activities are assessed in accordance with the following guidelines:

- NSW EPA *Noise Policy for Industry 2017* (EPA, 2017) for the assessment of the operational noise of the proposed development;
- NSW *Environmental Criteria for Road Traffic Noise* (EPA 1999) for the assessment of the off-site traffic noise on public roads;
- NSW *Interim Construction Noise Guidelines* (DECC 2009) for the assessment of the noise from construction of the proposed development;
- NSW *Assessing Vibration: a technical guideline* (DECC 2006) for the assessment of the vibration from the proposed development; and
- NSW *Road Noise Policy* (Department of Environment, Climate Change and Water NSW (DECCW), 2011) for the assessment of the noise from traffic generated by the proposed development.

A number of EPA guidelines are not applicable to the development including:

- Rail infrastructure noise guideline (DECC 2007)

13.13.3 Understanding noise

Sound may be defined as any pressure variation that the human ear can detect. As the ear responds logarithmically to stimuli, it is more practical to express acoustic parameters as a logarithmic ratio of the measured value to a reference value. This logarithmic ratio is called a decibel or dB. The smallest perceptible change is about 1 dB.

The most common frequency weighting in current use is “A-weighting” providing results often denoted as dB(A), which conforms approximately to the response of the human ear.

For context, Table 61 presents the sound pressure levels of some common sources.

Table 61 – Sound pressure levels of some common sources (Bies and Hansen, 2003)

Sound Pressure Level (dB)	Sound Source	Typical Subjective Description
140	Propeller aircraft; artillery fire	Deafening, Human pain limit
120	rock concert, wood chipper, jack hammer	
110	Large aircraft (150 m over head), Chainsaw (1 m)	Threshold of Discomfort
100	Lawn mower; vehicle horns	Very Loud
80	Road with busy traffic; shouting; Loud radio or TV	Loud
70	Inside a car,	
60	restaurant, voice conversation	
50	Quiet street, whispered speech	Moderate
40	Private office; Quiet residential area	Quiet
20	Unoccupied recording studio; Leaves rustling	Very Quiet
10	Virtual silence audiometric test room	
0	Hearing threshold, quietest audible sound for persons with excellent hearing under laboratory conditions	

The most important factors affecting the way noise travels through the air and how it arrives at the receiver are:

- type of source (point or line)
- distance from source
- atmospheric absorption
- wind
- temperature and temperature gradient
- obstacles such as barriers and buildings
- ground absorption
- reflections
- humidity
- rainfall.

13.13.4 Noise assessment criteria

13.13.4.1 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.13.4.2 Operation

The NSW Industrial Noise Policy (EPA, 2017) provides acceptable ambient noise levels that can be received by rural receptors within an industrial area. The NSW Industrial Noise Policy (EPA, 2017) is designed to assess "industrial noise" using the more stringent of the following two approaches. These are:

- intrusive noise impacts in the short term for residences
- amenity for particular land uses such as residences.

The intrusiveness of a noise source is generally considered acceptable if the equivalent continuous (energy average) A-weighted level of noise from the source measured over a 15 minute period does not exceed the background noise level measurement by more than 5dB(A) for each time period (daytime, evening or night time) of interest.

The amenity criterion is established to limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in the NSW Industrial Noise Policy (NSW EPA, 2017). Table 62 is a summary of the noise levels from NSW EPA (2017) applicable to the sensitive receptors within the area of the proposed development.

Table 62 – Recommended L_{Aeq} noise levels from industrial noise sources (NSW EPA, 2017)

Type of Receptor	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level dB(A)	
			Acceptable (ANL)	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45

Notes: Day: 7.00 am – 6.00 pm / Evening: 6.00 pm – 10.00 pm / Night: 10.00 pm – 7.00 am.

To put this in context, 40 dB is approximately equivalent to the noise from a refrigerator, 45 dB to a quiet conversation (EPA Victoria 2008).

Where there exists the possibility that instantaneous, short-duration, high-level noise events may occur during night-time hours (10.00pm – 7.00am), consideration should be given to the potential for the disturbance of sleep within residences.

As there exists little possibility of instantaneous, short-duration, high-level noise events occurring during night-time hours (10.00 pm – 7.00 am) an assessment of sleep disturbance for the potentially affected noise sensitive receptors has not been considered.

13.13.4.3 Off-site traffic

Criteria for off-site road traffic noise are specified in the NSW Environmental Criteria for Road Traffic Noise (ECRTN) (NSW EPA, 1999). The criteria applicable are summarised in Table 63. The location of the worst potentially affected receptor locations falls under the category of:

- Land use developments with potential to create additional traffic on local road.

Table 63 – Environmental criteria for road traffic noise

Type of Development	Day $L_{Aeq,1hr}$ dB(A)	Night $L_{Aeq,1hr}$ dB(A)	Where criteria are already exceeded
Land use developments with potential to create additional traffic on local roads	55	50	Where feasible and reasonable, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating time of use; using clustering; using 'quiet' vehicles; and using barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.
Notes: Day: 7.00 am – 10.00 pm / Night: 10.00 pm – 7.00 am.			

13.13.4.4 Vibration

Vibration impacts of the construction and operation of the proposed development have not been assessed. Generally, the main activities that could create vibration during construction are driven piling and blasting. However, there are no construction activities per se. No activities during operation of the proposed development are likely to cause vibration impacts.

13.13.5 Existing environment

The proposed development is in a rural area dominated by agricultural activities such as beef cattle grazing and irrigated and dryland cropping. The subject land is a large land holding and the nearest potentially affected noise sensitive receptor locations have been identified from examination of aerial imagery (Google Earth™) and a site inspection. The closest sensitive

receptors are rural dwellings located on the adjoining property some 990 m and 1,130 m from the proposed development respectively, whilst other sensitive receptors being rural dwellings are separated by over 1,200 m. These locations are shown in Table 66 and highlighted in Figure 46. The proposed development is setback from Broughans Road by 20 m.

The main sources of noise in the vicinity of the proposed development are from agricultural activities (tractors, cropping, irrigation pumping etc.) and traffic on James Road and Broughans Road.

Indicatively, Table 64 presents typical background noise levels extracted from AS1055.3–1997 (Standards Australia, 1997a). These are representative of background levels in rural areas and are considered applicable to the proposed development.

Table 64 – Estimated background noise levels (Standards Australia, 1997a)

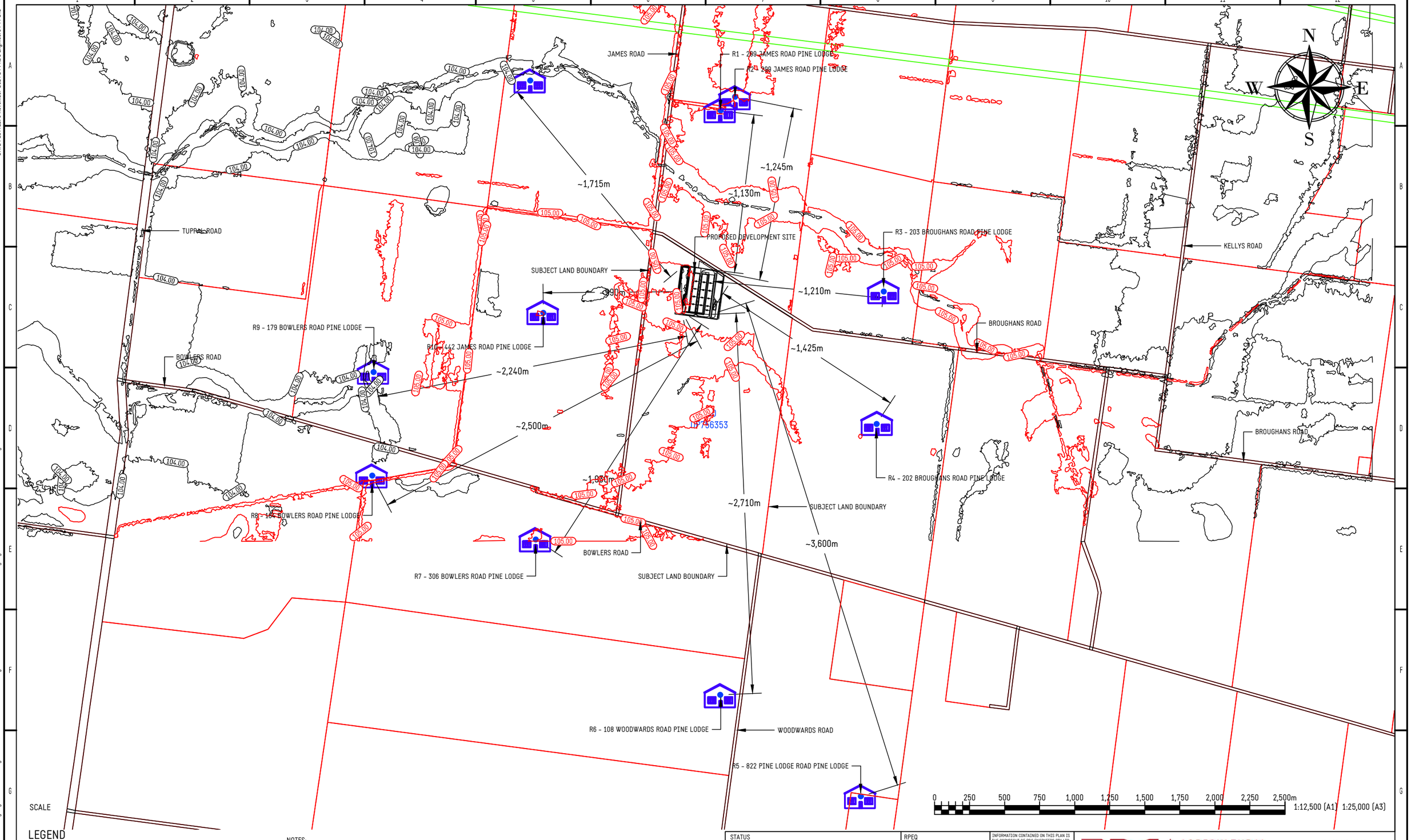
Description of neighbourhood	Average background A-weighted sound pressure level, L_{A90}					
	Monday to Saturday			Sunday and public holidays		
	7 am-6pm	6 pm- 10 pm	10 pm-7 am	7 am-6pm	6 pm-10 pm	10 pm-7 am
Area with low density transportation	40	35	30	40	35	30

Due to the nature of the proposed development and separation distances to sensitive receptors, no noise monitoring was undertaken to define the existing background noise levels in the vicinity of the proposed development.

As such, the following assumptions have been used in the noise assessment:

- There are no significant noise sources in the locality
- Existing background levels would be comparable to those of a typical rural environment.

Subsequently, the minimum background level for rural areas of 30 dB(A) (EPA, 2017) has been used for assessment of noise impacts.



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- RURAL RESIDENTIAL RECEPTOR
- SMALL TOWN RECEPTOR
- STREAM ORDER 1
- STREAM ORDER 2
- STREAM ORDER 3
- STREAM ORDER 4
- STREAM ORDER 5
- STREAM ORDER 6
- STREAM ORDER 7
- STREAM ORDER 8

NOTES:
1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2019, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
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4. HORIZONTAL DATUM - MGA2020 UTM ZONE 55.

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RPEQ

REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL ISSUE FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:25,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

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CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED DEVELOPMENT - SEPARATION TO SENSITIVE RECEPTORS (NOISE)

REPORT REFERENCE: FIGURE 46
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-00-46
REV.: B

DATE PLOTTED: 6 November 2024, BY : RDC Engineers PTY LTD
FILE NAME: F3- 107 ANVarLeg High Claire MASTERPLAN-00-20230407 -v8.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3- 107 A and N VarLeg High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

13.13.6 Assessment of impacts

There is potential for impacts of noise on nearby residences and other sensitive land uses as a result of the operation of the proposed development. There is no construction phase per se.

No receptors are likely to be impacted as a result of the construction and/or operation of the proposed development due to the separation distances from the proposed development and sensitive receptors (single rural residences being a minimum of some 990 m) and lack of certain vibration generating activities (blasting, jack-hammering, piling).

Operation traffic associated with livestock and feedstuffs to and from the development has the potential to result in vibration impacts at residential dwellings adjacent to James Road and Broughans Road. This risk is considered low due to the setback from the road of the residences.

13.13.6.1 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.13.6.2 Operation

Noise generated from the operation of the proposed development would be from the infrequent operation of machinery and equipment on the site and from animal noise.

The proposed development would operate between 6.00 am and 6.00 pm seven days per week, fifty-two weeks a year. Activities including the receipt and dispatch of cattle, feeding, cleaning and maintenance would occur throughout the day. Pens would be periodically cleaned using a front-end loader and the manure placed into compost stockpiles.

Increased noise from cattle would generally occur during loading and unloading of cattle and any situations where cattle may be distressed. Stress impacts upon cattle growth and would therefore be minimised to ensure cattle are healthy and well thereby ensuring optimum growth.

Table 65 below indicates the predicted noise levels during various operational activities associated with the proposed development. Traffic noise and vibration has been considered in the Traffic Impact Assessment (Appendix Q).

Table 65 – Typical sound power level from operational equipment (Department of Planning Transport and Infrastructure (SA), 2014)

Type	Activity	Typical Sound Power Level db(A)
Feed processing plant	Grain movement, processing	95
Truck (<20t)	Ration delivery, solid waste transport	107
Front-end loader	Ration preparation, pen cleaning, solid waste stockpiling/processing	105
Tractor	General activities /	100
Trucks (>20t)	Incoming/outgoing cattle, feed commodities	107

Based on data from Table 65 and predicted A-weighted Sound Power Level at residential receptors (Table 66), noise generation from the operational activities of the proposed development at residential receptors does not exceed the background noise level measurement by more than 5dB(A) for intrusive noise for daytime, evening or night time periods.

Further, noise generation from the operational activities of the proposed development at residential receptors is not expected to exceed the acceptable noise levels for amenity criterion due to the considerable distance between the development site and receivers shown in Table 66, the typical sound power levels of operational equipment (Table 65) and the relatively short periods of continuous activity.

Table 66 – Proposed development - Predicted sound power levels at residential receptors

Receptor	Distance to sensitive receptor	Nearest Activity A-weighted Sound Power Level at Source	Deduction from A-weighted Sound Power Level[1]	Predicted A-weighted Sound Power Level	Compliance with Acoustic Quality Objectives – Night time <40 db(A)
	m	db(A)	db(A)	db(A)	
R1	~1,130	110	75	34	Yes
R2	~1,245	110	76	33	Yes
R3	~1,210	110	76	34	Yes
R4	~1,425	110	78	32	Yes
R5	~3,600	110	88	22	Yes
R6	~2,710	110	85	25	Yes
R7	~1,930	110	81	28	Yes
R8	~2,500	110	84	26	Yes
R9	~2,240	110	83	27	Yes
R10	~990	110	74	36	Yes
R11	~1,715	110	80	30	Yes

Notes: 1. Deduction from A-weighted Sound Power Level obtained from Figure B1 and Table D1 in AS2436-2010 – Guide to Noise Control on Construction, Maintenance and Demolition Sites.

13.13.6.3 Off-site traffic

Increased traffic generation on James Road and Broughans Road would result in an associated increase in traffic noise. The proposed development is expected to generate approximately four (4) vehicle movements along part of Broughans Road and James Road per day as shown in section 13.12.3.1.3 when operational. However, due to the low numbers of existing traffic on this road, the similarity of vehicles generated by the proposed development, those currently using the Broughans Road and the few sensitive receptors within close proximity to the road, the potential increase in traffic noise is not expected to impact upon surrounding receptors. Subsequently, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB at sensitive receptor locations.

13.13.7 Mitigation measures

As discussed in section 13.13.6, noise generation from operational activities of the proposed development at residential receptors is not expected to exceed the acceptable noise levels. However, the implementation of the following management and mitigation measures would further minimise the potential for noise as a result of the proposed development.

13.13.7.1 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

Further, there is no infrastructure to be decommissioned. All infrastructure associated with the existing development shall be maintained and utilised.

13.13.7.2 Operation

The implementation of the following management and mitigation measures would minimise identified potential noise impacts as a result of the proposed development:

- Low-stress cattle handling techniques employed to manage cattle to ensure they are handled quietly and efficiently;
- Carrying out all noisy activities such as feed processing during the standard daytime operational hours;
- Awareness training for staff and contractors in environmental noise issues;
- Minimising the use of horn signals and consideration of alternative methods of communication;
- Switching off any equipment not in use for extended periods;
- Minimising heavy vehicles' entry to site and departure from site outside the nominated operational hours;

- All plant and equipment required would be well maintained and regularly serviced;
- All plant and equipment would be installed with the appropriate noise attenuation apparatus;
- Retrofitting reversing alarms that are quieter and display fewer annoying characteristics;
- Community consultation with local residents to assist in the alleviation of community concerns;
- Maintaining a suitable complaint register. Should noise complaints be received, undertake noise monitoring at the locations concerned. Reasonable and feasible measures would need to be implemented to reduce noise impacts;
- Selection of machines that are inherently free of or have low vibration;
- Vibration-producing machinery shall be supported on stiff structural components, and be provided with efficient vibration isolation systems. Maintenance of plant and equipment machinery – ensuring rotating parts are balanced, vibration isolators are functioning as intended etc.

13.13.8 Conclusion

Activities associated with the operation of the proposed development has the potential to generate noise impacts. Traffic noise on Broughans Road would also be generated from the light and heavy vehicle traffic movements associated with operation of the proposed development.

There are very few residential (sensitive) receptors in close vicinity of the noise sources of the proposed development. These residential receptor locations are shown in Figure 14, with the nearest residential receptor located approximately 990 m away from the proposed development.

It is predicted that no receptor shall be potentially impacted by vibration as a result of the operation of the proposed development due to the large separation distances from the proposed development and sensitive receptors, the topography and landform and lack of certain vibration generating activities (blasting, jack-hammering, piling).

Operational activities involve noise generating equipment such as feed storage and processing equipment (electric motors, conveyors, roller mills) and mobile plant (feed trucks, tractors, front-end loaders etc) on-site. Due to the significant distance to the nearest sensitive receptor and as the operational activities of the proposed development are consistent with the activities of the existing agricultural activities of the surrounding area, the noise generated from the proposed development is not expected to create a significant impact on the surrounding environment.

As there will be no variation in vehicle types and relatively low increase in traffic volumes using the existing road corridor for the existing feedlot compared to the volumes currently utilising the Broughans Road/James Road/Riverina Highway any local receptors on the route will not experience a significant increase in total traffic noise above that set out in the NSW Road Noise Policy.

13.14 Visual

This section of the EIS provides an assessment of the potential visual impacts of the proposed development on the existing landscape and visual values of the surrounding area, specifically in relation to impacts on the community and scenic and landscape values of the area.

The visual impacts of the proposed development, including both short-term and long-term impacts, have been assessed with methodologies developed in accordance with best practice as guided by Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute, 2002). Such methodologies are not provided in any formal regulatory guideline but for the purposes of this EIS, include:

- An assessment of the existing visual settings created by various landscapes in and around the proposed development;
- Establishing the visual character and visual effect created by the proposed development;
- A consideration of the visibility of the proposed development from sensitive receptors;
- The likely visual impacts created by the proposed development giving regard to visual effect and sensitivity;
- The development of available preliminary mitigation strategies to ameliorate adverse visual impacts; and
- Consideration of cumulative visual impacts in the locality and includes a consideration of night light effects.

13.14.1 Assessment methodology

13.14.1.1 Introduction

The methodology to determine the level of visual impact of the proposed development on the scenic and landscape values of locality and region involves four stages as follows:

1. The identification and evaluation of the existing visual environment. This stage involves a review of existing landscape settings and how they are seen from various viewing locations. In this way, the visual character of the landscape (as well as visual sensitivity of the various viewing locations) can be determined. Developing an understanding of proposed development's landscape character will help to ensure that development is well situated, sensitive to its location, and the potential impacts associated with the proposed development are mitigated where possible.

2. The identification and evaluation of the visual effect and the visual sensitivity of the proposed development on the existing visual environment. Visual effect and visual sensitivity are assessed by considering the visual characteristics of the proposed development in the context of the landscape within which it is seen.

3. A combined consideration and analysis of both the visual sensitivity of the visual environment and visual effect of the proposed development on that visual environment.

4. A consideration of the impact on landscape values based on the total perception of landscape, including sight, smell, sound, touch, as well as knowledge and personal perceptions based on a wide range of input factors. In this step, evaluation of these components includes a consideration of the landscape of the locality and its context in the region and how the relationship of the landscapes and the proposed development may be perceived in the broader context of perceptions of the Central Murray River region.

5. An overview of mitigation strategies and the objectives of reduced visual effects, sensitivity and visual impacts.

6. A description of how the study method is implemented which includes evaluation of plans and reports, using a joint consideration of all the analysis techniques summarised to outline view sheds, sensitive receptors, visual sensitivity and visual effect.

13.14.1.2 Evaluation of the existing visual environment

The evaluation of the existing visual environment consists of the assessment of both the existing landscape setting and viewing locations within it that may be impacted by the proposed development. The visual sensitivity assessment area extended some 2 km radius from the proposed development. The assessment area is based on the extent of the closest sensitive receptors in relation to the proposed development complex site.

13.14.1.3 Landscape setting

The landscape setting of the proposed development in terms of topography, vegetation, hydrology and land use features. These elements define the existing visual character of the landscape that the proposed development is located within and that it visually interacts with. Within any landscape there are areas of similar visual features that are defined as a Landscape Character Unit (LCU). Characterising the landscapes in terms of these units assists in understanding the visual character of the landscape as a whole. The LCUs are defined within the Primary Visual Catchment (PVC), which is the area from which there may be potential views of proposed development elements.

The scenic amenity of the various LCUs is defined as ‘distinctive’, ‘common’, ‘minimal’, or ‘disturbed’.

Distinctive LCUs are of regional significance and have unique scenic amenity values in terms of topography, vegetation, geology, hydrology and /or various cultural or heritage features. In addition, these areas would have a high visual integrity with no detracting features. These landscapes will also have unique form, shape, line and / or colour, geological, vegetation or hydrological features.

Common LCUs are areas that have visual integrity but are not uncommon or unique. These landscapes will have visually pleasing patterns, shapes, lines and / or colours (e.g. rural areas).

Minimal LCUs can have a high integrity but often lack visual interest. These landscapes will be common but will also lack visual variety of form, shape, line or colour (e.g. open grassland with scattered trees).

Disturbed landscapes lack visual integrity with intrinsic values of form, shape, line colour and texture significantly compromised (e.g. open-cut mining areas, industrial infrastructure). Disturbed landscapes are those that have been modified and would require some form of management to reinstate scenic amenity and restore integrity to surrounding landscapes (e.g. open-cut mining areas).

13.14.1.4 Viewing locations

The viewing locations are those areas where people are likely to obtain a view of the proposed development. These viewing locations have different significance based on numerous factors, collectively evaluated through land use, landscape characteristics and viewing distance to the Project. Viewing locations could include residences, roads, commercial and recreational areas as well as urban and rural areas.

13.14.1.5 Visual magnitude

Visual magnitude is a measure of the level of visual contrast and integration of the proposed development with the existing landscape. The degree of this contrast with the existing landscape will determine the level of visual effect. A new development will have a higher visual effect due to strong contrast with the existing visual environment. Extensions to the operations of an existing development will have a lesser visual effect due to elements of the development being present in the landscape.

13.14.1.6 Visual sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different land use areas in the vicinity of a development.

13.14.1.7 Visual impact

The visual impact of the proposed development has been determined by considering both visual magnitude and visual sensitivity.

13.14.2 Existing environment

13.14.2.1 Topography

The topography of the region is characterised by a wide alluvial floodplain of the Murray River. The terrain is described as flat with intermittent very low rises with localised remnant vegetation cover. As such there is a minimal degree of topographic relief resulting in a largely horizontal landscape aesthetic. Any vertical relief generally comes from the presence of trees, rural dwellings and associated infrastructure.

13.14.2.2 Drainage

The proposed development is located within the Central Murray River (NSW) catchment. The surface water environment in the surrounding area is dominated by the Murray River located some 16 km to the south of the subject land, and man-made the and the irrigation distribution channels (Tuppal Channel, Box Creek No 5 Channel and Mulwala No 17 Channel) and stormwater escape system (Box Creek Escape Channel). The Box Creek Escape Channel ultimately enters the Edward River. The Edward River flows westwards to ultimately become the Murray River.

There are no creeks or streams within or adjoining the subject land and the entire property is currently developed for surface irrigation, ensuring there is access to on-property drainage. There are no waterbodies on the site apart from surface irrigation infrastructure such as on-farm supply channels and irrigation tail water reuse channels.

Box Creek No. 5 Canal intersects the southern half of the subject land. Mulwala No. 17 Channel borders the subject land to the north-east. Tuppal Channel borders the subject land to the north-west.

13.14.2.3 Land uses

Rural land uses dominate the surrounding area and includes beef cattle and sheep grazing, dairying, existing beef feedlot on the subject land and irrigated and dryland cropping lands. The area is also scattered with built infrastructure that supports these activities such as machinery/hay storage sheds, livestock handling facilities, dairy and shearing sheds and rural residences other associated infrastructure.

Single rural dwellings are scattered on rural properties throughout the region and a number of these surround the subject land. The applicant owns several adjoining and neighbouring properties.

The surrounding land holdings are of similar size in area to the subject land on which the development is proposed. These land holdings are generally partitioned and identifiable due to the different types of rural infrastructure, including unsealed roads, landscape buffers, tree plantings, and fencing. Additional property separation exists due to the presence of the Murray Irrigation Limited's network of channels and canals.

The visual character of these land uses is representative of a moderately topographic features and linear irrigated alluvial plains of the Finley district. Farm residential settlement is sparse but continuous with most properties including one or more land parcels. Views are considered to be consistently similar in all directions and involve land uses of a similar nature to the subject land, that being irrigated cropping and livestock raising.

Dense undisturbed vegetation is rarely encountered in the subject landscape. Small localised pockets of open woodland remain on the more elevated and isolated knolls that rise above the floodplain.

13.14.2.4 Towns

Townships in the locality including Finley and Tocumwal approximately 10km directly to the east and 17 km directly to the south southeast respectively and Deniliquin some 35 km to the west. These towns are screened from views of the proposed development by intervening topography and vegetation.

The Finley Township represents one of the principle visual receptors due to its broad scale and its north-south alignment. However, due to its distant proximity to the subject land, and the presence of screening vegetation, there are no views to the subject land.

13.14.2.5 Rural residences

Rural residences are rather well spread out, reflecting the larger land holdings in this region. The residences are generally located setback from the road frontage and are not often orientated to long distance views. Rather, most residences are surrounded by homestead gardens and mature trees that to various extents limit long distant views. These residences are spread along all major and minor roads in the locality.

13.14.2.6 Roads, rail, industry

Major and minor roads surrounding the proposed development comprises of the Riverina Highway to the north and the Newell Highway to the east.

There are no mining / industrial sites or rail infrastructure currently located within the region. The Finley Solar Farm is located some 4 km to the east of the subject land and is the predominant industrial use in the area.

13.14.3 Primary visual catchment

The distinctly vast and open landscape character of area results in a locale with a significantly broad visual catchment. The dominance of agricultural development and infrastructure has resulted in a characteristic linear composition of the landscape and a distinct landscape character of the surrounding area as shown in Photograph 9.

Photograph 9 – Surrounding area – Landscape character

13.14.3.1 Visual character of subject land

The landscape of subject land has been shaped by impacts commonly associated with historical agricultural development in the area. These impacts are primarily the almost complete clearing of remnant vegetation communities and the establishment of an extensive network of irrigation channels and associated infrastructure. This development allowed for the growth in irrigated pastures and cropping in the area facilitating livestock grazing and cropping operations. This disturbance includes tree clearing, pasture improvement, weed invasion and edge effects. The current vegetation pattern is very scattered stands and isolated remnants of mature native trees within an otherwise extensively developed agricultural landscape.

The visual character of the northern area of the subject land is characterised by the built infrastructure of the existing beef cattle feedlot development as shown in Photograph 10.

The subject land has a high visual exposure due to the flat nature of the terrain and minimal landscaping.

Photograph 10 – Subject land – Visual character of site from Broughans Road

13.14.4 Proposed development

As the proposed development shall use the built infrastructure of the existing development the potential visual effect shall be the same post-development as pre-development.

From a visual perspective, the development elements outlined in section 8.1 can be divided into major and minor elements. Major elements have the potential for significant visual effect in relation to external views. Minor elements, although not necessarily insignificant in horizontal scale have a less significant visual effect due to lack of vertical scale and potential for visual projection beyond their immediate boundaries.

Major development elements, include:

- Production pen area,
- Solid and liquid waste management infrastructure; and
- Feed storage and processing infrastructure.

Minor development elements include:

- Water supply, storage and reticulation infrastructure;
- Cattle handling infrastructure;
- Administration/Maintenance infrastructure;
- Mobile equipment

- Development entry and access road;
- Communications and electricity reticulation infrastructure.

The location of these elements is illustrated in Figure 6.

13.14.4.1 Visual effect

The built infrastructure has a large horizontal and low (fences) to medium (buildings, shade structures) vertical scale. The built infrastructure will create a high visual effect for those areas that have views towards this feature in the landscape. However, as previously outlined the proposed development shall use the built infrastructure of the existing development which has been established for over 15 years.

Areas that do not have views of the proposed development will not be visually impacted

13.14.4.2 Visual sensitivity

There is a limited range of potentially sensitive viewing locations within the PVC (Figure 14). These include the rural residences, roads, limited tourist facilities/recreation areas and agricultural areas.

13.14.4.2.1. Rural residences

There are a number of rural residences spread throughout the PVC. Residences are associated with the various grazing and cropping farms in the PVC.

There are few residences that would have views and moderate to high sensitivity. The majority of residences are unsighted due to intervening topographic and vegetation features. Any views of the proposed development from these locations would have a low visual sensitivity. Further, the proposed development shall use the built infrastructure of the existing development which has been established for over 15 years.

13.14.4.2.2. Roads

There are three local roads within the PVC. These pass through agricultural and pastoral landscapes. These include:

- Broughans Road - local route east-west from Newell Highway through agricultural pastoral areas;

- Bowlers Road – bounds the subject land to the south. The proposed development is 1.5km to the north of Bowlers Road; and

- James Road – intersects Broughans Road and travels in a north-south direction to the Riverina Highway.

Broughans Road and James Road will have moderate to low sensitivity to the proposed development. Broughans Road being immediately adjacent proposed development will have

high sensitivity. Broughans Road serves as the local connector road. The proposed development site will be viewable from the road but these views will be limited in extent and duration for travellers along Broughans Road. The proposed development is not expected to be able to be seen from Bowlers Road which is 1.5 km to the south.

Some built infrastructure, like silos, maybe viewable from Bowlers Road however, onsite vegetation may screen the infrastructure. Beyond this, the proposed development will not be visible from either the Riverina Highway or the Newell Highway and will have lower sensitivity due to increased viewing distance, intervening topographic and vegetation features.

13.14.4.2.3. Public reserve area

The nearest mapped reserves found on the NSW Crownland Reserve Manager directory are located at

- Mapped reserved at Tuppal Road, land registration No. R22797, 300 south-east of the Delmenicos-Tuppal Road intersection, 6km south-south west;
- Mapped reserve 'Myrtle Park' land registration No. R50439, at Coree Road-Riverina Highway intersection, 5.8km north-west;
- Mapped reserve land registration No. R14491, Riverina Highway, 8.9km west;
- Finley caravan park and lake on the corner of Newell Hwy and Riverina Hwy Finley; and
- Barooga community centre reserve at 12-18 Gromley Court Barooga.

There are several public reserves within 9 km of the proposed development but no mapped public reserves in the immediate vicinity of the proposed development. Public reserve areas are frequented by campers and have a high sensitivity to changes in landscape based on existing views to surrounding rural lands. Any development elements that may be seen from a public reserve are likely to be screened by remnant vegetation in the landscape.

13.14.4.2.4. Protected and conservation areas

Murray Valley National Park and the Murray Valley Regional Park are 35 km to the south of the proposed development outside the PVC. There are no other NSW National Parks and Wildlife Service (NPWS) promoted bushwalks or camping areas closer to the proposed development.

Subsequently, the Murray Valley National Park and the Murray Valley Regional Park national park would have low visual sensitivity.

13.14.4.2.5. Rural lands

The predominant land use within the PVC is agriculture uses such as irrigated and dryland cropping and pasture.

All of these pastoral/ agricultural areas in the PVC have a low visual sensitivity.

13.14.5 Potential impacts

13.14.5.1 Visual receivers

The surrounding area to the proposed development comprises agricultural land with the main activity being irrigated and dryland cropping. As shown in Figure 14, there are few residences located within 5 km of the proposed development site and it was considered appropriate that the residences identified in the Odour Impact Assessment (section 13.1.5.1) were used as visual receivers.

Each identified visual receiver was assessed with respect to:

- View type from the receiver (e.g. permanent or intermittent views);
- Distance from the receiver to the proposed development; and
- Sensitivity of the receiver (e.g. residences have a higher sensitivity than a road user).

No mitigation measures outside the proposed development (off-site) are proposed. Existing vegetation/tree lines shall remain.

As indicated in Table 67, it was established that all viewing opportunities do not have direct views to the proposed development and would not be visually impacted by the development.

The flat terrain of the study area, the tree lines within the site and the relatively low profile of the proposed infrastructure would result in the proposed development being hidden from view from the rural dwellings to the west, south, north and east of the site.

The proposed development complex shall be visible from Broughans Road. However, views to the proposed development would generally be of short duration and seen from moving vehicles. The closest rural residence is some 990 m from the proposed development and views from that residence towards the proposed development are partially blocked by existing vegetation. Views towards the proposed development from other rural residences would be also obscured by existing vegetation and the distance of the viewer.

Generally, there are three main factors contributing to the lack of a direct view of the proposed development. The primary factor is due to the amount of scattered vegetation in the area between each receiver and the proposed development and immediately surrounding rural dwellings. This vegetation obstructs the view of the majority of the potential surrounding viewpoints. Secondly, the considerable distance between the receiver and the proposed development minimises the probability of a sensitive view of the proposed development. Thirdly, the siting of the proposed development adjacent to Broughans Road and the flat topography of the surrounding areas ensures that no sensitive view of the proposed development complex can be obtained other than from road frontages

Table 67 – Proposed development – Viewpoint analysis

Identifier	Type of Viewer	Distance to development complex	Type of View	Sensitivity	Magnitude	Impact
R1	Rural Residence	~1,130	Obstructed	High	Negligible	Low
R2	Rural Residence	~1,245	Obstructed	High	Negligible	Low
R3	Rural Residence	~1,210	Obstructed	High	Negligible	Low
R4	Rural Residence	~1,425	Obstructed	High	Negligible	Negligible
R5	Rural Residence	~3,600	Not visible	High	Negligible	Negligible
R6	Rural Residence	~2,710	Not visible	High	Negligible	Negligible
R7	Rural Residence	~1,930	Not visible	High	Negligible	Negligible
R8	Rural Residence	~2,500	Not visible	High	Negligible	Negligible
R9	Rural Residence	~2,240	Not visible	High	Negligible	Negligible
R10	Rural Residence	~990	Not visible	High	Negligible	Negligible
R11	Rural Residence	~1,715	Not visible	High	Negligible	Negligible
R12	Finley	~11,000	Not visible	Negligible	Negligible	Negligible
R13	Tocumwal	~20,000	Not visible	Negligible	Negligible	Negligible
Broughans Road	Road users	~20	Visible	High	Negligible	Medium
James Road	Road users	~225	Visible	Medium	Negligible	Low
Protected/conservation areas	Public	~4,100	Not visible	Negligible	Negligible	Negligible

Photograph 11 – Proposed development – View from Broughans Road (site entrance)

Photograph 12 – Proposed development – View from James Road

13.14.6 Assessment of impacts

This section considers the visual impact of the proposed development based on visual sensitivity values of receptors and visual effects of development elements. The visual sensitivity levels of the proposed development were discussed in section 13.14.4.2. The visual effects of the various elements of the proposed development were discussed in section 13.14.4. The impact will vary according to the visual effect of the proposed development, its visibility, and the visual sensitivity of areas from which it is seen.

13.14.6.1 Visual absorption capacity

Visual absorption capacity is the level of visual contrast of the proposed development to the context in which it is placed. The existing landscape does include small patches of remnant vegetation between the receptor to the west south-west and south-east of the proposed development complex. These vegetation communities will impact on the ability of receptors in these directions to see the proposed development complex.

The subject land consists of open cultivated areas on an extensive generally flat floodplain that does include small remnant patches of scattered trees and grassy woodland areas.

It is considered that the proposed development is consistent with the nature of the agribusiness undertaken in the local area. As such, the elements associated with the proposed development are generally consistent with infrastructure usually associated with these agricultural activities.

It is considered that the amount of vegetation in the area of the proposed development, the flat topography of the flood plains and the distance between the receivers and the proposed development minimises the potential visual impact due to the visual absorption capacity of the existing environment.

13.14.6.2 Viewpoint assessment

The proposed development shall use the built infrastructure of the existing development and therefore the potential visual impact shall be the same post-development as pre-development.

As discussed in section 13.14.5.1, there are several possible sensitive visual receivers to the proposed development. Due to the topography of the landscape and level and form of existing vegetation, no residential receivers would experience any level of visual impact as a result of the proposed development.

All of the selected viewpoints, as shown in Table 67, would experience no visual impact.

13.14.6.3 Impact of night lighting

Generally, the proposed development shall not operate at night. However, as outlined in section 8.7.12, the proposed development requires illumination of a number of elements within the complex for activities that may be undertaken outside of daylight hours if required. However, these activities are likely to be ephemeral.

Consequently, visual impacts emanating from light sources are low to negligible of sensitive receptors primarily treatments and normal light management through directional lighting and hooding will further reduce light spillage from active work areas.

13.14.7 Mitigation measures

As discussed in 13.14.6, the proposed development is not expected to impact on the visual amenity of sensitive receivers or the landscape character of the area in the immediate vicinity.

The mitigation measures incorporated in the design and operation for the proposed development will reduce the visual effect and mitigate the visual impact of the proposed development on sensitive viewing locations.

The implementation of the following management and mitigation measures would further reduce the visual impact:

- Provision of adequate separation distances between the proposed development and sensitive receivers as shown in Figure 14;
- Directional lighting on elevated infrastructure; and
- The implementation of woodland and scattered tree planting patterns to emulate existing treed and grassland landscape patterns that provide colour and texture continuums in the existing landscape for infrastructure areas and access road.

13.14.8 Conclusion

There are several receivers surrounding the proposed development as indicated in Table 67, with the closest residential receivers located some 990 m from the proposed development. The proposed development complex is located immediately adjacent to the property boundary adjoining the local access road, Broughans Road.

The visual impact of the proposed development from these viewpoints were assessed by taking into account the visual absorption capacity of the proposed development and the types of views experienced from these viewpoints. The type of view took into account the type of viewer, the nature of the view and also the distance to the proposed development.

As a result, the viewpoint assessment indicated that there was expected to be negligible visual impact from the proposed development apart from travellers along Broughans Road and James Road to a lesser extent. However, visual impacts for users along these roads will be temporary.

The proposed development complex will be viewable by road users immediately in front of the existing complex but views further afield will be limited in extent and duration for users along Broughans Road. The proposed development is not expected to be able to be seen from Bowlers Road which is 1.5 km to the south or the Riverina Highway or the Newell Highway.

The assessment deemed that the nature of the proposed development would be consistent with the existing intensive animal development on the subject land. It is considered that the proposed development would assimilate into the local landscape due to the nature of the development and the high visual absorption capacity of the surrounding landscape.

Overall, it is expected that the proposed development would not create any visual impacts to receivers in the surrounding area.

Based on the results of the viewpoint analysis, no landscape treatment have been proposed to reduce the impacts to road users due to the flat terrain and to allow adequate airflow for cattle during the warmer months.

13.15 Pest plants and animals

13.15.1 Introduction

Biosecurity relates to preventive measures designed to reduce the risk of transmission of infectious diseases, invasive pests or weeds or contaminants which may impact on the economy, environment, community or animal human health.

The *Biosecurity Act 2015* provides the statutory framework for managing biosecurity risks in NSW.

Pest plants and animals have the potential to become established as a result of the proposed development. Biosecurity risks shall be managed in accordance with the general biosecurity duty and the proposed development's relevant environmental management plans.

13.15.2 General Biosecurity Duty

The NSW Biosecurity Act 2015 is built around shared responsibility between government, industry and the people of NSW working together to protect NSW from biosecurity risks.

Consequently, any person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised. This is known as the general biosecurity duty.

The general biosecurity duty can apply to more than one person in relation to the same biosecurity risk, for example an owner and a manager may both be responsible for managing a particular biosecurity risk on the subject land.

The subject land is part of the Murray Local Land Services region and as such is subject to the strategic regional pest plant and animal initiatives of the Murray Regional Strategic Pest Animal Management Plan (Murray Region of Local Land Services, 2024). The overall goals of the plan are to

- reduce the impacts of pest animals within the Murray region on production, the environment and the community;
- improve community engagement and expertise in pest animal management; and •
- improve monitoring and reporting of pest animal management activities.

The pest species prioritised for action within the Murray Region are:

- European fox;
- Wild dog;
- Feral cat;
- Wild horse;
- Feral goat;
- Wild rabbit;
- Feral pig;
- Common carp; and
- Wild deer.

Pest animals can be defined as native or introduced, wild or feral, non-human species of animal that is currently troublesome locally, or over a wide area, to one or more persons, either by being a health hazard, a general nuisance, or by destroying food, fibre, or natural resources.

The problems caused by pest animals vary but include; competing with native wildlife for food and habitat; preying on livestock and wildlife; grazing pressure on pastures, crops and native plant communities. They may also spread weeds, contribute to erosion, waterway degradation and become nuisances to human activities which may, in turn, be responsible for stress in rural communities. Human and animal diseases may also be introduced and spread through these animals.

Weeds are non-native plant species that are in the early stages of establishment and have the potential to become a significant threat to biodiversity if they are not managed. Weeds are often grouped in categories depending on their characteristics and impacts with many occurring in more than one category. Categories include:

- Noxious weeds;
- Weeds of National Significance;
- National Environmental Alert List Weeds;
- Water weeds;
- Native plants considered weeds; and
- Non-saleable weeds.

13.15.3 Assessment of impacts

Whilst, the local area has been colonised by a range of pest animals such as foxes, feral pigs and feral goats and weeds, the potential for the proliferation and spread of these weeds and pest animals or introduction and invasion of other weeds or pest animal species is an important consideration for the proposed development.

As the proposed development has no construction activities per se, the biosecurity risk from the movement and transport of machinery, equipment and people to the site is negligible.

The operation of the proposed development requires the movement and transport of livestock, feed commodities, and people to the site. Subsequently, these activities are potential vectors for the introduction of weeds if not effectively managed. The key activities to be managed include:

- Movement of livestock, feed commodities and vehicles
- Pen cleaning, drain and sedimentation basin cleaning
- Solid waste (manure, carcasses, spoilt feed, human waste) handling, storage, processing and movement
- Movement of solid wastes
- Feed storage and processing
- Ration delivery, spoilage and spillage.

Incoming livestock and grains and roughages can carry weed seeds from other areas. Weeds can be easily imported from different regions or states because livestock and fodder can travel significant distances by road within a 24-hour period.

13.15.4 Mitigation measures

The implementation of the following management and mitigation measures shall minimise identified potential impacts from pest animals and weeds as a result of the operation of the development:

- A 'mitigation hierarchy' of first avoiding, then minimising and then mitigating the impact shall be adopted;
- Timely control of initial weed populations around the proposed development, such as, around sheds and buildings, along roadsides, cattle receival facilities/holding yards, along fence lines, drainage structures, in tree plantings etc. Weeds in these areas experience little competition and can produce large quantities of seed;
- Control of weeds around the proposed development also reduces any potential fire hazard. Control shall be achieved by regular mowing or herbicide application. Knockdown or residual herbicides (or a combination of the two) shall be used depending on whether the weeds have emerged, the time of year and the weeds present;
- Prior to importing livestock and /or feed commodities (grains, roughages) from known weed infestation areas (e.g. parthenium weed), the weed status of materials and vehicles shall be determined from the supplier;
- Aquatic weeds in water storages shall be controlled via mechanical and/or chemical means. Chemical control shall be undertaken with considerable care, considering the identity of the weed, the effect of herbicides on desirable plants, fish and other aquatic life and the eventual use of the water;

- A pest management program shall be implemented to control pest animal species already present, using acceptable methods as well as identifying potential pest species, their likely distribution and methods to prevent their spread;
- Wild dog, feral pig, fox and vermin pest species populations near the proposed development shall be monitored;
- Established pest animals shall be controlled, and their spread prevented;
- Pest animal control programs shall use the most humane, target specific, cost effective and efficacious techniques available;
- Mice and rat populations will be mitigated:
    - primarily through the solid waste management schedule outlined in Table 21 (i.e. minimise feed wastage and spillage to minimise likelihood of attracting vermin)
    - implementing a baiting program if the vermin population reaches a nuisance level.
- Fly breeding sites shall be mitigated using measures such as:
    - Integration of design features, such as pen foundation and slope to facilitate pen drying, wide feed bunk and water trough aprons and wide fence panels, to make cleaning aprons, under fences and drains that are known potential breeding sites easier or more effective;
    - Several control methods such as biological, chemical and physical methods following integrated pest management (IPM) principles shall be used;
    - Best practice sanitation methods such as solid waste management practices (pen cleaning, under-fence cleaning) and schedules as outlined in Table 21 to minimise fly breeding sites;
    - Controlling weeds and keeping grass and other vegetation short, particularly around pens, drains, sedimentation systems and holding ponds makes it more difficult for flies to find resting places and reduces the vegetation–manure interface, a preferred breeding substrate for stable flies.
- Composting carcasses shall be covered with manure; and
- Human waste shall be managed appropriately and in accordance with any relevant statutory requirements.

