ProTen

Rushes Creek Poultry Production Farm

SSD 7704

ENVIRONMENTAL IMPACT STATEMENT

Volume 2
APPENDICES A - F

Prepared for:
ProTen Tamworth Pty Limited

AUGUST 2018



Prepared by:

SLR

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Appendix A

Independent Cost Review
(Rider Levett Bucknall 2018)

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1744-01/MC

25 June 2018

ProTen Ltd
Attention: Mr Daniel Bryant
Level 10, 201 Miller Street
North Sydney NSW 2060
email: daniel@proten.com.au

Dear Daniel,

Proposed Rushes Creek Development
Initial Budget Estimate – Independent Cost Review

Task

As instructed in your email, we have undertaken an independent cost review of the Initial Budget Estimate (IBE) for the above mentioned project. This review has been undertaken for the sole purpose of the Planning lodgement process for this project.

We have only reviewed costs associated directly with building construction and have therefore excluded other project costs, due diligence and development/permit fees, professional and management fees, etc.

The total costs associated directly with building construction include:

- site preparation and earthworks
- site infrastructure
- building enclosures (sheds, houses, amenities and workshops)
- fit-out
- specialist internal services and equipment
- landscaping.

We have identified project costs of **$55,197,500** in the owner's IBE that are directly associated with building construction.

Information Available

We have based our review on a scope document provided to us by ProTen for the proposed development. Information provided included:

1. Size and extent of development in terms of number of sheds and overall areas.
2. Similar projects undertaken by ProTen that we have been involved with in the past and are currently working on.
3. Location of the proposed development.
4. Initial Budget Estimate as prepared by ProTen.

Using this information we have interpolated the construction costs using rates we have analysed to give us an opinion of the construction development costs.

Review and Recommendations

Our summary of the construction costs are:

54 SHEDS		
Bulk earthworks		$4,336,000
Main power switchboards and electrical		$8,324,000
Residential houses		$2,118,000
Water tanks and infrastructure		$2,200,000
Amenities and workshops		$484,000
Bird sheds		$17,783,000
Concrete structure		$5,140,000
Feeders and drinkers		$1,950,000
Winching and controllers		$1,792,000
Heater and fans		$2,649,000
Silos and augers		$987,000
Cooling units and pads		$879,000
Minivents		$616,000
Gas reticulation		$449,000
Other equipment and sundries		$5,491,000
	Sub-total	$55,198,000
Contingencies (5%)		$2,760,000
CONSTRUCTION TOTAL		**$57,958,000**
Consultant and approval fees		$2,032,000
Management fees		Excluded
Land		Excluded
TOTAL DEVELOPMENT COST		**$59,990,000**

Our review indicates the total costs indicated in the IBE, that are only associated directly with building construction, are generally reasonable. Considering the stage of documentation, the detailed measurements are reasonably accurate and the applied rates to be suitable for this type of construction.

For the purposes of a Planning lodgement we consider a total building construction cost of approximately $57,958,000 to be reasonable. We note that this construction cost is inclusive of a contingency allowance of approximately 5%.

We trust that the above meets your requirements, however, should you have any queries please do not hesitate to contact me.

Yours Sincerely,

Mark Chappé
Director

For Rider Levett Bucknall

Appendix B

Secretary's Environmental Assessment Requirements



Industry Assessments
Contact: Sally Munk
Phone: (02) 9228 6431
Fax: (02) 9228 6555
Email: sally.munk@planning.nsw.gov.au

Mr Daniel Bryant
Chief Executive Officer
ProTen Pty Ltd
PO Box 1746
North Sydney NSW 2060

SSD 7704

Dear Mr Bryant

Secretary's Environmental Assessment Requirements,
Rushes Creek Poultry Production Complex (SSD 7704)

Please find attached the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Rushes Creek Poultry Production Complex on Rushes Creek Road in the Tamworth local government area.

The attached SEARs have been prepared in consultation with the relevant State government agencies, Tamworth Regional Council and Gunnedah Shire Council (see **Attachment 2**), and are based on the information you have provided to date.

Please note that the Department may alter the SEARs at any time. You must consult further with the Department if you do not lodge a Development Application (DA) and Environmental Impact Statement (EIS) for the development within two years of the date of issue of these SEARs.

I wish to emphasise the importance of effective and genuine community consultation and the need for the proposal to proactively respond to the community's concerns. Accordingly, you must undertake a comprehensive, detailed and genuine community consultation and engagement process during the preparation of the EIS. This process must ensure the community is informed of the development and engaged with issues of concern to it. Sufficient information must be provided to the community to enable a good understanding of the development and any potential impacts.

Your development may require a separate approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). If EPBC Act approval is required, please advise the Department accordingly, as the Commonwealth approval process may be integrated into the NSW approval process, and supplementary SEARs may need to be issued.

Please contact the Department at least two weeks before you lodge the EIS and any associated documentation for the development. This will enable the Department to determine the:

- applicable fee (under Division 1AA, Part 15 of the *Environmental Planning and Assessment Regulation 2000)*; and
- consultation and public exhibition arrangements, including copies and format requirements of the EIS.

If you have any enquiries about these SEARs, please contact Sally Munk on the above details.

Yours sincerely

C. Ritchie 12/7/16.

Chris Ritchie
Director
Industry Assessments
As the delegate of the Secretary

Secretary's Environmental Assessment Requirements

Section 78A(8A) of the *Environmental Planning and Assessment Act 1979* Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*

State significant development

Application Number	SSD 7704
Development	Rushes Creek Poultry Production Complex
Location	Rushes Creek Road, Rushes Creek
Applicant	Mr Daniel Bryant, ProTen Limited
Date of Issue	12 July 2016
General Requirements	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 the *Environmental Planning and Assessment Regulation 2000*. The EIS must include: • a detailed description of the development including: – need for the proposed development; – justification for the proposed development; – likely staging of the development; – likely interactions between the development and existing, approved and proposed developments in the vicinity of the site, including the Keepit Dam impoundment; and – plans of any proposed works. • consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments; • a risk assessment of the potential environmental impacts of the development, identifying key issues for further assessment; • a detailed assessment, where relevant, of the key issues below, and any other potential significant issues identified in the risk assessment, must include: – a description of the existing environment, using adequate baseline data; – consideration of potential cumulative impacts due to other development in the vicinity; and – measures to avoid, minimise and if necessary, offset the predicted impacts, including detailed contingency plans for managing any significant risks to the environment. • consideration of issues raised at the Planning Focus Meeting; and • a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS. The EIS must be accompanied by a report from a qualified quantity surveyor providing: • a detailed calculation of the capital investment value (CIV) of the proposal (as defined in clause 3 of the *Environmental Planning and Assessment Regulation 2000*), including details of all assumptions and components from which the CIV calculation is derived; • an estimate of the jobs that will be created by the development during the construction and operational phases; and • certification that the information provided is accurate at the date of preparation.

Key issues	The EIS must include an assessment of the potential impacts of the proposal (including cumulative impacts) and develop appropriate measures to avoid, mitigate, manage and/or offset these impacts. The EIS must address the following specific matters: • **statutory and strategic context** – including: – justification for the proposal and suitability of the site; – demonstration that the proposal is generally consistent with all relevant planning strategies and environmental planning instruments, and justification for any inconsistencies; and – details of any proposed consolidation or subdivision of land. • **air quality and odour** – including: – a quantitative odour and air quality impact assessment in accordance with the relevant Environment Protection Authority (EPA) guidelines, including appropriate consideration of impacts on temporary and permanent residents at the Lake Keepit Sport and Recreation Centre, Lake Keepit Soaring Club and Manilla Ski Gardens Caravan Park; – evidence of appropriate meteorological data for use in air dispersion modelling; – an investigation and assessment of odour impacts likely to be associated with 'cold air drainage' effects on all identified and potential receivers; – inclusion of 'worst case' emission scenarios and sensitivity analyses; – a contingency plan to address unpredicted operational odour impacts; and – a description and appraisal of air quality and odour impact monitoring, emission control techniques and mitigation measures. • **transport and road traffic** – including: – a quantitative traffic impact assessment prepared in accordance with relevant Council, Austroads and Roads and Maritime Services guidelines; – details of all daily and peak traffic and transport movements likely to be generated during construction and operation of the development, including a description of haul routes, vehicle types, vehicle access routes and the impacts on nearby intersections; – details of access to the site from the road network including intersection location, design and sight distance; – an assessment of predicted impacts on road safety and the capacity of the road network to accommodate the development including identification of any necessary infrastructure upgrades and consideration of cumulative impacts, using SIDRA or a similar model; – details of any utility services which will need to be located within or across Rushes Creek Road or Ski Gardens Road; and – detailed plans of the proposed layout of the internal road network and parking on the site in accordance with the relevant Australian standards. • **soils and water** – including: – an accurate description of operational water demands, a breakdown of water supplies (including any water licensing or approval requirements), a description of measures to minimise water use and evidence of an adequate and secure water supply; – a detailed water balance; – details of water supply infrastructure to extract, transfer, treat and store water from the Namoi River; – a contingency plan for water supply in the event extraction from the Namoi River is restricted (e.g. drought conditions); – details of erosion, sediment, stormwater and leachate control during construction;

	- a description of surface, groundwater and stormwater management systems, including on site detention, surface water diversions, flood impact mitigation and measures to treat or reuse water; - an assessment of potential surface water, flooding and groundwater impacts, including impacts on nearby waterbodies (including Namoi River and Lake Keepit), surrounding properties, any licensed water users, landholder rights or groundwater dependent ecosystems; - an assessment of any potential existing soil contamination in accordance with *Managing Land Contamination Planning Guidelines: SEPP55 – Remediation of Land* (DUAP, 1998); and - a description and appraisal of impact mitigation, management, maintenance and monitoring measures. • **waste and wastewater management** – including: - identification and classification of waste streams that would be generated at the site in accordance with the *Waste Classification Guidelines* (EPA, 2014); - a description of waste transport, storage, handling, processing and disposal; - a description of proposed management and disposal of wastewater, leachate and effluent; - details on containment and monitoring of wastewater; and - a description and appraisal of waste impact mitigation, contingencies and management. • **biodiversity** – including: - an assessment of biodiversity impacts in accordance with the *Framework for Biodiversity Assessment* (OEH 2014) and the *NSW Biodiversity Offsets Policy for Major Projects* (OEH 2014); and - accurate predictions of any vegetation clearing on or off the site, including buildings, access roads and servicing and support infrastructure. • **heritage** – including: - an assessment of Aboriginal and non-Aboriginal heritage items and values of the site and surrounding area in accordance with the relevant Office of Environment and Heritage guidelines. • **animal welfare, bio-security and disease management** – including: - details of how the proposed development would comply with relevant codes of practice and guidelines; - details of all bio-security and disease control measures; and - a detailed description of the contingency measures that would be implemented for the mass disposal of livestock in the event of a disease outbreak. • **noise and vibration** – including: - a quantitative noise and vibration impact assessment in accordance with the relevant EPA guidelines; - a description of all potential noise and vibration sources during construction and operation, including traffic noise along primary haulage routes; and - a description of noise and vibration monitoring, management and mitigation measures. • **hazards and risk** – including: - a preliminary risk screening completed in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* and *Applying SEPP 33* (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development; and - should the preliminary screening indicate that the project is "potentially hazardous," a Preliminary Hazard Analysis must be prepared in accordance with the *Hazardous Industry Planning*

	Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and the *Multi-Level Risk Assessment* (DoP, 2011). • **visual impacts** – including: – a description of the visual catchment and visual impacts including lighting impacts on surrounding receivers and public areas; and – an appraisal of visual impact mitigation measures. • **socio-economic** – including an analysis of the economic and social impacts of the development, particularly of any benefits to the community. • **infrastructure** – including details of any upgrade or extension to existing services infrastructure (e.g. electricity supply). • **contributions** – including consideration of Tamworth Regional Council's Section 94/94A Contribution Plan and/or details of any Voluntary Planning Agreement.
Plans and Documents	The EIS must include all plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Environmental Planning and Assessment Regulation 2000. These documents should be included as part of the EIS rather than as separate documents.
Consultation	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: • Tamworth Regional Council; • Gunnedah Shire Council; • Environment Protection Authority; • Office of Environment and Heritage; • Department of Primary Industries; • Essential Energy; • WaterNSW; • Roads and Maritime Services; • Hunter New England Local Health District; • NSW Sport and Recreation; and • Local community and other stakeholders. The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, an explanation should be provided.
Further consultation after 2 years	If you do not lodge a development application and EIS for the development within 2 years, you must consult further with the Secretary in relation to the preparation of the EIS.
References	The assessment of the key issues listed above must take into account relevant guidelines, policies, strategies and plans. While not exhaustive, **Attachment 1** contains a list that may be relevant to the assessment of this proposal.

ATTACHMENT 1
Technical and Policy Guidelines

The following guidelines may assist in the preparation of the Environmental Impact Statement. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites:
http://www.planning.nsw.gov.au
http://www.bookshop.nsw.gov.au
http://www.publications.gov.au

Policies, Guidelines & Plans	
Plans and Documents	
	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Environmental Planning and Assessment Regulation 2000. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include the following: 1. An existing site survey plan drawn at an appropriate scale illustrating: • the location of the land, boundary measurements, area (in square metres) and north point; • the existing levels of the land in relation to buildings and roads; • location and height of existing structures on the site; • location and height of adjacent buildings and private open space; and • all levels to be to Australian Height Datum (AHD). 2. A locality/context plan drawn at an appropriate scale should be submitted indicating: • significant local features such as watercourses, drainage lines, residential and recreational areas, roads, and heritage items; • location of similar agricultural activities; • the location and uses of existing buildings and employment areas; and • traffic and road patterns, pedestrian routes and public transport nodes. 3. Drawings at an appropriate scale illustrating: • plans, sections and elevations of the proposed buildings, manager's residences and other related infrastructure; • detailed plans of proposed access driveways, internal roads, carparking and services infrastructure; and • detailed plans of any proposed boundary adjustment or subdivision, including details of the existing and proposed lot boundaries, lot areas and north point.
Documents to be Submitted	
	Documents to submit include: • 1 hard copy and 1 electronic copy of all the documents and plans; and • Other copies as determined by the Department once the development application is lodged

Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2010
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2005)
	Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2005)
	Action for Air (DECC)
	Assessment and Management of Odour from Stationary Sources in NSW (EPA, 2006)
	Best Practice Guidance for the Queensland Poultry Industry – Plume Dispersion Modelling and Meteorological Processing (PAE Holmes, 2011)
	Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia (TRC Environmental Corporation, 2011)
Odour	
	Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
	Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
	Level 1 odour assessment calculator for meat chicken (broiler) farm developments
Traffic	
	Guide to Traffic Generating Development (RTA)
	Road Design Guide (RTA)
Soil and Water	
Soil	Managing Urban Stormwater: Soils & Construction (Landcom)
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC & NHMRC)
	National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC)
	State Environmental Planning Policy No. 55 – Remediation of Land
	Acid Sulfate Soils Manual (Stone *et al*, 1998)
	Acid Sulfate Soils Laboratory Methods Guidelines (Ahern *et al*, 2004)
	Guidelines for Consultants Reporting on Contaminated Sites
	Managing Land Contamination - Planning Guidelines SEPP 55 – Remediation of Land (DUAP and EPA)
Surface Water	National Water Quality Management Strategy: Water quality management - an outline of the policies (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Policies and principles - a reference document (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Implementation guidelines (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000)
	National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ, 2000)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (EPA, 2006)
	Water Quality Objectives
	State Water Management Outcomes Plan
	NSW Government Water Quality and River Flow Environmental Objectives (DECC)
	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC)
	Sorting and Handling Liquids: Environmental Protection – Participants Manual (DECC)

	Managing Urban Stormwater: Council Handbook. Draft (EPA)
	Managing Urban Stormwater: Treatment Techniques (EPA, 1997)
	Managing Urban Stormwater: Source Control. Draft (EPA)
	Managing Urban Stormwater: Soils & Construction (Landcom, 2004)
	Technical Guidelines: Bunding & Spill Management (DECC)
Groundwater	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC, 1995)
	NSW State Groundwater Policy Framework Document (DLWC, 1997)
	NSW State Groundwater Quality Protection Policy (DLWC, 1998)
	NSW State Groundwater Dependent Ecosystems Policy (DLWC, 2002)
Flooding	Floodplain Development Manual
Waste	
	NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA, 2014)
	Waste Classification Guidelines (EPA)
	Environmental Guidelines: Assessment Classification and Management of Non-Liquid and Liquid Waste (NSE EPA)
	Environmental Guidelines: Use and Disposal of Biosolids Products (EPA, 1997)
Biodiversity	
	NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014)
	Framework for Biodiversity Assessment (OEH, 2014)
	Fisheries NSW Policies and Guidelines
	State Environmental Planning Policy No 44 – Koala Habitat Protection (SEPP 44)
	The NSW State Groundwater Dependent Ecosystem Policy (DLWC)
Heritage	
	The Burra Charter (The Australia ICOMOS charter for places of cultural significance)
	Statements of Heritage Impact 2002
	NSW Heritage Manual (Heritage Office and DUAP, 1996)
	Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)
	Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010)
	Guide to investigating, assessing and reporting on Aboriginal heritage in NSW (OEH, 2011)
	Aboriginal Heritage Information Management System (AHIMS) Registrar
Animal Welfare and Biosecurity	
	National Farm Biosecurity Manual – Poultry Production (2009)
	National Farm Biosecurity Manual for Chicken Growers (Australian Chicken Meat Federation 2009)
	Model Code of Practice: Domestic Poultry (CSIRO Publishing, 2002)
	Model Code of Practice: Land Transport of Poultry (CSIRO Publishing, 2006)
	Best Practice Management for Meat Chicken Production in New South Wales Manual 1 Site Selection & Development (DPI 2012)
	Best Practice Management for Meat Chicken Production in New South Wales Manual 2 – Meat Chicken Growing Management (DPI 2012)
Noise and Vibration	
	NSW Industrial Noise Policy (EPA, 2000) and Industrial Noise Policy Application Notes
	NSW Road Noise Policy (EPA, 2011)
	Environmental Noise Control Manual (DECC)
	Assessing Vibration: a Technical Guide (EPA, 2006)

	Interim Construction Noise Guidelines (EPA, 2009)
Hazards and Risk	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
	Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (DUAP)
	Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis

ATTACHMENT 2

State Government Agency and Council Submissions

Industry Assessments

Attention: Sally Munk

Notice Number	1541681
File Number	SF 16/24271
Date	29-Jun-2016

RE: Environmental Assessment Requirements - Proposed Rushes Creek Poultry Production Farm - SSD 7704

I refer to a request for the Environment Protection Authority's (EPA) requirements for an environmental impact study (EIS) in regard to the above proposal, received by the EPA on 16 June 2016.

The EPA has considered the details of the proposal as provided by SLR Consulting Australia Pty Ltd (the consultant) on behalf of Proten Tamworth Limited (the proponent), and has identified the information it requires to consider its general terms of approval in Attachment A. In summary, the EPA's key information requirements for the proposal include an adequate assessment of:

1 Air quality impacts, particularly odour assessments

- Sensitive locality: The proposal is located in the upper catchment of Lake Keepit and incorporates unique temporary and permanent residents at the Lake Keepit Sport and Recreation Centre, Lake Keepit Soaring Club and Manilla Ski Gardens Caravan Park. The predicted impact on these receptors needs to be fully understood and considered in the odour assessment.
- Status of Neighbouring Building Occupancy and Entitlements: There are clusters of buildings around the site with unknown residential occupancy status. There may also be building entitlements on land within the odour impact zones. The residential status of each building and potential building entitlements is essential to determine the appropriate odour criteria for modelling.
- Odour Criterion: It important that the total population affected by the project including maximum capacity of the recreation centre, soaring club, caravan park and building entitlements are accounted for in determining the odour criterion for the development.

  While the preliminary Environmental Assessment suggests 6 odour units (OU) may be appropriate for single rural residences, it does acknowledge that the recreation centre, soaring club and caravan park populations may require an alternative odour criterion. The EPA's initial advice to the proponent's consultants is that a single odour criterion for all receptors is the desired approach. An odour criterion below 6 OU may prove to be more appropriate when all receptors are considered.
- Local Meteorological Data: A minimum of six and ideally twelve months local weather data is necessary to provide accurate input data to validate CALMET generated data for odour modelling at the site. There is no local weather station on the proposed development site.

  It is important to validate the CALMET generated data (using TAPM data inputs) to ensure it captures the meteorological conditions at the project site and provides accurate data to be used as input to CALPUFF. The proponent should refer to the guidance document '*Generic Guidance and Optimum*

Model Settings for the CALPUFF Modeling System for Inclusion in the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, Australia' when setting up CALMET and CALPUFF.

It is proposed to extrapolate local weather data using weather data from Tamworth Airport. The site is located in the upper reaches of Lake Keepit and adjacent terrain that is ideal for the Soaring Club. It is reasonable to expect that weather conditions may be unique to the location given the topographical features are distinctly different from the Tamworth Airport. The proponent needs to obtain sufficient local weather data to clearly demonstrate that the use of CALMET generated data is appropriate for this site.

Any weather station should collect wind speed data using an ultrasonic wind speed sensor to ensure accurate representation of low wind speed frequencies to allow more accurate prediction of likely katabatic impacts on receivers.

- K Factor: The proposal includes discussion on modifying the K Factor used in odour modelling for the development. Any variation from the industry standard for K factor needs to be fully explained and justified.
- Katabatic Cold Air Drainage: Development sites that have a slope toward receptors on lower elevations have proven to experience katabatic "cold air drainage" that can drive odour impacts. The assessment must investigate and assess odour impacts likely to be associated with katabatic "cold air drainage" effects on all identified and potential receivers
- The odour assessment completed under guidance of the *EPA's Technical Framework - Assessment and Management of Odour from Stationary Sources in NSW* should demonstrate a "clear pass" compliance with the determined odour criterion. Where the assessment cannot demonstrate a "clear pass" with the odour criterion, a modified development proposal may be required.

  The EPA may also require that a contingency plan be developed to address unpredicted post development odour impacts. This may included "end of shed" technology and vegetation buffers to ensure that the proponent can comply with their obligations under section 129 of the Protection of the Environment Act to prevent off site offensive odours.

2 Waste Water

- Contaminated wash down from shed cleaning is proposed to be evaporated in small holding ponds near each farm complex. Specific detail on containment and monitoring of this wastewater is necessary given the location of the development in the catchment of Lake Keepit.

3 Mass deaths

- The size of the development warrants a detailed mass death disposal plan to protect the environment. This will need to provide sufficient confidence that all birds can be quickly disposed of in accordance with best practice management.

In carrying out the assessment, the proponent should also refer to the relevant guidelines listed in Attachment B and any relevant industry codes of practice and best practice management guidelines.

Please note that this response does not cover biodiversity or Aboriginal cultural heritage issues, which are the responsibility of the Office of Environment and Heritage.

The Proponent should be made aware that any commitments made in the EIS may be formalised as approval conditions and may also be placed on an environment protection licence (EPL) if applicable, as formal licence conditions.

The Proponent should be made aware that, consistent with provisions under Part 9.4 of the *Protection of the Environment Operations Act 1997* (the Act) the EPA may require the provision of a financial assurance and/or assurances. The amount and form of the assurance(s) are determined by the EPA and included as a condition in an Environment Protection Licence (EPL).

In addition, the EPA requires all holders of licences to prepare, implement and annually test a Pollution Incident Response Management Plan (PIRMP) in accordance with Section 153A of the Act.

Yours sincerely

.....

Robert O'Hern

Head Regional Operation Unit

North - Armidale

(by Delegation)

ATTACHMENT A: ENVIRONMENTAL IMPACT STATEMENT (EIS) REQUIREMENTS FOR THE PROPOSED RUSHES CREEK POULTRY PRODUCTION FARM

1 Environmental impacts of the project

1.1 Impacts related to the following environmental issues need to be assessed, quantified and reported on:

- Air Issues
  - Air quality
- Noise and vibration
- Waste including hazardous materials and radiation
  - General waste – disposal options
  - Hazardous materials and radiation
- Water and Soils
  - Soils - general
  - Water quality - catchment description, water balance

The EIS should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A list of guidelines is included in Attachment B.

2 Licensing requirements

2.1 On the basis of the information submitted to date, the proposal constitutes one or more scheduled activities as defined in Schedule 1 of the Protection of the Environment Operations Act 1997 the Act) and will therefore require an Environment Protection Licence (EPL) if approval is granted. The EIS should address the requirements of Section 45 of the Act, determining the extent of each impact and providing sufficient information to enable the EPA to determine appropriate limits for the EPL.

2.1. Should project approval be granted, the proponent will need to make a separate application to the EPA for an EPL for the proposed facility prior to undertaking any on site works. Additional information is available through the *EPA Guide to Licensing* document (www.epa.nsw.gov.au/licensing/licenceguide.htm).

SPECIFIC ISSUES

3 Air issues

The EIS should include an air quality impact assessment (AQIA) and should comprise the following:

3.1. An assessment of the risk associated with potential discharges of fugitive and point source emissions for all stages of the proposal. Assessment of risk relates to environmental harm, risk to human heath and amenity.

3.2. Justification of the level of assessment undertaken on the basis of risk factors, including but not limited to:

- the location of the proposal;
- characteristics of the receiving environment; and
- the type and quantity of pollutants emitted.

3.3. A description of the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to:
- meteorology and climate;
- topography;
- topography;
- surrounding land-use; receptors; and
- ambient air quality.

3.4. Inclusion of a detailed description of the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of all emissions must be provided.

3.5. Inclusion of a consideration of 'worst case' emission scenarios and impacts at proposed emission limits.

3.6. Accounting for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.

3.7. Inclusion of air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf.

3.8. A demonstration of the proposal's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997)* and the *POEO (Clean Air) Regulation 2010*. Particular consideration should be given to section 129 of the POEO Act concerning control of "offensive odour".

3.9. Details of emission control techniques/practices that will be employed by the proposal.

Odour

3.10. An investigation and assessment of odour impacts likely to be associated with cold air drainage effects on all identified and potential receivers.

3.11. A requirement to install a meteorological station as soon as possible on or near the proposed site to obtain site-specific meteorological data for a minimum of 3 months and ideally 6 to 12 months to aid in refining odour assessment and modelling.

3.12. Collection of wind speed data using an ultrasonic wind speed sensor to ensure accurate representation of low wind speed frequencies to allow more accurate prediction of likely katabatic impacts on receivers.

3.13. Improved and stronger justification of the K-Factor proposed to be used in updated odour modelling for the project.

3.14. The use of a more conservative odour impact assessment criterion may be appropriate in assessing odour impacts in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* given that the population of the affected community is considered by the EPA to be higher than the figure used in odour modelling in SLR Consulting's preliminary environmental assessment prepared 3 June 2016.

3.15. Include a consideration of 'worst case' emission scenarios, and sensitivity analysis around the timing of peak emissions (i.e. different initial placement dates).

3.16. Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.

3.17. Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2005) http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf and the *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'* (TRC Environmental Corporation, 2011) available at: http://www.epa.nsw.gov.au/resources/air/CALPUFFModelGuidance.pdf.

3.18. Demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997)* and the *POEO (Clean Air) Regulation (2002)*. Particular consideration should be given to section 129 of the POEO Act concerning control of "offensive odour".

3.19. Odour emissions must be assessed in accordance with the *Technical Framework - Assessment and Management of Odour from Stationary Sources in NSW* and/or the *Technical Notes - Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006) available at: http://www.epa.nsw.gov.au/air/odour.htm. Any odour dispersion modelling should also be consistent with the *Best Practice Guidance for the Queensland Poultry Industry – Plume dispersion Modelling and Meteorological Processing* available at: https://www.daff.qld.gov.au/__data/assets/pdf_file/0004/60358/Poultry-Modelling-Guidance-Report-2.pdf.

3.20. Detail emission control techniques/practices that will be employed by the proposal

4 Noise and Vibration

In relation to noise, the following matters should be addressed (where relevant) as part of the EIS.

General

4.21. Construction noise associated with the proposed development should be assessed using the *Interim Construction Noise Guideline (*DECC, 2009). http://www.epa.nsw.gov.au/noise/constructnoise.htm

4.22. Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the *Assessing Vibration: a technical guideline* (DEC, 2006). http://www.epa.nsw.gov.au/noise/vibrationguide.htm

4.23. If blasting is required for any reasons during the construction or operational stage of the proposed development, blast impacts should be demonstrated to be capable of complying with the guidelines

contained in *Australian and New Zealand Environment Council – Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration* (ANZEC, 1990). http://www.epa.nsw.gov.au/noise/blasting.htm

Industry

4.24. Operational noise from all industrial activities (including private haul roads and private railway lines) to be undertaken on the premises should be assessed using the guidelines contained in the *NSW Industrial Noise Policy* (EPA, 2000) and *Industrial Noise Policy Application Notes.* http://www.epa.nsw.gov.au/noise/industrial.htm

Road

4.25. Noise on public roads from increased road traffic generated by land use developments should be assessed using the guidelines contained in the *Environmental Criteria for Road Traffic Noise* (EPA, 1999). http://www.epa.nsw.gov.au/noise/traffic.htm

5 Waste, chemicals and hazardous materials and radiation

5.1. Identify, characterise and classify all waste that will be generated onsite through excavation, demolition or construction activities, including proposed quantities of the waste.
Note: All waste must be classified in accordance with the *EPA's Waste Classification Guidelines*.

5.2. Identify, characterise and classify all waste that is proposed to be disposed of to an offsite location, including proposed quantities of the waste and the disposal locations for the waste. This includes waste that is intended for re-use or recycling.
Note: All waste must be classified in accordance with the *EPA's Classification Guidelines*.

5.3. Include a commitment to retaining all sampling and classification results for the life of the project to demonstrate compliance with *EPA's Waste Classification Guidelines*.

5.4. Provide details of how waste will be handled and managed onsite to minimise pollution, including:

a) Stockpile location and management
- Labelling of stockpiles for identification, ensuring that all waste is clearly identified and stockpiled separately from other types of material (especially the separation of any contaminated and non-contaminated waste).
- Proposed height limits for all waste to reduce the potential for dust and odour.
- Procedures for minimising the movement of waste around the site and double handling.
- Measures to minimise leaching from stockpiles into the surrounding environment, such as sediment fencing, geofabric liners etc.

b) Erosion, sediment and leachate control including measures to be implemented to minimise erosion, leachate and sediment mobilisation at the site during works. The EIS should show the location of each measure to be implemented. The Proponent should consider measures such as:
- Sediment traps
- Diversion banks
- Sediment fences
- Bunds (earth, hay, mulch)
- Geofabric liners
- Other control measures as appropriate

5.5. The Proponent should also provide details of:

- how leachate from stockpiled waste material will be kept separate from stormwater runoff;
- treatment of leachate through a wastewater treatment plant (if applicable); and
- any proposed transport and disposal of leachate off-site.

5.6. Provide details of how the waste will be handled and managed during transport to a lawful facility. If the waste possesses hazardous characteristics, the Proponent must provide details of how the waste will be treated or immobilised to render it suitable for transport and disposal.

5.7. Include details of all procedures and protocols to be implemented to ensure that any waste leaving the site is transported and disposed of lawfully and does not pose a risk to human health or the environment.

5.8. Include a statement demonstrating that the Proponent is aware of the EPA's requirements with respect to notification and tracking of waste.

5.9. Include a statement demonstrating that the Proponent is aware of the relevant legislative requirements for disposal of the waste, including any relevant Resource Recovery Exemptions, as gazetted by the EPA from time to time.

5.10. Outline contingency plans for any event that affects operations at the site that may result in environmental harm, including: excessive stockpiling of waste, volume of leachate generated exceeds the storage capacity available on-site etc.

6 Water and soils

6.1 Soils

The EIS should include:

6.1.1. An assessment of potential impacts on soil and land resources should be undertaken, being guided by *Soil and Landscape Issues in Environmental Impact Assessment* (DLWC 2000). The nature and extent of any significant impacts should be identified. Particular attention should be given to:

a. Soil erosion and sediment transport - in accordance with *Managing urban stormwater: soils and construction* Volume 1 (Landcom 2004) and Volume 2 (2A Installation of services; 2B Waste landfills; 2C Unsealed roads; 2D Main Road Construction; 2E Mines and Quarries) (DECC 2008).

b. Mass movement (landslides) – in accordance with *Landslide risk management* guidelines presented in Australian Geomechanics Society (2007).

c. Urban and regional salinity – guidance given in the Local Government Salinity Initiative booklets which includes *Site Investigations for Urban Salinity* (DLWC, 2002).

6.1.2. A description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented. Where required, add any specific assessment requirements relevant to the project.

6.2 Water

Describe Proposal

6.2.1. Describe the proposal including position of any intakes and discharges, volumes, water quality and frequency of all water discharges.

6.2.2. Demonstrate that all practical options to avoid discharge have been implemented and environmental impact minimised where discharge is necessary.

6.2.3. Where relevant include a water balance for the development including water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.

Background Conditions

6.3.1. Describe existing surface and groundwater quality. An assessment needs to be undertaken for any water resource likely to be affected by the proposal.

Proponents are generally only expected to source available data and information. However, proponents of relatively large and/or high risk developments may be required to collect some ambient water quality / river flow / groundwater data to enable a suitable level of impact assessment. Issues to include in the description of the receiving waters could also include, for example:

- water chemistry
- a description of receiving water processes, circulation and mixing characteristics and hydrodynamic regimes
- lake or estuary flushing characteristics
- sensitive ecosystems or species conservation values
- specific human uses (e.g. fishing, proximity to recreation areas)

- a description of any impacts from existing industry or activities on water quality
- a description of the condition of the local catchment e.g. erosion, soils, vegetation cover, etc.
- an outline of baseline groundwater information, including, for example, depth to watertable, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users and by the environment
- historic river flow data

6.3.1. State the Water Quality Objectives for the receiving waters relevant to the proposal. These refer to the community's agreed environmental values and human uses endorsed by the NSW Government as goals for ambient waters (http://www.environment.nsw.gov.au/ieo/index.htm). Where groundwater may be impacted the assessment should identify appropriate groundwater environmental values.

6.3.2. State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC (2000) Guidelines for Fresh and Marine Water Quality (http://www.environment.gov.au/water/policy-programs/nwqms/).

6.3.3. State any locally specific objectives, criteria or targets which have been endorsed by the NSW Government.

Impact Assessment

6.4.1. Describe the nature and degree of impact that any proposed discharges will have on the receiving environment.

Depending on the nature, scale and/or risk of the proposal, this could include specific requirements to consider impacts on, for example:

- water circulation, current patterns, water chemistry and other appropriate characteristics such as clarity, temperature, nutrient and toxicants
- changes to hydrology (including drainage patterns, surface runoff yield, flow regimes, and groundwater)
- disturbance of acid sulphate soils and potential acid sulfate soils
- stream bank stability and impacts on macro invertebrates

Depending on the nature, scale and/or risk of the proposal, modelling, monitoring, or both, may need to be undertaken to assess the potential impact of discharges on the receiving environment. If modelling is required to assess the potential impact of any discharge(s), this could include, for example:

- a range of scenarios that encompass any variations in discharge quality and quantity as well as the relevant range of environmental conditions of the receiving waters. The scenarios could describe a set of worst-case conditions and typical conditions to ensure that both acute and chronic impacts are assessed,
- assumptions used in the modelling, including identification and discussion of the limitations and assumptions to ensure full consideration of all factors, including uncertainty in predictions.

6.4.2. Assess impacts against the relevant ambient water quality outcomes.

Demonstrate how the proposal will be designed and operated to:

- protect the Water Quality Objectives for receiving waters where they are currently being achieved; and
- contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.

6.4.3. Where a discharge is proposed that includes a mixing zone, the proposal should demonstrate how wastewater discharged to waterways will ensure the ANZECC (2000) water quality criteria for relevant chemical and non-chemical parameters are met at the edge of the initial mixing zone of the discharge, and that any impacts in the initial mixing zone are demonstrated to be reversible.

6.4.4. Assess impacts on groundwater and groundwater dependent ecosystems.

6.4.5. Describe how stormwater will be managed both during and after construction.

Monitoring

6.5.1. Describe how predicted impacts will be monitored and assessed over time.

For relatively large and/or high risk developments, proponents should develop a water quality and aquatic ecosystem monitoring program to monitor the responses for each component or process that affects the Water Quality Objectives that includes, for example:

- adequate data for evaluating compliance with water quality standards and/or Water Quality Objectives,
- measurement of pollutants identified or expected to be present in any discharge.

Water quality monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (http://www.epa.nsw.gov.au/resources/legislation/approvedmethods-water.pdf).

ATTACHMENT B: GUIDANCE MATERIAL

Title	Web address
Relevant Legislation	
Contaminated Land Management Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+140+1997+cd+0+N
Environmentally Hazardous Chemicals Act 1985	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+14+1985+cd+0+N
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
Best Practice Management for Meat Chicken Production in NSW (DPI, 2012)	http://www.dpi.nsw.gov.au/agriculture/livestock/poultry/development/bpm
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+2000+cd+0+N
Licensing	
Guide to Licensing	www.epa.nsw.gov.au/licensing/licenceguide.htm
Air Issues	
Air Quality	
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf
Technical framework: Assessment and management of odour from stationary sources in NSW (DEC, 2006)	http://www.epa.nsw.gov.au/air/odour.htm
Technical notes: Assessment and management of odour from stationary sources in NSW (DEC, 2006)	http://www.epa.nsw.gov.au/air/odour.htm
Level 1 odour assessment calculator for meat chicken (broiler) farm developments	http://www.epa.nsw.gov.au/air/odour.htm
Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia' (TRC Environmental Corporation, 2011)	http://www.epa.nsw.gov.au/resources/air/CALPUFFModelGuidance.pdf
Best Practice Guidance for the Queensland Poultry Industry – Plume dispersion Modelling and Meteorological Processing (PAE Holmes, 2011)	https://www.daff.qld.gov.au/__data/assets/pdf_file/0004/60358/Poultry-Modelling-Guidance-Report-2.pdf

POEO (Clean Air) Regulation 2010	http://www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+428+2010+cd+0+N
Noise and Vibration	
Interim Construction Noise Guideline (DECC, 2009)	http://www.epa.nsw.gov.au/noise/constructnoise.htm
Assessing Vibration: a technical guideline (DEC, 2006)	http://www.epa.nsw.gov.au/noise/vibrationguide.htm
NSW Industrial Noise Policy (EPA, 2000) and Application Notes	http://www.epa.nsw.gov.au/noise/industrial.htm
NSW Road Noise Policy (DECCW, 2011)	http://www.epa.nsw.gov.au/noise/traffic.htm
Rail Infrastructure Noise Guideline (EPA, 2013)	http://www.epa.nsw.gov.au/noise/railinfranoise.htm
Environmental assessment requirements for rail traffic-generating developments	http://www.epa.nsw.gov.au/noise/railnoise.htm

Waste, Chemicals and Hazardous Materials and Radiation	
Waste	
Environmental Guidelines: Solid Waste Landfills (EPA, 1996)	http://www.epa.nsw.gov.au/resources/waste/envguidlns/solidlandfill.pdf
Draft Environmental Guidelines - Industrial Waste Landfilling (April 1998)	http://www.epa.nsw.gov.au/resources/waste/envguidlns/industrialfill.pdf
Waste Classification Guidelines (DECC, 2009)	http://www.epa.nsw.gov.au/waste/envguidlns/index.htm
Resource recovery exemption	http://www.epa.nsw.gov.au/waste/RRecoveryExemptions.htm
Chemicals subject to Chemical Control Orders	
Chemical Control Orders (regulated through the EHC Act)	http://www.epa.nsw.gov.au/pesticides/CCOs.htm
National Protocol - Approval/Licensing of Trials of Technologies for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
National Protocol for Approval/Licensing of Commercial Scale Facilities for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
Water and Soils	
Acid sulphate soils	
Coastal acid sulfate soils guidance material	http://www.environment.nsw.gov.au/acidsulfatesoil/
Acid Sulfate Soils Planning Maps	http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm
Contaminated Sites Assessment and Remediation	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.planning.nsw.gov.au/assessingdev/pdf/gu_contam.pdf
Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000)	http://www.epa.nsw.gov.au/resources/clm/20110650consultantsglines.pdf
Guidelines for the NSW Site Auditor Scheme - 2nd edition (DEC, 2006)	http://www.epa.nsw.gov.au/resources/clm/auditorglines06121.pdf
Sampling Design Guidelines (EPA, 1995)	Available by request from EPA's Environment Line

National Environment Protection (Assessment of Site Contamination) Measure 1999 (or update)	http://www.scew.gov.au/nepms/assessment-site-contamination
Soils – general	
Managing land and soil	http://www.environment.nsw.gov.au/soils/landandsoil.htm
Managing urban stormwater for the protection of soils	http://www.environment.nsw.gov.au/stormwater/publications.htm
Landslide risk management guidelines	http://www.australiangeomechanics.org/resources/downloads/
Site Investigations for Urban Salinity (DLWC, 2002)	http://www.environment.nsw.gov.au/resources/salinity/booklet3siteinvestigationsforurbansalinity.pdf
Local Government Salinity Initiative Booklets	http://www.environment.nsw.gov.au/salinity/solutions/urban.htm
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	Contact the EPA on 131555
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf

File No: NTH16/00056/02
Your Ref: SSD_7704

The Director
Industry Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Sally Munk – Senior Environmental Planner

Dear Sir/Madam

Secretary's Environmental Assessment Requirements SSD 7704 – Poultry Production Rushes Creek

I refer to your email of 16 June 2016 requesting input to the Secretary's Environmental Assessment Requirements (EARs) for the abovementioned state significant development.

Roles and Responsibilities

The key interests for Roads and Maritime Services are the safety and efficiency of the road network, traffic management, the integrity of infrastructure assets and the integration of land use and transport.

The Oxley Highway is a classified (state) road. Tamworth Regional Council and Gunnedah Shire Council are the Roads Authorities for all public roads in their respective local government areas in accordance with Section 7 of the *Roads Act 1993*. Roads and Maritime is the Roads Authority for freeways and has responsibilities for classified roads in accordance with the Act.

Roads and Maritime Response

Roads and Maritime requests that the Environmental Assessment be supported by a Traffic Impact Assessment (TIA) prepared by a suitably qualified person in accordance with the Austroads Guide to Traffic Management Part 12, the complementary Roads and Maritime Supplement and RTA Guide to Traffic Generating Developments. The TIA is to address the following;

- The total impact of existing and proposed development on the road network with consideration for a 10 year horizon.
- The peak daily volume and distribution of traffic generated by the proposed development.
- Intersection sight distances at key intersections along the primary haulage route/s.
- Existing and proposed site access standards.
- Details of impacts on, and proposed improvements to, intersections along the primary haulage route/s.
- Details of servicing and parking arrangements.

- Impact on public transport (public and school bus routes) and consideration for alternative transport modes such as walking and cycling.
- Impacts of road traffic noise and dust generated along the primary haulage route/s.
- Consideration for the preparation of a Code of Conduct for haulage operators, which could include, but not be limited to;
    a. A map of the primary haulage route/s highlighting critical locations.
    b. Safety initiatives for haulage through residential areas and/or school zones.
    c. An induction process for vehicle operators and regular toolbox meetings.
    d. A complaints resolution and disciplinary procedure.
    e. Any community consultation measures for peak haulage periods.

Where road safety concerns are identified at a specific location along the identified haulage route/s, Roads and Maritime suggests that the TIA be supported by a targeted Road Safety Audit undertaken by suitably qualified persons.

The current Austroads Guidelines, Australian Standards and Roads and Maritime Supplements are to be adopted for any proposed works on the classified road network.

The Developer would be required to enter into a 'Works Authorisation Deed' (WAD) with Roads and Maritime for any works deemed necessary on the classified road network. The developer would be responsible for all costs associated with the works and administration for the WAD

Further information on undertaking private developments adjacent to classified roads can be accessed at:

http://www.rms.nsw.gov.au/projects/planning-principles/index.html

Advice to the Consent Authority

Roads and Maritime highlights the Consent Authority is responsible for considering the environmental impacts of any road works which are ancillary to the development. This includes any works which form part of the proposal and/or any works deemed necessary to include as requirements in the conditions of development consent.

If you have any further enquiries regarding the above comments please contact Liz Smith, Manager Land Use Assessment on (02) 6640 1362 or via email at: development.northern@rms.nsw.gov.au

Yours faithfully

30 June 2016
for Monica Sirol
Network & Safety Manager, Northern Region

NSW GOVERNMENT | Department of Primary Industries

OUT16/25037

Ms Sally Munk
Industry Assessments
NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Sally.munk@planning.nsw.gov.au

Dear Ms Munk

Poultry Production Farm, Rushes Creek (*SSD 7704*)
Request for Secretary's Environmental Assessment Requirements

I refer to your email dated 16 June to the Department of Primary Industries in respect to the above matter. Comment has been sought from relevant divisions of DPI. Any further referrals to DPI can be sent by email to landuse.enquiries@dpi.nsw.gov.au.

DPI has reviewed the request and recommends that the following matters be addressed in the SEARs:

- The proposal should consider the guidelines for Best Practice Management for Meat Chicken Production in NSW. The proponent should provide justification where they propose that the standard does not apply or where the development diverges from the standard.

- Adequate consultation with the surrounding Landholders and community should be undertaken. The consultation program should consider and avoid key periods for Agricultural activities such as Harvest, Sowing, Sales and Holiday periods. The issues identified during consultation and measures to address these issues should be stated in the Environmental Impact Statement.

- Landuse conflict arising from odour from the poultry industry is a significant issue that has the potential to inflame community tensions and prevent future poultry development in the region. A carefully considered approach to odour modelling, site selection and mitigation measures should be adopted.

It is further recommended that the EIS be required to include:

- Assessment of any volumetric water licensing requirements required for the project, including the identification of an adequate and secure water supply

for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This should also include an assessment of the current market depth where water entitlement is required to be purchased.

- A detailed and consolidated site water balance, including a table outlining inputs, water use, outputs.
- A detailed description of surface water management on the site including proposed sediment basins and information on whether the basin will be lined.
- A detailed description of groundwater and surface water resources (both quality and quantity) on the site and adjacent to the site. This should include a description of potential impacts and proposed mitigation measures.
- Assessment of impacts on related infrastructure, adjacent licensed water users, basic landholder rights and groundwater dependent ecosystems and measures proposed to reduce and mitigate these impacts.
- A description of proposed surface and groundwater monitoring activities and methodologies. DPI Water would require a number of monitoring bores across the site to monitor potential impacts to groundwater quality particularly with regards to the proposed sediment basins and swales. The EIS should include a groundwater monitoring plan for the project.
- Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.
- The EIS will need to identify all riparian areas on the site including any creeks, rivers, drainage lines and outline any impacts the development may have on these areas, outline the intended management of these areas, including monitoring and mitigation measures, or any works proposed for these areas. All watercourses and drainage lines in the area should be clearly located on a plan in the EIS.

  It is important appropriate buffers are provided adjacent to all watercourses and drainage lines affected by the development.

  Design and construction of works within 40 metres of watercourses are to be in accordance with the "*Guidelines for Controlled Activities on Waterfront Land*" (DPI 2012).

- The NSW Farm Dams Policy must be addressed in the EIS and the proposal needs to satisfy the Harvestable Rights Order published in accordance with section 54 of the *Water Management Act 2000*. Any current or additional dams, storages, detention basins constructed as part of the development will need to be in accordance with this policy or be otherwise appropriately approved and volumes of water taken in excess of Harvestable Rights need to be licenced.

- The EIS must address erosion and sediment control measures on the site during the construction and operations. It is important any riparian areas adjacent to the site are not affected by the proposed development.

- Consideration of all relevant State and Federal policies and guidelines.

- A statement of where each element of the SEARs is addressed in the EIS (i.e. in the form of a table).

Further detailed generic assessment requirements that may assist the proponent are included at **Attachment A** and **B**.

Yours sincerely

Mitchell Isaacs
Director, Planning Policy & Assessment Advice

Attachment A

Poultry Production Farm, Rushes Creek (*SSD 7704*)
Request for Secretary's Environment Assessment Requirements
Detailed comments – DPI Water

DPI Water General Assessment Requirements for general projects

The following detailed assessment requirements are provided to assist in adequately addressing the assessment requirements for this proposal.

For further information visit the DPI Water website, www.water.nsw.gov.au

Key Relevant Legislative Instruments

This section provides a basic summary to aid proponents in the development of an Environmental Impact Statement (EIS), and should not be considered a complete list or comprehensive summary of relevant legislative instruments that may apply to the regulation of water resources for a project.

The EIS should take into account the objects and regulatory requirements of the *Water Act 1912* (WA 1912) and *Water Management Act 2000* (*WMA 2000*), and associated regulations and instruments, as applicable.

Water Management Act 2000 (WMA 2000)
Key points:

- Volumetric licensing in areas covered by water sharing plans
- Works within 40m of waterfront land
- SSD & SSI projects are exempt from requiring water supply work approvals and controlled activity approvals as a result of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*.
- No exemptions for volumetric licensing apply as a result of the *EP&A Act*.
- Basic landholder rights, including harvestable rights dams
- Aquifer interference activity approval and flood management work approval provisions have not yet commenced and are regulated by the *Water Act 1912*
- Maximum penalties of $2.2 million plus $264,000 for each day an offence continues apply under the *WMA 2000*

Water Act 1912 (WA 1912)
Key points:

- Volumetric licensing in areas where no water sharing plan applies
- Monitoring bores
- Aquifer interference activities that are not regulated as a water supply work under the *WMA 2000*.
- Flood management works
- No exemptions apply to licences or permits under the *WA 1912* as a result of the *EP&A Act*.
- Regulation of water bore driller licensing.

Water Management (General) Regulation 2011
Key points:

- Provides various exemptions for volumetric licensing and activity approvals
- Provides further detail on requirements for dealings and applications.

Water Sharing Plans – these are considered regulations under the *WMA 2000*

Access Licence Dealing Principles Order 2004

Harvestable Rights Orders

Water Sharing Plans

It is important that the proponent understands and describes the ground and surface water sharing plans, water sources, and management zones that apply to the project. The relevant water sharing plans can be determined spatially at www.ourwater.nsw.gov.au. Multiple water sharing plans may apply and these must all be described.

The *Water Act 1912* applies to all water sources not yet covered by a commenced water sharing plan.

The EIS is required to:

- Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing Plan including rules for access licences, distance restrictions for water supply works and rules for the management of local impacts in respect of surface water and groundwater sources, ecosystem protection (including groundwater dependent ecosystems), water quality and surface-groundwater connectivity.
- Provide a description of any site water use (amount of water to be taken from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.
- Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP, including:
    - Sufficient market depth to acquire the necessary entitlements for each water source.
    - Ability to carry out a "dealing" to transfer the water to relevant location under the rules of the WSP.
    - Daily and long-term access rules.
    - Account management and carryover provisions.
    - Provide a detailed and consolidated site water balance.

Further detail on licensing requirements is provided below.

Relevant Policies and Guidelines

The EIS should take into account the following policies (as applicable):

- NSW Guidelines for Controlled Activities on Waterfront Land (NOW, 2012)
- NSW Aquifer Interference Policy (NOW, 2012)
- Risk Assessment Guidelines for Groundwater Dependent Ecosystems (NOW, 2012)
- Australian Groundwater Modelling Guidelines (NWC, 2012)
- NSW State Rivers and Estuary Policy (1993)
- NSW Wetlands Policy (2010)
- NSW State Groundwater Policy Framework Document (1997)
- NSW State Groundwater Quality Protection Policy (1998)
- NSW State Groundwater Dependent Ecosystems Policy (2002)
- NSW Water Extraction Monitoring Policy (2007)

DPI Water policies can be accessed at the following links:
http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/default.aspx
http://www.water.nsw.gov.au/Water-licensing/Approvals/Controlled-activities/default.aspx
An assessment framework for the NSW Aquifer Interference Policy can be found online at: http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/Aquifer-interference.

Licensing Considerations

The EIS is required to provide:

- Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site – such as evaporative loss from open voids or inflows).
- Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water.
- Explanation of how the required water entitlements will be obtained (i.e. through a new or existing licence/s, trading on the water market, controlled allocations etc.).
- Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc).
- Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing.
- Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storages
- Details on the location, purpose, size and capacity of any new proposed dams/storages.
- Applicability of any exemptions under the *Water Management (General) Regulation 2011* to the project.

Water allocation account management rules, total daily extraction limits and rules governing environmental protection and access licence dealings also need to be considered.

The Harvestable Right gives landholders the right to capture and use for any purpose 10% of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor. The MHRDC includes the capacity of all existing dams on the property that do not have a current water licence. Storages capturing up to the harvestable right capacity are not required to be licensed but any capacity of the total of all storages/dams on the property greater than the MHRDC may require a licence.

For more information on Harvestable Right dams, including a calculator, visit:
http://www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff

Dam Safety

Where new or modified dams are proposed, or where new development will occur below an existing dam, the NSW Dams Safety Committee should be consulted in relation to any safety issues that may arise. Conditions of approval may be recommended to ensure safety in relation to any new or existing dams.
See www.damsafety.nsw.gov.au for further information.

Surface Water Assessment

The predictive assessment of the impact of the proposed project on surface water sources should include the following:

- Identification of all surface water features including watercourses, wetlands and floodplains transected by or adjacent to the proposed project.
- Identification of all surface water sources as described by the relevant water sharing plan.
- Detailed description of dependent ecosystems and existing surface water users within the area, including basic landholder rights to water and adjacent/downstream licensed water users.
- Description of all works and surface infrastructure that will intercept, store, convey, or otherwise interact with surface water resources.
- Assessment of predicted impacts on the following:
    - flow of surface water, sediment movement, channel stability, and hydraulic regime,
    - water quality,
    - flood regime,
    - dependent ecosystems,
    - existing surface water users, and
    - planned environmental water and water sharing arrangements prescribed in the relevant water sharing plans.

Groundwater Assessment

To ensure the sustainable and integrated management of groundwater sources, the EIS needs to include adequate details to assess the impact of the project on all groundwater sources.

Where it is considered unlikely that groundwater will be intercepted or impacted (for example by infiltration), a brief site assessment and justification for the minimal impacts may be sufficient, accompanied by suitable contingency measures in place in the event that groundwater is intercepted, and appropriate measures to ensure that groundwater is not contaminated.

Where groundwater is expected to be intercepted or impacted, the following requirements should be used to assist the groundwater assessment for the proposal.

- The known or predicted highest groundwater table at the site.
- Works likely to intercept, connect with or infiltrate the groundwater sources.
- Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.
- Bore construction information is to be supplied to DPI Water by submitting a “Form A” template. DPI Water will supply “GW” registration numbers (and licence/approval numbers if required) which must be used as consistent and unique bore identifiers for all future reporting.
- A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).
- Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.
- The predicted impacts of any final landform on the groundwater regime.
- The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.

- An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.
- An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).
- Measures proposed to protect groundwater quality, both in the short and long term.
- Measures for preventing groundwater pollution so that remediation is not required.
- Protective measures for any groundwater dependent ecosystems (GDEs).
- Proposed methods of the disposal of waste water and approval from the relevant authority.
- The results of any models or predictive tools used.

Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- Any proposed monitoring programs, including water levels and quality data.
- Reporting procedures for any monitoring program including mechanism for transfer of information.
- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

Groundwater Dependent Ecosystems

The EIS must consider the potential impacts on any Groundwater Dependent Ecosystems (GDEs) at the site and in the vicinity of the site and:

- Identify any potential impacts on GDEs as a result of the proposal including:
  - the effect of the proposal on the recharge to groundwater systems;
  - the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections; and
  - the effect on the function of GDEs (habitat, groundwater levels, connectivity).
- Provide safeguard measures for any GDEs.

Watercourses, Wetlands and Riparian Land

The EIS should address the potential impacts of the project on all watercourses likely to be affected by the project, existing riparian vegetation and the rehabilitation of riparian land. It is recommended the EIS provides details on all watercourses potentially affected by the proposal, including:

- Scaled plans showing the location of:
  - wetlands/swamps, watercourses and top of bank;
  - riparian corridor widths to be established along the creeks;

  - existing riparian vegetation surrounding the watercourses (identify any areas to be protected and any riparian vegetation proposed to be removed);
  - the site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and
  - proposed location of any asset protection zones.
- Photographs of the watercourses/wetlands and a map showing the point from which the photos were taken.
- A detailed description of all potential impacts on the watercourses/riparian land.
- A detailed description of all potential impacts on the wetlands, including potential impacts to the wetlands hydrologic regime; groundwater recharge; habitat and any species that depend on the wetlands.
- A description of the design features and measures to be incorporated to mitigate potential impacts.
- Geomorphic and hydrological assessment of water courses including details of stream order (Strahler System), river style and energy regimes both in channel and on adjacent floodplains.

Landform rehabilitation

Where significant modification to landform is proposed, the EIS must include:

- Justification of the proposed final landform with regard to its impact on local and regional surface and groundwater systems;
- A detailed description of how the site would be progressively rehabilitated and integrated into the surrounding landscape;
- Outline of proposed construction and restoration of topography and surface drainage features if affected by the project; and
- An outline of the measures to be put in place to ensure that sufficient resources are available to implement the proposed rehabilitation.

Consultation and general enquiries
General licensing enquiries can be made to Advisory Services: water.enquiries@dpi.nsw.gov.au, 1800 353 104.

End Attachment A

Attachment B

Poultry Production Farm, Rushes Creek (*SSD 7704*)
Request for Secretary's Environment Assessment Requirements
Detailed comments – DPI Agriculture

Summary of issues outlined in 'Best Practice Management for Meat Chicken Production in NSW' guidelines.

ISSUE	Detail
Site suitability	Determine whether the size of the site is adequate for: ● the poultry sheds and feed silos, ● any amenity block, ● storage sheds, ● internal roads, ● litter composting and stockpile areas, ● dead bird management and storage areas. Size of site, topography and drainage and its location within the area and impact on the development's design. Separation distances and management practices to minimise odour, dust and noise sources to sensitive receptors (including residences, agricultural operations; other similar existing developments present in the immediate range of the proposed development).
Biosecurity risk assessment	Consideration of separation distances to other poultry farms to minimize disease outbreaks. Address management factors that can assist in disease management including: ● the management of litter, feed and water, ● disinfection of sheds, ● vermin removal,

ISSUE	Detail
	• disposal of used litter and • dead bird management. If dead birds are to be composted, composting management needs to be outlined. Separation distances and management practices to minimise odour, dust and noise sources to sensitive receptors.
	Consideration of other poultry farms (including any breeder or duck farms) and potential water bird habitat in the locality (see Section 3.2.5 Biosecurity separation page 13) of Best Practice Management for Meat Chicken Production in New South Wales Site Selection and Development http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0019/448210/BPMformeatchickenproductioninnswmanual1.pdf).
Power and water supply	Power supply is to be assessed for its ability to be sufficient for farm requirements including accessibility to 3 phase power, back up arrangements in case of power failure and sufficient power for future farm expansion. Water should be provided to be sufficient for bird drinking, shed cooling, shed clean out, bush fire management and other facilities such as rest rooms, landscaping requirements etc. The source of water and treatment method should also be outlined as well as back up arrangements in case of loss of supply or break down.
Bushfire risk	Risk assessment level and mitigation plan developed to address this.
Road access	Road access should be assessed for its suitability to provide all weather vehicle access to support articulated vehicles for the transport of feed, litter, birds and waste etc. Consideration of the route for truck movements needs to be taken into account so that impacts on sensitive receptors is minimised. Internal access also needs to be considered to avoid impacts and minimise

ISSUE	Detail
	noise and dust.
Shed design	Sheds should be designed to be able to control the internal environment regardless of the external environment conditions. Distances between sheds should enable vehicles to maneuver between sheds. Sheds are to have an impermeable floor and stormwater management around sheds is to be managed.
Surface & Groundwater	Farm management to minimise off site surface water movement and groundwater interference.
Community consultation and management	Outline consultation undertaken with neighbours and notifications within the wider area. Include details of a complaints register that includes reporting and investigating procedures and timelines, and liaison with Council in relation to complaint issues.
Landscaping	Amenity impacts and arrangements to mitigate visual impacts.
Bird mortality and waste management	Details of litter storage and dead bird management areas need to be provided as well as outlining type of dead bird composting system, if applicable and the fate and management of the litter. Any poultry reuse areas should be appropriately designed on the basis of a nutrient budget that considers proposed annual litter volumes and nutrient loads, soil types, current soil nutrient levels and pasture use rates. This should list; ● relevant contact details within and off the farm, ● identify roles,

ISSUE	Detail
	● quarantine measures and contingency plans for managing the disposal of dead birds.
Contingency and Environmental Management Plan?	Commitment to the preparation of an Emergency Management plan that outlines procedures and responsibilities for responding to bushfire threats and for possible mass deaths events which might result from extreme climatic conditions, routine or exotic disease outbreaks. Details of review and updates of this plan.
Animal welfare	Demonstrated compliance with the Model Code of Practice: Domestic Poultry (www.publish.csiro.au) (ARMCANZ 2002) and the Model Code of Practice: Land transport of poultry (www.publish.csiro.au)

End Attachment B

Sally Munk

From: Leanne Dunstan <leanne.dunstan@crownland.nsw.gov.au>
Sent: Thursday, 7 July 2016 9:29 AM
To: Sally Munk
Cc: Kylee Warner; wrike+97063636@wrike.com
Subject: Fwd: Lake Keepit State Park Affected - Request for Secretary's Environmental Assessment Requirements - Proposed Poultry Production Farm, Rushes Creek (SSD 7704)

Hi Sally,

Please see below the NSW Crown Holiday Park Trust (NSWCHPT) response regarding the proposed development for poultry farm near Lake Keepit. Thank you for accepting these late comments.

"The proposed development is approximately 9 km north east of Lake Keepit. I have read through the document and I think everything seems to be covered, although I would suggest that the park be noted as a sensitive land use in the vicinity of the proposed farm to ensure potential impacts are identified and addressed. Table 4 identifies separation distances to key features and this is where the park could be covered.
Russell Chaplin

Kind regards,
--
Leanne Dunstan | Senior Natural Resources Management Officer
Department of Primary Industries, Lands
25-27 Fitzroy Street | TAMWORTH NSW 2340
P O Box 2185 | DANGAR NSW 2309
T: 1300 886 235 | F: 02 4925 3517 | E: tamworth.crownlands@crownland.nsw.gov.au
W: www.crownland.nsw.gov.au

Please Note: Our office opening hours are 9.00am to 12.00pm Monday to Friday and outside of these hours by appointment only

DOC16/296417
SSD 7704

Ms Sally Munk
Senior Environmental Planner
Industry Assessments
Department of Planning and Environment
Sally.munk@planning.nsw.gov.au

Dear Ms Munk

Rushes Creek Poultry Farm SEARs – SSD 7704

I refer to your e-mail dated 16 June 2016 seeking input into the Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Assessment (EIS) for the Rushes Creek Poultry Farm (SSD 7704).

The Office of Environment and Hertiage (OEH) has considered your request and provides SEARs for the proposed development in Attachments A and B and guidance material in Attachment C.

OEH recommends the EIS needs to appropriately address the following:

1. Biodiversity and offsetting;
2. Aboriginal cultural heritage;
3. Historic heritage;
4. Water and soils; and
5. Flooding.

OEH notes that there are a number of endangered ecological communities (EECs) and threatened species potentially affected by the development, and that Aboriginal cultural heritage items may also be present.

In particular, there is remnant native vegetation on the development site, and this has the potential to contain EECs including:

- White Box Yellow Box Blakely's Red Gum Woodland;
- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions; and
- Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions.

OEH recommends that the design of the poultry farm and all associated infrastructure (including pipelines, access tracks and residences) avoids areas of native vegetation as much as possible.

Please note that the NSW Biodiversity Offsets Policy for Major Projects http://www.environment.nsw.gov.au/resources/biodiversity/140672biopolicy.pdf is now being implemented. The policy provides a standard method for assessing impacts of major projects on biodiversity and determining offsetting arrangements.

The policy is underpinned by the Framework for Biodiversity Assessment (FBA) http://www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf which contains the assessment methodology that is adopted by the policy to quantify and describe the impact assessment requirements and offset guidance that applies to Major Projects. The FBA must be used by a proponent to assess all biodiversity values on the development site.

If you have any questions regarding this matter further please contact Liz Mazzer on 02 6883 5325 or email liz.mazzer@environment.nsw.gov.au.

Yours sincerely,

STEVEN COX
Senior Team Leader Planning
North West Region

Date: 30 June 2016

Contact officer: LIZ MAZZER
6883 5325

Attachment A - Environmental Assessment Requirements

Attachment B – Species/Populations/Ecological Communities which require further consideration

Attachment C - Guidance material

Attachment A – Standard Environmental Assessment Requirements

Biodiversity

1. Biodiversity impacts related to the proposed development are to be assessed and documented in accordance with the Framework for Biodiversity Assessment, unless otherwise agreed by OEH, by a person accredited in accordance with s142B(1)(c) of the *Threatened Species Conservation Act 1995.*

Aboriginal cultural heritage

2. The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the EIS. This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011) and consultation with OEH regional officers.
3. Where Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the EIS.
4. Impacts on Aboriginal cultural heritage values are to be assessed and documented in the EIS. The EIS must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.

Historic heritage

5. The EIS must provide a heritage assessment including but not limited to an assessment of impacts to *State and local heritage* including conservation areas, natural heritage areas, places of Aboriginal heritage value, buildings, works, relics, gardens, landscapes, views, trees should be assessed. Where impacts to State or locally significant heritage items are identified, the assessment shall:
    a. outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) generally consistent with the NSW Heritage Manual (1996),
    b. be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria),
    c. include a statement of heritage impact for all heritage items (including significance assessment),
    d. consider impacts including, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment (as relevant), and
    e. where potential archaeological impacts have been identified develop an appropriate archaeological assessment methodology, including research design, to guide physical archaeological test excavations (terrestrial and maritime as relevant) and include the results of these test excavations.

Water and soils

6. The EIS must map the following features relevant to water and soils including:
   a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).
   b. Rivers, streams, wetlands, estuaries (as described in Appendix 2 of the Framework for Biodiversity Assessment).
   c. Groundwater.
   d. Groundwater dependent ecosystems.
   e. Proposed intake and discharge locations.

7. The EIS must describe background conditions for any water resource likely to be affected by the development, including:
   a. Existing surface and groundwater.
   b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations.
   c. Water Quality Objectives (as endorsed by the NSW Government http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters.
   d. Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.

8. The EIS must assess the impacts of the development on water quality, including:
   a. The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction.
   b. Identification of proposed monitoring of water quality.

9. The EIS must assess the impact of the development on hydrology, including:
   a. Water balance including quantity, quality and source.
   b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.
   c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.
   d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (eg river benches).
   e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water.
   f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.
   g. Identification of proposed monitoring of hydrological attributes.

Flooding

10. The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including:
    a. Flood prone land
    b. Flood planning area, the area below the flood planning level.
    c. Hydraulic categorisation (floodways and flood storage areas).
11. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 1 in 10 year, 1 in 100 year flood levels and the probable maximum flood, or an equivalent extreme event.
12. The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios:
    a. Current flood behaviour for a range of design events as identified in 11 above. This includes the 1 in 200 and 1 in 500 year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.
13. Modelling in the EIS must consider and document:
    a. The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood.
    b. Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazards and hydraulic categories.
    c. Relevant provisions of the NSW Floodplain Development Manual 2005.
14. The EIS must assess the impacts on the proposed development on flood behaviour, including:
    a. Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.
    b. Consistency with Council floodplain risk management plans.
    c. Compatibility with the flood hazard of the land.
    d. Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land.
    e. Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.
    f. Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
    g. Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the SES and Council.
    h. Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the SES and Council.
    i. Emergency management, evacuation and access, and contingency measures for the development considering the full range or flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the SES.
    j. Any impacts the development may have on the social and economic costs to the community as consequence of flooding.

Attachment B

Table 1

Species/Populations/Ecological Communities which require further consideration

Class	Scientific Name	Common Name	NSW Status	Comm Status
EEC	*Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions*	Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	EEC	Endangered
Fauna	*Anthochaera phrygia*	Regent Honeyeater	Critically Endangered	Critically Endangered
Flora	*Hakea pulvinifera*	Lake Keepit Hakea	Endangered	Endangered

Table 2

Critically endangered entities specifically excluded from requiring further consideration*

Class	Scientific Name	Common Name	NSW Status	Comm Status
EEC	*White Box Yellow Box Blakely's Red Gum Woodland*	White Box Yellow Box Blakely's Red Gum Woodland	EEC	Critically Endangered
Fauna	*Lathamus discolor*	Swift Parrot	Endangered	Critically Endangered

* Further information, as detailed in section 9.2.5.2 of the FBA, is not required for the excluded entities in Table 2. However, assessment of impacts and offset requirements must still be included in the biodiversity assessment report for these entities in accordance with the FBA.

Attachment C – Guidance material

Title	Web address
Relevant Legislation	
Coastal Protection Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+13+1979+cd+0+N
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+1994+cd+0+N
Marine Parks Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+64+1997+cd+0+N
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+1974+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
Threatened Species Conservation Act 1995	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+101+1995+cd+0+N
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+2000+cd+0+N
Wilderness Act 1987	http://www.legislation.nsw.gov.au/viewtop/inforce/act+196+1987+FIRST+0+N
Biodiversity	
NSW Biodiversity Offsets Policy for Major Projects (OEH, 2013)	http://www.environment.nsw.gov.au/resources/biodiversity/140672biopolicy.pdf
Framework for Biodiversity Assessment (OEH, 2013)	http://www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf
Fisheries NSW policies and guidelines	http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,-guidelines-and-manuals/fish-habitat-conservation
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchatoz.aspx
Revocation, recategorisation and road adjustment policy (OEH, 2012)	http://www.environment.nsw.gov.au/policies/RevocationOfLandPolicy.htm
Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/parks/policyRevocations.pdf
Heritage	
The Burra Charter (The Australia ICOMOS charter for places of cultural significance)	http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf
Statements of Heritage Impact 2002 (HO & DUAP)	http://www.environment.nsw.gov.au/resources/heritagebranch/heritage/hmstatementsofhi.pdf
NSW Heritage Manual (DUAP) (scroll through alphabetical list to 'N')	http://www.environment.nsw.gov.au/Heritage/publications/index.htm#M-O

Title	Web address
Aboriginal Cultural Heritage	
Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09781ACHconsultreq.pdf
Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/10783FinalArchCoP.pdf
Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)	http://www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf
Aboriginal Site Recording Form	http://www.environment.nsw.gov.au/resources/parks/SiteCardMainV1_1.pdf
Aboriginal Site Impact Recording Form	http://www.environment.nsw.gov.au/resources/cultureheritage/120558asirf.pdf
Aboriginal Heritage Information Management System (AHIMS) Registrar	http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm
Care Agreement Application form	http://www.environment.nsw.gov.au/resources/cultureheritage/20110914TransferObject.pdf
Water and Soils	
Acid sulphate soils	
Acid Sulfate Soils Planning Maps via 'The NSW Natural Resource Atlas'	www.nratlas.nsw.gov.au/
Acid Sulfate Soils Manual (Stone et al. 1998)	Manual available for purchase from: http://www.landcom.com.au/whats-new/the-blue-book.aspx Chapters 1 and 2 are on DPI's Guidelines Register at: Chapter 1 Acid Sulfate Soils Planning Guidelines: http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%20Acid%20Sulfate%20Soils%20Planning%20Guidelines.pdf Chapter 2 Acid Sulfate Soils Assessment Guidelines: http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%20Acid%20Sulfate%20Soils%20Assessment%20Guidelines.pdf
Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004)	http://www.advancedenvironmentalmanagement.com/Reports/Savannah/Appendix%2015.pdf This replaces Chapter 4 of the Acid Sulfate Soils Manual above.
Flooding and Coastal Erosion	
Reforms to coastal erosion management	http://www.environment.nsw.gov.au/coasts/coastalerosionmgmt.htm
Floodplain development manual	http://www.environment.nsw.gov.au/floodplains/manual.htm
Guidelines for Preparing Coastal Zone Management Plans	Guidelines for Preparing Coastal Zone Management Plans http://www.environment.nsw.gov.au/resources/coasts/130224CZMPGuide.pdf
NSW Climate Impact Profile	NSW Climate Impact Profile
Climate Change Impacts and Risk Management	Climate Change Impacts and Risk Management: A Guide for Business and Government, AGIC Guidelines for Climate Change Adaptation
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm

Title	Web address
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	www.environment.gov.au/water/publications/quality/australian-and-new-zealand-guidelines-fresh-marine-water-quality-volume-1
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	http://deccnet/water/resources/AWQGuidance7.pdf
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf

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D2016/73695

Ms Sally Munk
Senior Environmental Planner
Industry Assessments
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

Dear Ms Munk,

SSD 7704 – Rushes Creek Poultry Production Farm

Thank you for your email dated 16 June 2016 requesting WaterNSW's input for the Secretary's Environmental Assessment Requirements (SEARs) for the above proposal. WaterNSW owns and manages Keepit Dam adjacent to the proposed poultry production farm site, with the proposed 'Farm 1' on a lot directly bordering WaterNSW land.

It is noted that the Preliminary Environmental Assessment (PEA) exhibited for the SEARs preparation is the same version as provided for the planning focus meeting (PFM) held on site on 9 June 2016. WaterNSW attended the PFM and provided comments, which are reiterated in this letter as WaterNSW's key issues and assessment requirements for the proposal:

Land ownership

It is noted that the PEA does not acknowledge WaterNSW as being an adjoining landholder that may be affected by the proposal. The EIS should identify WaterNSW's ownership of the land immediately adjacent to the proposal, including the Keepit Dam impoundment (Lake Keepit), and the potential for the asset to be affected by water extraction and other impacts.

Stormwater

WaterNSW notes that there is a ridge to the west of 'Farm 1' between the proposed site and the boundary with WaterNSW land, precluding the overland flow of stormwater over the western boundary. However, it is also noted that there is a drainage depression running from the northern extent of the proposed 'Farm 1' buildings, which eventually drains into Lake Keepit.

It is noted that the PEA discusses surface water management in terms of clean water diversions around each farm. It does not, however, discuss the management of the diverted stormwater downslope of each farm i.e. whether it is concentrated and diverted into drainage depressions or watercourses.

At the PFM a representative from the proponent's consultant (SLR) stated that Lake Keepit was rarely more than 20% full, and only at full supply level (FSL) after very large flood events. This assumption is not correct. Records indicate that the Lake commonly reaches FSL, and beyond to the design flood level that encroaches on the development site where the aforementioned drainage depression enters the Lake.

The EIS should therefore demonstrate how stormwater diverted around the proposed site is dispersed on the downslope side to avoid erosion and other impacts, and provide correct assumptions regarding the frequency of Lake Keepit being full.

Wastewater and waste management

WaterNSW notes that eight manager's residences are proposed as part of the development, as well as staff amenities. The PEA discusses the treatment of wastewater only. The EIS should include details of effluent disposal in a manner that will not impact clean water overland flows.

The PEA also discusses the use of bunds, grassed swales and sediment basins to manage wash down water from the sheds. The EIS should include details of the maintenance of these swales and sediment basins.

WaterNSW also notes that mass bird mortalities are discussed, however disposal options are not included. The EIS should identify the removal of composted birds and manure and disposal on other sites.

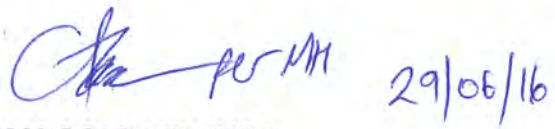
WaterNSW functions

On 1 July 2016 a number of functions, including the management of water supply and delivery, will be transferred from DPI Water to WaterNSW. This may have implications for the water access licencing arrangements being negotiated by the proponent and the current DPI Water as discussed in the PEA, and should be taken into consideration as the project moves forward.

WaterNSW requests that it is consulted during the preparation of the EIS, and the Department continues to consult with us regarding any future developments and SEARs requests for development in proximity to WaterNSW land and assets.

If you have any queries regarding the above please contact Alison Kniha, Environmental Policy and Planning Manager on 4724 2451 or at alison.kniha@waternsw.com.au.

Yours sincerely,



29/06/16

MALCOLM HUGHES
Manager Environment and Planning

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Department of Planning and Environment
GPO BOX 39
SYDNEY NSW 2001

Dear Sir/Madam,

REQUEST FOR SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS PROPOSED POULTRY PRODUCTION FARM, RUSHES CREEK

I refer to your correspondence received 16 June 2016 requesting Council provide comments in relation to the subject proposal and to nominate any issues to be addressed in the Environmental Impact Assessment (EIS). In this regard, the following information is provided:

Public Exhibition

- The public notice should be placed in the Manilla Express (published weekly) in addition to the Northern Daily Leader.
- The EIS should be displayed in Manilla and Tamworth. There is a branch office of Tamworth Regional Council located in Manilla.
- The public notification should include the provision of all documentation on USBs or CDs to the any person who requests a copy, at the locations where the EIS is displayed.

General

- The judgement from the *Woolcott Group Pty Ltd v Rostry Pty Ltd [2015] NSWLEC 46* should be used as a guide with respect to potential impacts, documentation and assessment requirements
- The proposal should consider the Ski Gardens Caravan Park as a receptor.
- The application should detail any public consultation, the issues identified by the public and the manner in which the issues have been addressed prior to the submission of the application.
- Details (including operational details) of any co-use such as grazing and/or cropping on the property should be identified and an assessment of the cumulative impacts undertaken.
- Details of the proposed methods of water supply, water supply requirements and the method in which water will be obtained and stored on the site should be addressed.

- Details of any existing and/or proposed Water Access Licence should be provided, including a contingency in the event water cannot be drawn from the Namoi River because it is not flowing over the weir in Manilla.

- Details of any proposed consolidation and/or subdivision of the land should be provided.

- Details of any existing structures to be demolished or retained should be provided.

- Full operational details, including the detail from the despatch of day old chicks to the site, transportation of mature birds to the processing facility and all associated activities e.g. grain and bedding deliveries should be provided.

- The Department of Primary Industries Best Practice Management for Meat Chicken Production in NSW Parts 1 and 2 should be addressed.

- The potential impact of any views of the sheds, particularly from the west should be considered.

- Contributions pursuant to section 94 of the Environmental Planning and Assessment Act 1979 should be levied in accordance with the Tamworth Regional Council Section 94A (Indirect) Development Contributions Plan 2013.

- Approvals will be required pursuant to section 68 of the Local Government Act 1993 to carry out water supply work, sewerage work and operate a system of sewerage management from Council as the Water Supply Authority.

Roads & Access

- An approval will be required pursuant to section 138 of the Roads Act 1993 from Council as the Local Roads Authority.

- A traffic control plan (TCP) will need to be submitted to Council for approval prior to issue of a Construction Certificate.

- When the driveway intersections and internal roads are being constructed, there will be continuous truck movements into and out of the site for the delivery of gravel. This should be addressed in the Traffic Impact Assessment report.

- The estimated traffic volumes contained in the EIS should be separated into day time and night time trips.

- Any upgrade works to Rushes Creek Road will be subject to the recommendations of the Traffic Impact Assessment report and associated traffic movements into and out of the sites.

- The Traffic Impact Assessment report should address the relevant RMS, AUSTROADS, and Council guidelines/standards.

- The following condition was imposed for "Strathfield" to allow birds to be processed at Oakburn upon commencement of the operations without the need for a modification.

> *All live birds must be processed by one processor only at all times. To achieve this requirement, all live birds collected from the Subject Land must only be delivered to:*

(a) *the Out Street Processing Plant; or*
(b) *once the approved Oakburn Processing Plant becomes operational, the Oakburn Processing Plant.*

Once the Oakburn Processing Plant is fully commissioned, live birds must not be delivered to the Out Street Processing Plant.

Notwithstanding the above, live birds may also be delivered to another suitable processing plant operated by the same processor, outside the Tamworth region, in the case of circumstances which make it unfeasible to deliver live birds to the relevant processing plant in the Tamworth region.

Surface Water Management:

- If the proposed detention basins are designed only for a 1 in 20 year storm event, how is drainage from the development is managed in a larger event?
- A spillway should be designed into each basin, and an overland flow path for water discharged (via the spillways).
- A maintenance plan should be prepared for each of the basins and the drainage swales around the site. This maintenance plan should include (but not be limited to) de-silting of the basins to ensure that the required capacity of the basins in maintained.

If you require any clarification in relation to the matters raised above, please contact Lucy Walker of Council's Development and Approvals Division on the number below.

As you would be aware, the Tamworth region is a core location for the poultry industry and Council encourages and supports all future growth and investment in this sector.