13.15.5 Conclusion

AJ and NA Varley are aware of their general biosecurity duty as per Part C of the *Biosecurity Act 2015*. That is "a*ny person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised".*

The operators of the feedlot will ensure the management of pest plants and animals is done in collaboration and consultation with The Murray Local Land Services agency and agency associated strategies such as the Murray Regional Strategic Pest Animal Management Plan 2018-2023, landholders, natural resource management bodies and the government.

An integrated approach to pest plant and animal management shall be implemented based around the important elements of weed hygiene, operational hygiene, prevention of infestations, arresting weed outbreaks using effective reporting and physical or chemical control procedures, documenting weed and pest animal infestations, compliance with relevant local land service plans and auditing management programs.

In summary, the proposed development is not expected to impact the surrounding environment in particular the soils, waterways and loss of biodiversity from the introduction and/or spread of pest animals and/or weeds provided the mitigation measures outlined in section 13.15.4 are implemented.

13.16 Resource use

13.16.1 Introduction

Various resources would be required to operate the proposed development and associated infrastructure. Water and energy are the predominant resource requirements for operation.

Water and energy are essential inputs for a beef cattle feedlot operation. However, there are increasing pressures to improve the efficiency of water and energy usage to reduce costs and meet regulatory requirements.

Energy is fundamental to a feedlot production system with a reliable energy supply required to operate and maintain feed and water supply to the cattle and for waste management. Furthermore, in recent years, there has been a substantial increase in the cost of energy.

Beef cattle feedlots use energy directly as fuel or electricity to operate machinery and equipment, to heat or cool buildings, for lighting and office equipment and indirectly through incoming and outgoing cattle and commodity delivery.

Water availability and cost of supply is changing rapidly, driven by increased demand for industry, urban water supply and the environment. With droughts adding to low river flows, water supplies are very tight in many regions of Australia.

Water is both the most important feed component fed to cattle and the most valuable natural resource after land in Australia. Water is required at the proposed development for cattle drinking water, cleaning of water troughs, evaporation and other losses from water troughs and pipes, evaporation from open water storages, feed processing, staff amenities, dust control and dilution of effluent for irrigation.

13.16.2 Resource use impacts

Various resources would be required to operate the proposed development and associated infrastructure including the following:

- Materials such as fuels and lubricants associated with operation of machinery and motor vehicles;

- Water to service the water demands of livestock and hygiene practices; and
- Electricity to service the electrical demand of plant and equipment.

While increasing scarcity of resources and environmental impacts are emerging from the use of nonrenewable resources, the supply of the above materials is not currently limited or restricted. In the volumes required, the proposed development is unlikely to place significant pressure on the availability of local or regional resources.

13.16.2.1 Energy consumption

During operation, direct energy usage is primarily diesel fuels to operate vehicles, trucks, tractors and other mobile machinery for feed delivery, waste management and administration. The range of equipment expected to be used includes excavator, box scraper, wheeled front-end loader, tractor, water cart, body trucks as shown in Table 25.

Vehicles utilised by employees travelling to and from the proposed development would also consume petrol or diesel fuel.

During operation, electricity shall be used to power grain processing equipment, water supply and cattle processing equipment. Electricity is used for lighting, heating, and cooling in the administration office.

The predominant energy sources shall be 3-phase electric power and diesel fuel. Single-phase power and petrol fuels shall also be used in lower quantities.

13.16.2.2 Water use

During operation of the proposed development water is required or used for:

- cattle drinking water;
- cleaning of water troughs;
- evaporation and other losses from water troughs and pipes;
- evaporation from open water storage (turkey nest);
- cleaning of cattle handling yards for general hygiene purposes;
- dust suppression;
- staff amenities; and
- dilution (shandying) of effluent.

13.16.3 Assessment of impacts

13.16.3.1 Energy

13.16.3.1.1. Operation

Davis et al (2010a; 2010b) measured actual energy usage within individual activities at a number of beef cattle feedlots representative of geographical, climatic and feed management systems within the Australian feedlot industry. The activities measured included water supply, feed management, waste management, cattle washing and administration and minor activities (cattle management and repairs and maintenance).

They found that total annual energy usage ranged from 444 MJ/head-on-feed to 1483MJ/head-non-feed with the total energy usage primarily dependent on the type of feed processing system in use. Dry processing of grain is the least intensive energy system. Electricity requirements are likely to be in the order of 444 MJ/head-on-feed. This equates to an annual usage in the order of 1,420,800 MJ or about 385 MWh per year for the size of the proposed development.

The subject property has an existing 3-phase electricity supply to operate existing feed processing equipment. The existing supply does not require upgrading.

Any potential electricity network constraints have not been investigated. The impacts of the proposed development relating to the consumption of electrical energy are considered to be negligible and comparable to average yearly demand of about 10 MWh per capita in NSW (Haylen, 2014).

13.16.3.2 Water

13.16.3.2.1. Operation

Davis et al (2010b) measured actual water usage within individual activities at a number of beef cattle feedlots representative of geographical, climatic and feed management systems within the Australian feedlot industry. The activities measured included water supply, feed management, waste management, cattle washing and administration and minor activities (cattle management and repairs and maintenance). They found that total water usage ranged from 13 to 20.5 ML/1000 head-on-feed depending on geographic location.

As outlined in section 8.7.3, the total annual water demand for the proposed development is estimated to be 41 ML when at a full capacity of 3,200 head.

The subject property has existing entitlements for groundwater and surface water as outlined in section 13.3 and 13.4 of 400 ML of groundwater entitlements and 273 ML of surface water entitlements from Mulwala No 17 Murray Irrigation Limited. A proportion of these existing allocations shall be used as a source of water for the proposed development.

Consequently, as there is a secure and adequate water supply available to meet the predicted operational needs, no adverse impact is predicted as a consequence of meeting the proposed development water needs.

If an extreme drought event were to occur which placed pressure on availability there is a fall-back capacity for the proponents to transport water to site or reduce livestock numbers during operation.

There is also an intent to capture stormwater from roof structures as may be available for incidental use, such as landscaping.

13.16.4 Mitigation measures

As discussed in 13.16.3, a number of resource use and waste generation impacts were identified. The implementation of the following management and mitigation measures would minimise identified impacts to resource use and waste generation as a result of the proposed development:

- Modern and well maintained equipment is to be used to encourage fuel efficiency;
- Renewable energy utilised where practical;
- Stormwater from roof structures captured for incidental uses; and
- Water efficiency measures implemented where practical.

13.16.5 Conclusion

The operation of the proposed development would result in resource consumption predominantly as energy in the form of electricity and fuel and water.

While increasing scarcity of resources and environmental impacts are emerging from the use of nonrenewable resources, the supply of the required resource materials are not currently limited or restricted. In the volumes required, the proposed development is unlikely to place significant pressure on the availability of local or regional resources.

13.17 Hazards and risks

13.17.1 Introduction

A review of State Environmental Planning Policy (Resilience and Hazards) 2021 was undertaken to assess whether the SEPP applies to the proposed development. The NSW Planning Portal Spatial Viewer indicates that the State Environmental Planning Policy (Resilience and Hazards) 2021 is a relevant planning control to the subject land. The applicable mapped triggers under SEPP (Resilience and Hazards) 2021 is Chapter 3 - Hazardous and offensive development.

SEPP Resilience and Hazards applies to proposed developments falling under the definition of "potentially hazardous" industry or "potentially offensive" industry. A beef cattle feedlot is a "potentially offensive" industry as when in operation if no measures to reduce or minimise its impact on the locality have been implemented, a polluting discharge (for example, odour, solid/liquid waste management) may be emitted in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.

The proposed development is defined as "Intensive livestock agriculture" and not within the definition of "hazardous industry" or "hazardous storage establishment" under the Edward River LEP 2013.

A development considered potentially hazardous requires a Preliminary Hazard Analysis (PHA) if the storage or transport of dangerous goods exceeds screening thresholds specified in SEPP (Resilience and Hazards) 2021. A preliminary risk screening assessment for the proposed development in accordance with section 3.11 of SEPP (Resilience and Hazards) 2021 was undertaken and confirms that dangerous goods stored on site do not exceed screening thresholds specified in SEPP (Resilience and Hazards) 2021 The preliminary risk screening assessment report is provided in Appendix N. Therefore a preliminary hazard analysis is not required.

However, other hazards and risks involved with the proposed development include:

- Risks to human health and safety
- Risks to animal health
- Other risks to the biophysical environment.

13.17.2 Human health and safety

Disease which is naturally transmissible from animals to people is classified as a zoonosis. More than 200 zoonoses have been identified involving all types of agents, bacteria, parasites,

viruses, prions, fungi and others. Zoonoses are common and the diseases they cause can be serious.

Zoonotic diseases can spread through a variety of means such as working closely with livestock or by coming in contact with soil or water contaminated by animals. In Australia, the two most common and important zoonoses diseases are Q Fever and Leptospirosis.

Q Fever is primarily a risk to workers in the livestock, agriculture, veterinary and meat industries, and therefore has been considered as part of this assessment for the proposed development.

Q Fever is an infection resulting from the organism *Coxiella burnetii*, and was first identified in Australia in the 1930s and the infection became known as "Query" fever as the cause of the illness was then unknown. Q Fever is caused by a small bacterium-like organism that multiplies inside the cells of various organs of infected cattle.

Coxiella burnetti can also exist in a variety of domestic and wild animals without the animal displaying apparent signs of infection. In Australia, *Coxiella burnetti* is maintained in the wild by kangaroos, bandicoots and rodents. Domestic animals such as goats, cattle and sheep and their ticks also often carry the organism.

Humans are infected by breathing the organism in droplets or dust contaminated by the placenta, birth fluids, faeces or urine of infected diseases.

The *Coxiella burnetti* organism is very resilient and it has the ability to withstand harsh environmental conditions. It has been found to be resistant to heating, drying and sunlight and to survive for more than a year at 4°C in a dried state (O'Neill, 1997).

Leptospirosis is a contagious disease which infects both animals and humans. It is caused by bacteria called *Leptospira*. There are over 200 different strains of *Leptospira* found worldwide, with infections being most prominent in areas that have a hot and humid climate. Leptospirosis is considered an occupational hazard for many people who work outdoors or with cattle, for example farmers, veterinarians, abattoir workers, and therefore has been considered as part of this assessment for the proposed development.

In NSW, there are two strains of *Leptospira* that are frequently identified in dairy and beef cattle:

- *Leptospira hardjobovis; and*
- *Leptospira Pomona.*

Both the strains may also cause severe illness in humans.

Leptospira bacteria occurs most commonly in cattle (and pigs), rodents and wild animals. They colonise the kidneys of infected animals and, in females, they also colonise the reproductive tract.

Leptospirosis is also spread in contaminated water supplies, food, pastures and soil. Many infected animals do not display any illness. These apparently healthy carriers are the main source of infection for other cattle as well as for humans. The bacteria can live for a long time in surface fresh water, damp soil, vegetation and mud, but are very quickly killed on dry soil or by sunlight (Zelski, 2007).

The organism is present in the urine of infected animals and enters the human body through damaged (e.g. scratched and abraded) skin or through linings of the eyes, mouth or nose.

13.17.3 Animal welfare and disease management

13.17.3.1 Animal health

The welfare of cattle is an important consideration to maximise cattle growth and productivity and thus profitability. The main potential risk to cattle health in a feedlot environment is disease as animals reside in close contact. The main causes of feedlot disease are:

- nutrition – deficiencies or excess;
- infections; and
- injuries.

The illnesses and diseases which affect cattle, particularly in feedlots include:

1. Nutritionally-based diseases;

    - Deficiency of energy – pregnancy toxaemia, ketosis, fatty liver, poor weight gain or weight loss;
    - Excess of energy – acidosis, rumenitis, polioencephalomalacia, nutritional diarrhoea
    - Deficiency of minerals (calcium) – transport tetany;
    - Deficiency of dietary fibre – indigestion, acidosis, feedlot bloat, inanition, liver abscesses, dietary diarrhoea; and
    - Excess of rough, unpalatable, indigestible fibre – impaction, poor weight gain and production.

2. Infectious diseases;

    - Respiratory infections/ pneumonia – runny noses, fever, depression and rapid breathing;
    - Bovine Ephemeral Fever (3-day Sickness);
    - Foot rot and foot abscess;
    - Pink Eye;
    - Diarrhoea (infectious); and
    - Ringworm.

3. Stress diseases;

    - Heat stress; and
    - Transport stress.

13.17.4 Biophysical environment

Risks to the biophysical environment would include the impacts of pests, odour, dust and solid and effluent and solid waste utilisation on the receiving environment.

13.17.5 Assessment of impacts

13.17.5.1 Human health

Q Fever and Leptospirosis are debilitating diseases. These infections are important and continuing public health problems in rural areas. Workers employed at the proposed development are at risk of contracting leptospirosis during normal cattle handling activities.

Q Fever and Leptospirosis illness may last for weeks or months, forcing the affected person to take considerable time off work. Relapses are common, with a 'washed out' feeling which may persist for months. Leptospirosis infection can cause serious problems for pregnant women and can prove fatal to a human foetus.

Leptospirosis in humans is a notifiable disease in Australia.

Subsequently, due to the mitigation and management measures proposed, the proposed development is not expected to impact on human health.

13.17.5.2 Animal health and disease management

The welfare of cattle is an important consideration to maximise cattle growth and productivity. Therefore, the proposed development has been designed to the highest of animal welfare and disease management standards and would be operated to ensure that the health and wellbeing of cattle is maintained and the potential for disease and spread of disease minimised.

Cattle for the proposed development may be sourced from multiple sources (markets or properties) and hence are high risk for introduction and spread of disease. The main causes of disease in lot-fed cattle are:

- nutrition – deficiencies or excess;
- infections; and
- injuries.

There are various health disorders routinely encountered in beef cattle feedlots. These can be broadly categorised as:

- Disease in special at-risk groups – new arrivals, fat cattle, late pregnancy/calving cows;
- Disease caused by faulty feeding or feedstuffs – acidosis, impaction, indigestion, bloat;
- Disease caused by faulty handling or faulty facilities – injuries, wounds, heat stress; and
- Disease caused by infectious agents – viruses, bacteria, internal or external parasites.

Heat stress is a significant animal welfare issue in beef cattle feedlots. Heat stress occurs when an animal cannot effectively control body heat and the body temperature rises to dangerous levels leading to reduced feed intake, poor production and, if not adequately controlled, death. There are several factors that can influence heat stress in feedlot cattle. These include:

- high humidity and air temperature over an extended period;
- an accumulation of manure within the pen;
- poor drainage and air circulation;
- lack of effective shelter;
- lack of options to reduce body temperature in the animal; and
- breed effect, with *Bos taurus* cattle recognised as more susceptible to heat stress.

Maintaining animal health and preventing disease in the proposed development is going to depend greatly on the experience of:

- stockmen – who have to be both skilled animal handlers and observers;
- consulting veterinarian; and
- animal nutritionist.

13.17.5.3 Biophysical environment

An assessment of odour and dust, and measures proposed to minimise these impacts have been considered and outlined in section 13.1.

An assessment of effluent and solid waste management and measures proposed to mitigate these impacts have been considered and outlined in sections 13.2 and 13.11.

An assessment of pest animals and weeds, and measures proposed to mitigate these impacts have been considered and are outlined section 13.15.

Assessments of the impacts to surface water and groundwater along with measures proposed to mitigate these impacts have been considered and outlined sections 13.3 and 13.4.

Assessment of the impacts to terrestrial ecology along with measures proposed to mitigate impacts has been considered and outlined section 13.8.

13.17.6 Mitigation measures

The implementation of the following management and mitigation measures shall minimise identified potential impacts from hazards and risks as a result of the operation of the proposed development:

- Maintaining animal health through biosecurity and animal health programs, including the use of vaccines, plays an important role in reducing the risk of zoonotic diseases;
- Development and implementation of a Health and Safety Management Plan that covers the risks for employees associated with operational activities such as general safety for working with plant, equipment and livestock;
- All personnel working with or handling animals shall take precautions to minimise the risk of infection from animal-borne diseases. Because different zoonotic diseases behave differently, avoiding specific infections requires an individual approach. The following practices shall be implemented to provide a high level of general protection;
    - Good personal hygiene practices such as washing hands after handling animals and before preparing or eating food or smoking cigarettes shall be implemented;
    - Hygienic food preparation: Food-borne diseases can be largely avoided through correct processing and hygienic food preparation;
    - Personnel shall be vaccinated for those zoonoses for which vaccinations are available, for example Q Fever;
    - Personal protective equipment such as gloves, boots and aprons or overalls shall be worn when handling animals. Cuts and scratches shall be covered with waterproof plasters;
    - Pest animals such as rats or feral pigs can carry zoonotic diseases and control programs will reduce the likelihood of transmission to people;
    - Employees are trained to understand the mechanisms of disease introduction and spread, including via cattle, feedstuffs, people, vehicles, machinery and equipment, feral animals and wildlife, and solid and liquid waste;
    - Development of a preventive herd health plan to help prevent and treat animal health shall be developed in conjunction with a veterinarian;
    - Implementation of herd management systems that support rapid and accurate trace-back and trace-forward of livestock;
    - Livestock are vaccinated against major preventable diseases;
    - Early identification of animal health issues through daily monitoring, observation and assessment of livestock for a range of key behavioural indicators. Experienced stockmen are usually very good observers, and less experienced staff shall be trained in observation techniques;
    - Accurate diagnosis of animal health issues backed by the local veterinarian;
    - Separation of sick cattle into hospital/treatment pens for treatment and convalescing;
    - Prudent use of antibiotics to manage infectious disease, reduce livestock pain and suffering, and to minimise losses due to disease; and

    - Destruction and disposal of infected and exposed susceptible animals.
- Accredited development under the National Feedlot Accreditation Scheme (NFAS). Subsequently, welfare issues will be adequately covered in the feedlots' Quality Assurance manuals, which are given both off-site and field audits.
- Development and implementation of a heat stress management plan to mitigate excessive heat stress events. The plan should include procedures and equipment for dealing with an excessive heat load event including:
    - regular removal of manure;
    - diet changes to reduce metabolic heat produced during digestion;
    - more frequent water changes to ensure cool, good quality water is available at all times;
    - provision of additional shade and activation of additional cooling (irrigation) equipment;
    - trigger points for when to activate the plan; and
    - for example during periods of prolonged high temperature and humidity, or forecasted extreme weather conditions.
- Provision of shade structures over production pens;
- Sufficient capacity of water required to supply cattle; to clean vehicles, yards etc; and for general hygiene is available on-site;
- Sufficient capacity of feed required to supply cattle is available on-site;
- Implementation of best practice solid and liquid waste management techniques including regular cleaning of pens, drains and sedimentation basin of manure and composting of mortalities; and
- Preparation of a contingency plan to manage the disposal of large numbers of mortalities.

13.17.7 Conclusion

There are some potential hazards and risks associated with the operation of the proposed development. The assessment has identified potential risks to human health and safety, potential risks to animal health and potential risks to the biophysical environment.

The main human risk is the potential for contracting a zoonootic disease (such as Q Fever and Leptospirosis) which may be acquired by personnel coming into contact with airborne particles created from tissue and waste from infected animals or dust.

The preparation and implementation of a Health and Safety Management Plan for the operational activities at the proposed development would manage the risks for employees such as general safety for working with machinery and cattle, including methods of managing the potential to acquire a zoonootic disease.

The proposed development also has the potential to impact upon the health of the animals through injury, infections and/or heat stress created from the climatic conditions.

Mismanagement of the proposed development would also adversely impact upon the welfare of the animals and thus their productivity.

The proposed development would be accredited under the NFAS. NFAS accreditation incorporates third-party audits of management measures aimed at preserving the welfare of the animals.

The biophysical environment would also be potentially impacted by the proposal, in particular odour, effluent and solid wastes. Sections 13.1.4, 13.2, 13.3, 13.4, 13.8 and 13.11 assess the potential impacts to these biophysical elements and outline measures to be implemented in order to minimise potential adverse impacts.

In summary, the proposed development is not expected to create significant hazards or risks to humans, animals or the biophysical environment provided the mitigation measures outlined in section 13.17.6 are implemented.

13.18 Land use

The proposed development shall be located in a rural area on land comprising an area of about 198 ha which is rectangular in shape with the northern edge truncated. The subject land is bounded on the west by James Road, on the south by Bowlers Road, on the north by Broughans Road, and on the east by rural land comprising irrigated and dryland cropping and beef cattle grazing.

The Riverina Highway is 3.8 km to the north and the Newell Highway is approximately 11 km to the east of the subject land.

The subject land is serviced by irrigation channels and has been historically used for irrigated and dryland cropping; beef cattle grazing and intensive livestock agriculture and is located in a rural area which encourages agricultural uses.

13.18.1 Surrounding land use

The subject land is in the Finley region, a prime agricultural region of the southern Riverina in New South Wales. The site is approximately 14 km by road west southwest of Finley and 20 km north northeast of Tocumwal.

The area is considered a prime agricultural region of the eastern Murray Basin of New South Wales. Agriculture in the general area is dependent on the existing irrigation system comprising irrigation canals. The irrigation system in the NSW Murray Valley was developed by the NSW Government between the 1930s and 1960s. It remained under government control and operation until 1995 when it was privatised under the irrigator-owned company Murray Irrigation Limited. The subject land and surrounding locality have historically been utilised for a variety of agricultural enterprises, including beef cattle grazing and dryland and irrigated broadacre cropping, and a small number of intensive animal industries such as beef cattle feedlots. Agricultural production continues to dominate the current land use practices in the locality. There are few other land uses such as solar farms, mining and gas exploration, rural and residential developments and recreational and conservation areas. The Ramsar Wetlands known as the NSW Central Murray State Forest and Barmah Forest are about 35 km to the south-west of the subject land.

The subject land on which the development is proposed is situated in the Central Murray River Valley to the north of the Murray River. The surrounding land uses include:

- Rural;
- Rural residences;
- Infrastructure/services; and
- Recreation (National Park, River activities).

13.18.1.1 Rural

Rural land uses dominate the surrounding area and include land used for beef cattle and sheep grazing and irrigated and dryland cropping. The area is also scattered with infrastructure that

supports these activities such as sheds, livestock handling facilities, shearing sheds and rural residences.

The surrounding land holdings are of similar size in area to the subject land on which the development is proposed.

The Finley Solar Farm is located some 4.0 km to the east of the subject land.

13.18.1.2 Transport infrastructure

The subject land is located on the southern side of Broughans Road. James Road is located on the western side of the subject land and Bowlers Road is located on the southern side. The Riverina Highway is about 4.0 km north along James Road from the subject land. The Newell Highway is approximately 11 km to the east via Broughans Road.

13.18.1.3 Service infrastructure

The subject land on which the development is proposed is connected to the electricity network grid and serviced by overhead electricity infrastructure as shown in Photograph 13.

Photograph 13 – Subject land – Overhead electrical supply

13.18.1.4 Recreation

The proposed development complex is separated from the nearest protected or conservation area, being the Murray Valley National Park and the Murray Valley Regional Park, by a minimum of some 35 km.

The Murray Valley National Park and The Murray Valley Regional Park were established to protect the river red gum forests of the Riverina Ramsar listed wetland. These parks host a

unique ecosystem with over 60 threatened native animals and 40 threatened plant species. The parks are suitable for drive touring, bushwalking, fishing, boating, birdwatching and camping.

13.18.1.5 Proposed land use

The proposed development would continue, but intensify, the existing rural land use of the subject land.

13.18.2 Assessment of impacts

13.18.2.1 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 5 and Figure 6.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

13.18.2.2 Operation

The operation of the proposed development would substantially intensify the agricultural activities on the site, with some 3,200 head of cattle to be located within the proposed development at full capacity.

Operation of the proposed development would provide employment for some 4 full time equivalent personnel. Noise, odour and traffic have the potential to affect surrounding land users. Measures would be implemented to minimise noise and odour and increases in traffic are not expected to significantly affect receivers adjoining Broughans Road.

The proposed development will not require any water supply in addition to that already permitted by entitlements held in accordance with the NSW Murray River Alluvium Groundwater Source and Murray Irrigation Limited.

13.18.3 Conclusion

It is considered that the proposed development is consistent with the surrounding land uses of the area. The operation of the proposed development is not expected to create significant impacts to the surrounding land uses. The implementation of management measures to mitigate air quality, noise, biodiversity, pest animals and weeds are summarised in sections 13.1, 13.2, 13.3, 13.4, 13.4, 13.8, 13.11, 13.13 and 13.15 would minimise the potential for the proposed development to adversely affect the surrounding environment.

13.19 Bush fire and incident management

13.19.1 Bush fire

13.19.1.1 Introduction

The SEARs for the proposed development requires an assessment of hazards and risks associated with bush fires and incidents.

The bush fire assessment was undertaken in accordance with the following regulations, methods and guidance documents:

- *Rural Fire Act 1997*;
- Guide for Bush Fire Prone Land Mapping (NSW RFS 2015);
- Mid Murray Zone Bushfire Risk Management Plan (NSW RFS 2011); and
- Planning for Bushfire Protection guidelines (NSW RFS 2019).

13.19.1.2 Existing environment

13.19.1.2.1. Bush fire prone land

Vegetation on and surrounding the proposed development complex is extensively cleared. Vegetation totalling an area of approximately 4.5 ha in two patches is centrally located on the relevant land. Category 1 and Category 2 vegetation generally defines what land is considered to be bush fire prone.

Category 1 vegetation is defined under the RFS's Guide for Bush Fire Prone Land Mapping (NSW RFS 2015) as:

- areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations;

Category 2 vegetation is defined as:

- Rainforests;
- Lower risk vegetation parcels. These vegetation parcels represent a lower bush fire risk to surrounding development and consist of:
  - Remnant vegetation;
  - Land with ongoing land management practices that actively reduces bush fire risk. These areas must be subject to a plan of management or similar that demonstrates that the risk of bush fire is offset by strategies that reduce bush fire risk; and include:
    - Discrete urban reserve/s;
    - Parcels that are isolated from larger uninterrupted tracts of vegetation and known fire paths;
    - Shapes and topographies which do not permit significant upslope fire runs towards development;
    - Suitable access and adequate infrastructure to support suppression by firefighters;

- Vegetation that represents a lower likelihood of ignitions because the vegetation is surrounded by development in such a way that an ignition in any part of the vegetation has a higher likelihood of detection.

Category 3 vegetation is defined as:

- Grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands.

Vegetation excluded from being mapped as bush fire prone includes:

- Single areas of vegetation less than 1 hectare in area and greater than 100 metres separation from other areas of Category 1, 2 or 3 vegetation;
- Multiple areas of vegetation less than 0.25 hectares in area and not within 30 metres of each other;
- Strips of vegetation less than 20 metres in width, regardless of length and not within 20 metres of other areas of Category 1, 2 or 3 vegetation;
- Areas of "managed grassland" including grassland on, but not limited to, recreational areas, commercial/industrial land, residential land, airports/airstrips, maintained public reserves and parklands, commercial nurseries and the like;
- Areas of managed gardens and lawns within curtilage of buildings;
- Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.
- Managed botanical gardens;
- Agricultural lands used for annual and/or perennial cropping, orchard, market gardens, nurseries and the likes are excluded;
- Saline wetlands including mangroves; and
- Other areas that, due to their size, shape and overall risk are not considered Category 1, 2 or 3 vegetation.

13.19.1.2.2. Mid Murray Bushfire Risk Management Plan

The NSW RFS's Mid Murray Zone Bushfire Management Committee has prepared a bushfire risk management plan for the Mid Murray which covers Edward River Shire Council LGA. The plan identifies community assets at risk from bush fire and describes treatment measures for those assets. There are no community assets identified in the plan in or adjacent to the proposed development area. The assets identified are categorised as human settlements (towns or villages, residences/schools and hospitals), economic (silos, power lines), environmental (RAMSAR wetlands, plantations), and cultural (Aboriginal places of significance).

The nearest human settlement is the town of Finley. The nearest economic asset to the site is Jerilderie grain storage and handling facility. The nearest environmental asset is considered to be the Tuppal State Forest approximately 35 km to the south west of the subject land. The nearest cultural asset listed in the risk management plan is the Yanco Homestead Kidman Way, Jerilderie.

13.19.1.2.3. Edward River Shire Council

The land on which the proposed development complex is proposed is mapped as bush fire prone land by the Edward River Shire Council. The area is mapped as Orange – Vegetation Category 1. Category 1 vegetation is defined by the RFS's Guide for Bush Fire Prone Land Mapping (NSW RFS 2015) as outlined in section 13.19.1.2.1. This guide provides the details for the mapping of bush fire prone land as required under section 146 of the EP&A Act. It is to be used by the NSW RFS, councils, and those involved in the mapping of urban release areas. Figure 47 shows the bush prone land overlay on the subject land.

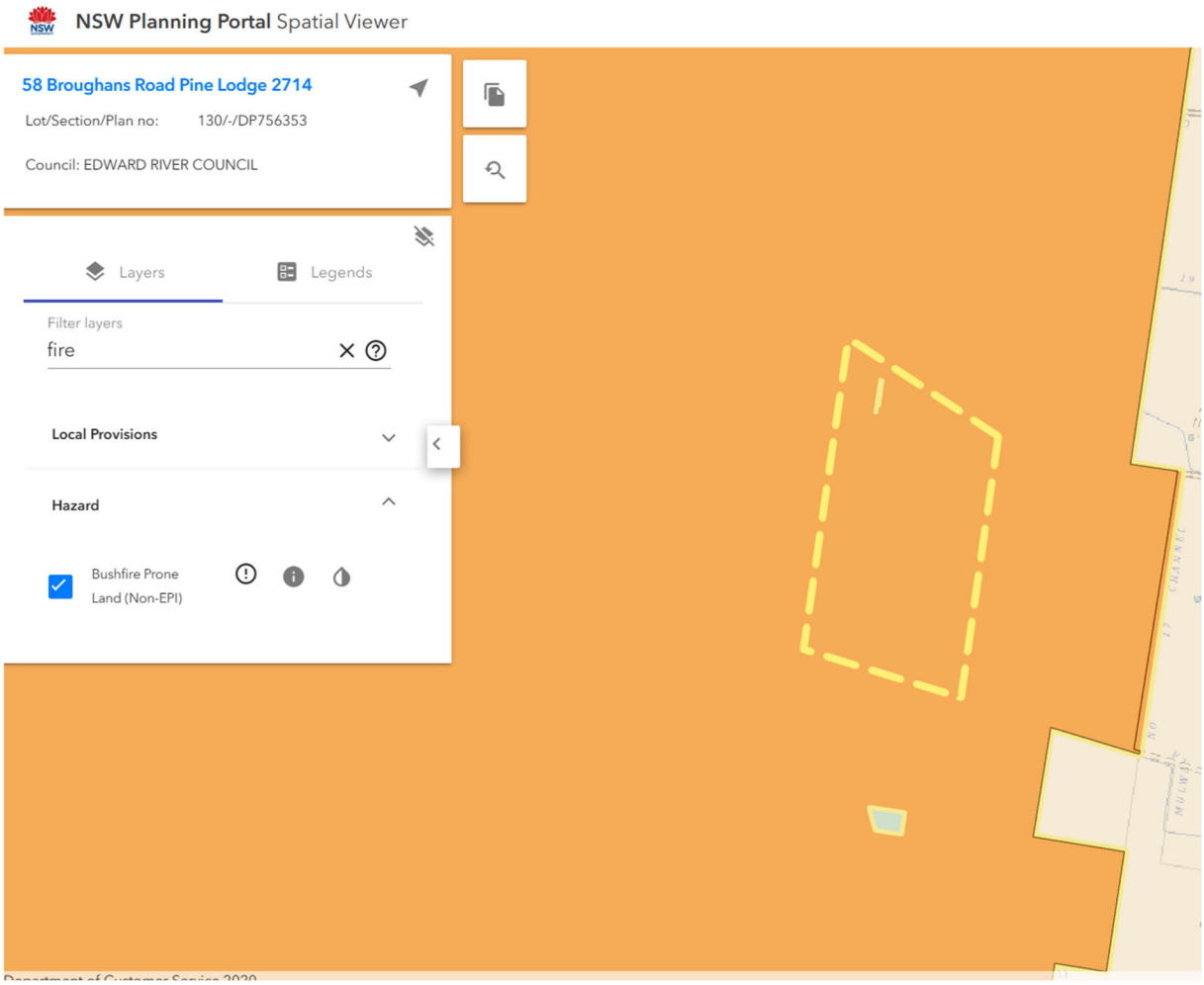

Figure 47 – Subject land – Bush fire prone land overlay

13.19.1.3 Impact assessment

13.19.1.3.1. Scope of assessment

The specifications and requirements of the NSW RFS's Planning for Bush Fire Protection (PBP) (NSW Rural Fire Service, 2019), have been considered in this bush fire assessment.

The PBP guidelines focus on protection of habitable buildings on bush fire prone land from bush fire. Habitable buildings are defined in accordance with the Building Code of Australia and include Class 1, 2, 3 and 4 buildings which are primarily used as residences, Class 5, 6, 7 and 8 buildings which are shops, warehouses, factories, offices and car parks and the like, and Class 9 buildings which include health care, community assembly buildings and aged care buildings.

The proposed development has one habitable building which is the administration office. Therefore, this bush fire hazard assessment focuses on this area.

The location of the habitable building within the proposed development complex is shown on Figure 6.

13.19.1.3.2. Assessment method

Bush fire risks have been assessed in accordance with the PBP guidelines and the requirements of the *NSW Rural Fire Act 1997*.

The objectives of the PBP guidelines (NSW RFS, 2019) are to:

- afford buildings and their occupants protection from exposure to a bush fire;
- provide for a defendable space to be located around buildings;
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- provide for ongoing management and maintenance of BPMs; and
- ensure that utility services are adequate to meet the needs of firefighters.

In addition, the *NSW Rural Fire Act 1997* requires the owners of land to prevent the ignition and spread of bush fires on their land.

Whilst, the subject land on which the proposed development is located is classified as “bush fire prone land” (BPL), the bush fire hazard of the proposed development has been assessed, and management and mitigation measures described, in accordance with Appendix 4 of the PBP guidelines (NSW RFS, 2019). The recommended management and mitigation measures in section 13.19.1.4 would aim to ensure that:

- human life, including fire fighters, is protected;
- impacts on property from the threat of bush fire are minimised; and
- the risk of bush fire ignition and spread would be as low as practically possible.

Recommended bush fire mitigation and management measures for other infrastructure in the proposed development complex are based on the PBP guidelines (NSW RFS, 2019).

Area Protection Zones (APZs), maintenance requirements and specifications for service and access provision were determined in accordance with the PBP guidelines (NSW RFS, 2019).

13.19.1.3.3. Type of development

The proposed development would be categorised in Chapter 8 of the PBP guidelines (NSW RFS, 2019) as ‘other development'.

Other development refers to any type of development that is not covered by Chapters 5 to 7 of the PBP guidelines. This includes commercial uses, industrial uses, infrastructure and development which involves large numbers of people. That is, development which is not a residential/rural residential subdivision, residential infill development (new houses or additions to new houses in existing subdivisions) or 'special fire protection purposes' (SFPP) development.

SFPP development is defined under section 100b of the *NSW Rural Fire Act 1997* as developments designed for occupants that are more vulnerable to bush fire attack, including seniors living accommodation, tourist facilities and schools.

13.19.1.3.4. Asset protection zones

As with all rural areas, there is a risk that bush fire could occur in or near the proposed development. Therefore, there is a risk that a bush fire could damage buildings and infrastructure and present a hazard to human life and livestock in the proposed development.

All vegetation in and around the development complex area is cleared to the disturbance boundary. The habitable buildings within the development complex area would have an Asset Protection Zone (APZ) of at least 30 m or greater. All infrastructure classed as special fire protection purpose in the development complex area would have an APZ greater than 100 m.

13.19.1.4 Management and mitigation

To ensure that human life, including fire fighters, is protected, impacts on property from the threat of bush fire are minimised, and the risk of bush fire ignition and spread will be as low as practically possible, a range of management and mitigation measures would be implemented during the operational phase of the proposed development.

The potential for development related activities to ignite a bush fire would be considered in the operation. A bush fire management plan would be prepared that would describe measures to minimise the risk of bush fire related damage or ignition of a bush fire. The primary management measures are described below.

Protection measures for electricity infrastructure, provision of water for firefighting and access to and within the proposed development complex would be in accordance with the PBP

guidelines (NSW RFS, 2019). Water and electricity services would be located and installed in a manner that minimises fire hazard.

13.19.1.4.1. Hazard reduction

The bush fire management plan would contain a strategy for hazard reduction, including hazard reduction in undeveloped areas where vegetation may regenerate.

13.19.1.4.2. Water

The availability of water is a critical element in the control of a bush fire, and would be provided as follows:

- The site water management system would provide water for firefighting; including from a dedicated fire-fighting outlet on t1 water storage tank as well as using other water sources (e.g. turkey nest storage) for supply; and
- dust suppression water carts may be fitted with water cannons to help with firefighting or other suitable mobile firefighting equipment will be provided on site;

If any fire cannot be controlled or attempts for control too dangerous, all staff would be evacuated to a safe area and the livestock let out of the pens into the surrounding paddocks.

13.19.1.4.3. Electricity

The risk of bush fire to electricity supplies in the proposed development, and the risk these could ignite a bush fire or contribute to the consequences of a bush fire, would be minimised through the following:

- where operationally practical, electrical transmission lines would preferably be placed underground;
- where overhead electrical transmission lines are used, they would be installed and managed in accordance with the electricity retailer's vegetation management near power lines;
- AS/NZS 1596 2014 The Storage and Handling of LP Gas would be followed for bottled gas installation and maintenance with metal piping to be used; AS/NZS 1596:2014 A2 Standards New Zealand
- There would be at least 10 m between fixed gas cylinders and flammable materials;
- shielding would be placed on the side of the cylinders which face potential fires; and
- release valves on gas cylinders that are close to buildings would be directed away from the building and at least 2 m from combustible material; metal connections would be used.

13.19.1.4.4. Access

Internal roads would be designed in accordance with the following PBP guidelines (NSW RFS, 2019):

- There would be a minimum vertical clearance of 4m to any overhead obstructions including branches;

- there would be a minimum carriageway of 4 m with 1 m clearance on each side;
- there would be a maximum grade of 15º if sealed and less than 10º if unsealed;
- crossfall would not be more than 10; and
- dead end roads are not recommended by the PBP guidelines; however, when they are unavoidable, turning circles would be provided with a minimum 12 m outer radius at the end of these roads.

All access roads to and from the proposed development complex are to be designed so that unobstructed, two-way, heavy vehicle (including articulating vehicles) movements associated with the proposed development and firefighting trucks responding to an emergency within the site can be safely accommodated.

13.19.1.4.5. Firebreaks

There will be a graded road around the development complex (outside the controlled drainage area) that will act as a firebreak and also provide access for fire-fighting vehicles.

Fire breaks shall be maintained along fence lines and property boundaries.

13.19.1.4.6. Bush fire construction levels

All buildings would be designed in accordance with the general bush fire construction levels in Australian Standard 3959 2018 Construction of Buildings in Bushfire Prone Areas (AS 3959 2018).

13.19.1.4.7. Flammable material storage

All flammable chemicals stored on-site shall be kept in designated bunded areas or stored in transportable bunded vessels. This includes machinery chemical, fuel and water treatment products.

The chemical register shall include details of dangerous goods stored, or used in quantities, which could conceivably be a subject of concern in an emergency and which may have the potential to act as a pollutant causing environmental harm under certain circumstances.

The following list of Hazmats and/or Dangerous Goods materials are likely to be stored on the site during operations:

- Diesel fuel for trucks and machinery;
- Oils and lubricants for machinery maintenance;
- Fire extinguishers;
- Cleaning agents; and
- Degreasers

13.19.1.4.8. Reducing risk of fire or explosion

The following measures would reduce the risk of a fire or explosion in the proposed development from igniting a bush fire:

- refuelling would take place away from vegetation;
- fire extinguishers would be maintained in buildings, vehicles and refuelling areas;
- there would be no smoking in, or next to, vegetated areas;
- smoke or thermal detection in the administration office and grain processing facility;
- control panels in the administration office, grain processing control room and pumps;
- dust suppression water truck would be made available to help with firefighting when required; and
- spill response kits would be available should there be a spill of flammable substances.

The following measures would be taken to reduce the likelihood of a bush fire or the consequences of a bush fire should one occur:

- UHF/VHF communication system would enable rapid response to emergencies; and
- the NSW Rural Fire Service would be contacted in the event of a fire. Staff will fight the fire, if it is reasonably safe to do so.

13.19.1.4.9. Bush fire management procedures

Bush fire management procedures would be documented within an emergency response and incident management plan (Refer section 13.19.1.5) prepared prior to operation for the proposed development. Bush fire management procedures would include:

- contact person/details for emergency management;
- communication strategy for coordinated response to bush fires with the RFS;
- availability of suppression equipment;
- firefighting water supplies;
- storage of fuels and other flammable materials;
- evacuation procedures for staff in case of bush fire emergency in accordance with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan; and
- evacuation procedures for livestock in case of bush fire emergency.

13.19.1.5 Incident management

An unplanned incident occurs without prior notice which can degrade safety, the environment or community.

Minor incidents defined as non-critical, regarding both safety and environment shall be managed through the development's Operation Environmental Management Plan and their related procedures as required.

An emergency situation is an event that could present significant risk to the environment, personnel or the community, as determined by the Feedlot Manager or Environmental Representative (during operation).

An emergency response and incident management plan (ERIMP) will be prepared for the operation phase of the proposed development. The plan will include, but not limited to, the following information:

- Induction protocol;
- Procedure approval – name and authority of the person approving the plan;
- 24 hour contact details of the site manager;
- Relevant authorities contact details – EPA, ERC, Work Cover NSW, NSW Rural Fire Service;
- Communications protocols;
- Handover responsibilities;
- Protocols for handing back responsibly once emergency services have left the site;
- Hazard response – full / partial evacuation;
- Pollution incident response;
- Assembly area;
- Site incident notification – to authorities, to employees/contractors;
- Notification to adjoining properties;
- Emergency equipment and inspection schedules – fire extinguisher, spill kit, first aid kit etc;
- Inventory of potential hazardous substances;
- Evacuation diagram; and
- Records management.

The objective of the ERIMP is to ensure incident planning and response procedures are managed effectively during operation. It outlines the general procedures for initiating an emergency response that could occur as a result of operation of the proposed development.

13.19.1.5.1. Potential environmental incident identification

This section lists identified potential environmental incidents and assessment of potential impacts. Mitigation measures from the Operational Environmental Management Plan and associated sub-plans will be implemented to counter the occurrence of such events.

Table 68 – Proposed development – Potential environmental incident identification

Issue	Potential Impact	Impact Assessment
Air quality		
	Dust event due to weather conditions	section 13.1.5 and 13.1.6
	Dust event due to a particular operation activity	section 13.1.5 and 13.1.6
	Community complaint relating to dust	section 13.1.5 and 13.1.6
	Odour event due to weather conditions	section 13.1.5 and 13.1.6
	Dust event due to a particular operation activity	section 13.1.5 and 13.1.6
	Community complaint relating to odour	section 13.1.5 and 13.1.6
	Weather monitoring equipment damaged or not operational	section 13.1.5 and 13.1.6
Groundwater		
	Leachate of effluent through the liner underlying the controlled drainage area as a	section 13.3.2.3 and 13.3.3.3

	result of integrity failure or exceedance of design criteria	
	Spills or leaks of hazardous chemicals or substances stored or used on-site such as fuels, chemicals etc	section 13.3.2.2, 13.3.2.3, 13.3.3.3 and 13.3.3.2
	Impacts to groundwater due to effluent utilisation	section and 13.11.7
Surface water		
	Flooding event	section 13.6.2.1 and 13.6.3.1
	Oil or fuel spill (e.g. hydraulic hose burst)	
	Damage to sediment basin/holding pond	section 13.4.2 and 13.4.3
	Effluent discharge event due to weather conditions	section 13.4.2 and 13.4.3
	Runoff event due to effluent utilisation	section 8.4.9.2 and 13.11.7
Heritage		
	Aboriginal heritage item found during operation	section 13.7.2.4 and Appendix K
Biodiversity		
	Unapproved works undertaken outside of disturbance limit	section 13.8.3 and 13.8.4
	Impacts due to effluent and /or solid waste utilisation	section 13.8.3 and 13.8.4
Waste		
	Hazardous wastes generated	section 13.10.7 and 13.10.8
	Community complaint relating to litter or effluent and/or solid waste utilisation	section 13.10.7 and 13.10.8
Soils		
	Unanticipated contaminated soil requires offsite disposal	section 13.2.4.6 and 13.2.5.4
	Soil degradation due to effluent and /or solid waste utilisation	section 13.11.4, 13.11.5 and 13.11.7
Noise & vibration		
	Noise levels from construction or operation activities exceed criteria	section 13.13.6 and 13.13.7
	Community complaint relating to noise or vibration	section 13.13.6 and 13.13.7
Pest animals		
	Damage to property including damage to fences, buildings, etc	section 13.15.3 and 13.15.4
	Introduction of weeds from operation activities	section 13.15.3 and 13.15.4
	Proliferation of pest animals from operation activities	section 13.15.3 and 13.15.4
Animal health		
	Mass sickness or death of livestock	section 13.17.3 and 13.17.6
Bush fire		
	Damage to property including damage to fences, buildings, machinery etc from bush fire	section 13.19.1.3 and 13.19.1.4

	Impacts to livestock and/or personnel from bush fire	section 13.19.1.3 and 13.19.1.4

13.19.2 Conclusion

Management measures such as separation distances, fire suppression systems etc are proposed to prevent a fire or explosion in the proposed development complex igniting a bush fire. The impact of an existing bush fire shall be mitigated through the provision of appropriately sized protection zones for habitable assets, fire protection systems and emergency and incident management procedures.

Therefore, the risks associated with the proposed development being damaged by, igniting or contributing to the severity of a bush fire are expected to be appropriately managed.

Potential incidents associated with the proposed development and adequate precautions have been identified to manage and resolve incidents and for emergency response.

The recommended mitigation measures would reduce incidents, hazards and risk during operation of the proposed development.

14. Summary of key planning issues

14.1 Introduction

The proposed development has been assessed under the relevant sections of the EP&A Act. A summary of these matters with regard to the proposed development is provided in the sections below.

14.1.1 Planning instruments

Section 9 addresses the relevant provisions of local, regional and State planning instruments as they relate to the proposed development. The proposed development is permissible with the approval of the Edward River Council.

There are no draft EPIs relating to the subject land on which the development is proposed.

There are no DCPs of relevance to the proposed development.

This EIS has been prepared in accordance with the matters required to be addressed in the EP&A Regulation 2000.

14.1.2 Site selection

Does the proposal fit in the locality?

The subject land on which the development is proposed is located within a rural area surrounded by agricultural holdings. The proposed development is a beef cattle feedlot which would involve the utilisation of existing infrastructure. The proposed development is of a nature and scale which would blend with the surrounding rural environment and given that the proposed development is for intensive agricultural use it is considered to be suited to the surrounding rural area.

Are the site attributes conducive to development?

A geotechnical and capability assessment of the proposed development complex and associated effluent and solid waste utilisation area indicates that the subject land is suitable for the siting, design, and operation of a beef cattle feedlot and for on-site utilisation of effluent and solid waste.

The subject land has been historically used for agricultural purposes including beef cattle grazing and irrigated and dryland cropping and is located in a rural area in which agricultural uses dominate. Subsequently, the subject land is therefore considered to be suitable for siting of the proposed development.

Social and economic impacts in the locality

The proposed development would result in the employment of some 4 full time equivalent personnel during the operation phase, many of whom are likely to be local to the area. Further, the proposed development would intensify the use of the land, promoting agricultural activity in the area and boosting the local economy. The potential adverse social impacts of the proposed development are limited to factors such as noise and odour which may detract from the quality of life of surrounding residents. However, the proposed development complex is located a significant distance from the nearest residential areas and mitigation measures shall be put into place to ensure that impacts upon the amenity of the area is minimal.

Design and layout

The design of the proposed development takes account of the characteristics of the subject land including topography, soil types, drainage patterns, separation distances to sensitive receivers and native vegetation. The proposed development utilises existing built infrastructure.

14.1.3 Potential impacts on natural, built and social environment

Context and setting

The subject land on which the development is proposed is located within a rural area, characterised by agricultural properties with grazing on native pastures and irrigated and dryland cropping. The proposed development is for the purposes of a beef cattle feedlot involving existing built infrastructure.

Similarly, there has been a beef cattle feedlot on the subject land for over 15 years is an appropriate use within a rural area and would not detract from the existing character or setting of the surroundings.

Air quality

Odour generated from the proposed development complex are expected to be the primary impact to air quality as a result of the proposed development. These impacts are discussed in section 13.1.4 and are expected to be acceptable due to the separation distance between the proposed development complex and rural residences.

Other issues relating to air quality such as dust and greenhouse gases are not expected to create significant air quality impacts to the local area.

Access, transport and traffic

Transport and traffic issues are discussed in detail in section 13.12. The operation of the proposed development would involve additional traffic movements. The subject land is located on Broughans Road, which currently experiences little traffic movements but of a similar nature to the traffic associated with the proposed development.

All vehicles accessing the proposed development would travel along the Riverina Highway to James Road to Broughans Road or from the Newell Highway to Broughans Road.

Access to the proposed development complex would be via the existing dedicated entrance off Broughans Road. The access road would connect the proposed development complex to Broughans Road. The various receival areas (livestock/feedstuffs), access road and entrance would be able to accommodate B-Double vehicles, as well as employee light vehicles. The proposed development provides sufficient car parking facilities for employees.

Overall, it is expected that with the proposed mitigation and management measures, the proposed development is unlikely to have a material impact on the existing road network in NSW.

Cultural heritage

The Aboriginal Heritage Assessment identified no Aboriginal sites within the proposed development complex site or effluent and solid waste utilisation areas which require disturbance. The level of human impact, through land disturbance (land clearing, timber harvesting, grazing, cultivation etc.) has substantially affected the most culturally sensitive areas on the subject land. Consequently, it seems highly unlikely that evidence of previous occupation by Aboriginal people remains within these areas. Measures have been prepared to mitigate any impacts to possible Aboriginal heritage sites and objects.

Subsequently, the proposed development would not impact on any Aboriginal heritage sites, objects or places, or areas of archaeological potential or Aboriginal sensitivity.

The non-Aboriginal Heritage Assessment and site assessment identified no non-Aboriginal sites on the land on which the development is proposed development. Therefore, it is considered that the proposed development would not impact on the non-aboriginal heritage fabric of the land on which the development is proposed.

An assessment of Aboriginal and Non-Aboriginal heritage is given in section 13.5.

Land resources

The proposed development would not contaminate the land which is a valuable resource.

Water

The proposed development would utilise water in accordance with existing groundwater and surface water access licences issued under the Water Management Act 2000. An assessment of groundwater and surface water is given in sections 13.3 and 13.4 respectively.

Biodiversity (Flora and Fauna)

A test of significance of potential biodiversity impacts from the proposed development has been undertaken and takes into account relevant Commonwealth and NSW legislation and environmental planning instruments.

The subject land is not in a declared area of outstanding biodiversity value, the proposed development area is not mapped as *Vulnerable or Sensitive Regulated Land* according to the Section 60F of the *Local Land Services Act 2013*, and is not mapped as an area of Biodiversity Value, and a BDAR is not triggered.

The proposed development has been designed to minimise impact to native vegetation by keeping impacts contained within the existing disturbed cleared and agricultural areas. As no clearing of native vegetation is proposed, a BDAR is not triggered on the basis of this mechanism.

After likelihood assessment, given the highly disturbed and modified condition of the proposed development area and the poor landscape connectivity of the site, it is considered that none of the threatened flora and fauna species were likely to utilise the proposed development area.

The assessments of significance concluded no threatened species would be significantly affected by the proposed development and a Species Impact Statement and/or Referral to the Federal Minister for the Department of Climate Change, Energy, the Environment and Water (DCCEEW) is not required.

A detailed discussion on biodiversity issues in relation to the proposed development is provided in section 13.8 and Appendix I.

Waste materials

The operation of the proposed development shall generate a small quantity of in-organic solid wastes such as product packaging, paper etc. Further, the operation of the proposed development shall significant levels of organic effluent and solid waste which can be wholly or partly sustainably utilised on the subject land as outlined in 13.11.

It is expected that, with the implementation of the outlined mitigation measures, the proposed development would not create significant impacts to the environment from waste generation.

14.1.4 The public interest

Section 4.15 (e) of the *Environmental Planning and Assessment Act 1979* require that the public interest be considered in the development assessment process.

The public interest is addressed by the orderly and economic use of land for purposes permissible under the relevant planning instruments and in accordance with the applicable planning controls relevant to the site.

Given the type of proposed development, its permissibility, general compliance with the planning controls, measures implemented to minimise adverse environmental impact, the lack of significant environmental impact, and the suitability of the site, the proposed development is in the public's interest. Further, the site is appropriately zoned for the development and the proposed use of the site aligns with the surrounding rural activities of the area.

There are no aspects of the proposed development that would be contrary to the public interest.

The proposed development has been designed to minimise potential adverse impacts upon the local community and the surrounding environment. Given the significant benefits of the proposed development to the local area such as providing employment for local people and promoting the efficient agricultural use of rural land, thus boosting the rural economy, the proposed development is considered to be in the public interest.

Part G – Commitments

15. Commitments

15.1 Introduction

This section outlines the environmental management strategy and provides a consolidated summary of the management measures that would be implemented during the construction and operation of the proposed development to manage, mitigate and/or monitor potential impacts identified within this EIS.

15.2 Environmental management strategy

AJ & NA Varley are committed to conducting activities associated with the construction and operation of the proposed development in an environmentally responsible manner; and aim to implement best practice environmental management as part of a program of continuous improvement. This will be achieved by addressing issues systematically and consistent with internationally accepted standards.

AJ & NA Varley vision is to minimise harm to the environment by designing, operating and closing all of our operations in an environmentally responsible manner. This is our commitment to environmental stewardship. Three fundamental environmental principles underpin our vision. These are;

- The mitigation hierarchy of avoiding, minimising, restoring and offsetting shall be applied as a best management approach to manage environmental impacts arising from our activities and services.
- Environmental incidents and non-conformances are reported, investigated and analysed to ensure corrective actions and preventative actions are taken and learnings shared to prevent their recurrence.
- Environmental management and performance standards and procedures shall be applied to both business and project operations.

Environmental management during the proposed development would be in accordance with an environmental management strategy (EMS). The EMS would contain a suite of environmental management plans which detail the site specific management measures and procedures to be implemented during construction and operation of the proposed development, as specified in this EIS, for mitigating and managing impacts including noise, air quality, biodiversity, heritage, water resources, land resources, traffic, social, hazards and risks, bush fire and visual.

The EMS would be consistent with the conditions of the proposed development's Development Consent and other planning approvals, should they be granted.

15.2.1 Environmental management plan

An Environmental Management Plan (EMP) is a procedural document which outlines the environmental goals of the proposed development, the safeguard measures to be implemented, the timing of the implementation in relation to the progress of the proposed development, responsibilities for implementation and management, and a review process.

An EMP would be prepared to address each stage of the proposed development namely, construction and operation.

The key objectives of the EMP include:

- Ensuring the works are carried out in accordance with appropriate environmental statutory requirements and relevant non-statutory policy as is detailed in this EIS;
- Operations and environmental protection measures shall be planned to minimise environmental risks and comply with specified environmental protection requirements;
- Ensuring that works are carried out in accordance with the objectives and requirements presented in this EIS;
- Ensuring that works are carried out in such a way as to minimise the likelihood of adverse environmental impact occurring;
- Ensuring that works are carried out in such a way as to manage the impact of the works on nearby sensitive receivers;
- Implement environmental management principles and practices to conserve and protect environmental resources through, amongst approaches, the efficient use of energy and water, reduction in greenhouse gas emissions intensity, vermin and pest control, minimising waste and preventing pollution;
- Communicate with our employees, local communities, contractors, suppliers, and other interested third parties to encourage an environmentally responsible culture;
- Monitor the effectiveness of the environmental protection measures;
- Response procedures which will initially contain, then remedy, any environmental incidents that may occur;
- Identifying management responsibilities and reporting requirements to demonstrate compliance with the EMP;
- Providing clear procedures for management of environmental incidents including corrective actions; and
- Improve environmental protection measures and revise the EMS and the EMP promptly when deficiencies are identified.

The scope and content of the EMP will be a function of the proposed development's potential environmental impacts as outlined in this EIS. The EMP, shall include, but not be limited to those elements identified and described in Table 69.

Table 69 – Typical EMP structure

Section	Description
Introduction	Background
	Purpose and Scope
	Objectives
Legislative and Other Requirements	Legal and Other Requirements
	Approvals, Permits and Licences
	Environmental Policy
Environmental Management Framework	EMS
	Obligations, Roles, Responsibilities and Authority Certification and Approval
Environmental Aspects and Impacts	Risk assessment to identify the actual and potential environmental impacts
	Risk analysis
	Objectives and Targets
Competence, Training and Awareness	Environmental Induction
	Training and Awareness
Consultation and Communication	Processes for external and internal communication in relation to the environmental aspects
Incident and Emergency Management	Incident Investigation, Reporting and Recording
	Environmental Emergency - Preparation and Response
Inspections, Monitoring and Auditing	Environmental Inspections
	Monitoring
	Auditing
	Reporting
	Non-conformances, Corrective, Preventative Actions
Review and Improvement	Review of environmental controls and procedures
Document Control and Records Management	Document Control
	Environmental Records

15.2.1.1 Construction environmental management plan

As there are no construction activities associated with the proposed development a Construction Environmental Management Plan (CEMP) would not form part of the EMS for the proposed development.

15.2.1.2 Operational environmental management plan

An Operational Environmental Management Plan (OEMP) would form an integral part of the EMS for the proposed development and would be consistent with the requirements of AS/NZS ISO14001:2014 and AS/NZS ISO 9001:2008.

An OEMP shall be developed, implemented and maintained during operation of the proposed development. The OEMP may incorporate or reference various specialist sub-plans or accreditation such as:

- Air Quality Management Plan;
- Soil and Water Quality Management Plan;
- Solid and Liquid Waste Management Plan;
- NFAS Standards; and
- Pollution Incident Management Response Plan (PIRMP).

A draft Operational Environmental Management Plan (OEMP) and relevant sub-plans has been prepared as part of the assessment process. The OEMP and associated sub-plans provides details and justification for the proposed monitoring program for soil characteristics, composted solid waste quality and quantity, effluent quality and quantity, surface and groundwater quality. The monitoring plan provides details of the locations of all monitoring sites and the parameters that will be monitored. The draft OEMP and associated sub-plans are provided in Appendix P.

15.3 Management and mitigation measures summary

In accordance with the EIS requirements issued under Schedule 2 of the EP&A Regulation, environmental management and mitigation measures described in section 13 are summarised in Table 70 as commitments.

Table 70 – Proposed development – Management and mitigation measures summary

Aspect	Phase	Commitment	EIS section
Air quality			
Odour	Design and siting	• Provision of adequate separation distances between the proposed development and sensitive receptors. • The pens shall be designed with adequate slope to maximise drainage and encourage rapid drying of the pen surface after rainfall. • Proposed grain treatment process maximises digestibility and minimises the amount of starch in faeces. • Sedimentation basin designed to maximise the removal of solids and drain free of water after a runoff event. • Design and siting of water troughs so that excess water released during trough cleaning or from a broken float valve does not enter the pen area, thus minimising wet areas in pens. • The catch and main drains designed with adequate and uniform slope to maximise drainage and encourage rapid drying after rainfall. • Design of shade structures that optimise pen drying by moving cattle (and their excretions) around the pen as the shade moves. • Provision of vegetative screen around proposed development as a wind break and vegetative filter.	section 13.1.6.2
	Operation	• Ensure the air quality and meteorological monitoring network is maintained and results are routinely analysed, assessed and reported. • Minimisation of wet areas in pens by fixing leaks from water troughs. • Utilising the best animal production genetics - Improved production traits such as growth rate and carcass weight will contribute significantly to reducing emissions intensity. • Maximise feed energy by eliminating parasites and nutrient deficiencies. • Generating and maintaining best practice management for solid and liquid waste storage, processing and utilisation. • Frequent removal of manure from the pens/drains and under-fences. • Elimination of wet areas within the pens.	section 13.1.6.3

		• Sedimentation basin control weir maintained in operational order to ensure that complete drainage occurs. • Remove solids from the sedimentation basin as soon as practical. • Dewatering of the holding pond by irrigation to crops or pastures as soon as possible after rainfall. • Receiving, reporting and responding to any complaints in relation to air quality through the 24-hour community response line. • Report the results of any air quality monitoring in accordance with the conditions of the Development Approval. • Ensure that all employees and contractors are given adequate training in environmental awareness, legal responsibilities, and air quality control methods.	
Dust	Design and siting	• Provision of adequate separation distances between the proposed development and sensitive receivers.	section 13.1.6.5
	Operation	• Adapting the cattle stocking density in pens to maintain manure on pen surface at a moisture content that minimises dust generation. For example, stocking density may change from lighter rates in winter to heavy rates in summer. • Setting and enforcing speed limits on internal road network • Dust suppression measures, such as watering access and feed roads and solid waste stockpiles as required. • Any operations involving the movement of dusty materials such as hay processing, grain movement, solid waste turning and spreading shall be timed and managed where possible when materials are have adequate moisture content. • Minimising the accumulation of manure in pens and cattle lanes by cleaning more frequently that Class 1 requirements. • Application of solid wastes to land when wind conditions and dispersion conditions are favourable. • Ensure the air quality and meteorological monitoring network is maintained and results are routinely analysed, assessed and reported. • Receiving, reporting and responding to any complaints in relation to air quality through the 24-hour community response line.	section 13.1.6.6

		• Report the results of any air quality monitoring in accordance with the conditions of the Development Approval. • Ensure that all employees and contractors are given adequate training in environmental awareness, legal responsibilities, and air quality control methods.	
GHG	Design and siting	• The pens shall be maintained with adequate slope to maximise drainage and encourage rapid drying of the pen surface after rainfall. • Sedimentation basin designed to maximise the removal of solids and drain free of water after a runoff event. • Appropriately sized effluent and solid waste utilisation area for sustainable application of nutrients.	section 13.1.6.8
	Operation	• Sourcing livestock from as close to the development as practical as well as on-site production to minimise fugitive emissions during transport. • Utilising the best animal production genetics - Improved production traits such as growth rate and carcass weight will contribute significantly to reducing emissions intensity. • Maximise feed energy by eliminating parasites and nutrient deficiencies. • Use of appropriately sized plant and equipment for respective processes. • Generating and maintaining best practice management for solid and liquid waste storage, processing and utilisation. • Frequent removal of manure from the pens/drains and under-fences. • Sedimentation basin control weir maintained in operational order to ensure that complete drainage occurs. • Remove solids from the sedimentation basin as soon as practical. • Dewatering of the holding pond by irrigation to crops or pastures should occur as soon as possible after rainfall. • Matching fertiliser to plant nutrient requirements to maximise crop growth. • Sourcing feed commodities from as close to the development as practical as well as on-site production to minimise fugitive emissions during transport. • Routine service and maintenance of mobile equipment used on-site to ensure efficient operation. • Continuous improvement of GHG intensity of production by identifying and controlling energy intensive processes.	section 13.1.6.9

		• Regular reviews and monitoring of GHG emissions and energy usage.	
Geology, landform and soils			
Soils	Construction	• Filling compacted to a field dry density of at least 98% maximum dry density as determined by AS 1289 5.1.1 (Standard Compaction). The material shall be compacted at a moisture content of within (+2% - 0%) of OMC as determined by AS 1289.5.1.1 (Standard Compaction). • Field dry density tests, according to AS 1289.5.1.1 (Standards Australia, 2003), shall be undertaken to ensure that adequate compaction is being achieved.	section 13.2.5
Groundwater			
	Design and siting	• Site selection considered the natural attributes and general suitability of the site with respect to soil characteristics (texture, depth, permeability), groundwater depth, and hydrogeological formation. • Geotechnical investigation conducted to determine those areas within the controlled drainage area where the permeability of underlying soil/rock strata exceeds the design permeability, thus requiring lining to prevent soil leachate movement. • The liner shall be capable of remaining effective when subject to the physical effects of livestock, machinery and water flow. • Runoff external to the controlled drainage area is diverted away from the controlled drainage area. • Effluent and solid waste utilisation areas are sited so that they do not pose an unacceptable risk to groundwater quality as a result of leaching. • Effluent and solid waste utilisation areas are designed to enable the sustainable use of effluent and any solid waste that is utilised on-site. • Facilities to store hazardous materials are designed to meet relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management.	section 13.3.3.1
	Operation	• An Operational Environmental Management Plan (OEMP) and an Irrigation Management Plan (IMP) would be prepared for the operation of the proposed development. The IMP would detail the management and monitoring requirements for wastewater treatment and irrigation. • Development and implementation of emergency and contingency plans within the IMP detailing methods to manage spills or other emergencies on site, such as pipe breakages, pond overflows, pump failures etc.	section 13.3.3.3

		• Sustainable use of groundwater in accordance with allocation and entitlements under the Murray Alluvium Water Resource Plan. • Solid waste stockpiles established within controlled drainage area to prevent contaminated leachate into groundwater resources. • The land application of effluent and solid wastes is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site. • The liner of all elements of the controlled drainage area such as drains, sedimentation basin, flow control structures etc is maintained to ensure the integrity and ongoing compliance with specified design criteria. • Effluent shall be stored, treated and sustainably applied to land on-site by irrigation.	
Surface water			
	Design and siting	• The proposed development is sited above the height of a 100 year average recurrence interval (Q_{100}) flood level • Access roads sited on flood prone do not impact the hydrology of the area. • A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling, solid waste storage and processing area and silage storage area which have high organic matter and therefore a high pollution potential. • Runoff external to the controlled drainage area is diverted away from the controlled drainage area. • Effluent and solid waste utilisation areas are sited so that they do not pose an unacceptable risk to surface water quality as a result of flood events. • Effluent and solid waste utilisation areas are designed to enable the sustainable use of effluent and any solid waste that is utilised on-site. • Any facilities to store hazardous materials are designed to meet relevant guidelines and Australian Standards for the storage of hazardous and dangerous goods and spill management. • Elements within the controlled drainage area are designed to capture contaminated runoff and safely divert it to a sedimentation system and holding pond. • A holding pond is designed to store runoff from the controlled drainage area without spilling or overtopping at an unacceptable frequency.	section 13.4.3.1

	Operation	• An Operational Environmental Management Plan (OEMP) and an Irrigation Management Plan (IMP) would be prepared for the operation of the proposed development. The IMP would detail the management and monitoring requirements for wastewater treatment and irrigation. • Development and implementation of emergency and contingency plans within the IMP detailing methods to manage spills or other emergencies on site, such as pipe breakages, pond overflows, pump failures etc. • Maintenance of buffer zones around drainage lines and riparian zones to prevent contamination of surface waters. • Solid waste stockpiles would be established within controlled drainage area to prevent contaminated runoff into clean water areas. • Sustainable use of surface water in accordance with MIL entitlements. • The land application of effluent and solid waste is made at rates consistent with the ability of soils and crops grown in the on-site utilisation areas to sustainably utilise the applied nutrients, salts and organic matter, under the climatic conditions prevailing at the site. • Soil condition is monitored periodically and soil tests are used where there is potential for deterioration of soil condition. • All elements of the controlled drainage area such as drains, sedimentation basin, flow control structures etc are cleaned and maintained to ensure their integrity and ongoing compliance with specified design criteria. • Effluent shall be stored, treated and sustainably applied to land on-site by irrigation. • Design discharge events from the holding pond shall be directed to a natural grassed discharge area. This cropped area shall filter and disperse the effluent whilst allowing some infiltration. As the design discharge events are at a frequency of one in 10 years the concentration of nutrients shall be sustainably adsorbed and utilised by vegetation in between events.	section 13.4.3.3
Flooding, stormwater and coastal hazards			
Flooding	Design and siting, construction and operation	• The proposed development is sited above the height of a 100 year average recurrence interval (Q_{100}) flood level. • Site selection considered the natural attributes and general suitability of the land for draining and capturing runoff from the proposed development complex.	section 13.6.2.1

		• Solid and liquid waste utilisation areas are sited so that they do not pose an unacceptable risk to surface water quality as a result of flood events. • Solid and liquid waste utilisation areas are designed and managed to enable the sustainable use of liquid waste and any solid waste that is utilised on-site.	
Stormwater	Operation	• A controlled drainage area designed to an acceptable hydrological standard that prevents unauthorised discharges of runoff from areas such as pens, livestock handling, solid waste storage and processing area and silage storage area which have high organic matter and therefore a high pollution potential. • Runoff external to the controlled drainage area is diverted away from the controlled drainage area to existing natural drainage lines. • Elements within the controlled drainage area are designed to capture contaminated stormwater runoff and safely divert it to the sedimentation system. • A holding pond is designed to store runoff from the controlled drainage area without spilling or overtopping at an unacceptable frequency. • Vehicles are maintained to minimise leaks of hydrocarbons, lubricating oil etc.	section 13.6.2.2
Cultural Heritage			
Aboriginal Heritage	Operation	• Any new Aboriginal heritage sites identified during the operation of the proposed development shall be registered with the NSW Office of Environment and Heritage (via Aboriginal site Impact Recording Form on AHIMS) in consultation with the Aboriginal community.	section 13.7.2.4
Non-Aboriginal Heritage	Operation	• The proposed development will be operated to avoid disturbance of heritage sites where possible, otherwise the appropriate consents will be obtained.	section 13.7.3.5
Biodiversity			
	Operation	• Existing native vegetation shall be not impacted and no clearing of native vegetation would be performed.	section 13.8.4
Waste materials			

Operation	• Ensure that all wastes (includes but not limited to liquid, air emissions, and solid material) generated by the proposed development, as far as reasonably practicable managed in a manner which reduces adverse impact to the environment. This approach is based on the hierarchy of waste materials management (elimination, reduction, reuse or recycling and treatment and disposal). • All waste to be transported off-site shall be assessed to determine whether the waste requires tracking under the Protection of the Environment Operations (Waste) Regulation 2014. • All waste requiring tracking shall only be transported after all necessary documentation such as consignment authorisation and transport certificates have been obtained from the relevant authorities. • Ensure procedures are implemented to minimise any adverse environmental impacts associated with the storage, management and disposal of waste materials. • Inspections of the waste management areas would be constructed on a weekly basis to ensure that correct waste management practices are being followed, in that all waste materials are appropriately separated and stored. • No burying of waste relating to the operation of the proposed development is to be conducted on the subject property with the exception of mass deaths of beef cattle. • No burning of waste relating to the operation of the proposed development is to be conducted on the subject land. • All waste that cannot be sustainable utilised on the subject land shall be removed from the subject land by an operator licensed to remove that waste removal and transported to a suitably licensed disposal site. • Putrescible domestic waste will be stored in a protected area away from vermin and inclement weather. • Wastes will be stored appropriately for its type. Different waste types will not be mixed to increase the potential for re-use or recycling of waste. Separate waste storage areas will be designated. • Quantities of waste stored onsite will be kept to a minimum. Maximum volume of each waste stored will be consistent with regulations and guidelines. • All sampling and classification results shall be retained for the life of the proposed development in accordance with EPA's Waste Classification Guidelines.	section 13.10.8

		• All waste shall be transported in accordance with Council and EPA regulations for the type and volume of waste transported. • All loads of waste removed from the proposed development site will be covered to prevent spillage. • Licensed waste contractors will be made responsible for collection and appropriate disposal of waste as required. • Records or a material register shall be retained detailing the quantity, classification method of transport of waste material removed from the site. The register will record the waste type, quantity, classification, contractor, licence details and details of the licensed receiving facility.	
Land capability			
	Design and siting	• The effluent and solid waste utilisation areas have been sited and designed to minimise any adverse impacts to groundwater and surface waters. • Mitigation measures including sustainable utilisation of applied nutrients shall be implemented to minimise any adverse impacts to groundwater and surface waters . • The physical and chemical characteristics of the soils proposed for effluent and solid waste utilisation were assessed. • A sustainable effluent utilisation system was developed using MEDLI, a water and nutrient balance model.	section 13.11
	Operation	• An Irrigation Management Plan (IMP) for the effluent utilisation area shall be prepared and implemented for the operation of the proposed development. • Monitoring of the effluent irrigation system shall be undertaken to ensure that the system is meeting environmental requirements as well as satisfying licence conditions. • Annual reporting shall be undertaken in accordance with EPL requirements.	section 13.11
Traffic and transport			
	Operation	• Maintain the dedicated entrance for the proposed development off Broughans Road based on ERSC recommended standards. • Negotiation of a road maintenance contribution to ERSC, if required.	section 13.12.6
Noise and vibration			

	Operation	• Low-stress cattle handling techniques employed to manage cattle to ensure they are handled quietly and efficiently. • Carrying out all noisy activities such as feed processing during the standard daytime operational hours. • Awareness training for staff and contractors in environmental noise issues. • Minimising the use of horn signals and consideration of alternative methods of communication. • Switching off any equipment not in use for extended periods. • Minimising heavy vehicles' entry to site and departure from site outside the nominated operational hours. • All plant and equipment required shall be well maintained and regularly serviced. • All plant and equipment would be installed with the appropriate noise attenuation apparatus. • Retrofitting reversing alarms that are quieter and display less annoying characteristics. • Community consultation with local residents to assist in the alleviation of community concerns. • Maintaining a suitable complaint register. Should noise complaints be received, undertake noise monitoring at the locations concerned. Reasonable and feasible measures would need to be implemented to reduce noise impacts. • Selection of machines that are inherently free of or have low vibration. • Vibration-producing machinery shall be supported on stiff structural components, and be provided with efficient vibration isolation systems. • Maintenance of plant and equipment machinery – ensuring rotating parts are balanced, vibration isolators are functioning as intended etc.	section 13.13.6.2
Landscape and visual amenity			
	Operation	• Provision of adequate separation distances between the proposed development complex and sensitive receivers as shown in Figure 14.	section 13.14.7
Pest animals and weeds			
	Operation	• Timely control of initial weed populations around the proposed development, such as, around sheds and buildings, along roadsides, cattle receival facilities/holding yards, along fence lines, drainage structures, in tree plantings etc. Weeds in these areas experience little competition and can produce large quantities of seed..	section 13.15.4

- Control of weeds around the proposed development also reduces any potential fire hazard control shall be achieved by regular mowing or herbicide application. Knockdown or residual herbicides (or a combination of the two) shall be used depending on whether the weeds have emerged, the time of year and the weeds present
- Prior to importing livestock and /or feed commodities (grains, roughages) from known weed infestation areas (e.g. parthenium weed), the weed status of materials and vehicles shall be confirmed from the supplier.
- Aquatic weeds in water storages shall be controlled via mechanical and/or chemical means. Chemical control shall be undertaken with considerable care, considering the identity of the weed, the effect of herbicides on desirable plants, fish and other aquatic life and the eventual use of the water.
- A pest management program shall be implemented to control animal pest species already present, using acceptable methods as well as identify potential pest species, their likely distribution and methods to prevent their spread.
- Established pest animals shall be controlled and their spread prevented.
- Pest animal control programs shall use the most humane, target specific, cost effective and efficacious techniques available.
- Mice and rat populations will be mitigated by:
  - minimising feed wastage and spillage to minimise likelihood of attracting vermin
  - implementing a baiting program if the vermin population reaches a nuisance level.
- Fly breeding sites shall be mitigated using several control methods such as biological, chemical and physical methods following integrated pest management (IPM) principles shall be used.
- Controlling weeds and keeping grass and other vegetation short, particularly around pens, drains, sedimentation basin and the holding pond makes it more difficult for flies to find resting places and reduces the vegetation–manure interface, a preferred breeding substrate for stable flies.
- Composting carcasses shall be covered with manure.
- Human waste shall be managed appropriately and in accordance with any relevant statutory requirements.

Other hazards and risks

Operation	• Maintaining animal health through biosecurity and animal health programs, including the use of vaccines, plays an important role in reducing the risk of some zoonotic diseases. • Development and implementation of a Health and Safety Management Plan that covers the risks for employees associated with operational activities such as general safety for working with plant, equipment and livestock. • All personnel working with or handling animals shall take precautions to minimise the risk of infection from animal-borne diseases. Because different zoonotic diseases behave differently, avoiding specific infections requires an individual approach. • Good personal hygiene practices such as washing hands after handling animals and before preparing or eating food or smoking cigarettes shall be implemented. • Personnel shall be vaccinated for those zoonoses for which vaccinations are available, for example Q Fever. • Personal protective equipment such as gloves, boots and aprons or overalls shall be worn when handling animals. Cuts and scratches shall be covered with waterproof plasters. • Pest animals such as rats or feral pigs can carry zoonotic diseases and control programs will reduce the likelihood of transmission to people. • Employees are trained to understand the mechanisms of disease introduction and spread, including via cattle, feedstuffs, people, vehicles, machinery and equipment, feral animals and wildlife, and manure and liquid waste. • Development of a preventive herd health plan to help prevent and treat animal health shall be developed in conjunction with a veterinarian. • Implementation of herd management systems that support rapid and accurate trace-back and trace-forward of livestock. • Livestock are vaccinated against major preventable diseases. • Early identification of animal health issues through daily monitoring, observation and assessment of livestock for a range of key behavioural indicators. • Accurate diagnosis of animal health issues backed by the local veterinarian. • Separation of sick cattle into hospital/treatment pens for treatment and convalescing. • Prudent use of antibiotics to manage infectious disease, reduce livestock pain and suffering, and to minimise losses due to disease. • Destruction and disposal of infected and exposed susceptible animals. • Seek accreditation under the National Feedlot Accreditation Scheme (NFAS).	section 13.17.6

- Development and implementation of a heat stress management plans to mitigate excessive heat stress events.
- Provision of shade structures over production and hospital pens.
- Sufficient capacity of water required to supply cattle; to clean vehicles, yards etc; and for general hygiene is available on-site.
- Sufficient capacity of feed required to supply cattle is available on-site.
- Implementation of best practice solid and liquid waste management techniques including regular cleaning of pens, drains and sedimentation basin of manure and composting of mortalities.
- Preparation of a contingency plan to manage the disposal of large numbers of mortalities.

Part H – Justification

16. Development justification

16.1 Introduction

The proposed development requires justification on biophysical, economic and social grounds together with the principles of Ecologically Sustainable Development (ESD), taking into consideration whether it is consistent with the objects of the EP&A Act. Each aspect is dealt with in the following sections.

16.2 Biophysical

The potential biophysical impacts associated with the proposed development have been assessed in section 13 and include assessment of the following impacts:

- Air quality;
- Biodiversity and habitat;
- Landform and soils (primarily for suitability for waste utilisation and protection of groundwater); and
- Groundwater and surface water quantity and quality.

As discussed in this EIS, the proposed development will be sited within built infrastructure of an existing beef cattle feedlot. No adverse impacts to air quality, biodiversity and habitat, surface water and/or groundwater quantity or quality or soils are expected.

As outlined in section 13.1.7, the proposed development would have a minimal impact upon air quality due to the separation distances from sensitive receivers and mitigation measures proposed.

As outlined in section 13.8, the proposed development would have a minimal impact upon biodiversity and habitat, given no native vegetation will be cleared.

Groundwater quality is not vulnerable as the aquifer is protected by overlying strata of medium-heavy clay material. Further, design, construction and operation standards shall be implemented that will further protect groundwater resources.

Water for the proposed development shall be sourced from existing ground and surface water access licences and no new allocation (or “new water”) is required.

Surface water quality shall be protected through design of a sustainable effluent and solid waste utilisation system, appropriate buffers, storages to capture first-flush runoff and best-practice application and management techniques. Further, the proposed development complex site is not subject to flooding.

The proposed development could result in impacts to soils through siting, design and/or unsustainable utilisation of effluent and solid wastes. However, as discussed in section 13.11, a sustainable effluent and solid waste utilisation system has been designed that incorporates various mitigation measures.

The assessment of the impact of the proposed development on each of the biophysical elements of the environment has concluded that providing management measures and monitoring systems are implemented to mitigate potential impacts, the proposed development would not have a significant impact.

The environmental mitigation, management and monitoring requirements have been compiled and summarised as commitments in section 15.

The proposed development is therefore justifiable in terms of the biophysical elements of the environment.

16.3 Economic

The operational expenditure required for the proposed development would stimulate the local, regional and NSW economies. The proposed development will provide both direct and indirect economic benefits to the local, regional and state economies.

The operational phase of the proposed development would provide direct economic benefits in the form of local employment opportunities, both onsite for some 4 full-time equivalent personnel and associated activities such as transport of cattle and feedstuffs, and indirect benefits through activities such as maintenance of equipment and environmental monitoring. Further, economic benefits to the local region include the opportunity to supply inputs such as cattle and feedstuffs and purchase of solid waste.

Subsequently, given these benefits, the proposed development is justifiable on economic grounds.

16.4 Social

The potential social impacts of the proposed development have been assessed in the EIS, and include consideration of an extensive range of issues, including:

- Odour;
- Dust;
- Traffic and transportation;
- Noise;
- Amenity;
- Biodiversity;
- Landscape character and visual impact;

- Cultural Heritage; and
- Hazard and risks.

A number of these issues interrelate with the biophysical and economic impacts of the proposed development, where, as described above, it has been concluded that the proposed development would not have a significant impact provided mitigation measures are implemented, and that the proposed development is justifiable on biophysical and economic grounds.

Through the consultation program, the community did not raise any issues about the proposed development, based on its understanding and perception of the proposed development and its likely impacts.

Many of these issues raised, such as odour, dust, social amenity, visual impact and traffic have been demonstrated through the impact assessment to have an acceptable level of impact providing management measures are implemented.

The noise impact assessment predicted that no residential receivers would experience noise impacts during operation.

The viewpoint assessment concluded that there was expected to be no visual impact from the proposed development other than from local road users due to the topography of the land and screening provided by existing vegetation.

Further, the assessment concluded that the nature of the proposed development would be consistent with the existing agricultural activities in the surrounding area although on a larger scale and that the proposed development would assimilate into the local landscape due to the nature of the development and the high visual absorption capacity of the surrounding landscape.

The proposed development is not expected to create significant hazards or risks to humans, animals or the biophysical environment provided the mitigation measures outlined in section 13.17.6 are implemented.

The proposed development is not considered to have significant social impacts on the community, given its location with respect to sensitive receivers and design and management measures to be implemented. Subsequently, the proposed development is justifiable on social grounds.

16.5 Ecologically sustainable development

Ecologically sustainable development (ESD) is integrated into NSW Environmental legislation and government policy. Schedule 2 of the Environmental Planning and Assessment Act 1979 lists four guiding principles to assist in achieving ESD. They are:

- *The precautionary principle*: if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- *Inter-generational equity*: the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- *Conservation of biological diversity and ecological integrity*: conservation of biological diversity and ecological integrity should be a fundamental consideration.
- *Improved valuation and pricing of environmental resources*: environmental factors should be included in the valuation of assets and services, such as polluter pays, full life cycle costing, and utilising incentive structures / market mechanisms to meet environmental goals.

The four principles of ESD as they relate to this development are considered in the following sections.

In addition, the Commonwealth's National Strategy for Ecologically Sustainable Development defines ESD as 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'.

Conservation of ecological resources would be achieved through avoiding valuable areas (as far as practicable).

16.5.1 Precautionary principle

AJ & NA Varley has adopted the 'precautionary principle' during the planning, design, construction and operation of the proposed development. This is demonstrated through the detailed investigations undertaken to determine the characteristics of the environment, and the likely impacts associated with the proposed development.

The identification and prioritisation of potential impacts to the environment has enabled environmental management measures to be developed to manage potential impacts to ensure that significant adverse environmental impacts are prevented.

The subject land is ideally suited for the proposed development. In addition, high standards of management are proposed for the proposed development. Providing the proposed development is operated as described in this EIS there is no significant threat of serious or irreversible environmental harm.

In addition, environmental monitoring of the operations will be used to ensure that the environmental impacts are appropriately managed and adjustments made to ensure that the proposed development is operating in an environmentally sustainable way.

16.5.2 Inter-generational equity

Inter-generational equity is a part of social equity, as is intra-generational equity.

Inter-generational equity is the concept that decisions made by the present generation would not result in a degradation of the environment for future generations. While intra-generational equity is applied within the same generation.

The proposed development would have minimal long-term impacts on the environment as a result of the suitability of the subject land for such development and the proposed high standards of design and construction of the existing development and proposed management of the proposed development.

The potential impacts associated with the operational phase of the proposed development, such as from odour and traffic, would be managed through the implementation of environmental management measures, and are reversible in nature, and therefore would not result in significant environmental degradation for future generations.

The design and management of the proposed development would ensure that environmental impacts are managed during the operational phase and would not result in significant long-term environmental damage.

Much of the region suffers from limited opportunities because of a narrow economic base which is agriculture. The proposed development would contribute to social equity by providing additional employment opportunities both directly and indirectly.

Hence the proposed development would contribute to both inter-generational and intra-generational equity.

16.5.3 Biological diversity and ecological integrity

The principle of 'biological diversity and ecological integrity' requires a full and diverse range of plant and animal species to be maintained and conserved.

Consideration of the impacts of the proposed development on biodiversity and habitat has been undertaken as part of environmental investigations.

The proposed development shall not result in the removal of any native vegetation and the biodiversity assessment concluded that the proposed development is unlikely to have significant impacts on threatened flora and fauna species or habitat.

Monitoring of the environmental safeguards and environmental impacts would be carried out for the lifetime of the proposed development.

The proposed development maintains ecosystems, species and genetic diversity and therefore meets the principle of biological diversity and ecological integrity.

16.5.4 Valuation and pricing of environmental resources

One of the underlying goals of ESD is economic efficiency, including improved valuation and pricing of environmental resources.

Integration of environmental and economic goals can be measured by undertaking a cost-benefit analysis, that is, by measuring the costs of proceeding with the proposed development against the benefits arising from the proposed development.

In the past, it was assumed that some environmental resources were free or under-priced, leading to their wasteful use and consequent degradation. Consideration of economic efficiency, with improved valuation of environmental resources, aims to overcome the under-pricing of natural resources and has the effect of integrating economic and environment considerations in decision making, as required by ESD.

Given the different values placed on an environment, the various components of an environment and the varying methodologies used for valuation, it is difficult to assign a monetary value against the environmental costs and benefits associated with the proposed development. However, various studies have made comparison between grass-finished and grain-fed cattle using life-cycle analysis.

LCA studies concluded that in comparison to grass finished cattle, grain finished cattle had higher lifetime ADG and higher finished weights. In addition to efficiency improvements, feeding proportions of grain reduce daily methane emissions compared to grass feeding (Dong et al., 2006). Including all impacts associated with production across the supply chain, Peters et al. (2010), Pelletier et al. (2010) and Wiedemann et al. (2015) found that finishing cattle on grain compared to grass reduced emissions intensity.

Therefore, the approach adopted for the proposed development is the management of environmental impacts through appropriate safeguards, and to incorporate the value of environmental resources via direct valuation where practicable (e.g. the adoption and funding of mitigation measures to manage potential environmental impacts, such as dust suppression, odour, ground and surface water quality monitoring, soil monitoring etc.).

Relevant to the consideration of the valuation and pricing of environmental resources are the environmental assessment and siting and design criteria which have been considered during planning of the proposed development.

The value of the environment is also managed through the legislative process by imposing financial penalties or requirements to rehabilitate on persons responsible for polluting the environment.

AJ & NA Varley would implement the mitigation and monitoring measures outlined in this EIS to minimise environmental impacts caused by the proposed development.

Having considered all aspects of ESD, the conclusion is that the proposed development is consistent with its specific components.

16.6 Conclusion

The proposed development described in this EIS is consistent with the principles of ESD and is justifiable taking into account potential health, biophysical, economic and social considerations.

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Appendix A

Environmental Planning Framework

Planning Policy (Housing) 2021, or a former site compatibility certificate, of which the council is aware, in relation to proposed development on the land and, if there is a certificate—

(a) the period for which the certificate is current, and

(b) that a copy may be obtained from the Department.

(2) If *State Environmental Planning Policy (Housing) 2021*, Chapter 2, Part 2, Division 1 or 5 applies to the land, any conditions of a development consent in relation to the land that are of a kind referred to in that Policy, section 21(1) or 40(1).

(3) Any conditions of a development consent in relation to land that are of a kind referred to in *State Environmental Planning Policy (Affordable Rental Housing) 2009*, clause 17(1) or 38(1).

(4) In this section—

former site compatibility certificate means a site compatibility certificate issued under *State Environmental Planning Policy (Affordable Rental Housing) 2009*.

23 Water or sewerage services

If water or sewerage services are, or are to be, provided to the land under the *Water Industry Competition Act 2006*, a statement to that effect.

Note—

A public water utility may not be the provider of some or all of the services to the land. If a water or sewerage service is provided to the land by a licensee under the *Water Industry Competition Act 2006*, a contract for the service will be deemed to have been entered into between the licensee and the owner of the land. A register relating to approvals and licences necessary for the provision of water or sewerage services under the *Water Industry Competition Act 2006* is maintained by the Independent Pricing and Regulatory Tribunal and provides information about the areas serviced, or to be serviced, under that Act. Purchasers should check the register to understand who will service the property. Outstanding charges for water or sewerage services provided under the *Water Industry Competition Act 2006* become the responsibility of the purchaser.

Schedule 3 Designated development

section 7

Part 1 Preliminary

1 Definitions

(1) In this Schedule—

acid sulfate soil means acid sulfate soil, potential acid sulfate soil, sulfidic clay or sulfidic sand with soil profiles or layers, within the material to be disturbed or impacted by the development, with more than 0.1% sulfide and a net acid generation potential of more than zero.