Yours faithfully

Peter Thompson
Director Planning and Compliance

Contact: Lucy Walker (02) 6767 5530 or l.walker@tamworth.nsw.gov.au

Reference: LF9690

30 June 2016

Shire of
Gunnedah
Land of Opportunity

PCU066053

Department Planning & Environment
GPO Box 39
SYDNEY NSW 2001

Sally.munk@planning.nsw.gov.au

29 June 2016

Dear Madam

Re: Request for Secretary's Environmental Assessment Requirements
Proposed Poultry Production Farm, Rushes Creek (SSD 7704)

I refer to your correspondence regarding the abovementioned.

The following comments are provided in regard to the proposal:

- SEPP No. 44 Koala Habitat Protection – the development site is located in the former Manilla Local Government Area, which is listed in Schedule 1 of this SEPP. An assessment under SEPP 44 is required for the proposed development.
- Detailed traffic impact assessment is required, with particularly reference to the intersection of Rushes Creek Road and the Oxley Highway

If you have any questions regarding this matter, please contact Council's Manager Development & Planning, Carolyn Hunt on 6740 2100.

Yours faithfully

Carolyn Hunt
MANAGER DEVELOPMENT & PLANNING

Contact: 02 6740 2100
Reference: 977238
Ch:vg

Department of Planning
Received
7 JUL 2016
Scanning Room

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Appendix C

Air Quality Assessment
(Pacific Environment Limited 2018)



Final Report

ProTen Rushes Creek Poultry Production Complex – Air Quality Assessment

Document Control Number: AQU-QD-006-21099

Date: 22 June 2018

Pacific Environment
an ERM Group company
www.pacific-environment.com

Project Name:	ProTen Rushes Creek Poultry Production Complex – Air Quality Assessment
Document Control Number:	AQU-QD-006-21099
Prepared For:	ProTen c/o SLR Consulting
Approved For Release By:	Bethany Warren
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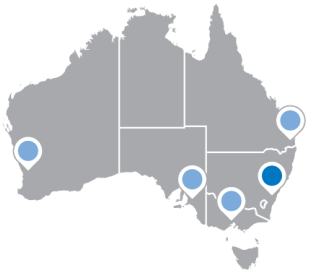
Version	Date	Comment	Prepared by	Reviewed by
R0	14.08.2017	Draft	W. Shillito	G. Galvin
R1	30.10.2017	Final	W. Shillito/J. Cox	J. Cox/ A. Williams
R2	22.06.2018	Final 2	R. Chalmer	B. Warren



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1. Introduction

ERM Australia Pacific Pty Ltd (formally Pacific Environment) was engaged by SLR Consulting Australia Pty Ltd (SLR) on behalf of ProTen Tamworth Limited (ProTen) to prepare an odour and dust assessment of a proposed intensive poultry broiler farm (the "Rushes Creek Poultry Production Complex") located approximately 43 km northwest of Tamworth and 33 km northeast of Gunnedah in the New England North West Region of New South Wales (NSW).

1.1 Secretary's Environmental Assessment Requirements

This air quality assessment has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARs) issued on the 29 June 2016 (Notice Number 1541681; File Number SF 16/24271).

The SEARs relevant to air quality and where they are assessed in the report are detailed below in Table 1-1.

Table 1-1 Secretary's Environmental Assessment Requirements relevant to air quality

Specific issues	Description	Report Section
3.1	An assessment of the risk associated with potential discharges of fugitive and point source emissions for all stages of the proposal. Assessment of risk relates to environmental harm, risk to human health and amenity.	Section 6, 7, 8, 9
3.2	Justification of the level of assessment undertaken on the basis of risk factors, including but not limited to: - the location of the proposal; - characteristics of the receiving environment; and - the type and quantity of pollutants emitted.	Section 1.3, 3, 5
3.3	A description of the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to: - meteorology and climate; - topography; - topography; - surrounding land-use; receptors; and - ambient air quality.	Section 3, 4.1.1, 4.1.4
3.4	Inclusion of a detailed description of the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of all emissions must be provided.	Section 1.2, 5
3.5	Inclusion of a consideration of 'worst case' emission scenarios and impacts at proposed emission limits.	Section 5.5
3.6	Accounting for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.	Section 6.1.1, 6.2.1

3.7	Inclusion of air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*	Section 4
3.8	A demonstration of the proposal's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997) and the POEO (Clean Air) Regulation 2010*. Particular consideration should be given to section 129 of the POEO Act concerning control of "offensive odour".	Section 6, 9
3.9	Details of emission control techniques/practices that will be employed by the proposal	Section 7
3.10	An investigation and assessment of odour impacts likely to be associated with cold air drainage effects on all identified and potential receivers.	Section 4.1, 6.1
3.11	A requirement to install a meteorological station as soon as possible on or near the proposed site to obtain site-specific meteorological data for a minimum of 3 months and ideally 6 to 12 months to aid in refining odour assessment and modelling.	Section 4.1.5
3.12	Collection of wind speed data using an ultrasonic wind speed sensor to ensure accurate representation of low wind speed frequencies to allow more accurate prediction of likely katabatic impacts on receivers.	Section 4.1.5
3.13	Improved and stronger justification of the K-Factor proposed to be used in updated odour modelling for the project.	Section 5.2
3.14	The use of a more conservative odour impact assessment criterion may be appropriate in assessing odour impacts in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* given that the population of the affected community is considered by the EPA to be higher than the figure used in odour modelling in SLR Consulting's preliminary environmental assessment prepared 3 June 2016.	Section 2.1.4
3.15	Include a consideration of 'worst case' emission scenarios, and sensitivity analysis around the timing of peak emissions (i.e. different initial placement dates).	Section 5.5
3.16	Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.	Section 6.1, 6.2
3.17	Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2016)* and the *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'* (TRC Environmental Corporation, 2011)	Section 4
3.18	Demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997) and the POEO (Clean Air) Regulation (2002).* Particular consideration should be given to section 129 of the POEO Act concerning control of "offensive odour".	Section 6, 9
3.19	Odour emissions must be assessed in accordance with the *Technical Framework - Assessment and Management of Odour from Stationary Sources in NSW and/or the Technical Notes – Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006). Any odour dispersion modelling should also be consistent with the *Best Practice Guidance for the Queensland Poultry Industry – Plume dispersion Modelling and Meteorological Processing.*	Section 2, 4, 5
3.20	Detail emission control techniques/practices that will be employed by the proposal	Section 5.1, 7

1.2 Background

The proposed Rushes Creek Poultry Production Complex will comprise four poultry production units (PPU) with a total of 54 tunnel-ventilated, fully-enclosed and climate-controlled poultry sheds. Each shed will have the capacity to house a maximum of 56,500 birds (at 19.6 birds per square metre). The proposed population is 3,051,000 birds. The proposed number of sheds for each PPU are as follows and is presented in Figure 1-1:

- Farm 1– 10 sheds
- Farm 2– 18 sheds
- Farm 3 – 10 sheds
- Farm 4 – 16 sheds

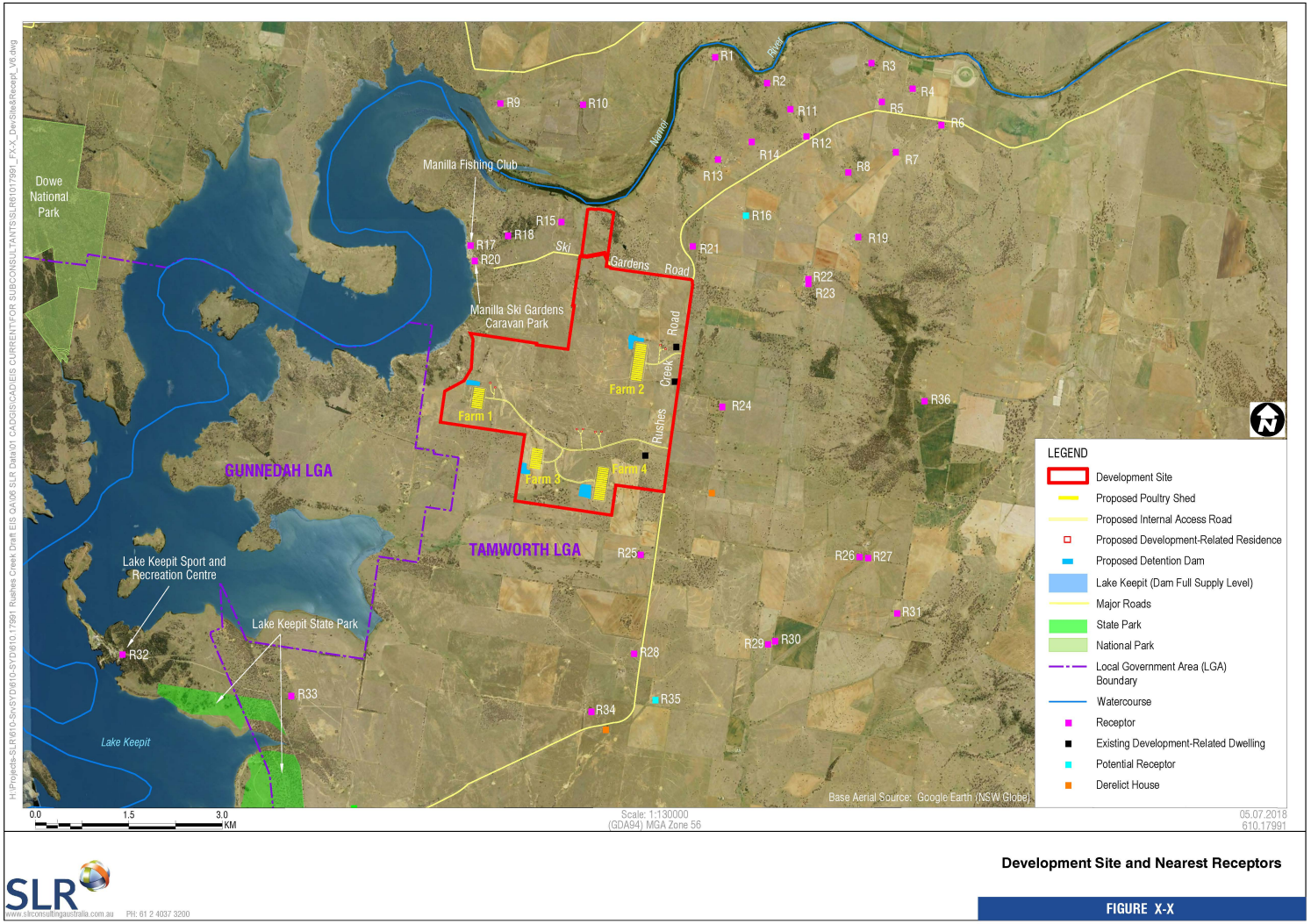


Figure 1-1 Rushes Creek Poultry Production Complex development site

1.3 Sensitive Receptors

The existing and future sensitive receptors identified by SLR are presented in Figure 1-2. The future sensitive receptors have been identified through a review of relevant development applications lodged in the vicinity of the Rushes Creek Poultry Production Complex based on information provided by Tamworth Regional Council. Future receptors are those that have an approved development application to construct a dwelling, however construction had not commenced. Future sensitive receptors include: R16 and R35.

It is noted that during the review of receptors, it was identified that two dwellings directly east and southeast of the Rushes Creek Poultry Production Complex are derelict and uninhabited. The dwellings are shown on Figure 1-2, but have been excluded from the assessment.

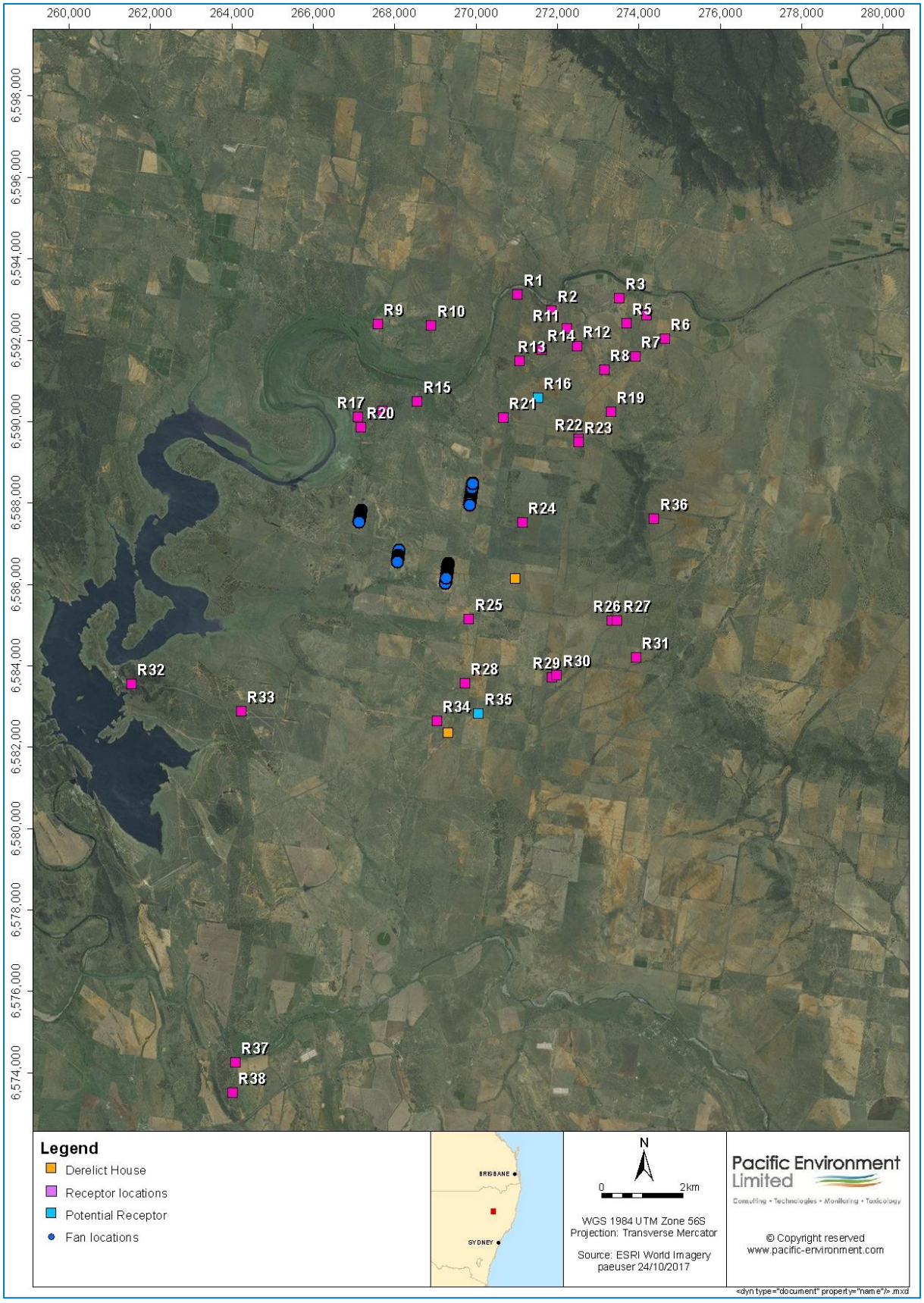


Figure 1-2 Sensitive receptors and shed fan locations

1.4 Study Objectives

The objective of the assessment was to determine odour and dust impacts from the proposed operation in accordance with relevant requirements including:

- "Approved methods for the modelling and assessment of air pollutants in NSW" (NSW EPA, 2016) (hereafter referred to as the Approved Methods); and
- "Assessment and management of odours from stationary sources in NSW" (NSW EPA, 2006).

1.5 Study Approach

The methodology for this project included the following stages (see Figure 1-3):

- Information and data review.
- Emissions estimation.
- Meteorological data processing.
- Dispersion modelling.
- Assessment of impacts on sensitive receptors.
- Reporting.

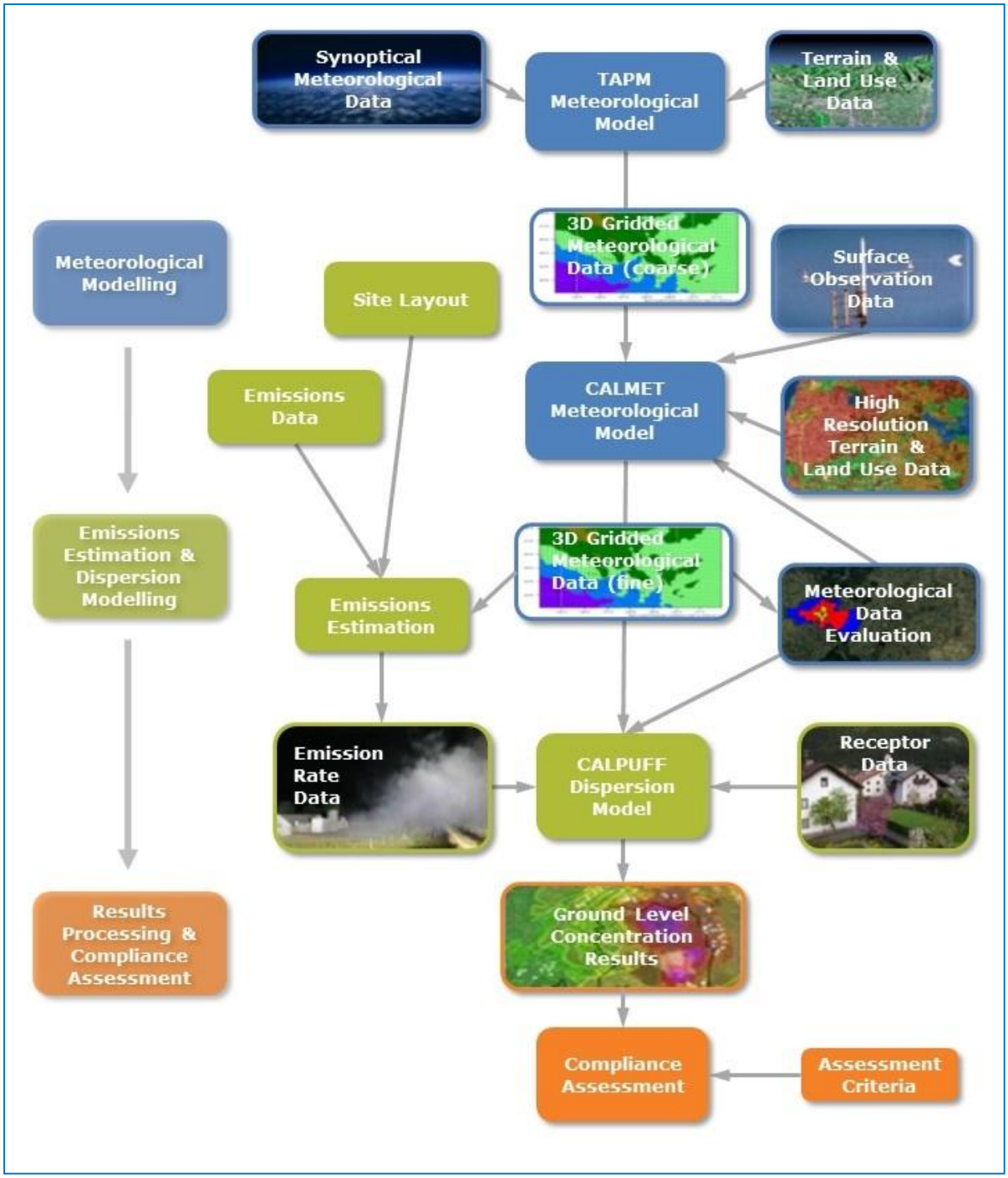


Figure 1-3 Assessment Methodology

2. Impact Assessment Criteria

2.1 Odour

2.1.1 Measuring odour concentration

Dynamic olfactometry when performed in line with AS4323.3 (Standards Australia, 2001) is the standard method for measuring odour in Australia.

Olfactometers operate by passing a diluted sample of odour to a trained panel of people (panellists) who then rate the odour based on whether they can detect the odour (certain), think they can detect the odour (inkling) or are simply guessing. Forced choice refers to the panellists having to provide a response even if they cannot detect odour. The concentration presented to the panellists is increased from where they can't detect a difference to where they can detect a difference by doubling the concentration until each panellist can detect the odour with certainty.

The theoretical minimum concentration is referred to as the "odour threshold" and is the definition of 1 odour unit (ou). Therefore, an odour concentration of less than 1 ou means there is no detectable difference between clean air and the odorous sample. It is important to note that 1 ou is not the point at which an odour is recognisable. 1 ou is the detection threshold. The recognition threshold, is a higher concentration, which enables someone to define what that odour is.

2.1.2 Odour performance criteria

The determination of air quality criteria for odour and their use in the assessment of odour impacts is recognised as a difficult topic in air pollution science. The topic has received considerable attention in recent years and the procedures for assessing odour impacts using dispersion models have been refined considerably. There is still debate in the scientific community about appropriate odour criteria as determined by dispersion modelling.

The EPA has developed odour criteria and the way in which they should be applied with dispersion models to assess the likelihood of nuisance impact arising from the emission of odour.

There are two factors that need to be considered:

- What "level of exposure" to odour is considered acceptable to meet current community standards in NSW?
- How can dispersion models be used to determine if a source of odour meets the criteria which are based on this acceptable level of exposure?

The term "level of exposure" has been used to reflect the fact that odour impacts are determined by several factors, the most important of which are the so-called FIDOL factors:

- frequency of the exposure
- intensity of the odour
- duration of the odour episodes
- offensiveness of the odour

- location of the source.

In determining the offensiveness of an odour, it needs to be recognised that for most odours the context in which an odour is perceived is also relevant. Some odours, for example the smell of sewage, hydrogen sulphide, butyric acid, landfill gas etc., are likely to be judged offensive regardless of the context in which they occur. Other odours such as the smell of jet fuel may be acceptable at an airport, but not in a house, and diesel exhaust may be acceptable near a busy road, but not in a restaurant.

In summary, whether or not an individual considers an odour to be a nuisance will depend on the FIDOL factors outlined above and although it is possible to derive formulae for assessing odour annoyance in a community, the response of any individual to an odour is still unpredictable. Odour criteria need to take these factors into account.

2.1.3 Peak-to-mean ratios

It is common practice to use dispersion models to determine compliance with odour criteria. This introduces a complication because Gaussian dispersion models are only able to directly predict concentrations over an averaging period of 3 minutes or greater. The human nose, however, responds to odours over periods of the order of a second or so. During a 3-minute period, odour levels can fluctuate significantly above and below the mean depending on the nature of the source.

To determine more rigorously the ratio between the one-second peak concentrations and three-minute and longer period average concentrations (referred to as the peak-to-mean ratio) that might be predicted by a Gaussian dispersion model, the EPA commissioned a study by (Katestone Scientific, 1995; Katestone Scientific, 1998). This study recommended peak-to-mean ratios for a range of circumstances. The ratio is also dependent on atmospheric stability and the distance from the source. For this assessment, we have assumed a peak-to-mean ratio of 2.3 (to convert from 1-hour averaging periods to 1 second) for all stability classes as all sources are treated as point sources. Stability classes for the meteorological dataset are described in Section 3.2. A summary of the factors is provided in Table 2-1.

Table 2-1: Factors for estimating peak concentrations on flat terrain

Source type	Pasquil-Gifford Stability Class	Near Field P/M60*	Near Field P/M60*
Area	A, B, C, D	2.5	2.3
	E, F	2.3	1.9
Line	A – F	6	6
Surface point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3
	D, E, F	35	6
Wake effected point	A – F	2.3	2.3
Volume	A – F	2.3	2.3

* Ratio of peak 1-second average concentrations to mean 1-hour average concentrations

The Approved Methods (NSW EPA, 2016) take account of this peaking factor and the criteria shown in Table 2-2 are based on nose-response time, which is effectively assumed to be 1 second.

2.1.4 Odour Criterion

The Approved Methods (NSW EPA, 2016) include ground-level concentration (glc) criterion for complex mixtures of odorous air pollutants. They have been refined by the EPA to take account of population density in the area. Table 2-2 lists the odour glc criterion to be exceeded not more than 1% of the time, for different population densities.

Table 2-2: Odour Performance Criteria for the Assessment of Odour

Population of affected community	Criterion for complex mixtures of odorous air pollutants (ou)
≤ ~2	7
~10	6
~30	5
~125	4
~500	3
Urban (2000) and/or schools and hospitals	2

The surrounding neighbourhood is primarily characterised by traditional agricultural production, along with recreational activities around Lake Keepit, including:

- Manilla Ski Gardens Caravan Park (R20) and Manilla Fishing Club (R17) (caravan park and camping ground), which is located approximately 2 km to the northwest of the nearest PPU.
- Lake Keepit Sport and Recreation Centre (R32) (cabins, a conference centre and recreational facilities), which is located approximately 7 km to the southwest of the nearest PPU.
- Lake Keepit Soaring Club (gliding facilities, a clubhouse and cabins), which is located approximately 8.2 km to the southwest of the nearest PPU.
- Inland Waters Holiday Park (caravan park, cabins, camping ground and recreational facilities), which is located approximately 9.4 km to the southwest of the nearest PPU. This is located within the Lake Keepit State Park.

The odour assessment criterion has been calculated based on the total population affected by the Rushes Creek Poultry Production Complex. Practically, this has been determined by counting the number of affected residents within the 2 ou contour line. There are 7 dwellings and no recreational receptors located within the 2 ou contour line for all three staging model scenarios (refer Section 6.1). The Australian Bureau of Statistics (ABS) Census data for 2016 gave an average population per house of 2.4 people for rural communities in NSW. It is understood that the EPA adopts an average of 2.8 people per house. This assessment has conservatively adopted the EPA's value (of 2.8 people per house), which has resulted in an estimated population of 20 people.

Therefore, the applied odour criterion for the Rushes Creek Poultry Production Complex:

- C_{99} 1 sec= 5 ou for all sensitive receptors

2.2 Particulate Matter

The Approved Methods (NSW EPA, 2016) specifies the air quality assessment criteria relevant for assessing impacts from dust generating activities. Table 2-3 summarises the air quality criteria for dust that are relevant to this assessment. For this assessment, particulate matter less than 10 micrometres (PM_{10}) was included as the assessment parameter for dust emissions.

The limiting air emission from chicken farms is generally odour. Meaning that the odour criterion is typically the air quality criteria with the largest footprint from chicken farm operations.

As dust was also required for assessment, PM_{10} emissions were selected as the assessment parameter. PM_{10} as it is the size fraction related to human health impacts and is generally the limiting dust parameter from chicken farms (i.e. dust generated from mechanical processes). Meaning that if the PM_{10} air quality criteria is met, there is minimal risk of exceedances of dust deposition or particulate matter less than 2.5 micrometres ($PM_{2.5}$) criteria.

Table 2-3: Air Quality Impact Assessment Criteria for Particulate Matter Concentrations

Pollutant	Standard/Criteria	Averaging Period	Agency
Particulate matter <10µm (PM_{10})	50 µg/m^3	24-hour maximum	NSW EPA
	25 µg/m^3	Annual mean	NSW EPA

3. Existing Environment

The primary meteorological parameters involved in modelling plume dispersion from poultry sheds are wind direction, wind speed, turbulence (atmospheric stability) and mixing height (depth of turbulent layer). The meteorological data for 2005 as generated by CALMET and used in the dispersion modelling are discussed below. The validation for the representative year is presented in section 4.1.1.

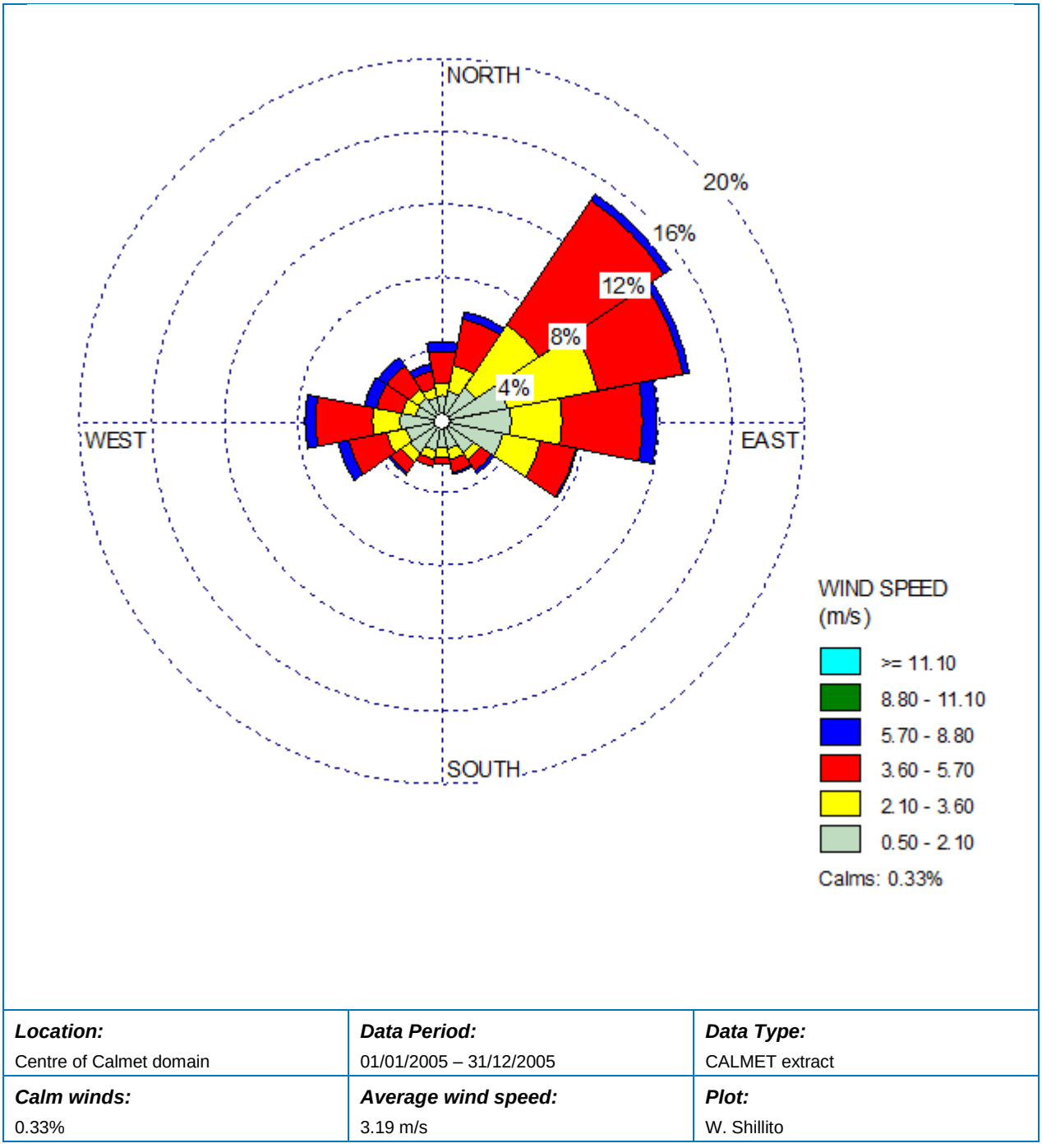
3.1 Wind

The wind roses show the frequency of occurrence of winds by direction and strength. The bars correspond to the 16 compass points (north, north-north-east, north-east etc.). The bar at the top of each wind rose diagram represents winds blowing from the north (i.e. northerly winds), and so on. 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 per the legend. Thus, it is possible to visualise how often winds of a certain direction and strength occur over any period of time.

The wind roses plotted from data extracted from CALMET is presented in Figure 3-1 and Figure 3-2. The annual wind rose (Figure 3-1) shows that the prevailing winds are from both the north-east and east with some winds from the west. This is consistent with expectations when the terrain in the area is considered.

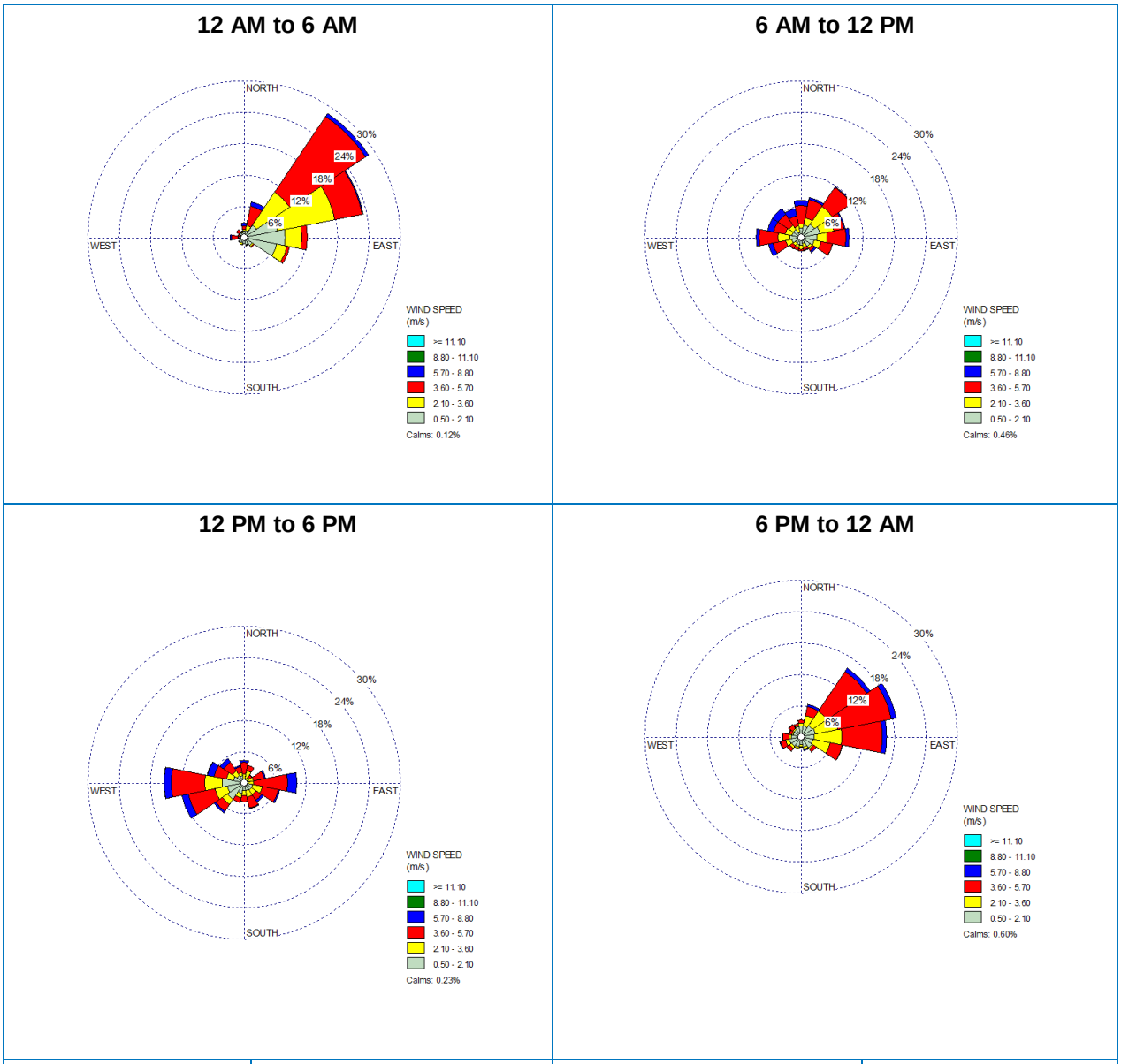
In the early morning and late at night winds (Figure 3-2) are typically light (3 m/s) and can be seen to be from north-east to east directions. This is a function of the local and regional terrain (which is discussed further in Section 4.1.4, below). During the morning and afternoon, the winds are typically stronger with less winds from the north-east and a higher proportion of winds from the west and southwest. As expected, the data for the afternoon period (12pm – 6pm) has the highest wind speed with an average of 3.5 m/s.

Overall the wind data show a high frequency of calm to light winds (up to 3 m/s), occurring 50% of the time. The wind speed frequency is shown in Figure 3-3.



Location: Centre of Calmet domain	***Data Period:*** 01/01/2005 – 31/12/2005	***Data Type:*** CALMET extract
Calm winds: 0.33%	***Average wind speed:*** 3.19 m/s	***Plot:*** W. Shillito

Figure 3-1 Annual wind rose for the Rushes Creek Poultry Production Complex



Time of day	*Average wind speed (m/s)*	*Calm winds frequency (%)*	WIND SPEED (m/s) >= 11.1 8.8 - 11.1 5.7 - 8.8 3.6 - 5.7 2.1 - 3.6 0.5 - 2.1 Calms: 0.12%
12 AM to 6 AM	2.96	0.12	
6 AM to 12 PM	3.22	0.46	
12 PM to 6 PM	3.45	0.23	
6 PM to 12 AM	3.14	0.60	
Location: Centre of Calmet domain	***Data Period:*** 01/01/2005 – 31/12/2005	***Data Type:*** CALMET extract	***Plot:*** W. Shillito

Figure 3-2 Time of day wind roses for the Rushes Creek Poultry Production Complex

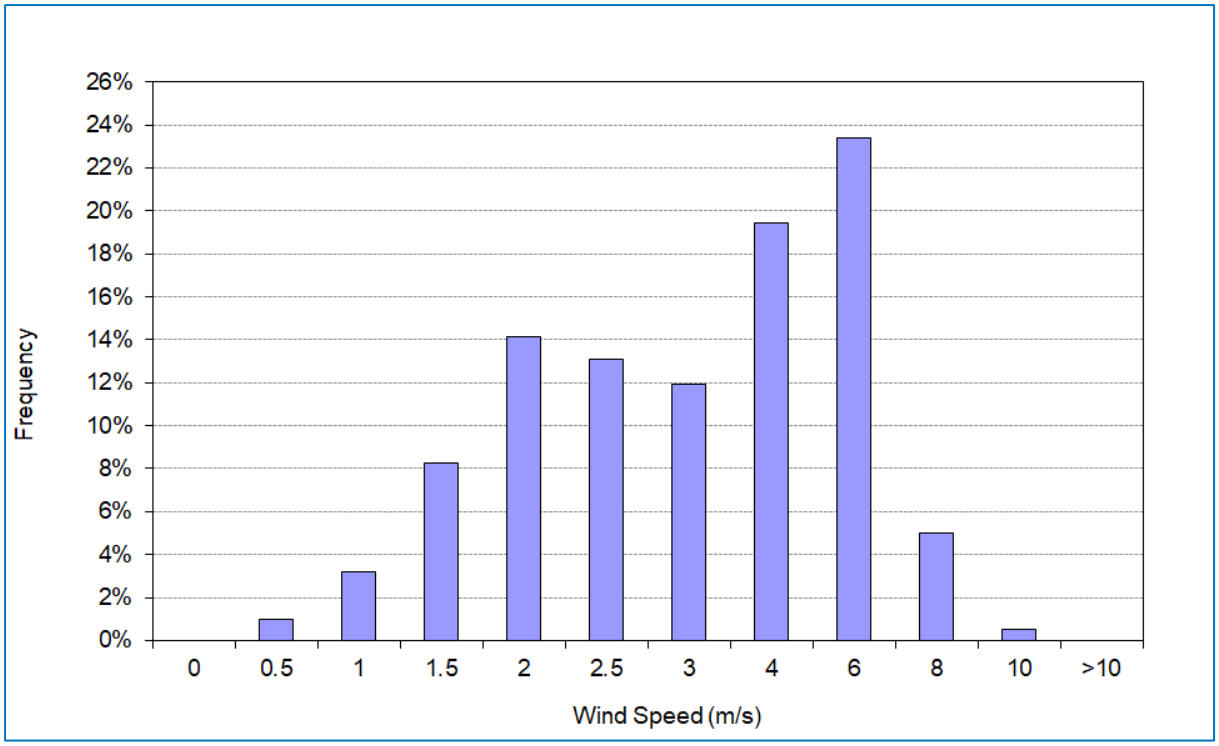


Figure 3-3 Wind speed frequency (hourly average)

3.2 Stability

Atmospheric turbulence is an important factor in plume dispersion. Turbulence acts to increase the cross-sectional area of the plume due to random motions, thus diluting or diffusing a plume. As turbulence increases, the rate of plume dilution or diffusion increases. Weak turbulence limits plume diffusion and is a critical factor in causing high plume concentrations downwind of a source, particularly when combined with very low wind speeds.

Turbulence is related to the vertical temperature gradient, the condition of which determines what is known as stability, or thermal stability. For traditional dispersion modelling using Gaussian plume models, categories of atmospheric stability are used in conjunction with other meteorological data to describe atmospheric conditions and thus dispersion.

The most well-known stability classification is the Pasquill-Gifford scheme[a], which denotes stability classes from A to F. Class A is described as highly unstable and occurs in association with strong surface heating and light winds, leading to intense convective turbulence and much enhanced plume dilution. At the other extreme, class F denotes very stable conditions associated with strong temperature inversions and light winds, which commonly occur under clear skies at night and in early mornings. Under these conditions plumes can remain relatively undiluted for considerable distances downwind.

Intermediate stability classes grade from moderately unstable (B), through neutral (D) to slightly stable (E). Whilst classes A and F are strongly associated with clear skies, class D is linked to windy and/or cloudy weather, and short periods around sunset and sunrise when surface heating or cooling is

[a] A more accurate turbulence scheme within CALPUFF, based on micrometeorological parameters was used for the modelling.

small. As a general rule, unstable (or convective) conditions dominate during the daytime and stable flows are dominant at night. This diurnal pattern is most pronounced when there is relatively little cloud cover and light to moderate winds.

The frequency distributions of stability classes in the CALMET meteorological file are presented in Figure 3-4. The data shows a typical frequency of occurrence of E and F class stability (41%) for inland locations, albeit with a relatively high proportion of F class because of low wind speeds (<2 m/s) at night.

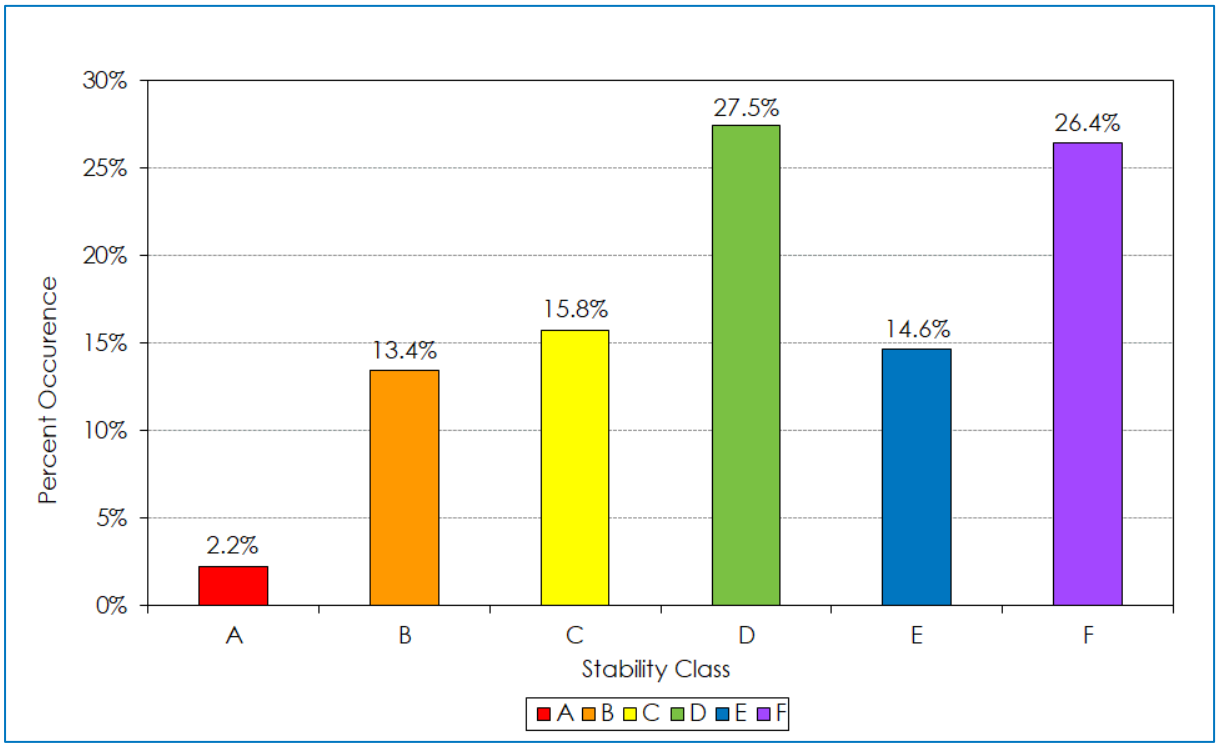


Figure 3-4 Frequency distribution of the estimated stability classes at the Rushes Creek Poultry Production Complex

3.3 Mixing Height

Mixing height is the depth of the atmospheric mixing layer beneath an elevated temperature inversion. It is an important parameter in air pollution meteorology as vertical diffusion or mixing of a plume is generally considered to be limited by the mixing height. This is because the air above this layer tends to be stable, with restricted vertical motions.

The estimated diurnal variation of mixing height at the site is presented in Figure 3-5. The diurnal cycle is clear in this figure. At night, mixing height is normally relatively low. After sunrise, it increases in response to convective mixing due to solar heating of the earth's surface. The estimated mixing height behaviour is consistent with expectations in that the mixing height is lower during the night, and highest during the day.

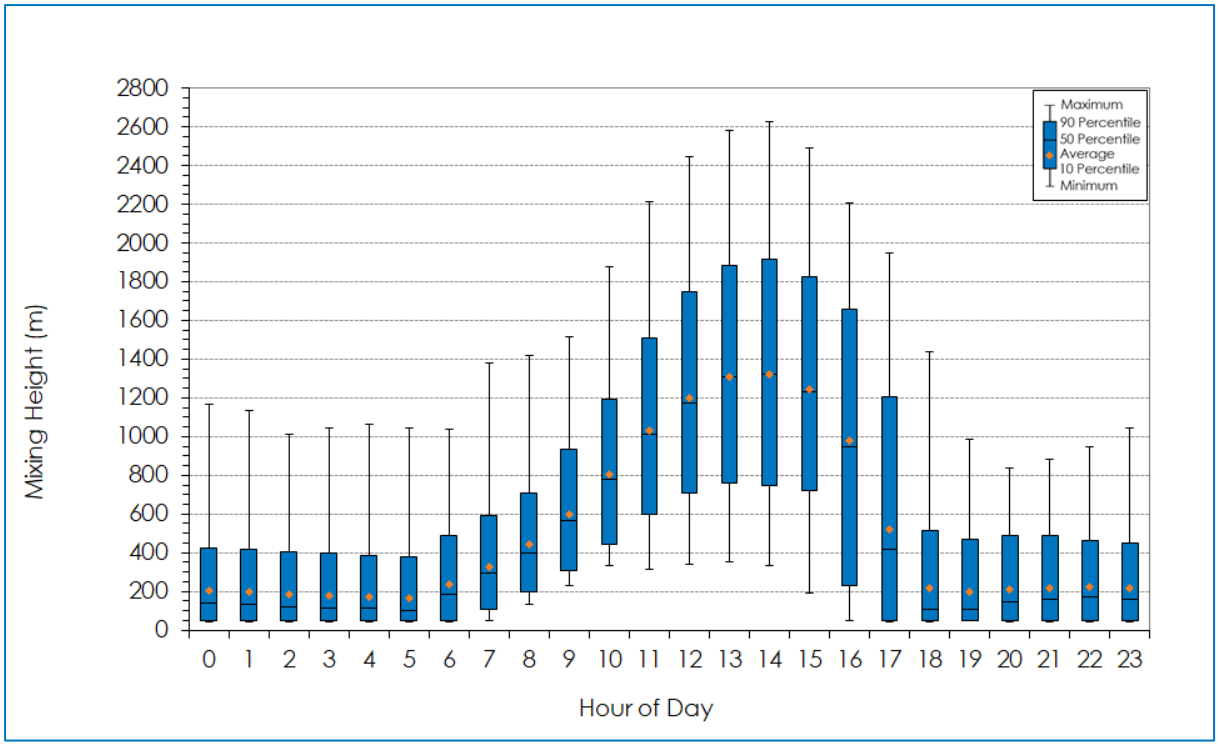


Figure 3-5 Estimated mixing heights at the Rushes Creek Poultry Production Complex

3.4 Background Air Quality

Air quality criteria refer to cumulative air quality levels which include existing and proposed sources. To fully assess impacts against all the relevant air quality criteria (detailed in Section 2) it is necessary to have information on existing dust concentration, deposition levels and dust sources in the vicinity of the Rushes Creek Poultry Production Complex .

No on-site air quality measurements have been made specifically for the complex, and the closest Office of Environment and Heritage (OEH) monitoring site is located approximately 44 km south-east of the Development Site in the city of Tamworth. However, as the complex is situated in a largely rural area, the data collected in the urban area of Tamworth are not considered representative of the local air quality in the vicinity of the Rushes Creek Poultry Production Complex.

The EPA have made available PM_{10} monitoring data through the Namoi Region Air Quality Monitoring Project (NRAQMP)[b], which aims to provide community members with access to baseline ambient air quality data from privately-owned monitoring stations in the Namoi region. The monitoring station located at Wil-gai is located in a rural area, approximately 40 km north-east of the complex. As these data are collected in rural area, similar to the location of the complex, these data were considered more representative of existing air quality in the vicinity.

Data from Wil-gai were only available for the period July 2015 to September 2017, and thus it is not possible to use data from the same year as the meteorological data used in the modelling (2005).

[b] http://www.epa.nsw.gov.au/your-environment/air/regional-air-quality/namoi-air-quality-monitoring-project

Since 2016 is the only complete year, as discussed further below, these data were used in the cumulative assessment.

The NRAQMP data were provided as 1-hour and rolling 24-hour averages. As the impact assessment criteria relate to a fixed 24-hour average (midnight to midnight), the 1-hour average data were processed to determine the fixed 24-hour average. There were a few occasions where the 24-hour average was calculated to be negative (despite each 1-hour average being identified as valid in the raw data files). These values were removed from the dataset to calculate the averages presented in Table 3-1.

Whilst there is an increase in average concentration over time, this is in part a function of the data for 2015 and 2017 not being for a complete year. As presented on Figure 3-6, the rolling annual average has remained relatively constant until May 2017, when a gradual increase is observed. As shown in Figure 3-7, the Bureau of Meteorology (BoM) have identified that much of NSW has experienced serious to severe rainfall deficiencies in the four months ending September 2017 (Commonwealth of Australia, 2017) that will have had a direct influence on these data.

Table 3-1: Summary – averages of PM_{10} monitoring data collected at Wil-gai

Year	Average (µg/m^3)
June – Dec 2015	8.0
January – December 2016	11.2
January – September 2017	13.3
Criteria	**25 µg/m^3**

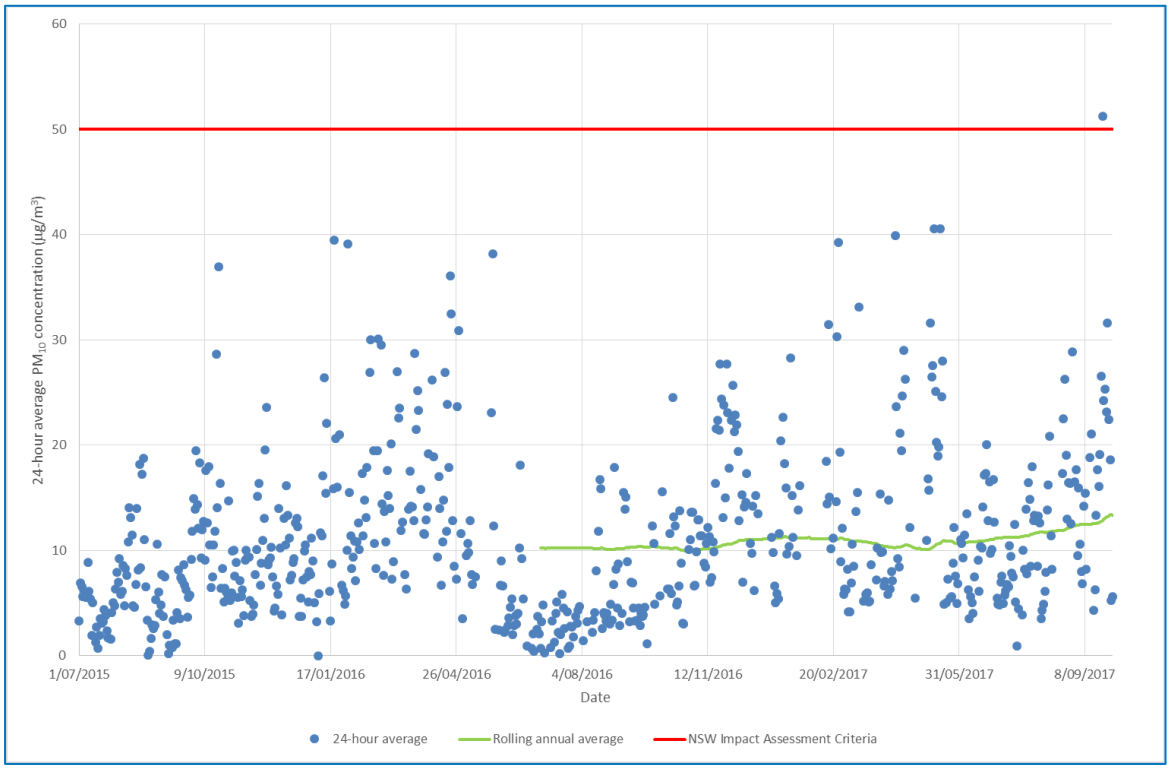


Figure 3-6 24-hour average and rolling annual average PM_{10} concentrations at Wil-Gai (June 2015 to September 2017)

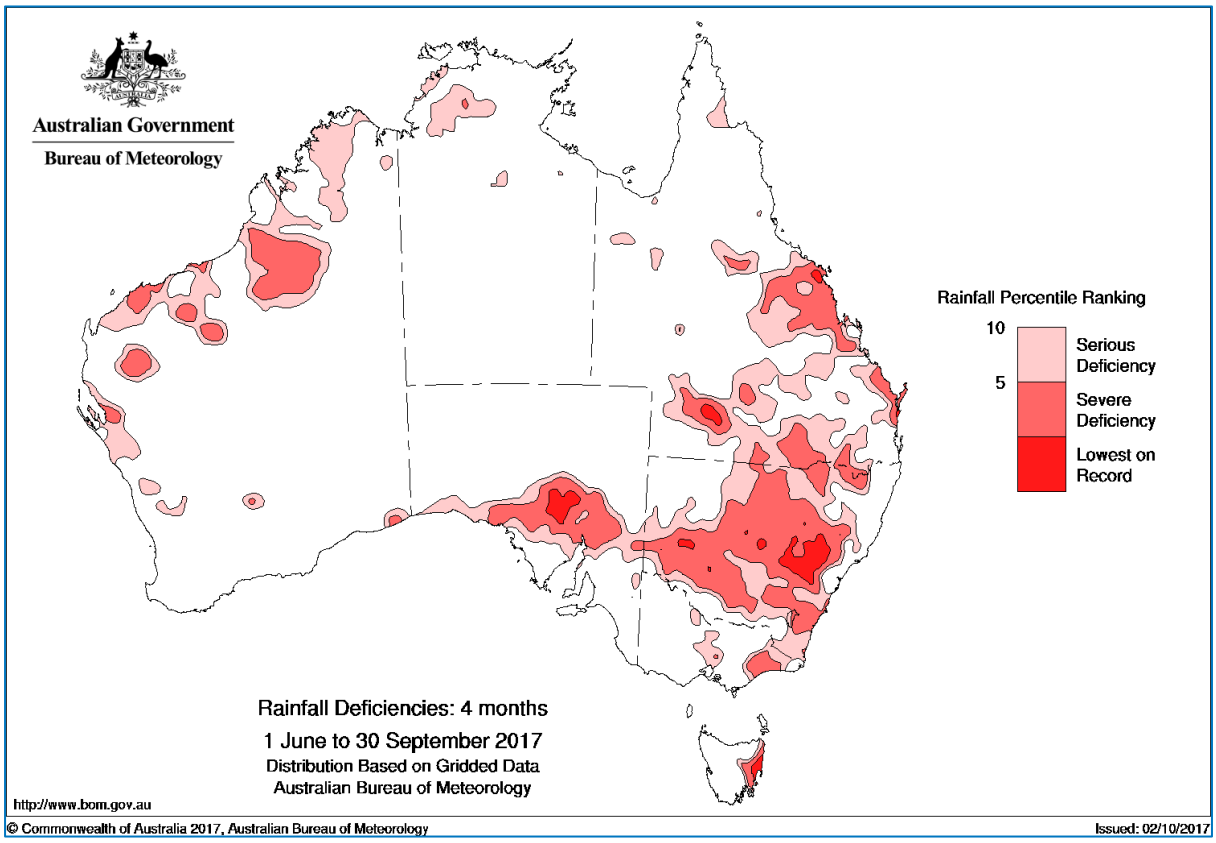


Figure 3-7 4-month Rainfall deficiencies

As the only complete year of data are for 2016, these were considered to represent current air quality in the area.

For the purposes of the cumulative assessment of 24-hour average PM_{10} concentrations (see Section 6.2.2) any missing values were replaced with the annual average.

4. Modelling Methodology

4.1 Meteorological Modelling

Meteorological modelling was performed using TAPM and CALMET for the site in accordance with NSW EPA (2016) and the *Generic Guidance and Optimum Model Settings for the CALPUFF modelling system for inclusion in the 'Approved methods for the Modelling and Assessment of Air Pollutants in NSW* (NSW OEH, 2011).

The meteorological data used in the dispersion modelling was processed in two steps. Synoptic scale meteorological data were first processed in The Air Pollution Model (TAPM) and then further processed in CALMET to produce the wind field and weather data suitable for dispersion modelling with CALPUFF.

This method is known as the 'No Observation' approach as detailed in the (NSW OEH, 2011). The no observation approach is considered appropriate for regulatory screening modelling.

4.1.1 Representative Year

To determine which year to model we assessed meteorological data from the nearest BoM station, Tamworth Airport for the years 2005-2012. This meteorological station was selected as it was the nearest BoM station to the complex with long term data.

The Mann-Whitney U test for large sample sizes was used to analyse the data for wind speed, temperature and relative humidity. The Mann-Whitney U-test is a statistical comparison with a null hypothesis where there is no significant difference between an individual year and the long-term average values. These meteorological parameters were selected as they show a clear diurnal cycle.

A summary of the best performing to least performing for wind speed, temperature and relative humidity are presented in Table 4-1.

Table 4-1 Summary of representative years

Statistical Rank	Wind Speed	Temperature	Relative Humidity
Best performing (Rank 1)	2009	2007	2012
Rank 2	2005	2010	2007
Rank 3	2006	2006	2005
Rank 4	2008	2005	2009

The year 2005 was selected as the most representative year for this assessment as it performed, on average, better than any other year for the most important parameters used in dispersion modelling (i.e. wind speed, temperature and relative humidity).

The wind roses for the eight years assessed are presented in Figure 4-1 and Figure 4-2. It can be seen that the wind roses look similar across all the years which, indicates minor inter-annual variation.

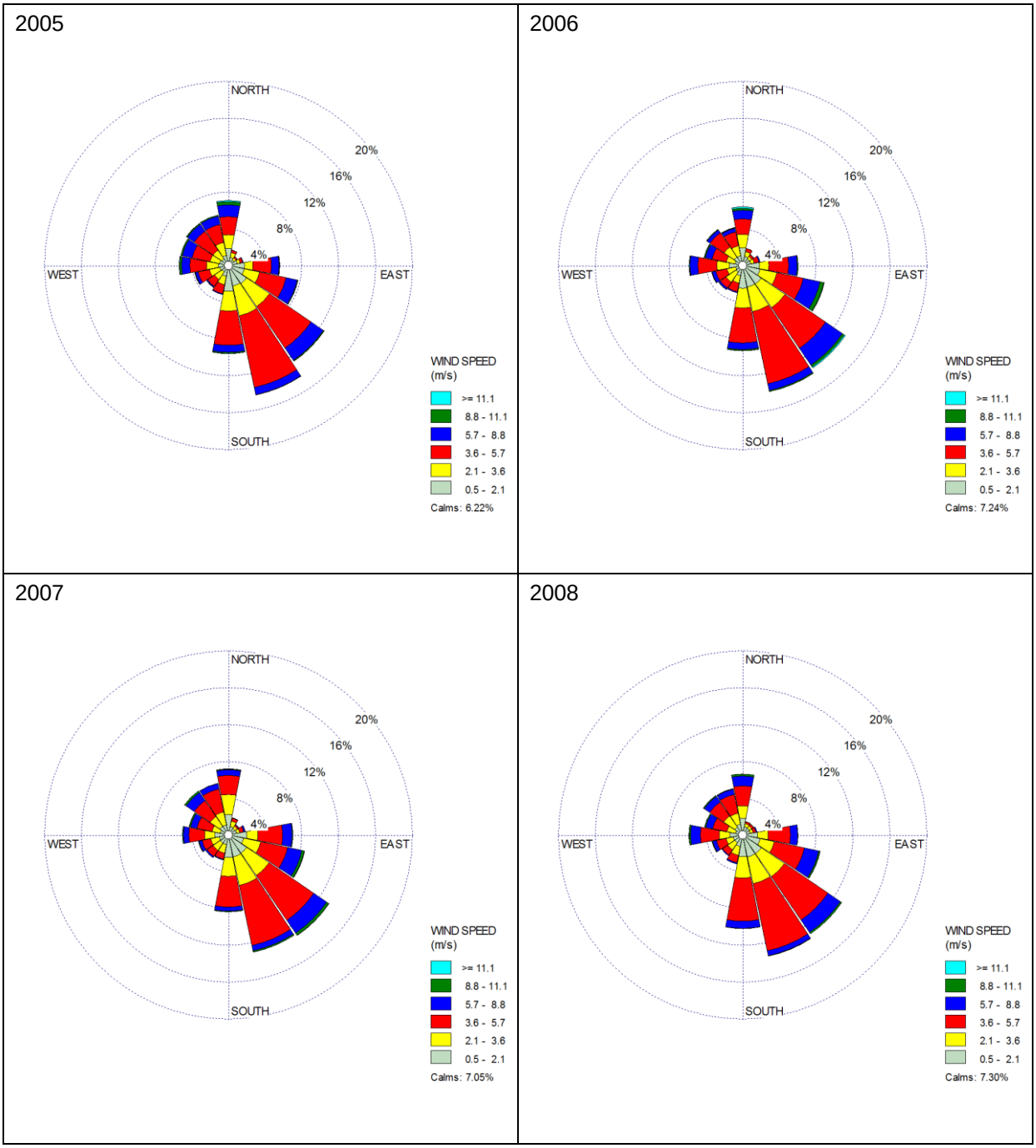


Figure 4-1 Tamworth Wind rose comparison 2005 – 2008

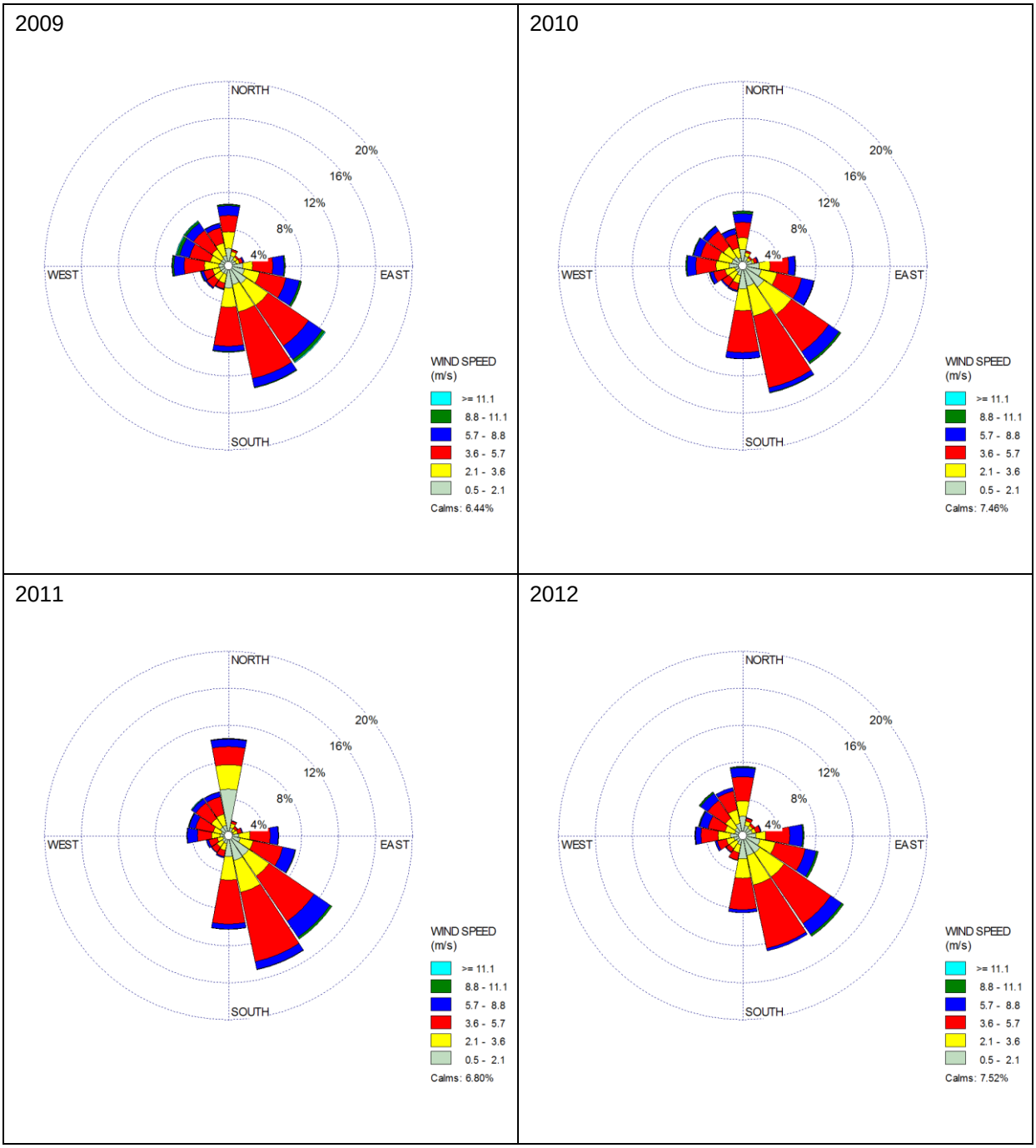


Figure 4-2 Tamworth Wind rose comparison 2009 - 2012

4.1.2 TAPM

TAPM (version 4), is a three-dimensional meteorological and air pollution model developed by the CSIRO Division of Atmospheric Research. Detailed description of the TAPM model is provided in the TAPM user manual (Hurley P, 2008a). The Technical Paper on TAPM (Hurley P, 2008b) describes technical details of the model equations, parameterisations, and numerical methods. A summary of some verification studies using TAPM is also available (Hurley P, 2008c).

The use of TAPM to produce meteorological data for a site where no local data is available is consistent with the *Generic Guidance and Optimum Model Settings for the CALPUFF modelling system for inclusion into the 'Approved methods for the Modeling and Assessment of Air Pollutants in NSW, Australia* (NSW OEH, 2011).

TAPM v4 solves the fundamental fluid dynamics and scalar transport equations to predict meteorology and (optionally) pollutant concentrations. It consists of coupled prognostic meteorological and air pollution concentration components. The model predicts airflow important to local scale air pollution, such as sea breezes and terrain induced flows, against a background of larger scale meteorology provided by synoptic analyses.

4.1.3 CALMET

CALMET is the meteorological pre-processor to CALPUFF and includes a wind field generator containing objective analysis and parameterised treatments of slope flows, terrain effects, and terrain blocking effects. The pre-processor uses the meteorological inputs in combination with land use and geophysical information for the modelling domain to predict a gridded three-dimensional meteorological field (containing data on wind components, air temperature, relative humidity, mixing height, and other micro meteorological variables) for the domain used in the CALPUFF dispersion model.

CALMET uses the meteorological data generated by TAPM in combination with land use and geophysical information to predict a gridded meteorological field for the modelling domain. The model setup for TAPM and CALMET is presented in Table 4-2.

Table 4-2 TAPM and CALMET parameters

TAPM	Value
Number of grids and spacing	5 (30km, 10km, 3km, 1km, 0.3km)
Number of grid points	25 x 25 x 25
Duration of analysis	28/12/2004 to 31/12/2005
Centre of TAPM model	30°49'60"South, 150°35'30"East
Data assimilation with observations	No
CALMET	**Value**
Centre of CALMET	269,500 m East; 6,585,500 m South
Meteorological grid domain	20km x 20km (200 x 200 x 9 grid dimensions)
Meteorological grid resolution	0.1 km
Surface meteorological stations	None
Upper air meteorological station	None
3D windfield	3D windfields from TAPM (1 km resolution) input as an initial guess
Terrad (radius of influence of terrain features)	1.3 km

4.1.4 Topographically Induced Winds

With regard to the surrounding terrain, the temperature gradient between slopes and valleys often produces local pressure gradients, which drive local winds along slopes and within valleys. The temperature gradients between mountains (escarpments) and open flat plains, often produces regional airflows on a larger scale (Ahrens, 2003). Such conditions occur in the Tamworth region.

Known as *mountain-plain* winds, they produce large scale regional airflow between cooler plains and warmer mountains by night. The opposite occurs between cooler mountains and warmer plains by night and are known as *plain-mountain* winds (Preston-Whyte, 1988).

The Rushes Creek Poultry Production Complex is situated west of the Great Dividing Range with the general topography of the area considered to be relatively flat albeit surrounded by areas of elevated terrain. The regional winds therefore are driven by the influence of the nearby ranges which do produce large scale topographically induced winds.

CALMET accounts for mountain and valley breezes in the initial-guess wind field where it is adjusted for kinematic effects of terrain, slope flows, and terrain blocking effects.

An example of the *mountain-plain* winds is presented in Figure 4-3. The figure shows a wind field for the area, with the length of the arrows representing the wind speed, and the direction of the arrow, representing the direction of wind flow.

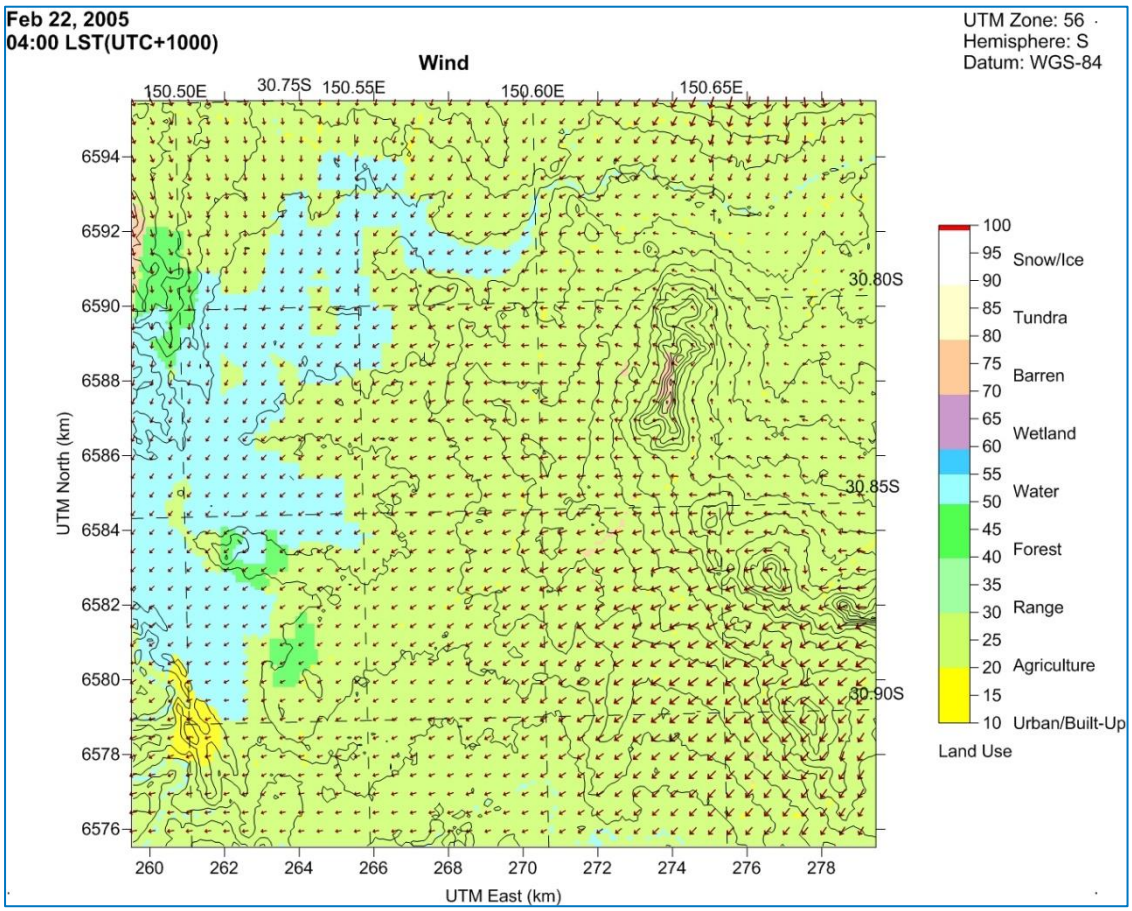


Figure 4-3 Example of CALMET produced wind vectors showing the influence of terrain

4.1.5 Evaluation of CALMET

To assist in evaluating wind fields, data were obtained for 2016 from a nearby poultry operation (the chicken farm “Moana” located approximately 11.5 km from the Development Site) for comparison with the output of the CALMET model. The CALMET dataset was extracted approximately 1.5 km north of the Moana poultry operation as Moana itself was outside the modelling domain.

To assess the data, a combination of wind roses, a radar plot and quantile-quantile (q-q) plots was used. The q-q plot is a graphical technique for determining if two data sets come from populations with a common distribution. A q-q plot is a plot of the quantiles of the first data set against the quantiles of the second data set (National Institute of Standards and Technology, 2013).

Wind roses and statistical analysis for the comparison of the CALMET and observational data is presented in the following figures;

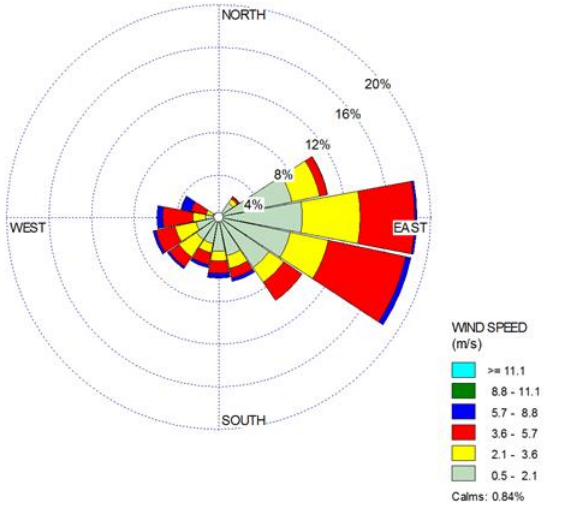
- Figure 4-4 Windrose comparison
- Figure 4-5 Quantile-Quantile plot of wind direction
- Figure 4-6 Quantile-Quantile plot of wind speed
- Figure 4-7 Wind speed

It is noted that when comparing two years of data, one measured and one modelled, some variation is expected.

The wind direction analysis has been presented in wind roses and a q-q regression plot. When looking at Figure 4-4, the CALMET data has predicted the general northeast to southeast direction with a degree of accuracy, particularly with the light winds (0.5 to 2.1 m/s) indicating that katabatic drift has been predicted correctly.

The differences between the two wind roses is due primarily to the differences in the topographical features in the immediate area. The CALMET data shows slightly more winds from the northeast which indicates drainage flows from the hills to the north-east of the Development Site. Whereas the observational data is showing more drainage flows from the south-east and east due to the fact that the station sits below the plain upon which the proposed site sits, and is influenced by local drainage flows along the river area. CALMET has under predicted the frequency of wind speeds between 0 - 0.5 m/s as presented in Figure 4-6 and Figure 4-7 however shows good agreement for wind speeds to 8 m/s. Given the location of the Moana site, the fact that the Moana data shows more light winds than CALMET is expected simply due to local drainage flows, due to the protection of the river area.

Observational Data 2016 - Moana



CALMET 2005 – Extract 1.5km north of Moana

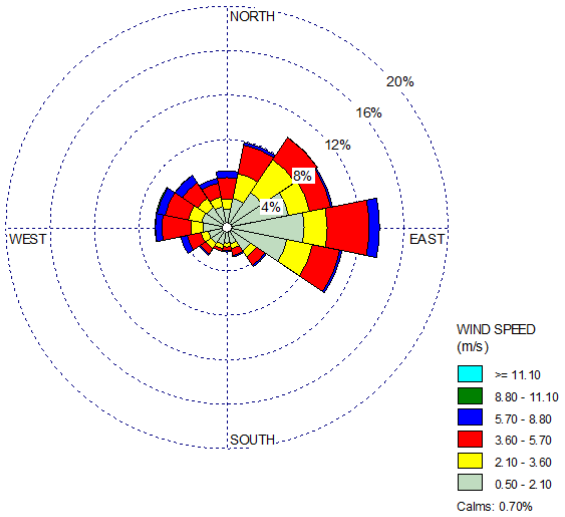


Figure 4-4 Windrose comparison

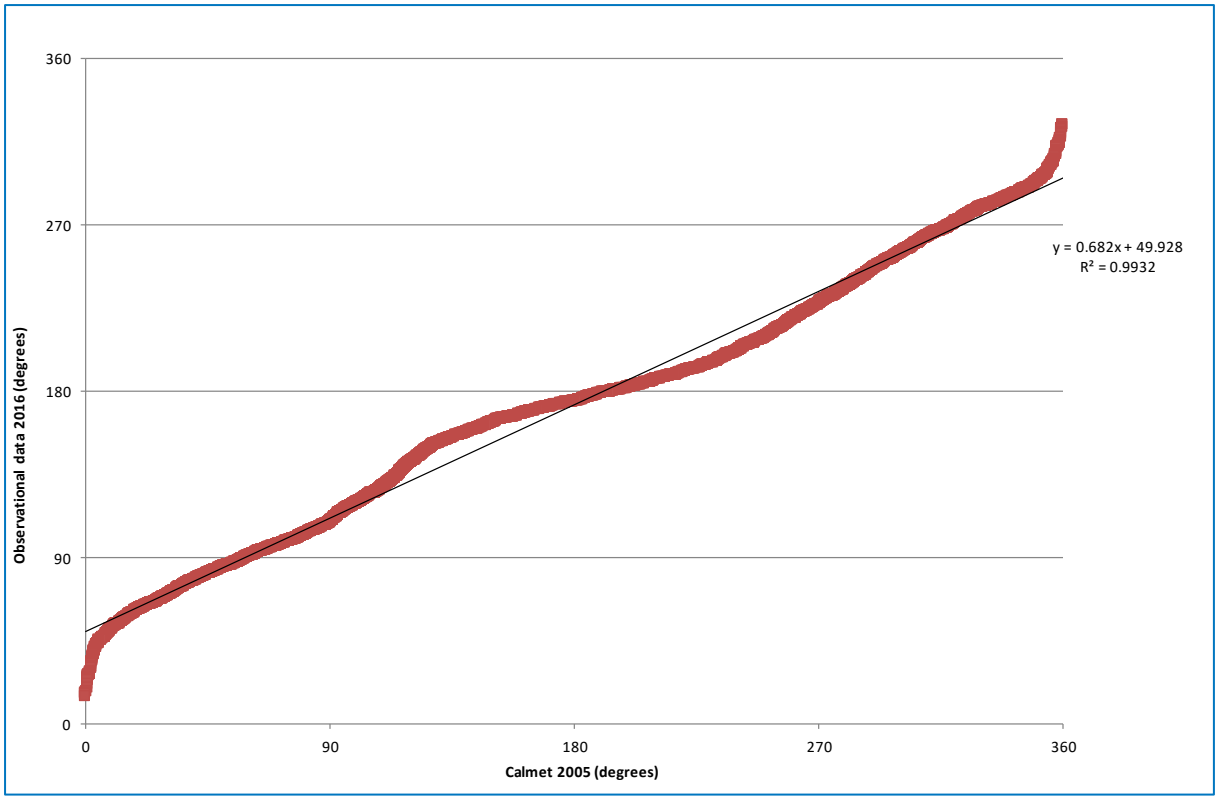


Figure 4-5 Quantile-Quantile plot of wind direction

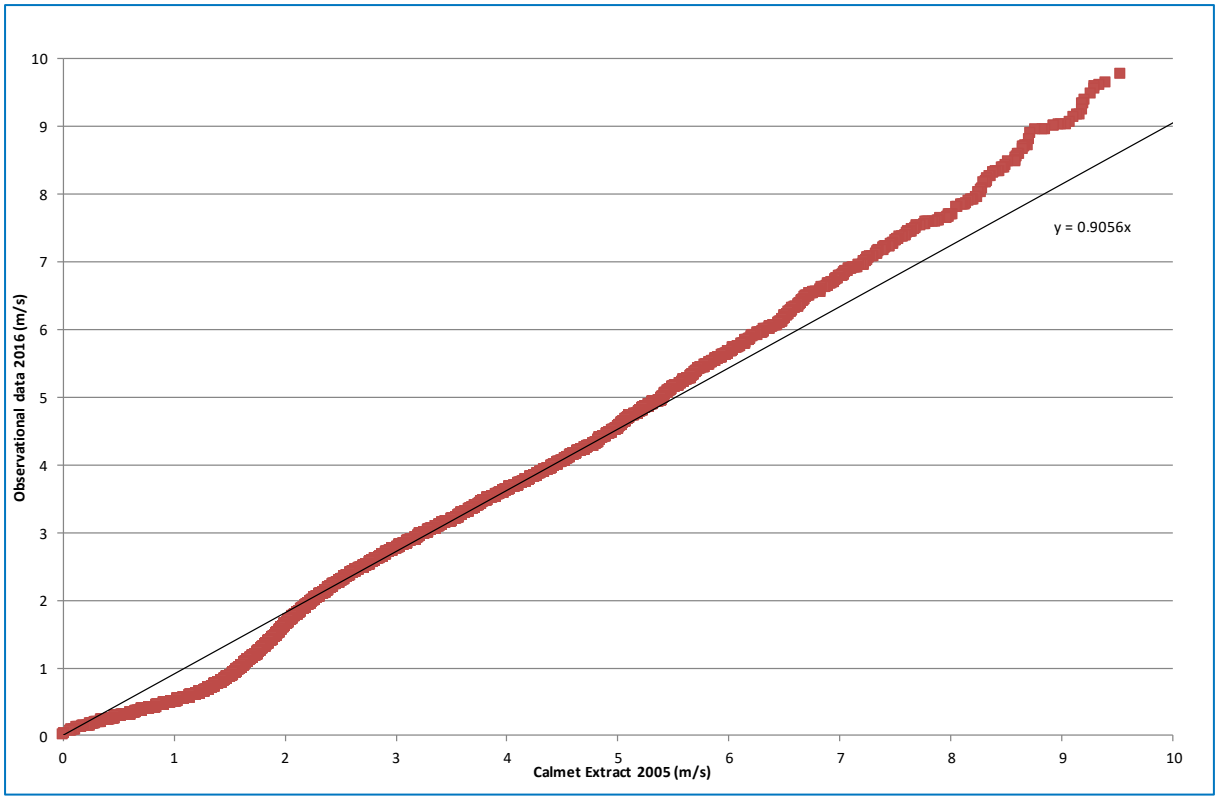


Figure 4-6 Quantile-Quantile plot of wind speed

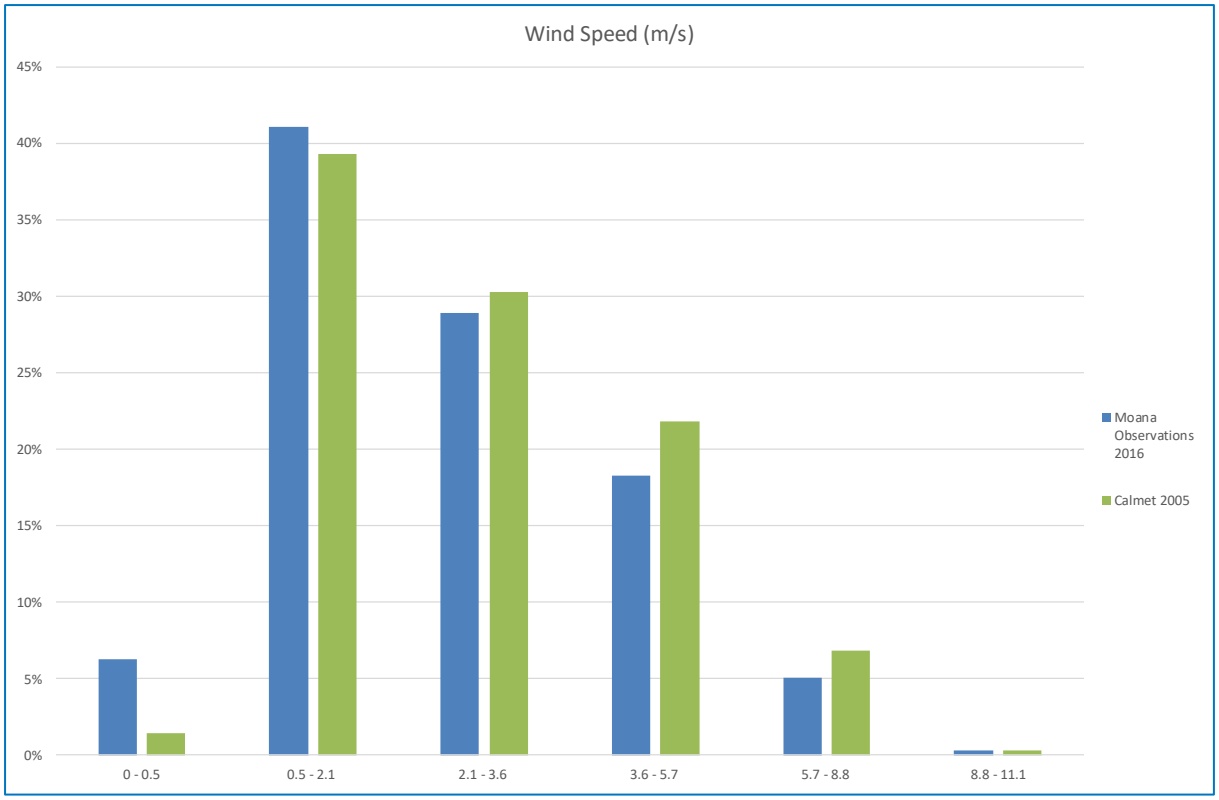


Figure 4-7 Wind speed frequency

Overall, the comparison of the data shown in Figure 4-5, Figure 4-6 and Figure 4-7 above indicates a reasonable agreement (irrespective of possible sources of variation) between the observed measurements and the output of the CALMET model. Overall, the data shows good agreement especially considering the extract location for CALMET is on more open ground, to the north of the Moana farm site.

4.2 Dispersion Modelling

CALPUFF (DEC NSW, 2016) is a multi-layer, multi species, non-steady state puff dispersion model that can simulate the effects of time and space varying meteorological conditions on emissions transport, transformation and removal. The model contains algorithms for near source effects such as building downwash, partial plume penetration, sub-grid scale interactions as well as longer range effects such as substance removal, chemical transformation, vertical wind shear and coastal interaction effects. The model uses dispersion equations based on a Gaussian distribution of emissions across released puffs and takes into account the complex arrangement of emissions from point, area, volume and line sources.

In addition to the three-dimensional meteorological data output from CALMET; CALPUFF requires the following input data:

- emission data and plant layout,
- receptor information.

Dispersion modelling using CALPUFF was performed in line with:

- The Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (NSW EPA, 2016).
- Generic Guidance and Optimum Model Settings for the CALPUFF modelling system for inclusion into the 'Approved methods for the Modeling and Assessment of Air Pollutants in NSW, Australia (NSW OEH, 2011).

A summary of the key settings for CALPUFF are presented in Table 4-3.

Table 4-3 Calpuff settings

Calpuff setting	Value
Height of pseudo point source on the end of each shed	1 m
Sigma Z	1 m
Sigma Y	4.5 m
Distance pseudo point source is located from the shed	9 m
Building wakes	Not modelled (See Section 4.2.2)
Sigma v (minimum horizontal turbulence parameter)	0.2 m/s

The receptor grid for the dispersion modelling of concentration was, as for the meteorological modelling, at a grid spacing of 100 m with additional discrete receptors representing the nearest houses to the site.

Each shed was represented as a pseudo point source on the end of each shed with a diameter the same as the shed width. The source diameter and vertical velocity were set as to ensure the momentum of the plume was maintained. The vertical momentum of the point sources was set to zero by using the 'rain hat' switch in CALPUFF. This switch accounts for the horizontal release of emissions from tunnel-ventilated poultry sheds. It then removes the need to apply dimensional

adjustments to source parameters (i.e. increasing diameter to achieve minimal exit velocity while conserving volumetric flow rate) to achieve the same end result.

4.2.1 Source Parameters and Model Inputs

Site specific source parameters and model inputs are required to ensure the dispersion modelling results will accurately reflect proposed farm operation. A summary of the shed and bird data used to calculate the odour and particulate emissions as well as inputs into CALPUFF are presented in Table 4-4 and Table 4-5.

Sigma Z and Sigma Y describe the initial plume size for a time varying point source. Sigma Z represents the vertical size of the plume at 1.0 m which is a conservative estimate. This was based on the assumption that the height of the plume would be roughly the height of the shed just after leaving the shed. A larger Sigma Z would result in an unrealistically high initial dilution, although considering most modern farms have double fan banks on the ends of the sheds, a higher Sigma Z may still be appropriate. Sigma Y is taken as a one quarter of the width of the shed to describe the width of the plume as it exits the shed.

Table 4-4: Summary of shed and bird data used [c]

Shed Type	Length	Width	Total Birds	Density (birds/m^2)	Sigma Z	Sigma Y
Tunnel ventilated	160m	18m	56,500	19.6	1.0m	4.5m

Table 4-5: Summary of batch data used

Parameter	Value
Batch Length	55 days
Cleanout	10 days
Day of first thin / % remain	32 (75%)
Day of second thin / % remain	38 (50%)
Day of third thin / % remain	44 (25%)
K Factor	2.0

4.2.2 Building Wake Effects

Building wake effects are normally not modelled on chicken farms. This is because experience has shown that the building downwash has negligible impacts on ground level plumes from narrow sources. The plume rise from chicken sheds is expected to be similar regardless of whether buildings are, or are not, included in the modelling. The lack of downwash, as an example, can be seen in various photographs in RIRDC (RIRDC, 2010). This is in part supported by Schulman (Schulman,

[c] Note that the long sheds have ventilation fans in the middle to ensure optimal cooling.

2000) showed that wake effects decrease to nothing at a distance of 6 to 8 times the building height. Thus, for an approximately 5 m high building (noting the sheds will be 4.2 m high), no effects would be expected within 40 m.

Moreover, it is noted that the equations used for calculating building wake effects were developed and tested using wind-tunnel data for a specific range of building dimensions with relatively small aspect ratios (length to width ratios were limited). Because of this, PRIME is known to over predict downwash and near-field impacts (Petersen, 2009). In their work, Petersen showed that PRIME lead to the over prediction of ground level concentrations up to 20 building heights downwind.

Considering the distances here and the findings above, building wake effects are not theoretically or practically relevant for this assessment.

5. Emission Estimation

5.1 Odour Emission Estimation

The odour emissions model of Ormerod and Holmes (2005) were used for this assessment. The methodology is consistent with that recommended in the *Best Practice Guidance for the Queensland Poultry Industry – Plume Dispersion Modelling and Meteorological Processing* (PAEHolmes, 2011) as prepared for the Queensland Government for inclusion in the *Queensland Guidelines – Meat Chicken Farms* (DAFF, 2012).

5.1.1 Basis of Odour Emissions Data

Odour emission rates (OERs) for this assessment were based on data from a variety of meat chicken farms in Australia, as well as theoretical considerations.

The approach generates hourly varying emission rates from meat chicken farm sheds based on the following factors:

- The number of birds, which varies later in the batch as harvesting takes place;
- The stocking density of birds, which is a function of bird numbers, bird age and shed size;
- Ventilation rate, which depends on bird age and ambient temperature; and
- Design and management practices, particularly those aimed at controlling litter moisture.

Data from existing farms were gathered from tunnel-ventilated sheds (many with nipple drinkers) and chicken batches at approximately five weeks of age or more. Given that maximum emissions occur around 5 weeks and later, these samples represent the maximum odour generating potential.

5.1.2 Analysis of Odour Data

Odour data from various farms and under various conditions were standardised to relate the OER per unit bird density and shed area to the ventilation rate at the time of sampling. The resulting relationship is shown in Figure 5-1.

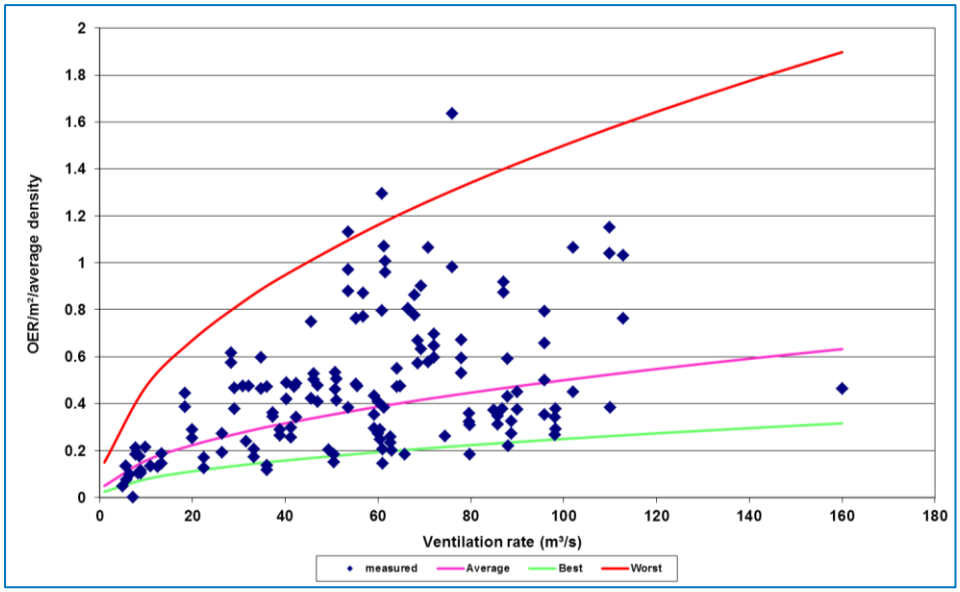


Figure 5-1 Data used in odour emissions modelling

The data can be segregated into two groups:

- Farms operating under typical conditions.
- Farms that were experiencing elevated odour emissions due to problems with shed design or management at the time of sampling.

High moisture litter is a common issue that can lead to increased odour emissions (Clarkson & Misselbrook, 1991). High moisture litter can be caused by using foggers in heatwave conditions, which was once common with older shed designs, and water spillage from drinkers, which can be avoided with newer technology. More frequent changing of litter between batches also minimises odour impacts. A vigilant approach to identifying and removing wet litter is now a well-accepted tenet of management. Further information on litter management can be found in DPI (2012).

Design factors include inadequate ventilation and retrofitted sheds. Many older sheds had lower maximum ventilation rates than newer sheds, thereby reducing the effectiveness of airflow to control litter moisture. Retrofitted sheds also did not often have the insulation properties of new sheds and were therefore more difficult to cool by ventilation in hot weather.

As illustrated by Figure 5-1, the degree to which these issues affect odour levels is highly variable. The curves represent a conservative estimate of the relationship between ambient temperature and odour emissions for tunnel ventilated sheds operating under varying degrees of management. The 'best' curve (green) represents a well-designed and managed shed with a high level of control over (for example) litter moisture levels. The 'worst' curve (red) represents a shed experiencing difficulties due to factors such as adverse weather conditions, equipment failure, poor design or management, or a combination of these factors.

Most of the farms for which data are presented in Figure 5-1 differ significantly from the best practice design and management criteria for modern farms which include:

- decreased bird density
- RSPCA acting as a third party auditor of operations (i.e. litter inspection)

- rotary hoeing the litter during the batch
- efficient mechanical ventilation
- nipple and cup drinkers
- fully insulated sheds
- impervious floors
- single or dual batch litter use[d]
- daily litter inspection and replacement (if litter becomes wet).

5.1.3 Odour Emissions Estimation

To estimate odour emissions the relationship between the 'standardised' OER and shed ventilation can be taken from Figure 5-1. This relationship is expressed as:

$$OER_S = 0.025\ K\ V^{0.5} \quad (1)$$

where:

***OER*$_S$** = standardised odour emission rate (ou.m³/s) per unit shed area (m²) per unit of bird density (in kg/m²)

V = ventilation rate (m³/s)

K = scaling factor between 1 and 5[e] where a value of 1 represents a very well designed and managed shed operating with minimal odour emissions.

The scaling factor (*K*) referred to in equation 1 is essentially a scale rating for the design and management of the sheds. The calculation of *K* for any given farm is based on several components of farm management.

Equation 1 can be expanded to provide a prediction of the OER from a shed at any given stage of the growth cycle as follows:

$$OER = 0.025\ K\ A\ D\ V^{0.5} \quad (2)$$

where:

OER = odour emission rate (ou.m³/s)

A = total shed floor area (m²)

D = average bird density (in kg/m²)

Bird density (*D*) is related to the age of the birds and the stocking density (i.e. the number of birds placed per unit area). It is common practice within the meat chicken industry to vary the stocking density with the time of year and market demands. Lower ambient temperatures during the winter months allow for higher bird densities. For this assessment, a maximum stocking density of

[d] The most recent research has shown no significant difference between single and dual use litter see Poultry CRC.

[e] Note that a K factor of 5 would be very uncommon and would represent a shed with serious odour management issues.

~19.6 birds/m^2 has been adopted[f]. With a known stocking density, a value of the mass per unit area can be estimated based on the relationship shown in Figure 5-2.

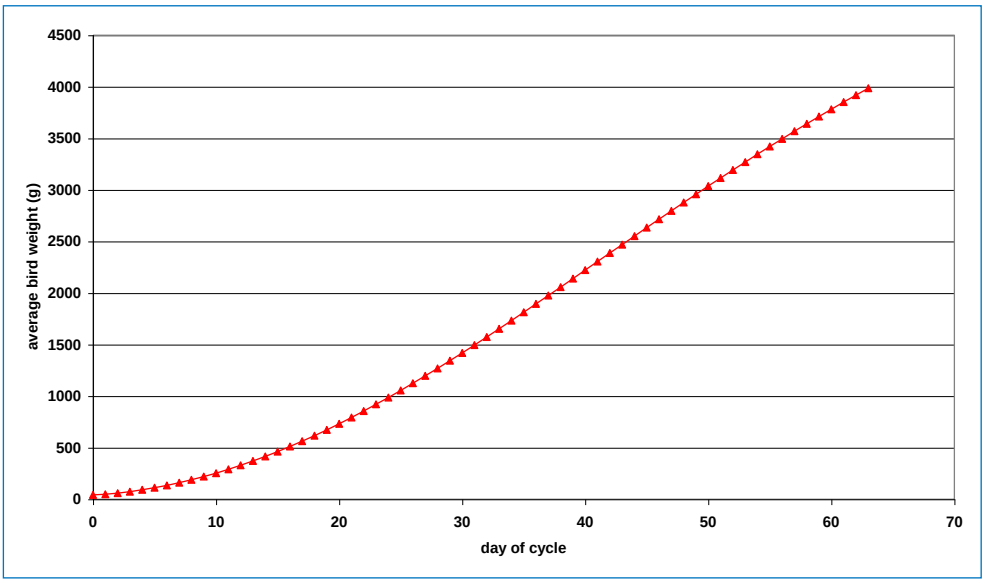


Figure 5-2 Average bird weight by age[g]

The ventilation rate (*V*) at any given time is a function of the age of the birds and the ambient temperature and humidity. Table 5-1 provides an estimate of the ventilation required for a tunnel ventilated shed as a percentage of the maximum for summertime conditions.

[f] Whilst stocking density is a relevant consideration with regard to site management, the key input for odour emission estimation is total bird numbers per shed.

[g] Source: Ross Broiler Manual www.ross-intl.aviagen.com.

Table 5-1 Example - Shed ventilation as a percentage of maximum ventilation

Bird Age (weeks)	1	2	3	4	5	6	7	8
Temperature (°C) above Target	Ventilation Rate (as a percentage of the maximum)							
<1	1.7	2.6	5.1	7.7	9.8	11.5	17.0	17.0
2	1.7	12.5	12.5	25.0	25.0	25.0	25.0	25.0
3	1.7	25.0	25.0	37.5	37.5	37.5	37.5	37.5
4	1.7	37.5	37.5	50.0	50.0	50.0	50.0	50.0
5	1.7	37.5	37.5	50.0	50.0	50.0	50.0	50.0
6	1.7	37.5	37.5	62.5	75.0	75.0	75.0	75.0
7	1.7	37.5	37.5	62.5	75.0	75.0	87.5	100.0
8	1.7	62.5	62.5	62.5	75.0	75.0	100.0	100.0
9	1.7	62.5	62.5	87.5	100.0	100.0	100.0	100.0

Based on data from the University of Georgia www.poultryventilation.com

5.2 Odour Emissions

In addition to the methodology mentioned above the emissions used for the Rushes Creek Poultry Production Complex were based on the following assumptions

- a K factor of 2.0 represents expected emissions
- the minimum ventilation rates were based on birds placed (i.e. maximum bird numbers)
- design and management practices are best practice
- maximum ventilation rates of 10 m^3/hr/bird.

In the year prior to the publication of the Queensland DAFF guidelines, ERM reviewed the results of 10 samples collected at a ProTen farm near Tamworth by The Odour Unit. The first six samples (duplicated samples collected in three sheds) were collected in the week leading up to first pickup (days 27 and day 28) and the remaining samples were collected at day 41. These data are summarised in Figure 5-3 where the red line represents a K factor of 2.2. The average K factor for this period for the ProTen farm was K = 1.5. Other data was erroneously collected at day 55 but was discarded as sampling this late in the batch produces unrealistic results if sampled immediately after thinning (which was the case).

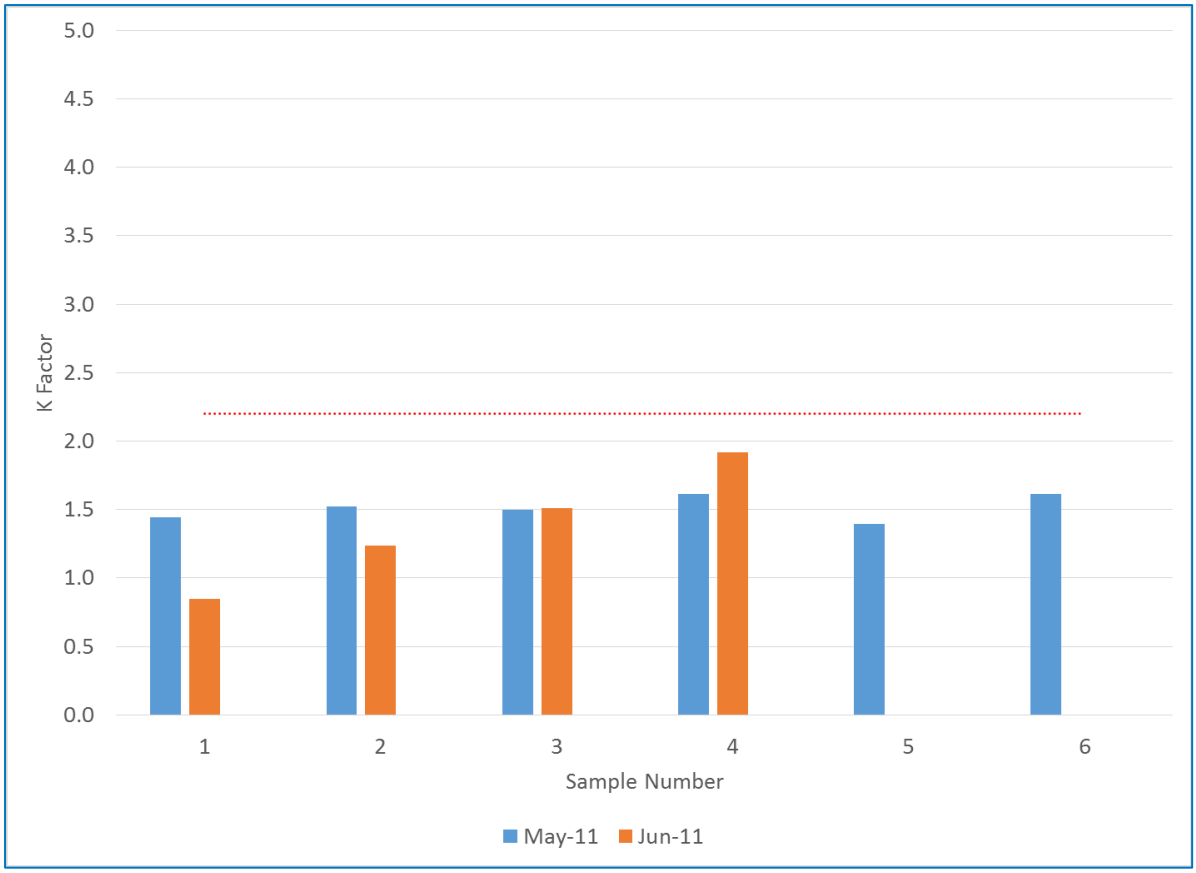


Figure 5-3 K factors - ProTen Tamworth – May and June 2011

This data is consistent with sample data held by ERM for sites in Queensland and New South Wales collected between 2012 and the present, for bird ages between 26 and 38 days. Overall, the emission rate data held by PE shows a downward trend in emissions towards an average of around K=1.5, which means the K factor of 2 used for this assessment is likely an upper value, rather than average emission rate value.

It is our experience that the majority of modern farms comply with the best practice management requirements detailed in *Best Practice Management for Meat Chicken Production in New South Wales - Manual 2 – Meat Chicken Growing Management* (DPI, 2012). As such the lower K factors are expected. And with the movement toward the RSPCA requirements, additional management measures, including rotary hoeing the litter during the batch (farms often use this irrespective of being RSPCA compliant or not), has led to even better on-site management, compared to 10 years ago when farms (with high K factors) were observed to not comply with what is now best practice. The Complex will comply with RSPCA requirements for poultry stocking density within mechanical ventilated sheds, which is 34 kilograms of live bird weight per square metre of floor space (kg/m^2). This is a significant reduction from the traditional industry adopted standard of 40 kg/m^2.

Figure 5-4 below shows the variability of odour emissions for a shed during a grow-out cycle based on Equation 2. The emissions presented in the figure is for the Day 1 (calendar day 4) batch staging as described in Section 5.5.

We have assumed that all sheds were placed in accordance with the batch staging presented in Table 5-3.

The decline in emissions 55 days after each batch placement represents the total removal of birds from the site and the clean out of the sheds. The shed clean-out may result in elevated odour release during disturbance of the litter, but odour emissions from the sheds can be easily managed by minimising the amount of air exchange through the shed during clean-out and cleaning only during the daytime when atmospheric dispersion is most effective.

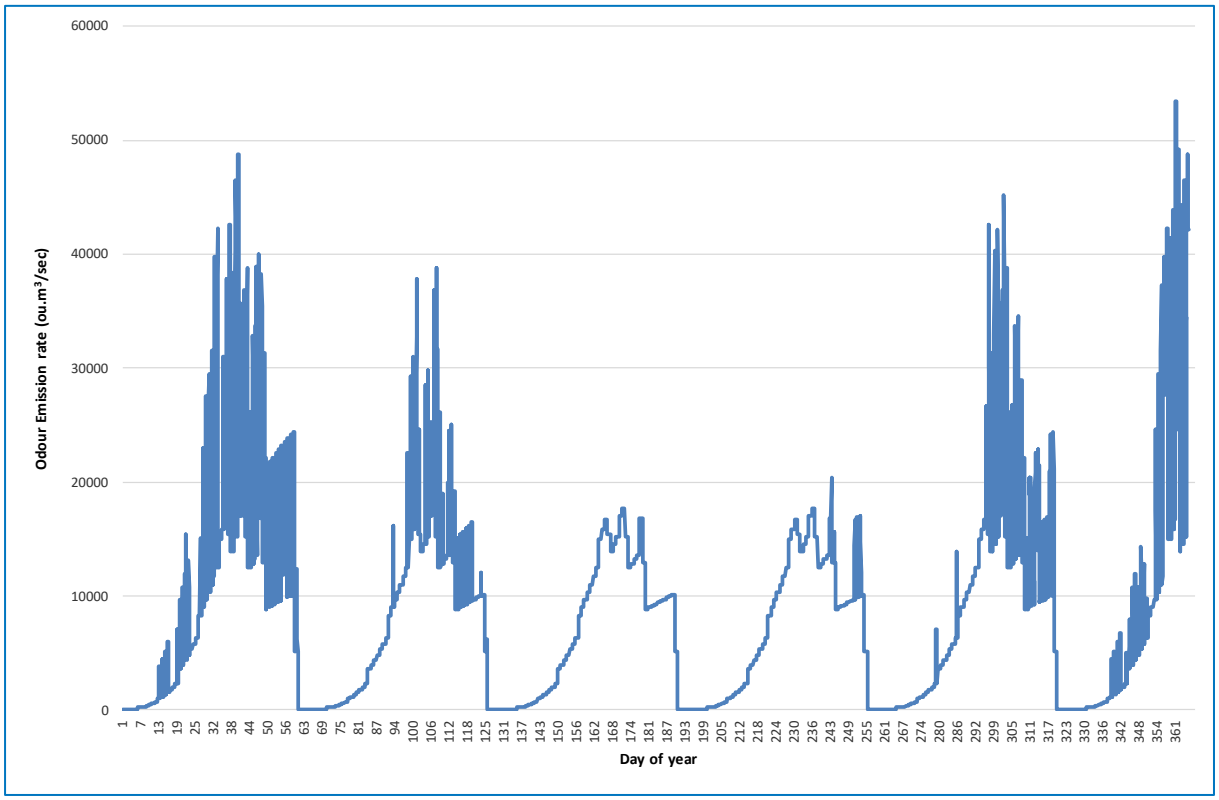


Figure 5-4 Example of modelled OER variations over time for a proposed shed (K=2)

5.3 Ventilation rate

Ventilation rate is critical with odour assessment as it is directly related to the OER. Much of the data available to date shows that odour emissions are non-linearly related to rate. Some of the more recent research has shown the ventilation rate is not as significant, however the data in some of the research (i.e. Poultry CRC (2011)) suffered from forced ventilation. That is, the ventilation rates were artificially raised irrespective of target or ambient temperature. This means that the data does not show the relationship as clearly as shown in earlier work including RIRDC (2010).

The ventilation rate (*V*) at any given time is a function of the age of the birds, the ambient temperature, humidity and the internal shed temperature. The primary aim of ventilation is to remove heat from the sheds, so the sheds are at “target temperature”, which is the temperature at which the birds grow optimally. The method used for the modelling to date provides an estimate of the ventilation required for a tunnel ventilated shed as a percentage of the maximum ventilation rate.

The data presented in Table 5-2 is based on the University of Georgia Poultry Ventilation studies as described in Ormerod and Holmes (2005) and Section 5.1 and has been applied successfully in Australia for over 10 years. The minimum ventilation rate for each week of bird age increases over time based on literature values.

Table 5-2 Example - Shed ventilation as a percentage of maximum ventilation

Bird Age (weeks)	1	2	3	4	5	6	7	8
Temperature (°C) above Target	Ventilation Rate (as a percentage of the maximum)							
<1	1.7	2.6	5.1	7.7	9.8	11.5	17.0	17.0
2	1.7	12.5	12.5	25.0	25.0	25.0	25.0	25.0
3	1.7	25.0	25.0	37.5	37.5	37.5	37.5	37.5
4	1.7	37.5	37.5	50.0	50.0	50.0	50.0	50.0
5	1.7	37.5	37.5	50.0	50.0	50.0	50.0	50.0
6	1.7	37.5	37.5	62.5	75.0	75.0	75.0	75.0
7	1.7	37.5	37.5	62.5	75.0	75.0	87.5	100.0
8	1.7	62.5	62.5	62.5	75.0	75.0	100.0	100.0
9	1.7	62.5	62.5	87.5	100.0	100.0	100.0	100.0

Recently, a report titled *Monitoring mechanical ventilation rates in poultry buildings: For the application of odour and dust control technologies* (RIRDC, 2014) was published. As noted in the executive summary of the report: "*This project was designed to quantify the daily, seasonal, and batch-age trends in ventilation rates for mechanically ventilated poultry sheds across different climatic zones of eastern Australia to support improved strategic design of odour and dust reducing technologies at critical periods of ventilation. In addition, this project will identify a suitable method to monitor ventilation rates of poultry production sheds*".

The report notes in numerous locations that the aim of the report was not for odour dispersion modelling of sheds, but for the assessment of odour control systems which could be used on new sheds.

The project tested five farms on the east coast of Australia which included an unknown site in the Tamworth area. As such, it is not clear if tested farm have new well sealed sheds, like those proposed here. The "tightness[h]" of the sheds is important, as the better the sheds are, the better they perform with regard to ventilation.

[h] A term used to refer to how well sealed sheds are. Sheds which have leaks in them, need more air to account for leakages where additional hot air is drawn into the sheds when ventilating.

The report included three “Fan Activity Prediction Models” for each farm, each with different inputs (e.g. bird age, ambient temperature etc). All three could be applied to a farm to derive a site-specific ventilation profile. The first two methods (1 and 2) used a number of easily obtained inputs, and the third made use of solar radiation data, which cannot be obtained without an on-site weather station. As such, we have focussed on the first two methods.

The predictions from the two methods is shown below as a scatter plot in Figure 5-5. The figure shows that the methods generally agree, but there are significant differences at both maximum and minimum (up to 30%) ventilation.

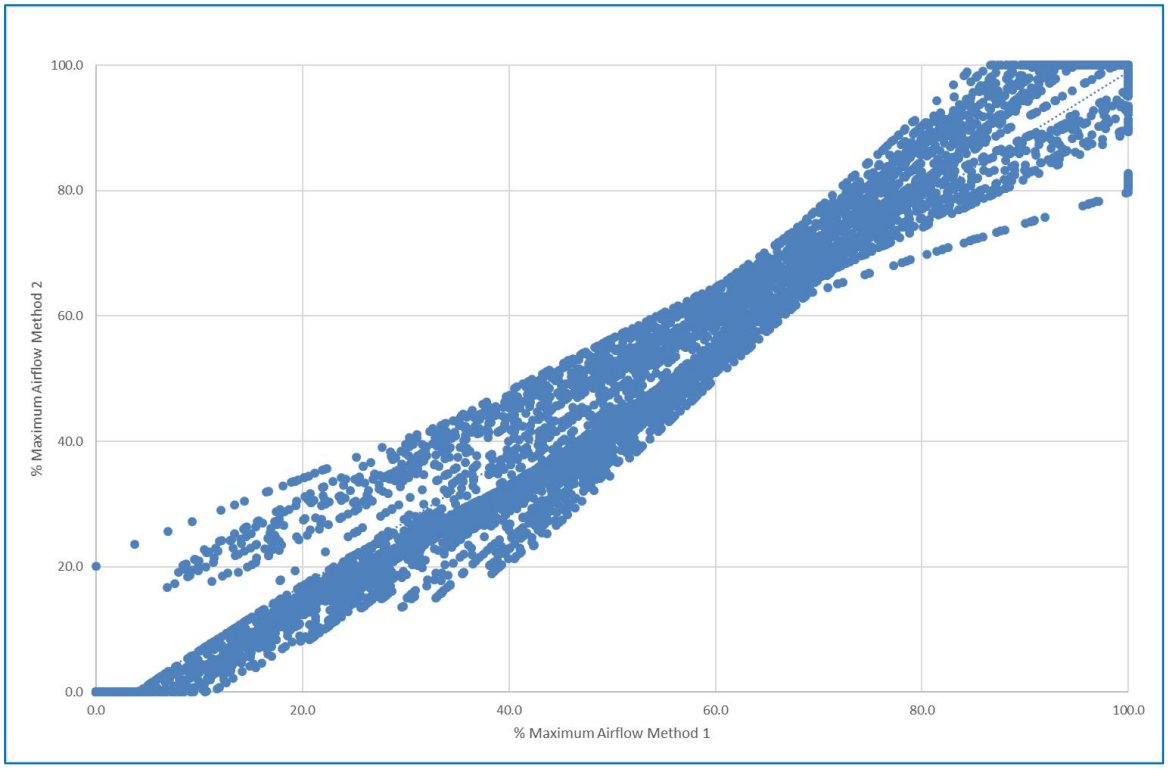


Figure 5-5 Predicted Ventilation, Tamworth methods 1 and 2

A summary of the predicted ventilation rate (m^3/s) for the Tamworth Farm (method 1 and 2) from the RIRDC and the modelled ventilation derived from the method described in Ormerod and Holmes (2005) is presented in Figure 5-6.

Figure 5-6 shows that the predicted ventilation rates are different between the RIRDC and the modelled ventilation rates presented here and specifically shows:

- Both the RIRDC methods (1 and 2) predict similar ventilation rates across the year.
- Peak ventilation rates are similar between the two RIRDC and modelled ventilation methods during the warmer summer months where peak emissions and impacts are expected to occur.
- Both RIRDC methods indicate higher minimum ventilation rates throughout the year but most noticeably during winter when compared to the Pacific Environment method (i.e. the minimum ventilation rate is high throughout winter, with little difference between peak and minimum ventilation rates predicted).

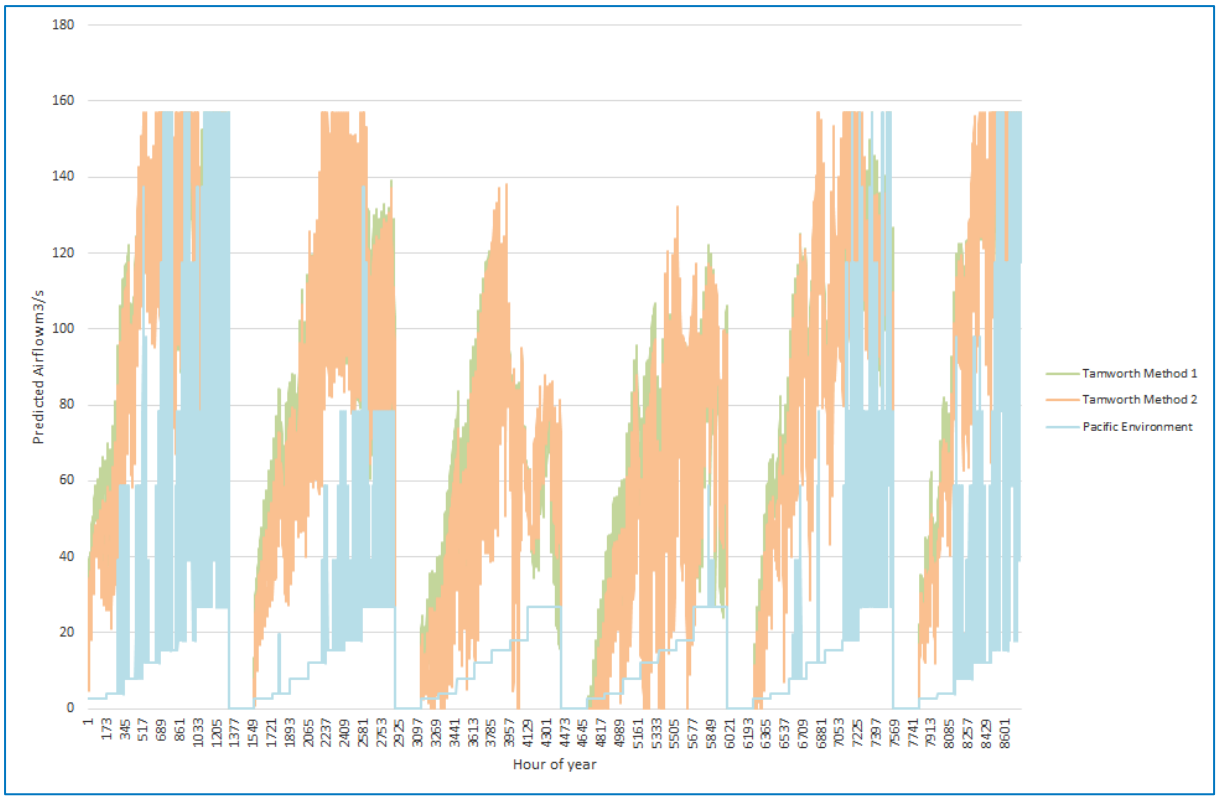


Figure 5-6 Predicted ventilation for the RIRDC Tamworth farm and University of Georgia ventilation – Whole year

As shown in Figure 5-6, there are differences in the predicted ventilation rates between the RIRDC and modelled ventilation rates. The odour emissions modelled in this air quality assessment are based on the "Pacific Environment" ventilation rates in Figure 5-6 (blue lines). What is clearly shown is the overprediction of the minimum ventilation of both RIRDC methods during early stages of the batch and most importantly during winter. This method does not provide a realistic representation of the ventilation rates in the real world. This is explained further below.

As discussed, the RIRDC methods collected ventilation data from five farms on the east coast of Australia. However, the data presented in the RIRDC report (RIRDC, 2014) must be viewed in context of the intent of the project. As noted above, the report was never intended to be used for the purpose shown in the above figure. With regard to this, the document states:

The target audience of the report is as follows;

- *poultry producers, who may be considering installation of add-on technologies, and require knowledge of ventilation rates and fan activity*
- *the chicken meat industry, which is under pressure to reduce odour and dust impacts and need to know actual ventilation rates and fan activity of modern poultry sheds to assess potential add-on technologies and whether they will be an appropriate odour reduction strategy*
- *environmental regulators/government agencies, who require information when making*

decisions on how to resolve or prevent odour impacts

- *consultants, who require greater knowledge of ventilation rates and fan activity when advising poultry producers, environmental regulators and community groups about odour and dust emission/dispersion and potential reduction strategies.*

Based on the above, it is clear that the intent of the report was never to be used as a methodology of estimating emissions to use in dispersion modelling assessments. To check this, Geordie Galvin contacted the author of the report, Dr Mark Dunlop, in July 2017. Dr Dunlop confirmed that the intent of the report was aimed at defining the potential flow rates used to design odour control systems. As the systems need to be designed based on maximum flow rates, the data was considered more useful for that purpose.

Whilst the predicted airflow is based on a research based dataset from the RIRDC report, and putting aside the issues in the preceding paragraphs, it is important to understand how these new data correlate with real world odour emission data.

Figure 5-7 below shows a comparison between the predicted RIRDC and modelled ventilation rates with actual data from the Rotem control system at the ProTen farm known as “Murrami” near Griffith, NSW. For simplicity, the data has been analysed with regard to whether or not the ambient temperature is above or below the target temperature of the birds at a point in time. That is, if the target temperature is below the ambient temperature, more air would be needed to cool the birds. With regard to this, the shed temperature sensor locations, especially on the outside of the shed may not be optimal, and may be subject to direct sunlight, which can lead to hotter temperatures than are actually occurring. This creates scatter in the data.

The figure includes the following assumptions and inputs:

- The Murrami Farm sheds are of similar size, bird capacity and design as the proposed sheds at the Development.
- Ventilation data is taken from the 21 to 24 July from batch age 42 to 46 days.
- Data is presented as volumetric flow (m^3/s; y-axis[i]) and the difference between ambient temperature and shed target temperature (x-axis).
- A negative value on the x-axis indicates that the ambient temperature is below shed target temperature typical of colder months and minimum ventilation conditions.
- Ambient temperatures are measured at the Murrami farm from an on-site weather station.
- Ambient temperatures for the modelled ventilation rates (Ormerod and Holmes (2005) are based on temperatures from an output of the CALMET model as described in Section 4.1.3.
- The RIRDC and modelled ventilation rates (Ormerod and Holmes (2005) have been calculated to be of a similar time and stage (day 42 growth) as measured at the ProTen Murrami Farm.

[i] Based on the CFM design limits in the Rotam controllers. In reality, the values could be less than this due to back pressure on the fans and maintenance of the fans.

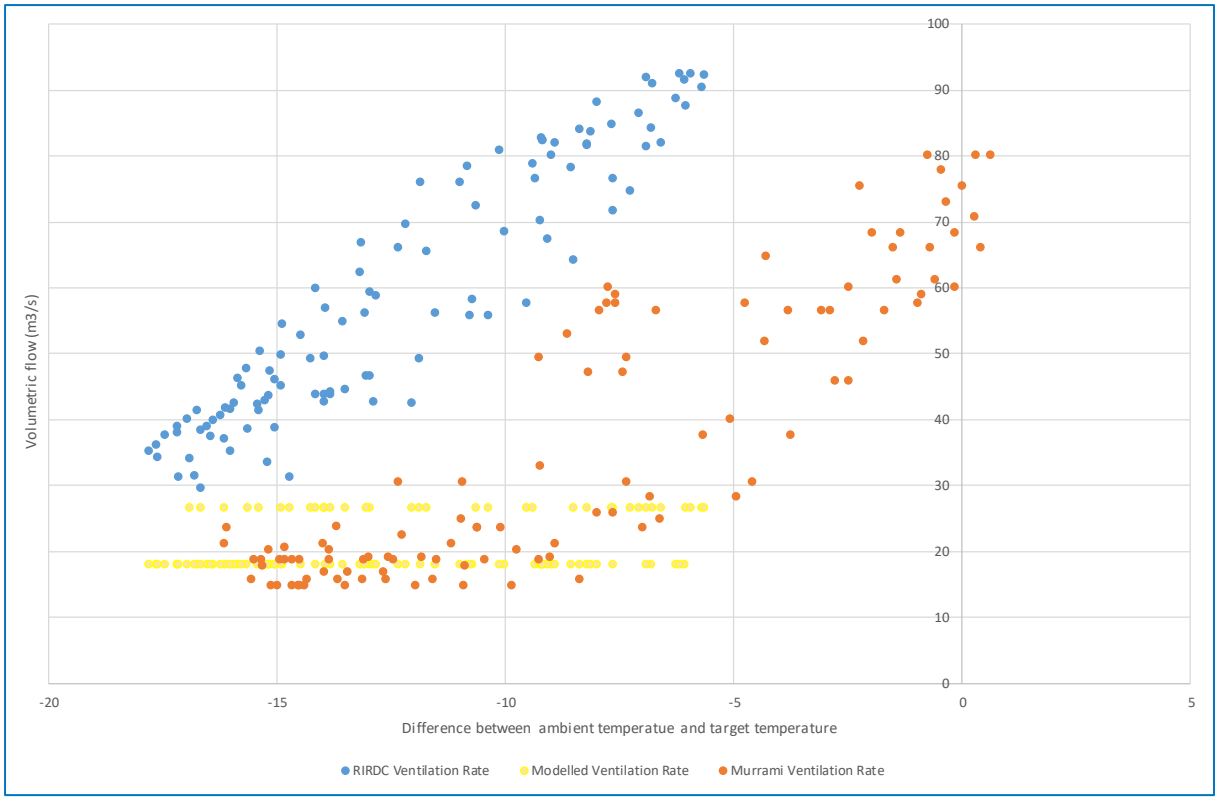


Figure 5-7 Predicted ventilation for the RIRDC Method 1 and Modelled Ventilation with real world data from the Murrami Farm[j]

Whilst based on a limited dataset, Figure 5-7 clearly shows that the RIRDC method (Method 1C) significantly over predicts ventilation rates when the ambient temperature is under the target temperature. For example, when the ambient temperature is ten degrees below the target temperature the RIRDC method predicts ventilation rates from 55 to 80 m^3/s whereas the modelled ventilation rates and the Murrami Farm data is less than half this ventilation. In the real world, if the RIRDC ventilation rates were used in a shed, this would result in the birds being cooled to a point which they would either not grow, or die.

The differences in the data presented for the modelled ventilation rates and when ambient and target temperature is approaching zero could be as a result of a difference in climatic conditions between the Development site northwest of Tamworth and the Murrami Farm southeast of Griffith. Furthermore, the difference could be associated with a difference between the target temperature in the system, the fact that the temperature sensors could be in the sun, and the pulsing of fans (where they turn off and on in each hour).

Whilst there is limited data for the modelled ventilation rates when ambient temperature is five degrees below target (-5 to 5 on the graph), the data presented between -20 and -5 shows a good relationship between the modelled ventilation rates and the Murrami Farm data.

[j] Murrami data is 15 minute data averaged to hourly data. The higher values around -8° are considered to be associated with direct sun on the sensors.

In summary, the RIRDC method has shown to be unrealistic, whereas the modelled ventilation rates and real world data taken from the Murrami farm are similar in prediction (considering the difference in inputs used to generate the data).

5.4 Particulate Emission Estimation

Particulate emission rates in this air quality assessment are based on the method and data presented in Mirrabooka (2002) measured at a meat chicken farm in NSW as well as theoretical considerations.

The approach generates hourly varying emission rates from each shed based on the following factors:

- the total weight of all birds, which varies later in the batch as harvesting takes place
- ventilation rate, which depends on bird age and ambient temperature
- design and management practices.

Data from Mirrabooka (2002) were from an existing farm (constructed prior to 2002) with tunnel-ventilated sheds and cup drinkers and were gathered for chicken batches between one to eight weeks of age to represent particulate emissions over a full batch cycle. The data were standardised to relate the particulate matter concentration to the total bird mass at the time of sampling. The resulting relationship is shown in Figure 5-8. The shed ventilation rate was also related to particulate matter concentration (as a fraction of the maximum) and is presented in Figure 5-9.

The data were gathered between July and August and therefore may not represent worst case meteorological conditions (i.e. maximum ventilation rates). However, Mirrabooka (2002) showed that the emission factors generated from these data were comparable to Victorian EPA recommended emission rates, which were in use in assessments at the time of the Mirrabooka publication.

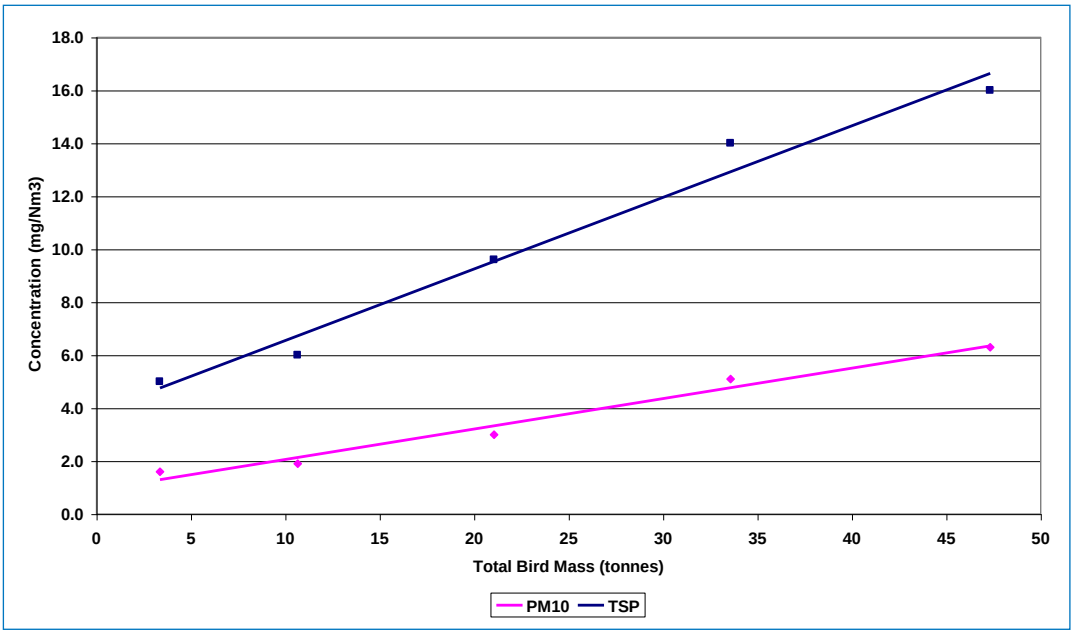


Figure 5-8 Data Used in Particulate Emissions Modelling (Mirrabooka 2002)

From Figure 5-8, the relationship between the maximum particulate emission concentration (PEC) and bird mass, assuming a single fan operating, is expressed as:

$$PEC = aM + b \quad (3)$$

where:

PEC = maximum particulate emission concentration (mg/m³)

M = Total mass of birds (tonnes)

a = 0.270 for TSP or 0.115 for PM_{10}

b = 0.385 for TSP or 0.917 for PM_{10}

To account for the dilution that occurs under higher flow rates, equation (4) has been taken from Figure 5-9:

$$PEC_v = PEC \times (cV^d) \quad (4)$$

where:

PEC_v = particulate emission concentration (mg/m³)

PEC = maximum particulate emission concentration (mg/m³)

V = Ventilation rate (m³/s) and

c = 3.3 for TSP and 4.11 for PM_{10}

d = -0.49 for TSP and –0.58 for PM_{10}

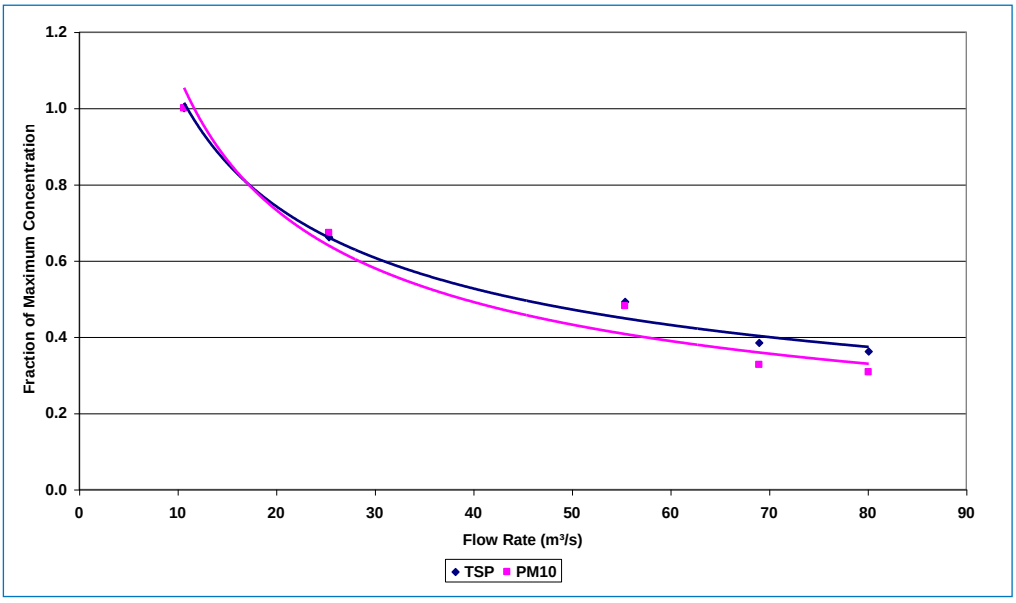


Figure 5-9 Relationship between Particulate Concentration and Flow Rate

A particulate matter emission rate (PER) can be calculated by multiplying the PEC by the ventilation rate (*V*).

The ventilation rate (*V*) used at any given time is a function of the age of the birds and the ambient temperature and humidity.

More recently two new datasets have become available for meat chickens. The first is the PM_{10} emission data detailed in Australian Poultry CRC (2011) and the second is data collected by Pacific Environment at a farm in South East Queensland (PAEHolmes, 2012). These data are compared in Figure 5-10 as standardised for number of birds and bird age. As there is a relatively consistent relationship between bird age and bird mass (across the industry), the data in Figure 5-10 are comparable from site to site when standardised by age and on a per 1,000 birds basis. The data are presented in Figure 5-10 as follows:

- Green Markers – particulate emissions based on the data in Mirrabooka (2002) and used in this assessment
- Red markers – data from PAEHolmes (2012)
- Blue Markers – CRC data from Australian Poultry CRC (2011)

It is noted that the red data markers (PAEHolmes, 2012) were collected over a period of five days every 15 minutes during summer just after first thin out. Due to project limitations, ventilation rates were unable to be measured in real time. The data shown in the figure therefore represent the range of potential concentrations over a range of ventilation rates during a warm period. The data showed a typical trend of low concentrations overnight, corresponding with conditions where lower ventilation rates are required. During the day, the concentrations were consistent over time when elevated ventilation levels were required (as the ambient temperature was above target temperature) with some peaks from time to time corresponding with short term ventilation changes.

Figure 5-10 shows that the modelled particulate emissions used in this assessment, that were based on Mirrabooka (2002) method, overpredicts actual measured dust concentrations at similar operations by a factor of at least two, thus resulting in a conservative assessment of potential impacts. This conservative estimation is further discussed in Section 6.2.2

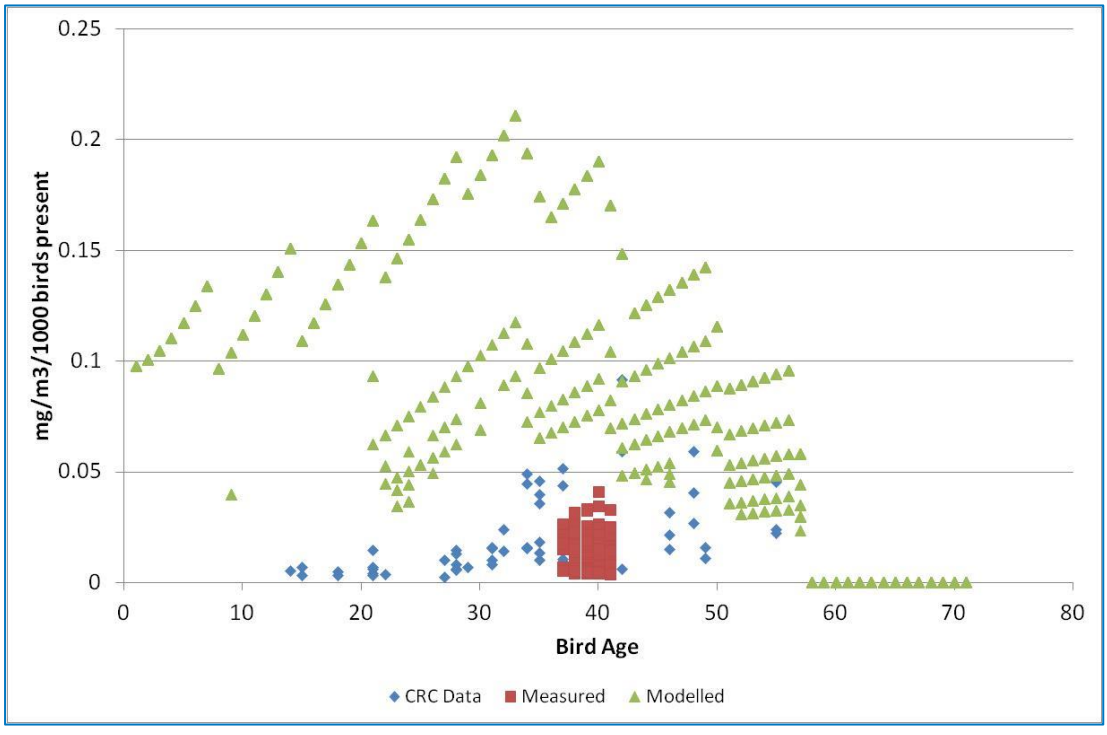


Figure 5-10 Summary of measured PM_{10} data (PE), CRC data and modelled (Mirrabooka 2002) emissions model data for a typical farm

5.5 Batch Staging

A sensitive analysis of the odour risk of the proposed Complex was completed by assessing the odour impact by changing the assumed start day of the bird placement. By changing the start day of the bird placement, the peak odour emissions have been assessed against a range of meteorology conditions throughout the year. This methodology has been adopted to provide a more realistic placement schedule based on data provided by ProTen.

The batch staging is presented as three model runs to represent day 1, day 14 and day 28 bird placements. We set the model up so that birds were placed on the first working day of 2005 (the modelled representative meteorological year – see Section 4.1.1) which is the Monday, day 4 of the calendar year. Therefore, the model begins on Day 4, day 18 and day 32 of the calendar year. We understand that the maximum number of birds that can be placed on any given day is 636,000 (±6%) which is equal to a maximum of 12 sheds per day.

Table 5-3 Day 1 (calendar day 4) Staging scenario – Number of sheds placed by date

	Day1	Day2	Day3	Day4	Day5	Day6	Day7	Day8	Day9	Day10	Day11	Day12
	1/01/05	2/01/05	3/01/05	4/01/05	5/01/05	6/01/05	7/01/05	8/01/05	9/01/05	10/01/05	11/01/05	12/01/05
	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue
Farm 1							8	2				
Farm 2								9			9	
Farm 3				10								
Farm 4				1	11		4					

Table 5-4 Day 14(calendar day 18) Staging scenario – Number of sheds placed by date

	Day15	Day16	Day17	Day18	Day19	Day20	Day21	Day22	Day23	Day24	Day25	Day 26
	15/01/20	16/01/20	17/01/20	18/01/20	19/01/20	20/01/20	21/01/20	22/01/20	23/01/20	24/01/20	25/01/20	26/01/20
	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue
Farm 1							8	2				
Farm 2								9			9	
Farm 3				10								
Farm 4				1	11		4					

Table 5-5 Day 28 (calendar day 32) Staging scenario – Number of sheds placed by date

	Day29	Day30	Day31	Day32	Day33	Day34	Day35	Day36	Day37	Day38	Day39	Day40
	29/01/2	30/01/2	31/01/2	1/02/20	2/02/20	3/02/20	4/02/20	5/02/20	6/02/20	7/02/20	8/02/20	9/02/20
	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tues
Farm 1							8	2				
Farm 2								9			9	
Farm 3				10								
Farm 4				1	11		4					

5.6 Excluded Sources

The following sections of the report include the discussion of other possible sources from site and the reason for their exclusion from the assessment.

5.6.1 Emergency Diesel Generator Emissions

The proposed on-site diesel generators will only be used during emergencies when the mains power supply from the electricity grid is interrupted or lost. Based on experience at other ProTen poultry production farms around Australia, the generators will only be required between one to five days per year.

It is proposed that there will be three generators at each PPU, each with a maximum standby rating of 390 kVA. The generators will be contained within a lockable acoustic enclosures with a vertical air

discharge. The generators will be tested on a regular basis as per the manufacturer's recommendations. The proposed generators will meet the relevant emission standards in Schedule 4 of the Protection of the Environment Operations (Clean Air) Regulation 2010 (Clean Air Regulation) (NSW Government, 2017).

Given the emission standards, low level of usage and the separation distances to the surrounding receptors, the diesel generators are not expected to exceed the relevant air quality criteria at the surrounding receptors. This was further proven in the Response to Submissions (SLR, 2015) (RTS) for ProTen's Narrandera Poultry Production Farm (SSD 6882) approved in November 2015.

5.6.2 Internal Road Emissions

Wheel generated dust from the internal roads were excluded from this assessment as the potential for emissions will be low given the constructed nature of the roads, the subsequent lower silt loading (compared to using unformed tracks) and the general low speeds the trucks travel on these roads. Based on the previous assessments of multiple poultry operations, wheel generated dust from internal roads was found to be a negligible source of dust. Furthermore, the buffer distances from the internal roads to surrounding receptors are suitably significant.

On this basis, modelling of dust emissions from the internal roads is not considered warranted. Dust emissions from the internal roads can be effectively mitigated and managed via appropriate construction and operational maintenance. This was also presented as a part of the RTS (SLR, 2015) for ProTen's Narrandera Poultry Production Farm (SSD 6882) approved in November 2015,

6. Results

6.1 Odour

6.1.1 Development alone

The predicted one second (peak to mean ratio included) odour concentrations at the most affected sensitive receptors and the recreational facilities in the general area of the site are presented in Table 6-1 and Table 6-2, respectively.

Table 6-1 Sensitive Receptor results for the most affected receptors

Batch scenario	Sensitive Receptor 22 – Results ($C_{99\ 1\ sec}$) OU	Sensitive Receptor 23– Results ($C_{99\ 1\ sec}$) OU	Sensitive Receptor 24 – Results ($C_{99\ 1\ sec}$) OU	Sensitive Receptor 25 – Results ($C_{99\ 1\ sec}$) OU
Day 4	2.1	2.0	3.4	2.7
Day 18	2.0	2.0	4.0	3.0
Day 32	3.7	3.6	4.2	2.8
Average	2.6	2.5	3.9	2.8

Table 6-2 Sensitive Receptor results for the recreational receptors

Batch scenario	Manilla Ski Gardens Caravan and Fishing Club (R20)–	Manilla Fishing Club (R17)– Results ($C_{99\ 1\ sec}$) OU	Lake Keepit Sport and Recreation Centre (R32)–

	Results ($C_{99\ 1\ sec}$) OU		Results ($C_{99\ 1\ sec}$) OU
Day 4	1.1	1.1	1.9
Day 18	1.1	1.1	1.7
Day 32	1.3	1.2	1.6
Average	1.2	1.1	1.7

The predicted odour concentrations for the sensitive receptors are presented in the following figures;

- Figure 6-1 Predicted 99th percentile 1-second odour concentration - Day 1 (calendar day 4);
- Figure 6-2 Predicted 99th percentile 1-second odour concentration - Day 4 (calendar day 18); and
- Figure 6-3 Predicted 99th percentile 1-second odour concentration - Day 28 (calendar day 32)

The predicted odour concentrations from the Rushes Creek Poultry Production Complex indicates that all rural sensitive receptors are expected to be below the odour criterion of $C_{99\ 1\ second}$ – 5 ou for all three batch staging scenarios. Whilst the results of the staging scenarios show a range of results for the predicted odour concentrations, the average for all three staging scenarios at the most affected sensitive receptors are well below the criteria. The highest predicted concentration occurs for the Day 14 staging scenario for sensitive receptor R24 at 4.2 ou which shows compliance and a clear pass with the $C_{99\ 1\ second}$ = 5 ou criteria.

The modelling also shows that the Recreational Facilities receptors are all below the population affected odour concentration of $C_{99\ 1\ second}$ = 2 ou. The Sport and Recreational Facility shows the highest risk of odour at with a maximum predicted concentration of 1.9 ou occurring on the Day 4 staging scenario.

It is noted that the Manilla Ski Gardens Caravan Park and Manilla Fishing Club are located over 2 km from the nearest sheds, while the Lake Keepit Sport and Recreation Centre is more than 6.5 km from the nearest sheds. It should be noted the location for each receptor is at the closest point to the Rushes Creek Poultry Production Complex, which represents a conservative result for each facility.

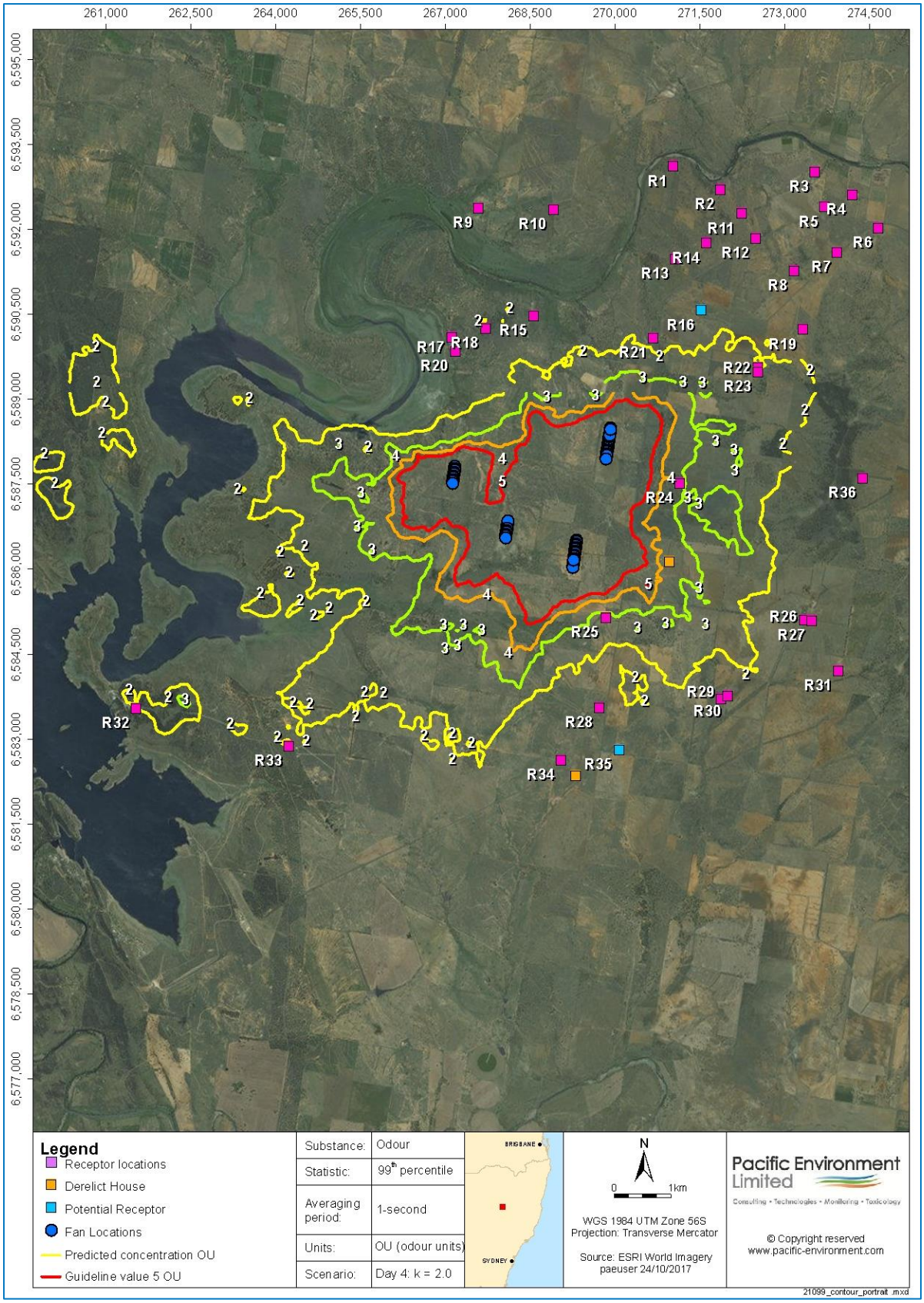


Figure 6-1 Predicted 99th percentile 1-second odour concentration - Day 1 (calendar day 4)

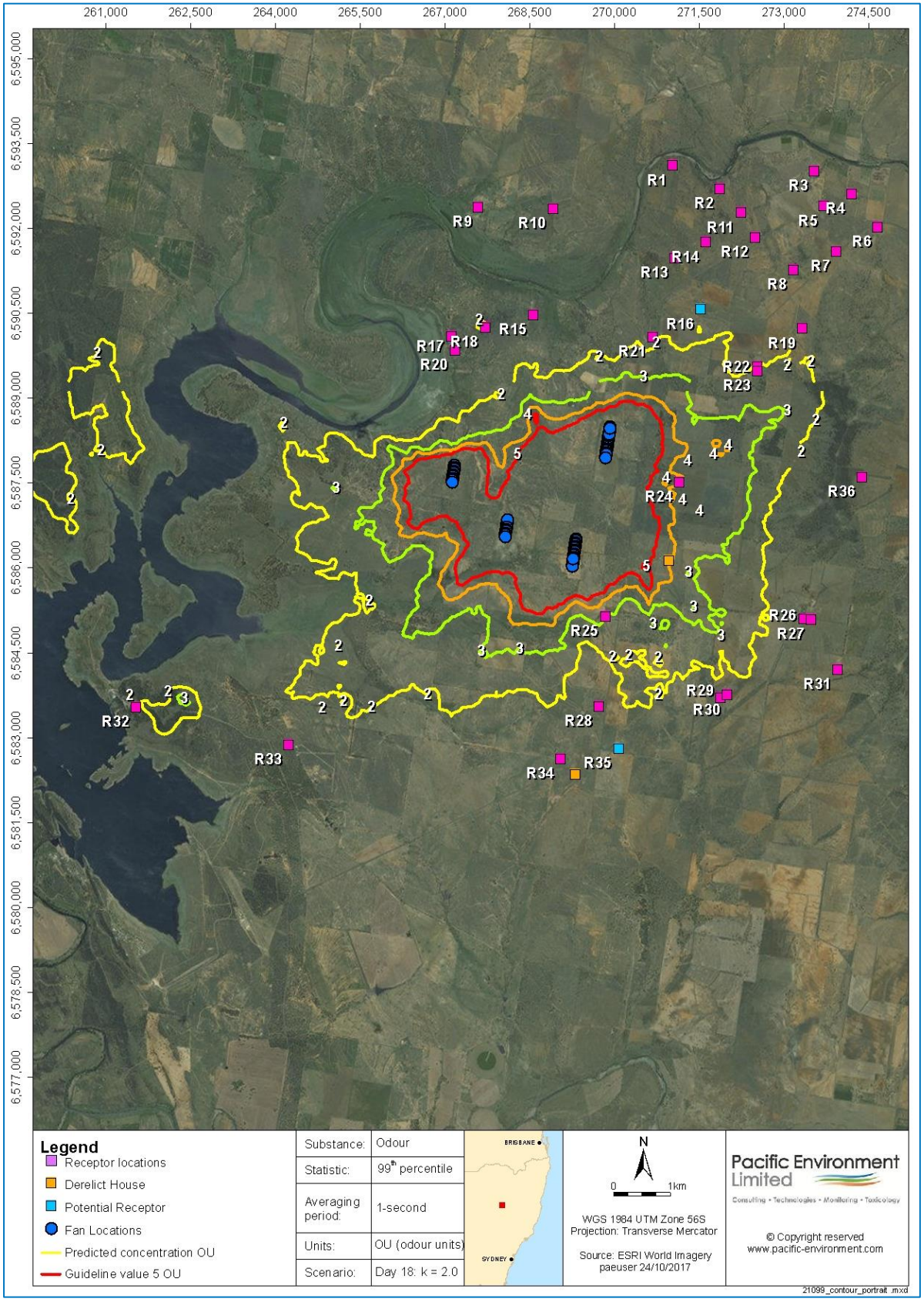


Figure 6-2 Predicted 99th percentile 1-second odour concentration - Day 4 (calendar day 18)

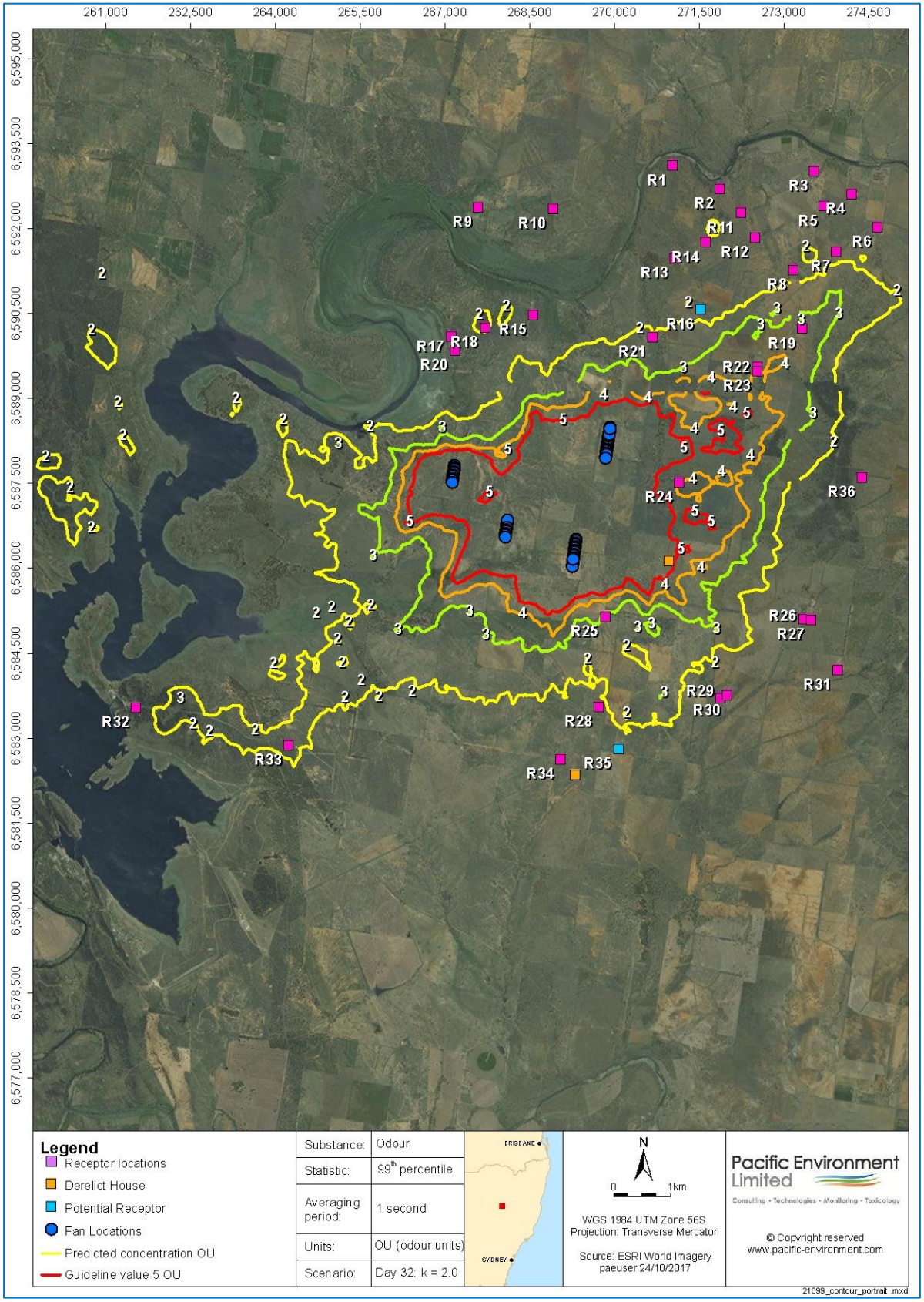


Figure 6-3 Predicted 99th percentile 1-second odour concentration - Day 28 (calendar day 32)

6.1.2 Cumulative Odour

With regard to the potential for cumulative impacts, the poultry developments we have identified in the area include:

Existing

- Glenara Park Poultry Breeder Farm (Baiada) - approved by Council as Development Consent DA 69-99/2000. This development houses 80,000 birds (it is understood that Baiada is proposing to expand this farm to 100,000 birds) and located approximately 6 km to the northwest the Development Site;
- Murrami Poultry Production Farm (ProTen) - approved by Council in December 2002 under Development Consent DA 2001/008. This development comprises 16 poultry sheds which accommodate up to 800,000 birds and is located approximately 11 km to the south-southeast of the Development Site;
- Moana Broiler Farm (Praedium) - approved by Council in November 2008 under Development Consent DA 0324/2008. This development comprises eight sheds which accommodate up to 450,000 birds and is located 11.5 km to the south-southwest of the Development Site; and
- Brubi Poultry Broiler Production Farm (Russell Chickens) - was original approved by Manilla Shire Council in 2001 as DA 23-00/2001 to house 400,000 birds in eight sheds. In 2012, Council approved an additional 8 sheds under Development Consent DA 0078/2013. This development comprises 16 sheds in total which accommodate up to 800,000 birds and is located approximately 10 km to the east of the Development Site.
- A small sow operation (approximately 50 sows) was identified by aerial photography located approximately 3 km to the north east of the Development Site in the vicinity of sensitive receptor R13. The odour emanating from the existing sow operation has different odour character from the proposed poultry development. Due to the size and nature of the sow operation, the separation distance and the predicted spread of odour emissions from the proposed poultry development, a cumulative odour assessment was not undertaken as there is a negligible potential for cumulative odour impacts.

Approved (i.e. Development Consent issued but not yet Constructed)

- Strathfield Poultry Broiler Complex (Baiada) - is a five farm poultry development approved by Council in July 2014 under separate development consents - DA 0273/2014, DA 0274/2014, DA 0275/2014, DA 0276/2014 and DA 0277/2014. The Complex will house up to 2.94 million birds and is located 26 km to the north east of the Development Site.

The only poultry farm within 10 kilometres is the Glenara Park breeder farm, which typically has a much smaller odour footprint than equivalent sized broiler farms. Therefore, we have not performed a cumulative assessment for odour other than combining Farms 1, 2, 3 and 4 as presented in this report.