ADG Code means the *Australian Code for the Transport of Dangerous Goods by Road and Rail* approved by the National Transport Commission, as in force from time to time.

coastal dune field means a system of wind-blown sand deposits extending landwards of the coastline, whether active or stable.

coastline means ocean beaches, headlands or other coastal landforms, excluding bays, estuaries or inlets.

contaminated soil means soil or sediment that contains a substance at a concentration that—

(a) is above the concentration at which the substance is normally present in soil or sediment from the same locality, and

(b) presents a risk of harm to human health or the environment, where harm to the environment includes a direct or indirect alteration of the environment that has the effect of degrading the environment.

development site, in relation to a development application—

(a) means—

(i) the whole of the land to which the application applies, or

(ii) the part of the land that is identified in the application as the actual site of the development, and

(b) includes, in relation to a development application for development involving alteration of a building, the actual site of the existing or approved development.

drinking water catchment means—

(a) land in a restricted area prescribed by a controlling water authority, including—

(i) a declared catchment area, within the meaning of the *Water NSW Act 2014*, and

(ii) a catchment district proclaimed under the *Local Government Act 1993*, section 128, or

(b) land within 500 metres of a groundwater source used by a local water utility or major utility, within the meaning of the *Water Management Act 2000*, for the purposes of town water supply.

dwelling means a room or suite of rooms occupied or used, or constructed or adapted to be capable of being occupied or used, as a separate domicile.

effluent includes treated or partially treated wastewater from—

(a) a sewage treatment plant, or

(b) a treatment plant associated with intensive livestock industries or aquaculture, agricultural, livestock, wood, paper or food processing industries.

environmentally sensitive area of State significance means the following—

(a) coastal waters of the State,

(b) land identified as coastal wetlands or littoral rainforest on the *Coastal Wetlands and Littoral Rainforests Area Map*, within the meaning of *State Environmental Planning Policy (Resilience and Hazards) 2021*, Chapter 2,

(c) an area declared to be an aquatic reserve or marine park under the *Marine Estate Management Act 2014*,

(d) a declared Ramsar wetland or declared World Heritage property within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999* of the Commonwealth,

(e) land reserved or dedicated under the *Crown Land Management Act 2016* for the preservation of flora, fauna, geological formations or for other environmental protection purposes,

(f) land declared as an area of outstanding biodiversity value under the *Biodiversity Conservation Act 2016*,

(g) land identified as critical habitat under the *Fisheries Management Act 1994*, Part 7A,

(h) land in a national park, state conservation area, historic site, nature reserve or wilderness area under the *National Parks and Wildlife Act 1974*,

(i) land in a wilderness area under the *Wilderness Act 1987*,

(j) land identified in an environmental planning instrument as being of high Aboriginal cultural significance or high biodiversity significance or as in a conservation zone,

(k) land, places, buildings or structures listed on the State Heritage Register under the *Heritage Act 1977*.

floodplain means—

(a) the floodplain level nominated in a local environmental plan, or

(b) if no level has been nominated—the areas inundated as a result of a 1 in 100 flood event.

high watertable means the areas where the groundwater depth is less than 3

metres below the surface at its highest seasonal level.

highly permeable soil means soil profiles or layers, within the upper 2 metres of the material to be disturbed or impacted by the development, with a saturated hydraulic conductivity of more than 50 millimetres per hour.

incinerate includes any method of burning or thermally oxidising solids, liquids or gases.

relevant irrigation land means—

(a) land in the area of operations of an irrigation corporation, within the meaning of the *Water Management Act 2000*, Chapter 4, Part 1, or

(b) land shown edged heavy black on the East Cadell Map under *State Environmental Planning Policy (Primary Production) 2021*, Chapter 2.

residential zone means land identified in an environmental planning instrument as being predominantly for residential use, including urban, village or living area zones, but excluding rural residential zones.

saline soil means soil profiles or layers, within the upper 2 metres of soil, with an electrical conductivity of saturated extracts (ECe) value of more than 4 deciSiemens per metre (dS/m).

sludge means semi-liquid particulate matter produced as a by-product of agricultural processing of produce, aquaculture, breweries or distilleries, intensive livestock agriculture, livestock processing industries, paper pulp or pulp product industries or sewerage systems or works.

sodic soil means soil profiles or layers, within the upper 2 metres of soil, with an exchangeable sodium percentage (ESP) of more than 6%.

thermal treatment has the same meaning as in the *Protection of the Environment Operations Act 1997*, Schedule 1.

toxic substance means a substance classified as toxic in the ADG Code, including toxic gases (Class 2.3) and toxic and infectious substances (Class 6).

waste tyres has the same meaning as in the *Protection of the Environment Operations Act 1997*, Schedule 1.

(2) In this Schedule, ***waste*** includes a matter or thing that—

(a) is solid, gaseous or liquid or a combination of solid, gaseous or liquid, and

(b) is discarded or is refuse from processes or uses.

Example—

Domestic, medical, industrial, mining, agricultural or commercial processes and uses.

(3) A substance may be ***waste*** for the purposes of this Schedule even if it may be—

(a) reprocessed, re-used or recycled, or

(b) sold or intended for sale.

2 Measuring distances

(1) The distance between aquaculture leases is measured as the shortest distance between—

(a) the boundary of an existing lease area, and

(b) the boundary of the area to which the development application applies.

(2) The distance from a coastline is measured as the shortest distance between—

(a) the mean high water mark, and

(b) the boundary of the development site, excluding access roads.

(3) The distance from a dwelling is measured as the shortest distance between—

(a) the edge of the dwelling, excluding associated works such as access roads, and

(b) the boundary of the development or works to which the development application applies.

(4) The distance from an environmentally sensitive area of State significance is measured as the shortest distance between—

(a) the boundary of the environmentally sensitive area of State significance, and

(b) the boundary of the development site.

(5) The distance between extractive industries or mine sites is measured as the shortest distance between—

(a) an area of disturbance by a mine or extractive industry that has operated within the past 5 years, and

(b) the boundary of the development site, excluding access roads.

(6) The distance between poultry farms is measured as the shortest distance between—

(a) the edge of facilities or works associated with an existing poultry farm, and

(b) the facilities or works to which the development application applies, excluding access roads.

(7) The distance from a residential zone is measured as the shortest distance between—

(a) the boundary of the residential zone, and

(b) the facilities or works to which the development application applies, excluding access roads.

(8) The distance between turf farms is measured as the shortest distance between—

(a) the edge of an area that is growing or has previously grown turf sod within the last 5 years, and

(b) the edge of the area for growing turf sod to which the development application applies.

(9) The distance from a waterbody is measured as the shortest distance between—

(a) the boundary of the development site, and

(b) the top of the high bank, if present, or, if no high bank is present—

(i) the mean high water mark in tidal waters, or

(ii) the mean water level in non-tidal waters.

(10) The distance from a wetland is measured as the shortest distance between—

(a) the boundary of the development site, and

(b) the top of the high bank, if present, or, if no high bank is present, the edge of vegetation communities dominated by wetland species.

Part 2 Designated development

3 Agricultural produce processing facilities

(1) Development for the purposes of an agricultural processing facility is designated development if the facility—

(a) involves crushing, juicing, grinding, ginning, milling, separating, washing, sorting, coating, rolling, pressing, steaming, flaking, combing, homogenising and pasteurising more than 30,000 tonnes of agricultural produce per year, or

(b) releases effluent, sludge or other waste—

(i) in or within 100 metres of a natural waterbody or wetland, or

(ii) in an area of high watertable, highly permeable soils or acid sulfate, sodic or saline soils.

(2) In this section—

agricultural processing facility means a building or place at which agricultural produce is processed.

agricultural produce includes dairy products, seeds, fruit, vegetables or other plant material.

4 Aircraft facilities

(1) Development for the purposes of an aircraft facility for seaplanes or aeroplanes is designated development if the facility—

(a) causes a significant environmental impact or significantly increases the environmental impacts as a result of—

(i) the number of flight movements, including taking-off or landing, or

(ii) the maximum take-off weight of aircraft capable of using the facility, and

(b) is located so that the whole or part of a residential zone, school or hospital is—

(i) in an ANEF contour of 20 or greater according to the Australian Noise Exposure Forecast for the facility within the meaning of the *Airports Act 1996* of the Commonwealth, or

(ii) within 5 kilometres of the facility, if there is no Australian Noise Exposure Forecast for the facility.

(2) Development for the purposes of an aircraft facility for helicopters is designated development if the facility—

(a) has an intended use of more than 7 helicopter flight movements per week, including taking-off or landing, and

(b) is located within 1,000 metres of a dwelling not associated with the facility.

(3) Subsection (2) does not apply to a facility used exclusively for emergency aeromedical evacuation, retrieval or rescue.

(4) Development for the purposes of an aircraft facility is designated development if the development will result in more than 20 hectares of native vegetation being disturbed by clearing.

(5) Development for the purposes of an aircraft facility is designated development if the facility is located within 40 metres of—

(a) an environmentally sensitive area of State significance, or

(b) a natural waterbody.

(6) Subsection (5)(b) does not apply to an aircraft facility for seaplanes or helicopters.

27 Feedlots

(1) Development for the purposes of a feedlot is designated development if the feedlot accommodates in a confinement area, and wholly or substantially rears or fattens on prepared or manufactured feed, more than—

(a) 1,000 head of cattle, or

(b) 4,000 sheep, or

(c) 5,000 animals of any kind, excluding poultry.

(2) This section does not apply to a facility for drought or similar emergency relief.

28 Geosequestration facilities

(1) Development for the purposes of a facility for the injection and geological storage of greenhouse gases is designated development.

(2) Development for the purposes of drilling or operating a greenhouse gas geological exploration well is designated development.

(3) Subsection (2) does not include apply to a stratigraphic borehole or monitoring well.

29 Horse facilities

(1) Development for the purposes of a facility or confined area operated on a commercial basis for the keeping or breeding of horses is designated development if the facility or area accommodates more than 400 horses.

(2) This section does not apply to a facility for drought or similar emergency relief.

30 Limestone mines and works

(1) Development for the purposes of limestone mines or works is designated development if the works disturb a total surface area of more than 2 hectares of land by—

(a) clearing or excavating, or

(b) constructing dams, ponds, drains, roads, railways or conveyors, or

(c) storing or depositing overburden, limestone, limestone products or tailings.

(2) Development for the purposes of a mine that mines or processes limestone is designated development if the mine is located—

(a) in or within 40 metres of—

(i) a natural waterbody, or

Appendix B

Consultation with Relevant Authorities

Appendix B.1

Consultation with DPIE (SEARs)

Department of Planning and Environment

25 September 2023

EF23/7053
SEAR 1788

Andrew Varley
AJ & NA Varley
“Arkoona" RMB 3095 Lower Finley Road
Finley NSW 2713

Dear Mr Varley

Intensive Livestock Industry
58 Broughans Road, Pinelodge (Lot 130 DP756353) - Edward River LGA
Planning Secretary’s Environmental Assessment Requirements (SEAR) 1788

Thank you for your request for the Planning Secretary’s Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for the above development proposal. I have attached a copy of these requirements.

In support of your application, you indicated that your proposal is both designated and integrated development under Part 4 of the *Environmental Planning and Assessment Act 1979* and requires a licence under the *Protection of the Environment Operations Act 1997*. In preparing the SEARs, the Department of Planning and Environment (the Department) has consulted with the Environment Protection Authority. A copy of their requirements is attached.

If other integrated approvals are identified before the Development Application (DA) is lodged, you must undertake direct consultation with the relevant agencies, and address their requirements in the EIS.

If your proposal contains any actions that could have a significant impact on matters of National Environmental Significance, then it will require an additional approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Commonwealth Department of Climate Change, Energy, the Environment and Water on (02) 6274 1111.

Should you have any further enquiries, please contact Laura Evert, Planning and Assessment, at the Department on 02 8289 6613 or via laura.evert@dpie.nsw.gov.au.

Yours sincerely

Chris Ritchie
Director
Industry Assessments
as delegate of the Planning Secretary

Planning Secretary's Environmental Assessment Requirements

Section 4.12(8) of the *Environmental Planning and Assessment Act 1979*.
Schedule 3 of the Environmental Planning and Assessment Regulation 2021.

Designated Development

SEAR Number	1788
Proposal	Expansion of a beef cattle feedlot from 999 head to 3200 head.
Location	58 Broughans Road, Pinelodge (Lot 130 DP756353)
Applicant	AJ & NA Varley
Date of Issue	25/09/2023
General Requirements	The Environmental Impact Statement (EIS) must comply with the assessment requirements and meet the minimum form and content requirements in sections 190 and 192 of the *Environmental Planning and Assessment Regulation 2021.*
Key Issues	The EIS must include an assessment of all potential impacts of the proposed development on the existing environment (including cumulative impacts if necessary) and develop appropriate measures to avoid, minimise, mitigate and/or manage these potential impacts. As part of the EIS assessment, the following matters must also be addressed: • **strategic and statutory context** – including: - a detailed justification for the proposal and suitability of the site for the development - a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies - a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out. - a description of how the proposed expansion integrates with existing on-site operations - a description of any amendments to and/ or additional licence(s) or approval(s) required to carry out the proposed development. • **waste management** – including: - details of waste handling including, transport, identification, receipt, stockpiling and quality control including off-site reuse and disposal - detail of waste management including manure and disposal of dead cattle for the proposal, including in the event of a mass mortality event - the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the *NSW Waste Avoidance and Sustainable Materials Strategy 2041.* • **animal welfare, bio-security and disease management** – including: - details of how the proposed development would comply with relevant codes of practice and guidelines - a heat load assessment in accordance with Department of Primary Industries guidelines

	- details of all pest, weed and disease control measures - a detailed description of the contingency measures that would be implemented for the mass disposal of livestock in the event of disease outbreak. • **air quality** – including: - a description of all potential sources of air and odour emissions during operation, including consideration of cumulative impacts associated with existing on-site operations - an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines - a description and appraisal of air quality impact mitigation and monitoring measures. • **noise and vibration** – including: - a description of all potential noise sources during operation, including road traffic noise and consideration of cumulative impacts associated with existing on-site operations - a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines - a description and appraisal of noise and vibration mitigation and monitoring measures. • **soil and water** – including: - a description of local soils, topography, drainage and landscapes - details of water usage for the proposed expansion including existing and proposed water licencing requirements in accordance with the *Water Act 1912* and/or the *Water Management Act 2000* - an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment - details of any changes to sediment and erosion controls - details of increases and/or changes to the site water balance - a contingency plan for water supply in the event of drought conditions - an assessment of potential impacts on the quality and quantity of surface and groundwater resources - assessment of the site's capacity to sustain an increase in solid waste and effluent irrigation and an assessment of potential impacts to any nearby terrestrial waterways and groundwater - details of how the proposed expansion integrates with existing on-site stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts - a description and appraisal of impact mitigation and monitoring measures. • **traffic and transport** – including: - details of road transport routes and access to the site - details of road traffic volumes, including consideration of cumulative impacts associated with existing on-site operations - an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development. • **biodiversity** – including a description of any potential vegetation clearing needed to undertake the proposal and any impacts on flora and fauna.
Environmental	The EIS must assess the proposal against the relevant environmental planning

Planning Instruments and other policies	instruments, including but not limited to: • State Environmental Planning Policy (Transport and Infrastructure) 2021 • State Environmental Planning Policy (Primary Production) 2021 • State Environmental Planning Policy (Resilience and Hazards) 2021 (Chapters 2, 3 and 4) • Conargo Local Environment Plan 2013 • relevant development control plans and section 7.11 plans.
Guidelines	During the preparation of the EIS you should consult the Department's Register of Development Assessment Guidelines which is available on the Department's website at https://www.planning.nsw.gov.au/Assess-and-Regulate/Development-Assessment/Industries. Whilst not exhaustive, this Register contains some of the guidelines, policies, and plans that must be taken into account in the environmental assessment of the proposed development.
Consultation	During the preparation of the EIS, you must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult with the: • Environment Protection Authority • Edward River Council • the surrounding landowners and occupiers that are likely to be impacted by the proposal. Details of the consultation carried out and issues raised must be included in the EIS.
Further consultation after 2 years	If you do not lodge an application under Section 4.12(8) of the *Environmental Planning and Assessment Act 1979* within 2 years of the issue date of these SEARs, you must consult with the Planning Secretary in relation to any further requirements for lodgement.

DOC23/521837
26 June 2023

Para Planner
Industry Assessments
Department of Planning and Environment

By email: laura.evert@planning.nsw.gov.au

Dear Ms Evert

RE SEAR 1788

I refer to your electronic mail on 15 June 2023 to the Environment Protection Authority (EPA) seeking our requirements for the preparation of an Environmental Impact Statement (EIS) for the proposed Feedlot expansion to 3200 Head Cattle by AJ & NA Varley, located at 58 Broughans Road, Pinelodge NSW 2713 (Lot 130 DP756353).

The EPA has responsibilities for the regulation of scheduled activities under the *Protection of the Environment Operations Act 1997* (the Act). Based on the information provided to us, this activity is scheduled under the Act and the applicant will require an Environment Protection Licence to carry out scheduled activities. The applicant will need to make a separate application to the EPA to obtain this licence if planning consent is granted.

We have considered the details of the proposal and have identified the information required for the EIS as outlined in Attachment A. The EPA's key information requirements for the proposal are as follows:

- Details on the potential environmental impacts such as odour, noise, dust, waste and contamination, including cumulative impacts and detail mitigation measures, including monitoring, that is proposed to be implemented to prevent or minimise these impacts;
- Details on an odour impact assessment completed in accordance with the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* (2022) and *Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW* (2006);
- Details on the proposed construction and management of the wastewater collection and treatment system, including a demonstration that surface water, groundwater and soils will be protected from adverse impacts;
- Details of the management of the waste produced by the feedlot; and
- Details of the management of mortalities at the feedlot.

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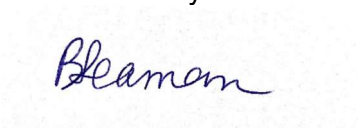
riverina.farwest@epa.nsw.gov.au

In carrying out the assessment the proponent should refer to the relevant guidelines identified at Attachment 'B'.

If you have any further enquiries about this matter please contact Mick Waanders by telephoning 02 6969 0712 or by electronic mail at info@epa.nsw.gov.au.

Yours sincerely



BRIOHNY SEAMAN
Acting Unit Head
Environment Protection Authority

TTACHMENT A

ATTACHMENT A

The EPA's assessment of the proposal has identified the following areas that require further information.

Potential environmental impacts of the project

The Environmental Impact Statement (EIS) must address the requirements of Section 45 of the *Protection of the Environment Operations Act 1997* (POEO Act) by determining extent of each impact and providing sufficient information to enable the EPA to determine appropriate conditions, limits and monitoring requirements for an Environment Protection Licence (EPL).

The following potential environmental impacts of the project need to be assessed, quantified and reported on.

- Air
- Noise
- Water
- Land
- Waste and chemicals.

The EIS should address how the required environmental goals will be met for each potential impact.

The EIS should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified potential environmental impacts associated with the project and to reduce risks to human health and prevent the degradation of the environment.

This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

Potential impacts on air quality

The goals of the project in relation to air quality should be to ensure sensitive receptors are protected from adverse impacts from odour and dust.

Details would need to be provided on the proposed measures to manage odour and dust from all sources and in particular pens, manure stockpiles and associated wastewater collection, treatment and storage ponds. Measures to prevent or control the emission of odour from these facilities must be detailed.

For a proposal of this scope we would expect an assessment of odour to be undertaken in accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022) and the *Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006). All potentially impacted residential or sensitive premises likely to be impacted by the development must be identified and included in the assessment.

The EIS needs to identify any other existing impacts on air quality within the area and if necessary provide an assessment and commentary on the predicted cumulative impacts that may arise.

Emissions from any plant must meet the design criteria detailed in the Protection of the Environment Operations (Clean Air) Regulation 2022.

Potential impacts of noise and vibration

The goals of the project should include design, construction, operation and maintenance of the facility in accordance with relevant EPA policy, guidelines and criteria, and in order to minimise potential impacts from noise.

The EPA expects that potential noise sources are assessed in accordance with the *Noise Policy for Industry* (EPA 2017), and where required mitigation measures are proposed (eg appropriate equipment chosen to minimise noise levels). All residential or noise sensitive premises likely to be impacted by the development must be identified and included in the assessment.

The proposed development may result in an increase in traffic movements associated with the receival of materials. The number of traffic movements associated with the proposal should be quantified and the potential noise impacts associated with these traffic movements need to be assessed in accordance with the *NSW Road Noise Policy* (DECCW, 2011).

Potential impacts on water quantity and quality

The EIS must demonstrate how the proposed development will meet the requirements of section 120 of the POEO Act.

The goals of the project should include the following.

- No pollution of waters (including surface and groundwater), except to the extent authorised by EPA (i.e in accordance with an Environment Protection Licence);
- Polluted water (including effluent, process waters, wash down waters, polluted stormwater or sewage) is captured on the site and collected, treated and beneficially reused, where this is safe and practicable to do so; and
- It is acceptable in terms of the achievement or protection of the River Flow Objectives and Water Quality Objectives.

The EIS should document the measures that will achieve the above goals.

The EIS should provide details of any water management systems for the site to ensure surface and ground waters are protected from contaminants. This should include an assessment of the following.

- Effluent storage and treatment measures, including the design storage capacity and overflow frequency of each wastewater storage pond;
- Effluent and sludge disposal measures, including sufficient detail to demonstrate sustainable irrigation and sludge disposal practices consistent with the *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2004).
- Measures to monitor effluent irrigation sustainably consistent with the *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2004), including an assessment of any effluent irrigation areas to determine soil capacity to accommodate hydraulic and nutrient loads;
- Details of management practices the proponent will implement on effluent areas, (e.g. effluent application rates, cropping regimes) to maintain sustainable hydraulic and nutrient loads; and
- Surface and groundwater conditions that may be potentially impacted by operations on site and any proposed environmental monitoring measures that the proponent will implement to monitor the receiving environment.

Potential impacts on land

The goals of the project should include the following.

- No pollution of land, except to the extent authorised by EPA (ie in accordance with an Environment Protection Licence);
- The potential impact of land erosion from the development is mitigated; and

- The land impacted by solid and liquid waste application are appropriately monitored and managed in accordance with relevant EPA guidelines.

The EIS should document the measures that will achieve the above goals.

Details on the proposed disposal or re-use applications of waste water and manure associated with the intensification must be provided including a demonstration of how any soils impacted will be monitored and protected.

Potential waste impacts

The EIS must address all aspects of waste generation, management and disposal associated with the proposed development. The EIS should include the following:

- It is in accordance with the principles of the waste hierarchy and cleaner production;
- Where potential impacts associated with the handling, processing and storage of all waste materials generated at the premises are identified, these be satisfactorily mitigated;
- The beneficial reuse of all wastes generated at the premises are maximised where it is safe and practical to do so;
- No waste disposal occurs on site except in accordance with an Environment Protection Licence.

The goal of the project should be to ensure that environmental risks from intensive livestock agriculture activities are minimised. The EIS needs to identify the proposed type, quantities and location of wastes to be stored and/or processed at the site. This should include a detailed plan for in-situ classification of waste material, including the sampling locations and sampling regime that will be employed to classify the waste under the *EPA's Waste Classification Guidelines*.

Spill management measures, including items such as bunding, and emergency procedures should be clearly outlined.

Monitoring

The EIS must outline the proposed monitoring regime to be implemented in relation to the following potential impacts, where relevant.

- Surface runoff and ground water quality monitoring; and
- Effluent and soil quality monitoring.

ATTACHMENT B

Title	Web address
Relevant Legislation	
Environmental Planning and Assessment Act 1979	https://www.legislation.nsw.gov.au/#/view/act/1979/203
Protection of the Environment Operations Act 1997	https://www.legislation.nsw.gov.au/#/view/act/1997/156/full
Licensing	
Guide to Licensing	http://www.epa.nsw.gov.au/licensing/licenceguide.htm
Air Issues	
POEO (Clean Air) Regulation 2010	https://www.legislation.nsw.gov.au/#/view/regulation/2010/428/historical2016-11-01/full
Approved methods for modelling and assessment of air pollutants in NSW (2016)	http://www.environment.nsw.gov.au/resources/air/ammodelling05361.pdf
Assessment and management of odour from stationary sources in NSW (DEC, 2006)	Technical framework: https://www.environment.nsw.gov.au/resources/air/20060440framework.pdf Technical notes: https://www.environment.nsw.gov.au/resources/air/20060441notes.pdf
Noise and Vibration	
Interim Construction Noise Guidelines (EPA, 2017)	https://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/interim-construction-noise-guideline
Noise Policy for Industry (EPA, 2017)	https://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-(2017)
NSW Road Noise Policy (EPA, 2011)	https://www.epa.nsw.gov.au/publications/noise/2011236-nsw-road-noise-policy
Assessing Vibration: a technical guideline (DEC 2006)	https://www.epa.nsw.gov.au/noise/vibrationguide.htm
Australian and New Zealand Environment Council: Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZECC 1990)	https://www.epa.nsw.gov.au/resources/noise/ANZECBlasting.pdf

Soils	
Managing Urban Stormwater: Soils and Construction (Landcom, 2004)	https://www.environment.nsw.gov.au/stormwater/publications.htm
Waste	
Waste Classification Guidelines (EPA, 2014)	https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines
Protection of the Environment Operations (Waste) Regulation 2014	https://www.legislation.nsw.gov.au/regulations/2014-666.pdf
Environmental Guidelines: Solid Waste Landfills, Second edition (EPA, 2016)	https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/waste/solid-waste-landfill-guidelines-160259.ashx
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
National Water Quality Management Strategy: Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000)	http://www.waterquality.gov.au/anz-guidelines/Documents/ANZECC-ARMCANZ-2000-guidelines-vol2.pdf
National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ, 2000)	http://www.waterquality.gov.au/anz-guidelines/Documents/ANZECC-ARMCANZ-monitoring-reporting.pdf
Using the ANZECC Guidelines and Water Quality Objectives in NSW (EPA, 2006)	https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/water/anzeccandwqos06290.pdf
Environmental Guidelines: Storage and Handling of Liquids (EPA, 2007)	https://www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/compliance-audit-program/chemical-storage-handling-and-spill-management/storing-and-handling-liquids-trainers-manual
The NSW State Groundwater Policy Framework Document (DLWC, 1997)	http://www.water.nsw.gov.au/__data/assets/pdf_file/0008/547550/avail_ground_nsw_state_groundwater_policy_framework_document.pdf
The NSW State Groundwater Quality Protection Policy (DLWC, 1998)	http://www.water.nsw.gov.au/__data/assets/pdf_file/0006/548286/nsw_state_groundwater_quality_policy.pdf
National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC, 1995)	https://www.water.wa.gov.au/__data/assets/pdf_file/0020/4925/8728.pdf

Appendix B.2

Consultation with Edward River Council

Rod Davis

From: Eliza Eastman <eliza.eastman@edwardriver.nsw.gov.au>
Sent: Monday, 15 May 2023 10:27 AM
To: Rod Davis
Cc: arkoona@bigpond.com
Subject: RE: Proposed expansion of High Claire Feedlot - Finley

Hi Rod,

I just left you a voice mail, we are having difficulty catching one another.
Correct the application will be designated development as it proposes over 1000 head of cattle, it will also require EPA licensing as over 999 SCU.

As the application will be designated development, you will need to apply for a SEARS.
The SEARS will outline what is to be included in the EIS.

Please let me know if you need any further clarity.

Regards
Eliza

From: Rod Davis <rod.davis@rdcengineers.com.au>
Sent: Thursday, 27 April 2023 3:45 PM
To: Eliza Eastman <eliza.eastman@edwardriver.nsw.gov.au>
Cc: arkoona@bigpond.com
Subject: Proposed expansion of High Claire Feedlot - Finley

Good afternoon Eliza,

I act for Andrew & Nichole Varley – High Claire feedlot, Finley. I have left several messages and I understand you tried to call last week but I was out of the office. So I thought it might be better to send an email.

I understand you have had some discussions with Andrew & Nichole in relation to this matter.

Andrew & Nichole Varley have current approval under the former Conargo Shire Council for a 999 head beef cattle feedlot and 3500 head sheep feedlot on the property High Claire (Lot 130 DP 756353) at Cnr James Rd & Broughans Rd, Finley NSW 2713. The development is fully constructed to this capacity.

Andrew & Nichole Varley wish to expand the current development from the approved 999 head of beef cattle and 3500 head of sheep to a capacity in the order of 3200 head of beef cattle. The proposal shall also utilise the existing beef cattle pen space and sheep pen space and operate at a lower stocking density to accommodate the expanded number of cattle.

Whilst a feedlot over 1000 head would be designated development, I wish to confirm the appropriate environmental assessment of development given that the footprint of the development is remaining the same with only a stocking density change, the only environmental impacts that would need further consideration would be traffic, odour and manure utilisation. Therefore will Council require an Environmental Impact Statement or would a Statement of Environmental Effects suffice in this case.

Could you please advise of Councils requirements in this regard.

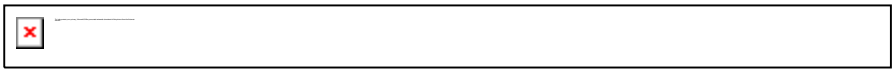
Regards,

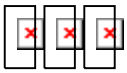
Rod Davis
Director
—
0427629203
rod.davis@rdcengineers.com.au

RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

Eliza Eastman
Planning Officer

Edward River Council
180 Cressy Street, PO Box 270
Deniliquin, NSW, 2710
T: 03 5898 3000
M:
E: eliza.eastman@edwardriver.nsw.gov.au
W: www.edwardriver.nsw.gov.au





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Appendix B.3

Consultation with NSW Environmental Protection Agency

DOC23/521837
26 June 2023

Para Planner
Industry Assessments
Department of Planning and Environment

By email: laura.evert@planning.nsw.gov.au

Dear Ms Evert

RE SEAR 1788

I refer to your electronic mail on 15 June 2023 to the Environment Protection Authority (EPA) seeking our requirements for the preparation of an Environmental Impact Statement (EIS) for the proposed Feedlot expansion to 3200 Head Cattle by AJ & NA Varley, located at 58 Broughans Road, Pinelodge NSW 2713 (Lot 130 DP756353).

The EPA has responsibilities for the regulation of scheduled activities under the *Protection of the Environment Operations Act 1997* (the Act). Based on the information provided to us, this activity is scheduled under the Act and the applicant will require an Environment Protection Licence to carry out scheduled activities. The applicant will need to make a separate application to the EPA to obtain this licence if planning consent is granted.

We have considered the details of the proposal and have identified the information required for the EIS as outlined in Attachment A. The EPA's key information requirements for the proposal are as follows:

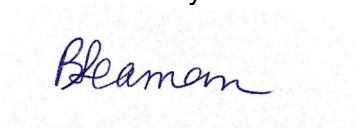
- Details on the potential environmental impacts such as odour, noise, dust, waste and contamination, including cumulative impacts and detail mitigation measures, including monitoring, that is proposed to be implemented to prevent or minimise these impacts;
- Details on an odour impact assessment completed in accordance with the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* (2022) and *Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW* (2006);
- Details on the proposed construction and management of the wastewater collection and treatment system, including a demonstration that surface water, groundwater and soils will be protected from adverse impacts;
- Details of the management of the waste produced by the feedlot; and
- Details of the management of mortalities at the feedlot.

Phone +61 2 6969 0700
Phone 131 555
(from *outside* NSW)
Fax +61 2 6969 0710
TTY 133 677
ABN 43 692 285 758
PO Box 397
Griffith
NSW 2680 Australia
Suite 7
130-140 Banna Ave
Griffith NSW
2680 Australia
www.epa.nsw.gov.au
riverina.farwest@epa.nsw.gov.au

In carrying out the assessment the proponent should refer to the relevant guidelines identified at Attachment 'B'.

If you have any further enquiries about this matter please contact Mick Waanders by telephoning 02 6969 0712 or by electronic mail at info@epa.nsw.gov.au.

Yours sincerely



BRIOHNY SEAMAN
Acting Unit Head
Environment Protection Authority

TTACHMENT A

ATTACHMENT A

The EPA's assessment of the proposal has identified the following areas that require further information.

Potential environmental impacts of the project

The Environmental Impact Statement (EIS) must address the requirements of Section 45 of the *Protection of the Environment Operations Act 1997* (POEO Act) by determining extent of each impact and providing sufficient information to enable the EPA to determine appropriate conditions, limits and monitoring requirements for an Environment Protection Licence (EPL).

The following potential environmental impacts of the project need to be assessed, quantified and reported on.

- Air
- Noise
- Water
- Land
- Waste and chemicals.

The EIS should address how the required environmental goals will be met for each potential impact.

The EIS should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified potential environmental impacts associated with the project and to reduce risks to human health and prevent the degradation of the environment.

This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

Potential impacts on air quality

The goals of the project in relation to air quality should be to ensure sensitive receptors are protected from adverse impacts from odour and dust.

Details would need to be provided on the proposed measures to manage odour and dust from all sources and in particular pens, manure stockpiles and associated wastewater collection, treatment and storage ponds. Measures to prevent or control the emission of odour from these facilities must be detailed.

For a proposal of this scope we would expect an assessment of odour to be undertaken in accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022) and the *Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006). All potentially impacted residential or sensitive premises likely to be impacted by the development must be identified and included in the assessment.

The EIS needs to identify any other existing impacts on air quality within the area and if necessary provide an assessment and commentary on the predicted cumulative impacts that may arise.

Emissions from any plant must meet the design criteria detailed in the Protection of the Environment Operations (Clean Air) Regulation 2022.

Potential impacts of noise and vibration

The goals of the project should include design, construction, operation and maintenance of the facility in accordance with relevant EPA policy, guidelines and criteria, and in order to minimise potential impacts from noise.

The EPA expects that potential noise sources are assessed in accordance with the *Noise Policy for Industry* (EPA 2017), and where required mitigation measures are proposed (eg appropriate equipment chosen to minimise noise levels). All residential or noise sensitive premises likely to be impacted by the development must be identified and included in the assessment.

The proposed development may result in an increase in traffic movements associated with the receival of materials. The number of traffic movements associated with the proposal should be quantified and the potential noise impacts associated with these traffic movements need to be assessed in accordance with the *NSW Road Noise Policy* (DECCW, 2011).

Potential impacts on water quantity and quality

The EIS must demonstrate how the proposed development will meet the requirements of section 120 of the POEO Act.

The goals of the project should include the following.

- No pollution of waters (including surface and groundwater), except to the extent authorised by EPA (i.e in accordance with an Environment Protection Licence);
- Polluted water (including effluent, process waters, wash down waters, polluted stormwater or sewage) is captured on the site and collected, treated and beneficially reused, where this is safe and practicable to do so; and
- It is acceptable in terms of the achievement or protection of the River Flow Objectives and Water Quality Objectives.

The EIS should document the measures that will achieve the above goals.

The EIS should provide details of any water management systems for the site to ensure surface and ground waters are protected from contaminants. This should include an assessment of the following.

- Effluent storage and treatment measures, including the design storage capacity and overflow frequency of each wastewater storage pond;
- Effluent and sludge disposal measures, including sufficient detail to demonstrate sustainable irrigation and sludge disposal practices consistent with the *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2004).
- Measures to monitor effluent irrigation sustainably consistent with the *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2004), including an assessment of any effluent irrigation areas to determine soil capacity to accommodate hydraulic and nutrient loads;
- Details of management practices the proponent will implement on effluent areas, (e.g. effluent application rates, cropping regimes) to maintain sustainable hydraulic and nutrient loads; and
- Surface and groundwater conditions that may be potentially impacted by operations on site and any proposed environmental monitoring measures that the proponent will implement to monitor the receiving environment.

Potential impacts on land

The goals of the project should include the following.

- No pollution of land, except to the extent authorised by EPA (ie in accordance with an Environment Protection Licence);
- The potential impact of land erosion from the development is mitigated; and

- The land impacted by solid and liquid waste application are appropriately monitored and managed in accordance with relevant EPA guidelines.

The EIS should document the measures that will achieve the above goals.

Details on the proposed disposal or re-use applications of waste water and manure associated with the intensification must be provided including a demonstration of how any soils impacted will be monitored and protected.

Potential waste impacts

The EIS must address all aspects of waste generation, management and disposal associated with the proposed development. The EIS should include the following:

- It is in accordance with the principles of the waste hierarchy and cleaner production;
- Where potential impacts associated with the handling, processing and storage of all waste materials generated at the premises are identified, these be satisfactorily mitigated;
- The beneficial reuse of all wastes generated at the premises are maximised where it is safe and practical to do so;
- No waste disposal occurs on site except in accordance with an Environment Protection Licence.

The goal of the project should be to ensure that environmental risks from intensive livestock agriculture activities are minimised. The EIS needs to identify the proposed type, quantities and location of wastes to be stored and/or processed at the site. This should include a detailed plan for in-situ classification of waste material, including the sampling locations and sampling regime that will be employed to classify the waste under the *EPA's Waste Classification Guidelines*.

Spill management measures, including items such as bunding, and emergency procedures should be clearly outlined.

Monitoring

The EIS must outline the proposed monitoring regime to be implemented in relation to the following potential impacts, where relevant.

- Surface runoff and ground water quality monitoring; and
- Effluent and soil quality monitoring.

ATTACHMENT B

Title	Web address
Relevant Legislation	
Environmental Planning and Assessment Act 1979	https://www.legislation.nsw.gov.au/#/view/act/1979/203
Protection of the Environment Operations Act 1997	https://www.legislation.nsw.gov.au/#/view/act/1997/156/full
Licensing	
Guide to Licensing	http://www.epa.nsw.gov.au/licensing/licenceguide.htm
Air Issues	
POEO (Clean Air) Regulation 2010	https://www.legislation.nsw.gov.au/#/view/regulation/2010/428/historical2016-11-01/full
Approved methods for modelling and assessment of air pollutants in NSW (2016)	http://www.environment.nsw.gov.au/resources/air/ammodelling05361.pdf
Assessment and management of odour from stationary sources in NSW (DEC, 2006)	Technical framework: https://www.environment.nsw.gov.au/resources/air/20060440framework.pdf Technical notes: https://www.environment.nsw.gov.au/resources/air/20060441notes.pdf
Noise and Vibration	
Interim Construction Noise Guidelines (EPA, 2017)	https://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/interim-construction-noise-guideline
Noise Policy for Industry (EPA, 2017)	https://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-(2017)
NSW Road Noise Policy (EPA, 2011)	https://www.epa.nsw.gov.au/publications/noise/2011236-nsw-road-noise-policy
Assessing Vibration: a technical guideline (DEC 2006)	https://www.epa.nsw.gov.au/noise/vibrationguide.htm
Australian and New Zealand Environment Council: Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZECC 1990)	https://www.epa.nsw.gov.au/resources/noise/ANZECBlasting.pdf

Soils	
Managing Urban Stormwater: Soils and Construction (Landcom, 2004)	https://www.environment.nsw.gov.au/stormwater/publications.htm
Waste	
Waste Classification Guidelines (EPA, 2014)	https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines
Protection of the Environment Operations (Waste) Regulation 2014	https://www.legislation.nsw.gov.au/regulations/2014-666.pdf
Environmental Guidelines: Solid Waste Landfills, Second edition (EPA, 2016)	https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/waste/solid-waste-landfill-guidelines-160259.ashx
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
National Water Quality Management Strategy: Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000)	http://www.waterquality.gov.au/anz-guidelines/Documents/ANZECC-ARMCANZ-2000-guidelines-vol2.pdf
National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ, 2000)	http://www.waterquality.gov.au/anz-guidelines/Documents/ANZECC-ARMCANZ-monitoring-reporting.pdf
Using the ANZECC Guidelines and Water Quality Objectives in NSW (EPA, 2006)	https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/water/anzeccandwqos06290.pdf
Environmental Guidelines: Storage and Handling of Liquids (EPA, 2007)	https://www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/compliance-audit-program/chemical-storage-handling-and-spill-management/storing-and-handling-liquids-trainers-manual
The NSW State Groundwater Policy Framework Document (DLWC, 1997)	http://www.water.nsw.gov.au/__data/assets/pdf_file/0008/547550/avail_ground_nsw_state_groundwater_policy_framework_document.pdf
The NSW State Groundwater Quality Protection Policy (DLWC, 1998)	http://www.water.nsw.gov.au/__data/assets/pdf_file/0006/548286/nsw_state_groundwater_quality_policy.pdf
National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC, 1995)	https://www.water.wa.gov.au/__data/assets/pdf_file/0020/4925/8728.pdf

Appendix B.4

Consultation with Water NSW

Rod Davis

From: Simone Tonkin <Simone.Tonkin@waternsw.com.au>
Sent: Friday, 8 December 2023 8:55 AM
To: rod.davis@rdcengineers.com.au
Subject: RE: [EXTERNAL] EIS Consultation - Proposed beef cattle Feedlot - A&N Varley - 58 Broughans Rd, Pine Lodge - L130 on DP756353

Good morning Mr Davis,

Please find attached a copy of SEAR response from WaterNSW for consideration when preparing your EIS for the above mentioned feedlot.

Regards Simone

Simone

Simone Tonkin
Water Regulation Specialist
Assessment and Approvals

WaterNSW

1/517 Spencer Street
ALBURY NSW 2640
M: 0427 138 188
E: customer.helpdesk@waternsw.com.au
www.waternsw.com.au

Good morning

We act for applicant in relation to the above matter.

AJ & NA Varley own and operate a 999 head beef cattle feedlot and 4,000 head sheep feedlot on the property "High Claire" located at 58 Broughans Road, Pine Lodge within the Edward River Shire.

AJ & NA Varley proposes to expand the existing beef cattle feedlot from 999 head to 3,200 head and cease lot feeding of lambs.

A Request for the Planning Secretary's Requirements for the preparation of an Environmental Impact Statement was made on the **29th May 2023**. The Planning Secretary's Environmental Assessment Requirements (SEAR) 1788 was received on the **25th September 2023**.

During the preparation of the EIS, direct consultation with relevant local, State and Commonwealth government authorities, service providers and community groups is required to identify and address any issues they may raise in the EIS.

In preparing the EIS, AJ & NA Varley wish to consult with the WaterNSW in relation to any issues they may raise in respect of the proposed development and/or additional requirements for the EIS.

Please refer to the attached document for further information.

Regards,

Rod Davis
Director
—
0427629203
rod.davis@rdcengineers.com.au

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Appendix B.5

Consultation with Murray Irrigation

Rod Davis

From: Thomas Kindred <tom.kindred@murrayirrigation.com.au>
Sent: Wednesday, 7 February 2024 9:10 AM
To: Rod Davis
Subject: RE: EIS Consultation - Proposed beef cattle Feedlot - A&N Varley - 58 Broughans Rd, Pine Lodge - L130 on DP756353

Hi Rod,

Murray Irrigation has no concerns regarding the expansion of the cattle feedlot. The applicant has shown excellent management of the current feedlot, with no issues arising following the flood event of 2022.
The applicant will be required to hold their own EPA licence. The proposal is being designed and operated according to National Standards for Beef feedlots.

Regards,

Tom Kindred
Customer Engagement Manager

Murray Irrigation

Murray Hut Drive, Finley, NSW, 2713
T. 1300 138 265
M. 0484 282 072
murrayirrigation.com.au

From: Rod Davis <rod.davis@rdcengineers.com.au>
Sent: Thursday, December 7, 2023 12:20 PM
To: Customer Support <customersupport@murrayirrigation.com.au>
Subject: EIS Consultation - Proposed beef cattle Feedlot - A&N Varley - 58 Broughans Rd, Pine Lodge - L130 on DP756353

Good morning

We act for applicant in relation to the above matter.

AJ & NA Varley own and operate a 999 head beef cattle feedlot and 4,000 head sheep feedlot on the property "High Claire" located at 58 Broughans Road, Pine Lodge within the Edward River Shire.

AJ & NA Varley proposes to expand the existing beef cattle feedlot from 999 head to 3,200 head and cease lot feeding of lambs.

A Request for the Planning Secretary's Requirements for the preparation of an Environmental Impact Statement was made on the **29th May 2023**. The Planning Secretary's Environmental Assessment Requirements (SEAR) 1788 was received on the **25th September 2023**.

During the preparation of the EIS, direct consultation with relevant local, State and Commonwealth government authorities, service providers and community groups is required to identify and address any issues they may raise in the EIS.

In preparing the EIS, AJ & NA Varley wish to consult with Murray Irrigation Limited in relation to any issues they may raise in respect of the proposed development and/or additional requirements for the EIS.

Please refer to the attached document for further information.

Regards,

Rod Davis
Director
—
0427629203
rod.davis@rdcengineers.com.au

RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

Appendix B.6

Consultation with NSW Rural Fire Service

NSW RURAL FIRE SERVICE

Rod Davis
PO BOX 1223, TOOWOOMBA QLD 4350

Our reference: DA20231209005591-Original-1

ATTENTION: Rod Davis

Date: Tuesday 19 December 2023

Dear Sir/Madam,

Development Application
Other – Other Assessment – Agriculture
EIS Consultation - 58 BROUGHANS RD PINE LODGE NSW 2714, 130//DP756353

I refer to your correspondence regarding the above proposal which was received by the NSW Rural Fire Service on 07/12/2023.