6.2 Particulate Matter

6.2.1 Annual average PM_{10} concentrations

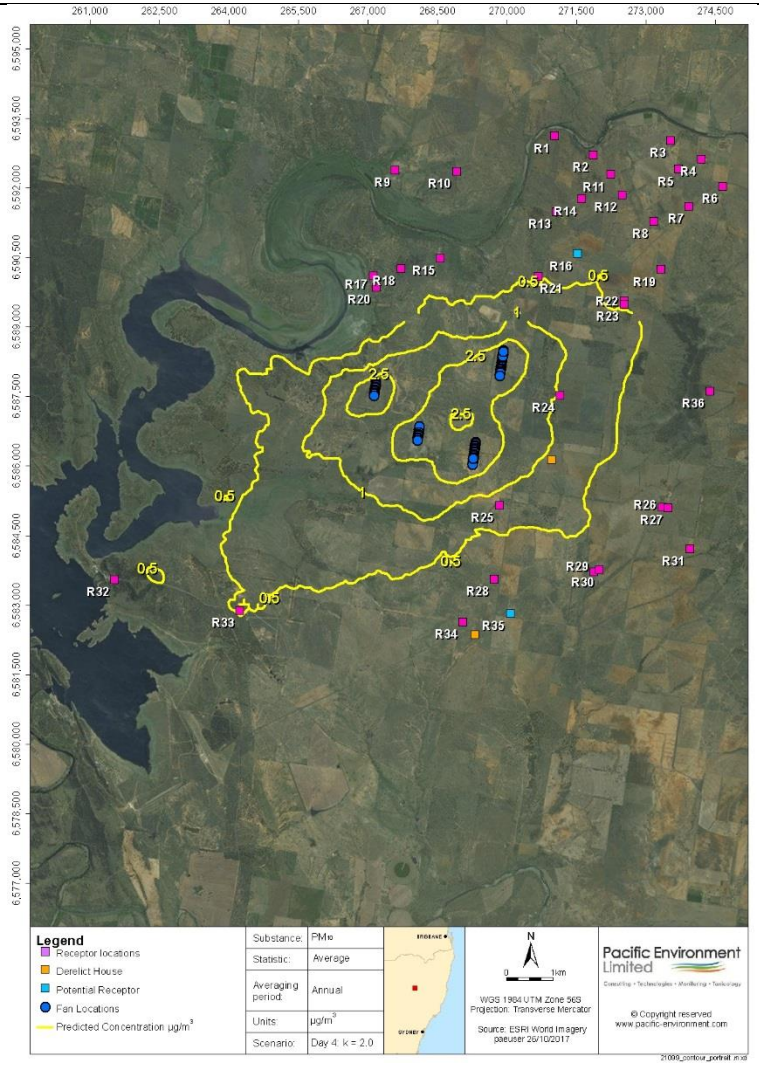
Table 6-3 presents the predicted annual average concentrations and levels at each of the sensitive receptor locations due to both the Rushes Creek Poultry Production Complex alone, and when including existing background concentrations, for the three batch staging scenarios detailed in Section 5.5 i.e. Day 4, Day 18 and Day 32 of the calendar year. The assumed background concentrations have been outlined previously in Section 3.4**.**

Contour plots of the predicted annual average concentrations due to the Rushes Creek Poultry Production Complex alone and cumulatively are presented in Figure 6-4 to Figure 6-6.

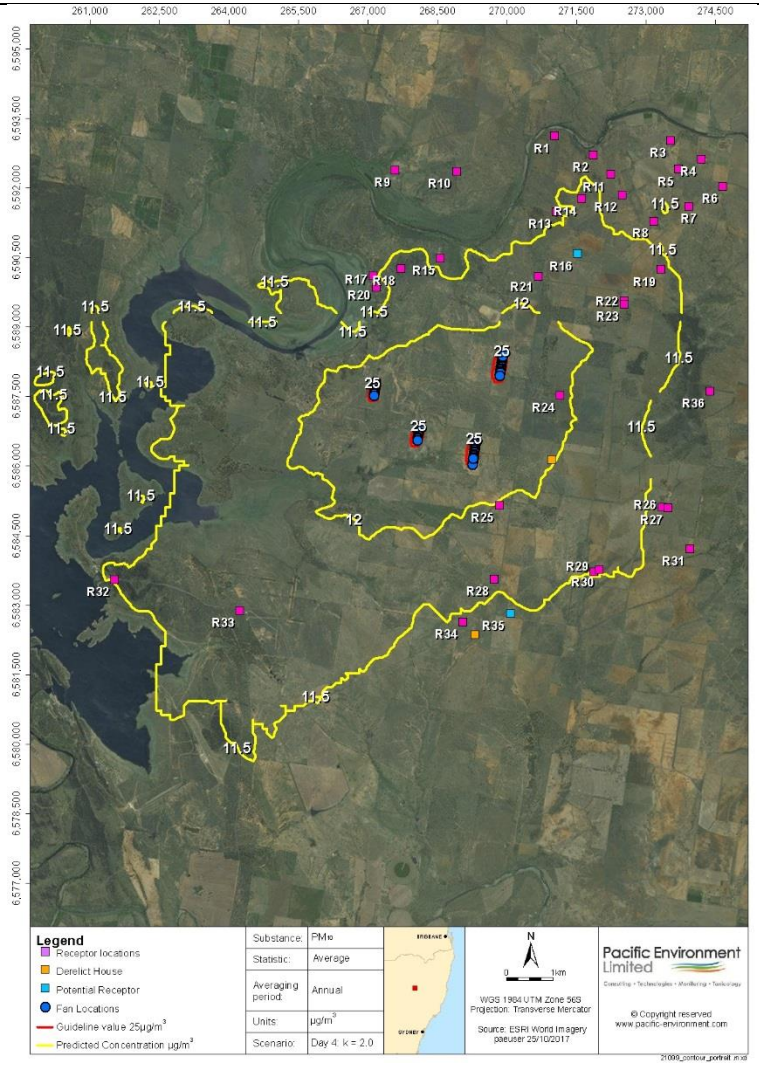
The results show that there are no sensitive receptors predicted to experience annual average concentrations above the relevant impact assessment criterion for PM_{10} of 25 $\mu g/m^3$, either due to the complex alone, or when including existing background concentrations. The maximum contribution at a sensitive from the complex alone, is 1.1 $\mu g/m^3$ at R24 when assessing operations for the batching scenario commencing on calendar Day 32.

Table 6-3: Predicted annual average PM_{10} concentrations due to Development alone and cumulatively

ID	Batch Stage					
	Day 4		Day 18		Day 32	
	Annual Average					
	Development alone	Cumulative	Development alone	Cumulative	Development alone	Cumulative
	Assessment criteria = N/A	Assessment criteria = 25 µg/m^3	Assessment criteria = N/A	Assessment criteria = 25 µg/m^3	Assessment criteria = N/A	Assessment criteria = 25 µg/m^3
R1	0.2	11.4	0.2	11.4	0.2	11.4
R2	0.2	11.4	0.2	11.4	0.2	11.4
R3	0.2	11.4	0.1	11.3	0.2	11.4
R4	0.2	11.4	0.1	11.3	0.2	11.4
R5	0.2	11.4	0.1	11.3	0.2	11.4
R6	0.2	11.4	0.1	11.3	0.2	11.4
R7	0.2	11.4	0.2	11.4	0.3	11.5
R8	0.2	11.4	0.2	11.4	0.3	11.5
R9	0.2	11.4	0.2	11.4	0.2	11.4
R10	0.2	11.4	0.2	11.4	0.2	11.4
R11	0.2	11.4	0.2	11.4	0.2	11.4
R12	0.2	11.4	0.2	11.4	0.2	11.4
R13	0.3	11.5	0.3	11.5	0.3	11.5
R14	0.3	11.5	0.3	11.5	0.3	11.5
R15	0.3	11.5	0.3	11.5	0.3	11.5
R16	0.4	11.6	0.3	11.5	0.4	11.6
R17	0.2	11.4	0.2	11.4	0.2	11.4
R18	0.4	11.6	0.4	11.6	0.4	11.6
R19	0.3	11.5	0.3	11.5	0.5	11.7
R20	0.2	11.4	0.2	11.4	0.3	11.5
R21	0.4	11.6	0.4	11.6	0.4	11.6
R22	0.5	11.7	0.4	11.6	0.6	11.8
R23	0.5	11.7	0.4	11.6	0.6	11.8
R24	0.9	12.1	0.9	12.1	1.1	12.3
R25	0.7	11.9	0.8	12.0	0.8	12.0
R26	0.3	11.5	0.3	11.5	0.3	11.5
R27	0.3	11.5	0.2	11.4	0.3	11.5
R28	0.3	11.5	0.4	11.6	0.4	11.6
R29	0.3	11.5	0.3	11.5	0.3	11.5
R30	0.3	11.5	0.3	11.5	0.3	11.5
R31	0.2	11.4	0.2	11.4	0.2	11.4
R32	0.3	11.5	0.3	11.5	0.3	11.5
R33	0.5	11.7	0.5	11.7	0.5	11.7
R34	0.3	11.5	0.3	11.5	0.3	11.5
R35	0.3	11.5	0.3	11.5	0.3	11.5
R36	0.2	11.4	0.2	11.4	0.2	11.4

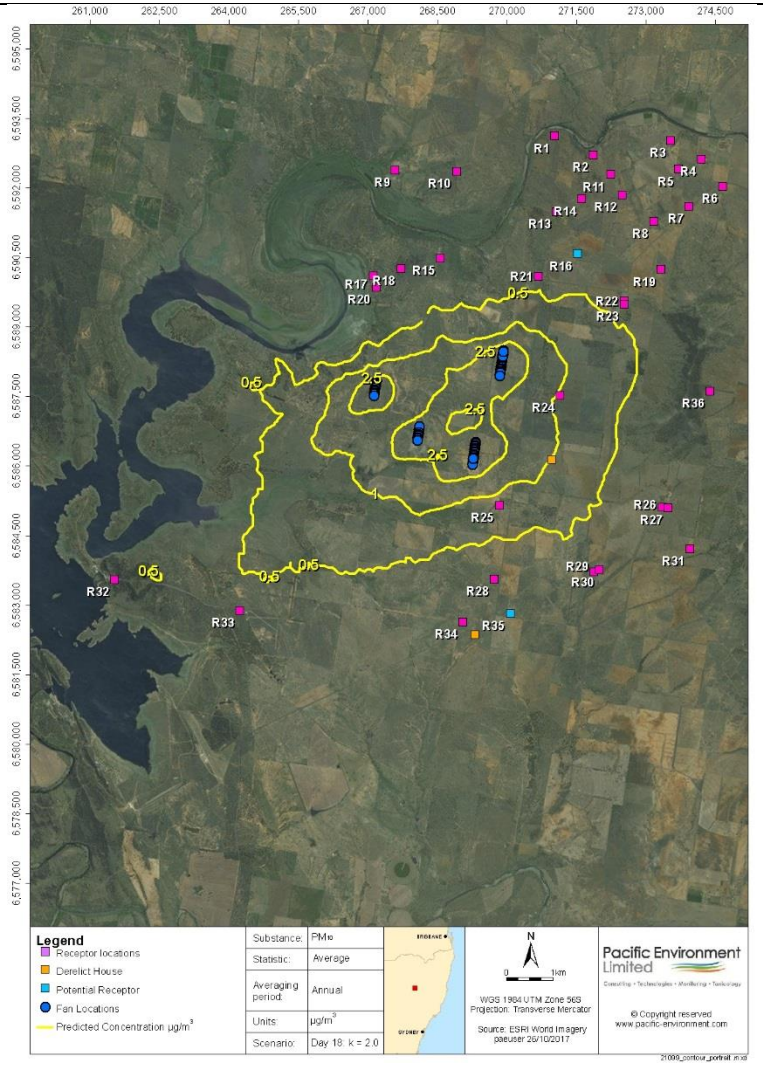


Development alone

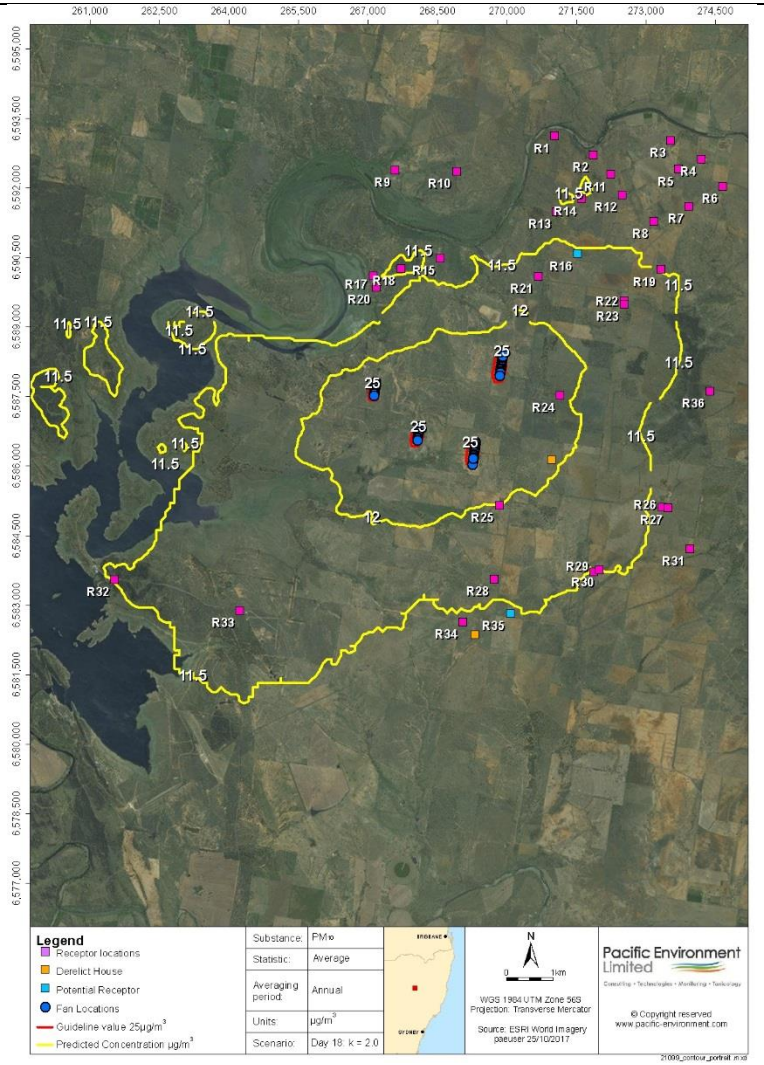


Cumulative

Figure 6-4 Predicted annual average PM_{10} concentration due to Development alone and cumulatively - Calendar Day 4

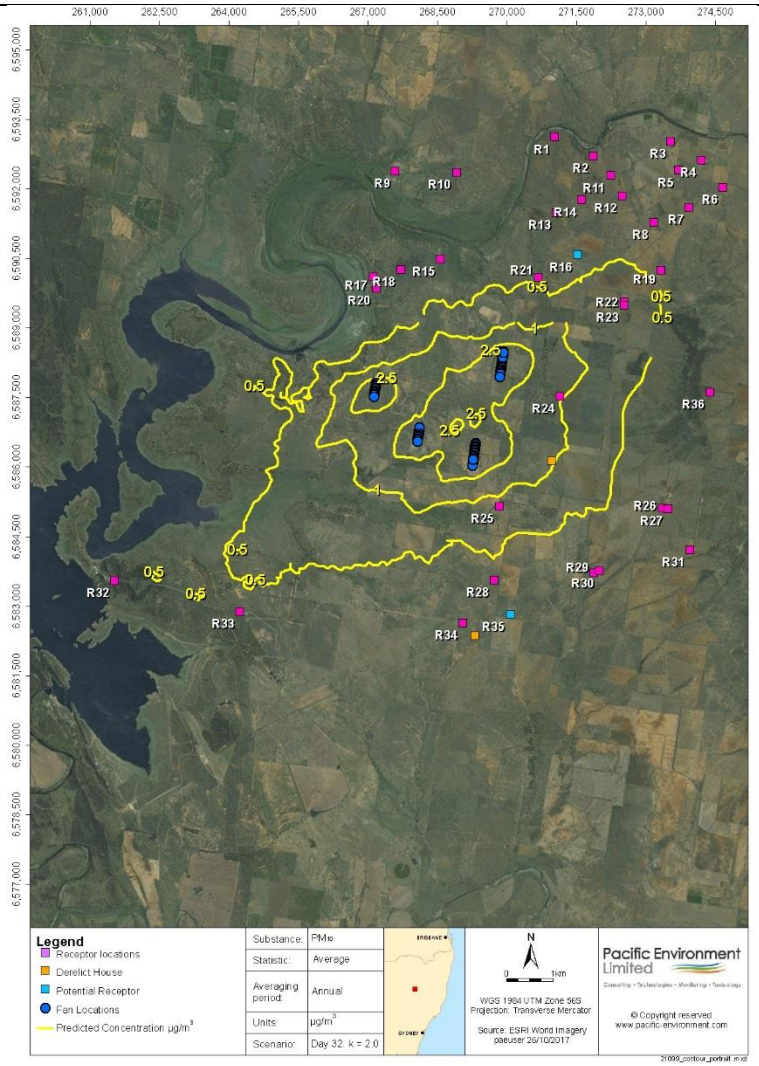


Development alone

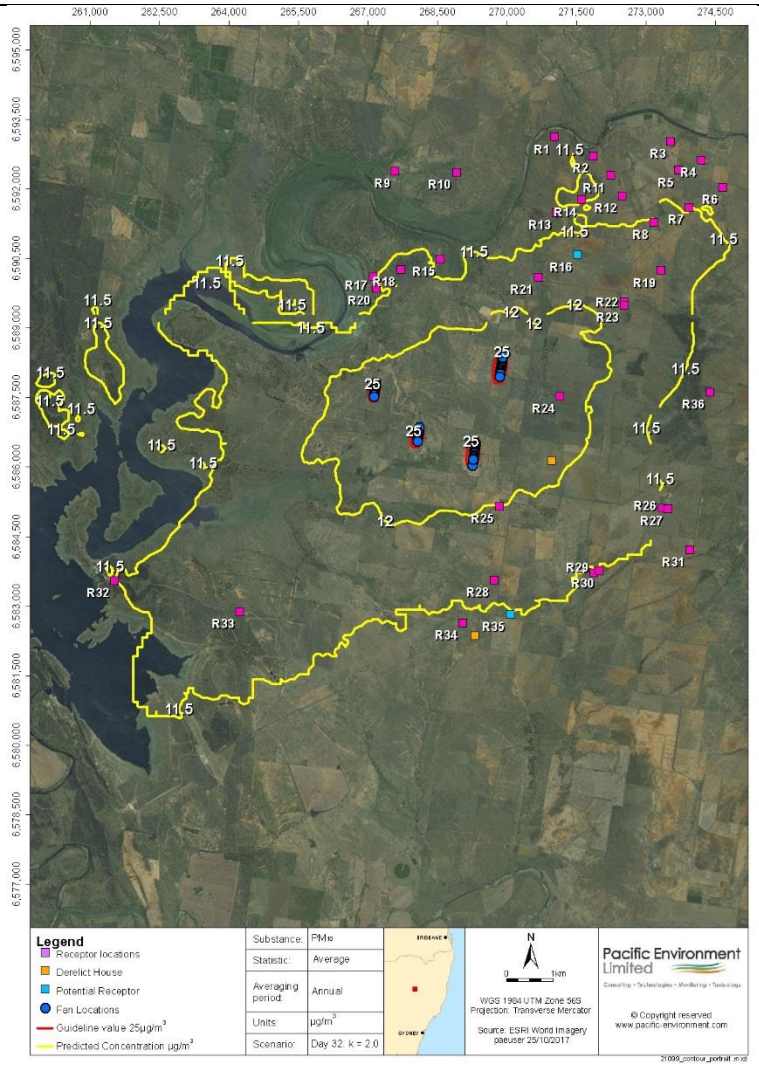


Cumulative

Figure 6-5 Predicted annual average PM_{10} concentration due to Development alone and cumulatively - Calendar Day 18



Development alone



Cumulative

Figure 6-6 Predicted annual average PM_{10} concentration without background due to Development alone and cumulatively - Calendar Day 32

6.2.2 24-hour average PM_{10} concentrations

It is important to note that it is not possible to accurately predict cumulative 24-hour average concentrations many years into the future using dispersion modelling, principally due to the variability in ambient levels and spatial and temporal variation in any day-to-day anthropogenic activity. Experience shows that the worst-case 24-hour PM_{10} concentrations are strongly influenced by other sources in the area, such as bushfires and dust storms, which are essentially unpredictable.

Due to a lack of any site-specific data, cumulative PM_{10} air quality impacts have been estimated by adding the contribution of the complex to the existing air quality or 'background' values taken from the NRAQMP monitoring station at Wil-gai. The 2016 data was selected based on the most complete dataset (Section 3.4) and the most recent year available which better represents current air quality within the region. As there was no data available from the modelled year, the year 2016 data is the most appropriate to use for the assessment.

Table 6-4 presents the maximum predicted 24-hour average concentrations of PM_{10} at each of the sensitive receptor locations due to the complex alone and cumulatively.

Contour plots of the maximum predicted 24-hour average concentrations due to the Development alone, for the three batch staging scenarios detailed in Section - Day 4, Day 18 and Day 32 of the calendar year are presented in Figure 6-7 to Figure 6-9

Note that the maximum 24-hour average PM_{10} contours do not represent a single worst-case day at all locations, but rather represent the potential worst case 24-hour average PM_{10} concentration that could be reached at any particular location across the entire modelling year.

The results from the three modelling scenarios show that there is only one sensitive receptor (R25) predicted to experience a cumulative 24-hour average PM_{10} concentration above the impact assessment criteria of 50 µg/m^3. This occurs only under the Calendar Day 3 assessment, on 30 October, with a predicted contribution from the complex of 41.6 µg/m^3.

Figure 6-10 to Figure 6-12 show the cumulative time series as stacked bar charts for the highest cumulative sensitive receptor R25, matching the predicted contribution from the Development for each day with the measured background from Wil-gai during 2016. It is apparent from these plots that predicted contribution from the Development typically results in a minor change to the existing background concentrations. This is further supported in the frequency plot for the Calendar Day 4 assessment at R25 (see Figure 6-13) which shows that over 95% of the predicted increments due to the complex are 5 µg/m³ or below.

As discussed in Section 5.4, the Mirrabooka (2002) data used for the modelling is inherently conservative. Therefore, the emission rate data used over-estimates the emissions and hence the impacts by a factor of at least two, thus resulting in a conservative assessment of potential impacts.

Taking into consideration the conservative particulate emissions, coupled with there being no consideration of mitigation measures (including the proposed vegetation screens – discussed further below) the results presented provide an unrealistically conservative assessment of particulate impacts. It is known that there are multiple similar operations in similar locations where the operations do not lead to any off-site dust impacts.

Vegetative buffers would be planted to further mitigate any potential risk with regard to dust. Various research has shown that dust from intensive livestock operations can be reduced by 35% to 65% (Laird, 1997; Thernelius, 1997; Hartung, 1985; Malone, et al., 2006; Malone, et al., 2008). In their

work, Malone et. al. (2006, 2008) showed an average reduction over three years of 56%. This is primarily associated with the dust impacting on the trees and depositing out. Therefore, even though the risk of dust impacts is low, the dust emissions can easily be mitigated by planting vegetative buffers.

Table 6-4: Maximum predicted maximum 24-h hour average PM_{10} concentrations due to Development alone and cumulatively

ID	Batch Stage					
	Day 4		Day 18		Day 32	
	Maximum 24-h average concentration					
	Development alone	Cumulative	Development alone	Cumulative	Development alone	Cumulative
	Assessment criteria = N/A	Assessment criteria = 50 µg/m³	Assessment criteria = N/A	Assessment criteria = 50 µg/m³	Assessment criteria = N/A	Assessment criteria = 50 µg/m³
R1	7.6	39.5	4.1	39.5	5.6	39.5
R2	8.4	39.5	9.5	39.5	12.2	39.5
R3	7.4	39.5	5.6	39.5	6.8	39.5
R4	6.4	39.5	5.8	39.5	4.0	39.5
R5	6.6	39.5	6.7	39.5	4.3	39.5
R6	5.1	39.5	3.3	39.5	5.5	39.5
R7	6.7	39.5	4.2	39.5	7.6	39.5
R8	9.4	39.5	6.9	39.5	10.1	39.5
R9	6.7	39.5	7.0	39.5	3.0	39.5
R10	8.4	39.5	6.0	39.5	3.8	39.5
R11	8.7	39.5	8.6	39.5	10.3	39.5
R12	10.4	39.5	7.9	39.5	6.1	39.5
R13	9.7	39.6	13.4	39.5	17.3	39.5
R14	9.8	39.5	10.3	39.5	12.7	39.5
R15	10.9	39.7	9.9	39.5	13.4	39.5
R16	14.7	39.8	12.9	39.5	9.7	39.5
R17	9.8	40.4	5.2	39.5	4.2	39.5
R18	13.7	41.2	8.8	39.6	6.0	39.5
R19	6.0	39.5	8.8	39.5	10.8	42.4
R20	10.7	40.3	6.6	39.5	4.6	39.5
R21	14.5	40.1	11.1	39.5	10.6	39.5
R22	9.5	39.6	10.8	39.7	14.3	42.5
R23	9.5	39.6	10.9	39.6	13.7	42.1
R24	15.5	40.0	18.8	39.5	19.2	40.9
R25	41.6	**55.2**	17.2	42.8	24.3	40.9
R26	6.6	39.5	6.2	39.5	8.6	39.5
R27	6.5	39.5	6.0	39.5	7.8	39.5
R28	8.2	39.7	10.3	39.5	10.1	40.1
R29	9.0	39.6	6.2	39.5	8.9	39.7
R30	7.4	39.6	5.8	39.5	8.3	39.7
R31	4.7	39.5	4.9	39.5	4.5	39.5
R32	4.7	40.0	5.9	39.5	4.3	39.5
R33	8.5	39.6	5.2	39.5	4.6	39.7
R34	10.8	39.7	7.5	39.5	4.8	40.1
R35	7.9	39.6	8.6	39.5	6.3	39.9
R36	5.4	39.5	3.7	39.5	3.4	39.5

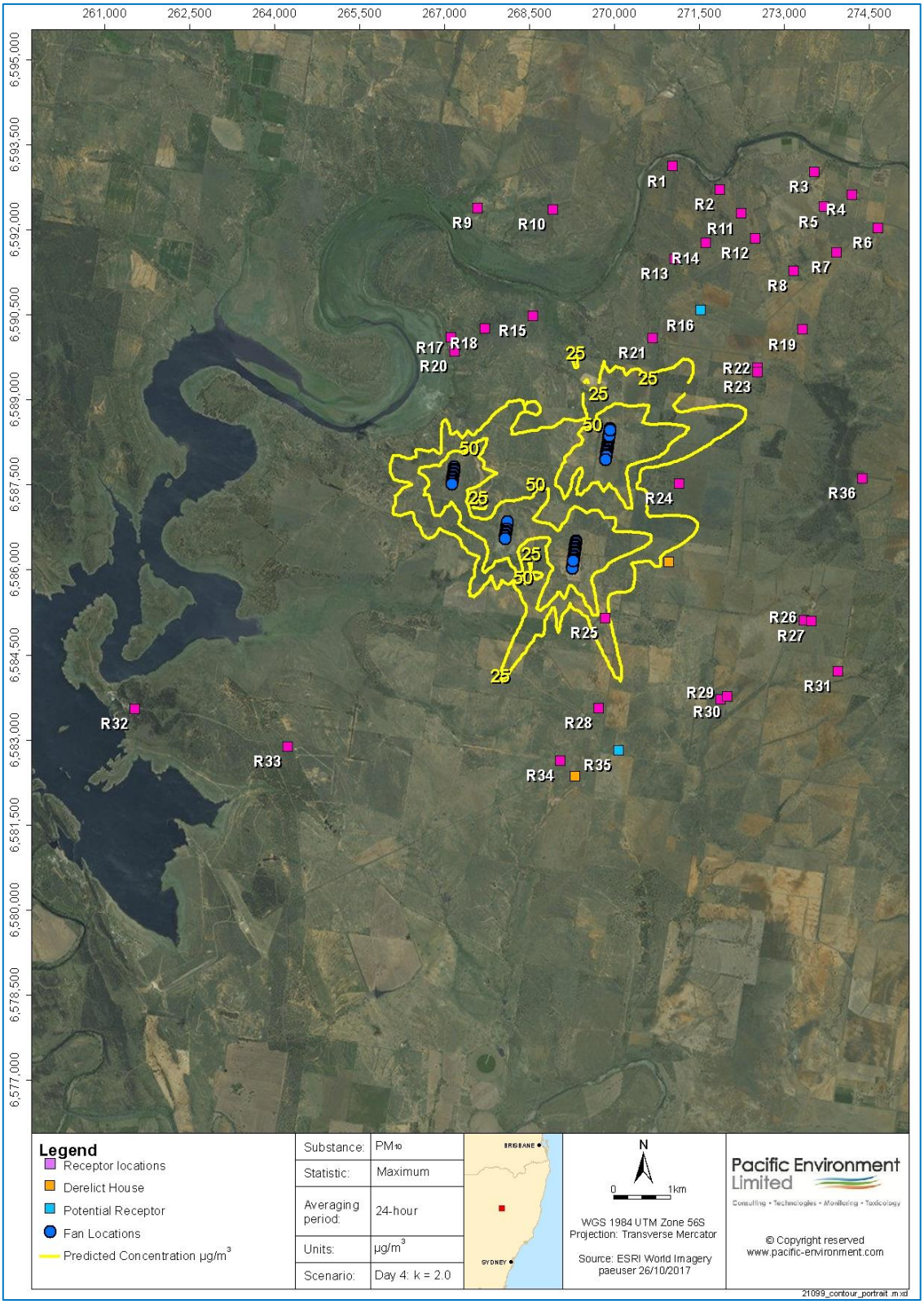


Figure 6-7 Maximum predicated 24-hour PM_{10} concentration without background - Calendar Day 4

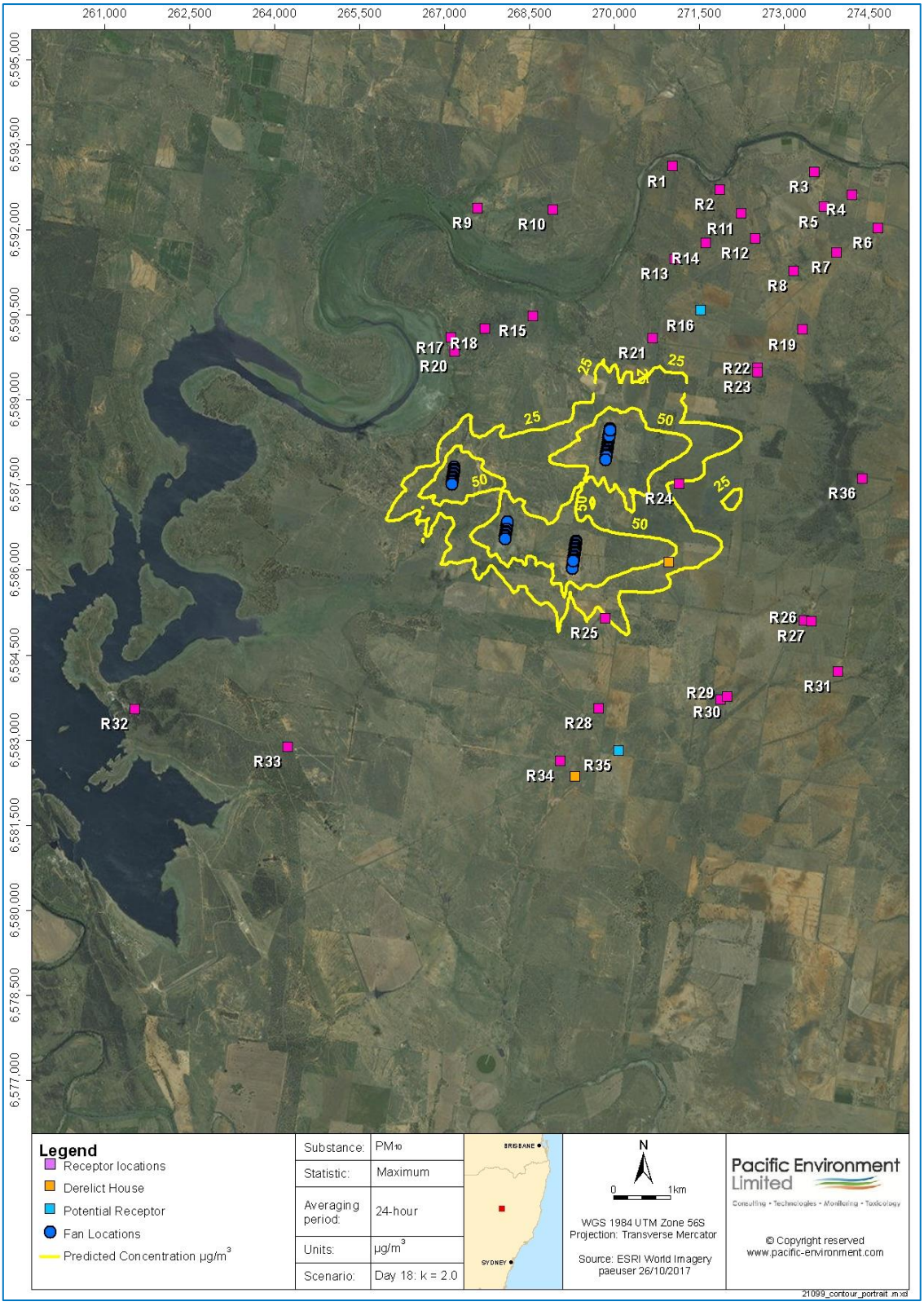


Figure 6-8 Predicted maximum 24-hour PM_{10} concentration without background - Day 14 (calendar day 18)

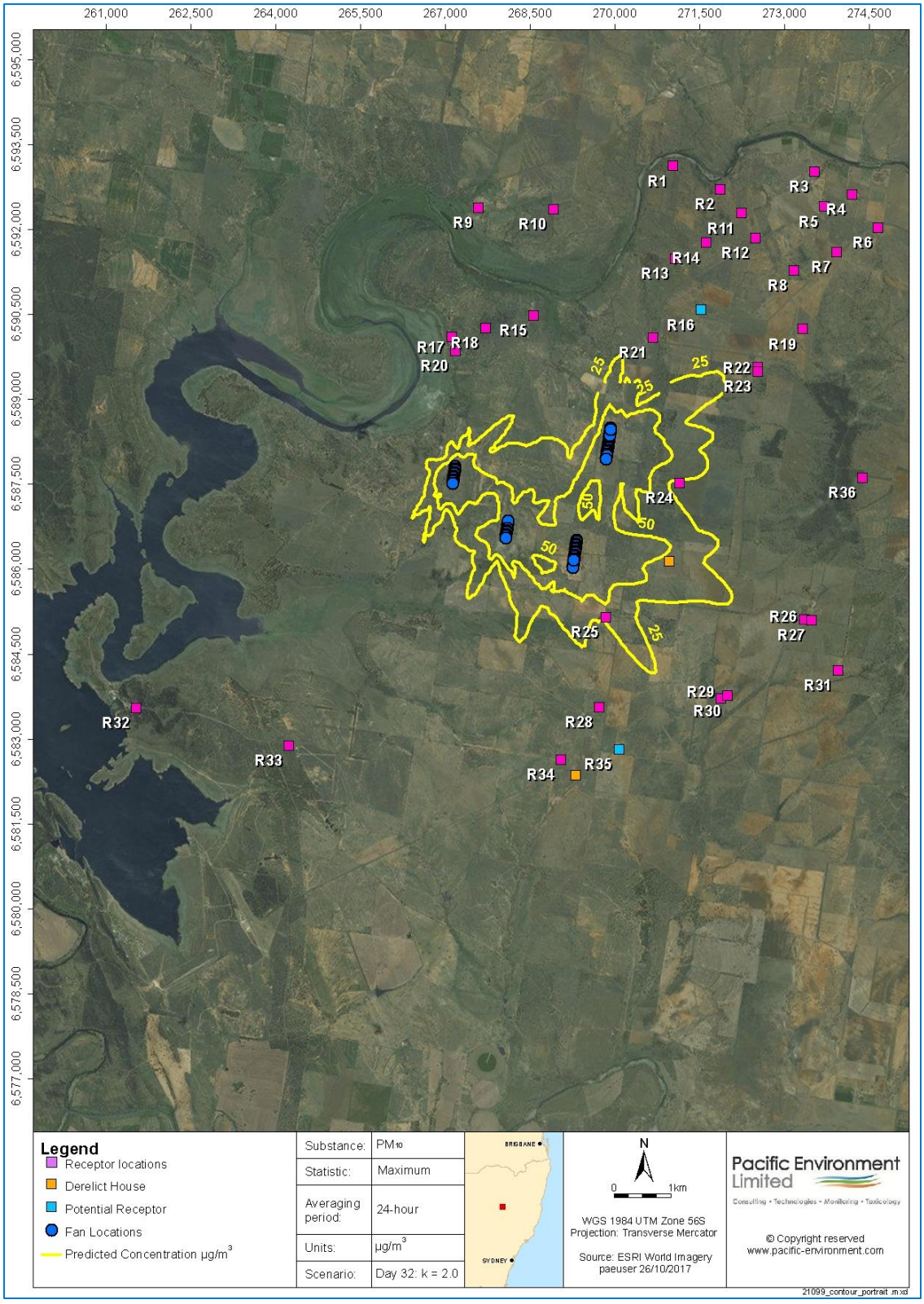


Figure 6-9 Predicted maximum 24-hour PM_{10} concentration without background - Day 28 (calendar day 32)

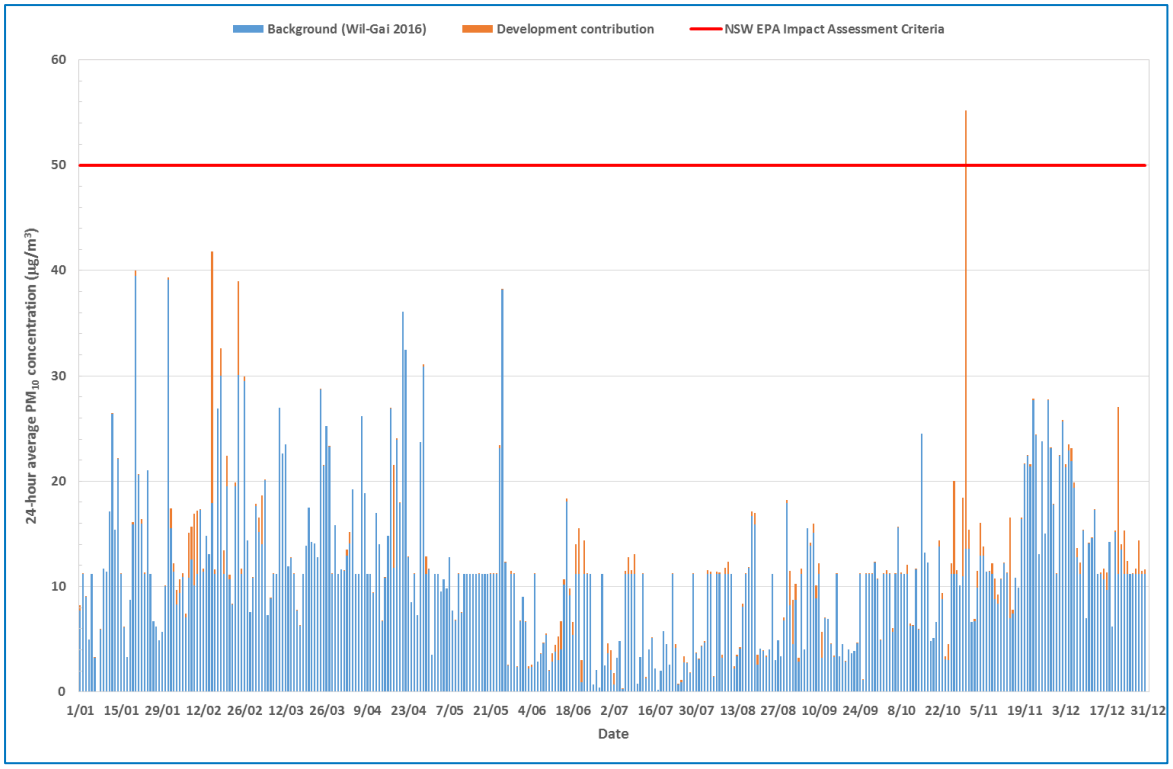


Figure 6-10 Maximum cumulative 24-hour average PM_{10} concentrations at R25 – Calendar Day 4

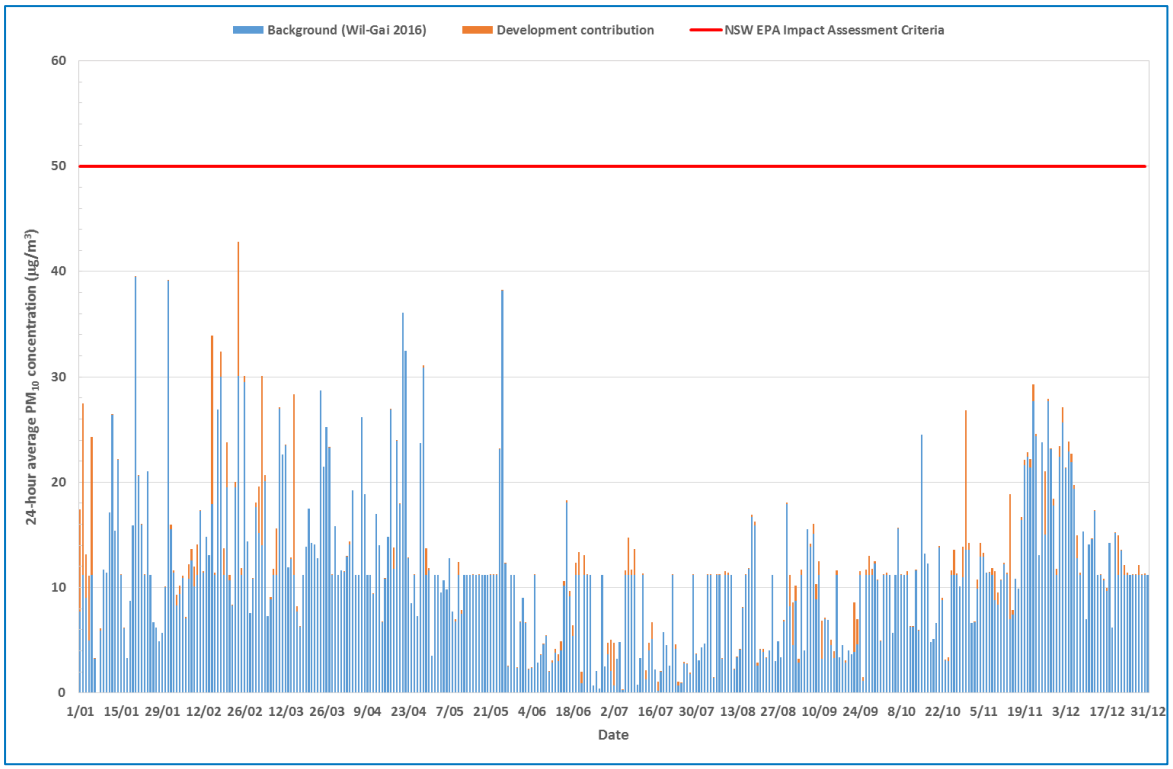


Figure 6-11 Maximum cumulative 24-hour average PM_{10} concentrations at R25 – Calendar Day 18

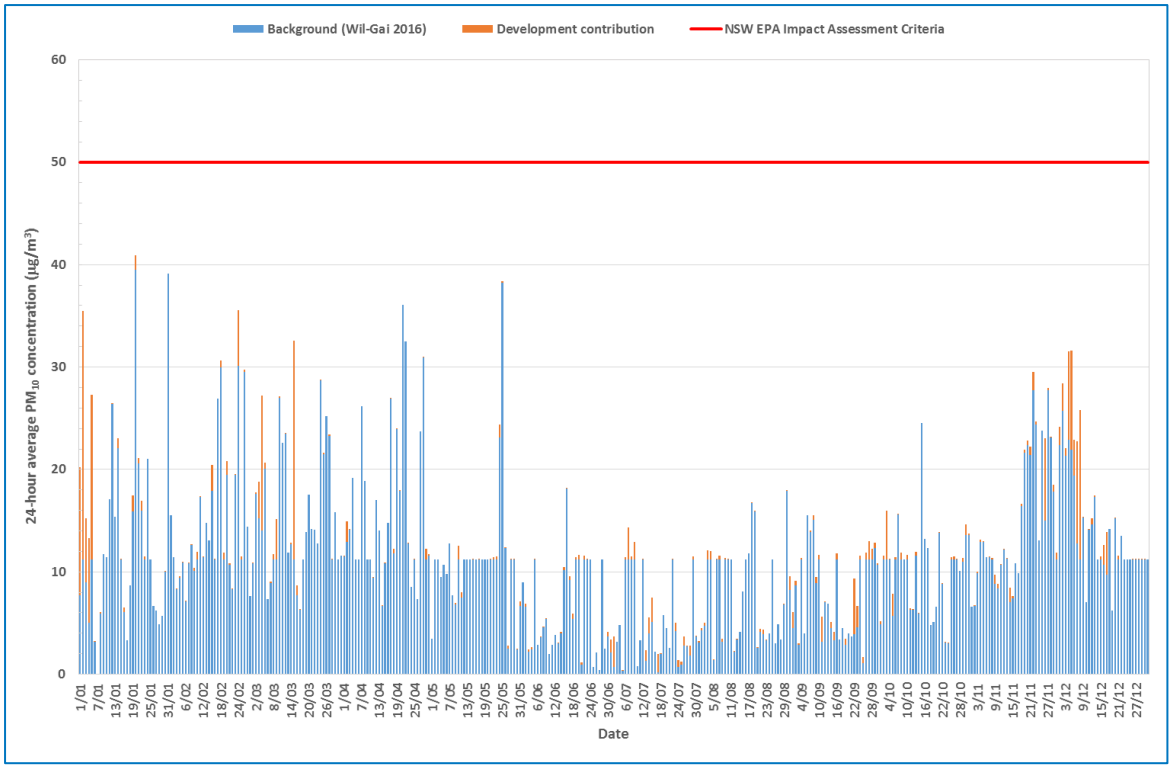


Figure 6-12 Maximum cumulative 24-hour average PM_{10} concentrations at R25 – Calendar Day 32

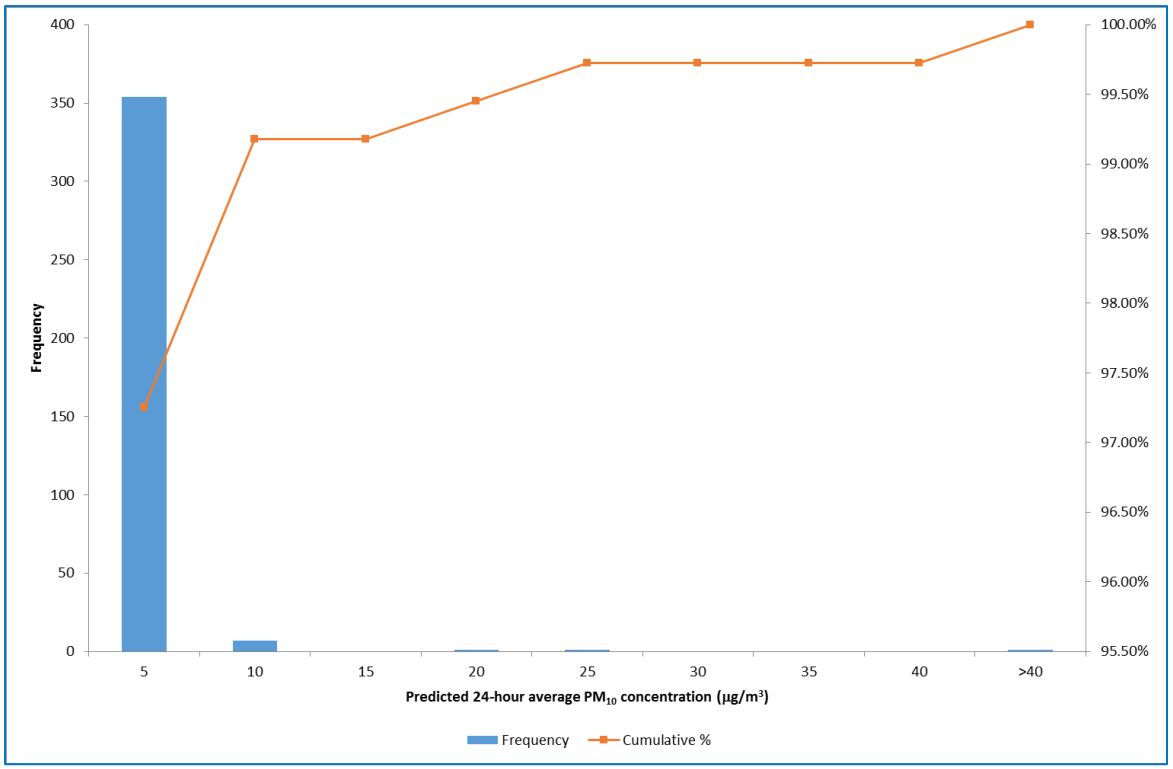


Figure 6-13 Frequency plot of 24-hour average PM_{10} concentrations at R25 – Calendar Day 4

7. Mitigation Measures

Air quality impacts are directly related to farm operation, with good management practices playing a significant role in reducing the potential for offensive odour and particulate matter emissions. The proposed Rushes Creek Poultry Production Complex offers several advantages in terms of the potential for air quality impacts, including low density of surrounding residences and significant separation distances.

While the complex is predicted to have a low impact on local amenity with respect to odour and dust impacts, ProTen will take reasonable and practicable measures to prevent or minimise emissions.

As listed below, a range of complementary design features, best management practices and mitigation measures will be applied to minimise and manage potential air quality impacts.

Development Design

- The poultry sheds will be fully enclosed, have adequate roof overhang (wide eaves) and be surrounded by dwarf concrete bund walls to prevent rainwater entering the sheds and to allow for the controlled discharge of wash down water from the sheds. These measures will all reduce the level of moisture within the poultry sheds, which is identified as a significant potential odour source.
- The feed silos will be fully enclosed to both prevent the entry of rainwater, with wet feed also identified as a potential odour source, and minimise emissions of dust/particulate matter when loading and unloading.
- The poultry sheds will be tunnel-ventilated, which will allow control over the moisture levels and promote optimum growing conditions and bird health. The increased airflow and improved feed conversion in tunnel-vented sheds helps to maintain bedding material within the optimal moisture range.
- All sheds will be fitted with nipple drinkers with drip cups, as opposed to traditional cup drinkers, to minimise water spillage and reduce the risk of increased shed moisture.

Operation and Maintenance

- Regular monitoring and maintenance of the tunnel ventilation systems and bird drinkers will be undertaken to avoid spillage, leaks and uneven distribution.
- Stocking densities and bird health within each of the poultry sheds will be regularly checked and, if necessary, appropriate corrective measures will be implemented.
- Daily monitoring and maintenance of the bedding material will occur to identify, remove and replace any caked material beneath drinking lines and/or areas with excessive moisture content.
- Poultry litter will be promptly removed from the sheds and transported off-site in covered trucks at the end of each production cycle during the clean-out phase. Wherever possible the handling of the material will be avoided during adverse climatic conditions, such as times of cold air drainage during early morning or towards nights and strong winds. The shed ventilation systems will not be used during the removal of bedding material.

- Dead birds will be collected from the sheds on a daily basis and stored in on-site chillers prior to removal from site.
- The insides of the poultry sheds and the surrounds will be maintained at all times to ensure a clean and sanitary environment.
- During sanitisation, the amount of air released from the sheds while any sanitising scent is present will be minimised and, if possible, a low scent sanitiser will be utilised.
- Internal access roads will be appropriately maintained to minimise dust emissions.

Landscaping Strategy

- Landscape plantings (vegetation screens) will be established and the plantings will act to effectively slow and filter air movement, which will enhance dust deposition and odour dispersion.

Meteorological Station

- A meteorological station will be installed within the complex to collect on-going and up-to date weather data. The collected data will assist in responding to any complaints relating to possible odour emissions.

Environmental Complaints and Incidents

- A Complaints and Incidents Management Strategy will be implemented to ensure that all complaints and incidents relating to the poultry operation are promptly and effectively addressed. Appropriate documentation of complaint/incident handling will assist in identifying and implementing measures to negate the possibility of re-occurrence in the future.

8. Discussion

Dispersion modelling of predicted odour emissions (K factor of 2.0) from the proposed farm (54 sheds) indicates that odour concentrations associated with the farm at the nearest off-site sensitive receptors will be below the NSW odour criterion of 5 ou. The highest predicted sensitive receptor concentration including the results from all staging runs is **4.2 ou**, which is well below (rounded to 4 ou) the guideline value.

The predicted results are directly related to the K factor values used. For this work, a K factor of 2 was used. The average K factor data PE holds for another ProTen site (Section 5.2) indicates that a K factor of 2 may be conservative for this site. This means that the predicted concentrations are not expected to be exceeded during normal operations.

As discussed in Section 5.3 the estimated ventilation rates have been compared to the flow rates used at the ProTen Murrami farm and shows a good agreement when the limitations of the datasets are considered. The ventilation data generated using the RIRDC methods, whilst newer in terms of the data underlying the methods, would unrealistically overpredict ventilation rates, and therefore odour emission rates. This was demonstrated when the ventilation rates were compared to real world test data from the Murrami Farm (Figure 5-7).

In the absence of site specific meteorology, we have used a combination of TAPM and CALMET known as the No Observation approach. This method is detailed and approved in the Generic Guidance and Optimum Model Settings for the CALPUFF modelling system for inclusion into the *'Approved methods for the Modelling and Assessment of Air Pollutants in NSW* (NSW EPA, 2016). When comparing the output of the CALMET model with observational data from a meteorological station outside the domain (i.e. Moana), as shown in Section 4.1.5, the model compared well with the observed data indicating that the modelled data was suitable for odour modelling.

With regard to normal operations and the potential for odour control to be required, as noted above, management of chicken farms has changed in the last 10 years. The publication of best practice documents (DPI, 2012) as well as the adoption of RSPCA management at some farms (RSPCA, 2013; RSPCA, 2014) has seen the minimum standard of management at farms rise significantly with a significant focus being placed on litter management. Improvements in litter management have a direct financial implication for growers in that dry and friable optimal bird growth and less bird health issues, it has also been beneficial in terms of a more consistent litter quality. Drier litter has previously been shown (Clarkson & Misselbrook, 1991) to have a much lower odour emission potential than moist or wet litter.

Furthermore, the complex will have a maximum stocking density of 34 kg/m^2, which complies with the recommended maximum stocking density for domestic poultry in tunnel ventilated sheds *RSPCA Approved Farming Scheme Standards – Meat Chickens* (RSPCA, 2013). This 15% reduction to the maximum stocking density significantly reduces their odour generating potential in comparison to farms which maintain a maximum stocking density of up to 40 kg/m^2, in accordance with the *National Animal Welfare Standards for the Meat Chicken Industry* (Australian Poultry CRC, 2008).

Finally, it is relevant to discuss dust emissions. To the best of our knowledge, there is no farm with suitable buffers (such as the farm unit here) that has dust issues. This is because, as shown in Figure 5-10, dust concentrations in sheds, even at peak density and maximum ventilation, are low. Even

though the risk of dust impacts is low, the dust emissions would easily be mitigated by planting vegetative buffers.

9. Conclusion

This report has assessed potential odour and dust impacts associated with the proposed ProTen Rushes Creek Poultry Production Complex located approximately 43 km northwest of Tamworth and 33 km northeast of Gunnedah in NSW. Local land use, terrain and meteorology have been considered in the assessment and dispersion modelling was conducted using CALPUFF in line with the approved methods.

In summary:

- The predicted odour concentrations at the rural residential receptors are predicted to be below the EPA assessment criterion of 5 ou.
- The conservatively predicted 24-hour and annual average PM_{10} concentrations are also predicted to be below the EPA assessment criterion with the exception of R25 for the Day 4 staging only.

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Appendix D

Traffic Impact Assessment
(RoadNet 2018)



RoadNet

Traffic Impact Assessment

Rushes Creek Poultry Production Farm

Rushes Creek Road (via Oxley Highway),

Tamworth, NSW

for

ProTen Tamworth Limited

25 June 2018

Document Control Sheet

Document Status	DRAFT	FINAL DRAFT	FINAL
Version	1	2	3
Date	11 September 2017	18 September 2017	25 June 2018
Issued to	Adam Williams, SLR Consulting	Adam Williams, SLR Consulting	Eryn Bath, SLR Consulting
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CONTENTS

APPENDICES

1. INTRODUCTION

RoadNet Pty Ltd (RoadNet) has been engaged by SLR Consulting Australia Pty Ltd (SLR), on behalf of ProTen Tamworth Limited (ProTen), to prepare a Traffic Impact Assessment (TIA) for the development of a large-scale intensive poultry production facility called the Rushes Creek Poultry Production Farm within a rural area known as Rushes Creek in the New England North West region of New South Wales (NSW). The Site is located in the Tamworth Local Government Area (LGA), approximately 43 kilometres (km) northwest of Tamworth and 33km northeast of Gunnedah. Access to the proposed Development Site will be via the adjoining Rushes Creek Road and Oxley Highway (B56).

The location of the Site is shown in Figure 1.1 on the next page.

1.1 Background to Development Proposal

The Rushes Creek Poultry Production Farm (the Development) will comprise 54 tunnel-ventilated, fully-enclosed, climate-controlled poultry sheds, along with associated support infrastructure and staff amenities, with the capacity to house a maximum population of approximately 3.05 million birds.

The Development will consist of four individual farms (poultry production units or PPUs) of varying size, where broiler birds will be grown for human consumption. The locations and configurations of the four farms, based on the proposed shed numbers at each location, are shown in Figure 1.2. The proposed number of sheds for each farm are as follows:

- Farm 1 (north-western farm) – 10 sheds
- Farm 2 (north-eastern farm) – 18 sheds
- Farm 3 (south-western farm) – 10 sheds
- Farm 4 (south-eastern farm) – 16 sheds

Access to the Development during its construction and operation will be achieved via two new internal farm access driveways connecting to Rushes Creek Road approximately 17.7km and 19.2km to the north, respectively, of its intersection with the Oxley Highway (B56). The equivalent distances to the south of Ski Gardens Road, which for the most part constitutes the northern boundary of the Development Site as discussed in Section 2.1, are 2.7km (southern access) and 1.2km (northern access). All movements to and from Farms 1, 3 and 4 will occur via the southern access, while Farm 2 will be accessed exclusively via the northern access.

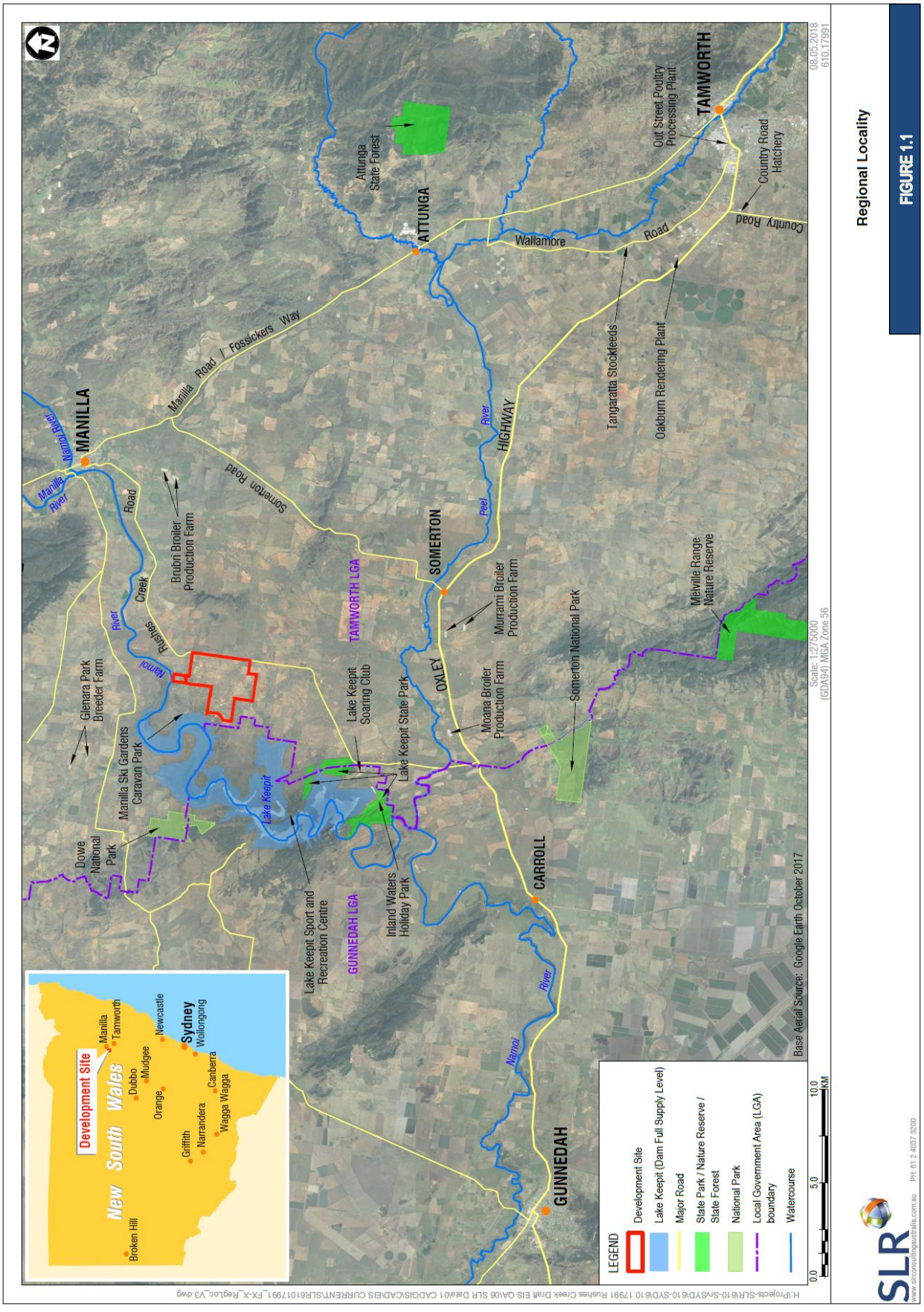
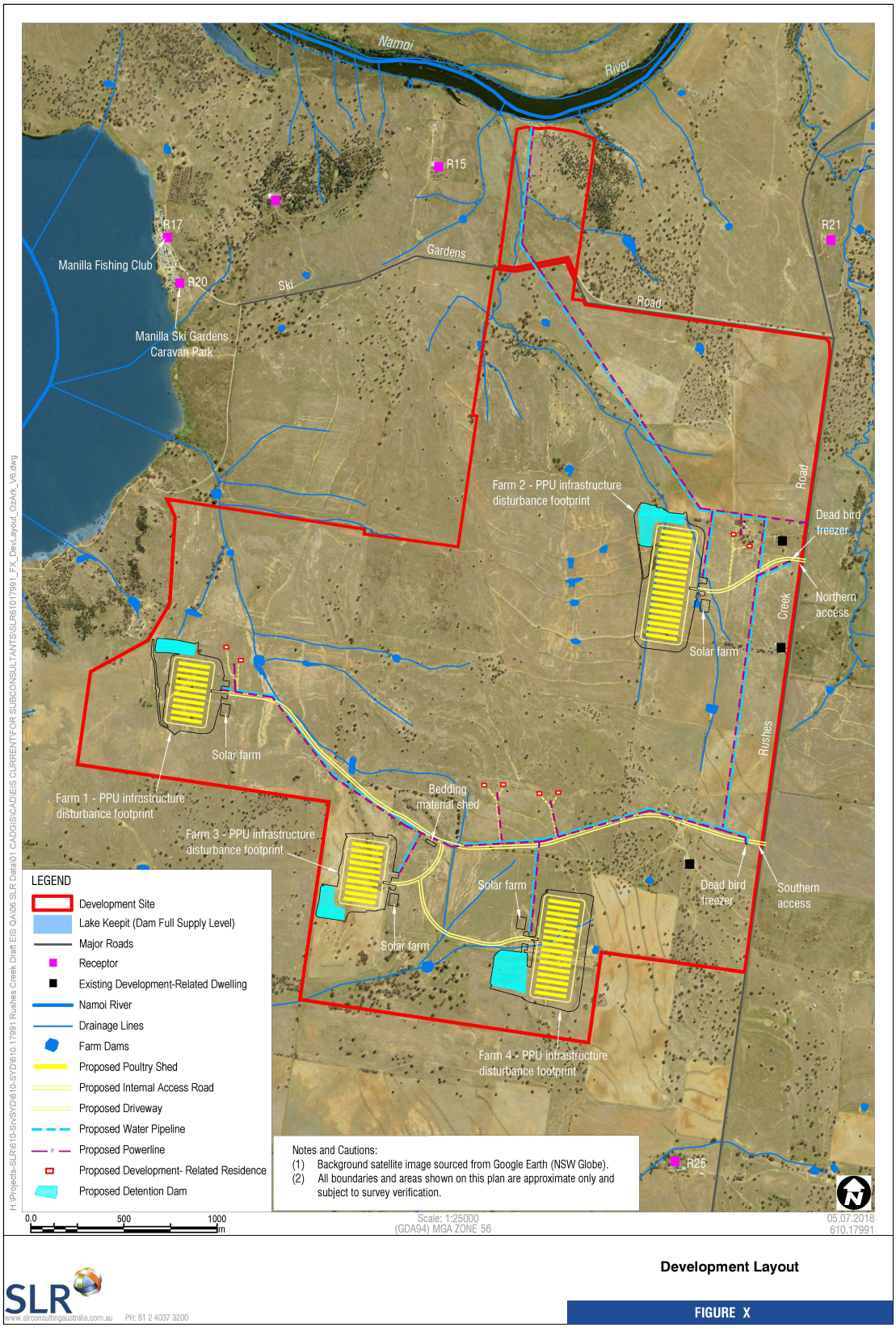


FIGURE 1.1
Regional Locality
MANILLA
ATTUNGA
TAMWORTH
SOMERTON
OXLEY
CARROLL
GUNNEDAH
Attunga State Forest
Out Street Poultry Processing Plant
Country Road Hatchery
Wallamore Road
Tangaratta Stockfeeds
Oakburn Rendering Plant
Melville Range Nature Reserve
Somerton National Park
Murrami Broiler Production Farm
Moana Broiler Production Farm
Lake Keepit State Park
Lake Keepit Soaring Club
Lake Keepit Sport and Recreation Centre
Inland Waters Holiday Park
Manilla Ski Gardens Caravan Park
Glenara Park Breeder Farm
Dowe National Park
Brubri Broiler Production Farm
Somerton Road
Manilla Road / Fossickers Way
HIGHWAY
TAMWORTH LGA
GUNNEDAH LGA
Manilla River
Namoi River
Rushes Creek
Peel River
Lake Keepit
Development Site
New South Wales
Sydney
Newcastle
Wollongong
Canberra
Tamworth
Manilla
Dubbo
Mudgee
Orange
Griffith
Narrandera
Wagga Wagga
Broken Hill
LEGEND
Development Site
Lake Keepit (Dam Full Supply Level)
Major Road
State Park / Nature Reserve / State Forest
National Park
Local Government Area (LGA) boundary
Watercourse
0.0
5.0
10.0
KM
Base Aerial Source: Google Earth October 2017
Scale: 1:275000 (GDA94) MGA Zone 56
08.05.2018
610.17991
SLR



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Development Layout

FIGURE X

FIGURE 1.2

1.2 Scope of Traffic Impact Assessment for the Development

This TIA report examines the potential impacts of traffic generated by the Development on the existing traffic movements on Rushes Creek Road, the Oxley Highway and adjacent areas. It also considers the cumulative impacts of the Development with other developments proposed in the study area, when operating concurrently.

This assessment has been prepared in accordance with the *RTA Guide to Traffic Generating Developments*, various standards and guidelines from Roads and Maritime Services (RMS) and Tamworth Regional Council (Council), and relevant Australian Standards and Austroads Guidelines (including their RMS Supplements). The following tasks have been undertaken in the preparation of this report:

- Review of existing and historical traffic information, including data collected through traffic surveys conducted on behalf of RoadNet in October 2016, to establish existing operating conditions along Rushes Creek Road, the Oxley Highway and other relevant roads in the vicinity of the Development;
- Site inspection conducted by RoadNet in October 2016 with associated video data collection;
- Assessment of traffic generation to and from the Development during its construction and operation;
- Assessment of background traffic growth;
- Determination of future traffic volumes with and without the Development;
- Examination of the potential impacts of the additional traffic generated by the Development during its construction and operation on the external road network, including Rushes Creek Road, the Oxley Highway and the intersection between these two roads;
- Examination of the access arrangements required for the Development;
- Consideration of requirements for pedestrians, cyclists and public transport in relation to the Development;
- Assessment of parking and site servicing provisions;
- Review of recent crash history and examination of potential safety issues along proposed haulage route for the Development; and
- Consideration of the cumulative impacts of the Development in conjunction with other known developments in the study area, when operating concurrently.

An Environmental Impact Statement (EIS) has been prepared by SLR to accompany the development application (DA) for the Development, which in turn has been informed by this TIA. As part of this process a Preliminary Environmental Assessment (PEA) was prepared by SLR in June 2016 to inform relevant government agencies of the Development, and in response to this the Secretary's Environmental Assessment Requirements (SEARS) for the Development were received on 12 July 2016 (SSD 7704). The key issues in relation to transport and road traffic that were identified in the SEARs are summarised in Table 1.1 below, which also shows the location in this report where each of the issues is addressed (where applicable). Specific requirements for the EIS received from RMS and Council are also included in Appendix A.

Aspect – Transport and Road Traffic	**Where addressed in this report**
A quantitative traffic impact assessment prepared in accordance with relevant Council, Austroads and Roads and Maritime Services guidelines;	Whole report
Details of all daily and peak traffic and transport movements likely to be generated during construction and operation of the development, including a description of haul routes, vehicle types, vehicle access routes and the impacts on nearby intersections;	2.3, 4.4, 4.5, 4.6, 6.1, 7, 8.3, 8.5
Details of access to the site from the road network including intersection location, design and sight distance;	1.1, 2.1, 4.2, 6.3, 8.3
An assessment of predicted impacts on road safety and the capacity of the road network to accommodate the development including identification of any necessary infrastructure upgrades and consideration of cumulative impacts, using SIDRA or a similar model;	3.6, 5, 6.1, 6.2, 8, 9, 10
Details of any utility services which will need to be located within or across Rushes Creek Road or Ski Gardens Road; and	7
Detailed plans of the proposed layout of the internal road network and parking on the site in accordance with the relevant Australian standards.	1.1, 4.2, 6.4

Table 1.1 – SEARs relating to Transport and Road Traffic for the Development

2. EXISTING LANDUSE, ACCESS AND ROAD NETWORK

2.1 The Site

The Development Site is located within a rural area known as Rushes Creek approximately 43km northwest of Tamworth and 33km northeast of Gunnedah in NSW. The long-standing and existing use of the Site is traditional agricultural production, including both livestock grazing and cropping. The land associated with the Development Site currently comprises of a number of separate freehold land titles and incorporates some sections of unformed Crown and/or public roads.

Access to the Development Site during both its construction and operation is proposed via two new internal access driveways connecting directly to Rushes Creek Road. Rushes Creek Road is an existing local rural road that connects to the Oxley Highway (B56) at its southern end and the River Street / South Street intersection in the town of Manilla at its northern end. Each of these roads in turn provides a connection to Manilla Road (B95).

The access arrangements and supporting infrastructure for the Development were illustrated previously in Figure 1.2. Additional plans showing the proposed location and layout for the Development are provided in the EIS (SLR 2018). The Development Site is located to the west of Rushes Creek Road and, for the most part, to the south of Ski Gardens Road which forms its northern boundary over the majority of its length. All heavy vehicle movements to and from the Development Site on a normal daily basis will be via Rushes Creek Road and the Rushes Creek Road / Oxley Highway intersection located to the south of the Development Site. Most light vehicle movements will also follow this route.

2.2 Surrounding Land Use

The primary land use for the surrounding neighbourhood is also traditional agricultural production, along with recreational activities around Lake Keepit. The nearest populated areas are the villages of Somerton and Manilla located approximately 12km to the southeast and approximately 13km to the northeast, respectively.

A number of other poultry developments currently exist in the area. These include:

- Glenara Park poultry breeder farm – located 6km (approx.) northwest of the Development housing 80,000 birds (Baiada is proposing to expand this farm to 100,000 birds);
- Murrami poultry broiler production farm (ProTen) - located 11km (approx.) to the south-southeast of the Development housing up to 800,000 birds;
- Moana poultry broiler production farm – located 11.5km (approx.) to the south-southwest of the Development housing up to 450,000 birds; and
- Brubri poultry broiler production farm – located 10km (approx.) to the east of the Development housing up to 800,000 birds.

2.3 Existing Road Network

2.3.1 Oxley Highway (B56)

The Oxley Highway is a state-controlled rural highway running east-west in NSW, extending from its connection to the Pacific Highway (A1) in the east near Port Macquarie, all the way to Nevertire at its connection with the Mitchell Highway (A32) in the west, a total distance of approximately 650km. It is an Approved Road for GML (General Mass Limit) 25m B-Doubles according to the interactive RMS Restricted Access Vehicles Map, an extract of which is included in Appendix C. Within the study area it intersects with the Kamilaroi Highway (B51) at Gunnedah, approximately 27km to the west of the Oxley Highway / Rushes Creek Road intersection. It also intersects with Manilla Road (B95, also known as Fossikers Way) and the New England Highway (A15) in Tamworth, which are approximately 47km and 48km, respectively, to the east of the Oxley Highway / Rushes Creek Road intersection.

Of particular relevance to this study, the Oxley Highway provides access to Tamworth which is the major centre in the area, as well as to the various poultry industry service facilities located on the western outskirts of Tamworth which include a hatchery, processing plant, rendering plant and feedmill.

The Oxley Highway, between its intersection with the Kamilaroi Highway on the eastern outskirts of Gunnedah and Rushes Creek Road, is a 2-lane, 2-way rural highway with approx. 3.5m sealed lanes, narrow sealed shoulders and grassed or gravel verges. The posted speed limit is generally 100km/h along this section of the highway, except at Carroll where it reduces to 70km/h through town and the outskirts of Gunnedah where it reduces to 60km/h on approach from the east (and 50km/h within Gunnedah).

Between Rushes Creek Road and the outskirts of West Tamworth near Bass Street the Oxley Highway remains a 2-lane, 2-way rural highway with 3.5m sealed lanes, slightly wider sealed shoulders and grassed or gravel verges. Baiada's existing rendering plant (and approved, but not yet constructed, processing plant) are located within this section at Oakburn, approximately 1.2km south of the Old Winton Road / Bowlers Lane intersection with the Oxley Highway and 1.8km north of Goddard Lane (which provides access to the light industrial area incorporating businesses such as Thomas Foods International Tamworth and the Tamworth Regional Livestock Exchange). The Baiada facility is accessed via a dedicated T-intersection which includes a right turn bay on the Oxley Highway in a short channelised right turn (CHR(S)) configuration for traffic travelling northbound.

Baiada's hatchery facility is also accessed from the Oxley Highway within this section via Country Road. Country Road is located between New Winton Road and Marathon Street in Westdale and has a Basic Left Turn (BAL) / Basic Right Turn (BAR) configuration at its intersection with the Oxley Highway.

Heading east from Bass Street (approx.) in West Tamworth the highway becomes more urban in character with adjacent development along the edges of the highway, roundabouts, turn lanes, wider shoulders and footpaths, etc. To the east of Dampier Street, which connects to the Oxley Highway via a 2-lane roundabout and provides access to Baiada's feedmill facility on Wallamore Road, it transitions again into a dual divided highway and retains this 4-lane cross-section (with or without a central island) through to the centre of Tamworth. Baiada's existing processing plant is located at Out Street in West Tamworth and is accessed from the Oxley Highway (Bridge Street) via a T-intersection that includes a right-turn bay for westbound traffic, with egress restricted to left-out only.

The posted speed limit between Rushes Creek Road and the outskirts of Westdale is 100km//h except at Somerton where it reduces to 80km/h through the town. Travelling in an easterly direction from the western edge of Westdale, the posted speed limit reduces to 70km/h and remains at this level until just before Bass Street in West Tamworth (i.e. the start of the urban area) where it reduces to 60km/h. It remains at this level until just before Bridge Street in West Tamworth, where it reduces further to 50km/h. There are also 3 40km/h School Zones, one at Westdale, one in West Tamworth and one in Tamworth (near Denison Street), where the posted speed limit reduces to 40km/h during school drop-off and pick-up times (8.00 - 9.30am and 2.30-4.00pm) on school days.

Images of the Oxley Highway near its intersection with Rushes Creek Road are shown in Figures 2.1 to 2.2.

Figure 2.1: Looking east along the Oxley Highway just east of Rushes Creek Road

Figure 2.2: Looking west along Oxley Highway to the west of Rushes Creek Road (Source: Google Maps)

2.3.2 Rushes Creek Road

Rushes Creek Road is a local 2-lane 2-way rural road extending in a south/southwest to north/northeast direction from the Oxley Highway at its southern end to River Street on the southern outskirts of Manilla at its northern end, a total distance of approximately 35km. It is also an Approved Road for GML 25m B-Doubles as illustrated in Appendix C. It crosses the Peel River via an overbridge at its southern end, approximately 1.8km to the north of its intersection with the Oxley Highway. It also crosses a tributary of the Namoi River between the Development Site and Manilla, approximately 6.8km south of its intersection with River Street. It is understood that during major flood events the road can become inundated at one or both of these

locations. However, anecdotal evidence suggests that the road is only ever blocked for a maximum of 24 hours and it is very infrequent (only during major flooding events). On this basis, consideration of alternative access routes for heavy vehicles is not necessary, with ProTen able to adjust operations and, if necessary, delay heavy vehicle-related activities over the very short period that the road is inundated.

Rushes Creek Road is sealed with a typical seal width varying between approximately 6.5 - 7.0m along its length, although at its northern end on approach to Manilla it narrows a little to approximately 6.0 - 6.5m. It has predominantly grass (and some gravel) verges approximately 0.5 to 1.5m wide on each side. There is a centre line marking along almost all of its length which, when travelling northbound, finishes approximately 80m south of Stoddart Street, the southernmost side street in Manilla. Stoddart Street is itself approximately 130m south of the South Street intersection, which is where Rushes Creek Road terminates and River Street begins. There are no edge lines provided along Rushes Creek Road, however, guideposts are provided at regular intervals for night-time delineation.

Rushes Creek Road has an open road speed limit of 100km/h which is posted at the northern end for southbound traffic leaving Manilla. For northbound traffic, the posted speed limit reduces to 50km/h on approach to the southern outskirts of Manilla.

There are a number of rural property accesses scattered along the length of Rushes Creek Road which are typically dirt or gravel in their construction. There are also a small number of rural local access roads connecting to Rushes Creek Road that provide access to local facilities and other local roads in the area. The most significant of these include:

- Keepit Dam Road - a narrow, sealed and unlinemarked road which provides access to the Keepit Dam, Lake Keepit Soaring Club as well as Lake Keepit State Park and its associated recreational, tourist information and accommodation/camping facilities at the southern end of Lake Keepit;
- National Fitness Camp Road – a good quality gravel road for much of its length (sealed on approach to Rushes Creek Road) which provides access to the Lake Keepit Sport and Recreation Centre, a popular destination for outdoor enthusiasts that provides a range of services, facilities and accommodation options catering in particular to school camps, kids' holiday camps, corporate training programs, etc;
- Bidford Access Road – a gravel road that provides access (albeit circuitous) via Perrings Road to Somerton Road located to the east of Rushes Creek Road, another north-south local rural road that connects to the Oxley Highway (B56) at its southern end and Manilla Road (B95) at its northern end. Bidford Access Road also connects to Sherwood Road via Perrings Road and Glenbrook Road;
- Ski Gardens Road – a good quality gravel road, 6.5m wide and sealed for the first 50m at its intersection with Rushes Creek Road, providing access to Manilla Ski Gardens Caravan Park and Manilla Fishing Club on the northern section of Lake Keepit; and
- Sherwood Road – a narrow sealed road (at least for the section near Rushes Creek Road) that provides a connection between Rushes Creek Road north of the Namoi River tributary and Bidford Access Road via Glenbrook Road and Perrings Road.

The Development Site is located to the west of Rushes Creek Road and immediately south (for the most part) of Ski Gardens Road. It is currently accessed via 3 driveways (serving individual land holdings) onto Rushes Creek Road:

- Access No. 1 (Property No. 1582, "Bundah") – located approximately 1km south of Ski Gardens Road, near the site of the proposed northern access to the Development. Rushes Creek Road is approximately 6.5m wide at this location and the sight distance was observed to be in excess of 500m in each direction;
- Access No. 2 (Property No. 1648 Rushes Creek Road) – located approximately 1.7km south of Ski Gardens Road. Rushes Creek Road is approximately 7.0m wide at this location and the sight distance was observed to be in excess of 1km in each direction; and
- Access No. 3 (Property No. 1788 Rushes Creek Road, "Happy Hills") – located approximately 3.1km south of Ski Gardens Road. Rushes Creek Road is approximately 6.5m wide at this location and the sight distance was observed to be in excess of 1km to the north but only approximately 250m to the south, due to a vertical crest in the Rushes Creek Road alignment. The proposed southern access to the Development is located approximately 400m north of this access, which will increase the available sight distance to the south to approximately 650m.

Some photos showing the general layout of Rushes Creek Road at various locations along the alignment are provided in Figures 2.3 to 2.8.

Figure 2.3: Rushes Creek Road looking southbound at Peel River Bridge

Figure 2.4: Rushes Creek Road looking northbound at Keepit Dam Road

Figure 2.5: Rushes Creek Road looking southbound at Ski Gardens Road

Figure 2.6: Rushes Creek Road looking northbound near Access No. 1 (on LHS in foreground)

Figure 2.7: Rushes Creek Road looking northbound near Access No. 2 (on LHS in foreground)

Figure 2.8: Rushes Creek Road looking southbound near Access No. 3 (on RHS in foreground)

2.3.3 Oxley Highway / Rushes Creek Road Intersection

The Oxley Highway / Rushes Creek Road intersection is a give-way controlled T-intersection that provides priority to Oxley Highway traffic. The intersection is sealed and linemarked, and is located on the inside of a large radius left-hand horizontal curve and on a downgrade for traffic travelling east along the Oxley Highway. It has a left-turn lane for eastbound traffic on the Oxley Highway that is approximately 235m long (including tapers), and a right-turn bay for westbound traffic that is approximately 150m long (including tapers). An overtaking lane also commences immediately to the west of the intersection for westbound traffic on the Oxley Highway, extending for a length in excess of 600m (including tapers). While the layout does not provide a true 'seagull' arrangement for traffic turning right out of Rushes Creek Road, it does allow for faster 'through' traffic travelling westbound on the Oxley Highway to use the overtaking lane to pass vehicles accelerating up to the posted speed in the left lane after exiting Rushes Creek Road. An aerial view of the intersection layout is provided in Figure 2.9:

Figure 2.9: Oxley Highway / Rushes Creek Road intersection (Source: Google Maps)

From the aerial imagery and site visit it was observed that the visibility to the west (right) for traffic turning left out of Rushes Creek Road is limited to approximately 230m by vegetation on the inside of the curve. This appears to be substandard for the geometry of the road (e.g. for a design speed of 100km/h and a reaction time of 2 seconds, *Austroads Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections* (AGRD Part 4A) requires a Safe Intersection Sight Distance (SISD) of 248m for cars (i.e. the reference vehicle) on a flat grade, which would also satisfy the requirements for heavy vehicles exiting this intersection). However, a more detailed field investigation or topographical survey would be required to accurately determine the horizontal and vertical geometry of the intersection and the nature and proximity of the adjacent vegetation, and hence the visibility requirements and availability. Some trimming of the adjacent vegetation may be possible, if required.

Visibility to traffic approaching from the left for traffic turning right out of Rushes Creek Road is greater, in the order of 400m or more based on site observations, and appears to be suitable for the geometry of the intersection.

Some photos of the intersection layout are presented in Figures 2.10 to 2.11 below.

Figure 2.10: Oxley Highway / Rushes Creek Road intersection looking west

Figure 2.11: Oxley Highway / Rushes Creek Road intersection looking east

3. EXISTING TRAFFIC AND TRANSPORT

3.1 Existing Traffic Volumes

3.1.1 Oxley Highway / Rushes Creek Road Intersection

Existing traffic volumes at the Oxley Highway / Rushes Creek Road intersection have been obtained from a 12-hour video intersection count undertaken by the specialist traffic survey company Data Audit Systems (DAS) on behalf of RoadNet on Thursday 20 October 2016 between 6am and 6pm. The results of that survey are attached in Appendix D and indicate that the peak hours on a typical weekday currently occur between 8.15 – 9.15am and 3.45 – 4.45pm. A summary of the weekday volumes is provided in Figure 3.1.

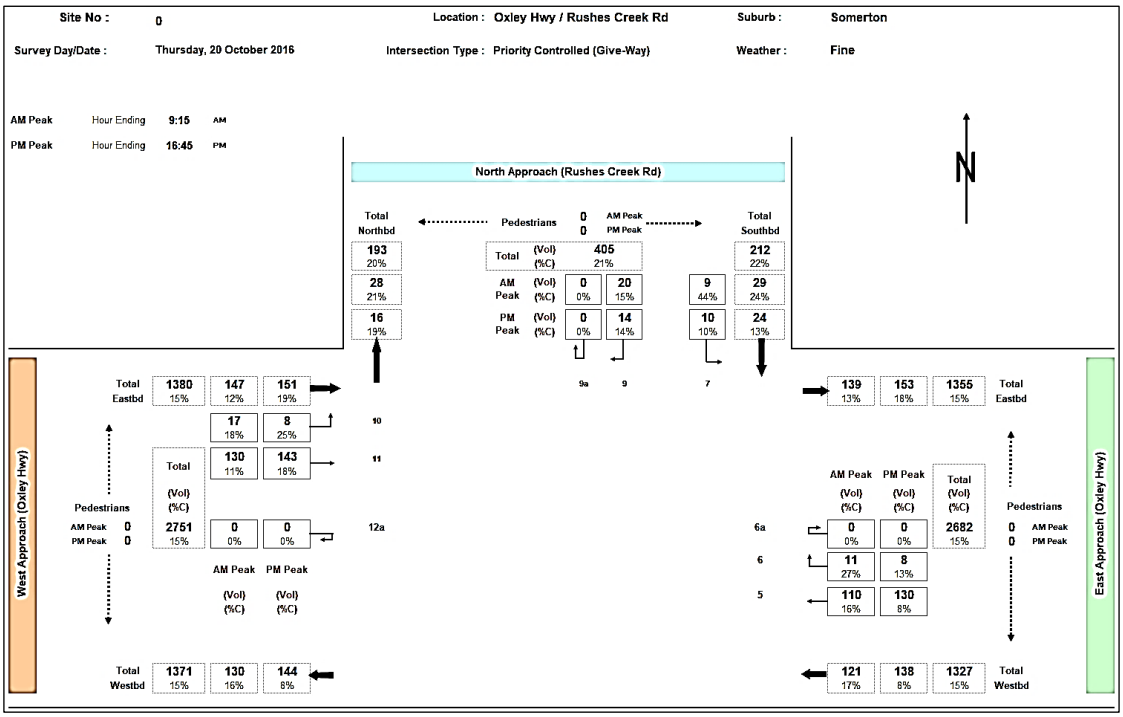


Figure 3.1: Existing weekday traffic volumes at Oxley Highway / Rushes Creek Road intersection

The results indicate that the volume of traffic currently accessing Rushes Creek Road from the Oxley Highway and vice-versa is quite low, with a total 2-way volume of 405 vehicles including 21% heavy vehicles (HVs) observed over the 12-hour period, comprising 193 vehicles northbound and 212 vehicles southbound. A summary of the peak and 12-hour volumes recorded entering and exiting Rushes Creek Road at the Oxley Highway intersection is provided in Table 3.1.

Existing Movements to / from Rushes Creek Road at Oxley Highway – Total Vehicles (%HVs)			
	IN	**OUT**	**2-WAY**
AM peak (8.15 – 9.15am)	28 (21%)	29 (24%)	57 (23%)
PM peak (3.45 – 4.45pm)	16 (19%)	24 (13%)	40 (15%)
12-hour (6am – 6pm)	193 (20%)	212 (22%)	405 (21%)

Table 3.1: Existing traffic volumes on Rushes Creek Road on a Typical Weekday

It is noted that only a portion of the traffic observed on Rushes Creek Road at the Oxley Highway intersection would be expected to travel the length of Rushes Creek Road to / from Manilla, with many of the movements being associated with other developments in the area such as the Keepit Dam, Lake Keepit Soaring Club, Lake Keepit Sport and Recreation Centre, Lake Keepit State Park, etc, all of which have access towards the southern end of Rushes Creek Road. In addition, some of the existing traffic movements are generated by other rural properties in the area which have access via Rushes Creek Road. Hence, the volume of traffic passing along the frontage of the Development on Rushes Creek Road would be expected to be much lower than observed near the intersection with the Oxley Highway. However, since the overall volume of traffic observed on Rushes Creek Road is quite low anyway, the surveyed volumes have been conservatively adopted without adjustment to represent the background traffic in the vicinity of the Development for the purposes of assessing its access requirements and traffic impacts (discussed later).

3.1.2 Oxley Highway

Existing traffic volumes along the Oxley Highway have also been obtained from traffic data collected by Roads and Maritime Services (RMS) at various count sites between Gunnedah and Tamworth. The sites are illustrated on Figure 3.2 and a summary is provided below:

- Station no. 6167 – Permanent Classifier site, 1.45km east of Wilkinson Road, Gunnedah;
- Station no. 92046 – Sample Classifier site, 1.87km east of Breeza Street, Carroll (nearest site west of Rushes Creek Road);
- Station no. 6194 – Permanent Classifier site, 530m north of Bective Reserve, Bective (nearest site east of Rushes Creek Road);
- Station no. 92002 – Sample Classifier site, 530m south of Ten Mile Lane, Wallamore;
- Station no. 6168 – Permanent Classifier site, 380m south of Bowlers Lane, Westdale; and
- Station no. 92179 – Sample Classifier site, 90m west of Cook Street, Taminda.

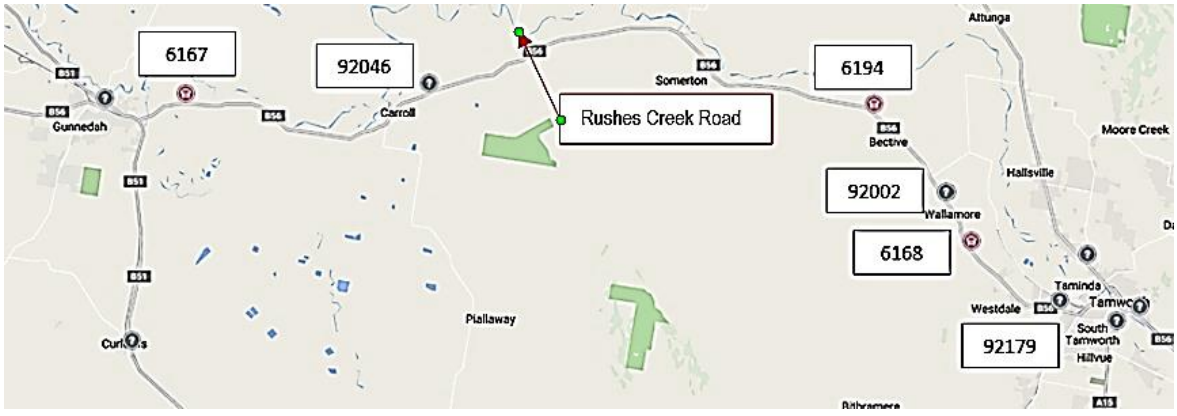


Figure 3.2: Locations of RMS Traffic Count Sites on the Oxley Highway

The average weekday traffic volumes and proportion of heavy vehicles recorded at each of these sites for the years since 2010 in which data is available are summarised in Table 3.2 below.

Year	Average Weekday Traffic Volumes (veh/day) and % Heavy Vehicles*					
	Station No.					
	6167 Permanent	92046 Sample	6194 Permanent	92002 Sample	6168 Permanent	92179 Sample
2011		1,600 (15%) WB only		3,219 (16%)		5,552 (9%) EB only
2015	1,780 (17%) EB only		1,685 (19%) WB only		3,797 (17%)	
2016	1,841 (17%) EB only		1,708 (20%) WB only		1,902 (20%) EB only	
2017	3,689 (18%)		3,379 (21%)		3,967 (19%)	

**2-way unless otherwise indicated*

Table 3.2: Average weekday traffic volumes on Oxley Highway

The data indicates that the average two-way weekday traffic volumes along the Oxley Highway are quite low, ranging in 2017 from approximately 3,400 veh/day in the vicinity of (east of) Rushes Creek Road, to between 3,700 and 4,000 veh/day closer to the centres of Gunnedah and Tamworth. The percentage of heavy vehicles is consistently in the order of 15-20%. Closer into Tamworth the volume of traffic increases significantly reflecting the higher number of local traffic movements that occur, with the limited data available from 2011 at Station no. 92179 suggesting a two-way weekday volume in excess of 10,000 veh/day with only 9% heavy vehicles.

Further investigation of data from the Permanent Classifier site at Station no. 6194 (nearest site east of Rushes Creek Road) reveals the following daily profile for weekday movements along the Oxley Highway across different months of the year.

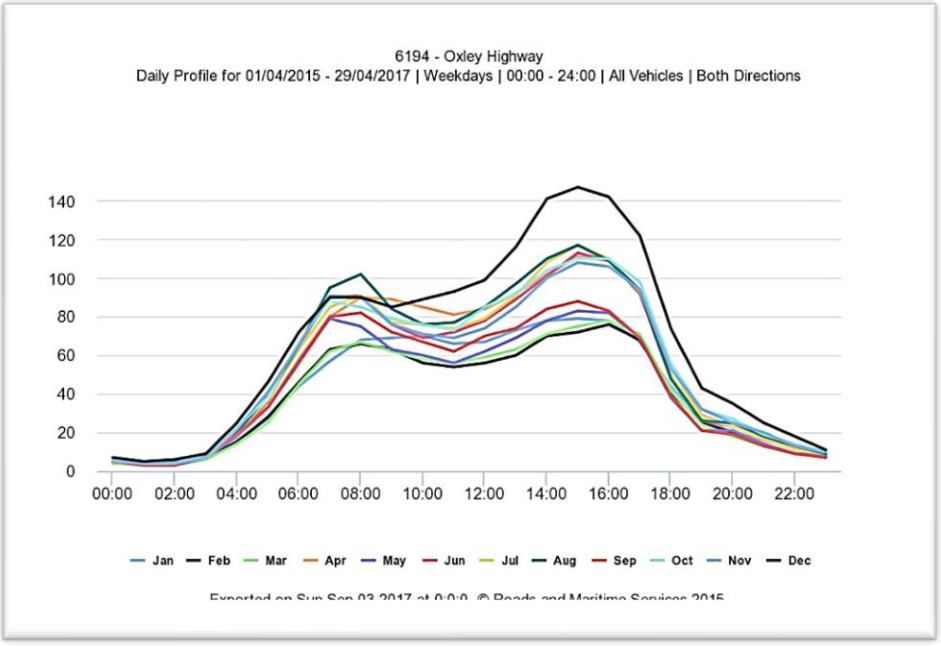


Figure 3.3: Average Daily Traffic Profile on Oxley Highway (Weekdays, 2-way)

As expected there is some variation across different months of the year, with a noticeable spike in December which presumably is associated with the recreational activities in the area over the Christmas holiday period. However, typical peak hour volumes range between approximately 80 to 100 veh/hr in the AM peak (approx. 8-9am) and approximately 100 to 120 veh/hr in the PM peak (approx. 3-4pm).

Based on the data presented in this section, the existing background traffic volumes on the Oxley Highway and Rushes Creek Road on both a peak hour and a daily basis are currently low and it is therefore expected that the existing infrastructure will be able to readily accommodate additional traffic generated by the Development.

3.2 Background Traffic Growth

Examination of the data at the permanent classifier sites presented in the previous section suggests a recent linear traffic growth rate in the order of approximately 2% per annum, which is consistent with the rural nature of the Oxley Highway through the study area and the relatively low levels of development occurring as a whole within the region. This rate of growth has been adopted going forward to factor up the background traffic volumes on both the Oxley Highway and (conservatively) Rushes Creek Road to future year values for both the peak hour and daily volumes, and is expected to provide a conservative basis against which any potential upgrades required on the external road network as a result of the Development can be assessed.

3.3 Existing Trip Generation

The existing trip generation associated with the traditional agricultural landuses that currently occupy the Development Site is assumed to be minor and has been conservatively ignored for the purposes of assessing the potential traffic impacts of the Development proposal (i.e. the trip generation arising from the Development proposal has not been offset by any existing trips associated with the existing land uses on the Development Site).

3.4 Existing Pedestrian and Cyclist Facilities

Given the rural location for the Development proposal, all access to and from Rushes Creek Road and the Development Site is expected to be via vehicle. No regular pedestrian or cyclist movements have been observed to currently occur in the area and none are expected as a result of the proposed Development.

3.5 Existing Public Transport

Public transport services within the study corridor are relatively limited. NSW TrainLink provides a regional train and coach service that connects Gunnedah to Tamworth via Werris Creek. Tamworth Buslines also provides bus services between Tamworth and Werris Creek to connect to the rail service. However, direct bus or coach services along the Oxley Highway between Gunnedah and Tamworth do not appear to be

available. The only services available along this corridor are three Community Transport (CT) services provided for people with special mobility needs, which include:

- Gunnedah CT (daily service);
- Gwydir (Moree) CT, operating on Tuesdays and Wednesdays only; and
- Wee Waa HACC (Home and Community Care) CT, operating every 2nd Wednesday.

School bus services also operate on the surrounding local road network during the school morning and afternoon peaks, including along Rushes Creek Road to provide a connection between local rural residences and Manilla. Specific details of the route and timetable are unknown, however.

3.6 Crash History

Crash data has been obtained from the RMS crash database for the most recent 5-year period available ending 30 September 2016, to examine the crashes occurring along two main routes as follows:

- Oxley Highway (B56) between Kamilaroi Highway at Gunnedah and Manilla Road (B95) at Tamworth;
- Rushes Creek Road and its northern extensions (River Street, etc.) to Manilla Road (B95) at Manilla.

The CrashLink Map and Summary Crash Report for each route are provided in Appendix E. A summary of the crashes that have occurred along each route is provided in Table 3.3.

No. of Crashes (Casualties)	Oxley Highway	Rushes Creek Road
Fatal	6 (8)	1 (1)
Serious Injury	17 (20)	1 (1)
Moderate Injury	59 (81)	2 (2)
Minor/Other Injury	10 (18)	0 (2)
Non-casualty	73 (0)	1 (0)
Total	**165 (127)**	**5 (6)**

Table 3.3: Average weekday traffic volumes on Oxley Highway

The crash reports clearly demonstrate that the subject section of the Oxley Highway has had a substantial number of crashes occur within the most recently available 5 year period, with these crashes distributed along its entire length. Approximately 55% of the crashes occurred at or within 10m of an intersection, while 67% of the crashes involved multiple vehicles. Most of the crashes occurred in fine and dry conditions, while 32% occurred in dawn, dusk or night-time conditions. Speeding was attributed as a contributing factor in 15% of the crashes and fatigue in 9% of the crashes. Of the 165 crashes reported during the period, only a small number occurred at or within close proximity to Rushes Creek Road as shown on the CrashLink map.

The number of crashes reported along Rushes Creek Road during the same period was much lower with a total of 5 crashes occurring, 4 to the south of the proposed Development Site and 1 to the north approximately 5km southwest of Manilla. None of the crashes occurred at intersections, with all of the

crashes reported as single vehicle loss of control type crashes. All of the crashes occurred in fine weather conditions and 80% on dry roads, while 40% occurred during night-time conditions. Speeding was attributed as a contributing factor in 60% of the crashes and fatigue in 40% of the crashes.

3.7 Safety Inspection along Proposed Haulage Route

As part of the site inspection conducted by RoadNet in October 2016, a driveover of the proposed haulage route (i.e. Rushes Creek Road, Oxley Highway / Rushes Creek Road intersection and the Oxley Highway between Rushes Creek Road and Tamworth) was conducted and video-recorded for later inspection in the office, to identify any potential safety issues along the route.

The inspection was conducted at a high level only, with the purpose of identifying key safety issues that could potentially have an impact on or be impacted by the Development proposal.

The main issues examined were in relation to the following:

- suitability of the locations proposed for the site access driveways onto Rushes Creek Road, having regard to their proximity to other existing access points, the vertical alignment of the road, available visibility, etc;
- the general cross-section of Rushes Creek Road between the proposed site access driveways and the Oxley Highway, and its ability to cater for B-Doubles travelling in each direction;
- the layout of the Oxley Highway / Rushes Creek Road intersection and its ability to cater for the swept paths of B-Doubles turning on and off the highway, provision of turn bays, deceleration lengths, visibility splays, etc; and
- any specific issues identified along the Oxley Highway of specific relevance/impact to the Development.

The findings have been included at the relevant sections in this report.

4. PROPOSED DEVELOPMENT

4.1 Development Description

ProTen intends to develop a large-scale intensive poultry broiler production farm known as Rushes Creek Poultry Production Farm (the Development) within the Development Site described in previous sections. The conceptual layout of the Development was shown previously in Figure 1.2. The key elements of the Development proposal include:

Table 4.1 - Summary of the Development Proposal

Development Characteristic	Proposed Development
Purpose	Birds grown for human consumption
Number of individual farms	Four (Farms 1, 2, 3 and 4)
Number of poultry sheds (total)	54 sheds, each measuring 160m long by 18m wide
Type of poultry sheds	Tunnel-ventilated, fully-enclosed, climate-controlled
Maximum shed population	56,500 birds
Maximum site population	3,051,000 birds
Hours of operation	24 hours a day, 7 days a week
Production cycle length	Approximately 9 weeks (65 days), comprising 7.5 weeks (55 days) of bird occupation and a 1.5 week (10 days) cleaning phase.
Number of production cycles per year	Approximately 5.6 on average

The Development will operate 24 hours a day, 7 days a week. Each of the four farms (or PPUs) will contain between 10 and 18 tunnel-ventilated, fully-enclosed and climate-controlled poultry sheds, along with associated support and servicing infrastructure. Each shed will have the capacity to house 56,500 birds and, with a total of 54 sheds, the Development will house a combined site population of 3.05 million birds.

The commercial activities associated with the Development will be largely confined to the four farms and internal access roads. It is intended that the land outside of the disturbance footprint within the Development Site will continue to be used for traditional agricultural production purposes under some form of lease or share farming arrangement.

In addition to poultry shedding, the Development will also comprise various support/servicing infrastructure, including:

- Eight new residences to house the farm managers;
- Water, power (electricity and solar) and gas servicing infrastructure;
- Two new access driveways from Rushes Creek Road and internal access roads;
- A staff amenities facility at each farm (office space, toilets, change rooms);
- Two dead bird freezers located adjacent to the internal access roads near Rushes Creek Road;
- One poultry bedding material storage shed;
- Chemical and fuel storage facilities at each farm;

- Generators and generator enclosures/sheds at each farm (emergency use only);
- A workshop at each farm;
- Vehicle wheel wash facilities;
- Feed silos at each farm;
- Water storage tanks at each farm; and
- Surface water management system at each farm (swale drains, table drains and detention dams).

4.2 Vehicular Access and Internal Road Layout

Vehicular access to the Development is proposed via the construction of two new access driveways from Rushes Creek Road located approximately 1.2km (northern access) and 2.7km (southern access) south of Ski Gardens Road, and the construction of internal access roads from these driveways to each of the four farms (PPUs). All movements to and from Farms 1, 3 and 4 will occur via the southern access driveway, while Farm 2 will be accessed exclusively via the northern access driveway.

A conceptual layout of the proposed access arrangements and supporting infrastructure to service the Development was previously provided in Figure 1.2. A one-way circulation road (ring road) will be constructed around the perimeter of each farm to enable traffic to enter, exit and manoeuvre around the poultry sheds for loading, unloading and servicing activities in a forward direction, thereby minimising the potential for traffic conflict and noise (e.g. reversing beepers).

The internal roads will be constructed as all-weather rural-type roads able to carry the anticipated heavy vehicle movements. Where necessary, culverts will be installed to traverse drainage lines.

Parking will be available adjacent to the sheds to accommodate staff and visitor movements.

4.3 Pedestrians, Cyclists and Public Transport

No provision is made for external pedestrians, cyclists or public transport connections due to the remote location of the Site.

4.4 Development Traffic Generation

This section focuses on the additional traffic that would be generated by the Development during its operation. Construction traffic generated during construction of the Development is discussed in Section 7.

4.4.1 Traffic Generating Sources

While the Development Site will operate 24 hours a day, seven days a week, the majority of activities will occur between 7.00am and 7.00pm. As the birds reach their desired processing (slaughter) weight they will be removed from the sheds and transported from the Development Site any time between 7.00pm and 4.00pm.

There will typically be one daily shift for farm workers commencing at 7:00am and finishing at 4:00pm.

At full capacity the Development will require around 20 employees, comprising:

- Four full-time farm managers (live on-site);
- Four full-time assistant farm managers (live on-site); and
- Twelve full-time equivalent farm hands.

There may be times when additional labour will be called upon. Several contract companies will also be involved in the operation, including for bird catching, equipment maintenance, litter removal and shed wash down.

It is estimated that approximately 65% of the total daily traffic generation arising from the Development will comprise of heavy vehicles, while the remaining traffic will be light vehicles (predominantly cars).

Light Vehicles

It is expected that a large proportion of the light vehicles (e.g. staff movements) will travel to and from Tamworth (where the majority of the local population resides), or places in between (such as Westdale, Wallamore, Bective or Somerton) via the Oxley Highway to access the Site. Most inbound light vehicles will turn right into Rushes Creek Road from the Oxley Highway and left into one of the two proposed site access driveways connecting to the Development (depending on which farm they are seeking to access), while traffic exiting will turn right out of the site access driveways on to Rushes Creek Road and then left onto the Oxley Highway from Rushes Creek Road.

A small number of light vehicle movements may have an origin or destination from/to Gunnedah and other locations to the west of Rushes Creek Road such as Carroll. These trips would also be made via the Oxley Highway, with traffic turning left in and right out at the Oxley Highway / Rushes Creek Road intersection.

A small number of light vehicle movements may also have an origin or destination from/to areas to the northeast of the Development Site such as Manilla, Upper Manilla and Barraba. These trips would be made via Manilla Road (B95) and the northern section of Rushes Creek Road and its connections to Manilla, turning right into one of the Site access driveways from Rushes Creek Road and left-out on departure.

The Oxley Highway route will provide the fastest route for the majority of light traffic originating from Tamworth and it is expected that the vast majority will utilise this route on a typical daily basis to access/egress the Development. This, in turn, will ensure that the majority of traffic (both light and heavy vehicles) generated by the Development will utilise the higher-standard section of Rushes Creek Road south of the Development Site and the Oxley Highway and its intersection with Rushes Creek Road, where turn bays are already available for traffic to turn safely off the highway.

For the purposes of this assessment, it is assumed that 80% of all light vehicle traffic movements access/egress the Development Site via the Oxley Highway to the east of the Rushes Creek Road

intersection, while 15% occur via the Oxley Highway west of Rushes Creek Road intersection and 5% occur via Manilla Road and its connections to the northern end of Rushes Creek Road.

Heavy Vehicles

The majority of heavy vehicles generated by the Development will travel between the Development Site and the poultry industry service facilities located on the western outskirts of Tamworth (hatchery, processing plant, rendering plant and feedmill) via the Oxley Highway. This means that they will turn right into Rushes Creek Road from the Oxley Highway and left out. All trucks on a normal daily basis will be directed to use the Oxley Highway / Rushes Creek Road intersection and the section of Rushes Creek Road to the south of the Development Site for access and egress. The associated operational activities include:

- Delivery of the shed floor bedding material in rigid trucks from various locations;
- Delivery of day-old chicks from Baiada's hatchery facility located to the west of Tamworth on Country Road in insulated pantechnicon trucks;
- Delivery of feed from Baiada's feedmill facility located to the northwest of Tamworth on Wallamore Road in semi-trailers and B-Doubles;
- Delivery of bulk liquid petroleum gas (LPG) from Tamworth in rigid trucks;
- Removal of birds to Baiada's processing plant located in West Tamworth in semi-trailers and B-Doubles (see below note);
- Removal of poultry litter (spent bedding material) in semi-trailers and B-Doubles to various locations;
- Removal of dead birds to the rendering plant at Baiada's Oakburn Rendering Plant to the west of Tamworth in rigid trucks; and
- Removal of general waste materials in rigid trucks to disposal facilities in and around Tamworth.

Heavy vehicle trips will be mostly spread over the nine week production cycle and will be distributed relatively evenly over the predicted delivery hours.

Note: Baiada has approval to establish a new poultry processing plant at the Oakburn location on the Oxley Highway to the west of Tamworth. This would result in the closure of the existing processing plant in West Tamworth and birds to be removed from the Development to the new Oakburn processing plant. There is currently no known timeframe for this development.

For the purposes of this assessment, it is assumed that 100% of all heavy vehicle traffic movements access/egress the Development Site via the Oxley Highway to the east of the Rushes Creek Road intersection.

4.4.2 Traffic Generation Volumes

Traffic generation for a typical 9 week production cycle and annually (based on 5.6 production cycles per year) has been based on operational data provided by Baiada via SLR Consulting. A summary of the traffic generation for the Development is provided in Table 4.2 below.

Activity	Vehicle Type	Vehicles (Two-Way Trips in brackets)*	
		Traffic Per 9 Week Production Cycle	Annual Traffic - 5.6 Production Cycles
Heavy Vehicles			
Delivery of shed bedding material	Twin axle rigid truck	84 (168)	470 (940)
Delivery of chicks	Twin axle rigid truck	35 (70)	196 (392)
Delivery of feed	Semi-trailer and B-Double	558 (1,116)	3,125 (6,250)
Delivery of fuel	Rigid tanker	2 (4)	11 (22)
Delivery of gas	Rigid tanker	10 (20)	56 (112)
Removal of birds	Semi-trailer and B-Double	576 (1,152)	3,226 (6,452)
Removal of birds – catching equipment transporter	Semi-trailer	6 (12)	34 (68)
Removal of birds – catching staff	Bus	39 (78)	218 (436)
Removal of shed litter material	Semi-trailer and B-Double	137 (274)	767 (1,534)
Shed wash down equipment transporter	Semi-trailer	2 (4)	11 (22)
Removal of dead birds	Twin axle rigid truck	59 (118)	330 (660)
Removal of general waste materials	Rigid truck	2 (4)	11 (22)
	Heavy Vehicle Sub-Total	**1,510 (3,020)**	**8,455 (16,910)**
Light Vehicles			
Staff visits (ProTen and Baiada)	Car	749 (1,498)	4,194 (8,388)
Tradesman	Ute/Van	9 (18)	50 (100)
Catching equipment maintenance	Van	17 (34)	95 (190)
Shed litter material removal contractors	Car	18 (36)	101 (202)
Shed wash down contractors	Car	28 (56)	157 (314)
	Light Vehicle Sub-Total	**821 (1,642)**	**4,597 (9,194)**
	TOTAL	**2,331 (4,662)**	**13,052 (26,104)**

**note – a 'trip' is defined as a one-way movement from an origin to a destination. Each vehicle is associated with two trips comprising an 'in' and an 'out' movement to/from the Development.*

Table 4.2 – Traffic Generation per Production Cycle and Year for the Development

Daily traffic generation and peak hourly volumes for the Development have been estimated from the per-cycle traffic generation estimates provided in Table 4.2. The volumes have been calculated on the basis of

20 full-time equivalent employees, with eight of these living on-site. For the purpose of the assessment, it is assumed that approximately 70% of the total vehicle movements generated by the Development in the morning will be into the Site, with 30% out, while the situation will be reversed in the afternoon (i.e. 30% in and 70% out). The calculations are based upon estimates, however, it is noted that peak vehicle movements are minor with respect to existing traffic volumes. The results are summarised in Table 4.3.

Vehicle Type	Vehicles Per Day (Two-way Trips in brackets)	AM Peak Hour Movements	PM Peak Hour Movements
Cars (LV)	13 (26)	12 (9 in, 3 out)	12 (3 in, 9 out)
Heavy Vehicles	23 (46)	5 (3 in, 2 out)	5 (2 in, 3 out)
Total	**36 (72)**	**17 (12 in, 5 out)**	**17 (5 in, 12 out)**

Table 4.3 – Traffic Generation per Day and in each Peak Hour for the Development

On average, there will be 72 movements per day (46 of these trucks) associated with the Development, including 17 trips in each of the AM and PM peak hours for the Development. The peak generating hours of the Development will occur at the start and end of the farm workers shift (i.e. around 7am and 4pm).

It is assumed that the heavy vehicle trips will be spread evenly over the 9 week cycle and will be distributed relatively evenly over the main hours of activity between 7am and 7pm. A number of heavy vehicle movements associated with the removal of birds will also take place any time between 7pm and 4pm.

4.5 Future Design Year Volumes

A design horizon of 10 years has been adopted to assess the potential impacts of the Development with respect to any intersection upgrade requirements and road infrastructure improvements. Accordingly, a design year of 2029 has been adopted to determine the future traffic volumes.

The AM peak, PM peak and 12-hour (6am to 6pm) background traffic volumes along the Oxley Highway and Rushes Creek Road, which were obtained from the 2016 Oxley Highway / Rushes Creek Road intersection count discussed in Section 3.1, were factored up to 2029 using a linear growth rate of 2% per annum as discussed in Section 3.2. The RMS Permanent Count site data at Station numbers 6167 and 6194 on the Oxley Highway was then used to derive 12-to-24 hour conversion factors, from which the average weekday (24hr) volumes of traffic on the Oxley Highway and Rushes Creek Road were estimated.

It is unclear from the data available whether traffic on Rushes Creek Road would grow at the same rate as traffic on the Oxley Highway. However, to provide a conservative assessment it has been assumed that it does and the design year background traffic volumes have been calculated accordingly.

The peak and daily traffic volumes generated by the Development, which are summarised in Table 4.3 above, were then superimposed with the design year background traffic volumes to provide the resulting future 'with Development' design year volumes. Note that the Development peaks are generally expected to occur earlier than the existing network peaks, particularly in the morning, due to the farm workers shift commencing at 7am and ending at 4pm. The Development peaks are assumed to coincide with the network

peaks to simplify the analysis and provide a conservative basis for assessing the potential impacts of the Development.

Tables 4.4 and 4.5 below show the estimated peak hour and average weekday traffic volumes with and without the Development for the design year of 2029. Note that traffic volumes at the southern and northern accesses to the Development have been distributed in proportion to the number of sheds served by each access (i.e. 36 of the 54 sheds, or 2/3^{rds}, are serviced by the southern access, with the remaining 1/3rd serviced by the northern access).

Design Year (2029) Peak Hour Traffic Volumes (veh/hr)								
Location	**AM Peak**				**PM Peak**			
	Northbound / Eastbound		**Southbound / Westbound**		**Northbound / Eastbound**		**Southbound / Westbound**	
	Volume	**%HV**	**Volume**	**%HV**	**Volume**	**%HV**	**Volume**	**%HV**
Without Development								
Oxley Highway								
West of Rushes Creek Road	185	12%	164	16%	190	19%	181	8%
East of Rushes Creek Road	175	13%	152	17%	193	18%	174	8%
Rushes Creek Road								
North of Oxley Highway	35	21%	37	24%	20	19%	30	13%
North of the Development*	35	21%	37	24%	20	19%	30	13%
With Development								
Oxley Highway								
West of Rushes Creek Road	187	12%	165	16%	191	19%	183	8%
East of Rushes Creek Road	179	14%	162	18%	203	19%	178	9%
Rushes Creek Road								
North of Oxley Highway	47	22%	42	26%	25	23%	42	16%
North of the Development	35	21%	37	24%	20	19%	30	13%
Site Accesses								
Southern Access	3	33%	8	25%	8	25%	3	33%
Northern Access	2	50%	4	25%	4	25%	2	50%

**assumed to be the same as surveyed at the Oxley Highway / Rushes Creek Road intersection for analysis purposes (worst case).*

Table 4.4 – Design Year (2029) Peak Hour Traffic Volumes with / without Development

Design Year (2029) Average Weekday Traffic Volumes (veh/day)				
Location	**Northbound / Eastbound**		**Southbound / Westbound**	
	Volume	**%HV**	**Volume**	**%HV**
Without Development				
Oxley Highway				
West of Rushes Creek Road	2,035	15%	2,123	15%
East of Rushes Creek Road	2,005	15%	2,068	15%
Rushes Creek Road				
North of Oxley Highway	293	20%	322	22%
North of the Development*	293	20%	322	22%
With Development				
Oxley Highway				
West of Rushes Creek Road	2,040	15%	2,128	15%
East of Rushes Creek Road	2,034	16%	2,097	16%
Rushes Creek Road				
North of Oxley Highway	327	25%	356	26%
North of the Development	295	20%	324	22%
Site Accesses				
Southern Access	24	64%	24	64%
Northern Access	12	64%	12	64%

**assumed to be the same as surveyed at the Oxley Highway / Rushes Creek Road intersection for analysis purposes (worst case).*

Table 4.5 – Design Year (2029) Average Weekday Traffic Volumes with / without Development

From Tables 4.4 and 4.5 it can be seen that the future traffic volumes, in terms of both background traffic and traffic generated by the Development, are very low. The resulting forecast traffic is expected to be able to be easily accommodated by the surrounding road network.

4.6 Relocation of Baiada's Processing Plant

As discussed in Section 4.4, Baiada has approval to establish a new poultry processing plant at the Oakburn location on the Oxley Highway to the west of Tamworth. This would result in the closure of the existing processing plant in West Tamworth and birds being removed from the Development Site to the Oakburn processing plant. There is currently no known timeframe for this development.

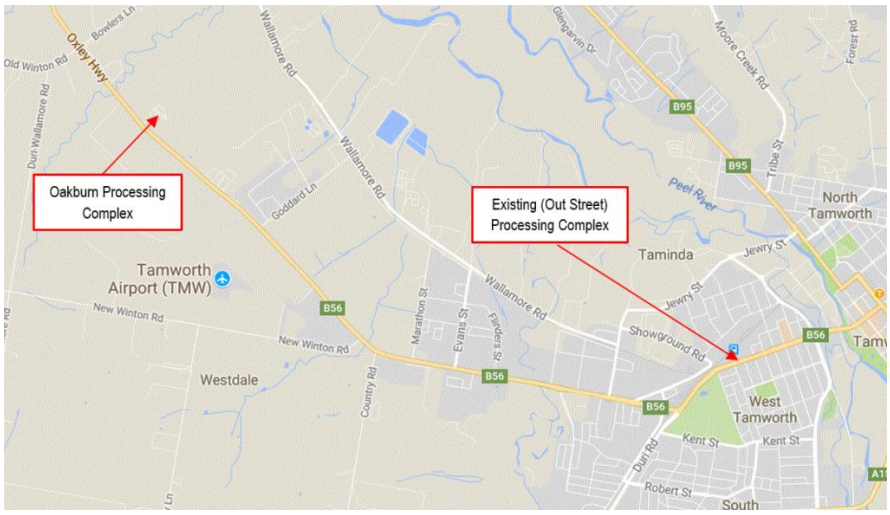


Figure 4.2 – Relocation of Baiada's Processing Plant from Out Street in West Tamworth to Oakburn (Base Plan: Google Maps)

The proposed relocation will result in a reduction in the length of trips required along the Oxley Highway between the Development and Baiada's existing processing plant. The same route via Rushes Creek Road and the Oxley Highway will be taken as at present, but trucks will not need to travel as far to reach the processing plant. This in turn will have a positive traffic impact, not only in terms of the reduction in the overall number of vehicles required to travel in and out of Tamworth, but also in terms of the size of vehicles since the live bird delivery from the poultry farms to the processing complex is typically conducted in either semi-trailers or B-Doubles.

5. OTHER DEVELOPMENTS IN THE STUDY AREA

In addition to the Rushes Creek Poultry Production Farm, at the time of writing this report the following developments had either been constructed (i.e. are existing) or were under construction, approved, or had been proposed (i.e. SEARS requested/issued or Development Application lodged):

5.1 Existing Developments (or under construction)

- Glenara Park poultry breeder farm – existing farm located 6km (approx.) northwest of the Development housing 80,000 birds (it is understood that Baiada is considering expanding this farm to 100,000 birds). There is no direct connection to Rushes Creek Road from this development;
- Murrami poultry broiler production farm (ProTen) – existing farm located 11km (approx.) to the south-southeast of the Development housing up to 800,000 birds. This development is accessed directly from the Oxley Highway via an access road in the vicinity of Dowes Road;
- Moana poultry broiler production farm – existing farm located 11.5km (approx.) to the south-southwest of the Development housing up to 450,000 birds. This development is accessed directly from the southern end of Rushes Creek Road via an access road; and
- Brubri poultry broiler production farm – existing farm located 10km (approx.) to the east of the Development housing up to 800,000 birds. This development has access roads that connect to both Rushes Creek Road and also Somerton Road.

The traffic generated by each of the existing developments listed above is already present on the adjacent road network and where applicable has been included in the background traffic counts undertaken as part of this study. No additional allowance is required to be made for these developments as part of this traffic assessment.

In addition to the existing developments above, the following project is currently under construction within the study area:

- Keepit Dam Upgrade Stage 2 – in order to meet modern dam safety standards, the main dam wall is currently being upgraded. The current Stage 2 upgrade works began in April 2017 and are planned to continue until mid-2019. The traffic associated with these construction works will be short term and is expected to be of a small magnitude only. Following completion of the construction works in mid-2019 there will not be any on-going operational traffic generation or impacts from the Keepit Dam Upgrade Stage 2.

5.2 Approved Developments (i.e. Development Consent issued but not yet constructed)

- Strathfield Poultry Broiler Farm (Baiada) – this is an approved but yet to be constructed five (5) farm poultry development located approximately 28km northeast of the Development Site to the north of Manilla. This development comprises a total of 70 sheds (14 sheds per farm) and at full development will accommodate up to 2,940,000 birds.

The EIS's prepared for each of the Strathfield farms indicates that traffic generated will travel via Namoi River Road, Arthur Street and Charles Street to Manilla Road (B95) in Manilla, and then from here the majority of the movements will be between Manilla and Tamworth. There is therefore likely to be minimal, if any, traffic generated by this development that will travel along Rushes Creek Road and through its intersection with the Oxley Highway.

5.3 Cumulative Traffic Assessment

Based on the above assessment of other potential developments in the area, there does not appear to be anything of any significance that will lead to the potential for cumulative traffic impacts to arise along the corridor that is primarily of interest for this study (i.e. Rushes Creek Road, the Oxley Highway between Rushes Creek Road and Tamworth, and the Oxley Highway / Rushes Creek Road intersection). A quantitative assessment of cumulative impacts for the Development has therefore been found to be unnecessary.

6. ACCESS REQUIREMENTS FOR THE PROPOSED DEVELOPMENT

6.1 Oxley Highway / Rushes Creek Road Intersection

6.1.1 Operational Performance (SIDRA Analysis)

As indicated in previous sections, access to the Development for all heavy vehicle traffic and most light vehicle traffic will occur via the Oxley Highway / Rushes Creek Road intersection. A comparison of the peak hour volumes with and without the Development in the design year of 2029, as presented in Table 4.4, indicates that the changes in traffic arising from the Development are generally very small, with the biggest increases occurring on Rushes Creek Road due to the existing (background) traffic volumes being so low.

An assessment of the existing intersection performance at 2016 based on the 2016 intersection count has been undertaken using the SIDRA INTERSECTION software. In addition, the intersection has been analysed at the Design Year of 2029 with and without the Development (using the traffic volumes derived in accordance with the methodology presented in Section 4.5) to assess the impacts of the proposal.

Geometric data for the assessment (e.g. lane configurations and disciplines, widths, lengths, posted speeds etc) was obtained from Nearmap and Google Maps. The results of the assessment for the key performance measures are presented in Table 6.1 below.

SIDRA Modelling Results – Existing (2016) and Design Year (2029) with/without Development					
Scenario	**Peak Hour**	**Performance Measure[1]**			
		Degree of Saturation (DOS)	**Average Delay (s)**	**Level of Service (LOS)[2]**	**95%ile Back of Queue (m)**
Existing (2016)	AM	0.075	1.8	A	1.3
	PM	0.086	1.2	A	0.9
2029 without Development	AM	0.095	1.9	A	1.7
	PM	0.109	1.3	A	1.3
2029 with Development	AM	0.095	2.2	A	2.0
	PM	0.109	1.6	A	1.8

1. Results represent the performance of the intersection as a whole for each scenario, unless otherwise stated.
2. Level of Service is for the worst performing movement at the intersection.

Table 6.1 – Oxley Highway / Rushes Creek Road Intersection Performance with/without Development

The results of the analysis indicate that the intersection currently performs very well during the AM and PM peaks, with a level of service (LOS) of A and minimal delays and queues. This remains the case at the Design Year (2029) with and without the Development, confirming that no improvements to the intersection are required on capacity grounds to address any delay and associated LOS issues or queuing issues.

6.1.2 Intersection Warrants

Although the Oxley Highway / Rushes Creek Road intersection is an existing intersection complete with various turn bay provisions, a check has been made on the layout requirements using the intersection warrants prescribed in *Austroads Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections* (AGRD Part 4A) to ensure that the current layout is suitable for the traffic predicted to use it with the inclusion of the Development.

The assessment has been based on the forecast 2029 AM and PM peak hour 'with Development' traffic volumes provided previously in Table 4.4. The results are illustrated in Figure 6.1 below.

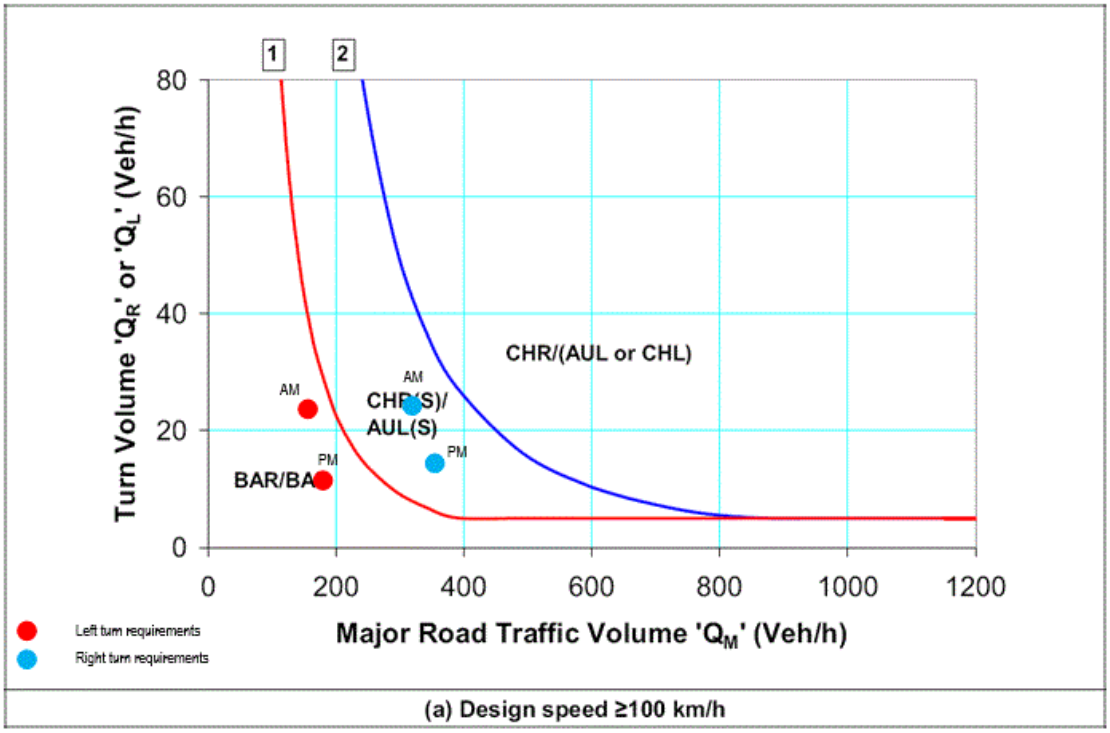


Figure 6.1: 2029 Traffic Volume Warrants at Oxley Highway / Rushes Creek Road Intersection (based on Figure 4.9 of AGRD Part 4A: Unsignalised and Signalised Intersections)

Figure 6.1 indicates that a basic left turn (BAL) treatment would be suitable for the left turn from the major road based on a consideration of traffic volumes alone; while a short, channelised right turn (CHR(S)) treatment is required for the right turn from the major road.

The existing intersection layout provides turn lanes for traffic turning into Rushes Creek Road from the Oxley Highway in an auxiliary left (AUL) configuration for the left turn, and in what appears to be (in the absence of topographical survey to precisely confirm the geometry) a CHR(S) configuration for the right turn. The AUL layout is to a higher standard than required based on the traffic warrants alone, and has likely been provided due to the presence of a downgrade at this location for eastbound traffic, as well as the reduced forward visibility to the intersection for left turning traffic caused by vegetation on the inside of the left-hand curve (this reduced visibility was also discussed in Section 2.3.3 for traffic turning left out of Rushes Creek Road and needing to look to the right for gaps in traffic). The AUL layout provided is approximately 235m long (including the taper), which exceeds the length required of 155m for an assumed Design Speed of 100km/h and grades of up to + or - 2%, based on a comfortable rate of deceleration of 2.5m/s^2 (AGRD Part 4A).

The layout provided for the right turn also appears to meet the requirements of a CHR(S) configuration, with approximately 150m (including the taper) provided which exceeds the length required for a CHR(S) of 95m (70m deceleration length + 25m storage length for one B-Double) for an assumed Design Speed of 100km/h and grades of up to + or - 2%. Note that the CHR(S) layout is based on a right-turning vehicle slowing to 80% of the design speed in the through lane prior to moving into the turn lane and decelerating. It also adopts the higher rate of deceleration of 3.5m/s^2. A full CHR treatment would need to be approximately 180m long (155m deceleration length + 25m storage length) for a Design speed of 100km/h, which would exceed the length provided on site. Based on the 2029 design volumes estimated for the Development, a further increase in the major road traffic volume of more than 20% would be required in the AM peak (the worst peak for assessing the right turn requirements) before an upgrade to the full CHR treatment would be required.

The storage length requirement for a CHR(S) is based on the need to cater for one design vehicle only, which in this case is assumed to be a B-Double vehicle. However, the intersection modelling indicates that the 95 percentile maximum queue lengths during both the AM and PM peak periods at 2029, even with the addition of the Development traffic, are predicted to be considerably less than one vehicle (i.e. most of the time gaps in the opposing traffic stream will be available, thereby enabling vehicles to turn right without the need to queue). This means that a storage length of 25m is expected to be sufficient to cater for the maximum queues that are predicted to occur on the majority of occasions.

The existing intersection layout also provides an overtaking lane for westbound traffic on the Oxley Highway immediately west of Rushes Creek Road. While not a true 'seagull' layout, it does indirectly allow traffic exiting from Rushes Creek Road to accelerate in the leftmost lane clear of through traffic, if necessary. It is considered to be sufficient for the Development given that there is very little additional traffic expected to either arrive or depart from/to the west as a result of the Development.

The remaining movement, being the left-turn out of Rushes Creek Road onto the Oxley Highway, is currently catered for by what appears to be a simple BAL treatment with flaring provided at the intersection mouth and a wider sealed shoulder but no specific turn bay / acceleration lane provision. This is considered to be consistent with the intersection warrants and appropriate for the very low volumes of traffic turning left from Rushes Creek Road both now as well as in the future (2029) with the Development in place.

Based on the above assessments, it is concluded that the general layout of the Oxley Highway / Rushes Creek Road intersection meets or exceeds the traffic warrants and is appropriate for the predicted levels of traffic arising from the Development, with a very good level of operational performance predicted to occur.

6.1.3 Other Issues

Notwithstanding the above findings, the following items will need to be reviewed and addressed if deemed appropriate in relation to this intersection:

- Swept path assessments or on-site trials may need to be conducted for the design vehicle (B-Double) to confirm that the existing intersection layout can accommodate the turn paths associated with these types of vehicles without encroaching into adjacent lanes or beyond the edge of the sealed shoulders. Given that this intersection is located along an existing B-Double route and currently used for this purpose by existing traffic, it is expected that the intersection layout should be suitable in its current form; however, it is recommended that this is checked for completeness;

- Visibility splays will need to be checked in both the horizontal and vertical planes by way of a more detailed field investigation or by using a topographical survey as a base, to confirm in particular whether there is a need for any vegetation clearing on the inside of the horizontal curve immediately to the west of the intersection;
- The intersection is controlled by a Give Way sign on Rushes Creek Road which appears to have been recently installed, however, no transverse hold line (pavement marking) to match this control has been included at the intersection; and
- It is recommended that additional signage be erected at the intersection in the form of advance signposting in both directions to warn of trucks turning at the intersection.

6.2 Rushes Creek Road

As discussed in Section 2.3.2, Rushes Creek Road is sealed with a typical seal width varying between approximately 6.5 - 7.0m along its length, although at its northern end on approach to Manilla it narrows a little to approximately 6.0 - 6.5m at some locations. It has predominantly grass (and some gravel) verges approximately 0.5 to 1.5m wide on each side. In addition, it has a centre line marking along almost all of its length and, although no edge lines are provided, guideposts are provided at regular intervals for night-time delineation.

The cross-section is broadly consistent with the requirements specified in Table 4.5 of *Austroads Guide to Road Design, Part 3: Geometric Design* (AGRD Part 3) for single carriageway rural road widths, which indicates that a minimum 2-way width ranging from 6.2-7.0m for the traffic lanes should be provided where the Design Annual Average Daily Traffic (AADT) is between 500-1,000 vehicles per day (i.e. the volume range predicted for Rushes Creek Road at 2029 with the Development traffic included based on Table 4.5 of this report). AGRD Part 3 also states that a minimum 7.0m seal width should be provided on designated heavy vehicle routes (or where the AADT contains more than 15% heavy vehicles), while a total carriageway width of 9.2-10m which includes 1.5m shoulders each side should be provided.

As discussed in previous sections of this report and illustrated in Appendix C, Rushes Creek Road is already an Approved Road for GML 25m B-Doubles. The proposed Development, which based on Table 4.3 in this report will generate just 36 additional vehicles per day (72 trips) including 23 heavy vehicles per day (46 trips), is not considered to materially change the current operating conditions along Rushes Creek Road. As such no changes to the current cross-section, which is sufficient to enable B-Doubles travelling in each direction to pass each other, are proposed in conjunction with the Development.

6.3 Access Roads and Driveways to the Development

Vehicular access to the Development is proposed via the construction of two new access driveways (crossovers) from Rushes Creek Road located approximately 1.2km (northern access) and 2.7km (southern access) south of Ski Gardens Road, and the construction of internal access roads from these driveways to each of the four farms (PPUs). All movements to and from Farms 1, 3 and 4 will occur via the southern access driveway, while Farm 2 will be accessed exclusively via the northern access driveway.

A conceptual layout of the proposed access arrangements and supporting infrastructure to service the Development was previously provided in Figure 1.2.

The proposed access roads are approximately 17.7km (southern access) and 19.2km (northern access) to the north, respectively, of the Oxley Highway / Rushes Creek Road intersection. They are therefore sufficiently removed from the State Highway road network to allow adequate room for traffic generated by the Development to manoeuvre or queue on Rushes Creek Road without impacting on traffic using the Oxley Highway.

The proposed access driveways are also separated from each other by approximately 1.5km, ensuring that each access is able to operate independently without impacting on the other in terms of queuing, visibility, road safety, delays etc.

Each access driveway appears to be located clear of any existing accesses servicing other properties in the area, thereby avoiding issues associated with conflicting vehicle movements. The accesses are also located on straight and level sections of Rushes Creek Road, thereby providing a good level of intervisibility with approaching traffic (see further discussion on visibility below).

The future access driveways connecting the internal access roads from the Development Site to Rushes Creek Road should comply with the minimum requirements of Figure 3.1 of *AS2890.2 – 2002: Parking Facilities – Off Street Commercial Facilities*, which details the dimensions of a driveway on a minor road catering for heavy vehicles including articulated vehicles (AVs) up to 19m in length. It is reproduced as Figure 6.2 below.

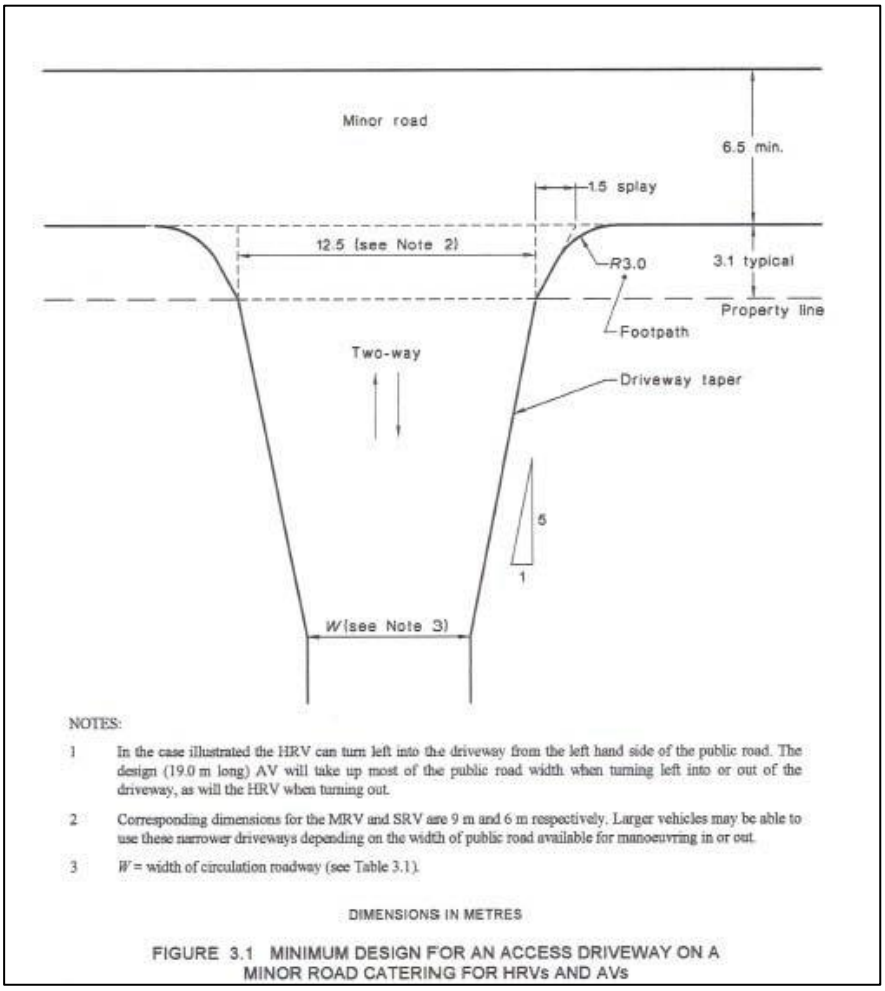


Figure 6.2: Minimum Design for an Access Driveway on a Minor Road catering for HRVs and AVs

The figure indicates that a minimum width of 6.5m will be required on the minor road (i.e. Rushes Creek Road). Based on the site visit this criterion would be satisfied at each of the proposed access driveway locations. However, additional width at each driveway entry should also be provided, if required, to accommodate the turn paths of B-Doubles. A swept path assessment of each access driveway should be undertaken as part of the design development to ensure that the proposed design layout can meet the intended purpose. Preferably, each access driveway intersection should be constructed as a BAL treatment in accordance with AGRD Part 4A, to provide additional shoulder width for Development traffic turning left into the access driveways to decelerate clear of through traffic on Rushes Creek Road.

The access driveways should be bitumen sealed for a minimum distance of 50m back from their intersection with Rushes Creek Road. Access control (Give Way) signage and associated linemarking should also be provided at each of the access driveways servicing the Development to control vehicles exiting the Site.

Based on the site inspection conducted by RoadNet in October 2016 and the discussion in Section 2.3.2, it is estimated that there will be in excess of 500m sight distance available in each direction at each of the northern and southern access driveways based on their currently-proposed locations, which reflects the straight alignment and flat grades within their immediate vicinity. This exceeds the requirement specified in the RMS Supplement to AGRD Part 4A for Safe Intersection Sight Distance (SISD) of 248m for cars (i.e. the reference vehicle) on a flat grade, based on an assumed Design Speed of 100km/h and a reaction time of 2s. It therefore also exceeds the requirement for heavy vehicles exiting these intersections.

6.4 Internal Access Requirements

The anticipated internal access arrangements, as shown on the conceptual layouts presented in Figure 1.2, will provide adequate and suitable vehicular access to the proposed poultry sheds via the construction of new all-weather crossovers and rural-type roads able to carry the anticipated heavy vehicle traffic.

The Development will include a one-way circulation road (ring road) around the perimeter of each farm to enable traffic to enter, exit and manoeuvre around the poultry sheds for loading, unloading and servicing activities in a forward direction, thereby minimising the potential for traffic conflict and noise (e.g. reversing beepers).

The internal roads will be constructed as all-weather rural-type roads able to carry the anticipated heavy vehicle movements. Where necessary, culverts will be installed to traverse drainage lines.

Parking will be available adjacent to the sheds to accommodate staff and visitor movements.

7. CONSTRUCTION STAGING AND TRAFFIC

While construction planning details are still in the early stages for the Development, with a construction program yet to be developed to cover the required civil, structural, electrical and building works, the information in this section seeks to provide a broad outline of the proposed construction activities and timing. A rough estimate of the traffic volumes is also provided.

It is proposed that the four farms (PPUs) that comprise the Rushes Creek Poultry Production Farm will be constructed consecutively, with a construction period of approximately 9 weeks required for every 10 sheds following an initial lead time of 4 months to complete the Site preparation and earthworks. The construction program will therefore span approximately 16 months.

Construction activities will include:

- Site preparation (including erosion and sediment control) and earthworks;
- Construction of two vehicular access driveways from Rushes Creek Road and internal access roads;
- Construction of the poultry sheds and ancillary infrastructure;
- Construction of eight dwellings to house the farm managers;
- Installation of the required electricity, gas and water servicing infrastructure;
- Construction of the water management systems at each farm; and
- Site landscaping.

All construction activities will be undertaken during standard daytime construction hours, namely:

- Monday to Friday – 7.00am to 6.00pm;
- Saturday – 8.00am to 1.00pm; and
- No audible construction work on Sunday and public holidays.

A Construction Environmental Management Plan (CEMP) will be developed which will include procedures for the management of surface water, soil, erosion and sedimentation, flora and fauna, dust, noise, traffic and waste.

Access to the Site during the construction stage will be provided initially via the existing access driveways servicing the Development Site from Rushes Creek Road, until such time as the new access driveways have been constructed. It is anticipated that the majority of the construction traffic will travel to and from the Site via Rushes Creek Road and the Oxley Highway to the south, although some movements may also occur from the north via Manilla.

All construction-related traffic (including light vehicles associated with construction workers) will park within the Site during the construction phase.

The first stage of construction within the Site will comprise of undertaking the Site earthworks, for which heavy earthmoving equipment will need to be brought onto Site. Once the earthmoving equipment is on Site, workers will come to and from the Site daily.

Following substantial completion of the earthworks, construction of the poultry sheds will commence. Each of the sheds will be 160m long by 18m wide (i.e. they will have an area of 2,880m^2) and will be made up of a

fully-sealed concrete flooring, a fabricated structural steel framework, zincalume corrugated iron roof sheeting, and insulated sandwich panel walls with a non-reflective colour-bond type material.

The concrete floor slab will be 100mm thick and will be poured over a duration of approximately 2 days for each shed. The concrete will be batch-mixed on-site to reduce the number of heavy vehicle construction movements to and from the Site. The raw ingredients of crushed rock, sand and cement will be delivered to the Site over a period of 1-2 weeks prior to their first use.

Other building materials will generally be delivered on semi-trailers and in shipping containers over longer periods of time and potentially throughout the duration of the construction period. At this stage no information on quantities is available.

Equipment required for the fit-out of each shed will generally be delivered in shipping containers over a period of a couple of weeks and stored on-site until needed.

Given the limited information available on quantities at this stage it is not possible to accurately determine the construction traffic volumes. However, for the types of construction activities involved and the proposed duration of work it is anticipated that only a low volume of traffic will be generated on a daily basis. This traffic is expected to comprise of the odd truck delivering materials throughout the course of a typical day and a small number of light vehicle trips each day, mostly concentrated around the construction shift start and end times, associated with construction workers.

The other construction activity that may impact the local road network is the installation of a water supply pipeline and electricity supply line in an underground conduit system to cross Ski Gardens Road. If required, appropriate traffic controls will be put in place during this period to manage traffic movements through the short section of Ski Gardens Road. Following the completion of these construction works, only the occasional light vehicle will be required to use this road for maintenance purposes. Therefore, the Development is not expected to have any impacts on Ski Gardens Road in the longer term.

Overall, it is concluded that the construction activities will generate only relatively low traffic volumes. The impacts arising from construction traffic are therefore expected to be low and able to be appropriately managed through the implementation of a Construction Traffic Management Plan (CTMP) and traffic control plan(s) (if required).

8. IMPACTS ON ADJOINING ROAD NETWORK

8.1 Oxley Highway and Rushes Creek Road

The additional traffic generated by the Development is minimal and will not have any significant impact on the safety or operation of the external road network. The Development is expected to generate up to 72 vehicle trips per day on average, including 46 heavy vehicle trips per day (approx. 5 per peak hour) and 26 car trips per day (approx.12 per peak hour). The majority of this traffic is predicted to use the section of Rushes Creek Road south of the Development Site and the Oxley Highway to the east of its intersection with Rushes Creek Road. Only a very small volume of traffic generated by the Development is predicted to use Rushes Creek Road north of the Development Site or the Oxley Highway to the west of Rushes Creek Road.

The forecast background traffic volumes on the Oxley Highway and Rushes Creek Road are low relative to their respective capacities and the additional traffic generated by the Development can be easily accommodated.

The following table shows the future forecast daily background traffic volumes in 2029 along the Oxley Highway and Rushes Creek Road in the vicinity of the Oxley Highway / Rushes Creek Road intersection, and the additional traffic generated by the Development.

Future Forecast Traffic Volumes on Oxley Highway and Rushes Creek Road (2029) – 2-way daily trips								
Background Traffic			**Additional Generated Traffic***			**Percentage Increase**		
Cars	**HVs**	**Total**	**Cars**	**HVs**	**Total**	**Cars**	**HVs**	**Total**
Oxley Highway west of Rushes Creek Road								
3,534	624	4,158	10	0	10	<1%	0%	<1%
Oxley Highway east of Rushes Creek Road								
3,462	611	4,073	12	46	58	<1%	7.5%	1.4%
Rushes Creek Road north of the Oxley Highway								
486	129	615	22	46	68	4.5%	35.7%	11.1%

*excludes very small volume of traffic (cars only) generated to/from Rushes Creek Road north of the Development Site.

Table 8.1 – Percentage Increase in Vehicle Trips on External Road Network from the Development

The results in Table 8.1 illustrate that the increase in total trips on the Oxley Highway, both to the west and east of Rushes Creek Road, is marginal only and will not cause any operational problems. Although a 7.5% increase in heavy vehicles is predicted to occur on the Oxley Highway east of Rushes Creek Road, this still only equates to an extra 2-way volume of 46 heavy vehicles per day (approximately 5 heavy vehicle trips during each peak hour), which is easily able to be accommodated on the existing road network without the need for any improvements.

The volume of background traffic on the Oxley Highway is higher at locations closer to Gunnedah and Tamworth as previously discussed in Section 3.1.2. The percentage increase in traffic arising from the Development will therefore be even less at those locations.

The percentage increases on Rushes Creek Road are higher, particularly with respect to the increase in heavy vehicles. However, this reflects the very low background traffic volumes that currently exist on this road, with total volumes on Rushes Creek Road with the Development still only 683 veh/day (2-way) at 2029. Overall, the proportion of heavy vehicles in the total traffic flow on Rushes Creek Road at 2029 increases from approx. 21% without the Development to 25% with the Development, which is not expected to have any significant impact on the operation of this road.

It is concluded that the additional trips generated by the Development are low and are not expected to have any operational impacts on the external road network. Both the Oxley Highway and Rushes Creek Road are easily able to accommodate the additional traffic generated by the proposal.

8.2 Heavy Vehicle Routes used by Development

As discussed in Section 4.4.1, heavy vehicles will generally travel between the Development Site and the poultry industry facilities located on the western outskirts of Tamworth (hatchery, processing plant, rendering plant and feedmill) via Rushes Creek Road and the Oxley Highway.

Both Rushes Creek Road and the Oxley Highway are Approved GML 25m B-Double routes. The daily volume of traffic along Rushes Creek Road near its intersection with the Oxley Highway is currently less than 500 veh/day, while volumes on the Oxley Highway currently range from approximately 3,400 veh/day in the vicinity of (east of) Rushes Creek Road, to between approximately 3,700 to 4,000 veh/day closer to the centres of Gunnedah and Tamworth. The percentage of heavy vehicles is consistently in the order of 15-20%.

The additional 46 heavy vehicle trips per day on average generated by the Development (5 in each of the peak hours for the Development) along Rushes Creek Road and the Oxley Highway east of Rushes Creek Road are not expected to have any significant traffic impacts.

It is concluded that the routes that will be used by the Development are suitable for the types of vehicle movements that will be generated and have sufficient facilities to accommodate the additional heavy vehicles generated by the Development proposal. No upgrades to roadways or intersections (other than any safety improvements which may be discussed in other sections of this report) are anticipated to be required on the external road network.

8.3 Intersections

8.3.1 Oxley Highway / Rushes Creek Road Intersection

An assessment of the existing (2016) operational performance of the Oxley Highway / Rushes Creek Road intersection, as well as the future (2029) performance with and without the Development, has been conducted using the SIDRA INTERSECTION modelling software as discussed in Section 6.1.1. The results of that analysis indicate that the intersection currently performs very well during the AM and PM peaks, with a level of service (LOS) of A and minimal delays and queues. This remains the case at the Design Year (2029) with and without the Development, confirming that the Development has no material impact on the operation of this intersection and no improvements to the intersection are required on capacity grounds to address any delay, LOS or queuing issues.

A review of the intersection warrants for the Oxley Highway / Rushes Creek Road intersection has also been conducted to ensure that the current layout is suitable for the traffic predicted to use it with the inclusion of the Development, as discussed in Section 6.1.2. Based on that review it is concluded that the general layout of the Oxley Highway / Rushes Creek Road intersection meets or exceeds the traffic warrants and is appropriate for the predicted levels of traffic arising from the Development.

From the above assessments it is concluded that the impacts of the Development on the operation and layout of the Oxley Highway / Rushes Creek Road intersection are acceptable, with no major upgrades required to the existing intersection layout.

Notwithstanding this, a few recommendations have been made in relation to the need for swept path assessments, visibility splay checks, and the provision of additional signage at the intersection to improve its safety. These recommendations are detailed in Section 6.1.3.

8.3.2 Rushes Creek Road / Site Access Driveways

Details in relation to the proposed site access driveways were discussed in Section 6.3 of this report from which the following conclusions and recommendations were made:

- The proposed access driveways are sufficiently removed from the State Highway road network to allow adequate room for traffic generated by the Development to manoeuvre or queue on Rushes Creek Road without impacting on traffic using the Oxley Highway;
- The future access driveways connecting the internal access roads from the Development Site to Rushes Creek Road should comply with the minimum requirements of Figure 3.1 of *AS2890.2 – 2002: Parking Facilities – Off Street Commercial Facilities*;
- Additional width at each driveway entry should be provided, if required, to accommodate the turn paths of B-Doubles. A swept path assessment of each access driveway should be undertaken to ensure that the proposed design layout can meet the intended purpose. Preferably, each access driveway intersection should be constructed as a BAL treatment in accordance with AGRD Part 4A, to provide additional shoulder width for Development traffic turning left into the access driveways to decelerate clear of through traffic on Rushes Creek Road;
- The access driveways should be bitumen sealed for a minimum distance of 50m back from their intersection with Rushes Creek Road;
- Access control (Give Way) signage and associated linemarking should be provided at each of the access driveways servicing the Development to control vehicles exiting the Site; and
- Sight distance at each of the proposed access driveway locations will need to be checked as the design development proceeds to ensure that it meets the sight distance requirements specified in AGRD Part 4A and the associated RMS Supplement.

8.4 Pedestrians, Cyclists and Public Transport

The Site is located in a lowly-populated rural area, removed from large urban residential areas. It is unlikely staff would travel to the Site via bicycle or walking in any significant numbers. Accordingly, the provision of cycle and pedestrian infrastructure and facilities to accommodate movements to and from the Site by these modes is considered unnecessary, and no allowance for this is included as part of the Development proposal.

Within the Site adequate provision should be made for pedestrians to move safely around the Site.

Similarly, with the exception of the school bus service running along Rushes Creek Road there are no dedicated public transport services currently servicing this rural area. Given that the overall volume of trips generated by the Development is only 72 trips per day, the proportion of those trips that could potentially be transferred to public transport would be insufficient to 'justify the means'. No further consideration of public transport options has therefore been undertaken as part of this Development proposal.

8.5 Impacts during Construction

As discussed in detail in Section 7, there is not expected to be any significant impact to the external road network during construction of the proposal.

All construction-related traffic (including light vehicles associated with construction workers) will park within the Site during the construction phase.

Access to the Site during construction will be provided initially via the existing access driveways servicing the Development Site from Rushes Creek Road, until such time as the new access driveways have been constructed. It is anticipated that the majority of the construction traffic will travel to and from the Site via Rushes Creek Road and the Oxley Highway to the south, although some movements may also occur from the north via Manilla.

The concrete will be batch-mixed on-site to reduce the number of heavy vehicle construction movements to and from the Site.

For the types of construction activities involved and the proposed duration of work it is anticipated that only a low volume of traffic will be generated on a daily basis. This traffic is expected to comprise of the odd truck delivering materials throughout the course of a typical day and a small number of light vehicle trips each day, mostly concentrated around the construction shift start and end times, associated with construction workers.

Overall, it is concluded that the construction activities will generate only relatively low traffic volumes. The impacts arising from construction traffic are therefore expected to be low and able to be appropriate managed through the implementation of a CTMP and traffic control plan(s) (if required).

8.6 Cumulative Impacts of Developments

An assessment of other developments in the study area, either existing/under construction, approved (i.e. Development Consent issued but not yet constructed), or proposed (i.e. SEARS requested/issued or Development Application lodged) was undertaken in Section 5.

That analysis concluded that there are a number of other existing developments in the study area for which the generated traffic would already have been present on the network at the time of conducting the traffic

counts for this study, and hence their impacts in conjunction with the Development proposal are already implicitly accounted for.

There is one development currently under construction in the study area which is the Keepit Dam Upgrade Stage 2. The current Stage 2 works began in April 2017 and are planned to continue until mid-2019. The traffic associated with the construction activities will be short term and is expected to be of a small magnitude only. Following the completion of the upgrade works in mid-2019 there will not be any on-going operational traffic generation or impacts from the Keepit Dam Upgrade Stage 2 works and, on this basis, it has therefore been excluded from further assessment.

There is one further development known as the Strathfield Poultry Broiler Farm Complex for which development consents have been issued but construction has not yet commenced. This development is located to the north of Manilla and the EIS's prepared for each of the five farms indicates that the majority of its generated traffic will travel between Manilla and Tamworth via Manilla Road (B95). There is therefore likely to be minimal, if any, traffic generated by this development that will travel along Rushes Creek Road and through its intersection with the Oxley Highway.

Based on the above assessment of other potential developments in the area, there does not appear to be anything of any significance that will lead to the potential for cumulative traffic impacts to arise along the corridor that is primarily of interest for this study (i.e. Rushes Creek Road, the Oxley Highway between Rushes Creek Road and Tamworth, and the Oxley Highway / Rushes Creek Road intersection). A quantitative assessment of cumulative impacts for the Development has therefore been found to be unnecessary.

8.7 Environmental Management Plans

A site-specific CEMP and also a site-specific Operational Environmental Management Plan (OEMP) will be prepared and implemented once the Development has been approved to ensure that the commitments made within the EIS, as well as the conditions imposed by the development consent and secondary approvals are fully implemented and complied with during the construction phase and throughout the life of the development.

The CEMP and OEMP are expected to include site-specific management strategies and mitigation measures to minimise the potential for traffic-related issues and risks. They will aim to to ensure that the Development is constructed and operates in a safe and efficient manner and does not cause adverse impacts on other users of the surrounding public road network.

9. CONCLUSIONS

ProTen intends to develop a large-scale intensive poultry production facility called the Rushes Creek Poultry Production Farm (the Development) within a rural area known as Rushes Creek in the New England North West region of NSW, approximately 43km northwest of Tamworth. Access to the Development Site will be via the adjoining Rushes Creek Road and Oxley Highway (B56).

The Development will comprise of 54 poultry sheds distributed across four individual farms (PPUs) of varying size, along with associated support infrastructure and staff amenities. The Development will have the capacity to house 3.05 million birds and will operate 24 hours a day, 7 days a week.

Access to the Development Site during its construction and operation will be achieved via two new internal farm access driveways connecting to Rushes Creek Road approximately 17.7km and 19.2km to the north, respectively, of its intersection with the Oxley Highway (B56). All movements to and from Farms 1, 3 and 4 will occur via the southern access driveway, while Farm 2 will be accessed exclusively via the northern access driveway.

The Development will generate an average of 72 vehicle trips per day (including 46 heavy vehicle trips), while 17 trips per hour (including 5 heavy vehicle trips) will be generated during the AM and PM peak periods. The peak generating hours of the Development will occur at the start and end of the farm workers shift (i.e. around 7am and 4pm).

The majority of heavy vehicles generated by the Development will travel between the Development Site and the poultry industry service facilities located on the western outskirts of Tamworth (hatchery, processing plant, rendering plant and feedmill) via the Oxley Highway. This means that they will turn right into Rushes Creek Road from the Oxley Highway and left out.

Most light vehicle movements (e.g. staff trips) will travel to and from the direction of Tamworth (where the main population resides) via the Oxley Highway to access the Site. This means that they will also turn right in and left out at the Oxley Highway / Rushes Creek Road intersection. However, some light vehicle movements may have an origin or destination from/to the direction of Gunnedah (left in & right out at the Oxley Highway / Rushes Creek Road intersection); while a small proportion may originate from areas northeast of the Development Site (e.g. Manilla) and access the Site from the northern end of Rushes Creek Road.

Existing and future background traffic volumes on the Oxley Highway and Rushes Creek Road are low relative to their respective capacities, and the additional traffic generated by the Development is not expected to result in any operational impacts on the external road network. Both the Oxley Highway and Rushes Creek Road are easily able to accommodate the additional traffic generated by the proposal.

Both Rushes Creek Road and the Oxley Highway are Approved GML 25m B-Double routes and are suitable for the types of vehicle movements that will be generated, with sufficient facilities to accommodate the additional heavy vehicles generated by the Development proposal.

An assessment of the existing (2016) intersection performance at the Oxley Highway / Rushes Creek Road intersection has been undertaken using the SIDRA INTERSECTION software. In addition, the intersection has been analysed at the Design Year of 2029 (10-year design horizon) with and without the Development traffic to assess the impacts of the proposal. The results of the analysis indicate that the intersection

currently performs very well during the AM and PM peaks, with a level of service (LOS) of A and minimal delays and queues. This remains the case at the Design Year (2029) with and without the Development, confirming that no improvements to the intersection are required on capacity grounds to address any delay, LOS or queuing issues.

A review of the traffic warrants at the Oxley Highway / Rushes Creek Road intersection has been conducted to ensure that the current layout is suitable for the traffic predicted to use it with the inclusion of the Development. Based on that review it is concluded that the general layout of the Oxley Highway / Rushes Creek Road intersection meets or exceeds the traffic warrants and is appropriate for the predicted levels of traffic arising from the Development.

From the above assessments, it is concluded that the impacts of the Development on the operation and layout of the Oxley Highway / Rushes Creek Road intersection are acceptable, with no major upgrades required to the existing intersection layout. However, a few recommendations have been made in relation to the need for swept path assessments, visibility splay checks, and the provision of additional signage at the intersection to improve its safety, which are listed in Section 10.

The access driveways proposed for the Development have been examined in detail in this report to confirm their suitability with respect to location and to determine their design requirements. The assessment has concluded that the access driveways are sufficiently removed from the State Highway road network to allow adequate room for traffic generated by the Development to manoeuvre or queue on Rushes Creek Road without impacting on traffic using the Oxley Highway. The proposed access driveways are also separated from each other by approximately 1.5km, ensuring that each access is able to operate independently without impacting on the other in terms of queuing, visibility, road safety, delays etc.

Furthermore, each access driveway appears to be located clear of any existing accesses servicing other properties in the area, thereby avoiding issues associated with conflicting vehicle movements. The accesses are also located on straight and level sections of Rushes Creek Road, thereby providing a good level of visibility estimated to be in excess of 500m to approaching traffic from each direction. The design requirements for the access driveways are listed in Section 10.