In recognition of the potential for the development to increase the level of bush fire risk within the landscape and be impacted upon during a bush fire event, the following matters should be addressed in the environmental assessment:

- the aim and objectives of Planning for Bush Fire Protection 2019;
- identification of potential ignition sources during construction and operation of the development;
- storage of fuels and other hazardous materials;
- proposed bush fire protection measures for the development, including vegetation management and fire suppression capabilities;
- operational access for fire fighting appliance to the site; and
- emergency and evacuation planning.

For any queries regarding this correspondence, please contact Bryan Netzler on 1300 NSW RFS.

Yours sincerely,

Anna Jones
Supervisor Development Assessment & Plan
Built & Natural Environment

Postal address

NSW Rural Fire Service
Locked Bag 17
GRANVILLE NSW 2142

Street address

NSW Rural Fire Service
4 Murray Rose Ave
SYDNEY OLYMPIC PARK NSW 2127

T (02) 8741 5555
F (02) 8741 5550
www.rfs.nsw.gov.au

Appendix B.7

Consultation with Department of Regional NSW – Department of Primary Industries – Agriculture (DPI)

Rod Davis

From: Lilian Parker <lilian.parker@dpi.nsw.gov.au>
Sent: Tuesday, 12 December 2023 9:10 AM
To: Rod Davis
Cc: DPI Landuse Ag Mailbox
Subject: Re: EIS Consultation - Proposed beef cattle Feedlot - A&N Varley - 58 Broughans Rd, Pine Lodge - L130 on DP756353
Attachments: Draft LUCRA Guide Feb 2023.pdf; National-guidelines-for-beef-cattle-feedlots-in-Australia-third-edition.pdf

Hi Rod

Thank you for providing the description and scope of the proposed Varley Feedlot at "High Claire", Pine Lodge.

DPI Ag requirements are based on the **National guidelines for beef cattle feedlots in Australia, 3rd edition,** with some specific assessment to be provided on:

Site Selection justification including access to waters, soils, drainage, shelter, impacts on neighbours, vehicle access and chemical residues.

- assessment of the soils, using land and soil capability mapping, BSAL, draft mapped SSAL (https://nswdpi.mysocialpinpoint.com/ssal/map#/) to indicate that the site selection is appropriate for the proposed land use and also avoids where feasible strategic agricultural land and key water resources/sensitive land.
- assessment of impacts on neighbouring sensitive receivers from an odour, visual, noise and dust perspective. Measures to mitigate impacts would include site selection, access points, screening, and, in particular, calculated buffers to sensitive receivers to avoid odour impacts.
- A Land Use Conflict Risk Assessment is a useful tool to identify potential risks from sensitive receivers and vice versa, see draft factsheet attached,https://www.dpi.nsw.gov.au/agriculture/lup/development-assessment/development-assessment2/lucra
- An overview of the relevant planning framework, including SEPP(primary production) and Guidelines https://www.planning.nsw.gov.au/sites/default/files/2023-03/planning-guidelines-intensive-livestock-agricultural-development.pdf

Stock density and management of impacts

- stocking density and effluent disposal to be considered in terms of environmental, land use and water resource impacts.

Pen Construction

- industry best practice management to be applied, including shade cover

Feed and Watering Facility Management

- stock water quality and supply arrangements year round

Yard Management

- industry best practice management to be applied

Animal Health and Welfare

- hospital pen arrangements / industry best practice management to be applied

Dead Animal Management

- industry best practice management to be applied

Biosecurity Matters Generally and Specifically as they relate to the Feedlot.

- industry best practice management to be applied
- The Managing Biosecurity Risks in Land Use Planning and Development Guide outlines steps to be considered to ensure biosecurity is appropriately addressed during the planning and assessment of development proposals.

Feeding and Nutrition of Feedlot Cattle

- industry standards to be applied.

I can be contacted as per below if you have any questions.
Lilian

Lilian Parker
Agricultural Land Use Planning
DPI Agriculture
Wagga Wagga Agricultural Institute Wagga Wagga NSW 2650
M: 0427 812 508 | E: lilian.parker@dpi.nsw.gov.au

Department of Primary Industries
Department of Regional NSW

I acknowledge the Wiradjuri people as the traditional custodians of the land on which I live and work. I pay my respects to Wiradjuri Elders past, present and emerging.

From: Rod Davis <rod.davis@rdcengineers.com.au>
Sent: Thursday, 7 December 2023 12:02 PM
To: DPI Landuse Ag Mailbox <landuse.ag@dpi.nsw.gov.au>
Subject: EIS Consultation - Proposed beef cattle Feedlot - A&N Varley - 58 Broughans Rd, Pine Lodge - L130 on DP756353

Good morning

We act for applicant in relation to the above matter.

AJ & NA Varley own and operate a 999 head beef cattle feedlot and 4,000 head sheep feedlot on the property "High Claire" located at 58 Broughans Road, Pine Lodge within the Edward River Shire.

AJ & NA Varley proposes to expand the existing beef cattle feedlot from 999 head to 3,200 head and cease lot feeding of lambs.

A Request for the Planning Secretary's Requirements for the preparation of an Environmental Impact Statement was made on the **29th May 2023**. The Planning Secretary's Environmental Assessment Requirements (SEAR) 1788 was received on the **25th September 2023**.

During the preparation of the EIS, direct consultation with relevant local, State and Commonwealth government authorities, service providers and community groups is required to identify and address any issues they may raise in the EIS.

In preparing the EIS, AJ & NA Varley wish to consult with The Department of Regional NSW – Department of Primary Industries – Agriculture in relation to any issues they may raise in respect of the proposed development and/or additional requirements for the EIS.

Please refer to the attached document for further information.

Regards,

Rod Davis
Director
—
0427629203
rod.davis@rdcengineers.com.au

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Appendix B.8

Consultation with Transport for NSW (TfNSW)

Rod Davis

From: Cam O'Kane <Cam.O'kane@transport.nsw.gov.au>
Sent: Thursday, 21 December 2023 4:06 PM
To: Rod Davis
Subject: RE: EIS Consultation - Proposed beef cattle Feedlot - A&N Varley - 58 Broughans Rd, Pine Lodge - L130 on DP756353

HI Rod,

Thank you for your email in relation to this matter.

TfNSW is happy to have an online meeting via TEAMS to discuss any issues they may raise in respect of the proposed development and/or additional requirements for the EIS.

We are available from 8 January 2024.

Please advise of some times that week.

Kind regards,

Cam O'Kane
Development Services Case Officer
Community and Place
Regional and Outer Metropolitan – South Region
Transport for NSW

M 0417 508 107 **E** cam.o'kane@transport.nsw.gov.au

transport.nsw.gov.au

Level 3, 193-195 Morgan Street
Wagga Wagga NSW 2650

Transport for NSW

OFFICIAL

From: Rod Davis <rod.davis@rdcengineers.com.au>
Sent: Thursday, 7 December 2023 12:12 PM
To: Development South <development.south@transport.nsw.gov.au>
Subject: EIS Consultation - Proposed beef cattle Feedlot - A&N Varley - 58 Broughans Rd, Pine Lodge - L130 on DP756353

Good morning

We act for applicant in relation to the above matter.

AJ & NA Varley own and operate a 999 head beef cattle feedlot and 4,000 head sheep feedlot on the property “High Claire” located at 58 Broughans Road, Pine Lodge within the Edward River Shire.

AJ & NA Varley proposes to expand the existing beef cattle feedlot from 999 head to 3,200 head and cease lot feeding of lambs.

A Request for the Planning Secretary’s Requirements for the preparation of an Environmental Impact Statement was made on the **29th May 2023**. The Planning Secretary’s Environmental Assessment Requirements (SEAR) 1788 was received on the **25th September 2023**.

During the preparation of the EIS, direct consultation with relevant local, State and Commonwealth government authorities, service providers and community groups is required to identify and address any issues they may raise in the EIS.

In preparing the EIS, AJ & NA Varley wish to consult with Transport for New South Wales (TfNSW) in relation to any issues they may raise in respect of the proposed development and/or additional requirements for the EIS.

Please refer to the attached document for further information.

Regards,

Rod Davis
Director
—
0427629203
rod.davis@rdcengineers.com.au

RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

Appendix B.9

Consultation with Department of Planning and Environment – Biodiversity and Conservation Division

Your ref: F3-107-ANF-HCFL-DPEB-20231207
Our ref: DOC23/1075018

Rod Davis
Director
RDC Engineers

Via email: rod.davis@rdcengineers.com.au

Dear Rod,

Subject: **Request for advice – Environmental Impact Statement (EIS) for feedlot, 58 Broughans Road, Pine Lodge**

Thank you for your referral, via email dated 7 December 2023, seeking comments from the Biodiversity and Conservation Division (BCD) of the Department of Planning and Environment. BCD has statutory responsibilities relating to biodiversity (including threatened species, populations, ecological communities, or their habitats) and flooding.

The Planning Secretary's Environmental Assessment Requirements (SEAR) 1788 was issued on the 25 September 2023. We have reviewed the documents supplied against the SEARs and provide the following comments. Detailed advice is included in **Attachment A.**

Flood

BCD considers that the proposed development presents a low flood risk. The applicant should consider conducting a flood impact and risk assessment determine the actual flood risk to inform the proposal and any future development of the site. However, as the level of flood risk is low, we do not consider this a requirement.

Biodiversity

Parts of the subject land are likely to support threatened ecological communities and habitat for threatened species. BCD understands that proposed development does not intend to reconfigure or increase the footprint of the existing development. The EIS should include evidence to demonstrate the proposed development and land use will not impact on threatened species and communities.

If impacts cannot be avoided, further detailed assessment will be required. Refer the Attachment A for detail.

If you have any questions regarding this advice, please contact Claire Coulson, Senior Conservation Planning Officer, via rog.southwest@environment.nsw.gov.au or 02 6022 0636.

Yours sincerely

Andrew Fisher
20 December 2023
Senior Team Leader Planning South West, Biodiversity and Conservation Division
Environment and Heritage Group
Department of Planning and Environment

ATTACHMENT A – Detailed comments on Environmental Impact Statement for feedlot, 58 Broughans Road, Pine Lodge

ATTACHMENT A Detailed comments on Environmental Impact Statement for feedlot, 58 Broughans Road, Pine Lodge

Flood

The SEARs require "*an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment*".

The subject site is located approximately 5 km north of Tuppal Creek and is surrounded by irrigation channels. Despite the proximity of these waterways, BCD agrees that the subject site is unlikely to be at risk from riverine flood events. However, due to the relatively flat topography, the site may be impacted from major overland flow flood events.

To determine the actual level of flood exposure, the applicant should consider conducting a flood impact and risk assessment (FIRA). A FIRA should be conducted in accordance with the NSW Flood Risk Management Manual (2023) and the Australia Rainfall & Runoff Guidelines (2019). A FIRA, and associated hydraulic modelling, would define the impact of flood events on the site, and the impact of the site's infrastructure on flood behaviour.

As the proposed development does not reconfigure existing, or construct new, infrastructure, it is unlikely that the proposed development will alter the existing flood risk. BCD recommends the applicant consider conducting a FIRA to determine the actual flood risk; however, in this instance this is not a requirement.

Biodiversity

The SEARs require "*including a description of any potential vegetation clearing needed to undertake the proposal and any impacts on flora and fauna."*

The State Vegetation Type Map indicates Plant Community Type (PCT) 76 occurs on site. This PCT is associated with Threatened Ecological Communities listed under State and Commonwealth legislation.

While no clearing of vegetation is proposed, we recommend the EIS demonstrates the development can occur without impacting on existing native vegetation and habitat. This should include:

- mapping of native vegetation and habitat in relation to the proposed development and land uses, and
- measures to avoid, minimise and mitigate any adverse environmental impacts, each measure should have nominated timing, frequency, method and responsible person.

We note that the subject land and adjoining roadside areas appear to support native vegetation outside the mapped native vegetation extent, for example scattered remnant trees. The EIS should address the potential impacts to these, and any other habitat present on site, not only the existing mapped vegetation.

When relying on existing mapping additional evidence, such as photographs, and recent aerial imagery should be used to support the proposal.

The description of the proposal provided references "*Riverina Regional Native Vegetation PCT Map Version v1.0 - VIS_ID 4469*" in relation to biodiversity. This dataset was superseded by the State Vegetation Type Map on 24.06.2022. To ensure the most recent biodiversity data is utilised we recommend you access biodiversity data via SEED and subscribe to frequently used datasets to receive updates.

Additional assessment may be required

If it is determined impacts to native vegetation or habitat cannot be avoided we recommend that the applicant provide evidence that any clearing associated with or ancillary to the activity is not likely to significantly affect threatened species, threatened ecological communities or their habitats.

At a minimum that evidence should take the form of a Test of Significance according to the Minister's Guidelines. The applicant should also apply the Biodiversity Offset Scheme Threshold test.

Where the proposal is likely to significantly affect threatened species within the meaning of Section 7.2 of the *Biodiversity Conservation Act 2016*, the application is to be accompanied by a Biodiversity Development Assessment Report (BDAR).

Appendix C

Community Consultation Information

RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

PO Box 1223
Toowoomba QLD 4350
info@rdcengineers.com.au
ABN 37 627 163 071

Our ref: F3-107-ANV-HCFL-ANV-20240425

25th April 2024

Mr & Mrs AJ & NA Varley
"Arkoona" / "Sunnyside" / "Glen Cluan"
RMB 3095 Lower Finley Road
FINLEY NSW 2713

Dear Andrew & Nichole,

RE: ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT ON THE PROPERTY "HIGH CLAIRE" 58 BROUGHANS ROAD, PINE LODGE, LAND DESCRIBED AS LOT 130 ON DP756353

Currently, a 999 head beef cattle feedlot and 4,000 head sheep feedlot is approved on the property "High Claire" located at 58 Broughans Road, Pine Lodge within the Edward River Council. The property is currently used for beef cattle grazing, intensive livestock agriculture, dryland and irrigated cropping. Expansion of the existing beef cattle feedlot from 999 head to 3,200 head and cessation of the lot feeding of lambs is proposed. The location of the property on which the proposed development will be established is shown on Figure 1.

The proposed development requires development consent from the Edward River Council for Intensive livestock agriculture and is considered Designated Development under the NSW Environment and Planning Assessment Act 1979. Consequently an Environmental Impact Statement (EIS) is required to be prepared to accompany the Development Application.

As part of the EIS, we are interested in consulting with the community and addressing any issues of concern residents may have with regards to the proposed development. Your comments will be considered and taken into account whilst undertaking the EIS.

RDC ENGINEERS

PO Box 1223
Toowoomba QLD 4350
info@rdcengineers.com.au

DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development is an expansion of an existing beef cattle feedlot from 999 head to 3,200 head. A layout plan of the proposed development is shown on Figure 2 and Figure 3.

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the property. The proposed development does not seek to reconfigure the existing built infrastructure.

The increase in the number of head in the development shall be gained by reducing the stocking density and utilising the pens currently used for the sheep feedlot as cattle pens.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the subject land as shown on Figure 3. The proposed development does not seek to reconfigure the existing waste utilisation areas.

The proposed development would incorporate industry best practice during operational activities to ensure that any environmental impacts are minimised. The environmental assessment process will identify these practices and incorporate them into the operation of the development, ensuring that any environmental impacts are appropriately dealt with.

The proposed development shall be operated in accordance with the following national industry best practice guidelines:

- National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition - www.mla.com.au
- National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition - www.mla.com.au

Further information on the Australian Lot Feeding Industry and can be found on the Australian Lot Feeding Industry (ALFA) website at www.feedlots.com.au

Site details

Access

The subject land has frontage to Broughans Road, James Road and Bowlers Road. The access to the proposed development shall be via the existing development entrance off Broughans Road and does not seek to construct a new subject land entrance from Broughans Road.

The proposed development shall utilise the approved haulage route for the existing development. The principal haulage route to the proposed development shall be:

RDC ENGINEERS

PO Box 1223
Toowoomba QLD 4350
info@rdcengineers.com.au

- Route A - from the Riverina Highway to James Road to the proposed development via Broughans Road.

Traffic generation

The existing development at the approved capacity of 999 head generates on average in the order of 2.5 vehicles per day (light vehicles [1.5vpd] and heavy vehicles [1vpd].

At 3,200 head, the estimated traffic generation for the proposed development is about 6.5 vehicles movements per day (light vehicles [3.0vpd] and heavy vehicles [3.5vpd]. These data are based on 1 staff member residing on-site in the property homestead and semi-trailer vehicles for haulage of livestock and commodities.

As a neighbour to the proposed development if you would like to provide some comments and feedback on the proposed development before Friday 24th May 2024, we would like to hear from you. You can send your written comments to:

Mr Rod Davis
RDC Engineers Pty Ltd
PO Box 1223
TOOWOOMBA QLD 4350
rod.davis@rdcengineers.com.au

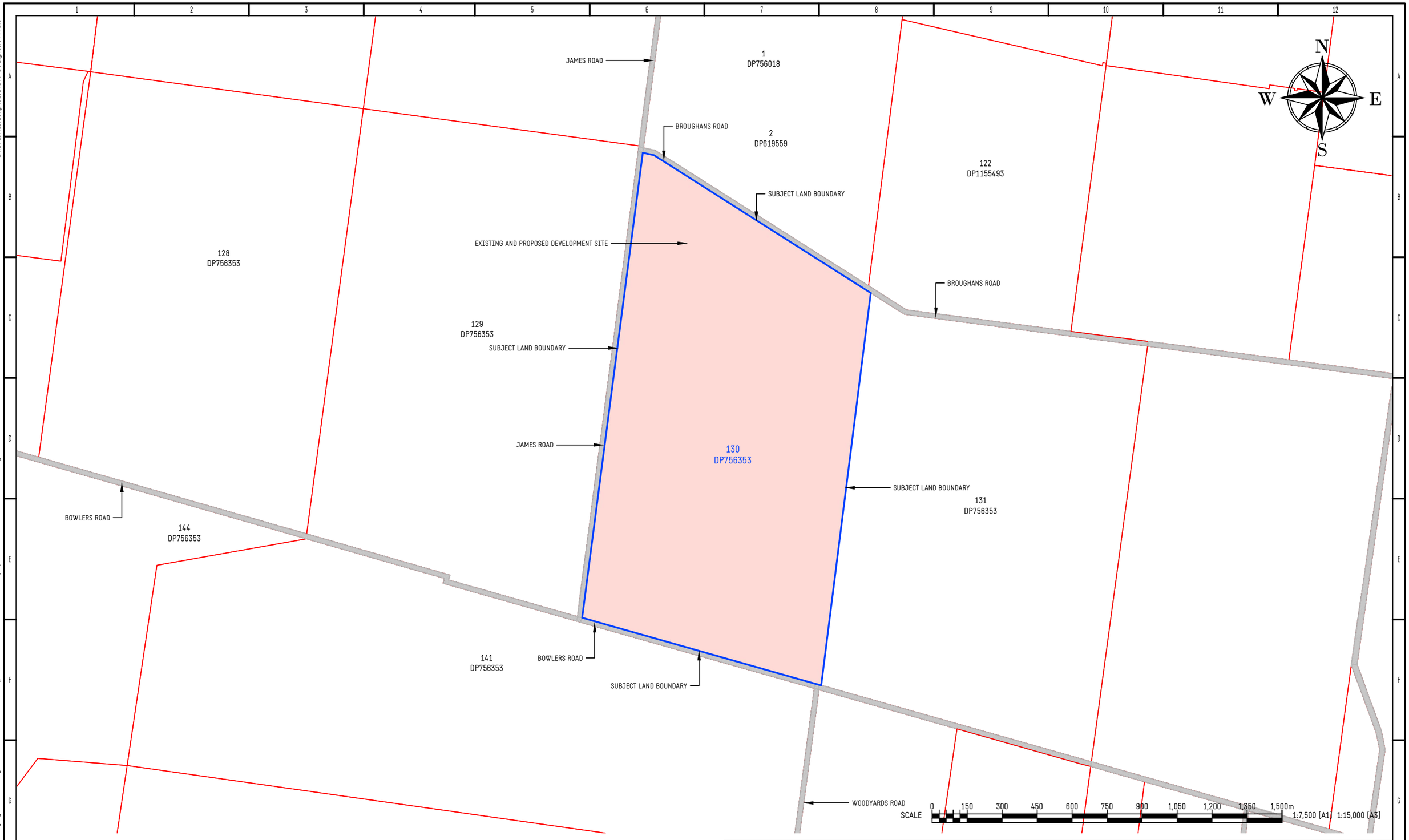
Alternatively, you can call Rod Davis on 0427 629 203 or email rod.davis@rdcengineers.com.au

Following completion and submission of the Development Application and EIS to Council, the application will be publicly exhibited at Edward River Council to enable the community to view the EIS and provide feedback and make further comments if they wish.

Yours sincerely,

R.J. Davis

Rod Davis
Director



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- SUBJECT LAND AREA
- ROAD RESERVE
- EASEMENT

NOTES:

1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2023, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
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A	25/04/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	25/04/24	FINAL FOR COMMUNITY CONSULTATION	RJD	RJD	RJD

SCALE	1:15,000 (A3)
DRAWN	RJD
DATE	25/04/2024
CHECKED	RJD
DATE	25/04/2024
APPROVED	RJD
DATE	25/04/2024

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AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT
ABN 37 627 163 071
PO BOX 1223
TOOWOOMBA QLD 4350
M: 0427 629 203
E: info@rdcengineers.com.au

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT
TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
SUBJECT LAND - CADASTRAL PLAN

REPORT REFERENCE: FIGURE 1
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-3000-01
REV.: B

DATE PLOTTED: 28 April 2024 BY: - RDC Engineers PTY LTD
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N Varley High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: F3-107 ANVanLeu High CLaire MASTERPLAN-00-20230407 vA.dwg

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EXISTING AND PROPOSED EFFLUENT UTILISATION AREA (APPROVED UNDER EXISTING DA)
- EXISTING AND PROPOSED SOLID WASTE UTILISATION AREA (APPROVED UNDER EXISTING DA)

NOTES:

1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2023, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
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4. HORIZONTAL DATUM - UTM ZONE 55.

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AGRICULTURAL
ENVIRONMENTAL
PROJECT MANAGEMENT

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PO BOX 1223
TOOWOOMBA QLD 4350
M: 0427 629 203
E: info@rdcengineers.com.au

REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	25/04/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
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SCALE	1:10,000 (A3)
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DATE	25/04/2024
APPROVED	RJD
DATE	25/04/2024

CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - LAYOUT PLAN

REPORT REFERENCE: FIGURE 2
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-3000-02
REV.: B

DATE PLOTTED: 28 April 2024, BY: RDC Engineers PTY LTD
FILE NAME: F3-107 ANVanLeig High Claire MASTERPLAN-00-20230407 vA.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VanLeig High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EXISTING AND PROPOSED EFFLUENT UTILISATION AREA (APPROVED UNDER EXISTING DA)
- EXISTING AND PROPOSED SOLID WASTE UTILISATION AREA (APPROVED UNDER EXISTING DA)

NOTES:

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M: 0427 629 203
E: info@rdcengineers.com.au

REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	25/04/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	25/04/24	FINAL FOR COMMUNITY CONSULTATION	RJD	RJD	RJD

SCALE	1:2,000 (A3)
DRAWN	RJD
DATE	25/04/2024
CHECKED	RJD
DATE	25/04/2024
APPROVED	RJD
DATE	25/04/2024

CLIENT AJ & NA VARLEY

PROJECT PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - DEVELOPMENT COMPLEX LAYOUT

REPORT REFERENCE FIGURE 3 | SUPPLIED DRAWING NUMBER | A3 | DRAWING NUMBER F3-107-2000-03 | REV. B

DATE PLOTTED: 28 April 2024 BY: RDC Engineers PTY LTD
FILE NAME: F3-107 ANVarLeg High Claire MASTERPLAN-00-20230407-v4.dwg
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RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

PO Box 1223
Toowoomba QLD 4350
info@rdcengineers.com.au
ABN 37 627 163 071

Our ref: F3-107-ANV-HCFL-DDS-20240425

25th April 2024

Mr & Mrs DF & DM Sexton
"Villa"
FINLEY NSW 2713

Dear Damien & Di,

RE: ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT ON THE PROPERTY "HIGH CLAIRE" 58 BROUGHANS ROAD, PINE LODGE, LAND DESCRIBED AS LOT 130 ON DP756353

Andrew & Nichole Varley own and operate a 999 head beef cattle feedlot and 4,000 head sheep feedlot on the property "High Claire" located at 58 Broughans Road, Pine Lodge within the Edward River Council. The property is currently used for beef cattle grazing, intensive livestock agriculture, dryland and irrigated cropping. Andrew & Nichole Varley propose to expand the existing beef cattle feedlot from 999 head to 3,200 head and cease lot feeding of lambs. The location of the property on which the proposed development will be established is shown on Figure 1.

The proposed development requires development consent from the Edward River Council for Intensive livestock agriculture and is considered Designated Development under the NSW Environment and Planning Assessment Act 1979. Consequently an Environmental Impact Statement (EIS) is required to be prepared to accompany the Development Application.

As part of the EIS, we are interested in consulting with the community and addressing any issues of concern residents may have with regards to the proposed development. Your comments will be considered and taken into account whilst undertaking the EIS.

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Toowoomba QLD 4350
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DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development is an expansion of an existing beef cattle feedlot from 999 head to 3,200 head. A layout plan of the proposed development is shown on Figure 2 and Figure 3.

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the property. The proposed development does not seek to reconfigure the existing built infrastructure.

The increase in the number of head in the development shall be gained by reducing the stocking density and utilising the pens currently used for the sheep feedlot as cattle pens.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the subject land as shown on Figure 3. The proposed development does not seek to reconfigure the existing waste utilisation areas.

The proposed development would incorporate industry best practice during operational activities to ensure that any environmental impacts are minimised. The environmental assessment process will identify these practices and incorporate them into the operation of the development, ensuring that any environmental impacts are appropriately dealt with.

The proposed development shall be operated in accordance with the following national industry best practice guidelines:

- National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition - www.mla.com.au
- National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition - www.mla.com.au

Further information on the Australian Lot Feeding Industry and can be found on the Australian Lot Feeding Industry (ALFA) website at www.feedlots.com.au

Site details

Access

The subject land has frontage to Broughans Road, James Road and Bowlers Road. The access to the proposed development shall be via the existing development entrance off Broughans Road and does not seek to construct a new subject land entrance from Broughans Road.

The proposed development shall utilise the approved haulage route for the existing development. The principal haulage route to the proposed development shall be:

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- Route A - from the Riverina Highway to James Road to the proposed development via Broughans Road.

Traffic generation

The existing development at the approved capacity of 999 head generates on average in the order of 2.5 vehicles per day (light vehicles [1.5vpd] and heavy vehicles [1vpd].

At 3,200 head, the estimated traffic generation for the proposed development is about 6.5 vehicles movements per day (light vehicles [3.0vpd] and heavy vehicles [3.5vpd]. These data are based on 1 staff member residing on-site in the property homestead and semi-trailer vehicles for haulage of livestock and commodities.

As a neighbour to the proposed development if you would like to provide some comments and feedback on the proposed development before Friday 24th May 2024, we would like to hear from you. You can send your written comments to:

Mr Rod Davis
RDC Engineers Pty Ltd
PO Box 1223
TOOWOOMBA QLD 4350
rod.davis@rdcengineers.com.au

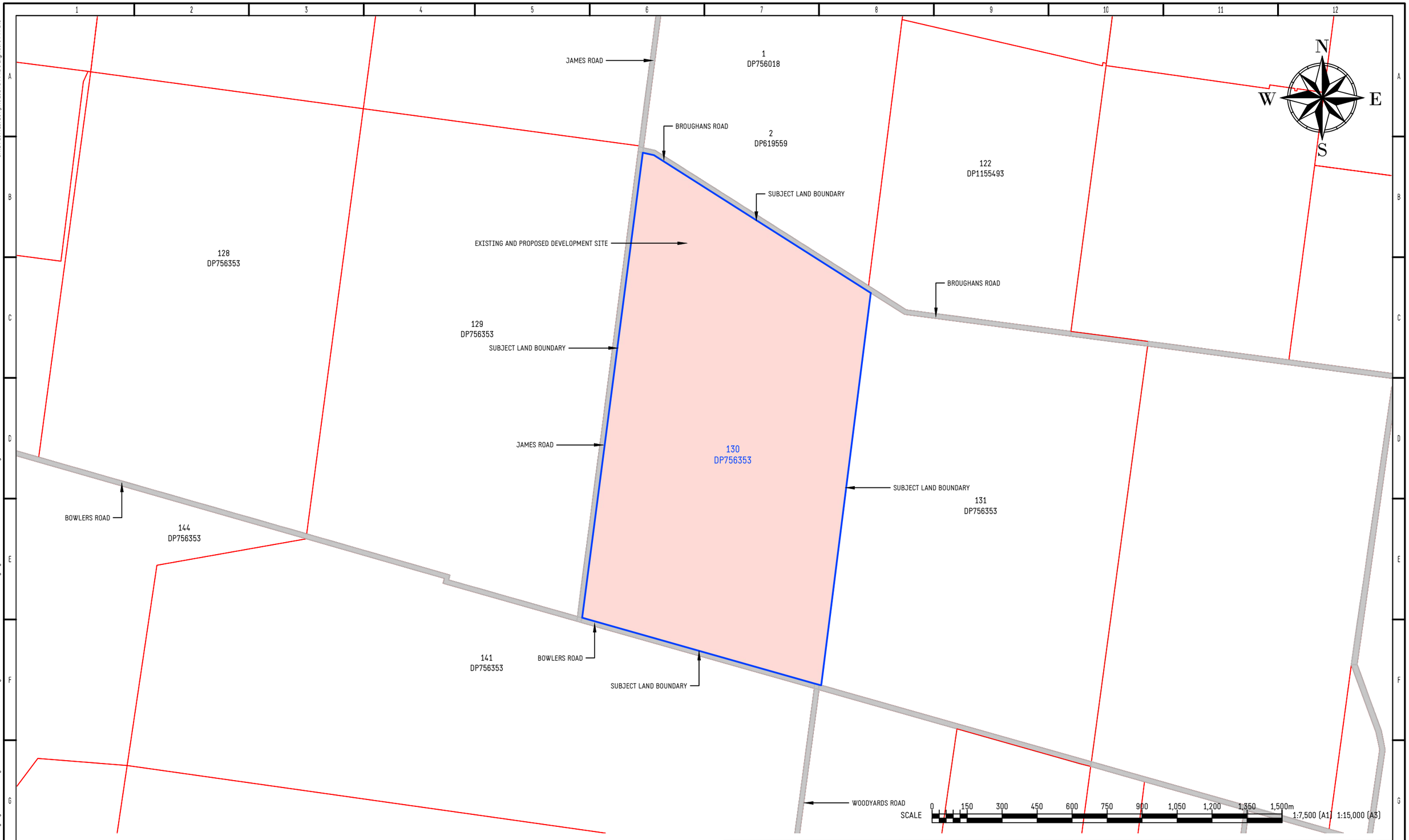
Alternatively, you can call Rod Davis on 0427 629 203 or email rod.davis@rdcengineers.com.au

Following completion and submission of the Development Application and EIS to Council, the application will be publicly exhibited at Edward River Council to enable the community to view the EIS and provide feedback and make further comments if they wish.

Yours sincerely,

R.J. Davis

Rod Davis
Director



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- SUBJECT LAND AREA
- ROAD RESERVE
- EASEMENT

NOTES:

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M: 0427 629 203
E: info@rdcengineers.com.au

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT
TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
SUBJECT LAND - CADASTRAL PLAN

REPORT REFERENCE: FIGURE 1
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-3000-01
REV.: B

DATE PLOTTED: 28 April 2024 BY: - RDC Engineers PTY LTD
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N Varley High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: F3-107 ANVanLeu High CLaire MASTERPLAN-00-20230407 vA.dwg

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- SUBJECT LAND BOUNDARY
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CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - LAYOUT PLAN

REPORT REFERENCE: FIGURE 2
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-3000-02
REV.: B

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FILE NAME: F3-107 ANVanLeig High Claire MASTERPLAN-00-20230407 vA.dwg
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LEGEND

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DATE	25/04/2024

CLIENT AJ & NA VARLEY

PROJECT PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - DEVELOPMENT COMPLEX LAYOUT

REPORT REFERENCE FIGURE 3 | SUPPLIED DRAWING NUMBER | A3 | DRAWING NUMBER F3-107-2000-03 | REV. B

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PO Box 1223
Toowoomba QLD 4350
info@rdcengineers.com.au
ABN 37 627 163 071

Our ref: F3-107-ANV-HCFL-MKvB-20240425

25th April 2024

Mr & Mrs M & K van Beek
"Cedar"
108 Woodwards Road
FINLEY NSW 2713

Dear Mark & Kendall,

RE: ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT ON THE PROPERTY "HIGH CLAIRE" 58 BROUGHANS ROAD, PINE LODGE, LAND DESCRIBED AS LOT 130 ON DP756353

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RDC ENGINEERS

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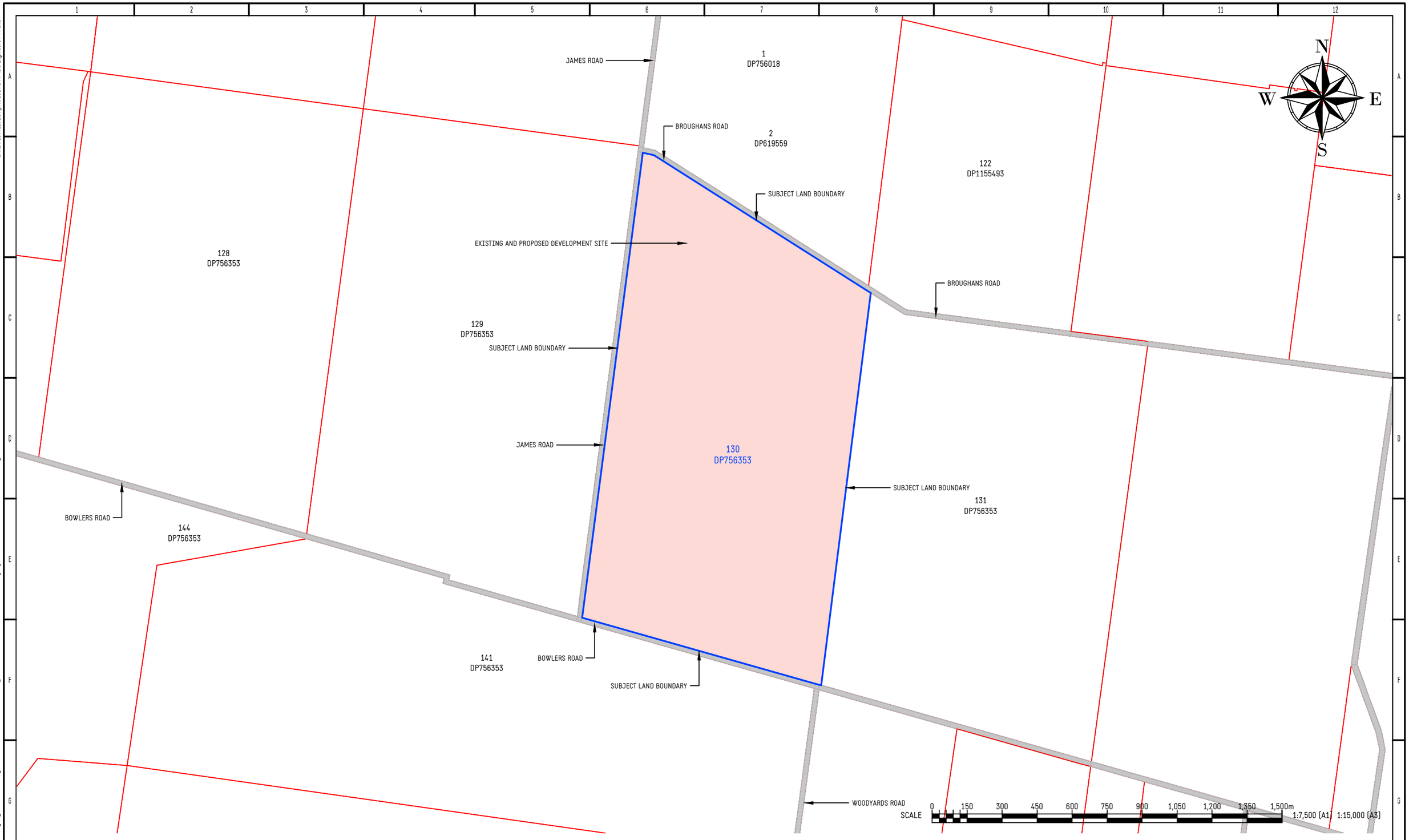
Yours sincerely,

R.J. Davis

Rod Davis
Director



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- SUBJECT LAND AREA
- ROAD RESERVE
- EASEMENT

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TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
SUBJECT LAND - CADASTRAL PLAN

REPORT REFERENCE: FIGURE 1
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CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - LAYOUT PLAN

REPORT REFERENCE: FIGURE 2
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A	25/04/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	25/04/24	FINAL FOR COMMUNITY CONSULTATION	RJD	RJD	RJD

SCALE	1:2,000 (A3)
DRAWN	RJD
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APPROVED	RJD
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CLIENT AJ & NA VARLEY

PROJECT PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - DEVELOPMENT COMPLEX LAYOUT

REPORT REFERENCE FIGURE 3 | SUPPLIED DRAWING NUMBER | A3 | DRAWING NUMBER F3-107-2000-03 | REV. B

DATE PLOTTED: 28 April 2024 BY: RDC Engineers PTY LTD
FILE NAME: F3-107 ANVarLeg High Claire MASTERPLAN-00-20230407-v4.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VarLeg High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT

PO Box 1223
Toowoomba QLD 4350
info@rdcengineers.com.au
ABN 37 627 163 071

Our ref: F3-107-ANV-HCFL-NT-20240425

25th April 2024

Mr N Thomas
"Warrack Park"
C:\ PO Box
FINLEY NSW 2713

Dear Neville,

RE: ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT ON THE PROPERTY "HIGH CLAIRE" 58 BROUGHANS ROAD, PINE LODGE, LAND DESCRIBED AS LOT 130 ON DP756353

Andrew & Nichole Varley own and operate a 999 head beef cattle feedlot and 4,000 head sheep feedlot on the property "High Claire" located at 58 Broughans Road, Pine Lodge within the Edward River Council. The property is currently used for beef cattle grazing, intensive livestock agriculture, dryland and irrigated cropping. Andrew & Nichole Varley propose to expand the existing beef cattle feedlot from 999 head to 3,200 head and cease lot feeding of lambs. The location of the property on which the proposed development will be established is shown on Figure 1.

The proposed development requires development consent from the Edward River Council for Intensive livestock agriculture and is considered Designated Development under the NSW Environment and Planning Assessment Act 1979. Consequently an Environmental Impact Statement (EIS) is required to be prepared to accompany the Development Application.

As part of the EIS, we are interested in consulting with the community and addressing any issues of concern residents may have with regards to the proposed development. Your comments will be considered and taken into account whilst undertaking the EIS.

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DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development is an expansion of an existing beef cattle feedlot from 999 head to 3,200 head. A layout plan of the proposed development is shown on Figure 2 and Figure 3.

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the property. The proposed development does not seek to reconfigure the existing built infrastructure.

The increase in the number of head in the development shall be gained by reducing the stocking density and utilising the pens currently used for the sheep feedlot as cattle pens.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the subject land as shown on Figure 3. The proposed development does not seek to reconfigure the existing waste utilisation areas.

The proposed development would incorporate industry best practice during operational activities to ensure that any environmental impacts are minimised. The environmental assessment process will identify these practices and incorporate them into the operation of the development, ensuring that any environmental impacts are appropriately dealt with.

The proposed development shall be operated in accordance with the following national industry best practice guidelines:

- National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition - www.mla.com.au
- National Beef Cattle Feedlot Environmental Code of Practice 2nd Edition - www.mla.com.au

Further information on the Australian Lot Feeding Industry and can be found on the Australian Lot Feeding Industry (ALFA) website at www.feedlots.com.au

Site details

Access

The subject land has frontage to Broughans Road, James Road and Bowlers Road. The access to the proposed development shall be via the existing development entrance off Broughans Road and does not seek to construct a new subject land entrance from Broughans Road.

The proposed development shall utilise the approved haulage route for the existing development. The principal haulage route to the proposed development shall be:

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- Route A - from the Riverina Highway to James Road to the proposed development via Broughans Road.

Traffic generation

The existing development at the approved capacity of 999 head generates on average in the order of 2.5 vehicles per day (light vehicles [1.5vpd] and heavy vehicles [1vpd].

At 3,200 head, the estimated traffic generation for the proposed development is about 6.5 vehicles movements per day (light vehicles [3.0vpd] and heavy vehicles [3.5vpd]. These data are based on 1 staff member residing on-site in the property homestead and semi-trailer vehicles for haulage of livestock and commodities.

As a neighbour to the proposed development if you would like to provide some comments and feedback on the proposed development before Friday 24th May 2024, we would like to hear from you. You can send your written comments to:

Mr Rod Davis
RDC Engineers Pty Ltd
PO Box 1223
TOOWOOMBA QLD 4350
rod.davis@rdcengineers.com.au

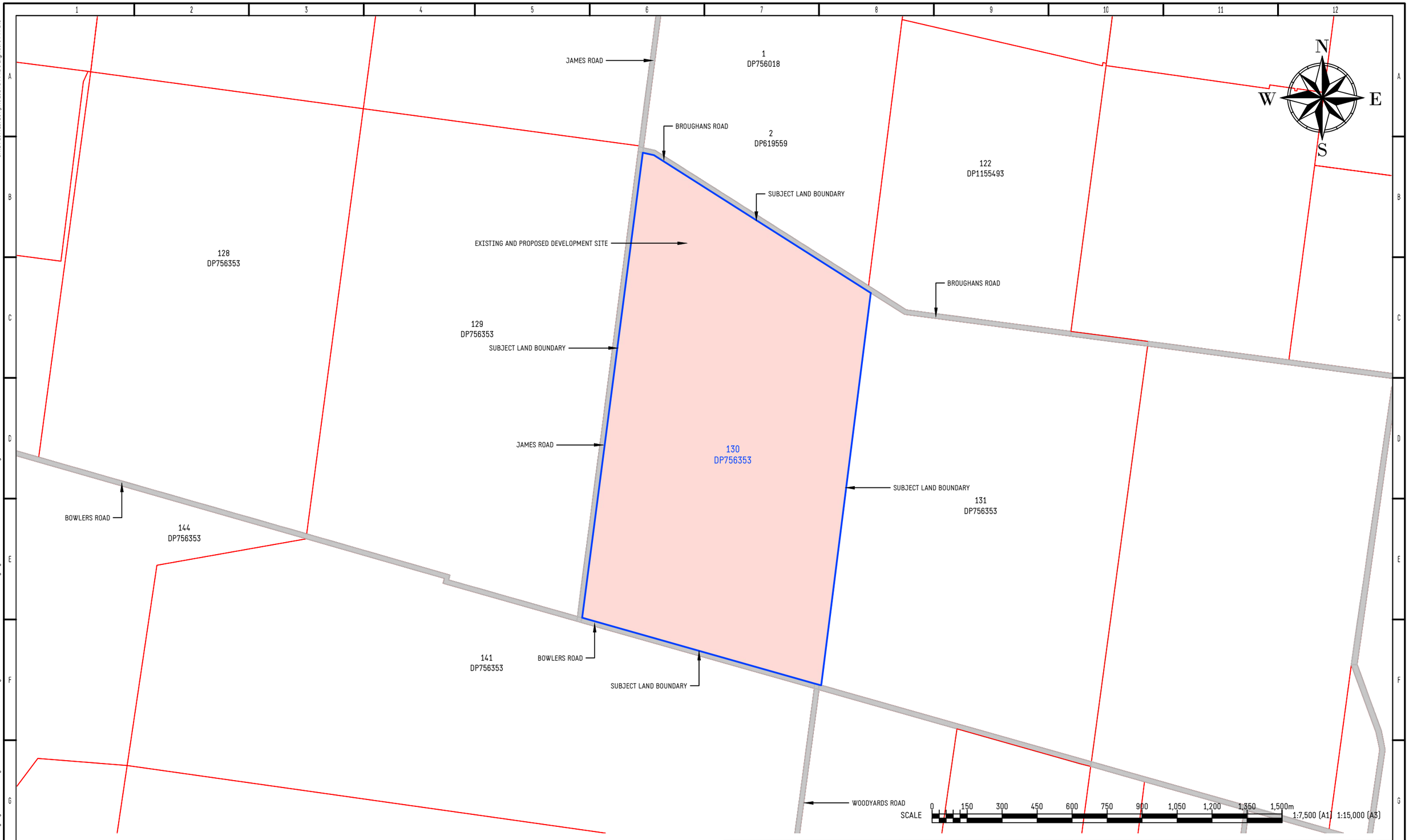
Alternatively, you can call Rod Davis on 0427 629 203 or email rod.davis@rdcengineers.com.au

Following completion and submission of the Development Application and EIS to Council, the application will be publicly exhibited at Edward River Council to enable the community to view the EIS and provide feedback and make further comments if they wish.

Yours sincerely,

R.J. Davis

Rod Davis
Director



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- SUBJECT LAND AREA
- ROAD RESERVE
- EASEMENT

NOTES:

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ABN 37 627 163 071
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M: 0427 629 203
E: info@rdcengineers.com.au

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT
TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
SUBJECT LAND - CADASTRAL PLAN

REPORT REFERENCE: FIGURE 1
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-3000-01
REV.: B

DATE PLOTTED: 28 April 2024 BY: - RDC Engineers PTY LTD
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N Varley High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT FILE NAME: F3-107 ANVanLeu High CLaire MASTERPLAN-00-20230407 vA.dwg

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- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EXISTING AND PROPOSED EFFLUENT UTILISATION AREA (APPROVED UNDER EXISTING DA)
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CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - LAYOUT PLAN

REPORT REFERENCE: FIGURE 2
SUPPLIED DRAWING NUMBER:
A3
DRAWING NUMBER: F3-107-3000-02
REV.: B

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FILE NAME: F3-107 ANVanLeig High Claire MASTERPLAN-00-20230407 vA.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VanLeig High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

LEGEND

- SUBJECT LAND BOUNDARY
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CLIENT AJ & NA VARLEY

PROJECT PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - DEVELOPMENT COMPLEX LAYOUT

REPORT REFERENCE FIGURE 3 | SUPPLIED DRAWING NUMBER | A3 | DRAWING NUMBER F3-107-2000-03 | REV. B

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PO Box 1223
Toowoomba QLD 4350
info@rdcengineers.com.au
ABN 37 627 163 071

Our ref: F3-107-ANV-HCFL-SG-20240425

25th April 2024

Mr S Gannon
"Myola"
184 Bowlers Road
PINE LODGE NSW 2713

Dear Stuart,

RE: ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT ON THE PROPERTY "HIGH CLAIRE" 58 BROUGHANS ROAD, PINE LODGE, LAND DESCRIBED AS LOT 130 ON DP756353

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RDC ENGINEERS

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- Route A - from the Riverina Highway to James Road to the proposed development via Broughans Road.

Traffic generation

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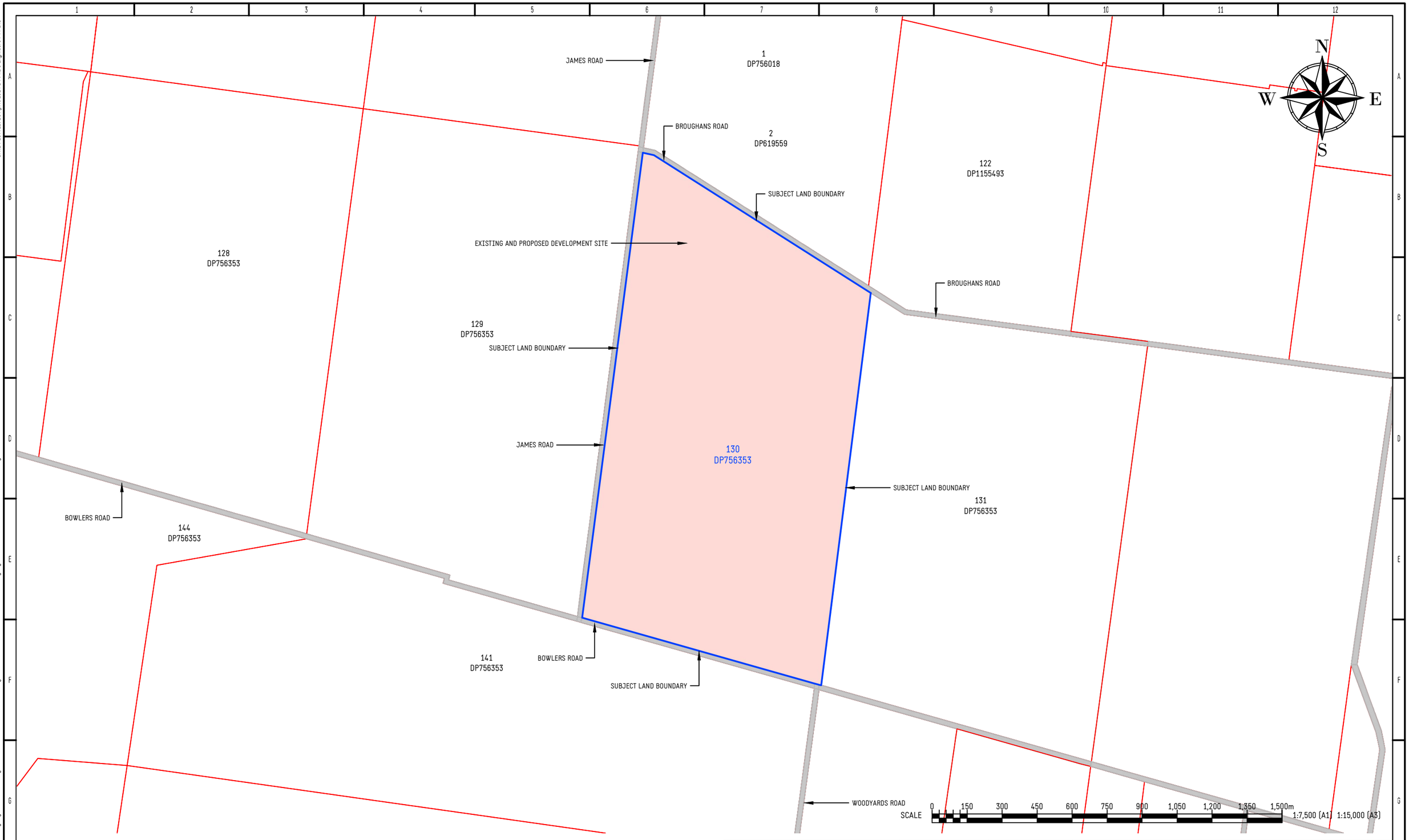
Yours sincerely,

R.J. Davis

Rod Davis
Director



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- LAND PARCEL BOUNDARY
- SUBJECT LAND AREA
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TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
SUBJECT LAND - CADASTRAL PLAN

REPORT REFERENCE: FIGURE 1
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CLIENT: AJ & NA VARLEY

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TITLE: CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
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4. HORIZONTAL DATUM - UTM ZONE 55.

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RPEQ

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ENVIRONMENTAL
PROJECT MANAGEMENT

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	25/04/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	25/04/24	FINAL FOR COMMUNITY CONSULTATION	RJD	RJD	RJD

SCALE	1:2,000 (A3)
DRAWN	RJD
DATE	25/04/2024
CHECKED	RJD
DATE	25/04/2024
APPROVED	RJD
DATE	25/04/2024

CLIENT AJ & NA VARLEY

PROJECT PROPOSED 3200 HEAD BEEF CATTLE FEEDLOT

TITLE CONSULTATION AND STAKEHOLDER ENGAGEMENT
ENVIRONMENTAL IMPACT STATEMENT - COMMUNITY CONSULTATION
PROPOSED DEVELOPMENT - DEVELOPMENT COMPLEX LAYOUT

REPORT REFERENCE FIGURE 3 | SUPPLIED DRAWING NUMBER | A3 | DRAWING NUMBER F3-107-2000-03 | REV. B

DATE PLOTTED: 28 April 2024 BY: RDC Engineers PTY LTD
FILE NAME: F3-107 ANVarLeg High Claire MASTERPLAN-00-20230407-v4.dwg
FILE PATH: C:\RDC Engineers\RDCE - Projects\F3-107 A and N VarLeg High Claire FL Finlay\05 - ACAD MasterPlan\05.1 Drawings - CURRENT

Appendix D

Study Team

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
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CURRICULUM VITAE

ROD DAVIS

Director – RDC Engineers Pty Ltd

BEng (Ag), MEng, FIEAust, CPEng, RPEQ, CPESC, CDec

CAREER OVERVIEW AND KEY STRENGTHS

Extensive experience and depth of expertise in:

Project management – project initiation, contract and budget preparation, planning and design, client management, managing sub-consultants, project monitoring, resource coordination and scheduling, report preparation, quality control, financial management, project closure.

Water Resource Engineering - Earthen dam design, channel design, surface irrigation design, low pressure seepage assessments, environmental hydrology, surface water hydrology, hydrological modelling, amended RO water quality assessment for irrigation and livestock, water regulatory management (certification of works that take overland flow, CSG water beneficial reuse plans, consequence assessment of dam, CAR dams, Riverine Protection Permits, Permit to Take Water).

Intensive livestock production and environmental management – facility layout and design.

Environmental Risk and Impact Assessments - Regulatory applications and approvals, Site-Based Management Plans, Environmental Management Plans (Construction and Operation), Stormwater management plans, Erosion and Sediment Control plans, Closure and Rehabilitation Plans, Consulting with Environmental regulators and assisting in the negotiation of approvals and conditions.

Environmental Monitoring – soil assessment, identifying standards, monitoring design, equipment selection and installation and commissioning, data collection and analysis, data interpretation.

Staff management – leadership, staff selection, staff motivation, goal setting, communication, mentoring.

Sugarcane production, harvesting operations and harvester technologies – farming systems improvement and mechanisation, harvester verification and validation, gathering and forward feeding of cane, optimisation of feed-train setup, chopper system performance and billet quality, harvesting best practice.

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
Phone: +61 427 629 203, email: rod.davis@rdcengineers.com.au

Electronic data acquisition systems – monitoring design, sensor selection, signal conditioning, data collation, data interpretation.

PROFESSIONAL MEMBERSHIP / ACCREDITATION

Fellow of The Institution of Engineers Australia (FIEAust)

Chartered Professional Engineer of The Institution of Engineers Australia (CPEng)
Membership No 448892
Civil Engineering and Environmental Engineering

Registered Professional Engineer of Queensland (RPEQ)
RPEQ No 20256
Civil Engineering and Environmental Engineering

Certified Professional in Erosion and Sediment Control (CPESC)
CPESC No 8857

EDUCATION

Master of Engineering
University of Southern Queensland (Completed in 1995)

Bachelor of Engineering (Agricultural)
University of Southern Queensland (Completed in 1992)

CAREER SNAPSHOT

Director From
RDC Engineers Pty Ltd July 2018

Responsibilities include:

- To undertake water resource, irrigation and intensive livestock facility design, environmental risk and impact assessments and development approvals.
- Prepare project documentation and technical reports.
- Effective and high-level communication with clients and state and local agencies.
- Managing clients and project scope methods.

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
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Senior Engineer September 2017
Stafford Adamson & Associates July 2018

Responsibilities include:

- To prepare water resource and intensive livestock development approvals and related supporting information.
- Effective and high-level communication with clients and state and local agencies.

Technical

- Earthen storage design and surface water hydrologic modelling.
- Design of irrigation infrastructure works including pipeline, supply and drainage channels, culverts and earthworks.
- Preparation of Site-Based Management Plans – Intensive Livestock Activities.
- Preparation of development applications – Intensive Livestock Activities.
- Preparation of Erosion and Sediment Control Plans – Intensive Livestock Activities.
- Layout design of feedlots including pens, water storages, effluent management systems.
- Undertaking geotechnical investigations for proposed development sites, assessment of material suitability.
- Checking and auditing report quality.

Group Manager - Environment July 2016 – August 2017
Ostwald Bros

- Monitor all environmental legislative requirements and standards and assist with implementation across the Ostwald Bros Group. Responsible for working with the HSEQ manager to gain ISO14001:2015 accreditation.
- Establish, develop and maintain positive relationships with key internal and external stakeholders to facilitate accurate dissemination of information relating to environmental issues.
- Assess and anticipate environmental issues relating to the Ostwald Bros Group by maintaining an awareness of projects and activities.
- Provide strategic advice and counsel to the executive management team regarding the identification and management of environmental issues and activities.
- Initiate and manage regulatory approvals, including environmental, water supply and wastewater beneficial use, intensive livestock, extractive materials etc. Negotiate approval conditions with agencies, and oversee approval compliance for current and future developments across the Ostwald Bros Group.
- Collaborate with the executive team to develop environmental systems and processes to support strategic directions and to identify risk exposures.
- Oversee development of planning, engineering, and/or environmental supporting information for relevant regulatory approvals, including coordination of consultants and contractors.
- Negotiate approval conditions with agencies, and ensure approval compliance for current and future developments across the Ostwald Bros Business Units.

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
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Engineering and Environment Manager January2015 -
Ostwald Bros June 2016

Responsibilities included:

- Lead negotiations and communications with local, state and federal government agencies for environmental, construction materials, water supply and wastewater beneficial use approvals for future developments across the Ostwald Bros Business Units.
- Oversee development of planning, engineering, and/or environmental supporting information for relevant regulatory approvals, including coordination of consultants and contractors.
- Negotiate approval conditions with agencies, and ensure approval compliance for current and future developments across the Ostwald Bros Business Units.
- Provide timely and accurate advice on environmental hazards and compliance issues to internal stakeholders and pro-actively develop mitigation strategies.
- Overseeing audits, analysis and collation of environmental and engineering performance data and reporting information to internal staff, clients and regulatory bodies.
- Prepare reports and submissions to internal and external stakeholders from a planning, engineering and environmental perspective.
- Providing planning and environmental training to Ostwald Bros Group staff at all levels.
- Develop and manage environmental monitoring, testing and compliance programs and any appropriate corrective actions that may be required.

Senior Environmental Coordinator May 2014 -
Ostwald Facilities and Accommodation December 2014

Responsibilities included:

- Initiate, draft and manage regulatory approvals, including environmental, water supply and wastewater beneficial use, negotiate approval conditions with agencies, and oversee approval compliance for current and future developments across the Facilities and Accommodation Group.
- Provide input into the development/review of development plans from an environmental perspective.
- Ensure all aspects of development activities comply with relevant environmental regulations and standards.
- Develop and manage environmental monitoring, testing and compliance programs and any appropriate corrective actions that may be required.
- Ensure currency of regulatory approvals and fee payments for environmental compliance.
- Generate reports and submissions to internal and external stakeholders from an environmental perspective.
- Administration of current and new development environmental approvals in line with all relevant legal and environmental standards.
- Prepare and submit environmental authority annual returns as required.
- Oversee development of environmental assessments, regulatory audits and similar documentation including coordination of consultants and contractors.

- Coordinate field implementation of environmental systems and procedures to ensure compliance with regulatory requirements
- Coordinate preparation of, and manage, schedule and budget for environmental aspects of developments and oversee the design, development, procurement and implementation of the development's environmental requirements.
- Liaise with Government agencies and/or external stakeholders in relation to environmental audits and other environmental issues.

Principal Engineer
FSA Consulting

November 2004 – April 2014

Responsibilities included:

- Providing leadership and management to a team of professionals in water resource engineering, intensive livestock design and environmental risk and impact assessment.
- To provide technical and professional development of the team.
- Prepare project documentation and technical reports.
- Project planning and leadership of multi-disciplinary project teams.
- Effective and high-level communication with clients and state and local agencies.
- Managing clients and project scope methods.

Key experience and achievements over this period include:

Staff Management

- Staff selection, conduct staff performance reviews and issue management.
- Directing and mentoring junior/mid-level professional staff as required on project management and technical tasks. Resolving local technical design issues with environmental risk and impact assessments, intensive livestock design, water resource engineering and regulatory applications.
- Ensuring compliance with FSA Consulting WHS and QA policies and procedures.

Project management

- Initiate project and establish terms of reference, clarify objectives, prepare budget, appoint project team and conduct mobilisation meeting.
- Project planning through development of a project plan, resource allocation, financial plan, identifying key deliverables and quality assurance.
- Execute project through construction of deliverables and client management.
- Manage sub-consultants.
- Monitor and control activities being undertaken. Manage time resources, costs against budget, quality management and scope management, preparation of deliverables ensuring completion against terms of reference and within budget.
- Manage issues between staff and clients.
- Project closure and review project completion.

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
Phone: +61 427 629 203, email: rod.davis@rdcengineers.com.au

Technical

- Preparation of Low Hazard Dam/Consequence Assessments.
- Preparation of Land and Water Management Plans (CSG beneficial reuse).
- Earthen storage design and surface water hydrologic modelling.
- Design of irrigation infrastructure works including pipeline, supply and drainage channels, culverts and earthworks.
- Undertaking soil suitability assessments for proposed surface and low pressure overhead irrigation developments.
- Amended RO water quality assessment for irrigation and intensive livestock.
- Preparation of Failure Impact Assessments for Regulatory dams.
- Identification of Technology for Improving Water Use Efficiency in Irrigation in the QLD MDB.
- Design of light and heavy vehicle washdown facilities and prepare functional design briefs.
- Preparation of Site-Based Management Plans – Extraction, Intensive Livestock Activities.
- Preparation of Closure and Rehabilitation Plans – Extraction, Waste Treatment.
- Preparation of Stormwater Management Plans – Extraction, Waste Treatment, Intensive Livestock Activities.
- Preparation of Erosion and Sediment Control Plans – Extraction, Waste Treatment, Intensive Livestock Activities.
- Preparation of Code of Environmental Compliance – Extraction Activities.
- Preparation of Operational Plans – Extraction Activities
- Preparation of Certification of Works that take overland flow.
- Preparation of Quality Assurance manuals and Environmental Impact Statements
- Layout design of feedlots including pens, water storages, effluent management systems.
- Design and development of electronic data logging systems. Resolving technical issues with water depth sensing equipment, power and water flow metering.
- Sugar Industry mechanisation and review projects.
- Undertaking geotechnical investigations for proposed development sites, assessment of material suitability.
- Management of automatic weather station design, procurement, installation and maintenance.
- Checking and auditing report quality.

Administrative

- Ensuring compliance with FSA Consulting WHS and QA policies and procedures.

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
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Project Engineer
BSES Limited
December 1995 - November 2004

Key achievements over this period included responsibility for

Staff Management

- Staff selection, conduct staff performance reviews and issue management.
- Directing and mentoring technical staff as required on project management and technical tasks.
- Ensuring compliance with BSES Limited WPHS policies and procedures.

Project management

- Initiate project and establish terms of reference, clarify objectives, prepare budget, appoint project team and conduct mobilisation meeting.
- Project planning through development of a project plan, resource allocation, financial plan and identifying key deliverables.
- Execute project through construction of deliverables.
- Monitor and control activities being undertaken. Manage time resources, costs against budget, quality management and scope management, preparation of deliverables ensuring completion against terms of reference and within budget.

Technical

- Design and development of alternative forward feeding geometry for cane-harvesters. Accountable for managing a range of key design and construction tasks.
- Implementation of a high-speed cine film system.
- Design, implement and conduct in-field assessments of pre-prototype designs.
- Preparation of detailed design drawings and design evaluation of an improved gathering system and feedtrain-chopper modifications.
- Development of an instrumentation system incorporating load, pressure and speed sensing transducers, interfacing circuits, programming for high-speed data acquisition.
- The design and implementation of weight transfer systems for infield haulouts.
- Preparation of a reference manual for irrigation materials for use by BSES Limited extension staff.
- Representing BSES Limited at industry conferences and presentation of conference papers to industry stakeholders.

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
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Design Engineer March 1995 -
Feedlot Services Australia Pty Ltd December 1995

Undertook a diverse range of design and assessment assignments including:

- Preparation of feedlot licence applications.
- Computer simulation of waste management systems including drainage, waste disposal and odour generation.
- Preparation of Quality Assurance manuals and Environmental Impact Statements.
- Cattle feedlots with an emphasis on conceptual design, preparation of technical specifications and earthworks.
- On-farm earth dams (up to 2000 ML capacity).
- Broadacre furrow irrigation layouts.
- Irrigation infrastructure works including pipeline, supply and drainage channels, culverts and earthworks.

Research Engineer January 1993 -
University of Southern Queensland February 2005

Worked as part of a multidisciplinary team on the Land and Water Resources Research and Development Corporation (LWRRDC) research project titled "Compaction Control and Repair practices for cropping lands in the sub-tropics". Undertook specific research on the behaviour of clay soils during compaction and compaction alleviating processes.

Undertook a diverse range of design, trials and assessment tasks including:

- Development of a simple shear apparatus.
- Field experiments to quantify the stresses applied to the soil with a soil stress transducer and soil deformation measurements using a novel pin displacement method.
- Laboratory experiments to establish the parameters of soil response utilising a simple shear box apparatus.

EDUCATION AND PROFESSIONAL DEVELOPMENT

Certified Professional in Erosion and Sediment Control (#8857)
International Erosion Control Association (Awarded 2017)

Master of Engineering (Research)
University of Southern Queensland (Awarded 1996)

Thesis - An Investigation of Soil Stresses and Mechanical Properties when Compacting Clay Soils

Bachelor of Engineering (Agricultural)
University of Southern Queensland (Awarded 1993)

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
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Department of Justice and Attorney-General: Commissioner for Declarations 1996 (CDec)

International Erosion Control Association (Australasia): Fundamentals in Erosion and Sediment Control – Completed 2014

Generic Induction (Coal and Surface) – Completed in 2010

Queensland Construction White Card - Completed in 2010

Queensland Ambulance First Aid - Completed in 2010

Operate ATV (Quad bike) Training – Completed in 2008

Certificate in Hydraulic Training. HMI – Basic Hydraulic maintenance and HA2 Advanced Hydraulic systems and electronic controls. Mannesmann Rexroth. Completed in 1997.

SOFTWARE EXPERTISE

- Microsoft Office - Word 2010, Excel 2010, Powerpoint 2010 (Advanced)
- Computer Aided Drafting - AutoCAD LT 2017 (Advanced), AutoCAD Civil 3d (Intermediate)
- High Speed Data Acquisition - Various proprietary software Easiacces, DASYLab, Labtech Notebook

INTERNATIONAL EXPERIENCE

2003: 2 weeks in JuJuy province, North Argentina. Site inspections and technical advice on harvester design, setup and performance in order to increase cane quality at the mill and minimise field and harvester losses on 33,000 ha sugar plantation. This work involved a series of field experiments and presentations.

2009: 3 weeks in Sao Paulo State, Brazil. Study tour of Brazilian Sugar Industry. This included discussions with equipment manufacturers John Deere, Case IH, AGCO and sugarcane mills. Presentations on Australian developments and Australian Sugar Industry made and technical advice on harvester design, setup and performance given.

2012: 2 weeks in Sao Paulo State, Brazil. Technical specialist for AGCO on alternative cane harvester developments.

AWARDS

2004 Rod Rookwood Design Award. Awarded by the Australian Society of Sugar Cane Technologists for Agriculture/Engineering design. This was awarded for the paper "Enhancing harvester forward-feeding performance: an exercise in optimising machine-crop interactions". The best paper at the ASSCT Conference which focused on innovation and excellence in agricultural or factory design of sugar industry equipment.

The **Eric Anderson Award** recognises the best article in the Australasian Journal of Environmental Management (The Institute's journal) in 2015 -2016. It is sponsored by Taylor & Francis and honours the journal's first editor. It was presented to Chirag Mehta, Robyn Tucker, Glenn Poad, Rod Davis, Eugene

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McGahan, Justin Galloway, Michael O'Keefe, Rachel Trigger and Damien Batstone for their article - ‘Nutrients in Australian agro-industrial residues: production, characteristics and mapping’ published in Vol 23(2).

ROD DAVIS PO Box 1223, TOOWOOMBA QLD 4350
Phone: +61 427 629 203, email: rod.davis@rdcengineers.com.au

PUBLICATIONS

Journal papers

Wiedemann SG, **Davis RJ**, McGahan EJ, Murphy, C, and Redding M, 2016, Resource use and greenhouse gas emissions from grain-finishing beef cattle in seven Australian feedlots: a life cycle assessment, Animal Production Science, CSIRO PUBLISHING, http://dx.doi.org/10.1071/AN15454.

Davis, RJ, Schembri, MG and Kingston, G, 2005, Optimising machine component layout for enhanced harvester feeding performance in lodged crops. *International Sugar Journal,* Vol.107, No. 1276.

Radford, BJ, Bridge, BJ, **Davis, RJ,** McGarry, D, Pillai, UP, Rickman, JF, Walsh, PA, and Yule, DF, 2000, Changes in Properties of a Clay Soil after Compaction with Header Tyres, *Soil and Tillage Research,* **54**: p 155-170.

Bakker, DM and **Davis, RJ,** 1995, Soil Deformation Observations in a Vertisol under Field Traffic, *Australian Journal of Soil Research,* **33**, p 817-32.

Conference and workshop papers

Schmidt, EJ, **Davis, RJ**, Giles, R, Baillie, CP, Jensen, TA, Sandell, GS and Norris CP, 2011, Sustainable Biomass Supply Chain for the Mallee Woody Crop Industry, BioEnergy Australia 2011 Conference, Novotel Twin Waters Resort, Twin Waters, Queensland

Davis, RJ, Water and Energy monitoring and efficiency in feedlots. Beefworks 2011, Toowoomba, Australia.

Schmidt, EJ, **Davis, RJ**, Baillie, CP, Jensen, TA, and Giles, R, 2010, Sustainable Biomass Supply Chain for the Mallee Woody Crop Industry, BioEnergy Australia 2010 Conference, Novotel Manly Pacific, Sydney, New South Wales

Jensen, TA, Baillie, CP, Bramley, R, Di Bella, L, Whiteing, C and **Davis, RJ**, Assessment of Sugarcane Yield Monitoring Technology for Precision Agriculture. Proc Aust Soc Sugar Cane Technol Vol 32 2010.

Davis RJ, Wiedemann, SG, Cornford GS and Watts, PJ, 2009, An Investigation Of Lot-Fed Cattle Drinking Water Consumption Under Australian Conditions, Biennial Conference of the Australian Society for Engineering in Agriculture (SEAg), published by SEAg, Editors: T.M. Banhazi and C. Saunders - 13-16 of September 2009, Brisbane, QLD.

Davis RJ, Wiedemann SG and Watts, PJ, 2009, Energy Usage of Individual Activities Within Australian Cattle Feedlots, Biennial Conference of the Australian Society for Engineering in Agriculture (SEAg). Published by SEAg, Editors: T.M. Banhazi and C. Saunders – 13-16 of September 2009, Brisbane, QLD.

Davis, RJ, Wiedemann, SG and Watts, PJ 2009, Water usage of individual activities within Australian cattle feedlots, Biennial Conference of the Australian Society for Engineering in

Agriculture (SEAg). Published by SEAg, Editors: T.M. Banhazi and C. Saunders – 13-16 of September 2009, Brisbane, QLD.

Ouellet-Plamondon, CM, **Davis, RJ**, Watts, PJ and Savoie, P, 2009, Audit, Need Analysis and Design of Vehicle Washdown Facilities for Biosecurity in Queensland, Australia, 2009 ASABE Annual International Meeting, Sponsored by ASABE, Grand Sierra Resort and Casino, Reno, Nevada, June 21 – June 24, 2009, Paper Number: 095775.

Davis, RJ, Norris, CP and Whiteing, C, 2009, Review of Sugarcane Harvester Performance. Biennial Conference of the Australian Society for Engineering in Agriculture (SEAg), published by SEAg, Editors: T.M. Banhazi and C. Saunders - 13-16 of September 2009, Brisbane, QLD.

Davis, RJ, Schembri, MG and Kingston, G, 2005, Optimising machine component layout for enhanced harvester feeding performance in lodged crops. *Proceedings of International Society of Sugar Cane Technologists,* **25**: p 326-330.

Davis, RJ and Norris, CP, 2005, An investigation of the feeding characteristics of the forward-feeding zone of chopper harvesters: Development of a research harvester. *Proceedings of International Society of Sugar Cane Technologists,* **25**: p 316-323.

Whiteing, C, **Davis, RJ** and Schmidt, EJ, 2004, Evaluation of cane loss monitoring systems. *Proceedings of Australian Society of Sugar Cane Technologists,* **26**: (CD-ROM, 12 pp).

Schembri, MG and **Davis, RJ,** 2004, Measuring the benefits of the SRI basecutter height control system and the floating basecutter system. *Proceedings of Australian Society of Sugar Cane Technologists,* **26**: (CD-ROM, 10 pp).

Davis, RJ and Schembri, MG, 2004, Enhancing harvester forward-feeding performance: an exercise in optimising machine-crop interactions. *Proceedings of Australian Society of Sugar Cane Technologists,* **26**: (CD-ROM, 14 pp).

Davis, RJ and Norris, CP, 2003, Optimising the forward feeding zone of harvesters. Development of a research platform. *Proceedings of Australian Society of Sugar Cane Technologists,* **25**: (CD-ROM, 12 pp).

Davis, RJ and Norris, CP, 2002, Improving the feeding ability of sugarcane harvesters. *Proceedings of Australian Society of Sugar Cane Technologists,* **24**: p 190–198.

Norris, CP and **Davis, RJ,** 2001, Developments in the feeding performance of sugarcane harvesters in large green crops. *Proceedings of International Society of Sugar Cane Technologists,* **24**: p 269–275.

Hockings, PR, Norris, CP and **Davis, RJ,** 2000, Chopper systems in cane harvesters: B: Results of a test program. *Proceedings of Australian Society of Sugar Cane Technologists,* **22**: p 250–255.

Norris, CP, Hockings, PR and **Davis, RJ,** 2000, Chopper systems in cane harvesters: A: Development of a test facility. *Proceedings of Australian Society of Sugar Cane Technologists,* **22**: p 244–249.

Norris, CP, **Davis, RJ** and Poulsen, LP, 1998, An Investigation into the Feeding of Lodged Green Cane by Harvesters. *Proceedings of Australian Society of Sugar Cane Technologists,* **20**: p 224–231.

Norris, CP, **Davis, RJ,** Quick, DJ and Mohammad, Y, 1998, An Alternative Approach to Cane Harvester Design: An Initial Review of the Massey Ferguson 405. *Proceedings of Australian Society of Sugar Cane Technologists,* **20**: p 10-16.

Davis, RJ and Harris, HD, 1995, Measuring the Variation of Soil Mechanical Properties with Treatment and Time in a Compaction Control and Repair experiment. *Proceedings of National Controlled Traffic Conference*, 13 - 14 September, 1995.

Books and Manuals

Watts, PJ, **Davis, RJ,** Keane, OB, Luttrell, MM, Tucker, RW, Stafford, RD and Janke, S, 2016, Beef Cattle Feedlots: Design and Construction Manual, *Meat and Livestock Australia*, Sydney.

Davis, RJ, Watts, PJ, Klepper, K and Hewitt, S, 2005, Managing Emissions from Intensive Livestock Wastes, in Chapter 5 – Greenhouse Best Practice Guide, *Australian Greenhouse Office*, Canberra.

Sandell, GR, Agnew, JR, Stainlay, GT, Whiteing, C, **Davis, RJ**, James, MP and Norris, CP, 2002, The Harvesting Best Practice Manual for Chopper-Extractor Harvesters. *Bureau of Sugar Experiment Stations*, Indooroopilly.

Reports and Thesis

Schmidt, EJ, Giles, R, **Davis, RJ**, Baillie, CP, Jensen, TA, Sandell, GS and Norris CP, 2011, Sustainable Biomass Supply Chain for the Mallee Woody Crop Industry, RIRDC Project No PRJ–005295, Rural Industries Research and Development Corporation, Canberra.

Watts, PJ, **Davis, RJ**, Fairfull, AR, Scobie, MJ, Muller, BD, Barker, SJ and Heinrich, NA, 2011, Estimating Land Surface Diversions: Stage 2. Murray-Darling Basin Authority project MD1015 Final Report.

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Davis, RJ, Watts, PJ and McGahan, EJ 2010, Quantification of feedlot manure output for BEEF-BAL model upgrade, RIRDC Project No. PRJ-004377, Rural Industries Research and Development Corporation, Canberra.

Tucker, RW, **Davis, RJ**, Scobie, MJ, Watts, PJ, Trigger, RZ, Poad, GD and O'Keefe, MF 2010, Determination of effluent volumes and reliability, effluent characterisation and feedlot water requirements, B.FLT.0348 Milestone Report, Meat & Livestock Australia Ltd, North Sydney.

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Davis, RJ, Wiedemann, SG and Watts, PJ 2008, Quantifying the Water and Energy Usage of Individual Activities within Australian Feedlots- Part B Energy Usage at Australian Feedlots, Meat and Livestock Australia Ltd, Project B.FLT.0339 Final Report, Sydney, NSW.

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Davis, RJ, Norris, CP and Whiteing, C, 2009, A Review of Opportunities to Improve the Performance of Sugarcane Harvesters. *Sugar Research and Development Corporation* project FSA001 Final Report.

Davis, RJ, Norris, CP and Whiteing C, 2009, A Review of Opportunities to Improve the Performance of Sugarcane Harvesters, FSA Consulting Report 6899/1, Toowoomba, Queensland.

Davis, RJ, 2007, Modified Rotary-Pinch Chopper System for Improved Harvesting Efficiency. *Sugar Research and Development Corporation* project HGP003 Final Report.

Davis, RJ, 2007, Stage 3 Report – Modified Rotary-Pinch Chopper System for Improved Harvesting Efficiency. *Sugar Research and Development Corporation* project HGP003 Milestone 4 Report.

Davis, RJ, Bartels, R and Schmidt, EJ, 2007, Precision agriculture technologies – Relevance and application to sugarcane production. *National Centre for Engineering in Agriculture* Publication 1002265/1, Toowoomba, Queensland.

Davis, RJ and Watts, PJ, 2006, Environmental Sustainability assessment of the Australian Feedlot Industry – Part A: Water usage at Australian Feedlots, *Meat and Livestock Australia*, project FLOT.328 Final Report, Sydney, NSW.

Davis, RJ and Watts, PJ, 2006, Environmental Sustainability assessment of the Australian Feedlot Industry – Part B: Energy Usage and Greenhouse Gas Emission Estimation at Australian Feedlots, *Meat and Livestock Australia*, project FLOT.328 Final Report, Sydney, NSW.

Tucker, RW, **Davis, RJ**, Klepper, K, Watts, PJ and McGahan, EJ, 2006, Environmental Sustainability assessment of the Australian Feedlot Industry – Part C: Nutrient Cycling at Australian Feedlots, *Meat and Livestock Australia*, project FLOT.328 Final Report, Sydney, NSW.

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Watts, PJ, **Davis, RJ** and Smith, RJ, 1992, Evaluation of an Electronic Odour Detection Meter. *Meat Research Council*, Report No DAQ 64/18.

CURRICULUM VITAE

MITCHELL FURNESS

PERSONAL DETAILS

NAME: Mitchell Furness

ADDRESS: 112 Jonel Park Road
ALLORA QUEENSLAND 4362

MOBILE: 0466 402 177 or 0417 613 996

PRESENT POSITION

Consulting scientist - RDC Engineers Toowoomba QLD.

EDUCATIONAL DETAILS

Bachelor of Applied Science-Rural Technology Honours Class 1
University of Queensland-Gatton Campus
Graduated June 2000

Completed Enrolled Nurse training Stanthorpe Hospital 1988

Completed Year 12 Education Stanthorpe State High School 1986

CAREER SUMMARY

June 2023 – ongoing
RDC Engineers. Mr Rod Davis.

Ad hoc science services to RDC Engineers. Services include project research, project management, legislative interpretation and comment, experienced application of computer modelling of natural systems including excel based models used in intensive livestock, daily time hydraulic and nutrient models such as Medli, and air pollution models such as TAPM. Experience in natural resource assessments including flora and fauna, soils, and waters, agricultural production systems. Extensive experience in regulatory agency bringing and understanding of the opportunities and constraints in the contemporary Federal, State and Local Government regulatory environments.

April 2023 – June 2023
Project Management Officer
Southern Downs Regional Council

Responsible for introduction of project management practices and principals to the development and roll out of major projects within the Southern Downs Regional Council.

September 2013 – January 2023
Manager, Environmental Regulation
Agri-Business Policy and Industry Development
Department of Agriculture and Fisheries

The role of Manager, Environmental Regulation is responsible for the delivery of environmental regulatory services for the intensive livestock industries of feedlotting, pig keeping and poultry farming in Queensland. I lead a team of five environmental scientists who are responsible for the assessment of new and expanding activities and also the compliance of these activities, across the state of Queensland. The role is multidisciplinary and seeks to promote the growth of these industries whilst minimising their environmental impacts. The role is guided by relevant legislation and Departmental policies. The role is dynamic and is centred around delivery of regulatory services whilst managing the development of the regulated industries and the subsequent impacts to the community. The role is both administrative and technical with a thorough understanding of the science that underpins these industries and the impacts that they have on the community. The role is also the most senior in the group to hold legislative delegations and as such is responsible entity for all legislative decision making.
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April 2008 – September 2013
Senior Environmental Scientist and Acting Manager
Intensive Livestock Environmental Regulation Unit
Department of Agriculture, Fisheries and Forestry

In my role as Senior Environmental Scientist with Animal Industries group, I am responsible for and deliver the following activities.

Implementation and delivery of a regulatory reform agenda within the Animal Industries group within DAFF that has resulted in improved outcomes such as lower numbers of complaints about activities, reduced regulatory burden and improved environmental performance by industry generally through adoption of a co-regulatory model for feedlotting. This has seen the adoption of an outcomes based best practice approach to regulatory services provides by DAFF for the intensive animal industries.

Development and implementation of new or existing practices, protocols, standards, and procedures that result in appropriate regulation of intensive animal industries in Queensland.

Preparation of Ministerial correspondence, briefings and memos on matters related to intensive animal industries.

Implementation and delivery of legislative reforms to both the relevant environmental and planning legislation as it applies to these industries.

The administration of environmental authorities for intensive livestock activities within Queensland, through the issuing of new authorities or ensuring compliance with authority conditions.

Leading a team of environmental scientists responsible for Departmental responses to development applications for new or expanding intensive livestock activities in Queensland under relevant state legislation and policies.

Leading a team that is responsible for the resolution of non compliance by operators of intensive livestock developments through offsite monitoring, onsite auditing, encouragement of adoption of best practice through one on one meetings, forums etc, compliance with development approval or environmental authority conditions and or infrastructure on ground. This often involves encouraging producers to adopt new practices and technologies reducing impacts to the environment and community.

Working with the Animal Industries team within DAFF to achieve the State agenda of economic development whilst minimising impacts to the community and environment.

Working with producers to ensure the Queensland State Government's agenda of economic development occurs in a way that Queensland environment values are maintained. This includes supporting the adoption of innovative practices to improve the economic and environmental performance of livestock developments.

Working collaboratively with fellow DAFF officers, other state agencies both local and interstate and consultants to develop environmental assessment policies in relation to odour, hydraulic modelling and sustainable reuse of animal waste products.

Development of a range state and national best practice environmental assessment protocol, policies and guidelines for the regulation of intensive animal development

Consulting with officers from other state and federal agencies including New South Wales, South Australia, Victoria and the Western Australian Department of Agriculture and Food on the development and implementation of environmental policies relating to intensive livestock industries.

July 2001 – April 2008
Environmental Scientist
Intensive Livestock Environmental Regulation Unit
Department of Employment, Economic Development and Innovation

Responsibilities:

Provide expert advice on the impacts of intensive livestock developments in Queensland in terms of predicting environmental impacts to soils, air, waters and the community.

Development of protocol in the modelling of intensive livestock systems with various spreadsheets and computer models such as Medli and Ausplume

Working with the regulated intensive livestock farming community ensuring adoption of accepted regulatory protocol

Enforcing compliance with relevant legislation, policies, and development approval conditions

March 2000 to July 2001
Scientist
Department of Natural Resources and Mines

Establishment of environmental trials investigating soil carbon sequestration in grazing landscapes in south western Queensland.

Enrolled Nurse
March 1987 to December 1995
Various hospitals in Queensland

TRAINING

- Certificate IV in Government Fraud Control – completed November 2001
- Conflict resolution training (QCOSS) – October 2002
- Authorised Officer Training – completed March 2003
- Getting to know groundwater (CGS Groundwater short course) – April 2004
- 4th Australian Groundwater Modelling School (CGS) – November 2005
- Mental Health Awareness Training 2008
- Constructive Team leadership Course February 2009
- Fitzroy Ag Invest Summit 30 June 2010
- Climate Risk Management and Adaptation Project 12 October 2010
- Media Training - Corporate Communications 2010
- Ausplume odour modelling training December 2010

- Ombudsman and Crown Law training 2011 in good decision making
- ChemCert Training completed 2016
- Authorised Officer Training EP Act 1994 2017
- Good Decisions Training Queensland Ombudsman 2019
- Complaints management training Queensland Ombudsman 2020
- Authorised Officer Training Public Health Act 2005 2021
- CPR refresher training 2021
- Domestic and family violence training, Queensland Government 2021

REFEREES

1. Mr Rod Davis
RDC Engineers
Telephone: 0427 629 203

2. Mr Luke Boucher
Department of Agriculture and Fisheries
Telephone: 0407 582 369

Talei Holm

Archaeologist • Heritage Advisor

Contact

0498 662 122
tholm.arch@gmail.com
Finley, NSW

Key Field Skills

Excavation direction
Hand excavation
Recording oral histories
Recording shelters
Rock art recording
Salvage excavation
Site survey
Stone tool identification
Photography

Key Office Skills

Community consultation
GIS programs
Professional quality graphics
Writing ARDs, due diligences, and post excavation reports
Development of ICIP protocols for databases
Thorough understanding of NSW, WA, and Commonwealth legislation

Qualifications

Manual car license
First aid and CPR
White Card
RIW

Education

Master of Archaeology and Heritage Management (ongoing)• Flinders University • Adelaide SA • Thesis on culturally modified trees and cultural landscapes on Wiradjuri Country • (2023-2024)

Bachelor of Archaeological Practice • Australian National University • Canberra ACT

Industry Experience

March 2023—Ongoing
Casual archaeologist • Various Heritage Companies • Eastern Australia
Working as a causal field archaeologist in Eastern Australia. I have been so far involved in several Aboriginal surveys in ACT and QLD, a 12 week historical archaeology salvage and several monitoring projects in NSW.

June 2022—January 2023
Heritage Advisor • Murujuga Aboriginal Corporation • Karratha WA
My key role in this position is to support the Heritage Research Manager in handling the heritage business side of the corporation. This includes liaising with proponents, reviewing reports and management plans from heritage consultants, advising the CEO and Circle of Elders on projects and coordinating and running field surveys. I have also drafted media releases and assisted in developing Indigenous Cultural Intellectual Property (ICIP) protocols for a Cultural Heritage Management System.

August 2021—May 2022
Heritage Consultant (Archaeologist) • GML Heritage • Sydney NSW
Write high-quality reports (including due diligence, archaeological research designs, and post-excavation reports) to the standard set out by legislation. Train graduates in research, report writing, GIS and field skills. Participate in fieldwork as 2IC, supervisor and excavation director. Prepare winning proposals, work within budgets and tight time frames, and liaise with clients on complex projects.

September 2019—July 2021
Graduate Heritage Consultant (Archaeologist) • GML Heritage • Sydney NSW
Develop all the critical skills to become a competent archaeologist, focusing on First Nations cultural heritage. This includes report writing, GIS skills, community consultation, and fieldwork coordination. During fieldwork, I acted as both 2IC on multiple projects and supervisor in the absence of the excavation director.

Research Interests

- Culturally modified trees
- Community-led research
- Indigenous research methodologies

Conference Presentations

Holm, T, 2018, *Triabunna Field School,* NASC Sydney (presentation)

Morris, H; Holm, T; Freeman, N and Owen, T, 2022, *Recording Ring Trees in South Eastern NSW,* AAA Darwin (poster)

(Upcoming) Holm, T; Morris, M; Young LALC; Owen, T, 2023, *Recording Ring Trees on Wiradjuri Country,* Arboreal Alterations Canberra (presentation)

(Upcoming) Morris, H and Holm, T, 2023, *Cultural Plants,* AAA Gold Coast (session)

(Upcoming) Morris, H; Holm, T; Young LALC; Owen, T, 2023, *Ring Trees: Creating a Typology for Recording to Prevent Loss,* AAA Gold Coast (presentation)

References:

Dr Tim Owen
Principal, GML Heritage
0404 233 789

Cat Morgan
Senior Heritage Advisor, PKKP Aboriginal Corporation
0410 867 481

Hannah Morris
Senior Heritage Advisor, Extent Heritage
0452 334 339

Selected Projects with Associated Skills

Parramatta Light Rail• State Significance Infrastructure • First Nations and Historical Archaeology

- Working with RAPs on site and integrating intangible values into site assessments,
- Managing small teams on site,
- Large scale salvage excavation in a sand body in arbitrary spits,
- Excavating 1m^2 and 0.5m^2 test units, by hand and by machine
- Recording and excavating features such as hearths,
- Supervising excavation of sensitive sediment by machine,
- Liaising with clients and contractors,
- Taking samples for carbon dating, OSL dating, and pollen analysis,
- Managing small teams on site,
- Interpretation of Aboriginal Cultural Heritage, and
- Coordinating several large excavations across the Parramatta CBD.

Mount Gilead Housing Development • Lendlease • First Nations Archaeology

- Coordinating and mobilising the 8-week excavation program,
- Test excavation program over large-scale landscapes,
- Identifying and excavating multiple soil landscapes,
- Recording culturally modified trees including scar and ring trees,
- Field recording, including test units sheets, landscape and test unit photography, and salvage trenches,
- Developing predictive models,
- Integrating up-to-date research for site interpretation, such as archaeo-astronomy
- In-depth discussions with RAPs on site regarding sensitive cultural information,
- Developing a post excavation report,
- Working within an Aboriginal Heritage Impact Permit (AHIP),
- Being up to date with WHS recommendations such as smoke levels to ensure the safety of the team,
- Identifying cultural materials such as IMST, quartz and silcrete lithics, ochre, and crystal,
- Liaising with client, and
- Subconsultant management.