Internal roads for the Development will be constructed as all-weather rural-type roads able to carry the anticipated heavy vehicle movements and will include one-way circulation roads around the perimeter of each farm to enable traffic to enter, exit and manoeuvre around the poultry sheds for loading, unloading and servicing activities in a forward direction, thereby minimising the potential for traffic conflict and noise. Parking will be available adjacent to the sheds to accommodate staff and visitor movements.

The potential construction impacts of the Development have been examined in this report. For the types of construction activities involved and the proposed duration of work it is anticipated that only a low volume of traffic will be generated on a daily basis. This traffic is expected to comprise of the odd truck delivering materials throughout the course of a typical day and a small number of light vehicle trips each day, mostly concentrated around the construction shift start and end times, associated with construction workers.

Overall, it is concluded that the construction activities will generate only relatively low traffic volumes. The impacts arising from construction traffic are therefore expected to be low and able to be appropriately managed through the implementation of a CTMP and traffic control plan(s) (if required).

The potential cumulative impacts of the Development with other known developments in the study area has been examined. The assessment concluded that here does not appear to be any other significant developments that will lead to the potential for cumulative traffic impacts to arise along the corridor that is primarily of interest for this study (i.e. Rushes Creek Road, the Oxley Highway between Rushes Creek Road and Tamworth, and the Oxley Highway / Rushes Creek Road intersection). A quantitative assessment of cumulative impacts for the Development has therefore been found to be unnecessary.

Provided the recommendations made in this report are met, the Development is not expected to cause any significant impacts in terms of road safety or operation, and there are no issues associated with traffic to reject the proposal.

10. RECOMMENDATIONS

Oxley Highway / Rushes Creek Road Intersection

1. Swept path assessments or on-site trials may need to be conducted for the design vehicle (B-Double) to confirm that the existing intersection layout can (as expected given its location along a designated B-Double route) accommodate the turn paths associated with these types of vehicles without encroaching into adjacent lanes or beyond the edge of the sealed shoulders;
2. Visibility splays will need to be checked in both the horizontal and vertical planes by way of a more detailed field investigation or by using a topographical survey as a base, to confirm in particular whether there is a need for any vegetation clearing on the inside of the horizontal curve immediately to the west of the intersection;
3. Review the linemarking arrangement on Rushes Creek Road at the intersection to ensure it is consistent with the Give-Way intersection control;
4. It is recommended that additional signage be erected at the intersection in the form of advance signposting in both directions to warn of trucks turning at the intersection;

Access Driveways to the Development

5. The future access driveways connecting the internal access roads from the Development Site to Rushes Creek Road should comply with the minimum requirements of Figure 3.1 of *AS2890.2 – 2002: Parking Facilities – Off Street Commercial Facilities*;
6. Additional width at each driveway entry should be provided, if required, to accommodate the turn paths of B-Doubles. A swept path assessment of each access driveway should be undertaken to ensure that the proposed design layout can meet the intended purpose. Preferably, each access driveway intersection should be constructed as a BAL treatment in accordance with AGRD Part 4A, to provide additional shoulder width for Development traffic turning left into the access driveways to decelerate clear of through traffic on Rushes Creek Road;
7. The access driveways should be bitumen sealed for a minimum distance of 50m back from their intersection with Rushes Creek Road;
8. Access control (Give Way) signage and associated linemarking should be provided at each of the access driveways servicing the Development to control vehicles exiting the Site; and
9. Sight distance at each of the proposed access driveway locations will need to be checked as the design development proceeds to ensure that it meets the sight distance requirements specified in AGRD Part 4A and the associated RMS Supplement.

APPENDIX A

RMS AND COUNCIL REQUIREMENTS FOR ENVIRONMENTAL IMPACT ASSESSMENT

Transport Roads & Maritime Services

File No: NTH16/00056/02
Your Ref: SSD_7704

The Director
Industry Assessments
Department of Planning and Environment

SYDNEY NSW 2001

Attention: Sally Munk – Senior Environmental Planner

Dear Sir/Madam

Secretary's Environmental Assessment Requirements SSD 7704 – Poultry Production Rushes Creek

16 June 2016 requesting input to the Secretary's Environmental Assessment Requirements (EARs) for the abovementioned state significant development.

Roles and Responsibilities

The key interests for Roads and Maritime Services are the safety and efficiency of the road network, traffic management, the integrity of infrastructure assets and the integration of land use and transport.

The Oxley Highway is a classified (state) road. Tamworth Regional Council and Gunnedah Shire Council are the Roads Authorities for all public roads in their respective local government areas in accordance with Section 7 of the *Roads Act 1993*. Roads Authority for freeways and has responsibilities for classified roads in accordance with the Act.

Roads and Maritime Response

Roads and Maritime requests that the Environmental Assessment be supported by a Traffic Impact Assessment (TIA) prepared by a suitably qualified person in accordance with the Austroads Guide to Traffic Management Part 12, the complementary Roads and Maritime Supplement and RTA Guide to Traffic Generating Developments. The TIA is to address the following;

- The total impact of existing and proposed development on the road network with consideration for a 10 year horizon.
- The peak daily volume and distribution of traffic generated by the proposed development.
- age route/s.
- Existing and proposed site access standards.
- Details of impacts on, and proposed improvements to, intersections along the primary haulage route/s.
- Details of servicing and parking arrangements.

Roads and Maritime Services

76 Victoria Street, Grafton NSW 2460 |
PO Box 576, Grafton NSW 2460 |

.gov.au | 13 22 13

- Impact on public transport (public and school bus routes) and consideration for alternative transport modes such as walking and cycling.
- Impacts of road traffic noise and dust generated along the primary haulage route/s.
- Consideration for the preparation of a Code of Conduct for haulage operators, which could include, but not be limited to;
    a. A map of the primary haulage route/s highlighting critical locations.
    b. Safety initiatives for haulage through residential areas and/or school zones.
    c. An induction process for vehicle operators and regular toolbox meetings.
    d. A complaints resolution and disciplinary procedure.
    e. Any community consultation measures for peak haulage periods.

Where road safety concerns are identified at a specific location along the identified haulage route/s, Roads and Maritime suggests that the TIA be supported by a targeted Road Safety Audit undertaken by suitably qualified persons.

The current Austroads Guidelines, Australian Standards and Roads and Maritime Supplements are to be adopted for any proposed works on the classified road network.

The Developer would be required to enter into a 'Works Authorisation Deed' (WAD) with Roads and Maritime for any works deemed necessary on the classified road network. The developer would be responsible for all costs associated with the works and administration for the WAD

Further information on undertaking private developments adjacent to classified roads can be accessed at:

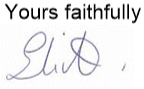
http://www.rms.nsw.gov.au/projects/planning-principles/index.html

Advice to the Consent Authority

Roads and Maritime highlights the Consent Authority is responsible for considering the environmental impacts of any road works which are ancillary to the development. This includes any works which form part of the proposal and/or any works deemed necessary to include as requirements in the conditions of development consent.

If you have any further enquiries regarding the above comments please contact Liz Smith, Manager Land Use Assessment on (02) 6640 1362 or via email at: development.northern@rms.nsw.gov.au

Yours faithfully



30 June 2016
for Monica Sirol
Network & Safety Manager, Northern Region

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Department of Planning and Environment
GPO BOX 39
SYDNEY NSW 2001

Dear Sir/Madam,

REQUEST FOR SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS PROPOSED POULTRY PRODUCTION FARM, RUSHES CREEK

I refer to your correspondence received 16 June 2016 requesting Council provide comments in relation to the subject proposal and to nominate any issues to be addressed in the Environmental Impact Assessment (EIS). In this regard, the following information is provided:

Public Exhibition

- The public notice should be placed in the Manilla Express (published weekly) in addition to the Northern Daily Leader.
- The EIS should be displayed in Manilla and Tamworth. There is a branch office of Tamworth Regional Council located in Manilla.
- The public notification should include the provision of all documentation on USBs or CDs to the any person who requests a copy, at the locations where the EIS is displayed.

General

- The judgement from the *Woolcott Group Pty Ltd v Rostry Pty Ltd [2015] NSWLEC 46* should be used as a guide with respect to potential impacts, documentation and assessment requirements
- The proposal should consider the Ski Gardens Caravan Park as a receptor.
- The application should detail any public consultation, the issues identified by the public and the manner in which the issues have been addressed prior to the submission of the application.
- Details (including operational details) of any co-use such as grazing and/or cropping on the property should be identified and an assessment of the cumulative impacts undertaken.
- Details of the proposed methods of water supply, water supply requirements and the method in which water will be obtained and stored on the site should be addressed.

All correspondence should be addressed to the General Manager:
Telephone: 6767 5555 | PO Box 555 (DX 6125) | trc@tamworth.nsw.gov.au
Facsimile: 6767 5499 | Tamworth NSW 2340 | www.tamworth.nsw.gov.au

- Details of any existing and/or proposed Water Access Licence should be provided, including a contingency in the event water cannot be drawn from the Namoi River because it is not flowing over the weir in Manilla.

- Details of any proposed consolidation and/or subdivision of the land should be provided.

- Details of any existing structures to be demolished or retained should be provided.

- Full operational details, including the detail from the despatch of day old chicks to the site, transportation of mature birds to the processing facility and all associated activities e.g. grain and bedding deliveries should be provided.

- The Department of Primary Industries Best Practice Management for Meat Chicken Production in NSW Parts 1 and 2 should be addressed.

- The potential impact of any views of the sheds, particularly from the west should be considered.

- Contributions pursuant to section 94 of the Environmental Planning and Assessment Act 1979 should be levied in accordance with the Tamworth Regional Council Section 94A (Indirect) Development Contributions Plan 2013.

- Approvals will be required pursuant to section 68 of the Local Government Act 1993 to carry out water supply work, sewerage work and operate a system of sewerage management from Council as the Water Supply Authority.

Roads & Access

- An approval will be required pursuant to section 138 of the Roads Act 1993 from Council as the Local Roads Authority.

- A traffic control plan (TCP) will need to be submitted to Council for approval prior to issue of a Construction Certificate.

- When the driveway intersections and internal roads are being constructed, there will be continuous truck movements into and out of the site for the delivery of gravel. This should be addressed in the Traffic Impact Assessment report.

- The estimated traffic volumes contained in the EIS should be separated into day time and night time trips.

- Any upgrade works to Rushes Creek Road will be subject to the recommendations of the Traffic Impact Assessment report and associated traffic movements into and out of the sites.

- The Traffic Impact Assessment report should address the relevant RMS, AUSTROADS, and Council guidelines/standards.

- The following condition was imposed for “Strathfield” to allow birds to be processed at Oakburn upon commencement of the operations without the need for a modification.

  All live birds must be processed by one processor only at all times. To achieve this requirement, all live birds collected from the Subject Land must only be delivered to:

(a) the Out Street Processing Plant; or
(b) once the approved Oakburn Processing Plant becomes operational, the Oakburn Processing Plant.

Once the Oakburn Processing Plant is fully commissioned, live birds must not be delivered to the Out Street Processing Plant.

Notwithstanding the above, live birds may also be delivered to another suitable processing plant operated by the same processor, outside the Tamworth region, in the case of circumstances which make it unfeasible to deliver live birds to the relevant processing plant in the Tamworth region.

Surface Water Management:

- If the proposed detention basins are designed only for a 1 in 20 year storm event, how is drainage from the development is managed in a larger event?
- A spillway should be designed into each basin, and an overland flow path for water discharged (via the spillways).
- A maintenance plan should be prepared for each of the basins and the drainage swales around the site. This maintenance plan should include (but not be limited to) de-silting of the basins to ensure that the required capacity of the basins in maintained.

If you require any clarification in relation to the matters raised above, please contact Lucy Walker of Council's Development and Approvals Division on the number below.

As you would be aware, the Tamworth region is a core location for the poultry industry and Council encourages and supports all future growth and investment in this sector.

Yours faithfully

Peter Thompson
Director Planning and Compliance
Contact: Lucy Walker (02) 6767 5530 or l.walker@tamworth.nsw.gov.au
Reference: LF9690
30 June 2016

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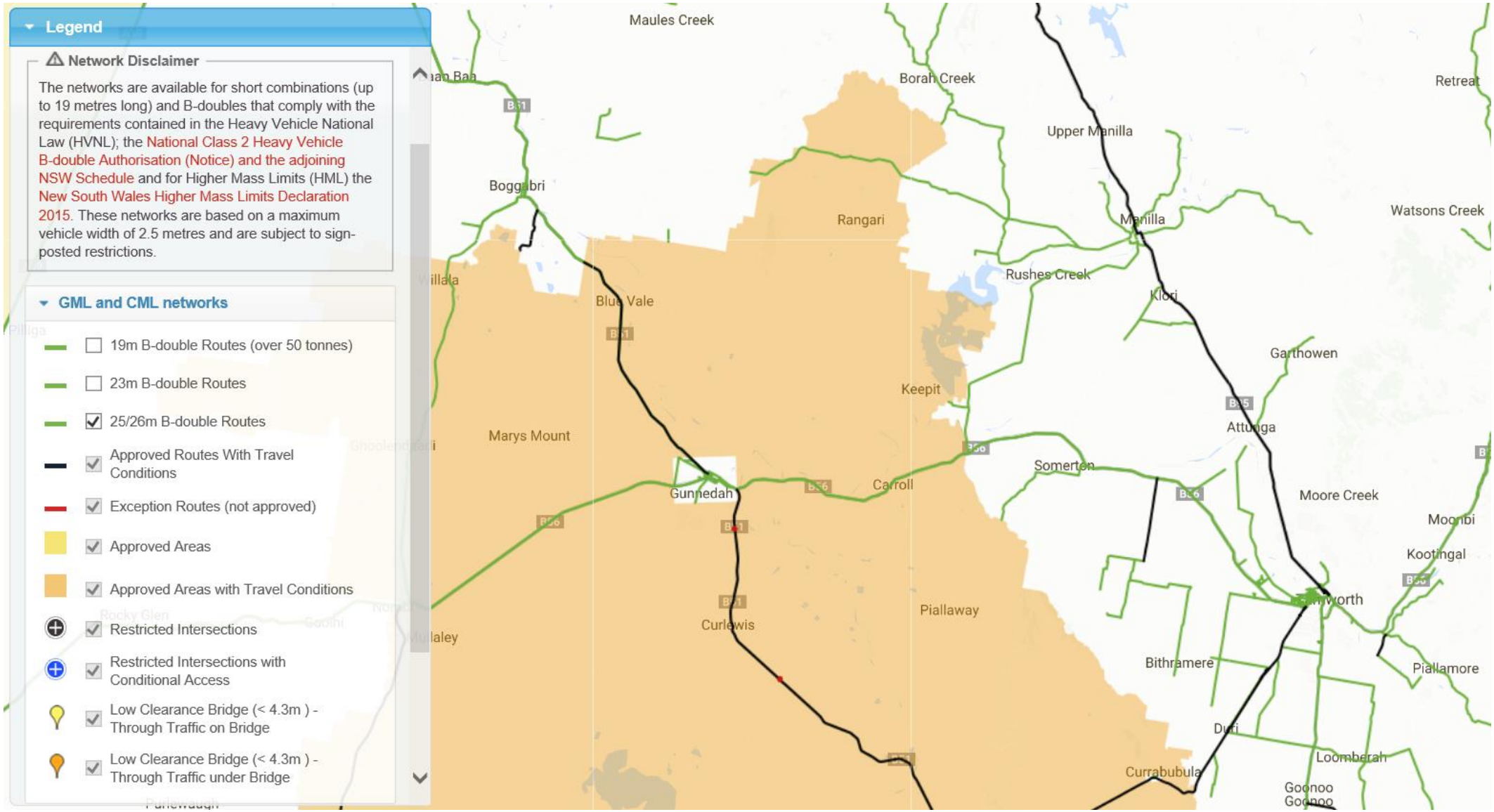
APPENDIX B

RMS RESTRICTED ACCESS VEHICLES (B-DOUBLES) MAP


Legend
Network Disclaimer
The networks are available for short combinations (up to 19 metres long) and B-doubles that comply with the requirements contained in the Heavy Vehicle National Law (HVNL); the National Class 2 Heavy Vehicle B-double Authorisation (Notice) and the adjoining NSW Schedule and for Higher Mass Limits (HML) the New South Wales Higher Mass Limits Declaration 2015. These networks are based on a maximum vehicle width of 2.5 metres and are subject to sign-posted restrictions.
GML and CML networks
19m B-double Routes (over 50 tonnes)
23m B-double Routes
25/26m B-double Routes
Approved Routes With Travel Conditions
Exception Routes (not approved)
Approved Areas
Approved Areas with Travel Conditions
Restricted Intersections
Restricted Intersections with Conditional Access
Low Clearance Bridge (< 4.3m) - Through Traffic on Bridge
Low Clearance Bridge (< 4.3m) - Through Traffic under Bridge
Maules Creek
Borah Creek
Retreat
Upper Manilla
Boggabri
Rangari
Manilla
Watsons Creek
Rushes Creek
Kiori
Blue Vale
Garthowen
Keepit
Attunga
Marys Mount
Somerton
Carroll
Gunnedah
Moore Creek
Moonbi
Kootingal
Curlewis
Piallaway
Bithramere
Piallamore
Loomberah
Currabubula
Goonoo Goonoo

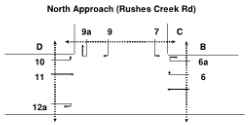
APPENDIX C

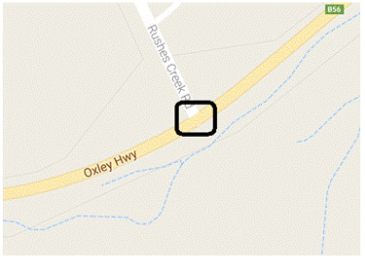
OXLEY HIGHWAY / RUSHES CREEK ROAD INTERSECTION – TRAFFIC SURVEY

Data Audit Systems
TRAFFIC SURVEYS

Intersection Count

Site No.:
Weather: Fine
Location: Oxley Hwy / Rushes Creek Rd
Suburb: Somerton
Day/Date: Thursday, 20 October 2016
9:15 AM AM Peak (hour ending)
4:45 PM PM Peak (hour ending)
Traffic Control: Priority Controlled (Give-Way)

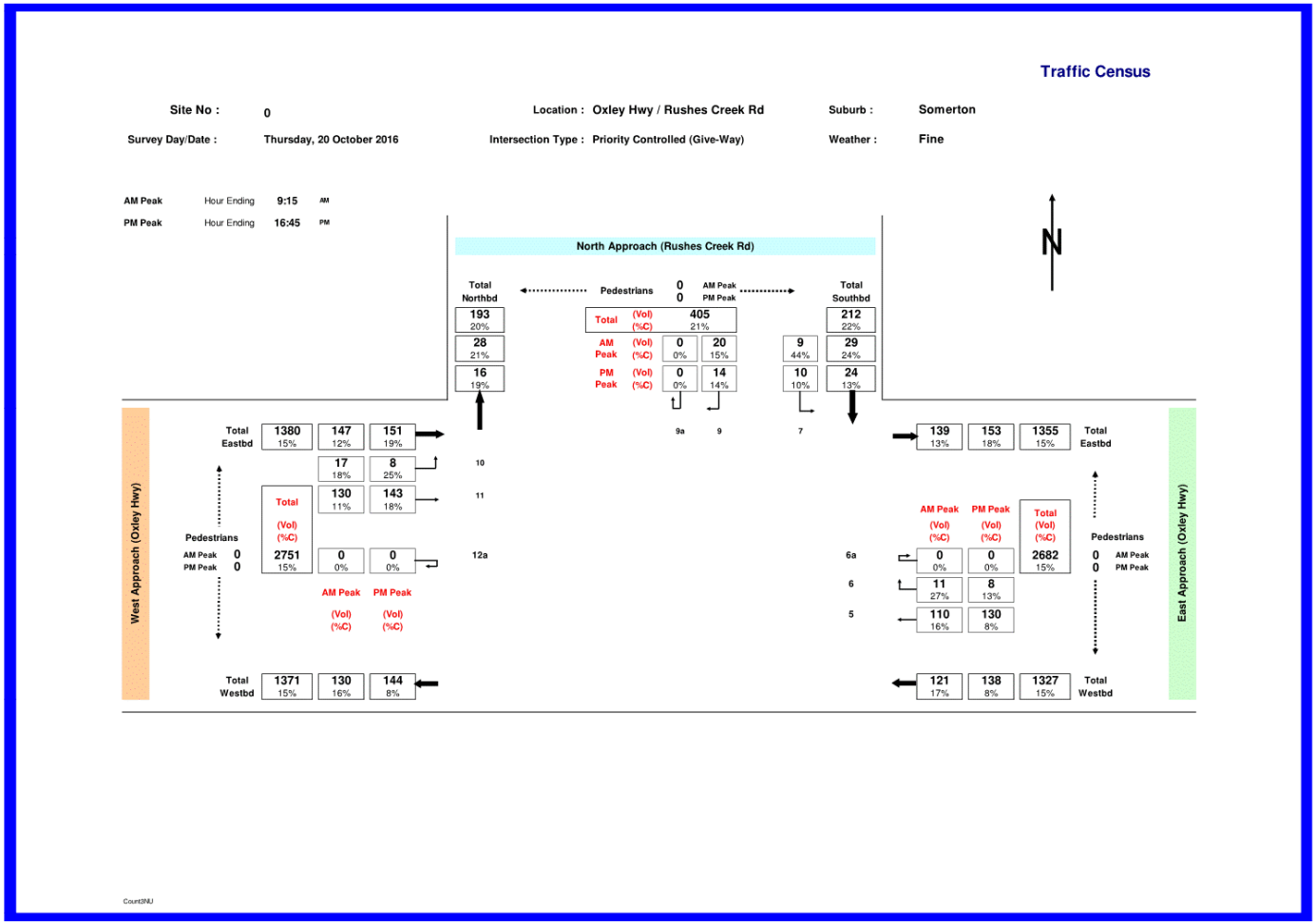




Run Macro

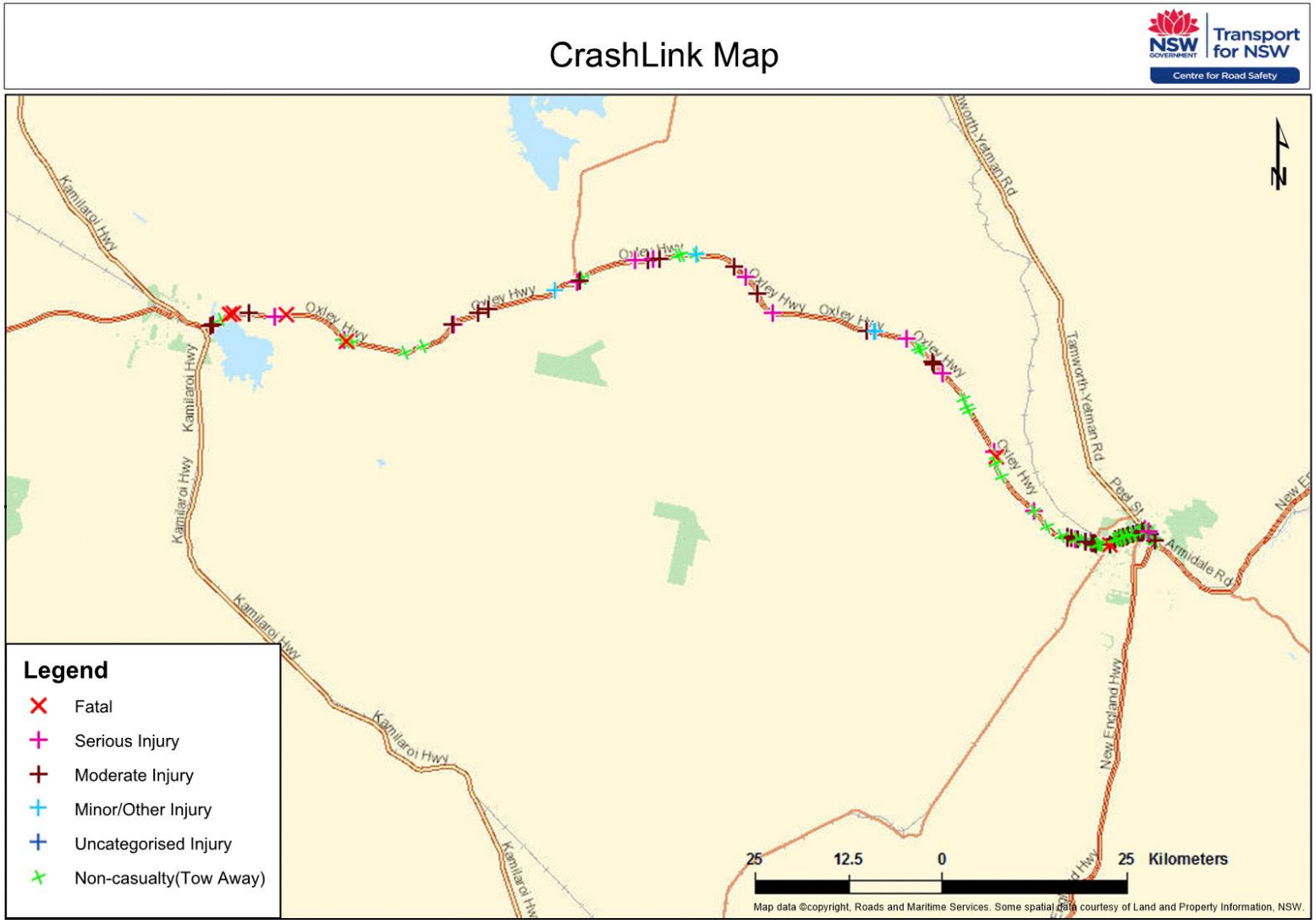
Enter Data in Header Cells, Copy Data into Cells D25:BC72
Then run macro to determine peaks and fill cells in Diagram

TIME	East Approach (Oxley Hwy)									North Approach (Rushes Creek Rd)									West Approach (Oxley Hwy)									PEDESTRIAN MOVEMENTS			
	Movement 5 (Through)			Movement 6 (Right Turn)			Movement 6a (U Turn)			Movement 7 (Left Turn)			Movement 9 (Right Turn)			Movement 9a (U Turn)			Movement 10 (Left Turn)			Movement 11 (Through)			Movement 12a (U Turn)						
15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	Cars, Utilities & Motorcycles	Trucks & Buses	Cyclists	East	North	West	Total
1 6:15 AM	14	4	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	31
2 6:30 AM	25	7	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	0	0	0	0	44
3 6:45 AM	22	8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	8	3	0	0	0	0	0	0	0	43
4 7:00 AM	22	8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	8	3	0	0	0	0	0	0	0	43 161
5 7:15 AM	21	7	0	2	1	0	0	0	0	0	1	0	2	1	0	0	0	0	0	0	0	7	1	0	0	0	0	0	0	0	43 173
6 7:30 AM	10	1	0	2	1	0	0	0	0	0	1	0	4	1	0	0	0	0	1	1	0	13	1	0	0	0	0	0	0	0	36 165
7 7:45 AM	26	3	0	0	1	0	0	0	0	1	1	0	4	0	0	0	0	0	1	0	0	21	2	0	0	0	0	0	0	0	62 184
8 8:00 AM	14	7	0	1	0	0	0	0	0	3	0	0	4	1	0	0	0	0	0	0	0	16	1	0	0	0	0	0	0	0	47 188
9 8:15 AM	15	7	0	0	1	0	0	0	0	1	0	0	3	0	0	0	0	0	2	1	0	16	2	0	0	0	0	0	0	0	48 193
10 8:30 AM	25	8	0	6	1	0	0	0	0	2	1	0	6	0	0	0	0	0	5	1	0	33	5	0	0	0	0	0	0	0	93 350
11 8:45 AM	22	6	0	1	1	0	0	0	0	0	1	0	3	1	0	0	0	0	1	0	0	32	3	0	0	0	0	0	0	0	71 259
12 9:00 AM	19	2	0	0	0	0	0	0	0	2	0	0	6	1	0	0	0	0	3	0	0	27	4	0	0	0	0	0	0	0	64 276
13 9:15 AM	26	2	0	1	1	0	0	0	0	1	2	0	2	1	0	0	0	0	5	2	0	24	2	0	0	0	0	0	0	0	69 297
14 9:30 AM	19	9	0	0	0	0	0	0	0	4	0	0	3	0	0	0	0	0	0	0	0	17	1	0	0	0	0	0	0	0	53 257
15 9:45 AM	25	9	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	1	1	0	33	1	0	0	0	0	0	0	0	73 259
16 10:00 AM	24	6	0	0	1	0	0	0	0	0	1	0	3	0	0	0	0	0	3	1	0	25	0	0	0	0	0	0	0	0	64 259
17 10:15 AM	20	3	0	2	0	0	0	0	0	2	2	0	7	0	0	0	0	0	1	1	0	25	4	0	0	0	0	0	0	0	67 257
18 10:30 AM	19	2	0	1	0	0	0	0	0	0	2	0	4	0	0	0	0	0	1	0	0	28	4	0	0	0	0	0	0	0	59 263
19 10:45 AM	25	6	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	23	2	0	0	0	0	0	0	0	62 252
20 11:00 AM	13	3	0	0	0	0	0	0	0	1	1	0	3	0	0	0	0	0	1	0	0	17	2	0	0	0	0	0	0	0	41 229
21 11:15 AM	24	2	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	1	0	0	25	3	0	0	0	0	0	0	0	60 222
22 11:30 AM	19	2	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	20	5	0	0	0	0	0	0	0	53 216
23 11:45 AM	12	2	0	1	2	0	0	0	0	2	0	0	2	0	0	0	0	0	5	0	0	24	5	0	0	0	0	0	0	0	55 209
24 12:00 PM	16	2	0	2	1	0	0	0	0	2	0	0	2	1	0	0	0	0	3	1	0	24	7	0	0	0	0	0	0	0	61 229
25 12:15 PM	18	1	0	1	0	0	0	0	0	2	1	0	3	0	0	0	0	0	2	0	0	23	1	0	0	0	0	0	0	0	56 225
26 12:30 PM	18	0	0	0	0	0	0	0	0	3	1	0	1	2	0	0	0	0	3	0	0	29	5	0	0	0	0	0	0	0	62 234
27 12:45 PM	16	4	0	1	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	1	0	26	4	0	0	0	0	0	0	0	56 235
28 1:00 PM	21	5	0	1	0	0	0	0	0	1	0	0	4	0	0	0	0	0	2	0	0	12	1	0	0	0	0	0	0	0	47 221
29 1:15 PM	12	5	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	1	0	25	2	0	0	0	0	0	0	0	47 212
30 1:30 PM	19	6	0	4	1	0	0	0	0	1	2	0	2	0	0	0	0	0	0	0	0	27	6	0	0	0	0	0	0	0	68 218
31 1:45 PM	12	2	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	1	0	25	3	0	0	0	0	0	0	0	47 209
32 2:00 PM	18	8	0	2	0	0	0	0	0	2	0	0	4	0	0	0	0	0	2	0	0	20	1	0	0	0	0	0	0	0	58 220
33 2:15 PM	25	7	0	2	0	0	0	0	0	2	1	0	5	1	0	0	0	0	2	0	0	23	0	0	0	0	0	0	0	0	60 233
34 2:30 PM	28	1	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	1	0	17	4	0	0	0	0	0	0	0	58 223
35 2:45 PM	28	3	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	27	12	0	0	0	0	0	0	0	77 253
36 3:00 PM	27	2	0	2	0	0	0	0	0	1	2	0	4	0	0	0	0	0	3	0	0	32	14	0	0	0	0	0	0	0	83 278
37 3:15 PM	37	3	0	1	0	0	0	0	0	3	0	0	2	1	0	0	0	0	2	0	0	17	8	0	0	0	0	0	0	0	74 292
38 3:30 PM	24	5	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	19	7	0	0	0	0	0	0	0	60 294
39 3:45 PM	23	5	0	0	0	0	0	0	0	5	1	0	1	0	0	0	0	0	1	0	0	26	8	0	0	0	0	0	0	0	70 287
40 4:00 PM	31	4	0	3	0	0	0	0	0	1	0	0	2	0	0	0	0	0	2	0	0	26	12	0	0	0	0	0	0	0	80 294
41 4:15 PM	32	3	0	2	0	0	0	0	0	1	1	0	3	1	0	0	0	0	3	2	0	25	2	0	0	0	0	0	0	0	75 285
42 4:30 PM	28	3	0	0	0	0	0	0	0	4	0	0	3	1	0	0	0	0	1	0	0	34	9	0	0	0	0	0	0	0	83 308
43 4:45 PM	29	2	0	2	0	0	0	0	0	3	0	0	4	0	0	0	0	0	0	0	0	32	3	0	0	0	0	0	0	0	75 313
44 5:00 PM	28	2	0	3	0	0	0	0	0	2	1	0	4	0	0	0	0	0	2	0	0	23	1	0	0	0	0	0	0	0	66 299
45 5:15 PM	29	1	0	2	0	0	0	0	0	3	1	0	1	1	0	0	0	0	5	0	0	32	4	0	0	0	0	0	0	0	79 303
46 5:30 PM	26	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	32	6	0	0	0	0	0	0	0	70 290
47 5:45 PM	35	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	27	3	0	0	0	0	0	0	0	74 289
48 6:00 PM	20	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	1	0	23	2	0	0	0	0	0	0	0	52 275
12 hr Total	0			1063	166	0	60	18	0	62	28	0	103	19	0	0	0	0	95	20	0	1084	161	0	0	0	0	0	0	0	
AM Peak	0			92	16	0							17	3					14	3		116	14	0							34
	1	0	0%	2	0	0%	3	0	0%	3a	0	0%	4	0	0%	5	118	16%	6	11	27%	6a	0	0%	7	9	44%	8	0	0%	9	20	15%	9a	0	0%	10	17	18%	11	138	11%	12	0	0%	12a	0	0%	
PM Peak	0			120	10	0																									64
	1	0	0%	2	0	0%	3	0	0%	3a	0	0%	4	0	0%	5	139	8%	6	8	13%	6a	0	0%	7	10	10%	8	0	0%	9	14	14%	9a	0	0%	10	8	25%	11	143	16%	12	0	0%	12a	0	0%	


Traffic Census
Site No : 0
Location : Oxley Hwy / Rushes Creek Rd
Suburb : Somerton
Survey Day/Date : Thursday, 20 October 2016
Intersection Type : Priority Controlled (Give-Way)
Weather : Fine
AM Peak Hour Ending 9:15 AM
PM Peak Hour Ending 16:45 PM
North Approach (Rushes Creek Rd)
West Approach (Oxley Hwy)
East Approach (Oxley Hwy)
Total Northbd
Total Southbd
Pedestrians
AM Peak
PM Peak
Total (Vol) (%C)
AM Peak (Vol) (%C)
PM Peak (Vol) (%C)
193 20%
28 21%
16 19%
0 0
0 0
405 21%
0 0%
20 15%
0 0%
14 14%
9 44%
10 10%
212 22%
29 24%
24 13%
9a
9
7
Total Eastbd
1380 15%
147 12%
151 19%
17 18%
8 25%
10
130 11%
143 18%
11
2751 15%
0 0%
0 0%
12a
Total Westbd
1371 15%
130 16%
144 8%
6a
6
5
139 13%
153 18%
1355 15%
0 0%
0 0%
2682 15%
11 27%
8 13%
110 16%
130 8%
121 17%
138 8%
1327 15%
Count3NU

APPENDIX D

OXLEY HIGHWAY & RUSHES CREEK ROAD - CRASH DATA



Oxley Highway Crashes Tamworth and Gunnedah

Summary Crash Report

Transport for NSW
Centre for Road Safety

# Crash Type		
Car Crash	137	83.0%
Light Truck Crash	51	30.9%
Rigid Truck Crash	2	1.2%
Articulated Truck Crash	8	4.8%
'Heavy Truck Crash	*(10)*	*(6.1%)*
Bus Crash	2	1.2%
"Heavy Vehicle Crash	*(11)*	*(6.7%)*
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	11	6.7%
Pedal Cycle Crash	2	1.2%
Pedestrian Crash	1	0.6%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	90	54.5%
Non intersection	75	45.5%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	55	33.3%
Multi Vehicle	110	66.7%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	165	100.0%
Other Classified Road	0	0.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	25	15.2%
Fatigue	14	8.5%

Weather		
Fine	140	84.8%
Rain	14	8.5%
Overcast	9	5.5%
Fog or mist	0	0.0%
Other	1	0.6%

Road Surface Condition		
Wet	22	13.3%
Dry	143	86.7%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	4	2.4%
Daylight	112	67.9%
Dusk	6	3.6%
Darkness	43	26.1%

Crash Movement		
Intersection, adjacent approaches	23	13.9%
Head-on (not overtaking)	5	3.0%
Opposing vehicles; turning	18	10.9%
U-turn	1	0.6%
Rear-end	43	26.1%
Lane change	5	3.0%
Parallel lanes; turning	3	1.8%
Vehicle leaving driveway	1	0.6%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	1	0.6%
Permanent obstruction on road	0	0.0%
Hit animal	5	3.0%
Off road, on straight	14	8.5%
Off road on straight, hit object	19	11.5%
Out of control on straight	2	1.2%
Off road, on curve	1	0.6%
Off road on curve, hit object	12	7.3%
Out of control on curve	0	0.0%
Other crash type	12	7.3%

Speed Limit					
40 km/h or less	4	2.4%	80 km/h zone	4	2.4%
50 km/h zone	45	27.3%	90 km/h zone	0	0.0%
60 km/h zone	56	33.9%	100 km/h zone	50	30.3%
70 km/h zone	6	3.6%	110 km/h zone	0	0.0%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less		~ School Travel Time Involvement		
	3	7.5%		40	24.2%

Day of the Week												
Monday	12	7.3%	Wednesday	22	13.3%	Friday	34	20.6%	Sunday	17	10.3%	WEEKEND	43	26.1%
Tuesday	22	13.3%	Thursday	32	19.4%	Saturday	26	15.8%	WEEKDAY	122	73.9%			

CRASHES	165	
Fatal	6	3.6%
Serious inj.	17	10.3%
Moderate inj.	59	35.8%
Minor/Other inj.	10	6.1%
Uncategorised inj.	0	0.0%
Non-casualty	73	44.2%

Self Reported Crash		
	17	10.3%

Time Group		% of Day	
00:01 - 02:59	7	4.2%	12.5%
03:00 - 04:59	4	2.4%	8.3%
05:00 - 05:59	3	1.8%	4.2%
06:00 - 06:59	3	1.8%	4.2%
07:00 - 07:59	5	3.0%	4.2%
08:00 - 08:59	6	3.6%	4.2%
09:00 - 09:59	12	7.3%	4.2%
10:00 - 10:59	10	6.1%	4.2%
11:00 - 11:59	8	4.8%	4.2%
12:00 - 12:59	7	4.2%	4.2%
13:00 - 13:59	10	6.1%	4.2%
14:00 - 14:59	17	10.3%	4.2%
15:00 - 15:59	17	10.3%	4.2%
16:00 - 16:59	11	6.7%	4.2%
17:00 - 17:59	14	8.5%	4.2%
18:00 - 18:59	5	3.0%	4.2%
19:00 - 19:59	5	3.0%	4.2%
20:00 - 21:59	12	7.3%	8.3%
22:00 - 24:00	9	5.5%	8.3%

Street Lighting Off/Nil		% of Dark	
18	of 43	in Dark	41.9%

CASUALTIES	127	
Killed	8	6.3%
Seriously inj.	20	15.7%
Moderately inj.	81	63.8%
Minor/Other inj.	18	14.2%
Uncategorised inj.	0	0.0%
^ Unrestrained	1	0.8%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Crashes		Casualties
20	2016	26
21	2015	14
30	2014	18
41	2013	29
39	2012	26
14	2011	14

McLean Periods		% Week	
A	20	12.1%	17.9%
B	1	0.6%	7.1%
C	50	30.3%	17.9%
D	9	5.5%	3.5%
E	5	3.0%	3.6%
F	18	10.9%	10.7%
G	23	13.9%	7.1%
H	16	9.7%	7.1%
I	11	6.7%	12.5%
J	12	7.3%	10.7%

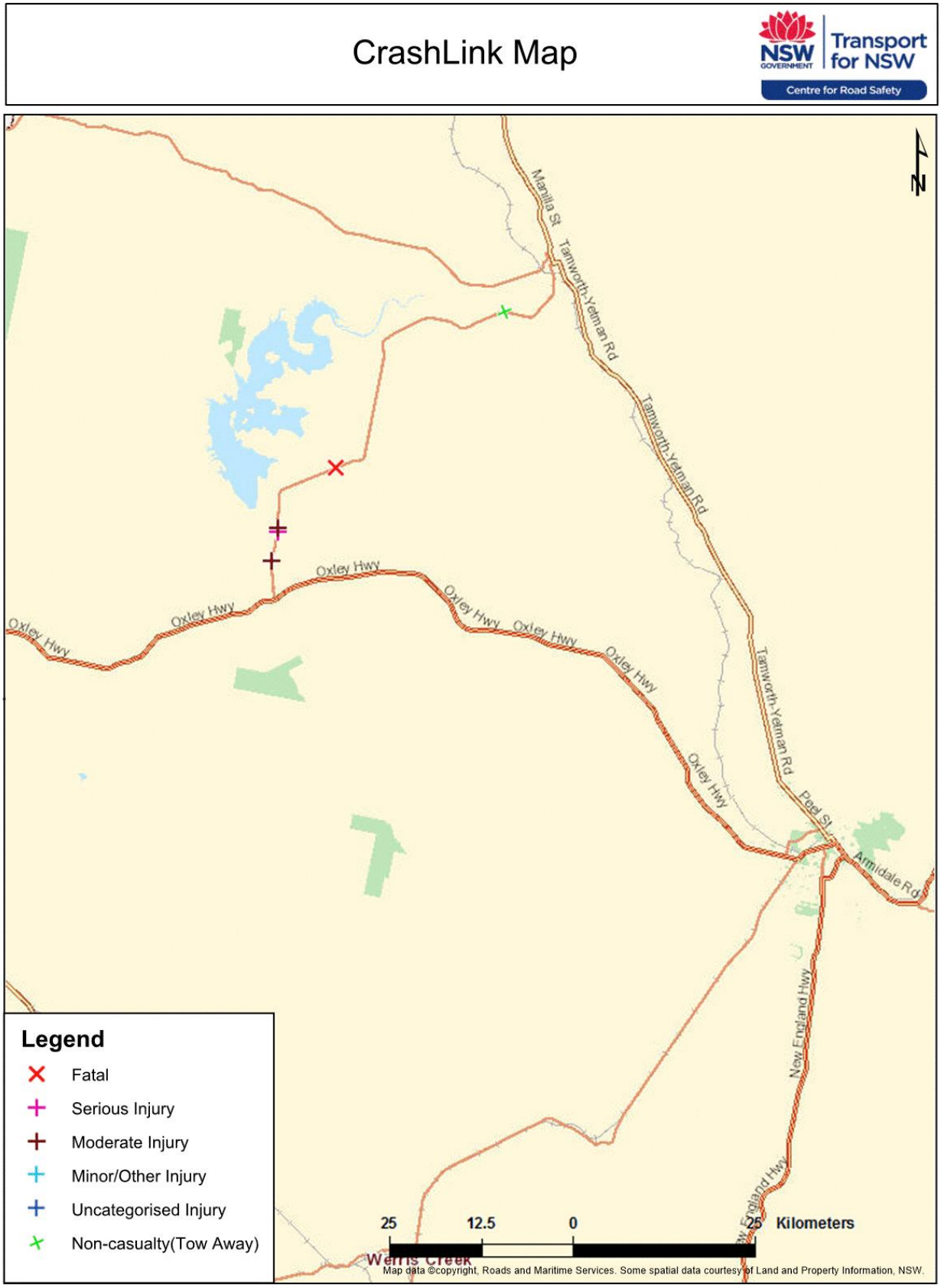
#Holiday Periods																
New Year	1	0.6%	Easter	0	0.0%	Queen's BD	0	0.0%	Christmas	5	3.0%	Easter SH	3	1.8%	Sept./Oct. SH	8	4.8%
Aust. Day	2	1.2%	Anzac Day	0	0.0%	Labour Day	1	0.6%	January SH	15	9.1%	June/July SH	5	3.0%	December SH	8	4.8%

Session dataset Gunnedah, Tamworth Regional LGAs; Oxley Hwy all crashes for 01 Oct 2011 to 30 Sep 2016. Oxley Highway Crashes New England Highway To Kamalaroi Highway

Note: Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data. Reporting yrs 1996-2004 and 2017 onwards contain uncategorised inj crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Rep ID: REG01 **Office:** Grafton **User ID:** baldwinm Page 1 of 1 Generated: 03/08/2017 15:35



Rushes Creek Road Crashes

Summary Crash Report

Transport for NSW
Centre for Road Safety

# Crash Type		
Car Crash	5	100.0%
Light Truck Crash	0	0.0%
Rigid Truck Crash	0	0.0%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	(0)	(0.0%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(0)	(0.0%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	0	0.0%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	0	0.0%
Non intersection	5	100.0%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	5	100.0%
Multi Vehicle	0	0.0%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	0	0.0%
Unclassified Road	5	100.0%

Contributing Factors		
Speeding	3	60.0%
Fatigue	2	40.0%

Weather		
Fine	5	100.0%
Rain	0	0.0%
Overcast	0	0.0%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	1	20.0%
Dry	4	80.0%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	3	60.0%
Dusk	0	0.0%
Darkness	2	40.0%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	0	0.0%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	0	0.0%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	0	0.0%
Off road on straight, hit object	1	20.0%
Out of control on straight	0	0.0%
Off road, on curve	2	40.0%
Off road on curve, hit object	2	40.0%
Out of control on curve	0	0.0%
Other crash type	0	0.0%

Speed Limit					
40 km/h or less	0	0.0%	80 km/h zone	1	20.0%
50 km/h zone	0	0.0%	90 km/h zone	0	0.0%
60 km/h zone	1	20.0%	100 km/h zone	3	60.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less	0	0.0%	~ School Travel Time Involvement	1	20.0%

Day of the Week												
Monday	1	20.0%	Wednesday	0	0.0%	Friday	0	0.0%	Sunday	1	20.0%	WEEKEND	1	20.0%
Tuesday	3	60.0%	Thursday	0	0.0%	Saturday	0	0.0%	WEEKDAY	4	80.0%			

CRASHES		5
Fatal	1	20.0%
Serious inj.	1	20.0%
Moderate inj.	2	40.0%
Minor/Other inj.	0	0.0%
Uncategorised inj.	0	0.0%
Non-casualty	1	20.0%

Self Reported Crash	0	0%

Time Group		% of Day	
00:01 - 02:59	2	40.0%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	0	0.0%	4.2%
08:00 - 08:59	0	0.0%	4.2%
09:00 - 09:59	0	0.0%	4.2%
10:00 - 10:59	0	0.0%	4.2%
11:00 - 11:59	0	0.0%	4.2%
12:00 - 12:59	0	0.0%	4.2%
13:00 - 13:59	1	20.0%	4.2%
14:00 - 14:59	1	20.0%	4.2%
15:00 - 15:59	0	0.0%	4.2%
16:00 - 16:59	1	20.0%	4.2%
17:00 - 17:59	0	0.0%	4.2%
18:00 - 18:59	0	0.0%	4.2%
19:00 - 19:59	0	0.0%	4.2%
20:00 - 21:59	0	0.0%	8.3%
22:00 - 24:00	0	0.0%	8.3%

Street Lighting Off/Nil	% of Dark			
2	of	2	in Dark	100.0%

CASUALTIES		6
Killed	1	16.7%
Seriously inj.	1	16.7%
Moderately inj.	2	33.3%
Minor/Other inj.	2	33.3%
Uncategorised inj.	0	0.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Crashes		Casualties
1	2016	1
1	2014	3
2	2013	1
1	2012	1

McLean Periods		% Week
A	0	0.0% 17.9%
B	0	0.0% 7.1%
C	1	20.0% 17.9%
D	0	0.0% 3.5%
E	1	20.0% 3.6%
F	1	20.0% 10.7%
G	0	0.0% 7.1%
H	0	0.0% 7.1%
I	2	40.0% 12.5%
J	0	0.0% 10.7%

#Holiday Periods												
New Year	0	0.0%	Easter	0	0.0%	Queen's BD	0	0.0%	Christmas	0	0.0%	Easter SH	0	0.0%	Sept./Oct. SH	1	20.0%
Aust. Day	0	0.0%	Anzac Day	0	0.0%	Labour Day	0	0.0%	January SH	0	0.0%	June/July SH	0	0.0%	December SH	0	0.0%

Session dataset Gunnedah, Tamworth Regional LGAs; all crashes for 01 Oct 2011 to 30 Sep 2016. Rushes Creek Road Crashes

Note: Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data. Reporting yrs 1996-2004 and 2017 onwards contain uncategorised inj crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Rep ID: REG01 **Office:** Grafton **User ID:** baldwinm Page 1 of 1 Generated: 03/08/2017 15:50

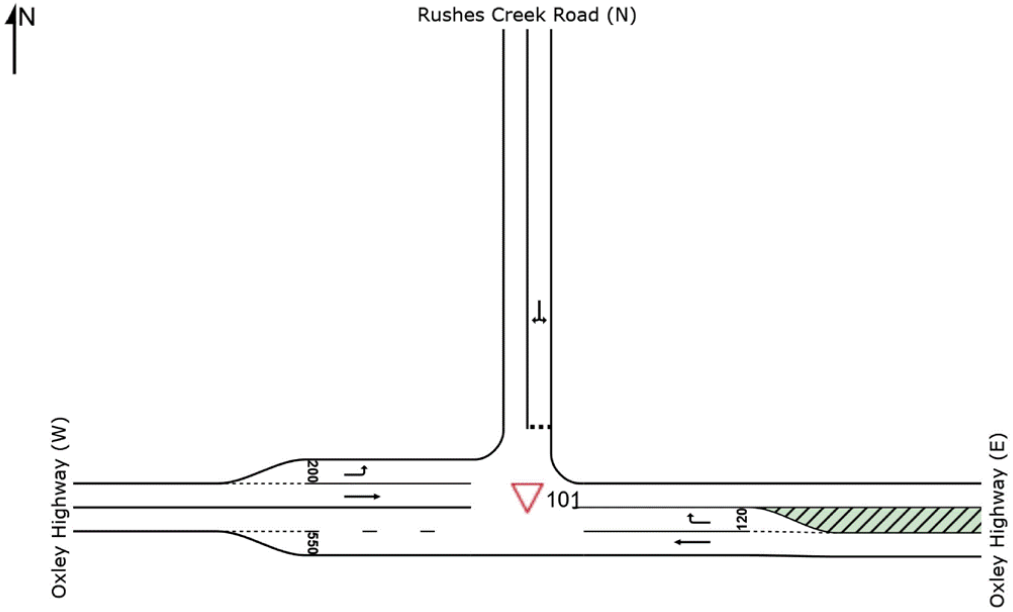
APPENDIX E

OXLEY HIGHWAY / RUSHES CREEK ROAD INTERSECTION – SIDRA RESULTS

SITE LAYOUT

▽ Site: 101 [Existing (2016) - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)



Organisation: ROADNET PTY LTD | Created: Tuesday, 5 September 2017 10:27:43 PM
Project: C:\Users\S\Desktop\RoadNet Info\Somerset Dr SIDRA Analysis\Analysis\Scenario B\Rushes Creek Poultry Production Farm _Oxley Highway & Rushes Creek Road Intersection.sip7

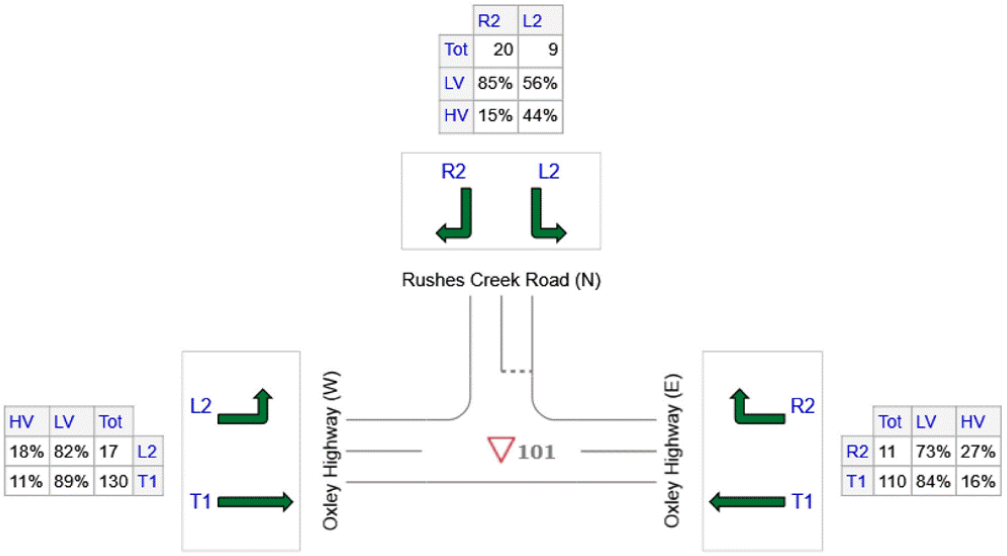
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: 101 [Existing (2016) - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: Oxley Highway (E)	121	100	21
N: Rushes Creek Road (N)	29	22	7
W: Oxley Highway (W)	147	130	17
Total	297	252	45

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MOVEMENT SUMMARY

▽ Site: 101 [Existing (2016) - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxley Highway (E)											
5	T1	116	16.0	0.066	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
6	R2	12	27.0	0.011	8.9	LOS A	0.0	0.4	0.28	0.62	64.0
Approach		127	17.0	0.066	0.8	NA	0.0	0.4	0.03	0.06	95.1
North: Rushes Creek Road (N)											
7	L2	9	44.0	0.041	9.8	LOS A	0.2	1.3	0.36	0.67	59.1
9	R2	21	15.0	0.041	10.4	LOS A	0.2	1.3	0.36	0.67	66.7
Approach		31	24.0	0.041	10.2	LOS A	0.2	1.3	0.36	0.67	64.2
West: Oxley Highway (W)											
10	L2	18	18.0	0.011	8.3	LOS A	0.0	0.0	0.00	0.66	68.2
11	T1	137	11.0	0.075	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		155	11.8	0.075	1.0	NA	0.0	0.0	0.00	0.08	94.8
All Vehicles		313	15.1	0.075	1.8	NA	0.2	1.3	0.05	0.13	90.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

▽ Site: 101 [Existing (2016) - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Oxley Highway (E)													
Lane 1	116	16.0	1766	0.066	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	12	27.0	1062	0.011	100	8.9	LOS A	0.0	0.4	Short	120	0.0	NA
Approach	127	17.0		0.066		0.8	NA	0.0	0.4				
North: Rushes Creek Road (N)													
Lane 1	31	24.0	747	0.041	100	10.2	LOS A	0.2	1.3	Full	500	0.0	0.0
Approach	31	24.0		0.041		10.2	LOS A	0.2	1.3				
West: Oxley Highway (W)													
Lane 1	18	18.0	1646	0.011	100	8.3	LOS A	0.0	0.0	Short	200	0.0	NA
Lane 2	137	11.0	1820	0.075	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	155	11.8		0.075		1.0	NA	0.0	0.0				
Intersectio	313	15.1		0.075		1.8	NA	0.2	1.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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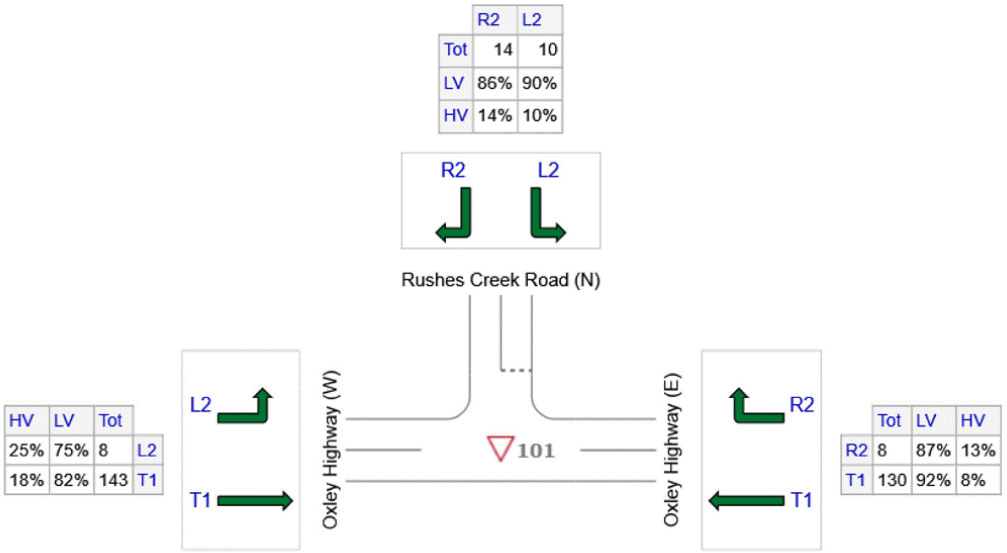
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: 101 [Existing (2016) - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: Oxley Highway (E)	138	127	11
N: Rushes Creek Road (N)	24	21	3
W: Oxley Highway (W)	151	123	28
Total	313	271	42

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MOVEMENT SUMMARY

▽ Site: 101 [Existing (2016) - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxley Highway (E)											
5	T1	137	8.0	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
6	R2	8	13.0	0.007	8.5	LOS A	0.0	0.2	0.28	0.61	68.5
Approach		145	8.3	0.074	0.5	NA	0.0	0.2	0.02	0.04	97.4
North: Rushes Creek Road (N)											
7	L2	11	10.0	0.032	8.8	LOS A	0.1	0.9	0.35	0.65	68.6
9	R2	15	14.0	0.032	10.6	LOS A	0.1	0.9	0.35	0.65	67.1
Approach		25	12.3	0.032	9.8	LOS A	0.1	0.9	0.35	0.65	67.7
West: Oxley Highway (W)											
10	L2	8	25.0	0.005	8.5	LOS A	0.0	0.0	0.00	0.66	66.1
11	T1	151	18.0	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		159	18.4	0.086	0.5	NA	0.0	0.0	0.00	0.03	97.3
All Vehicles		329	13.5	0.086	1.2	NA	0.1	0.9	0.03	0.08	94.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

▽ Site: 101 [Existing (2016) - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Oxley Highway (E)													
Lane 1	137	8.0	1854	0.074	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	8	13.0	1132	0.007	100	8.5	LOS A	0.0	0.2	Short	120	0.0	NA
Approach	145	8.3		0.074		0.5	NA	0.0	0.2				
North: Rushes Creek Road (N)													
Lane 1	25	12.3	791	0.032	100	9.8	LOS A	0.1	0.9	Full	500	0.0	0.0
Approach	25	12.3		0.032		9.8	LOS A	0.1	0.9				
West: Oxley Highway (W)													
Lane 1	8	25.0	1576	0.005	100	8.5	LOS A	0.0	0.0	Short	200	0.0	NA
Lane 2	151	18.0	1746	0.086	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	159	18.4		0.086		0.5	NA	0.0	0.0				
Intersectio	329	13.5		0.086		1.2	NA	0.1	0.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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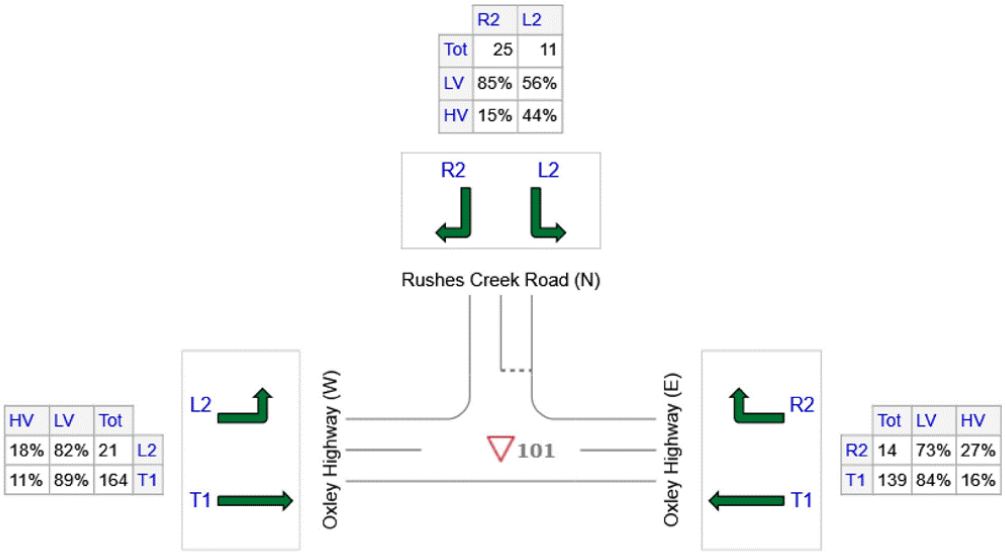
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 101 [Design Year (2029) - without development - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: Oxley Highway (E)	153	127	26
N: Rushes Creek Road (N)	36	27	9
W: Oxley Highway (W)	185	163	22
Total	374	318	56

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MOVEMENT SUMMARY

▽ Site: 101 [Design Year (2029) - without development - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxley Highway (E)											
5	T1	146	16.0	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
6	R2	15	27.0	0.015	9.1	LOS A	0.1	0.5	0.32	0.63	63.8
Approach		161	17.0	0.083	0.8	NA	0.1	0.5	0.03	0.06	95.0
North: Rushes Creek Road (N)											
7	L2	12	44.0	0.056	10.1	LOS A	0.2	1.7	0.41	0.70	58.4
9	R2	26	15.0	0.056	11.3	LOS A	0.2	1.7	0.41	0.70	65.9
Approach		38	23.9	0.056	10.9	LOS A	0.2	1.7	0.41	0.70	63.4
West: Oxley Highway (W)											
10	L2	22	18.0	0.013	8.3	LOS A	0.0	0.0	0.00	0.66	68.2
11	T1	173	11.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		195	11.8	0.095	1.0	NA	0.0	0.0	0.00	0.07	94.9
All Vehicles		394	15.1	0.095	1.9	NA	0.2	1.7	0.05	0.13	90.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

▽ Site: 101 [Design Year (2029) - without development - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Oxley Highway (E)													
Lane 1	146	16.0	1766	0.083	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	15	27.0	1011	0.015	100	9.1	LOS A	0.1	0.5	Short	120	0.0	NA
Approach	161	17.0		0.083		0.8	NA	0.1	0.5				
North: Rushes Creek Road (N)													
Lane 1	38	23.9	677	0.056	100	10.9	LOS A	0.2	1.7	Full	500	0.0	0.0
Approach	38	23.9		0.056		10.9	LOS A	0.2	1.7				
West: Oxley Highway (W)													
Lane 1	22	18.0	1646	0.013	100	8.3	LOS A	0.0	0.0	Short	200	0.0	NA
Lane 2	173	11.0	1820	0.095	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	195	11.8		0.095		1.0	NA	0.0	0.0				
Intersectio	394	15.1		0.095		1.9	NA	0.2	1.7				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\S\Desktop\RoadNet Info\Somerset Dr SIDRA Analysis\Analysis\Scenario B\Rushes Creek Poultry Production Farm _Oxley Highway & Rushes Creek Road Intersection.sip7

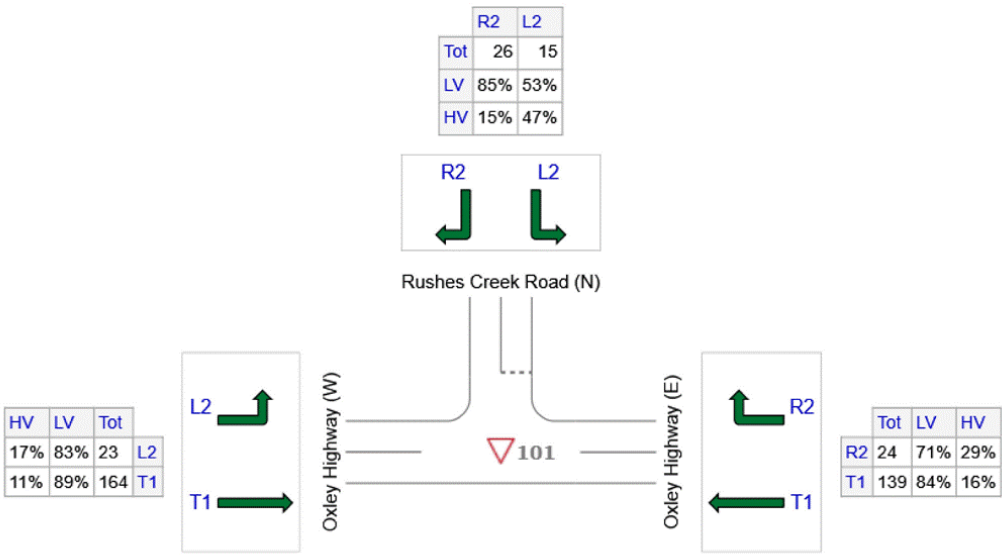
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: 101 [Design Year (2029) - with development - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: Oxley Highway (E)	163	134	29
N: Rushes Creek Road (N)	41	30	11
W: Oxley Highway (W)	187	165	22
Total	391	329	62

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MOVEMENT SUMMARY

▽ Site: 101 [Design Year (2029) - with development - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxley Highway (E)											
5	T1	146	16.0	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
6	R2	25	29.0	0.025	9.2	LOS A	0.1	0.9	0.33	0.64	63.2
Approach		172	17.9	0.083	1.4	NA	0.1	0.9	0.05	0.09	92.1
North: Rushes Creek Road (N)											
7	L2	16	47.0	0.064	10.2	LOS A	0.2	2.0	0.41	0.70	57.7
9	R2	27	15.0	0.064	11.4	LOS A	0.2	2.0	0.41	0.70	65.9
Approach		43	26.7	0.064	11.0	LOS A	0.2	2.0	0.41	0.70	62.7
West: Oxley Highway (W)											
10	L2	24	17.0	0.015	8.3	LOS A	0.0	0.0	0.00	0.66	68.6
11	T1	173	11.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		197	11.7	0.095	1.0	NA	0.0	0.0	0.00	0.08	94.6
All Vehicles		412	15.9	0.095	2.2	NA	0.2	2.0	0.06	0.15	88.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

▽ Site: 101 [Design Year (2029) - with development - AM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Oxley Highway (E)													
Lane 1	146	16.0	1766	0.083	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	25	29.0	997	0.025	100	9.2	LOS A	0.1	0.9	Short	120	0.0	NA
Approach	172	17.9		0.083		1.4	NA	0.1	0.9				
North: Rushes Creek Road (N)													
Lane 1	43	26.7	679	0.064	100	11.0	LOS A	0.2	2.0	Full	500	0.0	0.0
Approach	43	26.7		0.064		11.0	LOS A	0.2	2.0				
West: Oxley Highway (W)													
Lane 1	24	17.0	1656	0.015	100	8.3	LOS A	0.0	0.0	Short	200	0.0	NA
Lane 2	173	11.0	1820	0.095	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	197	11.7		0.095		1.0	NA	0.0	0.0				
Intersectio	412	15.9		0.095		2.2	NA	0.2	2.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: ROADNET PTY LTD | Processed: Tuesday, 5 September 2017 10:38:17 PM
Project: C:\Users\S\Desktop\RoadNet Info\Somerset Dr SIDRA Analysis\Analysis\Scenario B\Rushes Creek Poultry Production Farm _Oxley Highway & Rushes Creek Road Intersection.sip7

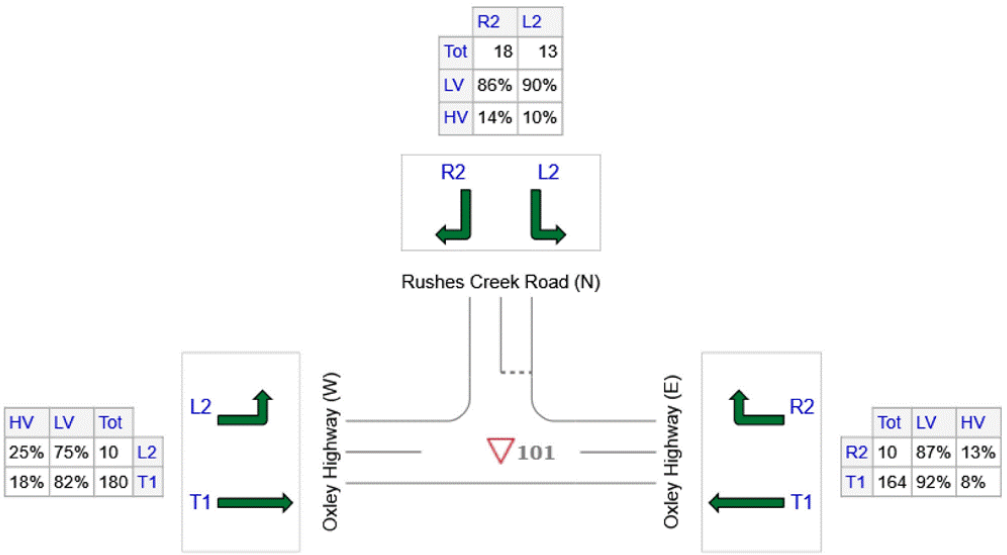
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: 101 [Design Year (2029) - without development - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: Oxley Highway (E)	174	160	14
N: Rushes Creek Road (N)	31	27	4
W: Oxley Highway (W)	190	155	35
Total	395	342	53

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MOVEMENT SUMMARY

▽ Site: 101 [Design Year (2029) - without development - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxley Highway (E)											
5	T1	173	8.0	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
6	R2	11	13.0	0.010	8.7	LOS A	0.0	0.3	0.32	0.62	68.3
Approach		183	8.3	0.093	0.5	NA	0.0	0.3	0.02	0.04	97.4
North: Rushes Creek Road (N)											
7	L2	14	10.0	0.046	9.0	LOS A	0.2	1.3	0.41	0.68	67.8
9	R2	19	14.0	0.046	11.6	LOS A	0.2	1.3	0.41	0.68	66.3
Approach		33	12.3	0.046	10.5	LOS A	0.2	1.3	0.41	0.68	66.9
West: Oxley Highway (W)											
10	L2	11	25.0	0.007	8.5	LOS A	0.0	0.0	0.00	0.66	66.1
11	T1	189	18.0	0.109	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		200	18.4	0.109	0.5	NA	0.0	0.0	0.00	0.03	97.3
All Vehicles		416	13.5	0.109	1.3	NA	0.2	1.3	0.04	0.09	94.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\S\Desktop\RoadNet Info\Somerset Dr SIDRA Analysis\Analysis\Scenario B\Rushes Creek Poultry Production Farm _Oxley Highway & Rushes Creek Road Intersection.sip7

LANE SUMMARY

▽ Site: 101 [Design Year (2029) - without development - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Oxley Highway (E)													
Lane 1	173	8.0	1854	0.093	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	11	13.0	1077	0.010	100	8.7	LOS A	0.0	0.3	Short	120	0.0	NA
Approach	183	8.3		0.093		0.5	NA	0.0	0.3				
North: Rushes Creek Road (N)													
Lane 1	33	12.3	716	0.046	100	10.5	LOS A	0.2	1.3	Full	500	0.0	0.0
Approach	33	12.3		0.046		10.5	LOS A	0.2	1.3				
West: Oxley Highway (W)													
Lane 1	11	25.0	1576	0.007	100	8.5	LOS A	0.0	0.0	Short	200	0.0	NA
Lane 2	189	18.0	1746	0.109	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	200	18.4		0.109		0.5	NA	0.0	0.0				
Intersectio	416	13.5		0.109		1.3	NA	0.2	1.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\S\Desktop\RoadNet Info\Somerset Dr SIDRA Analysis\Analysis\Scenario B\Rushes Creek Poultry Production Farm _Oxley Highway & Rushes Creek Road Intersection.sip7

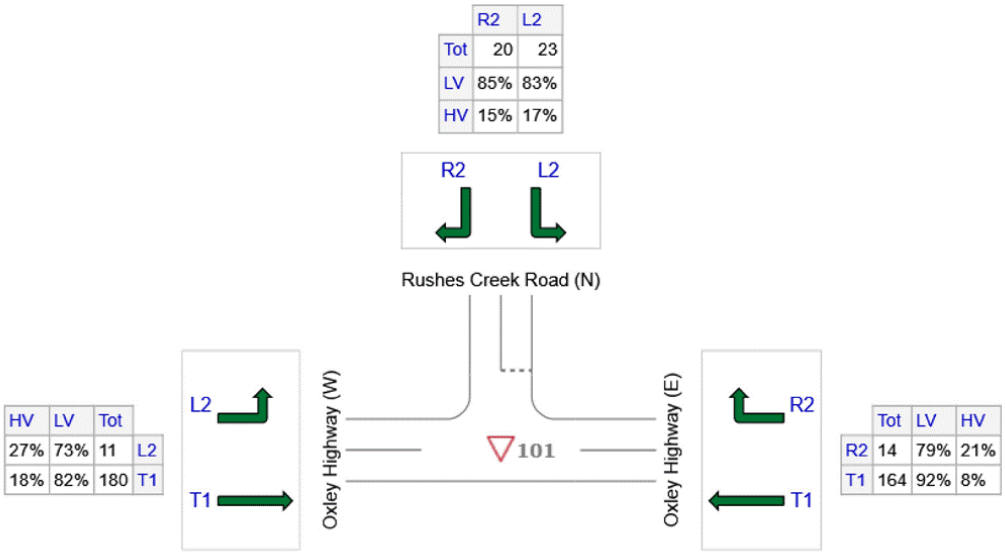
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 101 [Design Year (2029) - with development - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: Oxley Highway (E)	178	162	16
N: Rushes Creek Road (N)	43	36	7
W: Oxley Highway (W)	191	156	35
Total	412	354	58

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MOVEMENT SUMMARY

▽ Site: 101 [Design Year (2029) - with development - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxley Highway (E)											
5	T1	173	8.0	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
6	R2	15	21.0	0.014	9.0	LOS A	0.1	0.5	0.33	0.63	65.6
Approach		187	9.0	0.093	0.7	NA	0.1	0.5	0.03	0.05	96.0
North: Rushes Creek Road (N)											
7	L2	24	17.0	0.061	9.3	LOS A	0.2	1.8	0.39	0.68	65.9
9	R2	21	15.0	0.061	11.8	LOS A	0.2	1.8	0.39	0.68	66.2
Approach		45	16.1	0.061	10.4	LOS A	0.2	1.8	0.39	0.68	66.0
West: Oxley Highway (W)											
10	L2	12	27.0	0.007	8.5	LOS A	0.0	0.0	0.00	0.66	65.5
11	T1	189	18.0	0.109	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		201	18.5	0.109	0.5	NA	0.0	0.0	0.00	0.04	97.0
All Vehicles		434	14.2	0.109	1.6	NA	0.2	1.8	0.05	0.11	92.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
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Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: ROADNET PTY LTD | Processed: Tuesday, 5 September 2017 10:38:19 PM
Project: C:\Users\S\Desktop\RoadNet Info\Somerset Dr SIDRA Analysis\Analysis\Scenario B\Rushes Creek Poultry Production Farm _Oxley Highway & Rushes Creek Road Intersection.sip7

LANE SUMMARY

▽ Site: 101 [Design Year (2029) - with development - PM Peak]

Oxley Highway / Rushes Creek Road Intersection
Existing Layout
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Oxley Highway (E)													
Lane 1	173	8.0	1854	0.093	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	15	21.0	1028	0.014	100	9.0	LOS A	0.1	0.5	Short	120	0.0	NA
Approach	187	9.0		0.093		0.7	NA	0.1	0.5				
North: Rushes Creek Road (N)													
Lane 1	45	16.1	744	0.061	100	10.4	LOS A	0.2	1.8	Full	500	0.0	0.0
Approach	45	16.1		0.061		10.4	LOS A	0.2	1.8				
West: Oxley Highway (W)													
Lane 1	12	27.0	1557	0.007	100	8.5	LOS A	0.0	0.0	Short	200	0.0	NA
Lane 2	189	18.0	1746	0.109	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	201	18.5		0.109		0.5	NA	0.0	0.0				
Intersectio	434	14.2		0.109		1.6	NA	0.2	1.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix E

Groundwater Bore Baseline Assessment
(SLR Consulting Australia 2017)

MEMORANDUM

610.16117_R01-v1.0 Rushes Creek Groundwater Bore Survey Assessment.docx

TO:	Julian Johnson	FROM:	Andrew Macdonald	DATE:	11 January 2017
COMPANY:	ProTen Limited				
EMAIL:	julianj@proten.com.au				
SUBJECT:	**Rushes Creek Groundwater Bore Baseline Assessment**				

1 Introduction

SLR Consulting Australia (SLR) has been engaged by ProTen Limited (ProTen) to prepare the Rushes Creek Poultry Production Farm EIS in accordance with the Secretary's Environmental Assessment Requirements (SEARs). As part of this engagement, recent discussions have taken place between SLR and NSW DPI Water that have highlighted DPI Water's concerns regarding using historical water level data from the DPI Water registered bore database as part of the groundwater assessment for the EIS. In particular, DPI Water commented that it would be preferable that up to date groundwater data is collected from the existing groundwater supply bores on the Development Site. As such, ProTen engaged SLR to undertake a groundwater bore survey at the Development Site in November 2016.

2 Methodology

In the absence of NSW Government standards or guidelines related to farm bore assessments, SLR adopted the Queensland Government Department of Environment and Heritage Protection (EHP) Baseline Assessment Guideline as a means of planning and implementing the methodology of the baseline Assessment Program. SLR considers this Guideline to be the current best practice industry standards for undertaking a Bore Baseline Assessment, and suitable guidelines to follow when collecting to obtain the information sought for the Development's EIS groundwater assessment. The Guideline outlines information requirements and collection methodologies, and includes components collected from the bore itself as well as an interview of the landholder, as follows:

- Bore geographic location and status
- Bore equipment and condition details
- Bore construction details (ideally provided by the landholder on a drillers log)
- Water level measurement
- Water quality sampling (including field and laboratory testing for EC, TDS, pH and major ions)
- Anecdotal bore history information (provided by the landholder during the interview)
- Bore water supply (usage) information (provided by the landholder during the interview)

For the assessments, SLR provided a hydrogeologist with qualifications and experience that exceeded the minimum requirements outlined in the Baseline Assessment Guideline. The SLR hydrogeologist led the field assessment program and undertook the survey such that the requirements of the Guideline were met.

Where existing pumping infrastructure allowed, groundwater samples were collected for water quality analysis to inform the EIS groundwater assessment. Groundwater samples were submitted to a NATA-accredited laboratory by SLR under industry-standard chain of custody procedures.

3 Field Assessment Results

3.1 Bore Locations

The Rushes Creek groundwater bore survey assessment was undertaken on the 8th November 2016 and included three individual properties that comprise the Development Site. A total of nine bores and one well were subjected to assessment as outlined in **Table 1** and shown on **Figure 1**.

Table 1. Survey Summary Information

Bore ID	Local Bore Name	Property Lot/Plan	Easting (UTM 56J)	Northing (UTM 56J)	Bore Status
McCrae 1	House Bore	166//DP752169	269936	6586851	Operational
McCrae 2	New Bore	166//DP752169	270008	6587048	Operational
McCrae 3	Windmill Bore	118//DP752169	268785	6586324	Non-Operational
McCrae 4	The Well	101//DP752169	267976	6586045	Non-Operational
Doyle 5	House Bore	165//DP752169	270316	6588529	Operational
Doyle 5A	Unknown	165//DP752169	270307	6588531	Non-Operational
Doyle 6	New Bore	171//DP752169	269761	6588784	Operational
Doyle 7	Andrew's Bore	143//DP752189	267011	6587667	Operational
Doyle 8	Dam Bore	9//DP849741	267740	6589595	Operational
Doyle 9	Windmill on Hill	85//DP752169	268892	6587850	Non-Operational

3.2 Detailed Results

Appendix A presents the information collected for bore McCrae 1

Appendix B presents the information collected for bore McCrae 2

Appendix C presents the information collected for bore McCrae 3

Appendix D presents the information collected for bore McCrae 4

Appendix E presents the information collected for bore Doyle 5

Appendix F presents the information collected for bore Doyle 5a

Appendix G presents the information collected for bore Doyle 6

Appendix H presents the information collected for bore Doyle 7

Appendix I presents the information collected for bore Doyle 8

Appendix J presents the information collected for bore Doyle 9

Appendix K presents laboratory water quality analysis results

3.3 Water Quality Analysis QA/QC

Water sampling was conducted under the QA/QC protocols outlined in **Table 2** below.