Forest High School • Schools Infrastructure • First Nations Due Diligence and Aboriginal Cultural Heritage Assessment

- Writing a Due Diligence under Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (2010),
- Mapping historic ground disturbance using soil landscapes and historical aerials,
- Developing Archaeological Research Design,
- Preparing an Aboriginal Cultural Heritage Assessment Report under the legislation
- Excavation director of the testing program which finished ahead of schedule and within the budget,
- Site survey to identify both cultural features and ground truth areas of disturbance,
- Project management,
- Coordinating and participating in site inspection with Metropolitan Local Aboriginal Land Council, and
- Mapping intangible heritage values associated with the site.

Project	Tasks Preformed	Role	Length of fieldwork
Bowral Retirement Village Aboriginal Testing (2019)—Kayandle	Hand excavation, artefacts identification and test unit recording	Subconsultant—field archaeologist	8 weeks
Pitt St South Historical Salvage (2019)—AMBS	Single-context excavation and recording	Subconsultant—field archaeologist	8 weeks
Baldwin Drive Aboriginal Testing (2019)—GML	GIS, hand excavation, artefacts identification, test unit recording and assisting in running the excavation	Site 2IC and field archaeologist	3 weeks
Young High School Historical Salvage (2019) —GML	Single-context excavation, recording and machine monitoring	Field archaeologist	4 weeks
St Marys Development Site Aboriginal Testing (2020) —GML	GIS, hand excavation, artefacts identification, test unit recording and assisting to run the excavation	Site 2IC and field archaeologist	6 weeks
Luna Park Archaeological Monitoring (2020) —GML	Proposal writing, GIS, machine monitoring, field recording and writing advice	Project manager, field archaeology and report writing	2 weeks
Art Gallery NSW Historical Monitoring (2020) —GML	Machine monitoring and field recording	Field archaeologist	1 week
Hunter River High School ACHAR (2020) —GML	Writing proposals and ACHAR, and GIS	Office archaeologist	-
Paramatta Light Rail Historical Testing and Salvage (2020) —GML	Coordinating field work, sub-consultants, and equipment, single-context excavation, recording and machine monitoring	Field archaeologist and fieldwork coordinator	4 weeks
Paramatta Light Rail Aboriginal Testing and Salvage (2020-2021) —GML	Coordinating field work, sub-consultants, and equipment, hand excavation, artefact recording, supervising sites and report writing	Site supervisor and field archaeologist	14 weeks
Mount Gilead Aboriginal Testing and Survey (2021) —GML	GIS, hand excavation, artefacts identification, test unit recording, assisting in running the excavation and post-excavation writing	Site 2IC and field archaeologist	8 weeks
Albion Park Aboriginal Community Collection Artefact Repatriation (2021) —GML	Proposal writing, community collection, client relations, repatriation of objects and AHIMS recording	Project manager and field archaeologist	2 days
West Dapto Historical Testing (2021) —GML	Single-context excavation, recording and machine monitoring	Field archaeologist	2 weeks
West Dapto Aboriginal Testing and Salvage (2021) —GML	GIS, hand excavation, artefacts identification, test unit recording, assisting in running the excavation and post-excavation writing	Site 2IC and field archaeologist	6 weeks
ARTC ACHAR (2021) —GML	Report writing and GIS	Office archaeologist	-
Anambah Housing Development ACHAR (2021) —GML	Report writing, GIS and site inspection	Field and office archaeologist	-
Forest High School Testing and Survey (2021) —GML	Writing proposals, post-excavation, producing GIS and Excavation directing,	Project manager and excavator direction	4 days
Metro West Historical Testing (2022) —GML	Single-context excavation, recording and machine monitoring	Field archaeologist	2 weeks
Metro West Aboriginal Testing (2022) —GML	Proposal and post-excavation writing, producing GIS,	Site supervisor	2 weeks

Project	Tasks Preformed	Role	Length of fieldwork
	running fieldwork, liaising with clients and managing contamination		
Lancer Barracks Historical Testing (2022) —GML	Proposal writing, GIS, machine monitoring, field recording and writing advice	Site supervisor	2 weeks
Horizon Power Survey (2022)—Murujuga Aboriginal Corp	Onsite support to Traditional Owners and Custodians, report reviewing and presenting results to Circle of Elders	Project manager	3 days
Master Planning Survey (March-April 2023)—GML, ACT	Led a 2 day Indigenous archaeological field survey and writing associated Cultural Heritage Assessment	Subconsultant—field archaeologist and report writer	2 days
Master Planning Survey (April 2023)—GML, ACT	Led a 1 day Indigenous archaeological field survey and writing associated Cultural Heritage Assessment	Subconsultant—field archaeologist and report writer	1 day
Transport for Tomorrow Historical Monitoring (April 2023)—Artefact	Historical monitoring of geotechnical test pits at Central Station during rail shut-down	Subconsultant—field archaeologist	2 days
Waterloo OSD Historical Salvage (April-July 2023)—AMBS, NSW	Single and complex context excavation, recording and machine monitoring	Subconsultant—assistant supervisor	12 weeks
Clarke Creek Wind Farm Survey (August 2023)—Everick, QLD	Artefact identification, recording culturally important vegetation, working on Field Map system	Subconsultant—field archaeologist	2 weeks
Copper String Project (August 2023)—Everick, QLD	Artefact identification, working on Field Map system	Subconsultant—field archaeologist	2 weeks
Richmond Council Re-Zoning (August 2023)—Everick, QLD	Artefact identification, discussion and integration of intangible values, working on Field Map system	Subconsultant—field archaeologist	2 days
Clarke Creek Wind Farm Survey (September 2023)—Everick, QLD	Artefact identification, recording culturally important vegetation, working on Field Map system	Subconsultant—field archaeologist	2 weeks
Boomer Rangers Wind Farm Survey (October 2023)—Everick, QLD	Artefact identification, recording culturally important vegetation, working on Field Map system	Subconsultant—field archaeologist	1 week
Anglo America Coal Mine Survey (October 2023)—Everick, QLD	Artefact identification, recording culturally important vegetation, working on Field Map system	Subconsultant—field archaeologist	1 week
Waterloo Metro OSD (October 2023)—AMBS, NSW	Monitoring 5-, 30-, 35- and 40-ton machines	Subconsultant—field archaeologist	2 weeks

Appendix E

Title

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 130/756353

SEARCH DATE	TIME	EDITION NO	DATE
29/4/2024	9:36 AM	4	2/11/2017

LAND

LOT 130 IN DEPOSITED PLAN 756353
LOCAL GOVERNMENT AREA EDWARD RIVER
PARISH OF YALGADOORI COUNTY OF TOWNSEND
(FORMERLY KNOWN AS PORTION 130)
TITLE DIAGRAM CROWN PLAN 4354.1803

FIRST SCHEDULE

ANDREW JAMES JESSOP VARLEY
NICHOLE ANDREA VARLEY
AS JOINT TENANTS (T 7846234)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 AM802521 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Appendix F

Foundation and Clay lining of feedlot pens, pads and drainage system

Appendix C. – Clay lining of feedlot pens, pads and drainage system

Preamble

Runoff from the feedlot pad contains organic and mineralised manure constituents that could pose a significant ecological hazard if they were released, uncontrolled, into the environment.

If a groundwater assessment indicates a high potential for contamination of underground water resources because of leaching of nutrients through permeable, underlying soil or rock strata, an impermeable barrier will be needed between the contaminant and the groundwater. This is required if the permeability of underlying soil/rock strata exceeds 0.1mm/day (3.5 cm/year).

This impermeable barrier is generally created using a liner made of compacted clay or other suitable compactable soil materials. Where these materials are not available, a synthetic liner (polymembrane) may be used. Synthetic liners tend to be expensive, require specialist installation and are hard to protect from damage by cattle and cleaning equipment. Clay liners tend to be the most common form employed in feedlot construction, and the following section outlines the characteristics of suitable clay lining material.

Design standard

- Clay liners should have a maximum permeability of 1 x 10^{-9} m/s (0.1mm/day) for distilled water with 1 m of pressure head.
- Clay liners must be of sufficient depth so that the integrity of the structure is maintained throughout the general working of the feedlot.

Clay liners

Clay liners are commonly used in industry for a range of contaminants including liquid effluent.

For a given soil, permeability is related to soil particle composition, moisture content and level of compaction; and there are limits to the permeability that can be achieved at any level of compaction. *In-situ* and laboratory measurement of permeability is difficult, and relatively inaccurate. Also, some soil types, because of their physical and chemical properties, are impermeable *in-situ*, but fail to meet the design standard when measured in the laboratory.

For these reasons, rather than relying on permeability standards, this section provides guidance on specifications for materials and construction methods to be used for clay lining.

The specifications in Table C.1 provide guidance on the selection of the correct materials for use in the liner. Soils may need to be mixed or engineered to produce a material that meets the specifications.

Table C.1 Specifications for clay liner materials

Soil characteristic	Acceptability criterion	Test method
Percentage fines	More than 25% passing 75 µm sieve	AS 1289 3.6
	More than 15% passing 2 µm sieve	
Liquid Limit	Less than 70	AS 1289 3.1.2
Plasticity Index	More than 15	AS 1289 3.3.1
Emerson class number	5 to 6	AS 1289 3.8.1

Areas to be clay lined within the controlled drainage area include:

- effluent catch drain
- sedimentation system
- holding ponds
- manure stockpile and composting pad
- any area where contaminants are stored or handled.

Because of the formation of a low permeability soil-manure interface layer, clay lining is not generally required on the feedlot pen and yard areas.

Trafficability of clay lined materials

The liner should be trafficable for cattle and equipment. To ensure that the integrity of the liner is maintained, the depth of the liner should be sufficient to ensure that equipment does not damage it during harvesting of manure. The minimum depth recommended for the clay liner is 300 mm after compaction. Periodic repair of the liner will be necessary due to the wear and tear associated with cattle traffic and normal cleaning operations.

The mechanical strength of liners can be tested using the Californian Bearing Ratio (CBR) test, which was developed for measuring the load-bearing capacity of soils used for building roads. The test is performed by measuring the pressure required to penetrate a soil sample with a plunger of standard area in both the saturated and dry conditions at a specified compaction. The minimum standard for CBR wet and dry is 20%.

Particular attention should be applied to the load-bearing capability of areas where cleaning or harvesting of dry waste is undertaken, including:

- feedlot pens
- effluent catch drain
- sedimentation system
- manure stockpile and composting pad.

Construction

All areas to be clay lined should be cleared and grubbed, stripped of top soil and prepared to the required levels and gradients by cutting and filling. The surface of the excavated area should also be tined before the clay material is placed to produce a satisfactory bonding surface.

The clay lining material should be placed in layers of 150 mm (±50 mm). Each layer should be tined, wetted to ±2% of optimum moisture content (AS 1289 5.1.1) and compacted to the required compaction (relative to the maximum dry density, AS 1289 5.4.2) that is needed to achieve the required permeability of 1mm/day.

APPENDIX E
STANDARD SPECIFICATION

CATTLE FEEDLOTS

QUEENSLAND GOVERNMENT

DPI QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES

CLAY LINING OF DRAINS, SEDIMENTATION SYSTEMS, HOLDING PONDS AND MANURE STOCKPILE AREAS

Alan Skerman, Senior Environmental Engineer, Intensive Livestock Environmental Management Services

INTRODUCTION

This standard specification is intended to provide guidance and technical direction to licensees, contractors, consultants and project managers involved in the construction of cattle feedlots at sites where groundwater impact assessments have indicated a high potential for contamination of underground and/or surface water resources, because of leaching of nutrients through permeable, underlying soil or rock strata. It outlines this Department's recommended practices for the clay lining of drains, sedimentation systems, holding ponds and manure stockpile areas and provides a set of enforceable, quantitative standards to ensure that consistency is achieved throughout the industry.

This specification is based on established engineering principles and operational experience gained by the industry over several years. However, it may be revised from time to time as new methods are developed and/or as experience dictates. Proposals involving alternative materials and/or construction methods may be submitted to the administering authority for consideration.

1. PERMEABILITY STANDARD

If a groundwater impact assessment indicates a high potential for contamination of underground and/or surface water resources, because of the leaching of nutrients through permeable, underlying soil/rock strata, clay lining of the feedlot complex should be undertaken in accordance with this specification. For the purpose of this specification, it is considered that there is a significant risk of nutrient leaching if the permeability of underlying soil/rock strata exceeds 0.1 mm/day (37 mm/year).

Because in-situ and laboratory measurement of permeability is difficult and relatively inaccurate, rather than relying on permeability standards, this document provides proven standards for materials and methods used for clay lining. By applying these standards, the required permeability should be achieved consistently.

2. AREAS TO BE CLAY LINED

Unless the underlying soil type and geology changes significantly across the feedlot site, each of the following areas of the feedlot complex should be clay lined:

- internal catch drain(s),
- sedimentation system(s),
- holding pond(s) and
- manure stockpile area(s)

Because of the formation of a low permeability soil–manure interface layer, clay lining is not generally required on the pen and yard areas, unless directed by the administering authority.

3. CLAY LINING SURFACE PREPARATION

All surfaces to be clay lined shall be cleared and grubbed, stripped of topsoil and prepared to the required levels and gradients by cutting and filling, as required. This will involve over-excavation (excavation below the design level indicated on the plans) to accommodate the required thickness of clay lining while ensuring that the final design gradients, levels and dimensions are achieved, in accordance with the plans approved by the administering authority.

To produce a satisfactory bonding surface for the placement of subsequent layers, the following operations should be carried out on all areas to be clay lined:

(i) scarifying or ripping with a tined implement, to a minimum depth of 150 mm,
(ii) watering to produce the correct moisture content, as specified in Clause 6,
(iii) compaction in accordance with Clause 7.

4. CLAY LINING MATERIAL

Soils shall be considered suitable for use as clay lining materials, subject to compliance with the following requirements:

The material shall be classified as either CL, CI, CH, SC or GC in accordance with the soil classification system described in Appendix A of AS 1726. Furthermore, it shall conform with the following particle size distribution and plasticity limits:

(i) Particle Size Distribution:

AS Metric Sieve Size (mm)	**Percentage Passing** (by dry weight)
75	100
19	70 – 100
2.36	40 – 100
0.075	25 – 90

(ii) Plasticity Limits on fines fraction, passing 0.425 mm sieve:

Liquid Limit W_L	30 – 60 %
Plasticity Index I_p	> 10 %

Note for explanatory purposes: *The material classification symbols CL, CI, CH, SC* and *GC represent clays having low, intermediate and high plasticity, clayey sands and clayey gravels respectively.*

If materials complying with the above plasticity limits are not readily available, clays having liquid limits between 60% and 80% may be used as lining material, provided that the clay lining layer is covered with a layer of compacted gravel (or other approved material), having a minimum thickness of 100 mm, to prevent the clay lining from drying out and cracking.

Topsoil, soils incorporating tree roots or organic matter and any other material which does not compact properly, must not be placed in any of the areas to be clay lined. Wherever non-dispersive materials are available, they are to be used in preference to materials shown to be dispersive using the Emerson test, as described in Method 8.1 of AS 1289.

5. MATERIAL SUITABILITY AND IDENTIFICATION

The visual identification methods described in AS 1726 may be used by suitably qualified and experienced persons, for classifying soils in the field. However, if there is doubt about the suitability of the material, the administering authority may direct the licensee to arrange for laboratory testing, in accordance with the appropriate sections of AS 1289. All such laboratory testing must be carried out by a soils laboratory, accredited by the National Association of Testing Authorities (NATA).

6. CLAY LINING THICKNESS

The minimum required thickness of clay lining depends on the maximum head of effluent in contact with the clay lining and the duration of that contact. The following table outlines minimum lining thicknesses (after compaction), for the different areas of the feedlot, for two maximum head conditions.

Area of Feedlot	**Maximum Head Over Clay Lining** (m)	**Minimum Clay Lining Thickness** (mm)
Internal Catch Drains Sedimentation Systems Holding Ponds Manure Stockpile Areas	< 2 m	300
Sedimentation Systems Holding Ponds	> 2 m	450

7. PLACEMENT OF MATERIAL

Clay lining material complying with Clause 4, shall be placed at the correct moisture content as defined in Clause 8, on surfaces prepared in accordance with Clause 3, in progressive, uniform, horizontal layers, not exceeding 200 mm in thickness, prior to compaction.

8. CORRECT MOISTURE CONTENT

Prior to compaction, all material used for lining purposes shall be conditioned to have a moisture content within the range of two (2) percent wet to two (2) percent dry of the optimum moisture content required to produce the maximum dry density when compacted in accordance with Method 5.1.1 of AS 1289.

Note for explanatory purposes: *This moisture content is consistent with the requirements for compaction using a sheepsfoot roller to produce maximum impermeability. As a guide, the required moisture content is as wet as can be rolled without clogging a sheepsfoot roller. A preliminary assessment of the required moisture content can be made by rolling a sample of the material between the hands. If it can be rolled to pencil thickness without breaking, it should be satisfactory.*

9. COMPACTION

Each layer of material placed in accordance with Clause 7, shall be compacted to produce **either** a field dry density of at least 95% of the standard maximum laboratory dry density determined in accordance with Method 5.4.1 of AS 1289, **or alternatively**, a Hilf density ratio of at least 95% when tested in accordance with Method 5.7.1 of AS 1289.

Note for explanatory purposes: *This degree of compaction may generally be achieved by rolling each layer of material, placed at the correct moisture content, with at least eight (8) passes of a sheepsfoot roller of the configuration described in Clause 10 below. As a guide, compaction will generally be sufficient when there is a clearance of 100 mm between the drum of the roller and the compacted material.*

10. SHEEPSFOOT ROLLER

The following specifications describe a sheepsfoot roller which is suitable for fulfilling the compaction requirements described in Clause 9:

(i) The diameter of the drum(s) shall be not less than 1m.

(ii) The length of each drum(s) shall be approximately 1.2 times the drum diameter.

(iii) The feet shall extend approximately 175mm radially from the drum and be of the taper-foot type, with a cross-sectional area close to the outer end of not less than 3200mm^2 and not more than 4500mm^2.

(iv) The number of feet shall be such that their total area close to the outer ends shall be between 5% and approximately 8% of the area of the cylinder which would enclose all the feet, *i.e.* a cylinder having a diameter equal to the diameter of the drum plus twice the length of each foot.

(v) The weight of the roller ballasted, shall be such that the bearing pressure thus obtained shall be not less than 1750 kilopascals, in accordance with the following formula:

$$\text{Bearing Pressure (kPa)} = \frac{\text{Mass (kg)} \times 9.81 \times 1000}{\text{Area of contact of one row of feet (mm}^2\text{)}}$$

Rollers of other types and configurations may be used provided that the required compaction is achieved in accordance with Clause 9.

11. TEST FOR ADEQUATE COMPACTION

The administering authority may direct the licensee to arrange for compaction testing, in accordance with the methods referred to in Clause 9 of this specification, to be carried out on appropriate sections of the works area. Compaction testing is to be performed by suitably qualified and experienced personnel, employed by a soils laboratory accredited by the National Association of Testing Authorities (NATA) for the specified testing method.

Failure of the test results to comply with the compaction requirements described in Clause 9 will result in the licensee being prohibited from stocking the feedlot until appropriate remedial measures are implemented, as directed by the administering authority.

12. EXEMPTION FROM CLAY LINING REQUIREMENTS

The administering authority may exempt a licensee from the requirement to clay line cattle feedlot facilities if the licensee can submit certified test results confirming that the permeability of soils underlying nominated areas of the feedlot does not exceed 0.1 mm/day.

Permeability testing is to be carried in accordance with the methods specified in either Part 6 of BS 1377 (Triaxial Permeability) or Section F7.1 of AS 1289. The test results shall be submitted to the administering authority, following certification by a National Association of Testing Authorities (NATA) accredited soils laboratory.

13. FINAL TRIMMING

Following the completion of compaction, final trimming of all clay lined areas shall be carried out to produce a smooth, uniform surface, in accordance with the design gradients, levels and dimensions shown on the plans, as previously approved by the administering authority.

14. SYNTHETIC LINERS

A licensee may submit to the administering authority, alternate material and installation specifications relating to the use of synthetic lining materials, in lieu of clay lining. Approval of synthetic lining proposals will be subject to assessment by the administering authority.

15. INDEMNITY

The Department of Primary Industries and Officers of that Department shall not be responsible for any costs incurred by either the licensee or his/her contractor, in carrying out any works, as directed by the administering authority, for the purpose of rectifying design and/or construction faults or omissions.

Appendix G

Level 1 Odour Impact Assessment

Appendix H

Groundwater and Surface Water Licences

Murray Irrigation
Limited ABN 23 067 197 933

WATER ENTITLEMENTS CERTIFICATE

WARNING: This certificate contains information from the Company's Water Entitlements Register. This certificate does not create or evidence any proprietary interest at law or in equity.

Holder:	6004136
WEN:	MIL3382951320
Customer:	1004135
Edition:	3
Date:	10 May 2018

HOLDER

ANDREW JAMES JESSOP VARLEY
NICOLE ANDREA VARLEY

WATER ENTITLEMENTS

NUMBER:	273
CLASS:	Class C Water Supply
LANDHOLDING:	E438

ENCUMBRANCES

1. UNRECORDED INTERESTS AFFECTING THESE WATER ENTITLEMENTS MAY EXIST. A SEARCH OF LPI RECORDS, INCLUDING LAND TITLES OF LANDHOLDINGS HELD BY THE HOLDER (AND ASIC RECORDS FOR COMPANY CHARGES) IS RECOMMENDED. SEE NOTES.
2.

CONDITIONS

1. The Water Entitlements are derived from WAL 9426 held by the Company under the Water Management Act 2000 (NSW) and held subject to the provisions of an Entitlements Contract between the Holder and the Company.
2. Water Entitlements may be permanently transferred in accordance with the Policies of the Company and with the written consent of encumbrancees recorded on the Water Entitlements Register and on the title of any associated Landholding.

NOTES

1. Persons dealing with these Water Entitlements should first undertake a search of the Water Entitlements Register maintained by the Company in addition to other searches and obtain a copy of the Entitlements Contract currently in force from the Company Secretary.
2. The acceptance and recording by the Company of a Notice of Encumbrance is for the purpose of record only; it is not intended to create any legal or equitable proprietary rights in either party to the encumbrance nor to determine priority as between encumbrancees.

Verified correct as at the above date by:

Authorised Representative of Murray Irrigation Limited

Murray Irrigation

DELIVERY ENTITLEMENTS STATEMENT

Reference No.	9101816
WIN	MIL781113972
Landholding Number	E438
Customer No.	1004135
Certificate Edition No.	2
Page:	1 of 1
Date:	8 Jun 2018

Owners:

ANDREW JAMES JESSOP VARLEY
NICOLE ANDREA VARLEY

Delivery Entitlements

Date	Transaction Type	Transaction ID	Delivery Entitlements Acquired	Disposed	Holding Balance
21 Jun 2007	Movement due to issue	900001126	629		629
1 Jul 2009	Cancellation of Transmission Loss Component	900004742		106	523

ENCUMBRANCES

1. UNRECORDED INTERESTS AFFECTING THESE DELIVERY ENTITLEMENTS MAY EXIST. A SEARCH OF LPI RECORDS, INCLUDING LAND TITLES OF LANDHOLDINGS HELD BY THE HOLDER (AND ASIC RECORDS FOR COMPANY CHARGES) IS RECOMMENDED. SEE NOTES.
2.

NOTES

1. The acceptance and recording by the Company of a Notice of Encumbrance is for the purpose of record only; it is not intended to create any legal or equitable proprietary rights in either party to the encumbrance nor to determine priority as between encumbrancees.
2. Persons dealing with these Delivery Entitlements should first undertake a search of the Delivery Entitlements Register maintained by the Company in addition to other searches and obtain a copy of the Entitlements Contract currently in force from the Company Secretary.

Verified correct as at the above date by:

Authorised Representative of Murray Irrigation Limited

Murray Irrigation

SHARE STATEMENT

Shareholder Reference No:	4004136
Landholding Number:	L438
Customer No:	1004136
Edition:	1
Date:	8 Jun 2018

Members:

ANDREW JAMES JESSOP VARLEY
NICOLE ANDREA VARLEY

Ordinary Fully Paid

Date	Transaction Type	Transaction ID	Shares Acquired	Shares Disposed	Holding Balance
25 Oct 2001	Change in landholding particulars	510008777	629		629

Verified correct as at the above date by:

Authorised Representative of Murray Irrigation Limited

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: WAL30535

SEARCH DATE	TIME	EDITION NO	DATE
4/5/2023	4:15 PM	2	16/10/2017

WARNING NOTE: INFORMATION ON THIS REGISTER IS NOT GUARANTEED

TENURE TYPE: CONTINUING

HOLDER(S)

ANDREW JAMES JESSOP VARLEY
NICHOLE ANDREA VARLEY
AS TENANTS IN COMMON IN EQUAL SHARES (DW AG902079)

ENCUMBRANCES (2 ENCUMBRANCES)

1 TERM TRANSFER: NIL
2 AM804129 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

UNREGISTERED DEALINGS: NIL

ACCESS LICENCE DETAILS

CATEGORY: AQUIFER

SHARE COMPONENT:
SHARE - 400 UNITS
WATER SOURCE - LOWER MURRAY SHALLOW GROUNDWATER SOURCE
WATER SHARING PLAN - MURRAY ALLUVIAL GROUNDWATER SOURCES 2020

EXTRACTION COMPONENT:
TIMES/RATES/CIRCUMSTANCES - SUBJECT TO THE CONDITIONS OF THE WATER ACCESS LICENCE
EXTRACTION FROM - AQUIFER
EXTRACTION ZONE - LOWER MURRAY SHALLOW (EASTERN) MANAGEMENT ZONE

NOMINATED WORKS:
WORK APPROVAL NUMBER(S) - 50CA511670
INTERSTATE TAGGING ZONE - NIL

CONDITIONS

LICENCE CONDITIONS FORM A PART OF THIS LICENCE AND AFFECT THE SHARE AND EXTRACTION COMPONENTS. CONDITION STATEMENTS ARE AVAILABLE FROM

END OF PAGE 1 - CONTINUED OVER

CONDITIONS (CONTINUED)

WATERNSW

NOTES

A WATER LICENCE INFORMATION SHEET IS AVAILABLE FROM THE WATERNSW WEBSITE WWW.WATERNSW.COM.AU AND SHOULD BE REFERRED TO IN INTERPRETING THIS LICENCE.
WATERNSW PHONE 1300 662 077, EMAIL CUSTOMER.HELPDESK@WATERNSW.COM.AU
LICENCE REFERENCE NUMBER: 50AL511669
PREVIOUS WATER ACT LICENCE NUMBER(S): 50PT940893, 50BL199275, 50BL199276.

*** END OF SEARCH ***

PRINTED ON 4/5/2023

Appendix I

Groundwater Bore Report

WaterNSW
Work Summary
GW501806

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): TEST BORE, IRRIGATION

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 24/12/2002
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: LLOYD ANGOVE DRILLING
Driller: Lloyd John Angove
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m): 3.100
Salinity Description:
Yield (L/s): 8.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	TOWNSEND	YALGADOORI	130 756353
Licensed:			

Region: 50 - Murray
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6053244.000
Easting: 359046.000
Latitude: 35°39'16.6"S
Longitude: 145°26'34.4"E

GS Map: -
MGA Zone: 55
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	150			Rotary - Water
1	1	Casing	Pvc Class 9	0.00	8.00	90	72		Glued
1	1	Opening	Slots - Diagonal,Screen	8.00	9.00	90		0	PVC Class 9, SL: 50.0mm
1	1	Opening	Slots - Diagonal,Screen	8.00	9.00	90		0	PVC Class 9, Glued, A: 1.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	9.00	6.00	Unknown	3.10	4.70	8.00		03:00:00	489.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	red sandy loam	Invalid Code	
0.50	1.50	1.00	red sandy clay	Invalid Code	
1.50	3.00	1.50	red brown sandy clay	Invalid Code	
3.00	4.50	1.50	yellow brown fine sand	Invalid Code	
4.50	7.00	2.50	white coarse sand	Invalid Code	
7.00	9.00	2.00	white coarse sand and gravel	Invalid Code	

***** End of GW501806 *****

WaterNSW
Work Summary
GW503502

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): IRRIGATION

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary - Water
Owner Type: Private

Commenced Date: **Final Depth:** 7.00 m
Completion Date: 08/11/2007 **Drilled Depth:** 7.00 m

Contractor Name: LLOYD ANGOVE DRILLING
Driller: Lloyd John Angove
Assistant Driller: Bill Judd

Property: **Standing Water Level (m):** 3.000
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):** 6.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	TOWNSEND	YALGADOORI	130/756353
Licensed:			

Region: 50 - Murray **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6053112.000 **Latitude:** 35°39'21.0"S
Elevation Source: Unknown **Easting:** 359339.000 **Longitude:** 145°26'46.0"E

GS Map: - **MGA Zone:** 55 **Coordinate Source:** Unknown

Construction
Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.00	150			Rotary - Water
1	1	Casing	Pvc Class 9	0.00	6.00	90	72		Seated on Bottom, Glued
1	1	Opening	Slots - Diagonal	6.00	7.00	90		0	Casing - Hand Sawn Slot, PVC Class 9, Glued, SL: 50.0mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	7.00	4.00	Unknown	3.00	5.50	6.00		02:30:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	red sandy loam	Loam	
0.50	1.50	1.00	red sandy clay	Invalid Code	
1.50	3.00	1.50	red brown sandy clay	Invalid Code	
3.00	5.00	2.00	yellow brown fine sand	Sand	
5.00	7.00	2.00	white coarse sand	Sand	

Remarks

08/11/2007: Form A Remarks:
Entered by H. Lester

***** End of GW503502 *****

WaterNSW
Work Summary
GW503638

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary - Water
Owner Type: Private

Commenced Date: **Final Depth:** 7.00 m
Completion Date: 21/04/2005 **Drilled Depth:** 7.00 m

Contractor Name: LLOYD ANGOVE DRILLING
Driller: Lloyd John Angove
Assistant Driller: Rhys Johnson

Property: **Standing Water Level (m):** 4.000
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	TOWNSEND	YALGADOORI	130//756353
Licensed:			

Region: 50 - Murray **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6053513.000 **Latitude:** 35°39'07.9"S
Elevation Source: Unknown **Easting:** 359230.000 **Longitude:** 145°26'41.9"E

GS Map: - **MGA Zone:** 55 **Coordinate Source:** Unknown

Construction
Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.00	100			Rotary - Water
1	1	Casing	Pvc Class 12	0.00	6.00	60	36		Seated on Bottom, Glued
1	1	Opening	Slots - Diagonal	6.00	7.00	60		0	Casing - Machine Slotted, PVC Class 12, Glued, SL: 50.0mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	7.00	1.00	Unknown	4.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	6.00	6.00	clay grey brown	Clay Loam	
6.00	7.00	1.00	sandy clay grey brown	Sandy Clay Loam	

Remarks

21/04/2005: Form A Remarks:
No other details were provided.
Entered by H. Lester

***** End of GW503638 *****

WaterNSW
Work Summary
GW503710

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): STOCK, INDUSTRIAL, DOMESTIC, IRRIGATION

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary - Water
Owner Type: Private

Commenced Date: **Final Depth:** 9.00 m
Completion Date: 24/12/2002 **Drilled Depth:** 9.00 m

Contractor Name: LLOYD ANGOVE DRILLING
Driller: Lloyd John Angove
Assistant Driller: Jack Gray

Property: **Standing Water Level (m):** 3.100
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):** 8.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	TOWNSEND	YALGADOORI	130//756353
Licensed:			

Region: 50 - Murray **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6053230.000 **Latitude:** 35°39'17.0"S
Elevation Source: Unknown **Easting:** 359052.000 **Longitude:** 145°26'34.6"E

GS Map: - **MGA Zone:** 55 **Coordinate Source:** Unknown

Construction
Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	150			Rotary - Water
1	1	Casing	Pvc Class 9	0.00	8.00	90	72		Seated on Bottom, Glued
1	1	Opening	Slots - Diagonal	8.00	9.00	90		0	Casing - Hand Sawn Slot, PVC Class 9, Glued, SL: 50.0mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	9.00	6.00	Unknown	3.10	4.70	8.00		03:00:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	sandy loam red	Sandy Clay	
0.50	1.50	1.00	sandy clay red	Sandy Clay Loam	
1.50	3.00	1.50	sandy clay red brown	Sandy Clay Loam	
3.00	4.50	1.50	sand fine yellow brown	Sand Grains (Lithic)	
4.50	7.00	2.50	sand coarse white	Sand Grains (Lithic)	
7.00	9.00	2.00	sand coarse white and gravel	Sand Grains (Lithic)	

Remarks

24/12/2002: Form A Remarks:
Entered by H. Lester

***** End of GW503710 *****

WaterNSW
Work Summary
GW505116

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): STOCK

Work Type: Bore
Work Status:
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 09/07/1998
Final Depth: 20.00 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	TOWNSEND	YALGADOORI	130//756353
Licensed:			

Region: 50 - Murray
River Basin: 409 - MURRAY RIVERINA
Area/District:
CMA Map: 7926-N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6053006.000
Easting: 359002.000
Latitude: 35°39'24.3"S
Longitude: 145°26'32.5"E

GS Map: -
MGA Zone: 55
Coordinate Source: GIS - Geogra

Remarks

09/07/1998: Form A Remarks:
Entered by Clare Hillier
Guestimation of final depth at 20m as no depth provided
Signature of licensee date used as completion date as no date provided

***** End of GW505116 *****

WaterNSW
Work Summary
GW505453

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary Mud
Owner Type: Private

Commenced Date:
Completion Date: 09/08/1995
Final Depth: 43.50 m
Drilled Depth: 43.00 m

Contractor Name: STRATHMERTON DRILLING PTY LTD
Driller: Brian Ernest Madgwick
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m): 7.800
Salinity Description:
Yield (L/s): 3.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	TOWNSEND	YALGADOORI	129//756353
Licensed:			

Region: 50 - Murray
River Basin: 409 - MURRAY RIVERINA
Area/District:
CMA Map: 7926-N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6053800.000
Easting: 357998.000
Latitude: 35°38'58.0"S
Longitude: 145°25'53.1"E

GS Map: -
MGA Zone: 55
Coordinate Source: Map Interpre

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	37.50	190			Rotary Mud
1		Hole	Hole	37.50	43.50	114			Rotary Mud
1	1	Casing	P.V.C.	-0.10	37.50	125			Suspended in Clamps, Glued
1	1	Casing	P.V.C.	35.00	40.00	80			Suspended in Clamps, Glued
1	1	Opening	Screen	40.00	43.00	80		0	K-Packer, A: 1.00mm
1	1	Casing	P.V.C.	43.00	43.50	80			Seated on Bottom, Glued

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
40.00	43.00	3.00	Unknown	7.80		3.00		02:00:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	Clay, hard brown	Clay	
1.00	5.00	4.00	Clay,, hard brown grey	Clay	
5.00	8.00	3.00	Clay, hard brown	Clay	
8.00	11.00	3.00	Clayed sand, brown	Clayey Gravel	
11.00	18.00	7.00	Clay, hard brown grey	Clay	
18.00	20.00	2.00	Clay, grey	Clay	
20.00	21.00	1.00	Clay, brown	Clay	
21.00	25.00	4.00	Clay, soft brown grey	Clay	
25.00	40.00	15.00	Clay, hard brown grey	Clay	
40.00	43.00	3.00	Sand, brown	Sand	

Remarks

09/08/1995: Form A Remarks:
Entered by Clare Hillier

***** End of GW505453 *****

Appendix J

Biodiversity Assessment

Appendix K

Aboriginal Due Diligence Report

Appendix L

Soil Test Pit Analysis Results

BOWLER GEOTECHNICAL

BENDIGO & MELBOURNE

Geotechnical Engineering Consultants
Soils Laboratory Services
Environmental Consultants
ABN 93 083 629 001

BENDIGO
229 Woodward Road
GOLDEN SQUARE Vic 3555
Phone: (03) 5444 4810
Fax: (03) 5444 4812

MELBOURNE
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TULLAMARINE Vic 3043
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Email: bowler@smartchat.net.au
Website: www.bowlergeotechnical.com.au

Also at: Hillcrest • Gold Coast • Geebung • Sunshine Coast • Gladstone • Rockhampton • Mackay • Townsville • Cairns • Mount Isa • Sydney • Associated Offices in Adelaide, Perth, Vietnam and Papua New Guinea

Ref.: 2634

19 May 2005

Mr Andrew Varley
Arkoona
RMB 3095
FINLEY NSW 2713

Dear Andrew,

Re: Feedlot Development

As requested, we have carried out compaction testing on clay fill material on 20 April 05.

Please find the test results recorded on the attached documentation as follows :

Item - 3 compaction tests
Reports 2634/001 to 2634/003.

See invoice No. 2580 for details.

The attached final reports supersede any reports previously issued.

Should you have any queries or require any additional information, please do not hesitate to contact Bob Harris at this office.

Yours faithfully

R C HARRIS Assoc. Dip. Civil Eng.
MANAGER

BOWLER GEOTECHNICAL
BENDIGO
Geotechnical Engineering Consultants
Soils Laboratory
Environmental Consultants

229 Woodward Road
Golden Square Vic 3555
Office: Ph (03) 5444 4810 Fax: (03) 5444 4812
Email: bowlerb@bigpond.net.au
J&D Civil Testing Pty Ltd trading as Bowler Geotechnical Bendigo
ABN: 93 083 629 001

Hilf Compaction Assessment Test Report Nuclear Gauge Method AS1289.5.8.1

CLIENT: AJ & NA Varley
ADDRESS: 'Arkoona'
RMB 3095
Finley NSW 2713
PROJECT: 'Feedlot' Lot 130 Brains Rd Finley

JOB No.: 2634
REPORT No: 2634/001

* Denotes Information Supplied by Client

FIELD TEST No.	1	2	3			
SAMPLE No.	28676	28677	28678			
* *SPECIFICATION*	95%	95%	95%			
* *Compaction Effort*	Standard	Standard	Standard			
TEST REQUEST NUMBER	1	1	1			
MATERIAL DESCRIPTION	Existing	Existing	Existing			
* *ROAD/ALLOTMENT No.*	Pen Floor	Drain	Effluent Pond			
LOCATION/CHAINAGE (m)						
OFFSET (m)	12m West	0.25 Nth	2.0 West			
LEVEL OF TEST (m)	FSL	FSL	FSL			
TEST DEPTH (mm)	175	175	175			
OVERSIZE SIEVE SIZE (mm)	19.0	19.0	19.0			
PERCENTAGE OVERSIZE WET (%)	0	0	0			
FIELD WET DENSITY ((t/m3)	2.00	1.93	1.97			
FIELD MOISTURE CONTENT (%)	18.4	17.7	18.1			
OPTIMUM MOISTURE CONTENT (%)	18.7	18.0	18.4			
MOISTURE RATIO (%)	98.0	98.0	98.0			
COMPACTION SAMPLE No.	28676	28677	28678			
PEAK CONVERTED WET DENSITY (t/m3)	2.02	2.03	2.03			
MOISTURE VARIATION (%)	0.5	0.5	0.5			
DRYER OR WETTER THAN THE OMC	Dryer	Dryer	Dryer			
HILF DENSITY RATIO:	99.0	95.0	97.0			

TESTED BY: J.Barton *DATE:* 20/04/05 *TIME:* 13.00
APPROVED BY: P.Stirling *DATE:* 26/04/05
TEST PROCEDURES:
AS 1289.5.7.1 Hilf Density Ratio and Hilf Moisture Variation

NATA Accredited Laboratory No: 13746

Variation to test method: N/a

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

Form BBG13 Rev 2, 22/08/2003

APPROVED BY: .....
Approved Signatory

BOWLER GEOTECHNICAL
BENDIGO
Geotechnical Engineering Consultants
Soils Laboratory
Environmental Consultants

229 Woodward Road Golden Square
Bendigo Vic 3555
Office: Ph (03) 5444 4810 Fax: (03) 5444 4812
Email: bowlerb@bigpond.net.au
J&D Civil Testing Pty Ltd trading as Bowler Geotechnical Bendigo
ABN: 93 083 629 001

SOIL QUALITY REPORT

Client: AJ & NA Varley
Address: 'Arkoona'
RMB 3095
Finley NSW 2713
Project: 'Feedlot' Lot 130 Brains Rd - Finley

Job No. 2634
Report No. 2634/003
Test Request No. 1
Sample No. 28679

Client Reference: 'Feedlot' Lot 130 Brains Rd - Finley
Sample Source: Existing
Sampling Location: Effluent Pond 2.0m West
Depth of Sample: 0.175m *Nomin. Size:* *Specification:*
Sample Description: Silty Clay of high plasticity, trace of fine grained sand

Lot No.
Sampling Method: AS 1289.1.2.1
Clause: 6.4(b)
Date Sampled: 20/04/05

ATTERBERG LIMITS & LINEAR SHRINKAGE

SAMPLE HISTORY: Oven Dried(45-50Deg.C)
Test Methods:

Liquid Limit: AS1289.3.1.2
Plasticity Index: AS1289.3.3.2
Plastic Limit: AS1289.3.2.1
Linear Shrinkage: AS1289.3.4.1
Moisture Content: AS1289.2.1.1

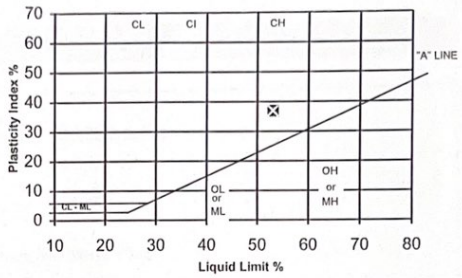
RESULTS

LIQUID LIMIT:	53 %
PLASTIC LIMIT:	16 %
PLASTICITY INDEX:	37 %
LINEAR SHRINKAGE:	15 %
PI X 0.425mm SIEVE:	3611

High Plasticity

Linear Shrinkage Remarks: Some Curling Occurred

Plasticity Chart - AS1726 1993 ⊠Sample Plot



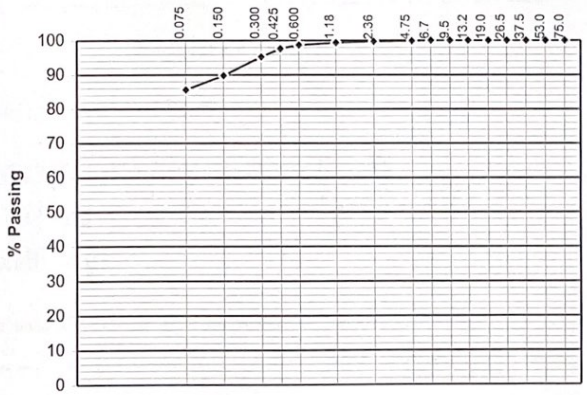
PARTICLE SIZE DISTRIBUTION

SAMPLE HISTORY: Oven Dried(105-110Deg.C)
Test Method: AS1289.3.6.1

Grading Envelope

SIEVE SIZE (mm)	Lower Limits	% PASSING (by mass)	Upper Limits
75.0		100	
53.0		100	
37.5		100	
26.5		100	
19.0		100	
13.2		100	
9.5		100	
6.7		100	
4.75		100	
2.36		100	
1.18		99	
0.600		99	
0.425		98	
0.300		95	
0.150		90	
0.075		86	

AUSTRALIAN STANDARD SIEVE APERTURES (mm)



0 % Gravel 14 % Sand 86 % Silt/Clay

EMERSON CLASS NUMBER

Test Method: AS1289.3.8.1

EMERSON CLASS NUMBER: **2**

Some Dispersion, after air dried

TYPE OF WATER: DISTILLED
TEMP. OF WATER: 17 °C

Natural moisture content of sample (%) :

Form BB034 Rev 1, 11/01/05

Tested By: T.Hocking
Approved By: P.Stirling

Date Tested: 03/05/04
Issued: 06/05/04

Accreditation No: 13746
This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its scope of accreditation.

APPROVED BY: .....
Approved Signatory

Remarks.

BOWLER GEOTECHNICAL
BENDIGO
Geotechnical Engineering Consultants
Soils Laboratory
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Email: bowlerb@bigpond.net.au
J&D Civil Testing Pty Ltd trading as Bowler Geotechnical Bendigo
ABN: 93 083 629 001

CO-EFFICIENT OF PERMEABILITY REPORT

Client: AJ & NA Varley
Address: 'Arkoona'
RMB 3095
Finley NSW 2713
Project: 'Feedlot' Lot 130 Brains Rd - Finley

Job No. 2634
Report No. 2634/002
Test Request No. 1
Sample No. 28679

Client Reference: 'Feedlot' Lot 130 Brains Rd - Finley
Sample Source: Existing
Sampling Location: Effluent Pond 2.0m West
Depth of Sample: 0.175m Nomin. Size: Specification:
Sample Description:

Lot No.
Sampling Method: AS 1289.1.2.1
Clause: 6.4(b)
Date Sampled: 20/04/05

TEST METHOD: Falling Head Method: AS1289.6.7.2

Compaction Method: Standard Compaction: AS1289.5.1.1

Percent Retained on 19mm Sieve: 0 %

Maximum Dry Density:	1.70 t/m^3	Optium Moisture Content:	19.5 %
Dry Density of Sample:	1.64 t/m^3	Moisture at Compaction:	19.8 %
Achieved Dry Density Ratio	**96.5 %**	**Achieved Moisture Ratio**	**100.5 %**

Surcharge Mass: 5.5 kg Surcharge Pressure: 3 kPa

Percent Moisture After Permeability: 23.4 %

COEFFICIENT OF PERMEABILITY (Falling Head)

$7x10^{-10}$ m/s

($7x10^{-8}$ cm/s)

This result is outside the range specified by the test method and should be considered impermeable by this method.

Tested By:	Approved By:
P.Stirling	T.Slingsby
Date Tested:	Isssued:
03/05/05	06/05/05

NATA Accredited Laboratory No: 13746

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

APPROVED BY: .....
Approved Signatory

Remarks:

Appendix M

Liquid Waste Utilisation Assessment

Appendix N

Preliminary Risk Screening

Development Application and Environmental Impact Statement

Expansion of Beef Cattle Feedlot from 999 head to 3,200 head

SEPP (Resilience and Hazards) 2021 Preliminary Risk Screening Assessment

"High Claire"
58 Broughans Road
Pinelodge NSW 2714

AJ & NA Varley
"Arkoona"
RMB 3095 Lower Finley Road
FINLEY NSW 2713

[November 2024]

RDC ENGINEERS
AGRICULTURAL
ENVIRONMENTAL
PROJECT MANAGEMENT

PO Box 1223
TOOWOOMBA QLD 4350

rdcengineers.com.au

DOCUMENT INFORMATION RECORD

Project details

Client name:	AJ & NA Varley (ABN 88 390 323 468)
Project:	Proposed expansion of High Claire Feedlot
Project No:	F3-107

Document control

Document title:	Development Application and Environmental Impact Statement – Expansion of Beef Cattle Feedlot from 999 head to 3,200 head - SEPP (Resilience and Hazards) 2021 Preliminary Risk Screening Assessment		
File name:	F3-107 ANV HCFL PRS V1R2.docx		
Revision:	V1R2		
Author:	Rod Davis	**Position:**	Director
Signature:	R.J. Davis	**Date:**	07/11/2024
Reviewed by:	Rod Davis	**Position:**	Director
Signature:	R.J. Davis	**Date:**	07/11/2024
Approved by:	Rod Davis	**Position:**	Director
Signature:	R.J. Davis	**Date:**	07/11/2024

Revision history

Version	Issue date	Reason for issue	Author	Reviewed by	Approved by
V1R1	31/08/2024	Draft for client review	Rod Davis	Rod Davis	Rod Davis
V1R2	07/11/2024	Final for lodgement to ERC	Rod Davis	Rod Davis	Rod Davis

Distribution

Version	Recipient	Lodgement	Copies
V1R1	AJ & NA Varley	Electronic	-
V1R2	AJ & NA Varley / Edward River Council (ERC)	Electronic	-

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RDC Engineers Pty Ltd, 2024, Development Application and Environmental Impact Statement – Expansion of Beef Cattle Feedlot from 999 head to 3,200 head - SEPP (Resilience and Hazards) 2021 Preliminary Risk Screening Assessment, F3-107D/V1R2 RDC Engineers Pty Ltd, Toowoomba, QLD, 4350.

Table of Contents

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Executive Summary

AJ & NA Varley own and operate a mixed farming operation across several properties at Pinelodge including "High Claire", "Arkoona", "Sunnyside", "Killara Rise", Langunyah" and "Glen Cluan" some 17 km by road west of Finley and 49 km by road east-southeast of Deniliquin in Riverina region of NSW.

AJ & NA Varley primarily engage in dryland and irrigated cropping, beef, sheep and wool production. Central to the beef production enterprise is the breeding, growing and lot feeding of cattle for the domestic market. Currently the beef supply chain includes breeding and growing of beef cattle and lot feeding of cattle within a feedlot on the property "High Claire".

"High Claire" comprises some 195.19 ha (~482.12 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with lot feeding of beef cattle and sheep.

There has been a beef cattle feedlot on "High Claire" for over twenty years after approval was granted for a 999 head feedlot by the former Conargo Shire (now Edward River Council) in 2004 (DA 293). Co-located with the beef cattle feedlot is a 4,000 head sheep feedlot which was granted approval in 2006 by the former Conargo Shire (now Edward River Council) in 2004 (DA 352).

AJ & NA Varley wish to expand the existing beef cattle feedlot from the current approved capacity of 999 head by gaining development approval for intensive livestock agriculture to operate as a 3,200 head beef cattle feedlot on the site. The proposal also involves the ceasation of lot feeding of lambs with the existing infrastructure repurposed for the lot feeding of cattle.

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The increase in the number of head in the development shall be gained by reducing the stocking density from 22 m^2/head to 10.1 m^2/head and utilising the pens currently used for lot feeding of lambs as cattle pens.

Existing infrastructure such as the grain storage and processing and cattle handling facilities have sufficient capacity to cater for the demands of the proposed development.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the property. The proposed development does not propose to reconfigure the existing waste utilisation areas.

The existing development has been designed and constructed according to recommended methods outlined in the relevant state guidelines at the time of construction in the early 2004. These included the NSW Feedlot Manual (NSW Agriculture, 1997) and the Reference Manual for the Establishment and Operation of Cattle Feedlots in Queensland (Skerman, 2000) and National Guidelines for Beef Cattle Feedlots in Australia 2nd Edition (SCARM, 1997).

Beef cattle feedlots which exceed 1,000 head capacity are defined as designated development under Schedule 3 (Part 1 section 21a) of the Environmental Planning and Assessment

Regulation 2000 and therefore require a full Environmental Impact Statement (EIS) to accompany the development application.

Pursuant to State Environmental Planning Policy (Resilience and Hazards) 2021 it has been identified that consideration should be made as to whether the proposed development is considered a 'hazardous or potentially hazardous industry'.

A development is considered potentially hazardous and requires a Preliminary Hazard Analysis (PHA) if the storage or transport of dangerous goods exceeds screening thresholds specified in SEPP (Resilience and Hazards) 2021.

This report forms part of the EIS prepared to support the Development Application to the Edward River Shire Council for the proposed development. A preliminary risk screening method set out in *Hazardous and Offensive Development Application Guidelines, Applying SEPP 3*3 (Department of Planning, 2011) has been undertaken to assess the possible off-site effects or consequences from hazardous materials present on site, taking into account locational characteristics.

Various hazardous materials, such as diesel fuel shall be stored on the proposed development site during operation. The preliminary risk screening assessment demonstrates that the quantity and distance from site boundaries is less than the screening threshold, and no further analysis is necessary. Hence, the proposed development is not a 'hazardous or potentially hazardous industry'.

1 Introduction

AJ & NA Varley own and operate a mixed farming operation across several properties at Pinelodge including "High Claire", "Arkoona", "Sunnyside", "Killara Rise", Langunyah" and "Glen Cluan" some 17 km by road west of Finley and 49 km by road east-southeast of Deniliquin in Riverina region of NSW.

AJ & NA Varley primarily engage in dryland and irrigated cropping, beef, sheep and wool production. AJ & NA Varley produce wheat, barley in winter and sorghum and maize in summer under irrigation and dryland farming systems.

Central to the beef production enterprise is the breeding, growing and lot feeding of cattle for the domestic market. Currently the beef supply chain includes breeding and growing of beef cattle and lot feeding of cattle within a feedlot on the property "High Claire".

"High Claire" comprises some 195.19 ha (~482.12 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with lot feeding of beef cattle and sheep.

There has been a beef cattle feedlot on "High Claire" for over twenty years after approval was granted for a 999 head feedlot by the former Conargo Shire (now Edward River Council) in 2004 (DA 293). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing beef cattle development does not exceed 1000 head it is not a designated development and an environmental licence from NSW EPA is not required.

Co-located with the beef cattle feedlot is a 4,000 head sheep feedlot which was granted approval in 2006 by the former Conargo Shire (now Edward River Council) in 2004 (DA 352). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing sheep development does not exceed 4000 head it is not a designated development and an environmental licence from NSW EPA is not required.

The existing beef cattle feedlot is known as High Claire. High Claire is used to finish AJ & NA Varley's own cattle for the domestic and export market along with custom feeding. The beef cattle feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

The beef cattle feedlot currently operates for 12 months of the year and employs approximately 2 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

AJ & NA Varley wish to expand the existing beef cattle feedlot from the current approved capacity of 999 head by gaining development approval for intensive livestock agriculture to operate as a 3,200 head beef cattle feedlot on the site. The proposal also involves the ceasation of lot-feeding of lambs with the existing infrastructure repurposed for the lot feeding of cattle. The proposed development is not proposed to be staged.

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure.

The increase in the number of head in the development shall be gained by reducing the stocking density from 22 m^2/head to 10.1 m^2/head and utilising the pens currently used for lot-feeding lambs as cattle pens.

The proposed development shall comprise one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Existing infrastructure such as the grain storage and processing and cattle handling facilities have sufficient capacity to cater for the demands of the proposed development.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the property. The proposed development does not propose to reconfigure the existing waste utilisation areas.

The property "High Claire" is within the Edward River Shire Council local government area and relevant environmental planning instrument is the Conargo Local Environmental Plan 2013 (CLEP).

AJ & NA Varley have access to a secure and appropriately licensed supply of groundwater for 400 shares under the Lower Murray Shallow Groundwater Source for irrigation use on the subject land under water access licence 30535 (Works Approval 50CA511670).

The existing development has been designed and constructed according to recommended methods outlined in the relevant state guidelines at the time of construction in the early 2004. These included the NSW Feedlot Manual (NSW Agriculture, 1997) and the Reference Manual for the Establishment and Operation of Cattle Feedlots in Queensland (Skerman, 2000) and National Guidelines for Beef Cattle Feedlots in Australia 2nd Edition (SCARM, 1997).

Beef cattle feedlots which exceed 1,000 head capacity are defined as designated development under Schedule 3 (Part 1 section 21a) of the Environmental Planning and Assessment Regulation 2000 and therefore require a full Environmental Impact Statement (EIS) to accompany the development application.

This report forms part of the EIS prepared to support the Development Application to the Edward River Council for the proposed development. It provides a preliminary risk screening assessment to ensure that Council has sufficient information to assess whether the development is hazardous or offensive and to ensure that any measures proposed to be employed to reduce the impact of the development are taken into account.

2 Objectives

AJ & NA Varley wish to expand High Claire Feedlot from the current approved capacity of 999 head by gaining development approval for intensive livestock agriculture to operate as a 3,200 head beef cattle feedlot on the site.

The proposed development is categorised as Intensive livestock agriculture under the Conargo Local Environment Plan 2013.

Beef cattle feedlots which exceed 1,000 head capacity are defined as designated development under Schedule 3 (Part 1 section 21a) of the Environmental Planning and Assessment Regulation 2000 and therefore require a full Environmental Impact Statement (EIS) to accompany the development application. Consequently, the development application is required to be accompanied by an EIS.

Assessment of the impacts of the proposed development include consideration of State Environmental Planning Policies (SEPPs) which deal with matters of state or regional environmental planning significance. Various SEPPs are of relevance to the proposed development and are outlined in the EIS.

State Environmental Planning Policy (Resilience and Hazards) 2021 aims to amend the definitions of hazardous and offensive industries where used in environmental planning instruments and to ensure that the consent authority has sufficient information to assess whether the development is hazardous or offensive and to ensure that any measures proposed to be employed to reduce the impact of the development are taken into account.

It has been identified that consideration should be made as to whether the proposed development is considered a hazardous or potentially hazardous industry under State Environmental Planning Policy (Resilience and Hazards) 2021.

In accordance with the risk screening method provided by the Department of Planning (DoP) document "*Applying SEPP 33 Hazardous and Offensive Development Application Guidelines*" (Department of Planning, 2011), this report presents the details of the determination as to the classification of the proposed development under State Environmental Planning Policy (Resilience and Hazards) 2021.

Industries or projects determined to be hazardous or potentially hazardous would require the preparation of a Preliminary Hazard Analysis (PHA) in accordance with Clause 12 of SEPP 33. No further assessment under State Environmental Planning Policy (Resilience and Hazards) 2021 is required for projects not considered potentially hazardous following a State Environmental Planning Policy (Resilience and Hazards) 2021 Risk Assessment.

3 Proposed development

AJ & NA Varley wish to expand the existing beef cattle feedlot on the property "High Claire" from the currently approved capacity of 999 head to 3,200 head.

The proposed development comprises a permanent pen area with adjoining feed alley in which the beef cattle are housed in the open air and provided with their daily feed and water requirements. The pen area shall incorporate water, feeding and shade infrastructure.

There are two components of the proposed development being the infrastructure and waste utilisation area.

The infrastructure of the proposed development includes:

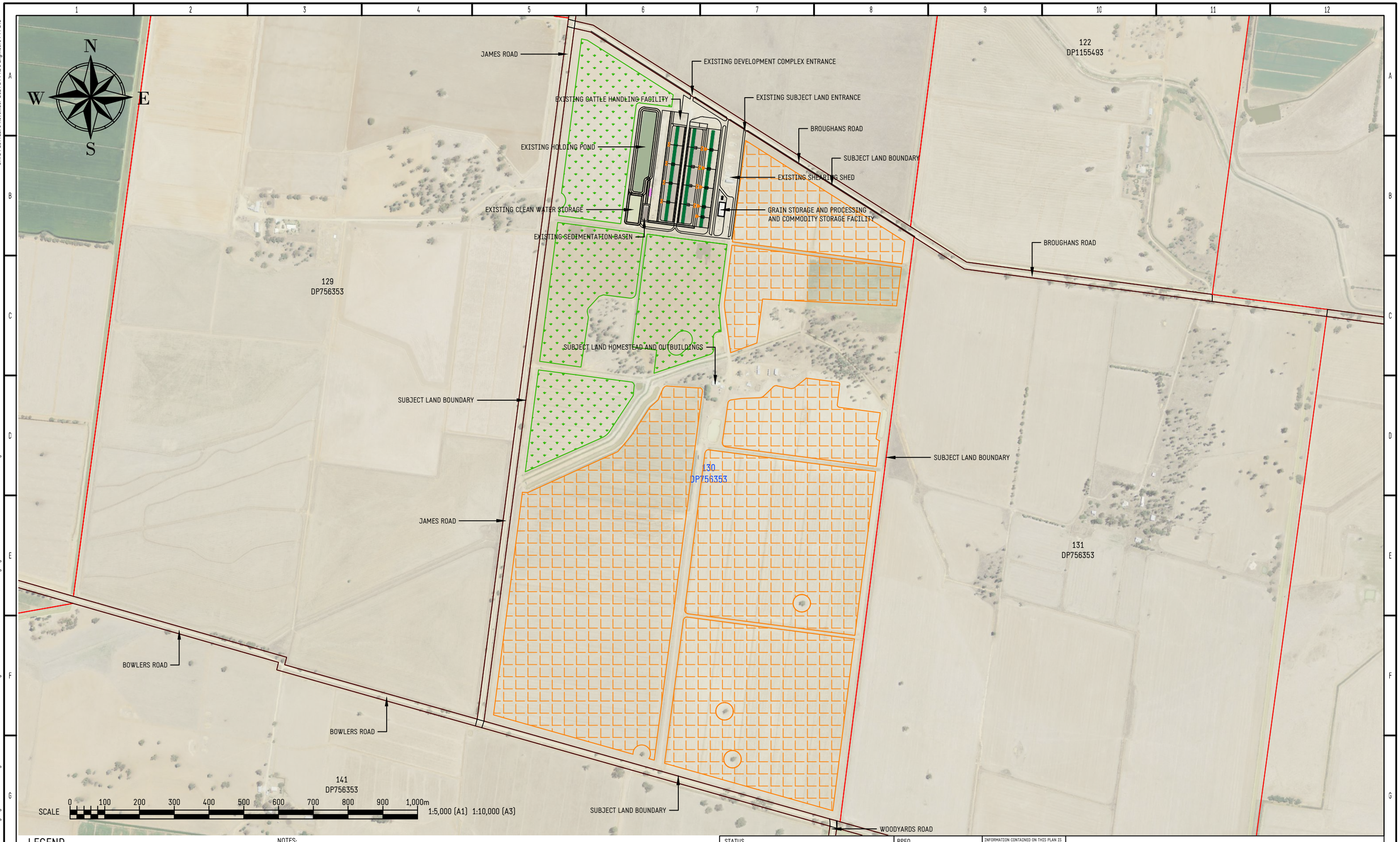
- Production pens for beef cattle;
- Drainage system incorporating catch drains, sedimentation basin and holding pond;
- A cattle handling facility with receival/dispatch infrastructure;
- Internal roadways connecting the subject land access to the cattle handling and commodity storage facilities;

The waste utilisation area includes:

- Effluent and solid waste (manure) utilisation areas. When available, effluent shall be applied to crops land via irrigation and solid waste applied to cropping land within the dedicated utilisation areas.

The layout of the proposed development is shown in Figure 1.

The proposed development shall be managed as a Class One feedlot. A Class One feedlot has highest standard of design, operation, maintenance, pad management and cleaning frequency and is defined in the National Guidelines for Beef Cattle Feedlots in Australia (MLA, 2012).



LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA

NOTES:

1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2023, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
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STATUS
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

RPEQ

REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:10,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

RDC ENGINEERS | AGRICULTURAL ENVIRONMENTAL PROJECT MANAGEMENT
ABN 37 627 163 071
PO BOX 1223
TOOWOOMBA QLD 4350
M: 0427 629 203
E: info@rdcengineers.com.au

CLIENT: AJ & NA VARLEY
PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT
TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
EIS APPENDIX N - PRELIMINARY RISK SCREENING
PROPOSED DEVELOPMENT - DEVELOPMENT LAYOUT

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 1		A3	F3-107-6000-01	B

4 Hazardous materials

Hazardous materials are defined within Department of Planning (2011) as substances falling within the classification of the Australian Code for Transportation of Dangerous Goods by Road and Rail (Dangerous Goods Code). Based on this definition and the classifications in Appendix 7 of Department of Planning (2011), the hazardous materials to be stored on the proposed development site, quantities and storage location and mode are summarised in Table 1 for the operational phase of the proposed development.

4.1 Construction

The proposed development shall utilise existing built infrastructure as shown in Figure 1.

No infrastructure shall be developed as part of the proposed development and therefore there are no earthworks, roads, buildings or structures to be constructed.

Consequently there are no construction activities per se.

4.2 Operation

Table 1 – Hazardous materials storage during operation phase

Hazardous Material	Classification	Description	Storage quantity	Storage location	Storage mode
Diesel Fuel	Class 3 C1	Combustible liquids: flashpoint above 61°C but not exceeding 150°C	5,000L (4.43t)*	Development complex	Above-ground tank
Lubricating oils and greases	Class 3 C2	Combustible liquids flashpoint above 150°C	205L (~0.187t)**	Development complex	Above-ground portable 205L drums

*Based on a specific gravity of 0.885 t/m^3 for diesel; **Based on a specific gravity of 0.910 t/m^3 for lubricating oils/greases.

** Combustible Liquid Class C1, treated as Class 3 PG II for assessment purposes, as it is stored together with petrol (within the fuel tank of a truck).

4.3 Hazardous materials transport

Table 2 shows the average number of annual and weekly road movements of hazardous material to and from the proposed development, and the typical quantity in each load during operation. As outlined in section 4.1, there is no infrastructure to be constructed and therefore no construction phase.

Table 2 – Hazardous materials transport during operation phase

Hazardous material	No of loads per annum	Load size	Vehicle type
Diesel fuel	26	5 kL	Medium rigid truck
Lubricating oils and greases	6	205kg	Medium rigid truck

The distance of the stored material to the closest site boundary for all the materials listed in Figure 2 and Table 1 (dangerous goods classes 3) is provided in Table 3 and shown in Figure 2.

Table 3 – Separation distances to site boundary

Hazardous Material	Distance to site boundary m
Diesel fuel	>100
Lubricating oils and greases	>100

EXISTING DEVELOPMENT COMPLEX ENTRANCE

SUBJECT LAND BOUNDARY

EXISTING CATTLE HANDLING FACILITY

JAMES ROAD

EXISTING SOLID WASTE STORAGE AREA

EXISTING CATTLE LANE

BROUGHANS ROAD

EXISTING HOLDING POND

EXISTING SHADE INFRASTRUCTURE

EXISTING CATCH DRAIN

SUBJECT LAND BOUNDARY

EXISTING WATER TROUGH

EXISTING PRODUCTION PEN

EXISTING FEED ROAD

EXISTING FEED ROAD

EXISTING EFFLUENT CATCH DRAIN

100m SETBACK TO SUBJECT LAND BOUNDARY

EXISTING PRODUCTION PEN

EXISTING EFFLUENT DRAIN

EXISTING LUBRICATING OILS AND GREASES STORAGE

EXISTING WATER STORAGE TANKS

EXISTING CATTLE LANE

EXISTING GRAIN STORAGE AND PROCESSING AND COMMODITY STORAGE FACILITY

EXISTING CARCASS COMPOSTING AREA

EXISTING CLEAN WATER STORAGE

EXISTING DIESEL FUEL STORAGE FACILITY

EXISTING SEDIMENTATION BASIN

EXISTING CATCH DRAIN

EXISTING FEED ROAD

LEGEND

- SUBJECT LAND BOUNDARY
- LAND PARCEL BOUNDARY
- EFFLUENT UTILISATION AREA
- SOLID WASTE UTILISATION AREA

NOTES:

1. CADASTRAL INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES DIGITAL CADASTRAL DATABASE (DCDB) 2023, PROVIDED BY THE NSW DEPARTMENT OF FINANCE, SERVICES AND INNOVATION (DFSI) SPATIAL INFORMATION eXCHANGE AND ACCURACY IS LIMITED.
2. TOPOGRAPHIC INFORMATION BASED ON THE NSW GOVERNMENT SPATIAL SERVICES NSW TOPOGRAPHIC MAPS 2023, PROVIDED BY THE NSW DEPARTMENT OF CUSTOMER SERVICES SPATIAL SERVICES AND ACCURACY IS LIMITED.
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STATUS

FOR APPROVAL

NOT TO BE USED FOR CONSTRUCTION PURPOSES

RPEQ

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REV.	DATE	REVISION DESCRIPTION	DRAWN	CHECK	APPROVED
A	31/08/24	DRAFT ISSUE TO CLIENT	RJD	RJD	RJD
B	07/11/24	FINAL FOR LODGEMENT TO EDWARD RIVER COUNCIL	RJD	RJD	RJD

SCALE	1:2,000 (A3)
DRAWN	RJD
DATE	07/11/2024
CHECKED	RJD
DATE	07/11/2024
APPROVED	RJD
DATE	07/11/2024

CLIENT: AJ & NA VARLEY

PROJECT: PROPOSED EXPANSION OF BEEF CATTLE FEEDLOT

TITLE: DEVELOPMENT APPLICATION FOR INTENSIVE LIVESTOCK AGRICULTURE
EIS APPENDIX N - PRELIMINARY RISK SCREENING
PROPOSED DEVELOPMENT - DEVELOPMENT COMPLEX LAYOUT

REPORT REFERENCE	SUPPLIED DRAWING NUMBER		DRAWING NUMBER	REV.
FIGURE 2		A3	F3-107-6000-02	B

5 Risk screening assessment

5.1 Threshold assessment

The screening method set out in "*Applying SEPP 33 Hazardous and Offensive Development Application Guidelines"* (Department of Planning, 2011) provides the first step in the analysis. The screening method is based on broad estimates of the possible off-site effects or consequences from hazardous materials present on site, taking into account locational characteristics.

If the quantity/distance is less than the screening threshold, then no further analysis is necessary. The safety management regime in this case relies on observance of the requirements of engineering codes and standards. If the quantities/distances exceed the screening threshold, further analysis is necessary.

5.2 Storage screening

5.2.1.1 Storage volume

5.2.1.1.1 Class 3 Materials (above ground)

As the diesel fuel (combustible Liquid Class C1) may be stored with the petrol (contained in the fuel tank of the vehicle), it is treated as Class 3 PG II for assessment purposes.

The proposed development involves the storage of approximately 4.43 tonnes of diesel fuel stored above ground. From the Department of Planning (2011), there is not greater than 5 tonnes stored above ground. Consequently, the development is not potentially hazardous on the basis of that material, alone.

The proposed development does not involve the storage of petrol fuel. From the Department of Planning (2011), there is less than 5 tonnes stored above ground. Consequently, the development is not potentially hazardous on the basis of that material, alone.

The proposed development involves the storage of approximately 0.19 tonne of lubricating oils stored above ground. As the lubricating oils and greases (Class C2) are not stored adjacent to any other hazardous materials, Department of Planning (2011) does not require these to be considered further.

5.2.1.2 Setback distance to site boundary

5.2.1.2.1 Class 3 Materials (above ground)

The total storage capacity of Class 3 PGII materials is some 4.4 t during operation. The materials shall be stored in bunded vehicle mounted above-ground tanks in accordance with relevant guidelines and Australian Standards. As the materials are stored above-ground, there is no adjustment to the screening capacity.

Figure 3 shows the minimum storage distance for Class 3 PGII and Class 3 PGIII as per Department of Planning (2011)

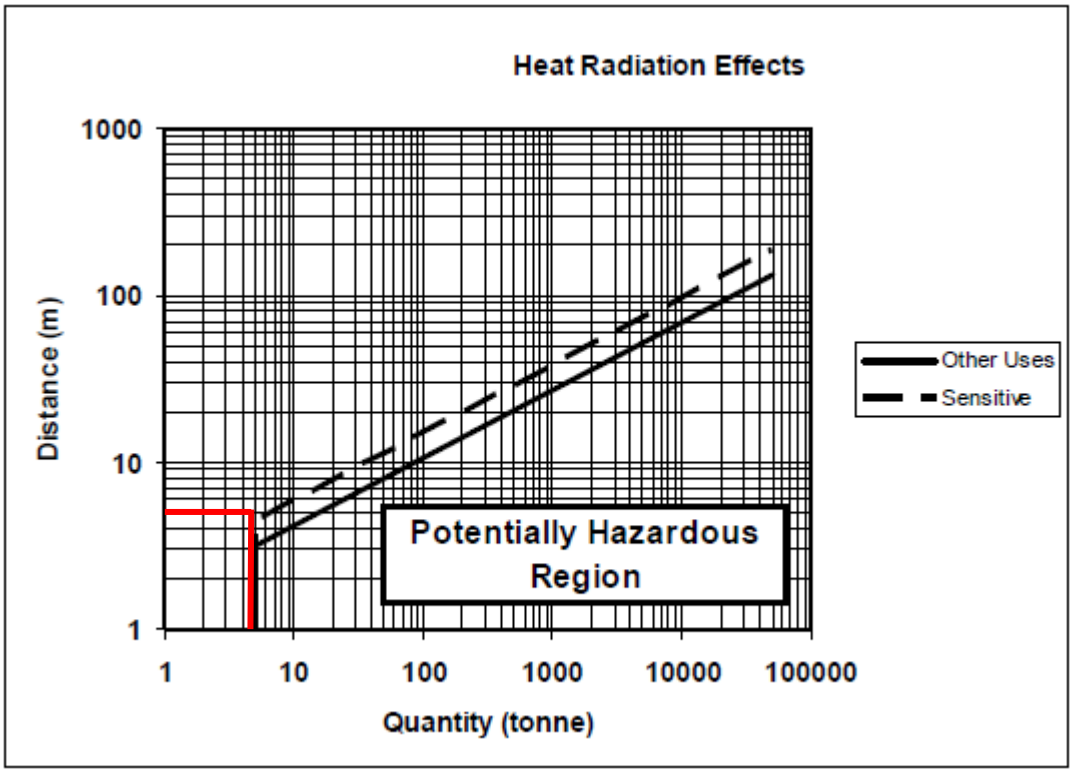

Figure 3 – Minimum storage distance Class 3 PGII and Class 3 PGIII flammable liquids (Department of Planning, 2011, Figure 9)

By utilising Figure 9 contained within "*Applying SEPP 33 Hazardous and Offensive Development Application Guidelines"* (Department of Planning, 2011) and measuring separation distances, it can be determined whether further analysis is required. For a screening quantity of 4.4 t, the minimum separation distance from site boundaries is about 5 m. Since there are no site boundaries within this separation distance as shown on Figure 2, the storage and dispensing of the fuel passes initial screening. Therefore, no further analysis is required.

5.2.2 Transport screening

Department of Planning (2011) methodology also requires assessment of the transporting/delivery frequencies, for the proposed development. As outlined in Table 2, it is envisaged that deliveries to the proposed development site, for Class 3 PG II substances will be about 6 per quarter, or 26 movements per year. According to the "Transportation Screening Thresholds", as shown in Table 4, up to 45 movements per week or 750 movements per year for Class 3 PG II substances are acceptable prior to becoming potentially hazardous. Since the expected number of deliveries is less than 750 per annum and less than 45 movements per week, expected deliveries transport threshold figures do not exceed the required amount.

Table 4 – Transport screening thresholds (Department of Planning, 2011, Table 2)

	Vehicle Movements		Minimum quantity* per load (tonne)	
	Cumulative	Peak		
Class	Annual *or*	Weekly	Bulk	Packages
1	see note	see note	see note	
2.1	>500	>30	2	5
2.3	>100	>6	1	2
3PGI	>500	>30	1	1
3PGII	>750	>45	3	10
3PGIII	>1000	>60	10	no limit
4.1	>200	>12	1	2
4.2	>100	>3	2	5
4.3	>200	>12	5	10
5	>500	>30	2	5
6.1	all	all	1	3
6.2	see note	see note	see note	
7	see note	see note	see note	
8	>500	>30	2	5
9	>1000	>60	no limit	

Note: *Where proposals include materials of class 1, 6.2 or 7, the Department of Planning should be contacted for advice. Classes used are those referred to in the Dangerous Goods Code and are explained in Appendix 7.*

** If quantities are below this level, the potential risk is unlikely to be significant unless the number of traffic movements is high.*

5.3 Conclusion

Based on the risk screening method outlined by the Department of Planning (2011), the storage of fuel (diesel) and transportation to and from the site does not constitute a hazardous industry or a potentially hazardous industry. Subsequently, no Preliminary Hazard Assessment is required.

6 Potentially Offensive Industry

The proposed development is beef cattle feedlot and is considered a 'potentially offensive industry' because in the absence of safeguards, the proposed development would emit a polluting discharge which would cause a significant level of offence.

Information on the quantity and nature of any discharges, and the significance of the offence likely to be caused by the development, having regard to the nature of the surrounding land use and the proposed controls has been provided in the EIS. The proposed development exceeds the threshold of feeding more than 1,000 head of cattle under Schedule 1 of the POEO Act definition. Hence, pursuant to Section 48 of the POEO Act, an Environment Protection Licence (EPL) is required.

As outlined in the EIS, adequate safeguards are proposed to ensure emissions from the proposed development can be controlled to a level at which they are not significant.

All receptors are outside of the separation distances required for the proposed development. Therefore, the proposed development meets the conservative separation distance requirements for sensitive receptors calculated in accordance with the S-factor method outlined in the National Guidelines for Beef Cattle Feedlots in Australia (3rd Edition) (MLA, 2012).

It is considered that as separation distances exceed the requirements under the National Guidelines for Beef Cattle Feedlots in Australia (3rd Edition) (MLA, 2012) that the proposed development is not an 'offensive industry'.

7 References

Department of Planning (NSW), 2011, Hazardous and Offensive Development Application Guidelines, Applying, SEPP 33, Department of Planning (NSW), Sydney, NSW.

Meat and Livestock Australia, 2012, National Guidelines for Beef Cattle Feedlots in Australia 3rd Edition, Meat & Livestock Australia, North Sydney, NSW.

Appendix O

MNES

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: 07-May-2024

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	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	36
Listed Migratory Species:	9

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	16
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:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
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
Hattah-kulkyne lakes	200 - 300km upstream from Ramsar site	In feature area
Nsw central murray state forests	10 - 20km upstream from Ramsar site	In feature area
Riverland	400 - 500km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	500 - 600km 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
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			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely 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 likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may 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 may 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 likely to occur within area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely 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 likely 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 likely to occur within area	In feature area
FISH			
[Galaxias rostratus](#) Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area	In feature area
[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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[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
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 likely to occur within area	In feature area
[Pteropus poliocephalus](#)			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			
[Amphibromus fluitans](#)			
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Austrostipa wakoolica](#)			
[66623]	Endangered	Species or species habitat likely to occur within area	In feature area
[Brachyscome muelleroides](#)			
Mueller Daisy [15572]	Vulnerable	Species or species habitat may occur within area	In feature area
[Lepidium aschersonii](#)			
Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
[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 buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sclerolaena napiformis			
Turnip Copperburr [11742]	Endangered	Species or species habitat likely to occur within area	In feature area
Senecio macrocarpus			
Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat may occur within area	In feature area
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 may occur within area	In feature area
REPTILE			
Aprasia parapulchella			
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area

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 may occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca			
Satin Flycatcher [612]		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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
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 likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [15359]	NSW	In buffer area only

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
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 likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma			
Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
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

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
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

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 are 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

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

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

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
- 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 P

Operation Environmental Management Plan (Draft)

Appendix Q

Traffic Impact Assessment

Appendix R

Waterfront etool

Rod Davis

From: Google Forms <forms-receipts-noreply@google.com>
Sent: Tuesday, 29 October 2024 9:43 AM
To: rod.davis@rdcengineers.com.au
Subject: Waterfront land e-tool

Thanks for filling in Waterfront land e-tool

Here's what was received.

Edit response

Waterfront land e-tool

Version 1 - 2020

Email *

rod.davis@rdcengineers.com.au

Is this the right e-tool for me?

This waterfront land e-tool has been developed to help controlled activity applicants and consultants determine if a controlled activity approval is required under the provisions of the Water Management Act 2000. The tool can be used to help identify:

- if there is waterfront land
- the location of top of bank of the waterfront land and
- if an exemption applies for works within certain mapped areas under clause 36 of Schedule 4 of the Regulation

The e-tool is recommended for use by people who are familiar with environmental assessment and suitably qualified consultants. Members of the general public who are planning works near waterfront land should seek professional advice.

The e-tool must be completed separately for each individual mapped or visible watercourse on, or near, your property. If you have multiple properties or multiple watercourses on or near your property, submit your response for the first assessment and then re-start the tool from the beginning to assess another watercourse or property. This will ensure each property and watercourse receives its own separate emailed result outcome that you can keep as a record.

Using the tool

Some of the questions in this e-tool can be answered using materials online. Depending on your circumstances, you may also need to the visit the site of the proposed work in person to gather supporting evidence.

There is a PDF version of the tool available that you can download and take into the field at:
https://water.nsw.gov.au/__data/assets/pdf_file/0009/367272/waterfront-land-tool.pdf

The e-tool must be completed separately for each individual mapped or visible watercourse on the property. Each watercourse assessed with the e-tool will then receive a separate emailed result outcome.

Stopping and returning

You can choose to exit the tool at certain questions where field work is recommended. You will be asked if you wish to exit, and, if you agree, be emailed a link that you can use to return to the tool later to complete the rest of the questions.

If you close the tool anywhere else - without completing it and clicking the 'Submit' button - your data will not be retained. Please ensure you only close the tool when prompted if you wish to retain your answers.

Supporting evidence

When you complete the tool, you will receive email confirmation containing your answers, which you must keep as a record of your decision-making. You must also keep all reference material and information used–including maps, photos and observations to answer the tool questions. You will be prompted throughout the tool about what information to keep.

NSW Department of Climate Change, Energy, the Environment and Water may request copies of the Waterfront land tool answers and supporting documents from landholders where works are carried out without a controlled activity approval under the Water Management Act 2000.

The Waterfront land e-tool will store your email address so you can be emailed a record of your answers on completion. It will also record your answers but it will not identify your location or any other personal details. If you do not wish to supply your email address, please use the hard copy version of the tool at:
https://water.nsw.gov.au/__data/assets/pdf_file/0009/367272/waterfront-land-tool.pdf

More information

- about this e-tool, contact NSW Department of Climate Change, Energy, the Environment and Water via email: waterlicensing.servicedesk@dpie.nsw.gov.au
- about controlled activity approvals, visit https://water.dpie.nsw.gov.au/licensing-and-trade/controlled-activity-approvals

Disclaimer

- This tool is intended for guidance purposes only and cannot be used as evidence of compliance with the Water Management Act 2000.
- Users of this tool will be responsible for making their own assessment of the material and should verify all relevant representations, statements and information with their own professional advisers.
- This tool only applies controlled activities on waterfront land—it does not apply to water access licences or water supply work and/or water use approvals.
- This is not an approval to undertake work on waterfront land and you will still need to obtain relevant approvals as required under the Water Management Act 2000 (WM Act).
- The use of this tool does not remove the obligation to obtain approval under any other relevant

legislation.

- Users should also refer to the disclaimer on the department's website at: https://www.industry.nsw.gov.au/disclaimer

Description or Reference

Please enter a description or reference number below for the property or watercourse you are going to assess. This will allow you to easily identify this assessment from any other assessments you undertake using the tool. *

58 Broughans Road, Finley

Question 1 - Department of Planning and Environment—Water waterfront land maps

After answering the question, click next at the bottom of the screen.

Is your property located on a watercourse, lake or estuary within the area marked in orange in any of the Department of Planning and Environment—Water waterfront land maps below? *

- Yes, Botany Bay
- Yes, Brisbane Water
- Yes, Hunter River
- Yes, Lake Macquarie
- Yes, Lake Mulwala
- Yes, Port Hacking
- Yes, Port Jackson
- Yes, Port Stephens
- Yes, Tuggerah Lakes
- Yes, Wallis Lakes
- No, none of the above

Using the maps below

Using your browser zoom in to any of the maps below to help you identify the location of your property.

Alternatively you can access the maps at the below link:
https://www.dpie.nsw.gov.au/water/licensing-and-trade/controlled-activity-approvals/controlled-activity-exemptions

What supporting evidence do I need?

- Saved or printed screenshot of aerial photo of your property
- Saved or printed copy of any maps to identify property boundary
- Saved or printed screenshot of the location of your property on the waterfront land map

Botany Bay

Brisbane Water

Hunter River

Lake Macquarie

Lake Mulwala

Port Hacking

Port Jackson

Port Stephens

Tuggerah Lakes

Wallis Lakes

Question 2a - Hydro Line spatial data map

Open the link provided below for the Hydro Line spatial data map and enter your property address.

Is there a blue line on your property or within 40m of the proposed work? *

Yes

No

What supporting evidence do I need?

- Saved or printed screenshot of aerial photo of your property
- Saved or printed copy of any maps to identify property boundary
- Saved or printed screenshot of the location of your property on the Hydro Line spatial data map

The Hydroline spatial data is used to determine the Strahler stream order of a watercourse.
https://trade.maps.arcgis.com/apps/webappviewer/index.html?id=07b967fd0bdc4b0099fc5be45b6d1392

Collecting evidence in the field

For this part of the tool, you may need to go to your site to collect evidence and answers.

What to take into the field

The following equipment will be required to complete field work:

- Digital camera
- Note taking equipment - notebook or computer
- Measuring tape or equipment able to measure 50m
- Saved or printed screenshot of aerial photo of your property and the watercourse

If you can't do the field work right now, you can save your answers

To save your answers so far in the e-tool, select 'Yes, save my answers' below and click 'Submit' on the next page.

You will then be emailed a copy of the answers and a link you can use to return to the e-tool when in the field or after your field work is completed.

The link is at the top of the email 'Edit response'.

This is the only point in the tool where you can stop and return to your answers

If you close the tool anywhere else - other than the final 'Submit' page - the data you have entered so far will not be retained.

Can't take this tool into the field?

A PDF version is available at:
https://water.nsw.gov.au/__data/assets/pdf_file/0009/367272/waterfront-land-tool.pdf

Would you like to save your answers? *

Yes, save my answers so I can return here later

No, keep going, I'm ready to answer the field-based questions

Question 2b - Department of Planning and Environment—Water Map —Western land map local government area

Is your property within the shaded area of the Department of Planning and Environment—Water Map —Western land map local government area provided below? *

Yes

No

Using the map below

Using your browser to zoom in to the map and LGA list below to help you identify the location of your property

What supporting evidence do I need?

- Saved or printed screenshot of aerial photo of your property
- Saved or printed copy of any maps to identify property boundary
- Using the Department of Planning and Environment—Water Map—Western land map local government area, record the local government area your property is located within

Department of Planning and Environment—Water Map —Western land map local government area

Department of Planning and Environment—Water Map —Western land map local government area

Question 2c - Visible watercourse

Is there a watercourse visible on your property? *

Yes

No

What supporting evidence do I need?

- Current site photos looking up and downstream. Photos should be taken within one month of completing this tool and include a date stamp or metadata.
- Saved or printed screenshot of aerial photo of your property and the watercourse
- Written observations of the watercourse including bed, bank and erosion features and flow conditions

Question 2d - Lake or wetland

Is there a lake or wetland on your property or within 40m of the proposed work? You can see some examples of lakes and wetlands below to help you decide. *

Yes - a lake

Yes - a wetland

No

Using the photos below

Use your browser to zoom in to the photos below

What supporting evidence do I need?

- Saved or printed screenshot of aerial photo of your property and any lake or wetland
- Saved or printed copy of any maps to identify property boundary
- Current site photos of any lake or wetland. Photos should be taken within one month of completing this tool and include a date stamp or metadata and a short location description.
- Where a lake or wetland is present, saved or printed screenshot of the lake/wetland type from the Department of Planning and Environment—Water Lakes and wetlands examples document
- Written observations of any lake/wetland present

Lakes

Wetlands

Question 7 - Change in vegetation

Using the photos below, is there a change in vegetation on the property that indicates a wetland? *

Yes (the vegetation indicates a wetland)

No

Using the photos below

Use your browser to zoom in to the photos below.

What supporting evidence do I need?

- Current site photos of the possible wetland area or at the location in the area of proposed works. Photos should be taken within one month of completing this tool and include a date stamp or metadata and a short location description.
- Saved or printed screenshot of aerial photo of your property and the possible wetland area
- Written observations of the possible wetland area

Department of Planning and Environment—Water Guide—Wetlands change in vegetation

Department of Planning and Environment—Water Guide—Wetlands change in vegetation

Result 11 - Controlled activity approval not required - No watercourse, lake or wetland present

Based on your answers, the result is :

CONTROLLED ACTIVITY APPROVAL NOT REQUIRED - NO WATERCOURSE, LAKE OR WETLAND PRESENT

Statements

When completing the e-tool you provided the following answers:

- There is no blue line on the Hydro Line spatial data map
- The site is not within the Department of Planning and Environment—Water non-mapped watercourse area map
- There is no lake or wetland
- There is no change of vegetation that would indicate a wetland

Are ALL of the above statements correct? *

Yes

No (restart tool)

Record keeping and Disclaimer

Please ensure you keep the electronic and/or printed copies of all supporting evidence required for questions answered in this tool and the confirmation email you receive after clicking submit.

NOTE:

- The results given by this tool are generated using the answers you have provided. If any answers are incorrect or incomplete, the result produced may be incorrect.
- This tool is intended for guidance purposes only and cannot be used as evidence of compliance with the Water Management Act 2000.
- Users of this tool will be responsible for making their own assessment of the material and should verify all relevant representations, statements and information with their own professional advisers.
- This is not an approval to undertake work on waterfront land and you will still need to obtain relevant approvals as required under the Water Management Act 2000 (WM Act).
- The use of this tool does not remove the obligation to obtain approval under any other relevant legislation.
- Users should also refer to the disclaimer on the department's website at industry.nsw.gov.au/disclaimer.

If ANY of your assessments identify that a controlled activity approval is required for your proposed works, you must complete the following tasks:

- Confirm if an exemption applies to your site or proposed works by using the Department's Controlled activity exemption e-tool at: https://forms.office.com/pages/responsepage.aspx?id=IYjvljkqHEe4mmewgz3TuaJ8VvZiyYZKiR3x1NniFCZUQ0lWTUZRUVpWMFhHTlBEM05aNFVOVlFSOC4u or refer to exemption information here: https://www.dpie.nsw.gov.au/water/licensing-and-trade/controlled-activity-approvals/controlled-activity-exemptions
- For matters requiring a development application (DA) from Council, you should lodge your DA as Integrated Development.
- For matters NOT requiring a DA, please refer to the Department of Planning and Environment—Water website for instructions on how to apply for a Controlled Activity Approval: https://www.dpie.nsw.gov.au/water/licensing-and-trade/controlled-activity-approvals/how-to-apply

You MUST click Submit to be emailed a copy of your answers and your result.

Reminder: The e-tool must be completed separately for each individual mapped or visible watercourse on, or near, your property. If you have multiple properties or multiple watercourses on

or near your property, submit your response for the first assessment and then re-start the tool from the beginning to assess another watercourse or property. This will ensure each property and watercourse receives its own separate emailed result outcome that you can keep as a record.

Feedback

Please let us know whether you found this tool helpful and what we could do to make it better. Your comments will help us to improve the tool further.

Thankyou for your feedback.

How helpful was this tool?

Additional feedback about this tool

If you have a question or require further information regarding your specific circumstances, please email waterlicensing.servicedesk@dpie.nsw.gov.au

If you wish to undertake another assessment, please click 'Submit' below and then select 'Submit another response'.

Appendix S

NFAS Manual