Table 2 Water quality QA/QC

Method	Sample Reference	Frequency	Description
Primary	LandholderName_#	1 per bore	Primary sample from each bore for laboratory analysis.
Blind Duplicate	Project_DUP	1 per day of sampling	Duplicate sample collected in the same manner as the primary sample. Used to assess the precision/repeatability of the sampling procedure and laboratory analysis.
Equipment Blank	Project_EB	1 per day of sampling	De-ionised water blank sample collected in the field under identical conditions to primary samples following sampling equipment decontamination. Used to verify appropriate decontamination of field equipment between different bores.
Field Blank	Project_FB	1 per day of sampling	De-ionised water blank sample collected in the field under identical conditions to primary samples. Used to verify a high standard of sampling procedure and identify if any contamination is being introduced during sampling.

The blind duplicate was collected from bore Doyle_08. The laboratory results show little variance between the primary and blind duplicate samples, validating the results of the primary sample and providing confidence in the primary sample analysis result.

Laboratory results for the equipment blank sample shows parameter values at or below the limit of reporting, validating the equipment decontamination methods as appropriate, and providing further confidence in the primary sample analysis results.

Laboratory results for the field blank sample show very low results consistent with clean de-ionised water for most parameters including EC, TDS, and anions.

4 Limitations and exclusions

This document is a factual report intended to present the information collected during the bore baseline assessment, and therefore has the following limitations and exclusions:

- This report does not provide any interpretation including, but not limited to:
    - Potential historic, current or future development-related impacts
    - Condition of bores surveyed (casing integrity, efficiency, etc)
    - Suitability for use (current or intended)
- Some information presented herein is not measured or confirmed, but is reliant upon anecdotal evidence provided by landholders/bore owners/bore owners representatives.

- Measurements and samples collected and presented herein are considered representative of conditions at the time those measurements and samples were taken.

- Location figure is not included in this report due to possible changes in layout design. An updated figure will be included in a future amendment to this report.

5 Closing

We trust the information contained herein meets your expectations. Please don't hesitate to contact Andrew Macdonald or Adam Williams with any queries.

Checked/
Authorised by: DL

Appendix A - Information for bore McCrae 1

Appendix A.1 – Bore baseline assessment form McCrae 1

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION	
NHG bore Id: McCrae_01 **NSW office of water registration number:** Unknown	
NSW office of water registration number comments: n/a	
Local bore name: House Bore	
Property name: Happy Hills	
Property Lot/Plan: 166//DP752169	
Date of site assessment: 08-11-2016	
Geographic location (AGD84)	**Easting:** 0269936 **Northing:** 6586851
	Location method: Handheld GPS (56J UTM)
Status of works: Operational	
Additional comments: Attempted to tag bottom (total depth) hung up at 47m bgl.	
PART B: BORE CONSTRUCTION DETAILS	
Source of bore construction details? Anecdotal information provided by landholder	
Driller name: George Mannion	
Date the bore was drilled: < 24 years	
Total Depth of water bore (m): 73 m	
Casing material and outside diameter: PVC 152mm	
Water entry: unknown	
Geological formation from which water is accessed: unknown	
Additional comments: Bore has low yield. Pumps for 17 minutes at 12 litres / minute then shuts down for an hour. This bore replaced an old abandoned bore located ~3 metres away. Abandoned bore is likely NSW office of water registration number GW014482, based on location details.	

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? Yes		
Pump type: Submersible **Pump make and model:** unknown		
Power source: Electric		
Pump setting depth (depth from ground in metres): 71		
Pumping rate at the time of visit (L/s): Unable to measure due to fitting on well head.		
Is the bore equipped with a meter? No		
Headworks description: Riser 1.5" to 0.3m above ground level connected to 90° elbow with dial gauge and 1.5" gate valve leading to 1.5"poly pipe and 1.5" ball valve. Tee connection leads to garden tap and 90° 1.5" poly fitting and discharge line.		
Repairs/maintenance history: Continuous problems with pump faults (short out of pump). Pump replaced three to four years ago.		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock and Domestic		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** Supplies water to 5 rams or sheep per year and water for the domestic garden	

PART E: WATER LEVEL MEASUREMENT					
Was a water level or pressure measurement taken?	Yes	**Water level**	**Water level** (depth from measurement point in metres) 19m bgl		
			Method of measuring water level: direct access _ dip tape		
		Datum point description: ground level			
		Height of datum above ground level (metres): n/a			
Antecedent and/or current conditions relevant to the water level or pressure measurement: NIL					
Are historical water level and/or pressure records available for this bore? No					
Anecdotal water level information: NIL					
PART F: WATER QUALITY					
LABORATORY WATER QUALITY					
Were water quality samples taken for submission to a laboratory? Yes					
Are historical water quality laboratory records available for this bore? No					
FIELD WATER QUALITY					
Were water quality field measurements taken?	Yes	**Field measurements**			
		pH: 7.11	**Temperature (°C):** n/a	**Electrical conductivity (µs/cm):** 1120	
		Total Alkalinity as $CaCO_3$ (mg/L): n/a			
		Field gas measurements			
		CO_2 (ppm_v): n/a	**H_2S (ppm_v):** n/a	**CH_4 (%LEL):** n/a	
Are historical water quality field records available for this bore? No					

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? Yes		
Was bore purged according to guidelines?	No	**Purge method description:** Due to pump recently operated, tap on well head configuration was operated to collect water sample.
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald	**Given Name:** Andrew	
Company: SLR Consulting	**Role:** Hydrogeologist	
Signature:	**Date:** 08-11-2016	
PART H: CERTIFICATION		
Surname: Lyons	**Given Name:** Derwin	
Company: SLR Consulting	**Role:** Principal Hydrogeologist	
Signature:	**Date:** 11-11-2016	
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: McCrae	**Given name:** Steve	
Relationship to bore owner: Bore owner		

Appendix A.2 - Photographs for bore McCrae 1

Appendix B - Information for bore McCrae 2

Appendix B.1 – Bore baseline assessment form McCrae 2

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION	
NHG bore Id: McCrae_02 **NSW office of water registration number:** GW970840	
NSW office of water registration number comments: Identified bore location and details similar to actual bore location.	
Local bore name: New Bore	
Property name: Happy Hills	
Property Lot/Plan: 166//DP752169	
Date of site assessment: 08-11-2016	
Geographic location (AGD84)	**Easting:** 0270008 **Northing:** 6587048
	Location method: Handheld GPS (56J UTM)
Status of works: Operational	
Additional comments: Main bore for property. Supplies 2x 5000 gallon tanks plus other tanks connected around the property.	
PART B: BORE CONSTRUCTION DETAILS	
Source of bore construction details? Anecdotal information provided by landholder and NSW office of water construction details	
Driller name: Randall George Mannion	
Date the bore was drilled: 30/04/2014	
Total Depth of water bore (m): 36.5m	
Casing material and outside diameter: PVC 152mm 0 – 31.5m Slotted PVC 152mm 31.5 – 36.00m	
Water entry: 33.5 – 34.10m	
Geological formation from which water is accessed: Basalt	
Additional comments: Pumps at a set rate of 360 gallons / hour for three hours. It is operated every two to three day in hot weather and once per week in cooler months. Flow and time controlled by a Kelco F29 Flow switch, Kelco brand.	

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? Yes		
Pump type: Submersible **Pump make and model:** unknown		
Power source: Electric		
Pump setting depth (depth from ground in metres): 36.5m		
Pumping rate at the time of visit (L/s): Unable to measure due to fitting on well head.		
Is the bore equipped with a meter? No		
Headworks description: Riser 1.5" to 0.3m above ground level connected to 4 way connection. 1. Dial gauge 2. F29 Flow Switch 3. Pressure line 4. 1.5" ball valve. This lead to flow tee connected to garden tap then 1.5" galvanised line to 90° poly elbow and discharge line.		
Repairs/maintenance history: None reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock and Domestic		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** Supplies water to 400 sheep and 30 head of cattle per year and water for the domestic garden as required	

PART E: WATER LEVEL MEASUREMENT				
Was a water level or pressure measurement taken?	Yes	**Water level**	**Water level** (depth from measurement point in metres) 20.83m bgl	
			Method of measuring water level: direct access _ dip tape	
		Datum point description: ground level		
		Height of datum above ground level (metres): n/a		
Antecedent and/or current conditions relevant to the water level or pressure measurement: NIL				
Are historical water level and/or pressure records available for this bore? Yes NSW office of water report 24.60m				
Anecdotal water level information: NIL				
PART F: WATER QUALITY				
LABORATORY WATER QUALITY				
Were water quality samples taken for submission to a laboratory? Yes				
Are historical water quality laboratory records available for this bore? No				
FIELD WATER QUALITY				
Were water quality field measurements taken?	Yes	**Field measurements**		
		pH: 6.88	**Temperature (°C):** n/a	**Electrical conductivity (µs/cm):** 1233
		Total Alkalinity as $CaCO_3$ (mg/L): n/a		
		Field gas measurements		
		CO_2 (ppm_v): n/a	**H_2S (ppm_v):** n/a	**CH_4 (%LEL):** n/a
Are historical water quality field records available for this bore? No				

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? Yes		
Was bore purged according to guidelines?	No	**Purge method description:** Due to pump recently operated, tap on well head configuration was operated to collect water sample.
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald	**Given Name:** Andrew	
Company: SLR Consulting	**Role:** Hydrogeologist	
Signature:	**Date:** 08-11-2016	
PART H: CERTIFICATION		
Surname: Lyons	**Given Name:** Derwin	
Company: SLR Consulting	**Role:** Principal Hydrogeologist	
Signature:	**Date:** 11-11-2016	
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: McCrae	**Given name:** Steve	
Relationship to bore owner: Bore owner		

Appendix B.2 - Photographs for bore McCrae 2

Appendix B.3 - NSW office of water records for bore McCrae 2

NSW Office of Water
Work Summary

GW970840

Licence: 90WA832517 **Licence Status:** CURRENT

Authorised Purpose (s): STOCK,DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 30/04/2014
Final Depth: 36.50 m
Drilled Depth: 36.50 m

Contractor Name: GEORGE MANNION DRILLING
Driller: Randall George Mannion
Assistant Driller: James Mannion

Property: Happy Hills 1788 Rushes Creek Rd Manilla 2346
GWMA:
GW Zone:
Standing Water Level: 24.600
Salinity:
Yield: 0.450

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI,2	166//752169
Licensed:			

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6587048.0
Easting: 270004.0
Latitude: 30°49'38.8"S
Longitude: 150°35'43.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: GPS - Global Positioning System

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	1.80	220			Rotary Air
1		Hole	Hole	1.80	36.50	165			Down Hole Hammer
1	1	Casing	Pvc Class 9	-0.30	36.50	152	140		Seated on Bottom, Screwed and Glued, S: 34.10-36.50m
1	1	Opening	Slots - Vertical	31.50	36.00	152		1	Mechanically Slotted, PVC Class 9, Screwed and Glued, SL: 200.0mm, A: 3.00mm

Water Bearing Zones

			WBZ Type						

From (m)	To (m)	Thickness (m)		S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
33.50	34.10	0.60	Unknown	24.60		0.45		01:00:00	

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil	Topsoil	
0.30	1.65	1.35	Shale; brown	Shale	
1.65	33.50	31.85	Basalt; blue	Basalt	
33.50	34.10	0.60	Basalt; water bearing	Basalt	
34.10	36.50	2.40	Basalt; blue	Basalt	

Remarks

30/04/2014: Form A Remarks:
Nat Carling, 11-June-2014; GPS provided by the drillers.

*** End of GW970840 ***

Appendix C - Information for bore McCrae 3

Appendix C.1 – Bore baseline assessment form McCrae 3

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION	
NHG bore Id: McCrae_03 **NSW office of water registration number:** GW014483	
NSW office of water registration number comments: Identified bore location and details similar to actual bore location.	
Local bore name: Windmill Bore	
Property name: Happy Hills	
Property Lot/Plan: 118//DP752169	
Date of site assessment: 08-11-2016	
Geographic location (AGD84)	**Easting:** 0278785 **Northing:** 6586324
	Location method: Handheld GPS (56J UTM)
Status of works: Non-Operational	
Additional comments: NIL	
PART B: BORE CONSTRUCTION DETAILS	
Source of bore construction details? Anecdotal information provided by landholder and NSW office of water construction details	
Driller name: Unknown	
Date the bore was drilled: 01/09/1946	
Total Depth of water bore (m): 25.6m	
Casing material and outside diameter: Steel 152mm	
Water entry: Unknown	
Geological formation from which water is accessed: Unknown	
Additional comments: NIL	

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? No		
Pump type: n/a **Pump make and model:** n/a		
Power source: n/a		
Pump setting depth (depth from ground in metres): n/a		
Pumping rate at the time of visit (L/s): n/a		
Is the bore equipped with a meter? No		
Headworks description: 1.5" steel riser clamped at bore head.		
Repairs/maintenance history: None reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	✓ No	
Bore Utilisation	**Description:** None	

<table>
<tr><td colspan="5">PART E: WATER LEVEL MEASUREMENT</td></tr>
<tr><td rowspan="3">Was a water level or pressure measurement taken?</td><td rowspan="3">Yes</td><td rowspan="2">Water level</td><td colspan="2">Water level (depth from measurement point in metres) 11.29m bgl</td></tr>
<tr><td colspan="2">Method of measuring water level: direct access _ dip tape</td></tr>
<tr><td colspan="3">Datum point description: ground level</td></tr>
<tr><td colspan="5">Height of datum above ground level (metres): n/a</td></tr>
<tr><td colspan="5">Antecedent and/or current conditions relevant to the water level or pressure measurement:

NIL</td></tr>
<tr><td colspan="5">Are historical water level and/or pressure records available for this bore?

No</td></tr>
<tr><td colspan="5">Anecdotal water level information:

NIL</td></tr>
<tr><td colspan="5">PART F: WATER QUALITY</td></tr>
<tr><td colspan="5">LABORATORY WATER QUALITY</td></tr>
<tr><td colspan="5">Were water quality samples taken for submission to a laboratory? No</td></tr>
<tr><td colspan="5">Are historical water quality laboratory records available for this bore? No</td></tr>
<tr><td colspan="5">FIELD WATER QUALITY</td></tr>
<tr><td rowspan="5">Were water quality field measurements taken?</td><td rowspan="5">No</td><td colspan="3">Field measurements</td></tr>
<tr><td>pH: n/a</td><td>Temperature (°C): n/a</td><td>Electrical conductivity (µs/cm): n/a</td></tr>
<tr><td colspan="3">Total Alkalinity as $CaCO_3$ (mg/L): n/a</td></tr>
<tr><td colspan="3">Field gas measurements</td></tr>
<tr><td>CO_2 (ppm_v): n/a</td><td>H_2S (ppm_v): n/a</td><td>CH_4 (%LEL): n/a</td></tr>
<tr><td colspan="5">Are historical water quality field records available for this bore? No</td></tr>
</table>

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? n/a		
Was bore purged according to guidelines?	n/a	**Purge method description:** n/a
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: McCrae		**Given name:** Steve
Relationship to bore owner: Bore owner		

Appendix C.2 - Photographs for bore McCrae 3

Appendix C.3 - NSW office of water records for bore McCrae 3

NSW Office of Water
Work Summary

GW014483

Licence: 90BL005819 **Licence Status:** CONVERTED

Authorised Purpose (s): STOCK
Intended Purpose(s): STOCK

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/09/1946
Final Depth: 25.60 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: HAPPY HILLS
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI,002	118
Licensed:	DARLING	BALDWIN	Whole Lot //

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6586327.0
Easting: 268780.0
Latitude: 30°50'01.3"S
Longitude: 150°34'57.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing	Threaded Steel	0.00	1.80	152			

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW014483 ***

Appendix D - Information for bore McCrae 4

Appendix D.1 – Bore baseline assessment form McCrae 4

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION		
NHG bore Id: McCrae_04 **NSW office of water registration number:** Unknown		
NSW office of water registration number comments: NIL		
Local bore name: The Well		
Property name: Happy Hills		
Property Lot/Plan: 101//DP752169		
Date of site assessment: 08-11-2016		
Geographic location (AGD84)	**Easting:** 0267976 **Northing:** 6586045	
	Location method: Handheld GPS (56J UTM)	
Status of works: Abandoned		
Additional comments: NIL		
PART B: BORE CONSTRUCTION DETAILS		
Source of bore construction details? Anecdotal information provided by landholder		
Driller name: Unknown		
Date the bore was drilled: n/a		
Total Depth of water bore (m): n/a		
Casing material and outside diameter: n/a		
Water entry: n/a		
Geological formation from which water is accessed: n/a		
Additional comments: Well is approximately 2 metres deep from surface with minor pooling of water present at base. Non-operational collapsed windmill is present over well.		

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? No		
Pump type: n/a **Pump make and model:** n/a		
Power source: n/a		
Pump setting depth (depth from ground in metres): n/a		
Pumping rate at the time of visit (L/s): n/a		
Is the bore equipped with a meter? No		
Headworks description: None		
Repairs/maintenance history: None reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: NIL		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** None	

<table>
<tr><td colspan="5">PART E: WATER LEVEL MEASUREMENT</td></tr>
<tr><td rowspan="4">Was a water level or pressure measurement taken?</td><td rowspan="4">No</td><td rowspan="2">Water level</td><td colspan="2">Water level (depth from measurement point in metres) n/a</td></tr>
<tr><td colspan="2">Method of measuring water level: n/a</td></tr>
<tr><td colspan="3">Datum point description: n/a</td></tr>
<tr><td colspan="3">Height of datum above ground level (metres): n/a</td></tr>
<tr><td colspan="5">Antecedent and/or current conditions relevant to the water level or pressure measurement:

NIL</td></tr>
<tr><td colspan="5">Are historical water level and/or pressure records available for this bore?

No</td></tr>
<tr><td colspan="5">Anecdotal water level information:

NIL</td></tr>
<tr><td colspan="5">PART F: WATER QUALITY</td></tr>
<tr><td colspan="5">LABORATORY WATER QUALITY</td></tr>
<tr><td colspan="5">Were water quality samples taken for submission to a laboratory? No</td></tr>
<tr><td colspan="5">Are historical water quality laboratory records available for this bore? No</td></tr>
<tr><td colspan="5">FIELD WATER QUALITY</td></tr>
<tr><td rowspan="5">Were water quality field measurements taken?</td><td rowspan="5">No</td><td colspan="3">Field measurements</td></tr>
<tr><td>pH: n/a</td><td>Temperature (°C): n/a</td><td>Electrical conductivity (µs/cm): n/a</td></tr>
<tr><td colspan="3">Total Alkalinity as $CaCO_3$ (mg/L): n/a</td></tr>
<tr><td colspan="3">Field gas measurements</td></tr>
<tr><td>CO_2 (ppm_v): n/a</td><td>H_2S (ppm_v): n/a</td><td>CH_4 (%LEL): n/a</td></tr>
<tr><td colspan="5">Are historical water quality field records available for this bore? No</td></tr>
</table>

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? n/a		
Was bore purged according to guidelines?	n/a	**Purge method description:** n/a
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: McCrae		**Given name:** Steve
Relationship to bore owner: Bore owner		

Appendix D.2 - Photographs for bore McCrae 4

Appendix E - Information for bore Doyle 5

Appendix E.1 – Bore baseline assessment form Doyle 5

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION	
NHG bore Id: Doyle_05 **NSW office of water registration number:** GW967889	
NSW office of water registration number comments: Identified bore location and details similar to actual bore location.	
Local bore name: House Bore	
Property name: Bundah	
Property Lot/Plan: 165//DP752169	
Date of site assessment: 08-11-2016	
Geographic location (AGD84)	**Easting:** 0270316 **Northing:** 6588529
	Location method: Handheld GPS (56J UTM)
Status of works: Operational	
Additional comments: NIL	

PART B: BORE CONSTRUCTION DETAILS
Source of bore construction details? Anecdotal information provided by landholder and NSW office of water construction details
Driller name: Randall George Mannion
Date the bore was drilled: 17/01/2007
Total Depth of water bore (m): 67
Casing material and outside diameter: PVC Class 9 152mm 0 - 59m
Water entry: Slots Vertical 152mm 59 – 65m
Geological formation from which water is accessed: 62.4 – 63m Basalt
Additional comments: NIL

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? Yes		
Pump type: Plunger **Pump make and model:** unknown		
Power source: Windmill		
Pump setting depth (depth from ground in metres): unknown		
Pumping rate at the time of visit (L/s): Unable to measure		
Is the bore equipped with a meter? No		
Headworks description: 1.5" steel riser clamped at bore head; tee 0.4m above ground with 90° elbow leading to another 90° elbow at ground level. Connected to 1.5" tee 1. connected to 1." Poly line leading to house tank 2. 1.5" leading to 5000gallon tank.		
Repairs/maintenance history: NIL none reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock and Domestic		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** Constantly in use and supplies a 5000 gallon tank and a house tank of approximately 3000-4000gallons. Supplies water for approximately 20 – 30 head of cattle per year	

PART E: WATER LEVEL MEASUREMENT				
Was a water level or pressure measurement taken?	No (no access at well head)	**Water level**	**Water level** (depth from measurement point in metres) n/a	
			Method of measuring water level: n/a	
		Datum point description: n/a		
		Height of datum above ground level (metres): n/a		
Antecedent and/or current conditions relevant to the water level or pressure measurement: NIL				
Are historical water level and/or pressure records available for this bore? NSW office of water bore details states 14m				
Anecdotal water level information: NIL				
PART F: WATER QUALITY				
LABORATORY WATER QUALITY				
Were water quality samples taken for submission to a laboratory? Yes				
Are historical water quality laboratory records available for this bore? No				
FIELD WATER QUALITY				
Were water quality field measurements taken?	Yes	**Field measurements**		
		pH: 7.59	**Temperature (°C):** n/a	**Electrical conductivity (µs/cm):** 1045
		Total Alkalinity as $CaCO_3$ (mg/L): n/a		
		Field gas measurements		
		CO_2 (ppm_v): n/a	**H_2S (ppm_v):** n/a	**CH_4 (%LEL):** n/a
Are historical water quality field records available for this bore? No				

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? No. Taken approximately six metres away from windmill at inlet to tank.		
Was bore purged according to guidelines?	No	**Purge method description:** Bore purged via from windmill to gather sufficient sample.
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: Doyle		**Given name:** Ray
Relationship to bore owner: Bore owner		

Appendix E.2 - Photographs for bore Doyle 5

Appendix E.3 - NSW office of water records for bore Doyle 5

NSW Office of Water
Work Summary

GW967889

Licence: 90BL253750 **Licence Status:** CONVERTED

Authorised Purpose (s): STOCK,DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore
Work Status:
Construct.Method: Rotary - Percussion (Down Hole Hammer)
Owner Type:

Commenced Date:
Completion Date: 17/01/2007
Final Depth: 67.00 m
Drilled Depth: 67.00 m

Contractor Name: GEORGE MANNION DRILLING
Driller: Randall George Mannion
Assistant Driller:

Property: BUNDAH RUSHES CREEK ROAD MANILLA 2346
GWMA: 024 - MISCELLANEOUS FRACTURED ROCK OF THE BARWON REGION
GW Zone: -
Standing Water Level: 14.000
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.2	165 752169
Licensed:	DARLING	BALDWIN	Whole Lot 165//752169

Region: 90 - Barwon
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6588462.0
Easting: 270236.0
Latitude: 30°48'53.0"S
Longitude: 150°35'53.5"E

GS Map: -
MGA Zone: 0
Coordinate Source: Map Interpretation

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	67.00	152			Rotary - Percussion (Down Hole Hammer)
1	1	Casing	Pvc Class 9	-0.30	67.00	152			Seated on Bottom, Glued
1	1	Opening	Slots - Vertical	59.00	65.00	152		1	Casing - Hand Sawn Slot, PVC Class 9, SL: 200.0mm, A: 0.30mm

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)
62.40	63.00	0.60	Unknown	14.00	62.00			02:00:00	

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	topsoil	Topsoil	
0.30	0.90	0.60	clay	Clay	
0.90	11.30	10.40	shale	Shale	
11.30	62.40	51.10	basalt	Basalt	
62.40	63.00	0.60	water bearing basalt	Invalid Code	
63.00	67.00	4.00	basalt	Basalt	

Remarks

*** End of GW967889 ***

Appendix F - Information for bore Doyle 5a

Appendix F.1 – Bore baseline assessment form Doyle 5a

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION	
NHG bore Id: Doyle_05a **NSW office of water registration number:** GW011498	
NSW office of water registration number comments: Identified bore location and details similar to actual bore location.	
Local bore name: Unknown	
Property name: Bundah	
Property Lot/Plan: 165//DP752169	
Date of site assessment: 08-11-2016	
Geographic location (AGD84)	**Easting:** 0270307 **Northing:** 6588531
	Location method: Handheld GPS (56J UTM)
Status of works: Abandoned and reportedly still useable	
Additional comments: Stands in paddock no well head construction. Bucket over inlet to bore. Total measured depth 12.5m from surface.	
PART B: BORE CONSTRUCTION DETAILS	
Source of bore construction details? Anecdotal information provided by landholder and NSW office of water construction details	
Driller name: Unknown	
Date the bore was drilled: 01/01/1954	
Total Depth of water bore (m): 24.40m	
Casing material and outside diameter: Threaded Steel 152mm 0 – 24.4m	
Water entry: Unknown	
Geological formation from which water is accessed: Unknown	
Additional comments: NIL	

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? No		
Pump type: n/a **Pump make and model:** n/a		
Power source: n/a		
Pump setting depth (depth from ground in metres): n/a		
Pumping rate at the time of visit (L/s): n/a		
Is the bore equipped with a meter? No		
Headworks description: No headworks.		
Repairs/maintenance history: NIL none reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	✓ No	
Bore Utilisation	**Description:** None.	

<table>
<tr><td colspan="5">PART E: WATER LEVEL MEASUREMENT</td></tr>
<tr><td rowspan="3">Was a water level or pressure measurement taken?</td><td rowspan="3">Yes</td><td rowspan="2">Water level</td><td colspan="2">Water level (depth from measurement point in metres) 9.05m bgl</td></tr>
<tr><td colspan="2">Method of measuring water level: direct access _ dip tape</td></tr>
<tr><td colspan="3">Datum point description: ground level</td></tr>
<tr><td colspan="5">Height of datum above ground level (metres): n/a</td></tr>
<tr><td colspan="5">Antecedent and/or current conditions relevant to the water level or pressure measurement:

NIL</td></tr>
<tr><td colspan="5">Are historical water level and/or pressure records available for this bore?

No</td></tr>
<tr><td colspan="5">Anecdotal water level information:

NIL</td></tr>
<tr><td colspan="5">PART F: WATER QUALITY</td></tr>
<tr><td colspan="5">LABORATORY WATER QUALITY</td></tr>
<tr><td colspan="5">Were water quality samples taken for submission to a laboratory? No</td></tr>
<tr><td colspan="5">Are historical water quality laboratory records available for this bore? No</td></tr>
<tr><td colspan="5">FIELD WATER QUALITY</td></tr>
<tr><td rowspan="5">Were water quality field measurements taken?</td><td rowspan="5">No</td><td colspan="3">Field measurements</td></tr>
<tr><td>pH: n/a</td><td>Temperature (°C): n/a</td><td>Electrical conductivity (µs/cm): n/a</td></tr>
<tr><td colspan="3">Total Alkalinity as $CaCO_3$ (mg/L): n/a</td></tr>
<tr><td colspan="3">Field gas measurements</td></tr>
<tr><td>CO_2 (ppm_v): n/a</td><td>H_2S (ppm_v): n/a</td><td>CH_4 (%LEL): n/a</td></tr>
<tr><td colspan="5">Are historical water quality field records available for this bore? No</td></tr>
</table>

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? n/a		
Was bore purged according to guidelines?	n/a	**Purge method description:** n/a
Were samples taken using existing pump on bore? n/a		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: Doyle		**Given name:** Ray
Relationship to bore owner: Bore owner		

Appendix F.2 - Photographs for bore Doyle 5a

Appendix F.3 - NSW office of water records for bore Doyle 5a

NSW Office of Water
Work Summary

GW011498

Licence: 90BL004725 **Licence Status:** CONVERTED

Authorised Purpose (s): STOCK
Intended Purpose(s): NOT KNOWN

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/01/1954
Final Depth: 24.40 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: BUNDAH
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.002	165
Licensed:	DARLING	BALDWIN	Whole Lot //

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6588549.0
Easting: 270381.0
Latitude: 30°48'50.3"S
Longitude: 150°35'59.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing	Threaded Steel	0.00	24.40	152			Suspended in Clamps

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)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW011498 ***

Appendix G - Information for bore Doyle 6

Appendix G.1 – Bore baseline assessment form Doyle 6

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION	
NHG bore Id: Doyle_06 **NSW office of water registration number:** GW967028	
NSW office of water registration number comments: Identified bore location and details similar to actual bore location.	
Local bore name: New Bore	
Property name: Bundah	
Property Lot/Plan: 171//DP752169	
Date of site assessment: 08-11-2016	
Geographic location (AGD84)	**Easting:** 0279761 **Northing:** 6588784
	Location method: Handheld GPS (56J UTM)
Status of works: Operational	
Additional comments: NIL	
PART B: BORE CONSTRUCTION DETAILS	
Source of bore construction details? Anecdotal information provided by landholder and NSW office of water construction details	
Driller name: Leonard George Mannion	
Date the bore was drilled: 14/03/2005	
Total Depth of water bore (m): 55	
Casing material and outside diameter: PVC Class 9 152mm 0 - 49m	
Water entry: Slots Vertical 152mm 49 – 55m	
Geological formation from which water is accessed: Basalt	
Additional comments: NIL	

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? Yes		
Pump type: Plunger **Pump make and model:** unknown		
Power source: Windmill		
Pump setting depth (depth from ground in metres): unknown		
Pumping rate at the time of visit (L/s): Unable to measure		
Is the bore equipped with a meter? No		
Headworks description: 1.5" steel riser clamped at bore head; tee connection at 3 metres above ground level. 1.5" discharge galvanised pipe supplies tank.		
Repairs/maintenance history: NIL none reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** Constantly in use and supplies a 5000 gallon tank. Supplies water for approximately 20 – 30 head of cattle per year.	

<table>
<tr><td colspan="5">PART E: WATER LEVEL MEASUREMENT</td></tr>
<tr><td rowspan="3">Was a water level or pressure measurement taken?</td><td rowspan="3">Yes</td><td rowspan="2">Water level</td><td colspan="2">Water level (depth from measurement point in metres) 15m bgl</td></tr>
<tr><td colspan="2">Method of measuring water level: direct access _ dip tape</td></tr>
<tr><td colspan="3">Datum point description: ground level</td></tr>
<tr><td colspan="5">Height of datum above ground level (metres): n/a</td></tr>
<tr><td colspan="5">Antecedent and/or current conditions relevant to the water level or pressure measurement:

NIL</td></tr>
<tr><td colspan="5">Are historical water level and/or pressure records available for this bore?

Yes. Water level in drill record states 17.3m</td></tr>
<tr><td colspan="5">Anecdotal water level information:

NIL</td></tr>
<tr><td colspan="5">PART F: WATER QUALITY</td></tr>
<tr><td colspan="5">LABORATORY WATER QUALITY</td></tr>
<tr><td colspan="5">Were water quality samples taken for submission to a laboratory? Yes</td></tr>
<tr><td colspan="5">Are historical water quality laboratory records available for this bore? No</td></tr>
<tr><td colspan="5">FIELD WATER QUALITY</td></tr>
<tr><td rowspan="5">Were water quality field measurements taken?</td><td rowspan="5">Yes</td><td colspan="3">Field measurements</td></tr>
<tr><td>pH: 7.45</td><td>Temperature (°C): n/a</td><td>Electrical conductivity (µs/cm): 1013</td></tr>
<tr><td colspan="3">Total Alkalinity as $CaCO_3$ (mg/L): n/a</td></tr>
<tr><td colspan="3">Field gas measurements</td></tr>
<tr><td>CO_2 (ppm_v): n/a</td><td>H_2S (ppm_v): n/a</td><td>CH_4 (%LEL): n/a</td></tr>
<tr><td colspan="5">Are historical water quality field records available for this bore? No</td></tr>
</table>

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? No. Taken approximately five metres away from windmill at inlet to tank.		
Was bore purged according to guidelines?	No	**Purge method description:** Bore purged via from windmill to gather sufficient sample.
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: Doyle		**Given name:** Ray
Relationship to bore owner: Bore owner		

Appendix G.2 - Photographs for bore Doyle 6

Appendix G.3 - NSW office of water records for bore Doyle 6

NSW Office of Water
Work Summary

GW967028

Licence: 90BL252504 **Licence Status:** CONVERTED

Authorised Purpose (s): STOCK
Intended Purpose(s): STOCK

Work Type: Bore
Work Status:
Construct.Method: Rotary - Percussion (Down Hole Hammer)
Owner Type:

Commenced Date:
Completion Date: 14/03/2005
Final Depth: 55.00 m
Drilled Depth: 55.00 m

Contractor Name: Mannion Drilling Pty Ltd
Driller: Leonard George Mannion
Assistant Driller:

Property: BUNDAH BUNDAH RUSHES CREEK ROAD MANILLA 2346
GWMA: -
GW Zone: -
Standing Water Level: 17.300
Salinity:
Yield: 1.250

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.2	171 752169
Licensed:	DARLING	BALDWIN	Whole Lot 171//752169

Region: 90 - Barwon
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6588995.0
Easting: 269648.0
Latitude: 30°48'35.3"S
Longitude: 150°35'31.9"E

GS Map: -
MGA Zone: 0
Coordinate Source: Map Interpretation

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	55.00	152			Rotary - Percussion (Down Hole Hammer)
1	1	Casing	Pvc Class 9	-0.30	55.00	152	138		Seated on Bottom, Glued
1	1	Opening	Slots - Vertical	49.00	55.00	152		1	Casing - Hand Sawn Slot, PVC Class 9, SL: 200.0mm, A: 3.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)		Duration (hr)	Salinity (mg/L)

							Hole Depth (m)		
45.00	45.30	0.30	Unknown	17.30		0.12			
47.00	48.00	1.00	Unknown	17.30		0.50			
51.00	52.00	1.00	Unknown	17.30		0.63		01:00:00	

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	topsoil	Topsoil	
0.30	2.00	1.70	blacksoil	Invalid Code	
2.00	5.00	3.00	clay	Clay	
5.00	15.00	10.00	shale/brown	Shale	
15.00	40.00	25.00	basalt/blue	Basalt	
40.00	43.00	3.00	limestone	Invalid Code	
43.00	45.00	2.00	basalt/blue	Basalt	
45.00	45.30	0.30	water bearing	Invalid Code	
45.30	47.00	1.70	basalt/blue	Basalt	
47.00	48.00	1.00	water bearing	Invalid Code	
48.00	51.00	3.00	basalt/blue	Basalt	
51.00	52.00	1.00	water bearing	Invalid Code	
52.00	55.00	3.00	basalt/blue	Basalt	

Remarks

14/03/2005: Form A Remarks:
Sump Installed from 52m to 55m
1m of Steel Casing Protector cemented in place

***** End of GW967028 *****

Appendix H - Information for bore Doyle 7

Appendix H.1 – Bore baseline assessment form Doyle 7

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION		
NHG bore Id: Doyle_07 **NSW office of water registration number:** GW016839		
NSW office of water registration number comments: Identified bore location and details similar to actual bore location.		
Local bore name: Andrew's Bore		
Property name: Kyora		
Property Lot/Plan: 143//DP752189		
Date of site assessment: 08-11-2016		
Geographic location (AGD84)	**Easting:** 027011 **Northing:** 6587667	
	Location method: Handheld GPS (56J UTM)	
Status of works: Operational		
Additional comments: NIL		
PART B: BORE CONSTRUCTION DETAILS		
Source of bore construction details? Anecdotal information provided by landholder and NSW office of water construction details		
Driller name: Uknown		
Date the bore was drilled: 01/09/1958		
Total Depth of water bore (m): 103.6m		
Casing material and outside diameter: Steel 152mm 0 – 100.1m		
Water entry: 100.6 – 103.6		
Geological formation from which water is accessed: Sandstone		
Additional comments: NIL		

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? Yes		
Pump type: Plunger **Pump make and model:** unknown		
Power source: Windmill		
Pump setting depth (depth from ground in metres): unknown		
Pumping rate at the time of visit (L/s): Unable to measure		
Is the bore equipped with a meter? No		
Headworks description: 1.5" steel riser clamped at bore head; tee approximately 0.62m above ground connected to galvanized 1.5" elbow and discharge pipe that supplies dam.		
Repairs/maintenance history: NIL none reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** Constantly in use and supplies a dam. Supplies water for approximately 20 head of cattle per year.	

<table>
<tr><td colspan="5">PART E: WATER LEVEL MEASUREMENT</td></tr>
<tr><td rowspan="3">Was a water level or pressure measurement taken?</td><td rowspan="3">Yes</td><td rowspan="2">Water level</td><td colspan="2">Water level (depth from measurement point in metres): 10.94m bgl</td></tr>
<tr><td colspan="2">Method of measuring water level: direct access _ dip tape</td></tr>
<tr><td colspan="3">Datum point description: ground level</td></tr>
<tr><td colspan="5">Height of datum above ground level (metres): n/a</td></tr>
<tr><td colspan="5">Antecedent and/or current conditions relevant to the water level or pressure measurement:

NIL</td></tr>
<tr><td colspan="5">Are historical water level and/or pressure records available for this bore?

Yes. Water level in drill record states 12.20m</td></tr>
<tr><td colspan="5">Anecdotal water level information:

NIL</td></tr>
<tr><td colspan="5">PART F: WATER QUALITY</td></tr>
<tr><td colspan="5">LABORATORY WATER QUALITY</td></tr>
<tr><td colspan="5">Were water quality samples taken for submission to a laboratory? Yes</td></tr>
<tr><td colspan="5">Are historical water quality laboratory records available for this bore? No</td></tr>
<tr><td colspan="5">FIELD WATER QUALITY</td></tr>
<tr><td rowspan="5">Were water quality field measurements taken?</td><td rowspan="5">Yes</td><td colspan="3">Field measurements</td></tr>
<tr><td>pH: 6.97</td><td>Temperature (°C): n/a</td><td>Electrical conductivity (µs/cm): 1609</td></tr>
<tr><td colspan="3">Total Alkalinity as $CaCO_3$ (mg/L): n/a</td></tr>
<tr><td colspan="3">Field gas measurements</td></tr>
<tr><td>CO_2 (ppm_v): n/a</td><td>H_2S (ppm_v): n/a</td><td>CH_4 (%LEL): n/a</td></tr>
<tr><td colspan="5">Are historical water quality field records available for this bore? No</td></tr>
</table>

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? No. Taken approximately two metres away from windmill at pipe coupling.		
Was bore purged according to guidelines?	No	**Purge method description:** Bore purged via from windmill to gather sufficient sample.
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: Doyle		**Given name:** Ray
Relationship to bore owner: Bore owner		

Appendix H.2 - Photographs for bore Doyle 7

Appendix H.3 - NSW office of water records for bore Doyle 7

NSW Office of Water
Work Summary

GW016839

Licence: 85BL007308 **Licence Status:** CONVERTED

Authorised Purpose (s): STOCK
Intended Purpose(s): STOCK

Work Type: Bore open thru rock
Work Status:
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/09/1958
Final Depth: 103.60 m
Drilled Depth: 103.60 m

Contractor Name:
Driller:
Assistant Driller:

Property: KALLARA STATION
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description: 10001-14000 ppm
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	KILLA	KILLA,999	WLL 7844
Licensed:	KILLARA	NIL	Whole Lot //

Region: 80 - Macquarie-Western
River Basin: 424 - PAROO RIVER
Area/District:
CMA Map: 7836
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6587612.0
Easting: 268576.0
Latitude: 30°49'19.5"S
Longitude: 144°34'50.4"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing	Threaded Steel	-0.30	100.10	127			Suspended in Clamps

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)
100.60	103.60	3.00	Consolidated	12.20		1.14			

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.05	3.05	Clay Grey	Clay	
3.05	4.88	1.83	Clay	Clay	
4.88	11.58	6.70	Clay Sandy	Clay	
11.58	17.68	6.10	Sand Drift	Sand	
17.68	42.98	25.30	Drift Clay Bands	Invalid Code	
42.98	48.77	5.79	Sandstone	Sandstone	
48.77	50.60	1.83	Sandstone Red	Sandstone	
50.60	58.52	7.92	Clay Yellow	Clay	
58.52	61.57	3.05	Clay Yellow Sandy	Clay	
61.57	70.10	8.53	Clay White	Clay	
70.10	73.76	3.66	Clay Grey	Clay	
73.76	76.81	3.05	Clay	Clay	
76.81	86.56	9.75	Shale	Shale	
86.56	87.48	0.92	Rock	Rock	
87.48	91.74	4.26	Shale	Shale	
91.74	92.66	0.92	Rock	Rock	
92.66	100.58	7.92	Shale	Shale	
100.58	103.63	3.05	Sandstone Water Supply	Sandstone	

Remarks

*** End of GW016839 ***

Appendix I - Information for bore Doyle 8

Appendix I.1 – Bore baseline assessment form Doyle 8

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION		
NHG bore Id: Doyle_08 **NSW office of water registration number:** n/a		
NSW office of water registration number comments: n/a		
Local bore name: Dam Bore		
Property name: Bundah		
Property Lot/Plan: 9//DP849741		
Date of site assessment: 08-11-2016		
Geographic location (AGD84)	**Easting:** 0267740 **Northing:** 658595	
	Location method: Handheld GPS (56J UTM)	
Status of works: Operational		
Additional comments: NIL		
PART B: BORE CONSTRUCTION DETAILS		
Source of bore construction details? Anecdotal information provided by landholder		
Driller name: unknown		
Date the bore was drilled: > 53 years		
Total Depth of water bore (m): unknown		
Casing material and outside diameter: Steel 152mm		
Water entry: unknown		
Geological formation from which water is accessed: unknown		
Additional comments: NIL		

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? Yes		
Pump type: Plunger **Pump make and model:** unknown		
Power source: Windmill		
Pump setting depth (depth from ground in metres): unknown		
Pumping rate at the time of visit (L/s): Unable to measure		
Is the bore equipped with a meter? No		
Headworks description: 1.5" steel riser clamped at bore head; riser tee at 3 m above ground level. Discharge offtake at ~3m above ground level; discharge line is 1.5" galvanised line.		
Repairs/maintenance history: NIL none reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** Constantly in use and supplies a 5000 gallon tank. Supplies water for approximately 20 – 30 head of cattle per year.	

<table>
<tr><td colspan="5">PART E: WATER LEVEL MEASUREMENT</td></tr>
<tr><td rowspan="3">Was a water level or pressure measurement taken?</td><td rowspan="3">Yes</td><td rowspan="2">Water level</td><td colspan="2">Water level (depth from measurement point in metres) 3.49m bgl</td></tr>
<tr><td colspan="2">Method of measuring water level: direct access _ dip tape</td></tr>
<tr><td colspan="3">Datum point description: ground level</td></tr>
<tr><td colspan="5">Height of datum above ground level (metres): n/a</td></tr>
<tr><td colspan="5">Antecedent and/or current conditions relevant to the water level or pressure measurement:

NIL</td></tr>
<tr><td colspan="5">Are historical water level and/or pressure records available for this bore?

No</td></tr>
<tr><td colspan="5">Anecdotal water level information:

NIL</td></tr>
<tr><td colspan="5">PART F: WATER QUALITY</td></tr>
<tr><td colspan="5">LABORATORY WATER QUALITY</td></tr>
<tr><td colspan="5">Were water quality samples taken for submission to a laboratory? Yes</td></tr>
<tr><td colspan="5">Are historical water quality laboratory records available for this bore? No</td></tr>
<tr><td colspan="5">FIELD WATER QUALITY</td></tr>
<tr><td rowspan="5">Were water quality field measurements taken?</td><td rowspan="5">Yes</td><td colspan="3">Field measurements</td></tr>
<tr><td>pH: 7.21</td><td>Temperature (°C): n/a</td><td>Electrical conductivity (µs/cm): 977</td></tr>
<tr><td colspan="3">Total Alkalinity as $CaCO_3$ (mg/L): n/a</td></tr>
<tr><td colspan="3">Field gas measurements</td></tr>
<tr><td>CO_2 (ppm_v) : n/a</td><td>H_2S (ppm_v) : n/a</td><td>CH_4 (%LEL): n/a</td></tr>
<tr><td colspan="5">Are historical water quality field records available for this bore? No</td></tr>
</table>

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? No. Taken approximately three metres away from windmill at inlet to tank.		
Was bore purged according to guidelines?	No	**Purge method description:** Bore purged via from windmill to gather sufficient sample.
Were samples taken using existing pump on bore? Yes		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: Doyle		**Given name:** Ray
Relationship to bore owner: Bore owner		

Appendix I.2 - Photographs for bore Doyle 8

Appendix J - Information for bore Doyle 9

Appendix J.1 – Bore baseline assessment form Doyle 9

Bore Baseline Assessment Form

PART A: DOCUMENT IDENTIFICATION AND BORE SITE INFORMATION	
NHG bore Id: Doyle_09 **NSW office of water registration number:** GW011958	
NSW office of water registration number comments: Identified bore location and details similar to actual bore location.	
Local bore name: Windmill on Hill	
Property name: Bundah	
Property Lot/Plan: 85//DP752169	
Date of site assessment: 08-11-2016	
Geographic location (AGD84)	**Easting:** 0268892 **Northing:** 6587850
	Location method: Handheld GPS (56J UTM)
Status of works: Non-Operational	
Additional comments: Damaged windmill non operational	
PART B: BORE CONSTRUCTION DETAILS	
Source of bore construction details? Anecdotal information provided by landholder and NSW office of water construction details	
Driller name: unknown	
Date the bore was drilled: 01/01/1956	
Total Depth of water bore (m): unknown	
Casing material and outside diameter: Steel 152mm	
Water entry: 42.7m	
Geological formation from which water is accessed: unknown	
Additional comments: NIL	

PART C: BORE EQUIPMENT AND CONDITION DETAILS		
Is the bore equipped with a pump? No		
Pump type: n/a **Pump make and model:** n/a		
Power source: n/a		
Pump setting depth (depth from ground in metres): n/a		
Pumping rate at the time of visit (L/s): n/a		
Is the bore equipped with a meter? No		
Headworks description: 1.5" steel riser clamped at bore head; Discharge offtake at ~3m above ground level; discharge line is 1.5" galvanised.		
Repairs/maintenance history: NIL none reported		
PART D: BORE WATER SUPPLY INFORMATION		
Purpose of Bore: Stock		
Is the bore water use formally licensed?	☐ Yes	**License Number:** n/a
		Allocation: n/a
		Other Details: n/a
	☑ No	
Bore Utilisation	**Description:** NIL	

<table>
<tr><td colspan="5">PART E: WATER LEVEL MEASUREMENT</td></tr>
<tr><td rowspan="3">Was a water level or pressure measurement taken?</td><td rowspan="3">Yes</td><td rowspan="2">Water level</td><td colspan="2">Water level (depth from measurement point in metres) 17.83m bgl</td></tr>
<tr><td colspan="2">Method of measuring water level: direct access _ dip tape</td></tr>
<tr><td colspan="3">Datum point description: ground level</td></tr>
<tr><td colspan="5">Height of datum above ground level (metres): n/a</td></tr>
<tr><td colspan="5">Antecedent and/or current conditions relevant to the water level or pressure measurement:

NIL</td></tr>
<tr><td colspan="5">Are historical water level and/or pressure records available for this bore?

Yes. 36.60 based on NSW office of water bore log</td></tr>
<tr><td colspan="5">Anecdotal water level information:

NIL</td></tr>
<tr><td colspan="5">PART F: WATER QUALITY</td></tr>
<tr><td colspan="5">LABORATORY WATER QUALITY</td></tr>
<tr><td colspan="5">Were water quality samples taken for submission to a laboratory? No</td></tr>
<tr><td colspan="5">Are historical water quality laboratory records available for this bore? No</td></tr>
<tr><td colspan="5">FIELD WATER QUALITY</td></tr>
<tr><td rowspan="5">Were water quality field measurements taken?</td><td rowspan="5">No</td><td colspan="3">Field measurements</td></tr>
<tr><td>pH: n/a</td><td>Temperature (°C): n/a</td><td>Electrical conductivity (µs/cm): n/a</td></tr>
<tr><td colspan="3">Total Alkalinity as $CaCO_3$ (mg/L): n/a</td></tr>
<tr><td colspan="3">Field gas measurements</td></tr>
<tr><td>CO_2 (ppm_v): n/a</td><td>H_2S (ppm_v): n/a</td><td>CH_4 (%LEL): n/a</td></tr>
<tr><td colspan="5">Are historical water quality field records available for this bore? No</td></tr>
</table>

WATER QUALITY SAMPLING METHODOLOGY		
Was the sampling point and field measurement point at the bore head? n/a		
Was bore purged according to guidelines?	n/a	**Purge method description:** n/a
Were samples taken using existing pump on bore? n/a		
PART G: ASSESSMENT FIELD OFFICER DETAILS		
Surname: Macdonald		**Given Name:** Andrew
Company: SLR Consulting		**Role:** Hydrogeologist
Signature:		**Date:** 08-11-2016
PART H: CERTIFICATION		
Surname: Lyons		**Given Name:** Derwin
Company: SLR Consulting		**Role:** Principal Hydrogeologist
Signature:		**Date:** 11-11-2016
PART I: BORE OWNER REPRESENTITIVE INTERVIEWED		
Surname: Doyle		**Given name:** Ray
Relationship to bore owner: Bore owner		

Appendix J.2 - Photographs for bore Doyle 9

Appendix J.3 - NSW office of water records for bore Doyle 9

NSW Office of Water
Work Summary

GW011958

Licence: 90BL004724 **Licence Status:** CONVERTED

Authorised Purpose (s): STOCK
Intended Purpose(s): NOT KNOWN

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/01/1956
Final Depth: 42.70 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: BUNDAH
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description: Hard
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.002	85
Licensed:	DARLING	BALDWIN	Whole Lot //

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6587869.0
Easting: 268880.0
Latitude: 30°49'11.3"S
Longitude: 150°35'02.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing		0.00	0.00				Suspended in Clamps

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)
42.70	42.70	0.00	(Unknown)	36.60					

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW011958 ***

Appendix K - Laboratory water quality analysis results

eurofins | mgt

Certificate of Analysis

SLR CONSULTING
Level 2 15 Astor Terrace
Spring Hill
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Adam McDonald**

Report **522926-W**
Project name PROTEN RUSHES CK GW
Project ID 610.16117.0030
Received Date Nov 09, 2016

Client Sample ID			**DOYLE 5**	**DOYLE 6**	**DOYLE 8**	**DOYLE 7**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B16-No07607**	**B16-No07608**	**B16-No07609**	**B16-No07610**
Date Sampled			**Nov 08, 2016**	**Nov 08, 2016**	**Nov 08, 2016**	**Nov 08, 2016**
Test/Reference	LOR	Unit				
Bromide	0.5	mg/L	0.7	0.6	< 0.5	1.5
Chloride	1	mg/L	140	100	65	230
Conductivity (at 25°C)	1	uS/cm	1500	1200	1300	1900
Fluoride	0.5	mg/L	1.0	0.8	< 0.5	< 0.5
pH	0.1	pH Units	7.5	7.9	7.6	7.8
Reactive Silica (as SiO2)	5	mg/L	19	20	16	13
Sulphate (as S)	5	mg/L	60	41	21	72
Total Dissolved Solids	10	mg/L	960	890	810	1500
Hardness mg equivalent CaCO3/L	5	mg/L	580	520	580	770
Sodium Adsorption Ratio*	0.1		2.0	2.3	1.6	2.5
Alkalinity (speciated)						
Total Alkalinity (as CaCO3)	20	mg/L	530	610	710	590
Alkali Metals						
Calcium	0.5	mg/L	140	110	140	170
Magnesium	0.5	mg/L	54	56	56	87
Potassium	0.5	mg/L	2.4	1.2	1.4	3.0
Sodium	0.5	mg/L	120	140	94	180
Heavy Metals						
Aluminium	0.05	mg/L	< 0.05	0.24	< 0.05	0.16
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Barium	0.02	mg/L	0.05	0.08	0.04	0.07
Barium (filtered)	0.02	mg/L	0.05	0.08	0.04	0.07
Beryllium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Beryllium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Boron	0.05	mg/L	0.32	0.48	0.17	0.30
Boron (filtered)	0.05	mg/L	0.30	0.46	0.17	0.28
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	0.005	0.006	0.006	0.036

Client Sample ID			DOYLE 5	DOYLE 6	DOYLE 8	DOYLE 7
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			B16-No07607	B16-No07608	B16-No07609	B16-No07610
Date Sampled			Nov 08, 2016	Nov 08, 2016	Nov 08, 2016	Nov 08, 2016
Test/Reference	LOR	Unit				
Heavy Metals						
Copper (filtered)	0.001	mg/L	0.004	< 0.001	0.005	0.018
Iron	0.05	mg/L	2.5	8.7	< 0.05	0.85
Iron (filtered)	0.05	mg/L	2.2	5.0	< 0.05	0.10
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Manganese	0.005	mg/L	0.058	0.087	< 0.005	0.15
Manganese (filtered)	0.005	mg/L	0.056	0.085	< 0.005	0.15
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel	0.001	mg/L	0.002	0.001	< 0.001	0.002
Nickel (filtered)	0.001	mg/L	0.002	0.001	< 0.001	0.002
Selenium	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Silver	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Silver (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Strontium	0.005	mg/L	4.0	4.1	1.5	3.3
Strontium (filtered)	0.005	mg/L	3.7	4.0	1.5	3.3
Vanadium	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	0.005	mg/L	0.084	0.11	0.039	0.17
Zinc (filtered)	0.005	mg/L	0.080	0.068	0.039	0.14

Client Sample ID			MCCRAE 1	MCCRAE 2	DUP01	PROTEN EB
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			B16-No07611	B16-No07612	B16-No07613	B16-No07614
Date Sampled			Nov 08, 2016	Nov 08, 2016	Nov 08, 2016	Nov 08, 2016
Test/Reference	LOR	Unit				
Bromide	0.5	mg/L	0.7	0.9	< 0.5	< 0.5
Chloride	1	mg/L	110	140	65	16
Conductivity (at 25°C)	1	uS/cm	1500	1400	1200	120
Fluoride	0.5	mg/L	< 0.5	< 0.5	< 0.5	< 0.5
pH	0.1	pH Units	7.6	7.8	7.8	7.3
Reactive Silica (as SiO2)	5	mg/L	24	25	18	29
Sulphate (as S)	5	mg/L	24	28	21	< 5
Total Dissolved Solids	10	mg/L	860	980	830	90
Hardness mg equivalent CaCO3/L	5	mg/L	540	650	570	25
Sodium Adsorption Ratio*	0.1		2.0	1.8	1.6	1.0
Alkalinity (speciated)						
Total Alkalinity (as CaCO3)	20	mg/L	690	700	650	31
Alkali Metals						
Calcium	0.5	mg/L	160	160	130	5.6
Magnesium	0.5	mg/L	36	61	56	2.8
Potassium	0.5	mg/L	1.2	2.0	1.4	1.5
Sodium	0.5	mg/L	120	120	92	11

Client Sample ID			MCCRAE 1	MCCRAE 2	DUP01	PROTEN EB
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			B16-No07611	B16-No07612	B16-No07613	B16-No07614
Date Sampled			Nov 08, 2016	Nov 08, 2016	Nov 08, 2016	Nov 08, 2016
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Barium	0.02	mg/L	0.17	0.14	0.04	< 0.02
Barium (filtered)	0.02	mg/L	0.17	0.14	0.04	< 0.02
Beryllium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Beryllium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Boron	0.05	mg/L	0.33	0.20	0.19	< 0.05
Boron (filtered)	0.05	mg/L	0.32	0.19	0.19	< 0.05
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	0.007	0.003	0.007	< 0.001
Copper (filtered)	0.001	mg/L	0.007	0.004	0.006	< 0.001
Iron	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Iron (filtered)	0.05	mg/L	< 0.05	2.8	< 0.05	< 0.05
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.001
Manganese	0.005	mg/L	0.012	0.010	< 0.005	0.008
Manganese (filtered)	0.005	mg/L	0.012	0.022	< 0.005	0.008
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Molybdenum	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Nickel (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Selenium	0.001	mg/L	< 0.001	< 0.001	0.001	< 0.001
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	0.001	< 0.001
Silver	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Silver (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Strontium	0.005	mg/L	8.4	3.1	1.6	0.044
Strontium (filtered)	0.005	mg/L	8.3	3.0	1.6	0.044
Vanadium	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	0.005	mg/L	0.015	0.026	0.040	< 0.005
Zinc (filtered)	0.005	mg/L	0.015	0.040	0.040	< 0.005

Client Sample ID			PROTEN FB
Sample Matrix			Water
Eurofins | mgt Sample No.			B16-No07615
Date Sampled			Nov 08, 2016
Test/Reference	LOR	Unit	
Bromide	0.5	mg/L	< 0.5
Chloride	1	mg/L	22
Conductivity (at 25°C)	1	uS/cm	100
Fluoride	0.5	mg/L	< 0.5
pH	0.1	pH Units	7.5
Reactive Silica (as SiO2)	5	mg/L	31
Sulphate (as S)	5	mg/L	13
Total Dissolved Solids	10	mg/L	92
Hardness mg equivalent CaCO3/L	5	mg/L	25
Sodium Adsorption Ratio*	0.1		1.0
Alkalinity (speciated)			
Total Alkalinity (as CaCO3)	20	mg/L	28
Alkali Metals			
Calcium	0.5	mg/L	5.6
Magnesium	0.5	mg/L	2.8
Potassium	0.5	mg/L	1.5
Sodium	0.5	mg/L	11
Heavy Metals			
Aluminium	0.05	mg/L	< 0.05
Aluminium (filtered)	0.05	mg/L	< 0.05
Arsenic	0.001	mg/L	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001
Barium	0.02	mg/L	< 0.02
Barium (filtered)	0.02	mg/L	< 0.02
Beryllium	0.001	mg/L	< 0.001
Beryllium (filtered)	0.001	mg/L	< 0.001
Boron	0.05	mg/L	< 0.05
Boron (filtered)	0.05	mg/L	< 0.05
Cadmium	0.0002	mg/L	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001
Cobalt	0.001	mg/L	< 0.001
Cobalt (filtered)	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Iron	0.05	mg/L	< 0.05
Iron (filtered)	0.05	mg/L	< 0.05
Lead	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Manganese	0.005	mg/L	0.008
Manganese (filtered)	0.005	mg/L	0.008
Mercury	0.0001	mg/L	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Molybdenum	0.005	mg/L	< 0.005
Molybdenum (filtered)	0.005	mg/L	< 0.005
Nickel	0.001	mg/L	< 0.001
Nickel (filtered)	0.001	mg/L	< 0.001
Selenium	0.001	mg/L	< 0.001

Client Sample ID			PROTEN FB
Sample Matrix			**Water**
Eurofins | mgt Sample No.			**B16-No07615**
Date Sampled			**Nov 08, 2016**
Test/Reference	LOR	Unit	
Heavy Metals			
Selenium (filtered)	0.001	mg/L	< 0.001
Silver	0.005	mg/L	< 0.005
Silver (filtered)	0.005	mg/L	< 0.005
Strontium	0.005	mg/L	0.044
Strontium (filtered)	0.005	mg/L	0.043
Vanadium	0.005	mg/L	< 0.005
Vanadium (filtered)	0.005	mg/L	< 0.005
Zinc	0.005	mg/L	< 0.005
Zinc (filtered)	0.005	mg/L	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Coal Seam Gas Monitoring - Intermediate Suite			
Bromide	Sydney	Nov 14, 2016	28 Day
- Method: E045 Anions by Ion Chromatography			
Chloride	Melbourne	Nov 10, 2016	28 Day
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (at 25°C)	Melbourne	Nov 10, 2016	28 Day
- Method: LTM-INO-4030			
Fluoride	Melbourne	Nov 10, 2016	28 Day
- Method: LM-LTM-INO-4300 (Fluoride by Ion Chromatography)			
pH	Melbourne	Nov 10, 2016	0 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Reactive Silica (as SiO2)	Melbourne	Nov 16, 2016	5 Day
- Method: #4500SiC			
Sulphate (as S)	Melbourne	Nov 10, 2016	28 Day
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Total Dissolved Solids	Melbourne	Nov 10, 2016	7 Day
- Method: LM-LTM-INO-4110 (Total Dissolved Solids @ 178°C - 182°C)			
Hardness mg equivalent CaCO3/L	Melbourne	Nov 11, 2016	28 Day
- Method: APHA 2340B Hardness by Calculation			
Alkalinity (speciated)	Melbourne	Nov 10, 2016	14 Day
- Method: APHA 2320 Alkalinity by Titration			
Alkali Metals	Melbourne	Nov 11, 2016	180 Day
- Method: USEPA 6010 Alkali Metals			
CSG Metals : Metals M20	Melbourne	Nov 11, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
CSG Metals : Metals M20 filtered	Melbourne	Nov 11, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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Murarrie QLD 4172
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NATA # 1261 Site # 20794

Company Name:	SLR Consulting (Qld)	**Order No.:**	
Address:	Level 2 15 Astor Terrace Spring Hill QLD 4000	**Report #:**	522926
		Phone:	07 3858 4800
		Fax:	
Project Name:	PROTEN RUSHES CK GW		
Project ID:	610.16117.0030		

Received:	Nov 9, 2016 1:20 PM
Due:	Nov 16, 2016
Priority:	5 Day
Contact Name:	- ALL INVOICES

Eurofins | mgt Analytical Services Manager : Ryan Gilbert

Sample Detail						Coal Seam Gas Monitoring - Intermediate Suite
Melbourne Laboratory - NATA Site # 1254 & 14271						X
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	DOYLE 5	Nov 08, 2016		Water	B16-No07607	X
2	DOYLE 6	Nov 08, 2016		Water	B16-No07608	X
3	DOYLE 8	Nov 08, 2016		Water	B16-No07609	X
4	DOYLE 7	Nov 08, 2016		Water	B16-No07610	X
5	MCCRAE 1	Nov 08, 2016		Water	B16-No07611	X
6	MCCRAE 2	Nov 08, 2016		Water	B16-No07612	X
7	DUP01	Nov 08, 2016		Water	B16-No07613	X
8	PROTEN EB	Nov 08, 2016		Water	B16-No07614	X
9	PROTEN FB	Nov 08, 2016		Water	B16-No07615	X
Test Counts						9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Bromide	mg/L	< 0.5			0.5	Pass	
Chloride	mg/L	< 1			1	Pass	
Fluoride	mg/L	< 0.5			0.5	Pass	
Reactive Silica (as SiO2)	mg/L	< 5			5	Pass	
Sulphate (as S)	mg/L	< 5			5	Pass	
Total Dissolved Solids	mg/L	< 10			10	Pass	
Method Blank							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Barium	mg/L	< 0.02			0.02	Pass	
Barium (filtered)	mg/L	< 0.02			0.02	Pass	
Beryllium	mg/L	< 0.001			0.001	Pass	
Beryllium (filtered)	mg/L	< 0.001			0.001	Pass	
Boron	mg/L	< 0.05			0.05	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Cobalt	mg/L	< 0.001			0.001	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Molybdenum	mg/L	< 0.005			0.005	Pass	
Molybdenum (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Silver	mg/L	< 0.005			0.005	Pass	
Silver (filtered)	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Strontium	mg/L	< 0.005			0.005	Pass	
Strontium (filtered)	mg/L	< 0.005			0.005	Pass	
Vanadium	mg/L	< 0.005			0.005	Pass	
Vanadium (filtered)	mg/L	< 0.005			0.005	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Bromide	%	113			70-130	Pass	
Chloride	%	106			70-130	Pass	
Fluoride	%	114			70-130	Pass	
Reactive Silica (as SiO2)	%	89			70-130	Pass	
Sulphate (as S)	%	107			70-130	Pass	
Total Dissolved Solids	%	97			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	106			70-130	Pass	
LCS - % Recovery							
Alkali Metals							
Calcium	%	97			70-130	Pass	
Magnesium	%	100			70-130	Pass	
Potassium	%	88			70-130	Pass	
Sodium	%	85			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			80-120	Pass	
Arsenic (filtered)	%	105			80-120	Pass	
Barium	%	96			80-120	Pass	
Beryllium	%	99			80-120	Pass	
Boron	%	110			80-120	Pass	
Boron (filtered)	%	87			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Cadmium (filtered)	%	104			80-120	Pass	
Chromium	%	95			80-120	Pass	
Chromium (filtered)	%	98			80-120	Pass	
Cobalt	%	98			80-120	Pass	
Cobalt (filtered)	%	103			80-120	Pass	
Copper	%	96			80-120	Pass	
Copper (filtered)	%	103			80-120	Pass	
Iron	%	98			80-120	Pass	
Iron (filtered)	%	104			80-120	Pass	
Lead	%	96			80-120	Pass	
Lead (filtered)	%	98			80-120	Pass	
Manganese	%	96			80-120	Pass	
Manganese (filtered)	%	105			80-120	Pass	
Mercury	%	97			75-125	Pass	
Mercury (filtered)	%	91			70-130	Pass	
Molybdenum	%	94			80-120	Pass	
Molybdenum (filtered)	%	101			80-120	Pass	
Nickel	%	96			80-120	Pass	
Nickel (filtered)	%	104			80-120	Pass	
Selenium	%	117			80-120	Pass	
Selenium (filtered)	%	92			80-120	Pass	
Silver	%	81			80-120	Pass	
Silver (filtered)	%	102			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Strontium			%	93			80-120	Pass	
Strontium (filtered)			%	103			80-120	Pass	
Vanadium			%	95			80-120	Pass	
Zinc			%	99			80-120	Pass	
Zinc (filtered)			%	107			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Chloride	B16-No07607	CP	%	99			70-130	Pass	
Sulphate (as S)	B16-No07607	CP	%	93			70-130	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	B16-No07607	CP	%	102			70-130	Pass	
Magnesium	B16-No07607	CP	%	100			70-130	Pass	
Potassium	B16-No07607	CP	%	88			70-130	Pass	
Sodium	B16-No07607	CP	%	91			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Barium	B16-No07607	CP	%	101			75-125	Pass	
Beryllium	B16-No07607	CP	%	97			75-125	Pass	
Chromium	B16-No07607	CP	%	106			75-125	Pass	
Cobalt	B16-No07607	CP	%	103			75-125	Pass	
Copper	B16-No07607	CP	%	99			75-125	Pass	
Lead	B16-No07607	CP	%	103			75-125	Pass	
Manganese	B16-No07607	CP	%	99			75-125	Pass	
Molybdenum	B16-No07607	CP	%	106			75-125	Pass	
Nickel	B16-No07607	CP	%	101			75-125	Pass	
Silver	B16-No07607	CP	%	134			75-125	Fail	Q08
Vanadium	B16-No07607	CP	%	108			75-125	Pass	
Spike - % Recovery									
Alkalinity (speciated)				Result 1					
Total Alkalinity (as CaCO3)	B16-No07608	CP	%	124			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	B16-No07609	CP	%	107			70-130	Pass	
Barium (filtered)	B16-No07609	CP	%	99			75-125	Pass	
Beryllium (filtered)	B16-No07609	CP	%	111			75-125	Pass	
Cadmium (filtered)	B16-No07609	CP	%	102			70-130	Pass	
Chromium (filtered)	B16-No07609	CP	%	102			70-130	Pass	
Cobalt (filtered)	B16-No07609	CP	%	101			75-125	Pass	
Copper (filtered)	B16-No07609	CP	%	98			70-130	Pass	
Iron (filtered)	B16-No07609	CP	%	98			70-130	Pass	
Lead (filtered)	B16-No07609	CP	%	101			70-130	Pass	
Manganese (filtered)	B16-No07609	CP	%	102			70-130	Pass	
Mercury (filtered)	B16-No07609	CP	%	102			70-130	Pass	
Molybdenum (filtered)	B16-No07609	CP	%	103			75-125	Pass	
Nickel (filtered)	B16-No07609	CP	%	99			70-130	Pass	
Selenium (filtered)	B16-No07609	CP	%	106			70-130	Pass	
Silver (filtered)	B16-No07609	CP	%	117			75-125	Pass	
Vanadium (filtered)	B16-No07609	CP	%	105			75-125	Pass	
Zinc (filtered)	B16-No07609	CP	%	100			70-130	Pass	
Spike - % Recovery									
				Result 1					
Fluoride	B16-No07610	CP	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M16-No08670	NCP	%	96			75-125	Pass	
Cadmium	M16-No08670	NCP	%	95			75-125	Pass	
Spike - % Recovery									
				Result 1					
Bromide	B16-No07615	CP	%	107			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Chloride	B16-No07607	CP	mg/L	140	150	4.9	30%	Pass	
Sulphate (as S)	B16-No07607	CP	mg/L	60	62	3.0	30%	Pass	
Hardness mg equivalent CaCO3/L	B16-No07607	CP	mg/L	580	580	<1	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	B16-No07607	CP	mg/L	140	140	<1	30%	Pass	
Magnesium	B16-No07607	CP	mg/L	54	55	1.0	30%	Pass	
Potassium	B16-No07607	CP	mg/L	2.4	2.4	2.0	30%	Pass	
Sodium	B16-No07607	CP	mg/L	120	120	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	M16-No08445	NCP	mg/L	31	30	2.0	30%	Pass	
Arsenic	B16-No07607	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Barium	B16-No07607	CP	mg/L	0.05	0.05	1.0	30%	Pass	
Beryllium	B16-No07607	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	B16-No07607	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	B16-No07607	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt	B16-No07607	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	B16-No07607	CP	mg/L	0.005	0.005	<1	30%	Pass	
Iron	B16-No07607	CP	mg/L	2.5	2.5	1.0	30%	Pass	
Lead	B16-No07607	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese	B16-No07607	CP	mg/L	0.058	0.059	1.0	30%	Pass	
Mercury	B16-No07607	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum	B16-No07607	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel	B16-No07607	CP	mg/L	0.002	0.003	4.0	30%	Pass	
Selenium	B16-No07607	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Silver	B16-No07607	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Strontium	B16-No07607	CP	mg/L	4.0	3.9	3.0	30%	Pass	
Vanadium	B16-No07607	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc	B16-No07607	CP	mg/L	0.084	0.088	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Fluoride	B16-No07609	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	B16-No07609	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Barium (filtered)	B16-No07609	CP	mg/L	0.04	0.03	7.0	30%	Pass	
Beryllium (filtered)	B16-No07609	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	B16-No07609	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	B16-No07609	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt (filtered)	B16-No07609	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	B16-No07609	CP	mg/L	0.005	0.005	3.0	30%	Pass	
Iron (filtered)	B16-No07609	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Lead (filtered)	B16-No07609	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Manganese (filtered)	B16-No07609	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Mercury (filtered)	B16-No07609	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum (filtered)	B16-No07609	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel (filtered)	B16-No07609	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Selenium (filtered)	B16-No07609	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Silver (filtered)	B16-No07609	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Strontium (filtered)	B16-No07609	CP	mg/L	1.5	1.5	1.0	30%	Pass	
Vanadium (filtered)	B16-No07609	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	B16-No07609	CP	mg/L	0.039	0.038	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	B16-No07612	CP	mg/L	980	960	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	B16-No07613	CP	uS/cm	1200	1200	1.0	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Total Alkalinity (as CaCO3)	B16-No07613	CP	mg/L	650	670	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Bromide	B16-No07614	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

Authorised By

Ryan Gilbert	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix F

Stage 1 Preliminary Environmental Investigation (SLR Consulting Australia 2018a)



STAGE 1 PRELIMINARY SITE INVESTIGATION

Proposed Poultry Production Farm
Rushes Creek Road, Rushes Creek, NSW

Prepared for:

ProTen Tamworth Pty Ltd
PO Box 1746
North Sydney NSW 2060

SLR Ref: 610.16117.00400-R01
Version No: -v0.2
July 2018

PREPARED BY

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with ProTen Tamworth Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.16117.00400-R01-v0.2	10 July 2018	Craig Cowper	Eryn Bath	

EXECUTIVE SUMMARY

SLR Consulting Pty Ltd (SLR) was engaged by ProTen Tamworth Pty Limited to prepare a Stage 1 Preliminary Site Investigation (PSI) for the proposed poultry production farm (the Development) on Rushes Creek Road, Rushes Creek, NSW (the Development Site).

SLR understands the following, with respect to the Development:

- The Development Site is comprised of 14 registered freehold lots (or part lots) and one section of unformed Council public road.
- The Development is proposed to include:
  - four individual poultry farms, each comprising between 10 and 18 poultry sheds (total of 54 poultry sheds) and associated support/servicing infrastructure;
  - eight new residential houses; and
  - various other support/servicing infrastructure items.
- The Development is classified as State significant development and the NSW Department of Planning and Environment has issued the Secretary's Environmental Assessment Requirements (SEARs), which includes an assessment of any potential existing soil contamination in accordance with 'Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land' (Department of Urban Affairs and Planning [DUAP] and Environment Protection Authority [EPA] 1998).
- Reference in the SEARs is also made to land contamination guidelines:
  - 'National Environment Protection (Assessment of Site Contamination) Measure 1999' as amended in May 2013 (National Environment Protection Council [NEPC] 1999) (ASC NEPM);
  - 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites' (Office of Environment and Heritage [OEH] 2011).

The objectives of this PSI were to:

- Assess the potential for contamination to be present on the Development Site as a result of past and present land use activities;
- Provide advice on the suitability of the Development Site (in the context of land contamination) for the proposed poultry development; and
- Provide preliminary recommendations for additional investigation, management or remediation of the Development Site (if warranted).

SLR undertook the following scope of work to address these objectives:

- a desktop review;
- a walkover of portions of the Development Site; and
- data assessment and reporting.

Based on the results of the desktop review and site walkover, SLR has identified an area of environmental concern (AEC) and contaminants of potential concern (COPC) within the Development Site. The AEC and associated COPC have been presented in the table below and graphically in **Figure 3**.

EXECUTIVE SUMMARY

Areas of Environmental Concern and Contaminants of Potential Concern

ID	AEC	Activity of Concern	Contaminants of Potential Concern
AEC01	Sheep yard west of residential dwelling at "Bundah".	Former sheep dip	Arsenic, organochlorine pesticides (OCP), organophosphate pesticides (OPP), carbamates and synthetic pyrethroids

Based on a review of the available desktop search data and observations made during the site walkover, SLR makes the following conclusions:

- An AEC has been identified for the Development Site (former sheep dip at Bundah) based on past and current land use activities;
- It is considered that the Development Site could be made suitable for the proposed redevelopment, subject to the undertaking of a targeted soil investigation addressing the AEC;
- Based on the nature of the COPC identified for the AEC, there are well established means of remediation and/or management that could be implemented to allow the Development to proceed, regardless of the findings of a targeted soil investigation; and
- Further site investigation works should be undertaken by a suitably experienced environmental consultant.

This report must be read in conjunction with the limitations set out in **Section 12** of this report.

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1 Introduction

1.1 Background

SLR Consulting Pty Ltd (SLR) was engaged by ProTen Tamworth Pty Limited (ProTen) to prepare a Stage 1 Preliminary Site Investigation (PSI) for the proposed poultry production farm (the Development) on Rushes Creek Road, Rushes Creek, NSW (the Development Site).

SLR understands the following, with respect to the Development:

- The Development Site is comprised of 14 registered freehold lots (or part lots) and one section of unformed Council public road.
- The Development is proposed to include:
  - four individual poultry farms, each comprising between 10 and 18 poultry sheds (total of 54 poultry sheds) and associated support/servicing infrastructure;
  - eight new residential houses; and
  - various other support/servicing infrastructure items.
- The Development is classified as State significant development and the NSW Department of Planning and Environment has issued the Secretary's Environmental Assessment Requirements (SEARs), which includes an assessment of any potential existing soil contamination in accordance with 'Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land' (Department of Urban Affairs and Planning [DUAP] and Environment Protection Authority [EPA] 1998).
- Reference in the SEARs is also made to land contamination guidelines:
  - 'National Environment Protection (Assessment of Site Contamination) Measure 1999' as amended in May 2013 (National Environment Protection Council [NEPC] 1999) (ASC NEPM); and
  - 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites' (Office of Environment and Heritage [OEH] 2011).

1.2 Objectives

The objectives of this PSI were to:

- Assess the potential for contamination to be present on the Development Site as a result of past and present land use activities;
- Provide advice on the suitability of the Development Site (in the context of land contamination) for the proposed poultry development; and
- Provide preliminary recommendations for additional investigation, management or remediation of the Development Site (if warranted).

1.3 Scope of Work

SLR undertook the following scope of work to address the PSI objectives:

- a desktop review;
- a walkover of portions of the Development Site; and
- data assessment and reporting.

2 Site Identification

The locality of the Development Site is presented in Figure 1.

As shown on Figure 2, the Development Site comprises the following land parcels:

- Lot 1 in DP 44215;
- Part Lot 1 in DP 1108119;
- Lot 1 in DP 1132298;
- Lots 26, 85, 86, 101, 118, 165, 166 and 171 in DP 752169;
- Part Lot 143 in DP 752189;
- Lot 1 in DP 1132078;
- Lot 1 in DP 1141148; and
- A section of unformed Council public road traversing through Lot 171 DP 752169.

The site is irregular in shape and occupies an area of approximately 1,016 hectares.

3 Site Setting

3.1 Geology

The NSW Government Manilla-Narrabri 1:250,000 Metallogenic Series Sheet SH/56-9, SH/55-12 First Edition 1992, indicates that the Development Site is likely to be underlain primarily by Carboniferous Namoi Formation, comprising thinly bedded mudstone and siltstone with minor conglomerate, litharenite, calcareous sandstone and siltstone, and bioclastic sandstone. The sheet also indicates the presence of:

- Carboniferous Tulcumba Sandstone adjacent to the eastern boundary of the site, comprised of coarse, crossbedded feldsarenite, siltstone, conglomerate, calcareous mudstone, oolithic and bioclastic limestone; and
- Devonian Kiah Limestone Member towards the north eastern corner of the site, comprised of fine grained, grey, thinly bedded and laminated micritic limestone.

3.2 Topography

The topography of the Development Site is relatively flat, with a natural southeast-northwest trending ridgeline running through the centre of the Development Site. Elevations range between 325 metres Australian Height Datum (a AHD) and 410 m AHD.

3.3 Hydrogeology

The nearest significant surface water features to the Development Site are:

- Namoi River, located to the north of the Site; and
- Lake Keepit, located to the west and south west of the Site.

A search of the NSW Government's on-line groundwater works database identified eight registered groundwater bores within the Development Site, with SLR's groundwater bore survey (2017) identifying one additional bore and one well not registered within the Development Site. Some summary information from SLR (2017):

- Six of the groundwater bores are currently operational and used mainly for stock and domestic purposes.
- Depth to groundwater is greater than 9 metres below ground level (mbgl) across the Development Site. There was one exception to this at a bore where the measured groundwater level was 3.4 mbgl, however this bore was located adjacent to a surface water storage dam that was full during the survey and therefore the measured level was likely influenced by dam seepage.
- The direction of groundwater flow is a subdued replica of topography, with groundwater flowing away from the southeast-northwest trending ridgeline in the centre of the Development Site towards the Namoi River in the north, west and northwest.
- Based on groundwater samples from the six operational bores within the Development Site, groundwater quality was noted as fresh to slightly brackish, with field electrical conductivity (EC) ranging between 977 and 1,609 microSiemens per centimetre (µS/cm) and field pH ranging between 6.9 and 7.6 (i.e. neutral).

A copy of the registered groundwater bore search record is provided in **Appendix B**.

Further information on local groundwater characteristics can be found in the Groundwater Bore Baseline Assessment (SLR 2017) appended to the EIS (SLR 2018).

3.4 Acid Sulfate Soils

A copy of a Department of Land and Water Conservation Acid Sulfate Soil Edition Two risk map for the Development Site could not be sourced. However, a search of the Australian Soil Resource Information System (ASRIS) website (www.asris.csiro.au) on 20 October 2016, indicated that the Site is classified as 'B4 Low Probability / Very Low Confidence' with respect to acid sulfate risk.

It is noted that acid sulfate soils typically occur at elevations less than 10 m AHD, particularly low-lying coastal areas. The Development Site is located approximately 230 km from the coast and has elevations ranging between 325 m AHD and 410 m AHD. On this basis, it is very unlikely that acid sulfate soils are present within the Development Site and further assessment is not considered warranted.

4 Site History

4.1 Aerial Photography

A review of a selection of historical aerial photographs covering the Development Site was undertaken. Observations made during the review are presented in **Table 1**.

Table 1 Aerial Photography Review

Year of Photograph	Site Land Use Observation	Surrounding Land Use Observations
1961 (black and white)	Appears to be primarily rural grazing land. Features which appear to be dams are scattered across the Development Site. Given the inferred grazing land use, it is likely these are stock watering dams. There are limited vehicle access roads traversing the Development Site, which appear to be unsealed. Evidence of structures on the Development Site was not observed.	Rural (grazing).
1968 (SIX Viewer)	No significant change from previous image. The roadway with similar alignment to the current Ski Gardens Road, is present along a portion of the northern boundary of the Development Site.	No significant change from previous image.
1975 (black and white)	There are three areas containing buildings adjacent to the eastern boundary of the Development Site. The northernmost developed area appears to comprise a residential dwelling and a number of sheds. The central area appears to comprise a residential dwelling. The southernmost area appears to comprise a residential dwelling and possibly small sheds. It is noted that the southernmost area location appears to correlate with Lot 26 in DP752169, which was reported to have been dedicated for a public hall in 1957 (refer Section **4.2** of this report).	No significant change from previous image. Limited rural type structures are present.
1980 (black and white)	The northernmost developed area observed in 1975 appears to have additional structures (likely to be sheds). The central area appears to have additional structures (likely to be sheds). The southernmost area appears to have additional structures (likely to be sheds and a potential residential dwelling).	No significant change from previous image. Limited rural type structures are present.
1997 (colour)	The northernmost developed area appears to have additional structures (most likely sheds), however some structures are no longer present. The central developed area does not appear to have changed since the previous image. The structures in the southernmost developed area do not appear to have changed.	No significant change from previous image. Limited rural type structures are present.
2005 (Nearmap)	One structure in the northernmost developed area is no longer present. Livestock (sheep?) in yards are present. The central area has been redeveloped, with multiple structures present, likely to include residential dwelling/s and sheds. The structures in the central developed area are no longer present. Selected structures in the southernmost developed area no longer present.	No significant change from previous image. Limited rural type structures are present.

The aerial photography review indicates a potential for localised land contaminating activities to have been undertaken on the Development Site, including:

- Demolition of buildings;

- Storage and handling of farming related chemicals and fuels;
- Livestock dips; and
- Livestock burial.

4.2 Historical Land Titles

A search of historical land title ownership records was undertaken on 13 October 2016. In summary, the records indicate proprietors for the Development Site from approximately 1901 onwards included:

Primarily private owners

- Occupations of those owners (where reported) were typically 'farmer' or 'grazier';
- Early title to portions of the land was also reported to be Crown Tenure;

Lot 26 in DP752169 was dedicated for a public hall in 1957 and revocated in 1977;

A portion of Lot 1 in DP44215 was formerly a Crown Road and subsequently closed.

A portion of Lot 1 in DP1108119 was formerly a Crown Road and subsequently closed.

A portion of Lot 1 in DP1132298 was formerly a Crown Road and subsequently closed.

A portion of Lot 1 in DP1132078 was formerly a Crown Road and subsequently closed.

A portion of Lot 1 in DP1141148 was formerly a Crown Road and subsequently closed.

No easements or leases were reported for the Development Site.

The land title information:

- does not indicate a potential for widespread land contaminating activities to have occurred on the Development Site;
- indicates a potential for localised land contaminating activities to have occurred on the Development Site, including the following:
  - storage of fuels and other chemicals associated with farming / grazing;
  - operation of livestock dips;
  - livestock burial;
  - demolition of former buildings (including a potential public hall); and
  - importation of uncontrolled filling for dams.

In SLR's experiences with comparable land use scenarios, dams tend to be excavated into the ground, with excavated material used for building of walls around dams (if required). On this basis, SLR considers that importation of uncontrolled filling material for dam construction does not warrant further assessment.

SLR considers that the remaining identified localised potential land contaminating activities warrant further assessment, specifically in the context of other lines of evidence in this investigation, particularly the historical aerial imagery review.

A copy of the title search record is presented in **Appendix C**.

4.3 Regulatory Authorities

4.3.1 NSW Environment Protection Authority

A search of the NSW EPA (EPA) contaminated land public register of record of notices (maintained under Section 58 of the Contaminated Land Management Act 1997 [CLM Act]) was undertaken on 10 October 2016. The search results indicated that, with regard to the Development Site, or for properties immediately adjacent to the Development Site, there are no:

- orders made under Part 3 of the CLM Act;
- approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the EPA has not been revoked;
- site audit statements provided under Section 53B of the CLM Act that relate to significantly contaminated land;
- where practicable, copies of anything formerly required to be part of the public record;
- actions taken by EPA under Sections 35 or 36 of the Environmentally Hazardous Chemicals Act 1985.

A search of the EPA's public register of licences, applications and notices (maintained under Section 308 of the Protection of the Environment Operations Act 1997 [POEO Act]) was undertaken on 10 October 2016. The register contains information on:

- environment protection licences;
- applications for new licences and to transfer or vary existing licences;
- environment protection and noise control notices;
- penalty notices issued by the EPA;
- convictions in prosecutions under the POEO Act;
- the results of civil proceedings;
- licence review information;
- exemptions from the provisions of the POEO Act or regulations;
- approvals granted under clause 9 of the POEO (Control of Burning) Regulation;
- approvals granted under clause 7A of the POEO (Clean Air) Regulation;
- any mandatory audits required to be undertaken in relation to a licence;
- each pollution study required by a condition of a licence;
- each pollution reduction program required by a condition of a licence; and
- each penalty notice issued in relation to a premises.

The search did not identify any records for the Development Site or for any properties located immediately adjacent to the Site.

A search of the EPA's public register of contaminated sites notified to the EPA under Section 60 of the CLM Act (as of 30 August 2016) was undertaken on 11 October 2016. The search did not identify any records for the Site or for land immediately adjacent to the Development Site.

A copy of the search records is presented in **Appendix D**.

4.3.2 Council Records

Planning certificates (dated 12 January 2016, 18 January 2016, 21 January 2016 and 7 July 2016) issued by Tamworth Regional Council (Council) under Section 149 of the Environmental Planning and Assessment Act 1979 (EP&A Act) were reviewed. The planning certificates indicated that the land to which the certificate relates to, in the context of the CLM Act and at the date the certificate was issued, is not affected by one of the matters prescribed in Section 59(2) of the CLM Act.

Correspondence included with the planning certificate issued for Lots 86, 101, 118, 166 in DP752169 and Lot 1 in DP1141148 (referred to as the Happy Hills portion of the site), indicated that this portion of the Development Site is serviced by an on-site sewage management system. SLR notes that the potential for on-site sewage management systems to be present on other portions of the Development Site (particularly where residential and/or waste water generating activities are undertaken) cannot be precluded. SLR considers that risks associated with residential land use on-site sewage management systems would likely be assessed as low, in the context of human health exposure. However, risks associated with sewage management systems handling and treating discharges of other waste water generating activities, may be assessed as moderate and even high, in the context of human health exposure risks.

A copy of the planning certificates is presented in **Appendix E**.

5 Previous Contamination Assessments

There were no previous contamination assessment reports made available for review.

6 Site Walkover

A walkover of the Development Site was undertaken by a suitably experienced SLR environmental consultant (Craig Cowper) on 28 November 2016. The purpose of the site walkover was to make observations of portions of the Development Site that were identified during the desktop review as requiring additional assessment. A discussion and photographic record of observations made are presented in **Sections 6.1** to **6.10.**

6.1 Site Features

Three portions of the Development Site, located towards the eastern boundary, were visited during the site walkover. These portions were located in:

- Lot 166 in DP752169 (part of the Happy Hills property);
- Lot 26 in DP752169 (part of unnamed property); and
- Lot 165 in DP752169 (part of the Bundah property).

The walkover in these portions focussed on making observations of above ground infrastructure. General observations made in each portion are presented in the below sub-sections.

6.1.1 Lot 166 (Happy Hills)

- Two primary residential dwellings, with one in use and the other appearing vacant and run-down;
- Workshop / equipment storage sheds;
- Remnants of former timber and iron shed;
- Sheep pens; and

- Remnants of potential tennis court.

Photo 1 Western side of active primary residential dwelling

Photo 2 North western side of vacant run down residential dwelling

Photo 3 Workshop / shed adjacent to primary dwelling

Photo 4 Workshop / shed adjacent to primary dwelling

Photo 5 Shed located between primary residential dwelling and vacant residential dwelling

Photo 6 Remnants of former timber and iron shed located between primary residential dwelling and sheep pens

Photo 7 Sheep pens located north of primary residential dwelling

Photo 8 Remnants of potential tennis court, located south of primary residential dwelling

6.1.2 Lot 26 (unnamed)

- Two primary residential dwellings;
- One large shed; and
- Sheds used as workshop / equipment storage.

Photo 9 One of the primary residential dwellings

Photo 10 Site shed

Photo 11 Shed used for workshop / equipment storage

Photo 12 Inside shed used for workshop / equipment storage

Photo 13 Equipment storage shed

6.1.3 Lot 165 (Bundah)

- One primary residential dwelling;
- Sheds for equipment storage;
- Sheep pens; and
- Cattle pens.

Photo 14 Southern side of primary residential dwelling

Photo 15 Example of equipment storage shed

Photo 16 Shed for storage and former sheep sheering

Photo 17 Former animal pen area

6.2 Site Drainage

Observations made during the site walkover indicate that site drainage is likely to include:

- roof top water flows to downpipes onto surface or into rainwater tanks (if present);
- surface runoff from external hardstand areas; and
- infiltration in unsealed areas.

6.3 Wastes

There was no evidence of wastes being stored in an uncontrolled manner on the Development Site.

6.4 Fill

There was no evidence observed of significant or widespread filling on the Development Site.

6.5 Chemical Use and Storage

6.5.1 Chemicals

There was no visual evidence observed of significant or widespread chemical usage or storage on the Development Site. Observations of a limited number of oil drums and small chemical containers were observed. There was no evidence observed of staining or odours associated with these drums or containers.

Photo 18 Example of drums and containers being stored on Lot 166

There was visual evidence observed of a former sheep dip on Lot 165.

Photo 19 Former sheep dip adjacent sheep holding yard

6.5.2 Underground and Aboveground Storage Tanks

There was no visual evidence observed to suggest the presence of underground fuel storage tanks on the Development Site.

There was evidence of septic tanks (for treatment of domestic waste water) observed on each of the portions visited. There was no evidence observed of any other on-site sewage treatment management systems on each of the portions visited.

Photo 20 Septic tank in Lot 166

Photo 21 Septic tank in Lot 26

Photo 22 Septic tank in Lot 165

There was evidence observed of above ground fuel storage tanks observed on Lot 166. There was no evidence observed of leaks, spills or stains in the immediate vicinity of these tanks.

Photo 23 Above ground fuel storage tanks on Lot 166

There was evidence observed of above ground fuel storage tanks observed on Lot 165. There was no evidence observed of leaks, spills or stains in the immediate vicinity of these tanks.

Photo 24 Septic tank in Lot 165

6.6 Asbestos

There was no visual evidence of potential asbestos containing materials observed on the surface of the portions of the Development Site visited.

It is noted that a hazardous building materials survey was not within the scope of this investigation.

6.7 Phytotoxicity

Vegetation observed on the Development Site, and on nearby properties, did not display evidence of significant or widespread phytotoxic impact (i.e. plant stress or dieback).

6.8 Odours and Staining

Olfactory evidence of significant odours or visual evidence of widespread staining at the Development Site was not observed.

6.9 Incidents and Complaints

There was no information provided to suggest any incidents had occurred at the Development Site or that complaints had been made about the Development Site.

6.10 Anecdotal Information

Anecdotal information was provided by residents at each of the portions of the Development Site visited. This information is presented in **Sections 6.10**, **6.10.2**, and **6.10.3**.

6.10.1 Lot 166 (Happy Hills)

Steve McRae has owned the property for the last 10 years. The property has been used for raising of fat lambs and cattle, and growing of feed. A small number of free range pigs were historically kept on the property, but not to the extent or practice of a piggery.

Former sheds on site were constructed from timber and iron. Fibrous cement sheeting was not used.

Mr McRae was not aware of any mass fatality animal burial pits on the property. On the rare occasion that a dead animal is encountered, it is buried locally or burnt.

The septic tank on the property is only used for receiving domestic waste water.

6.10.2 Lot 26 (Unnamed)

Steve Olah has owned the property for the last 10 years. The property used to contain a 'dance hall' constructed of timber and iron. The dance hall was demolished and removed from site.

The septic tank on the property is only used for receiving domestic waste water.

Photo 25 Location of former dance hall

6.10.3 Lot 165 (Bundah)

Ray Doyle has owned the property for 53 years. The property has been used for raising sheep and cattle, and growing wheat. A small number of free range pigs were kept on the property, but not to the extent or practice of a piggery.

Former sheds on site were constructed from timber and iron. Fibrous cement sheeting was not used.

The sheep dip has not been used during the 53 years he has owned the property, however, it is likely that it was used by a previous owner. The sheep dip is believed to be constructed out of concrete and the associated sump is considered to be relatively small. The dip has been covered over with iron sheeting as a safety precaution.

Mr Doyle was not aware of any mass fatality animal burial pits on the property. On the rare occasion that a dead animal is encountered, it is left to decay naturally or burnt. Burial of dead animals has been rare, as ground conditions are quite hard. The septic tank on the property is only used for receiving domestic waste water.

6.11 Current Adjacent Land Uses

Land uses observed on the properties adjacent to the Development Site are summarised in **Table 2**.

Table 2 Adjacent Land Uses

Adjacent boundary	Land Use
North	Primarily agricultural
East	Primarily agricultural
West	Primarily agricultural
South	Primarily agricultural

7 Data Quality Assessment

The sources of data relied upon for this investigation included:

- EPA;
- Department of Industry – Lands and Water (formally NSW Office of Water, NSW Land and Property Information et al);
- Commonwealth Scientific and Industrial Research Organisation;
- Google Earth;
- Nearmap;
- Council; and
- Observations made in the field by SLR.

Field observations reported were made by a suitably experienced SLR environmental consultant (Craig Cowper). Observations made in the field were consistent with information viewed from relevant data provided by third parties during the desktop review.

SLR considers the data presented in this report is adequately complete, representative, reliable and accurate for the purpose of interpretation within the objectives of this project.

8 Conceptual Site Model

8.1 Historical and Current Land Use Activities

A review of available site history data and observations made during the site walkover indicated a history of potential localised land contaminating activities to have been undertaken on the Development Site, including:

- Demolition of buildings;
- Storage and handling of farming related chemicals and fuels;
- Livestock dips; and

- Livestock burial
- On-site sewage management systems

An assessment of observations made on site and anecdotal information provided indicates that the risk of unacceptable land contamination occurring as a result of building demolition, storage/handling of chemicals and fuels, livestock burial or the presence of sewage management systems is low and does not warrant further investigation.

SLR notes that 'sheep and cattle dips' is listed in Table 1 of DUAP (1998) as an activity that may cause contamination. A dip site typically refers to the sump, the draining platform, the disposal area for used dipping chemicals, sludge disposal area, the splash zone, the run out and/or sheep drying paddock, associated timber railings and posts, other yards/paddocks used to hold treated sheep, and dip chemical storage areas. Some or all of these can be associated with land contamination.

Further assessment of the identified sheep dip on the Development Site is considered warranted.

8.2 Receptors and Pathways

8.2.1 Proposed Land Use Scenario

The Development proposed for the Development Site comprises (in summary):

- four individual poultry farms, each comprising between 10 and 18 poultry sheds (total of 54 poultry sheds) and associated support/servicing infrastructure;
- eight new residential houses; and
- various other support/servicing infrastructure items.

Based on the proposed redevelopment concept and observed site conditions, it is therefore considered reasonable to adopt a 'residential with garden / accessible soil' land use scenario for initial screening purposes. This land use scenario is adopted from Section 2.2 in NEPC (1999).

8.2.2 Human Health – Direct Contact

It is considered appropriate to assess whether a sheep dip related direct contact exposure risk for future land users may be present on the Development Site.

8.2.3 Human Health – Vapour inhalation / Intrusion

Published guidance on sheep dip land contamination indicates that chemicals associated with sheep dip activities include arsenic, organochlorines, organophosphates, carbamates and synthetic pyrethroids. This chemical suite is not typically considered volatile in the context of land contamination and vapour inhalation / intrusion.

Further assessment of sheep dip related vapour inhalation / intrusion exposure risk for future land users at the Development Site is considered not warranted.

8.2.4 Aesthetics

Visual evidence of widespread or significant surficial staining or olfactory evidence of odours was not observed in the immediate vicinity of the sheep dip area. The potential for staining or odours to be present in sub surface soils (associated with vertical migration of sheep dip chemicals) should not be precluded.

Further assessment of sheep dip related aesthetics exposure risks is considered warranted.

8.2.5 Ecological – Terrestrial Ecosystems

NEPC (1999) requires a pragmatic risk-based approach should be taken in applying ecological investigation and screening levels in residential and commercial / industrial land use settings.

Evidence of phytotoxic stress in the area of the sheep dip was not observed in the vicinity of the sheep dip area. However, the potential for an unacceptable ecological terrestrial ecosystem impact to be present in sub surface soils should not be precluded.

Further assessment of unacceptable risk to terrestrial ecosystems is considered warranted.

8.2.6 Drinking Water

There are no registered groundwater bores in the vicinity of the sheep dip location, being used for drinking water purposes. However, there are bores (which do not appear to be registered) on the portion of the site where the sheep dip is located, that have been or may be used for domestic drinking water purposes.

Further assessment of this groundwater value at the site is considered warranted.

8.2.7 Recreational Water Use

The nearest hydraulically down gradient surface water for the site is considered to be Namoi River.

Namoi River may be suitable for primary and secondary recreational uses, however it is located a minimum of 2.3km from the location of the sheep dip. Given the localised nature of the potential contamination source, the nature of the contaminants of potential concern and the distance to the River, SLR considers it highly unlikely that sheep dip related contamination would migrate to Namoi River.

Further assessment of this groundwater value is considered not warranted.

8.2.8 Agricultural (Irrigation and Stock Watering)

There are groundwater bores on the Development Site registered for agricultural (stock) use. These are located at least 700m from the location of the sheep dip. Given the localised nature of the potential contamination source, the nature of the contaminants of potential concern and the distance to the bores, SLR considers it highly unlikely that sheep dip related contamination would migrate to these bores.

Further assessment of this groundwater value is considered not warranted.

8.2.9 Aquatic Ecosystems

The nearest likely aquatic ecosystem down gradient of the Development Site is the Namoi River, which is considered to be a freshwater aquatic environment and is located a minimum of approximately 2.3km from the location of the sheep dip. Given the localised nature of the potential contamination source, the nature of the contaminants of potential concern and the distance to the River, SLR considers it highly unlikely that sheep dip related contamination would migrate to Namoi River.

Further assessment of this groundwater value is considered not warranted.

9 Areas of Environmental Concern and Contaminants of Potential Concern

Based on the results of the desktop review and site walkover, SLR has identified one area of environmental concern (AEC) and associated contaminants of potential concern (COPC) for the Development Site. This AEC and associated COPC have been presented in **Table 3** and on **Figure 3**.

Table 3 Areas of Environmental Concern and Contaminants of Potential Concern

ID	AEC	Activity of Concern	Contaminants of Potential Concern
AEC01	Sheep yard west of residential dwelling at "Bundah".	Former sheep dip	Arsenic, organochlorine pesticides (OCP), organophosphate pesticides (OPP), carbamates and synthetic pyrethroids

10 Conclusions and Recommendations

Based on a review of the available desktop search data and observations made during the site walkover, SLR makes the following conclusions:

- An AEC has been identified for the Development Site (former sheep dip at Bundah) based on past and current land use activities;
- It is considered that the Development Site could be made suitable for the proposed redevelopment subject to the undertaking of targeted soil investigation addressing the AEC. The targeted soil investigation would only need to focus on the AEC and would likely involve the drilling of three soil boreholes with associated soil sampling and laboratory analysis for the COPC identified;
- Based on the nature of the COPC identified for the AEC, there are well established means of remediation and/or management that could be implemented to allow the Development to proceed, regardless of the findings of a targeted soil investigation; and
- Further site investigation works should be undertaken by a suitably experienced environmental consultant.

This report must be read in conjunction with the limitations set out in **Section 12** of this report.

11 References

National Environment Protection Council (NEPC) 1999, 'Schedule B(2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'.

NSW DUAP 1998 'Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land'

NSW OEH 2011, 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'.

12 Limitations

This report is for the exclusive use of ProTen Tamworth Pty Limited. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR Consulting.

This report has been prepared based on the scope of services (see below). SLR Consulting cannot be held responsible to the Client and/or others for any matters outside the agreed scope of services. Other parties should not rely upon this report and should make their own enquiries and obtain independent advice in relation to such matters.

This report has been prepared by SLR Consulting with reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected (data, surveys, analyses, designs, plans and other information), which has been accepted in good faith as being accurate and valid.

It should be noted that many investigations are based upon an assessment of potentially contaminating processes which may have occurred historically on the site. This assessment is based upon historical records associated with the site. Such records may be inaccurate, absent or contradictory. In addition documents may exist which are not readily available for public viewing.

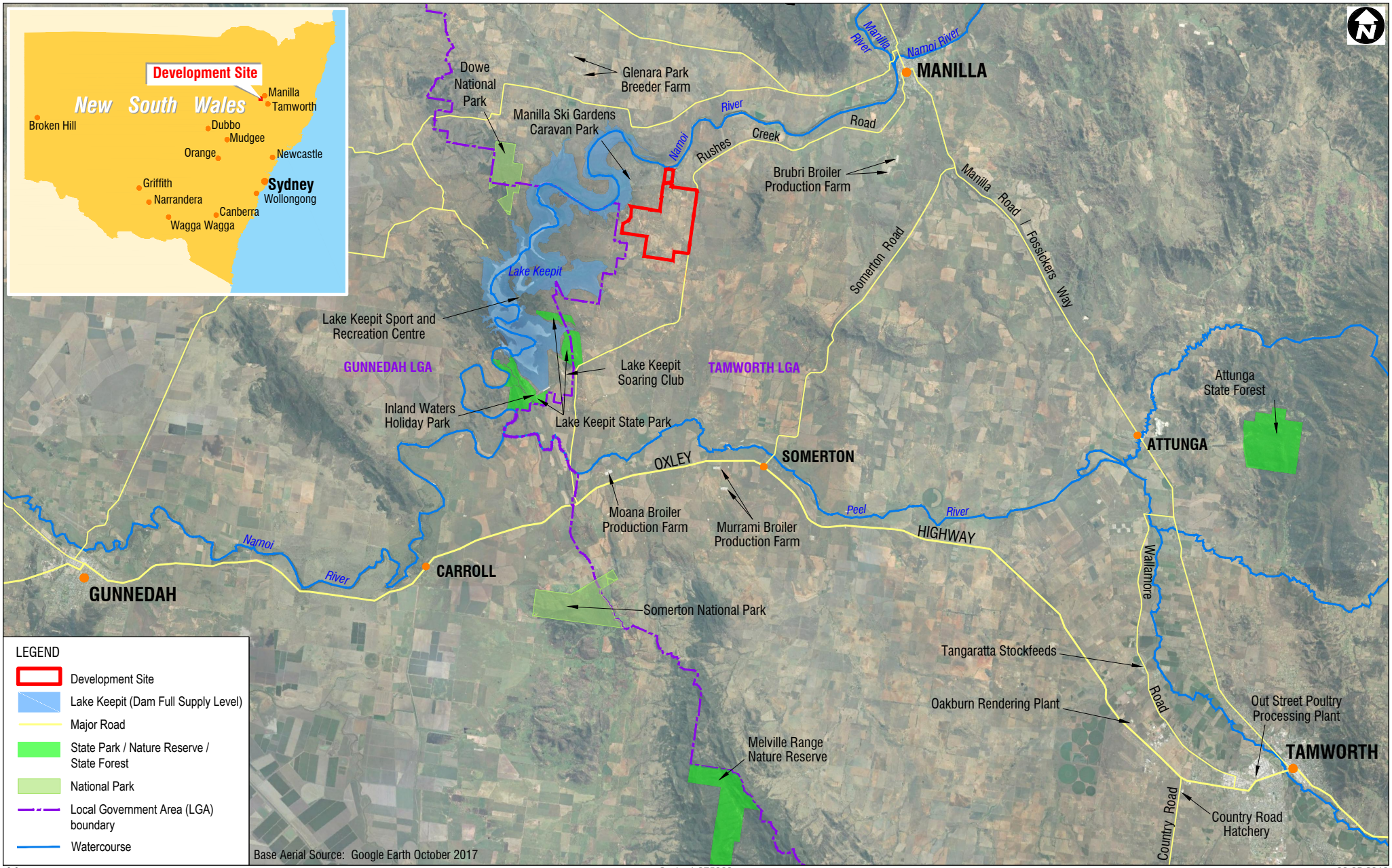
Except where it has been stated in this report, SLR Consulting has not verified the accuracy or completeness of the data relied upon. Statements, opinions, facts, information, conclusions and/or recommendations made in this report ("conclusions") are based in whole or part on the data obtained, those conclusions are contingent upon the accuracy and completeness of the data. SLR Consulting cannot be held liable should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to SLR Consulting leading to incorrect conclusions.

Should the report be reviewed for any reason, the report must be reviewed in its entirety and in conjunction with the associated Scope of Services. It should be understood that where a report has been developed for a specific purpose, for example a due diligence report for a property vendor, it may not be suitable for other purposes such as satisfying the needs of a purchaser or assessing contamination risks for classifying the site. The report should not be applied for any purpose other than that originally specified at the time the report was issued.

Report logs, figures, laboratory data, drawings, etc. are generated for this report by SLR consultants (unless otherwise stated) based on their individual interpretation of the site conditions at the time the site visit was undertaken. Although SLR consultants undergo training to achieve a standard of field reporting, individual interpretation still varies slightly. Information should not under any circumstances be redrawn for inclusion in other documents or separated from this report in any way.

APPENDIX A

Figures



H:\Projects-SLR\610-SrvSYD\610-SYD\610.17991 Rushes Creek Draft EIS QA\06 SLR Data\01 CADGIS\CADEIS CURRENT\SLR610.17991_FX-X_RegLoc_V3.dwg

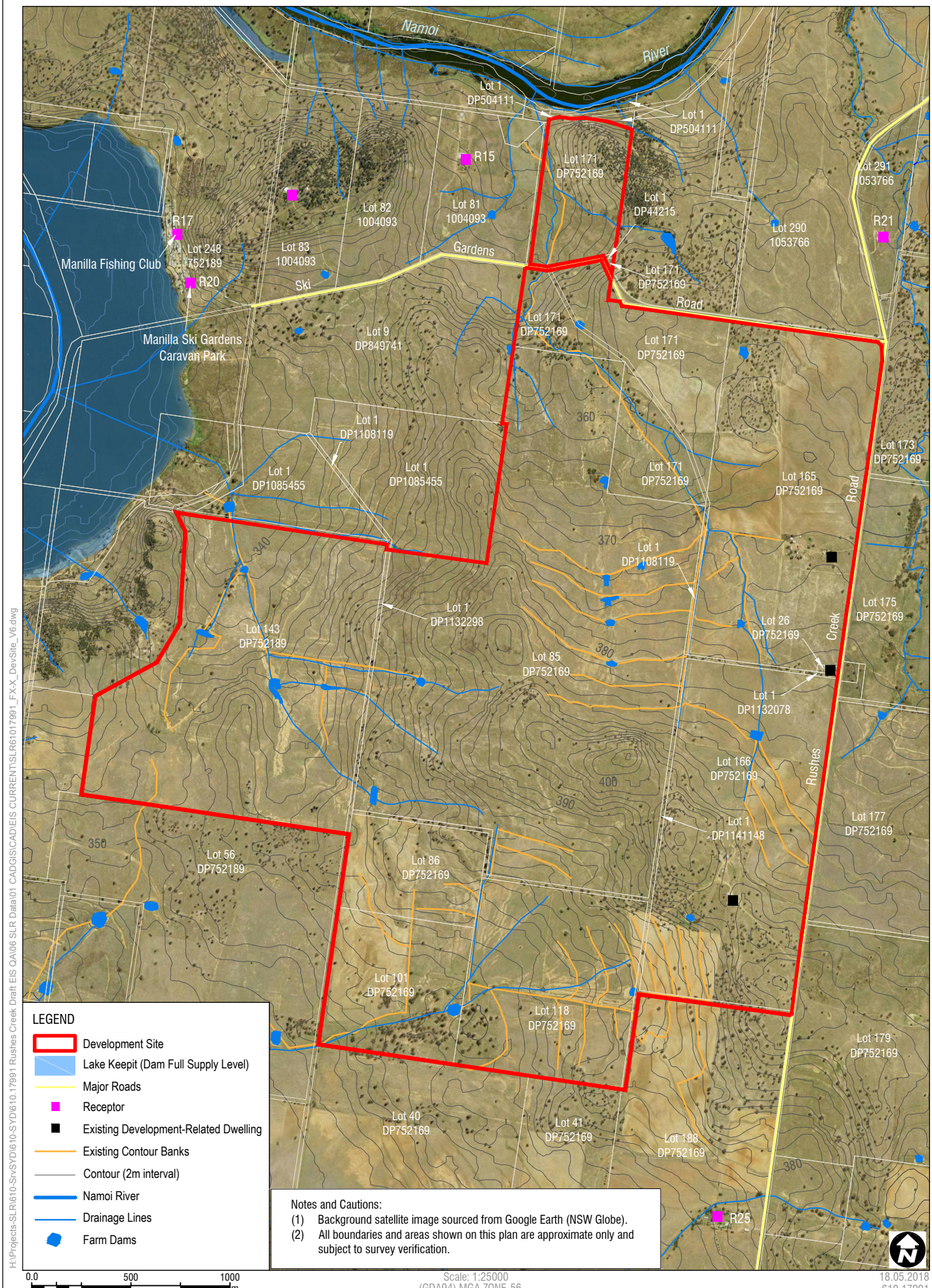
Scale: 1:275000
(GDA94) MGA Zone 56

08.05.2018
610.17991

SLR
www.slrconsultingaustralia.com.au PH: 61 2 4037 3200

Regional Locality

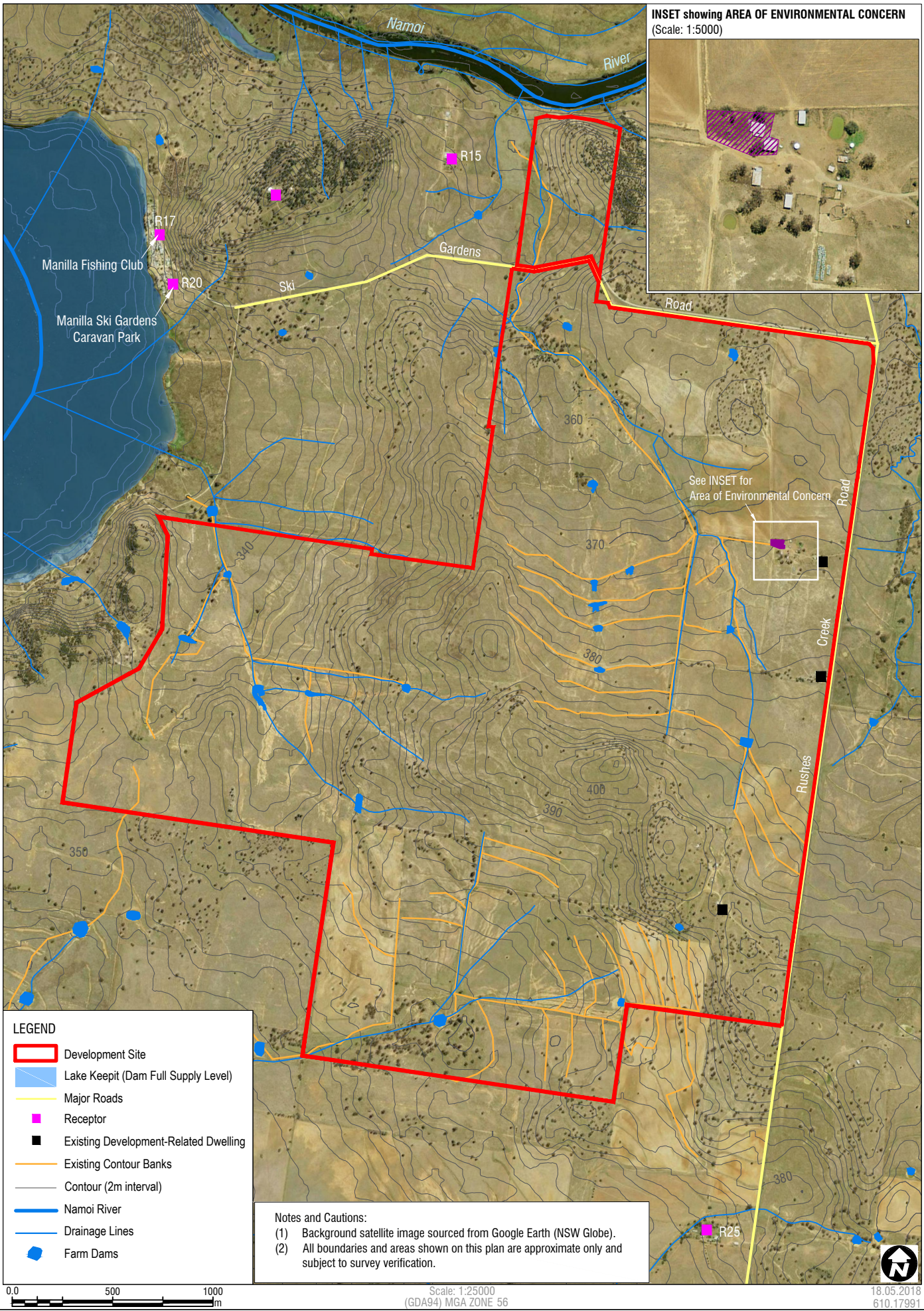
FIGURE 1



SLR
www.slrconsultingaustralia.com.au PH: 61 2 4037 3200

Site Layout

FIGURE 2



Area of Environmental Concern

SLR
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FIGURE 3

APPENDIX B

Groundwater

Department of Primary Industries Office of Water

All Groundwater
find a site
- All Groundwater Map
  - North Coast Region
  - Hunter Region
  - Greater Sydney Region
  - South Coast Region
  - Northwest Region
  - **Central West Region**
    - Lachlan River Basin
    - Castlereagh River Basin
    - Macquarie River Basin
  - Southwest Region
  - Far West Region
  - Great Artesian Basin
  - Coal Basins

All Groundwater > All Groundwater Map

Central West Region

All data times are Eastern Standard Time

Map

current site: GW902297

Scale = 1 : 27K | 150.576, -30.807 | 268092, 6589274, 56

NSW Office of Water
Work Summary

GW011498

Licence: 90BL004725 **Licence Status:** CONVERTED

Authorised Purpose(s): STOCK
Intended Purpose(s): NOT KNOWN

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/01/1954
Final Depth: 24.40 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: BUNDAH
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.002	165
Licensed:	DARLING	BALDWIN	Whole Lot //

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6588549.0
Easting: 270381.0
Latitude: 30°48'50.3"S
Longitude: 150°35'59.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing	Threaded Steel	0.00	24.40	152			Suspended in Clamps

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

***** End of GW011498 *****

NSW Office of Water
Work Summary

GW011958

Licence: 90BL004724 **Licence Status:** CONVERTED

Authorised Purpose(s): STOCK
Intended Purpose(s): NOT KNOWN

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/01/1956
Final Depth: 42.70 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: BUNDAH
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description: Hard
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.002	85
Licensed:	DARLING	BALDWIN	Whole Lot //

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6587869.0
Easting: 268880.0
Latitude: 30°49'11.3"S
Longitude: 150°35'02.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing		0.00	0.00				Suspended in Clamps

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)
42.70	42.70	0.00	(Unknown)	36.60					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

***** End of GW011958 *****

NSW Office of Water
Work Summary

GW014482

Licence: 90BL005820 **Licence Status:** CONVERTED

Authorised Purpose(s): STOCK,DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/08/1909
Final Depth: 53.60 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: HAPPY HILLS
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.002	166
Licensed:	DARLING	BALDWIN	Whole Lot //

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6586907.0
Easting: 269991.0
Latitude: 30°49'43.3"S
Longitude: 150°35'43.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing	Threaded Steel	0.00	1.80	127			
1	1	Casing	Threaded Steel	0.00	25.60	152			

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

***** End of GW014482 *****

NSW Office of Water
Work Summary

GW014483

Licence: 90BL005819 **Licence Status:** CONVERTED

Authorised Purpose(s): STOCK
Intended Purpose(s): STOCK

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/09/1946
Final Depth: 25.60 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: HAPPY HILLS
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.002	118
Licensed:	DARLING	BALDWIN	Whole Lot //

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6586327.0
Easting: 268780.0
Latitude: 30°50'01.3"S
Longitude: 150°34'57.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

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	1	Casing	Threaded Steel	0.00	1.80	152			

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

***** End of GW014483 *****

NSW Office of Water
Work Summary

GW967028

Licence: 90BL252504 **Licence Status:** CONVERTED

Authorised Purpose(s): STOCK
Intended Purpose(s): STOCK

Work Type: Bore
Work Status:
Construct.Method: Rotary - Percussion (Down Hole Hammer)
Owner Type:

Commenced Date:
Completion Date: 14/03/2005
Final Depth: 55.00 m
Drilled Depth: 55.00 m

Contractor Name: Mannion Drilling Pty Ltd
Driller: Leonard George Mannion
Assistant Driller:

Property: BUNDAH BUNDAH RUSHES CREEK ROAD MANILLA 2346
GWMA: -
GW Zone: -
Standing Water Level: 17.300
Salinity:
Yield: 1.250

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.2	171 752169
Licensed:	DARLING	BALDWIN	Whole Lot 171//752169

Region: 90 - Barwon
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6588995.0
Easting: 269648.0
Latitude: 30°48'35.3"S
Longitude: 150°35'31.9"E

GS Map: -
MGA Zone: 0
Coordinate Source: Map Interpretation

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	55.00	152			Rotary - Percussion (Down Hole Hammer)
1	1	Casing	Pvc Class 9	-0.30	55.00	152	138		Seated on Bottom, Glued
1	1	Opening	Slots - Vertical	49.00	55.00	152		1	Casing - Hand Sawn Slot, PVC Class 9, SL: 200.0mm, A: 3.00mm

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)
45.00	45.30	0.30	Unknown	17.30		0.12			
47.00	48.00	1.00	Unknown	17.30		0.50			
51.00	52.00	1.00	Unknown	17.30		0.63		01:00:00	

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

0.00	0.30	0.30	topsoil	Topsoil	
0.30	2.00	1.70	blacksoil	Invalid Code	
2.00	5.00	3.00	clay	Clay	
5.00	15.00	10.00	shale/brown	Shale	
15.00	40.00	25.00	basalt/blue	Basalt	
40.00	43.00	3.00	limestone	Invalid Code	
43.00	45.00	2.00	basalt/blue	Basalt	
45.00	45.30	0.30	water bearing	Invalid Code	
45.30	47.00	1.70	basalt/blue	Basalt	
47.00	48.00	1.00	water bearing	Invalid Code	
48.00	51.00	3.00	basalt/blue	Basalt	
51.00	52.00	1.00	water bearing	Invalid Code	
52.00	55.00	3.00	basalt/blue	Basalt	

Remarks

14/03/2005: Form A Remarks:
Sump Installed from 52m to 55m
1m of Steel Casing Protector cemented in place

***** End of GW967028 *****

NSW Office of Water
Work Summary

GW967889

Licence: 90BL253750 **Licence Status:** CONVERTED

Authorised Purpose(s): STOCK,DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore
Work Status:
Construct.Method: Rotary - Percussion (Down Hole Hammer)
Owner Type:

Commenced Date:
Completion Date: 17/01/2007
Final Depth: 67.00 m
Drilled Depth: 67.00 m

Contractor Name: GEORGE MANNION DRILLING
Driller: Randall George Mannion
Assistant Driller:

Property: BUNDAH RUSHES CREEK ROAD MANILLA 2346
GWMA: 024 - MISCELLANEOUS FRACTURED ROCK OF THE BARWON REGION
GW Zone: -
Standing Water Level: 14.000
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.2	165 752169
Licensed:	DARLING	BALDWIN	Whole Lot 165//752169

Region: 90 - Barwon
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6588462.0
Easting: 270236.0
Latitude: 30°48'53.0"S
Longitude: 150°35'53.5"E

GS Map: -
MGA Zone: 0
Coordinate Source: Map Interpretation

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	67.00	152			Rotary - Percussion (Down Hole Hammer)
1	1	Casing	Pvc Class 9	-0.30	67.00	152			Seated on Bottom, Glued
1	1	Opening	Slots - Vertical	59.00	65.00	152		1	Casing - Hand Sawn Slot, PVC Class 9, SL: 200.0mm, A: 0.30mm

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)
62.40	63.00	0.60	Unknown	14.00	62.00			02:00:00	

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

0.00	0.30	0.30	topsoil	Topsoil	
0.30	0.90	0.60	clay	Clay	
0.90	11.30	10.40	shale	Shale	
11.30	62.40	51.10	basalt	Basalt	
62.40	63.00	0.60	water bearing basalt	Invalid Code	
63.00	67.00	4.00	basalt	Basalt	

Remarks

***** End of GW967889 *****

NSW Office of Water
Work Summary

GW970840

Licence: 90WA832517 **Licence Status:** CURRENT

Authorised Purpose(s): STOCK,DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 30/04/2014
Final Depth: 36.50 m
Drilled Depth: 36.50 m

Contractor Name: GEORGE MANNION DRILLING
Driller: Randall George Mannion
Assistant Driller: James Mannion

Property: Happy Hills 1788 Rushes Creek Rd Manilla 2346
GWMA:
GW Zone:
Standing Water Level: 24.600
Salinity:
Yield: 0.450

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	DARLI	DARLI.2	166//752169
Licensed:			

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9036-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6587048.0
Easting: 270004.0
Latitude: 30°49'38.8"S
Longitude: 150°35'43.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: GPS - Global Positioning System

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	1.80	220			Rotary Air
1		Hole	Hole	1.80	36.50	165			Down Hole Hammer
1	1	Casing	Pvc Class 9	-0.30	36.50	152	140		Seated on Bottom, Screwed and Glued, S: 34.10-36.50m
1	1	Opening	Slots - Vertical	31.50	36.00	152		1	Mechanically Slotted, PVC Class 9, Screwed and Glued, SL: 200.0mm, A: 3.00mm

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)
33.50	34.10	0.60	Unknown	24.60		0.45		01:00:00	

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

0.00	0.30	0.30	Topsoil	Topsoil	
0.30	1.65	1.35	Shale; brown	Shale	
1.65	33.50	31.85	Basalt; blue	Basalt	
33.50	34.10	0.60	Basalt; water bearing	Basalt	
34.10	36.50	2.40	Basalt; blue	Basalt	

Remarks

30/04/2014: Form A Remarks:
Nat Carling, 11-June-2014; GPS provided by the drillers.

***** End of GW970840 *****

APPENDIX C

Titles

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

LPI **Sydney**

Address: - Rushes Creek Road, Rushes Creek

Description: -

Lot 1 D.P. 44215	**Lot 9 D.P. 849741**
Lot 1 D.P. 1085455	**Lot 1 D.P. 1108119**
Lot 1 D.P. 1132298	**Lots 26, 85, 86 & 101 D.P. 752169**
Lots 118, 165, 166 & 171 D.P. 752169 (Excluding Lot 1 D.P. 504111 from Lot 171, also excluding parts in Road Plan 31470-1603)	**Lot 143 D.P. 752189**
Lot 1 D.P. 1132078	**Lot 1 D.P. 1141148**

As regards Lot 143 D.P. 752189

The early title to this land is Crown Tenure, we are aware of the following events: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
07.11.1901 (1901 to 1932)	Michael John Brady (Farmer)	Homestead Selection 1901/10 Now Conditional Lease 1924/5
30.05.1932 (1932 to 1948)	Godfrey Anthony Doring (Farmer)	Conditional Lease 1924/5 (Book 1646 No. 64)
05.08.1948 (1948 to 1959)	Page Henry Pilon (Grazier)	Conditional Lease 1924/5 (Book 2094 No. 676)
10.11.1959 (1959 to 1969)	Pearl Pilon (Widow)	Conditional Lease 1924/5 (Book 2521 No. 849)
25.06.1964 (1964 to 1969)	Charles Henry Pilon Meryl Martha Cornelia Pilon (Married Woman) (The title derivation to this land seems to be identical to the land to the south – Lot 56 D.P. 752189)	Conditional Lease 1924/5
29.10.1969 (1969 to 1973)	Robert Bede Newbigging (Farmer) Judith Anne Newbigging (Married Woman)	Conditional Lease 1924/5
13.04.1973 (1973 to 1990)	John Douglas Moy (Farmer) Helen Frances Moy (Married Woman)	Conditional Lease 1924/5 Now 143/752189
21.12.1990 (1990 to 2004)	Raymond John Doyle (Farmer & Grazier)	143/752189
02.12.2004 (2004 to date)	# Raymond Andrew Doyle	143/752189

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

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(Ph: 0412 199 304)

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Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards Lots 86, 101 & 118 D.P. 752169

The early title to these lands is Crown Tenure, we are aware of the following events: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
28.12.1910 (1910 to 1953)	William Charles Moy (Farmer) (& His deceased estate)	Conditional Lease 1910/40
05.06.1953 (1953 to 1967)	Henry Amos Moy (Farmer)	Conditional Lease 1910/40
23.03.1967 (1967 to 1992)	John Douglas Moy (Farmer) Helen Frances Moy (Married Woman)	Conditional Lease 1910/40 Now 86/752169, 101/752169 & 118/752169
10.02.1992 (1992 to 2006)	Stephen Douglas Woods Leah Woods (Married Woman)	86/752169, 101/752169 & 118/752169
27.03.2006 (2006 to date)	# Stephen Charles McCrae # Margaret Joy McCrae	86/752169, 101/752169 & 118/752169

# Denotes Current Registered Proprietors

Easements & Leases: - NIL

As regards Lot 166 D.P. 752169

The early title to this land is Crown Tenure, we are aware of the following events: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
28.12.1910 (1910 to 1953)	William Charles Moy (Farmer) (& His deceased estate)	Conditional Lease 1910/219 Now Vol 5225 Fol 150
22.09.1951 (1951 to 1953)	Thomas Scott Bell (Farmer) (? Executor of the Will of William Charles Moy)	Vol 5225 Fol 150
05.06.1953 (1953 to 1967)	Henry Amos Moy (Farmer)	Vol 5225 Fol 150
23.03.1967 (1967 to 1992)	John Douglas Moy (Farmer) Helen Frances Moy (Married Woman)	Vol 5225 Fol 150 Now 166/752169
10.02.1992 (1992 to 2006)	Stephen Douglas Woods Leah Woods (Married Woman)	166/752169
27.03.2006 (2006 to date)	# Stephen Charles McCrae # Margaret Joy McCrae	166/752169

# Denotes Current Registered Proprietors

Easements & Leases: - NIL

---

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Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards Lot 85 D.P. 752169

The early title to this land is Crown Tenure, we are aware of the following events: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
19.07.1909 (1909 to 1929)	George Coote (Grazier)	Additional Conditional Purchase 1909/254 (Book 888 No. 622)
30.03.1929 (1929 to 1946)	David Ernest Boyton Grazier)	Additional Conditional Purchase 1909/254 (Book 1560 No. 781) Now Vol 5896 Fol 238
15.08.1946 (1946 to 1950)	Bruce Charters Adams (Grazier)	Vol 5896 Fol 238
04.05.1950 (1950 to 1953)	Andrew William Briggs (Grazier)	Vol 5896 Fol 238
06.08.1953 (1953 to 1954)	Ian Douglas Southwell (Farmer & Grazier)	Vol 5896 Fol 238
13.01.1954 (1954 to 1964)	Theodore George Tomlinson (Farmer & Grazier)	Vol 5896 Fol 238
12.02.1964 (1964 to 1984)	Raymond John Doyle (Farmer & Grazier)	Vol 5896 Fol 238 Now Vol 9747 Fol 3
13.03.1984 (1984 to 1986)	Raymond Andrew Doyle	Vol 9747 Fol 3
25.11.1986 (1986 to Date)	# Raymond John Doyle (Farmer & Grazier)	Vol 9747 Fol 3 Now 85/752169

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

As regards Lots 165 & 171 D.P. 752169 (excluding Lot 1 D.P. 504111 and parts resumed for road – Road Plan 31470-1603)

The early title to these lands is Crown Tenure, we are aware of the following events: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
07.01.1911 (1911 to 1929)	George Coote (Grazier)	Conditional Purchase 1911/4
30.03.1929 (1929 to 1946)	David Ernest Boyton Grazier)	Conditional Purchase 1911/4 (Book 1563 No. 41) Now Vol 5831 Fol 175
15.08.1946 (1946 to 1950)	Bruce Charters Adams (Grazier)	Vol 5831 Fol 175
04.05.1950 (1950 to 1953)	Andrew William Briggs (Grazier)	Vol 5831 Fol 175
06.08.1953 (1953 to 1954)	Ian Douglas Southwell (Farmer & Grazier)	Vol 5831 Fol 175

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Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Search continued as regards Lots 165 & 171 D.P. 752169 (excluding Lot 1 D.P. 504111 and parts resumed for road – Road Plan 31470-1603)

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
13.01.1954 (1954 to 1964)	Theodore George Tomlinson (Farmer & Grazier)	Vol 5831 Fol 175
12.02.1964 (1964 to 1984)	Raymond John Doyle (Farmer & Grazier)	Vol 5831 Fol 175 Now Vol 9747 Fol 4
13.03.1984 (1984 to 1986)	Raymond Andrew Doyle	Vol 9747 Fol 4
25.11.1986 (1986 to Date)	# Raymond John Doyle (Farmer & Grazier)	Vol 9747 Fol 4 Now Auto Consol 9747-4

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

As regards Lot 26 D.P. 752169

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
28.09.1923 (1923 to 1957)	George Coote (Grazier)	Vol 3511 Fol 203
28.06.1957	Resumed by the Crown of Land and reserved from sale or lease	
01.11.1957	Dedicated for Public Hall	
09.12.1977	Revocation of Dedication	
22.10.1979 (1979 to 2003)	Harold Paul Jackson	Vol 13963 Fol 204 Now 26/752169
15.11.2003 (2003 to 2006)	Istvan Olah Stephen Olah	26/752169
14.07.2006 (2006 to date)	# Istvan Olah	26/752169

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

---

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Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards Lot 1 D.P. 1085455

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
18.12.1923 (1923 to 1929)	George Coote (Grazier)	Vol 3539 Fol 219
30.03.1929 (1929 to 1946)	David Ernest Boyton Grazier)	Vol 3539 Fol 219 Now Vol 5857 Fol 222
15.08.1946 (1946 to 1950)	Bruce Charters Adams (Grazier)	Vol 5857 Fol 222
04.05.1950 (1950 to 1953)	Andrew William Briggs (Grazier)	Vol 5857 Fol 222
06.08.1953 (1953 to 1954)	Ian Douglas Southwell (Farmer & Grazier)	Vol 5857 Fol 222
13.01.1954 (1954 to 1964)	Theodore George Tomlinson (Farmer & Grazier)	Vol 5857 Fol 222 Now Vol 8466 Fol 235
12.02.1964 (1964 to 1984)	Raymond John Doyle (Farmer & Grazier)	Vol 8466 Fol 235
13.03.1984 (1984 to 1986)	Raymond Andrew Doyle	Vol 8466 Fol 235
25.11.1986 (1986 to Date)	# Raymond John Doyle (Farmer & Grazier)	Vol 8466 Fol 235 Now 1/1085455

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

As regards Lot 9 D.P. 849741

As regards the part numbered (1) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
01.10.1926 (1926 to 1929)	George Coote (Grazier)	Vol 3917 Fol 227
30.03.1929 (1929 to 1946)	David Ernest Boyton Grazier)	Vol 3917 Fol 227 Now Vol 5857 Fol 223
15.08.1946 (1946 to 1950)	Bruce Charters Adams (Grazier)	Vol 5857 Fol 223
04.05.1950 (1950 to 1953)	Andrew William Briggs (Grazier)	Vol 5857 Fol 223
06.08.1953 (1953 to 1954)	Ian Douglas Southwell (Farmer & Grazier)	Vol 5857 Fol 223
13.01.1954 (1954 to 1964)	Theodore George Tomlinson (Farmer & Grazier)	Vol 5857 Fol 223
12.02.1964 (1964 to 1984)	Raymond John Doyle (Farmer & Grazier)	Vol 5857 Fol 223

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Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Search continued as regards the part numbered (1) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
13.03.1984 (1984 to date)	# Raymond Andrew Doyle	Vol 5857 Fol 223 Now 9/849741

# Denotes Current Registered Proprietor

As regards the part numbered (2) on the attached cadastre

The early title to this part is Crown Tenure, we are aware of the following events: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
12.10.1910 (1910 to 1925)	James Scanlon (Farmer)	Conditional Purchase 1910/158
22.12.1925 (1925 to 1927)	Roy Thomas Vickery Searles (Farmer)	Conditional Purchase 1910/158 (Book 1413 No. 927)
09.02.1927 (1927 to 1929)	Colin john Gardner (Farmer)	Conditional Purchase 1910/158 (Book 1460 No. 60)
24.05.1929 (1929 to 1933)	Robert Allan Parker (Farmer) James Leslie Parker 9Farmer)	Conditional Purchase 1910/158 (Book 1567 No. 344)
30.12.1933 (1933 to 1937)	Samuel Gilbert Best (Farmer)	Conditional Purchase 1910/158 (Book 1689 No. 64)
08.05.1937 (1937 to 1951)	Stanley James Brines (Farmer)	Conditional Purchase 1910/158 (Book 1791 No. 595)
04.12.1951 (1951 to 1994)	Charles Greer Johnston (Grazier) (& his deceased estate)	Conditional Purchase 1910/158 (Book 2207 No. 521) Now Vol 8406 Fol 64
26.11.1976 (1976 to 1989)	Lillian May Johnston (Widow) Winnifred Elizabeth Gardner (Married Woman) (Executors of the Will of Charles Greer Johnston)	Vol 8406 Fol 64
15.03.1989 (1989 to 1994)	Winnifred Elizabeth Gardner (Married Woman)	Vol 8406 Fol 64 Now 98/752189
09.08.1994 (1994 to 1994)	Edward Mark Leyden Scott Civil Gardner Greer Elizabeth Rushby (Executors of the Will of Winnifred Elizabeth Gardner)	98/752189
01.11.1994 (1994 to 1995)	Scott Civil Gardner	98/752189 Now 9/849741
19.06.1995 (1995 to date)	# Raymond John Doyle (Farmer & Grazier)	9/849741

# Denotes Current Registered Proprietor

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards the part numbered (3) on the attached cadastre

This part was formerly a Crown Road subsequently closed by notification in Government Gazette dated 29.03.1968 -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
26.07.1968 (1968 to 1994)	Charles Greer Johnston (Grazier) (& his deceased estate)	Vol 10832 Fol 185
02.08.1989 (1989 to 1994)	Winnifred Elizabeth Gardner (Married Woman) (Transmission Application not investigated)	Vol 10832 Fol 185 Now 1/128144
09.08.1994 (1994 to 1994)	Edward Mark Leyden Scott Civil Gardner Greer Elizabeth Rushby (Executors of the Will of Winnifred Elizabeth Gardner)	1/128144
01.11.1994 (1994 to 1995)	Scott Civil Gardner	1/128144 Now 9/849741
19.06.1995 (1995 to date)	# Raymond John Doyle (Farmer & Grazier)	9/849741

# Denotes Current Registered Proprietor

Easements & Leases as regards the whole of Lot 9 D.P. 849741: - NIL

As regards Lot 1 D.P. 44215

This part was formerly a road closed by notification in Government Gazette dated 10.10.1969

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
19.01.1984 (1984 to date)	# Raymond John Doyle (Farmer & Grazier)	Vol 15183 Fol 173 Now 1/44215

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

As regards Lot 1 D.P. 1108119

This part was formerly a road closed by notification in Government Gazette dated 25.05.2007

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
23.07.2007 (2007 to date)	# Raymond John Doyle (Farmer & Grazier)	1/1108119

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

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scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards Lot 1 D.P. 1132298

This part was formerly a road closed by notification in Government Gazette dated 12.12.2008

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
19.01.2009 (2009 to date)	# Raymond Andrew Doyle	1/1132298

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

As regards Lot 1 D.P. 1132078

This part was formerly a road closed by notification in Government Gazette dated 05.12.2008

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
20.01.2009 (2009 to date)	# Istvan Olah	1/1132078

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

As regards Lot 1 D.P. 1141148

This part was formerly a road closed by notification in Government Gazette dated 23.04.2010

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
12.05.2010 (2010 to date)	# Stephen Charles McCrae # Margaret Joy McCrae	1/1141148

# Denotes Current Registered Proprietor

Easements & Leases: - NIL

Yours Sincerely
Mark Groll
13 October 2016

Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 166 DP 752169

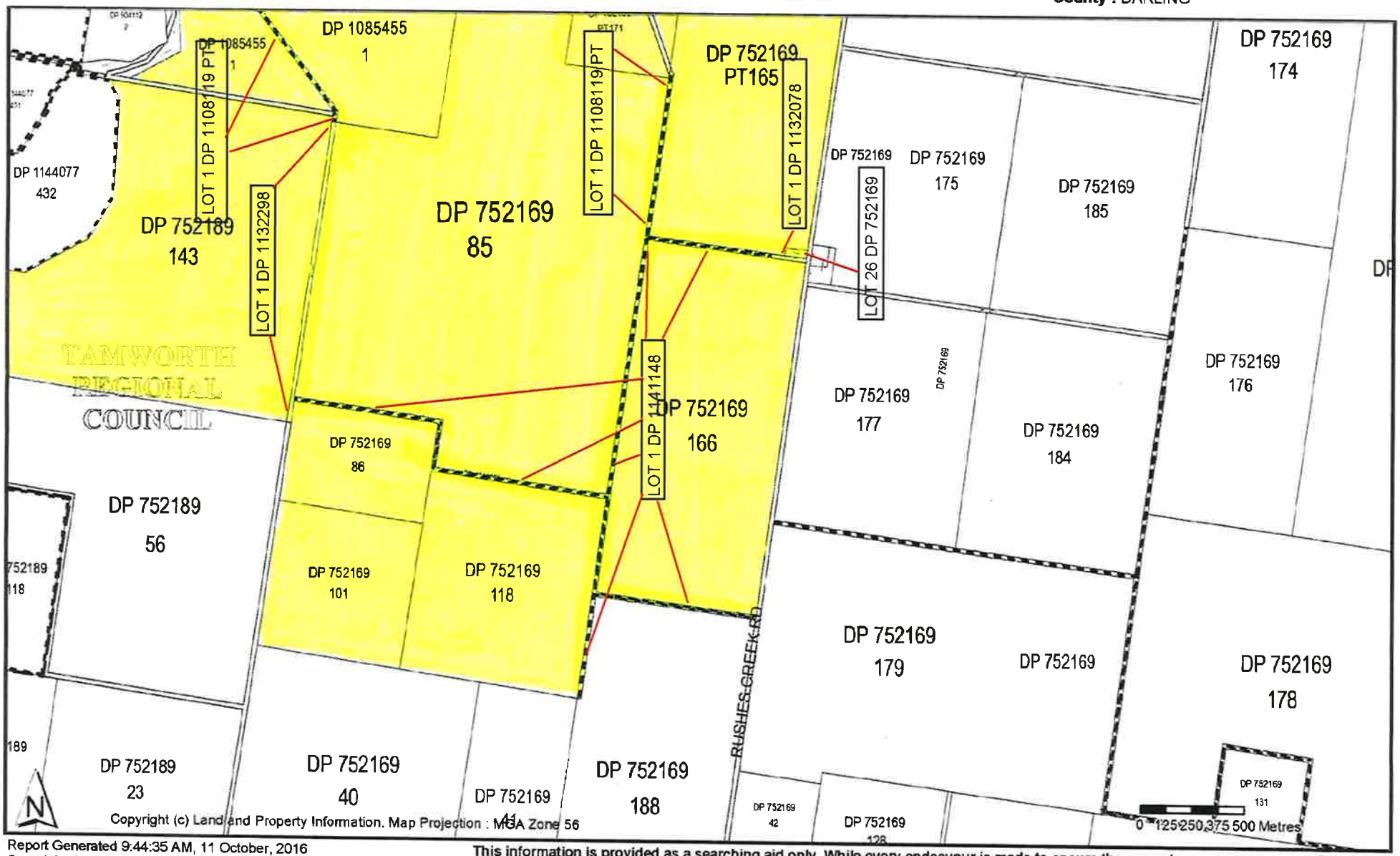
Identified Parcel : Lot 166 DP 752169

Locality : RUSHES CREEK

LGA : TAMWORTH REGIONAL

Parish : BALDWIN

County : DARLING



Copyright (c) Land and Property Information. Map Projection : MGA Zone 56

Report Generated 9:44:35 AM, 11 October, 2016

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 85 DP 752169

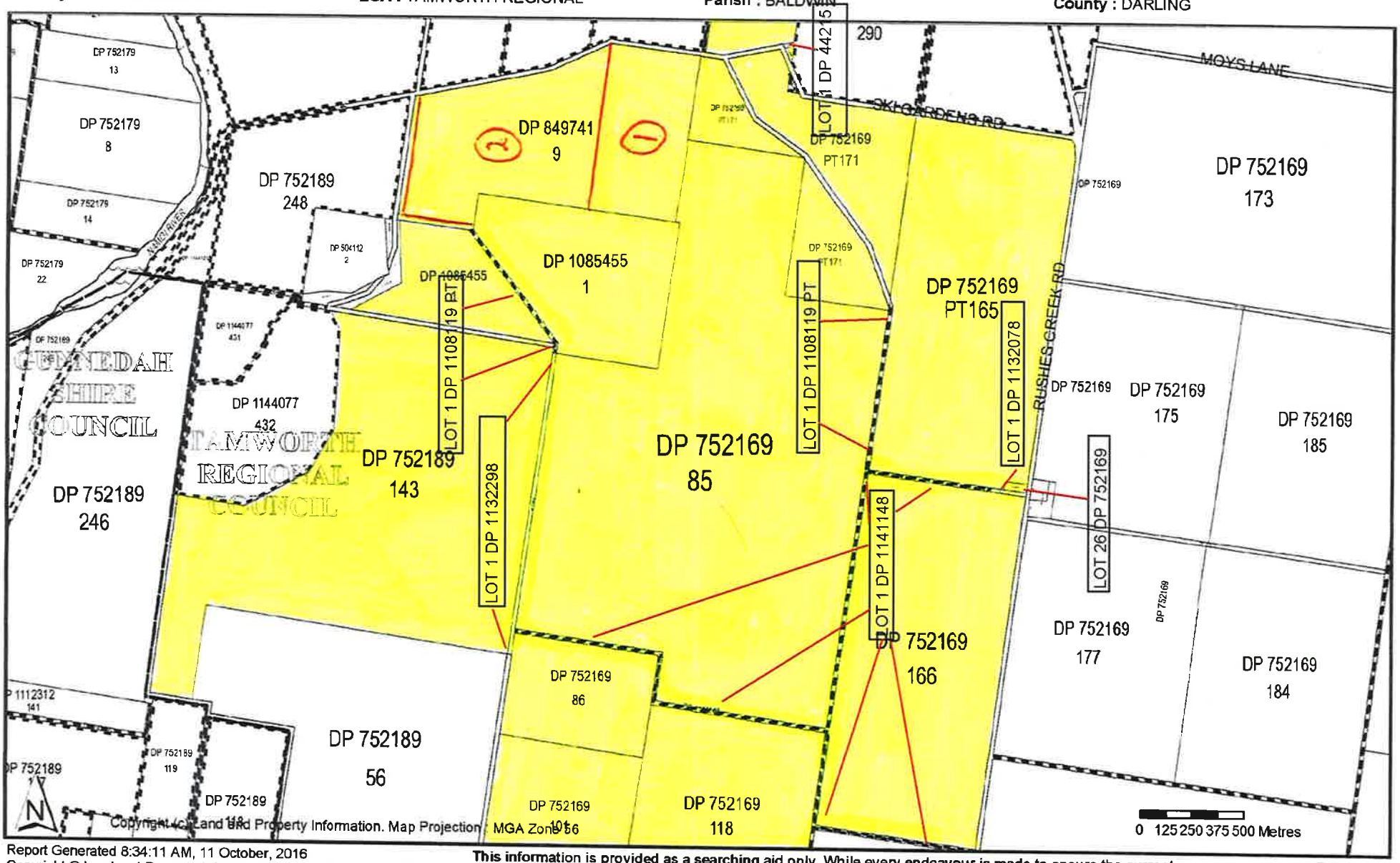
Identified Parcel : Lot 85 DP 752169

Locality : RUSHES CREEK

LGA : TAMWORTH REGIONAL

Parish : BALDWIN

County : DARLING



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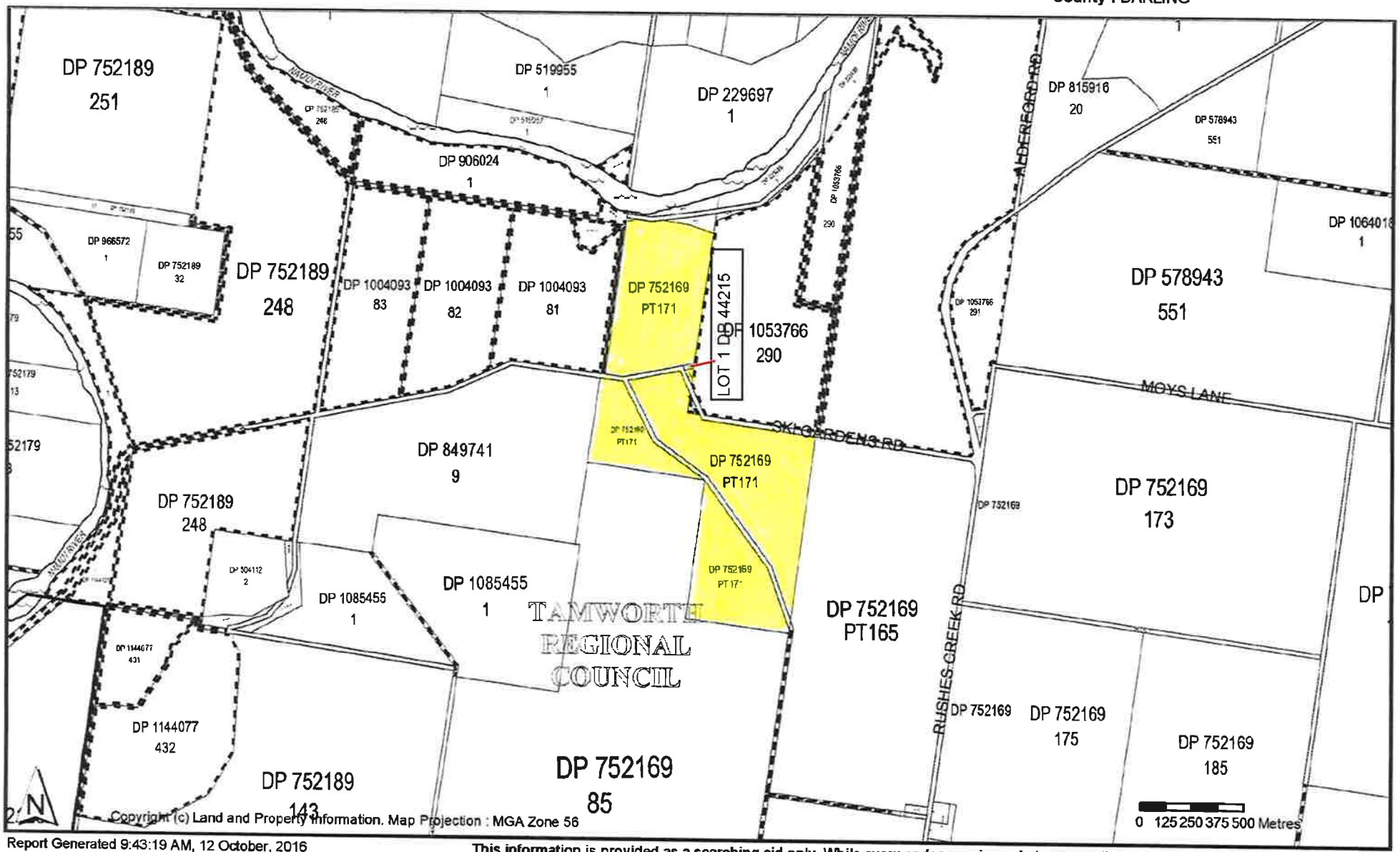
This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

NSW Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 171 DP 752169 **Identified Parcel** : Lot 171 DP 752169

Locality : RUSHES CREEK **LGA** : TAMWORTH REGIONAL **Parish** : BALDWIN **County** : DARLING



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This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

33439

Within Keepit Catchment Area, Notified 5th October 1945, under the Soil Conservation Act, 1938.

PLAN

of 1 portion No 118

Parish of Baldwin

COUNTY OF DARLING

Applied for under the 21st clause of the Crown Lands Alienation Act of 1861 by

James Coolahan

~~CP 77.74 15 Feb. 1877 forfeited vide Gaz. 5th Nov. 80~~

~~Forfeiture of CP77.74 Reversed Oct. vide 81-4244...~~

Por. 118 proposed to be surrendered under Sec. 47 C. L. A. of 1895 vide Aln 02.2612

118 ... 03.15401

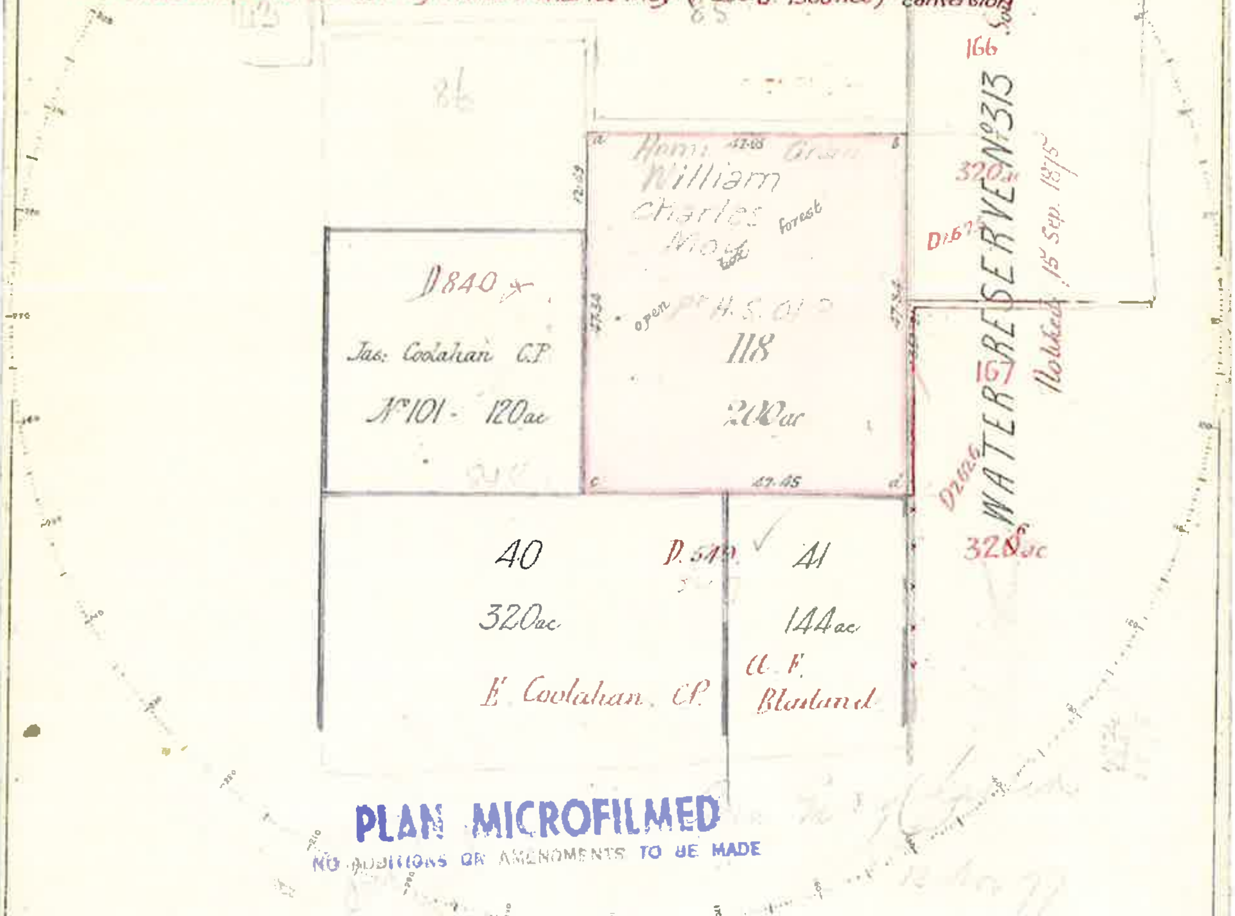
118 declared to be Crown Lands, vide Gaz. 13th July '04
not removed

and improvements ... to the Crown, vide Aln 03.15403

Por 118 part H.S. 01.3 of 723ac William Charles Moy added under Sec 47 Vide Gaz 13th July '04

now Hom Grant vide C.S. 07.19671 see also D. 840, 2203 & 2625

Por. 118 Pt CL. 1910-40 Decr 28th by William Charles Moy (Sec. 3. 1908 Act) conversion



PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE

Reference to Corners

Corner	Bearing	From	Links	No on Tree
a	S 40° 42 E	Box	·24	113
b	N 70° 13 E	Iron bark	·55	113
c	S 17° 6 W	Box	·17	101 - 113
d	S 6° 15 W	Ironbark	·52	40 - 113

Reference to Traverse

Line	Bearing	Distance

Scale 20 Chains to an Inch.

Marked in accordance with regulations
Instrument used in Survey Theodolite
Date of Survey 7th & 8th May 1877
Value of Improvements Nil
Situated in the Keepit Run

a/c 17.15. Con. e plan 1/13 24/...

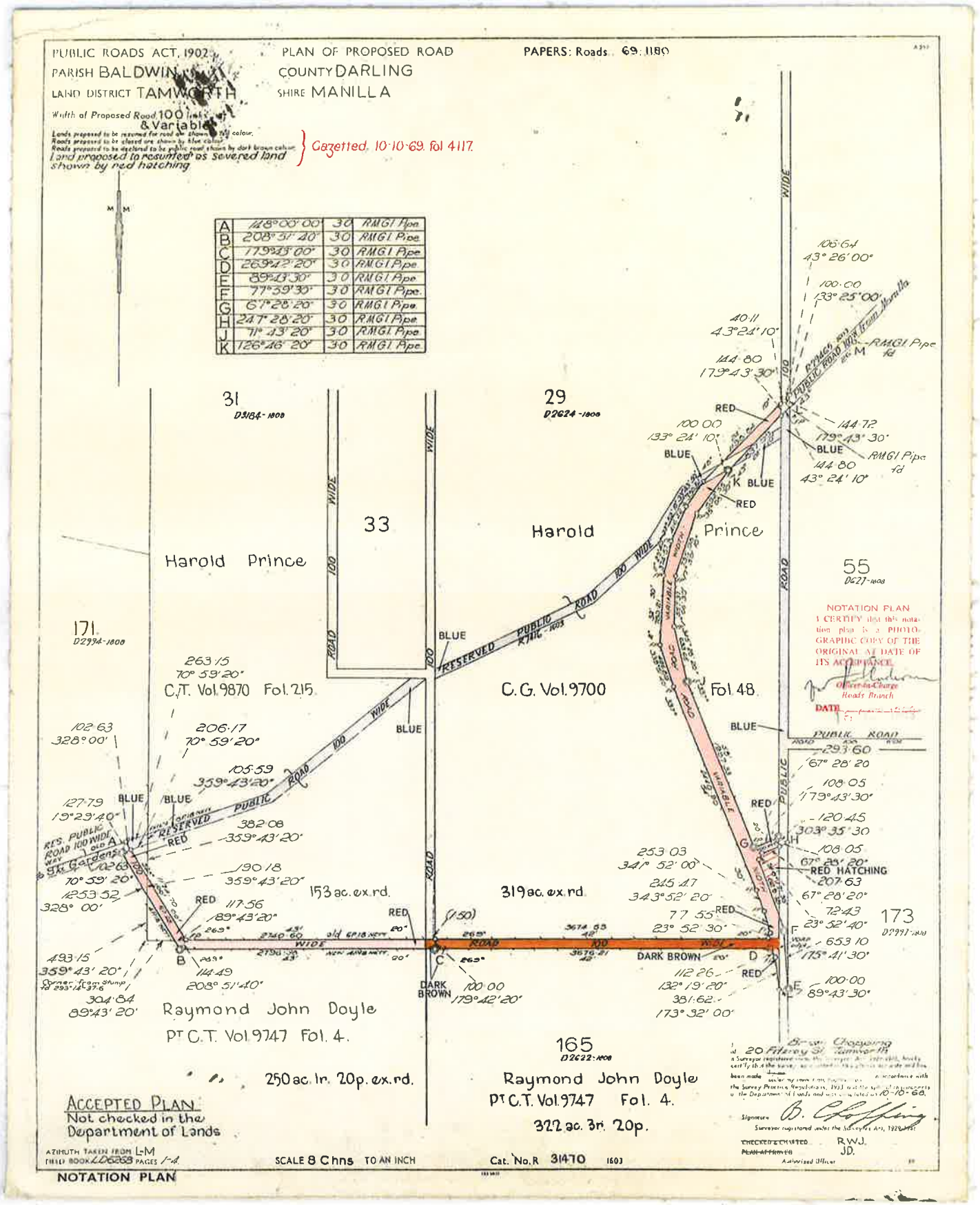
Plan accepted 29 Nov 77 WBD

Transmitted to the Surveyor General with my letter of the 30th August No 77/53

George Brown
Licensed Surveyor

971-1808

971



NEW SOUTH WALES

CROWN GRANT

No. 88003

14497118

Vol. 14497 Fol. 118
Registered 24-8-1981

Registrar General

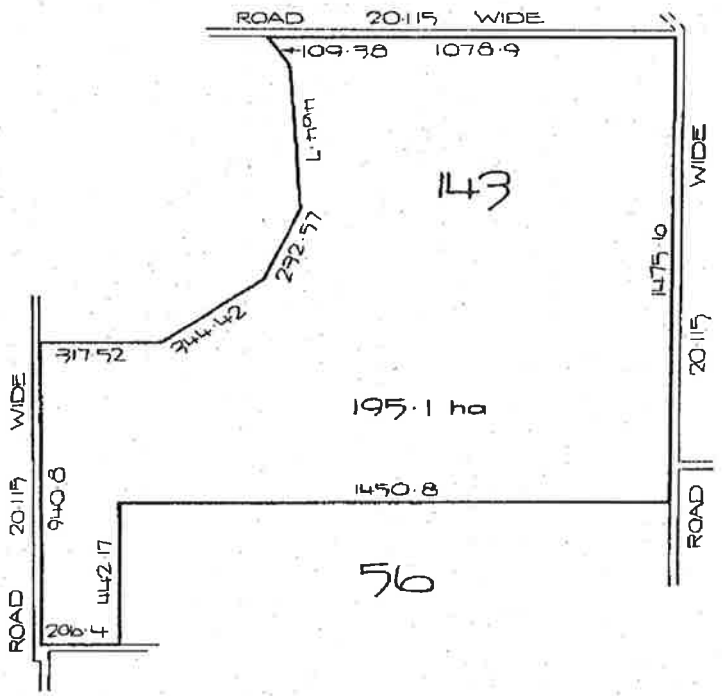
We, Elizabeth the Second, by the Grace of God Queen of Australia and Her other Realms and Territories, Head of the Commonwealth, do hereby grant to the person described in the First Schedule a Lease in Perpetuity in the land within described, subject nevertheless to such reservations, conditions and other provisions as are shown in the Second Schedule. In testimony whereof We have caused this Our Grant to be sealed with the seal of Our said State

Witness Our Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this fourteenth day of August in the thirtieth year of Our Reign and in the year of Our Lord one thousand nine hundred and eighty one.

Governor

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



CANCELLED

SEE AUTO FOLIO

PL

LAND REFERRED TO

P Portion 143 in the Shire of Gunnedah Parish of Keepit and County of Darling.

FIRST SCHEDULE

BANK OF NEW SOUTH WALES. Mortgagee

GSC

SECOND SCHEDULE

1. The reservation and exception unto Us Our Heirs and Successors of all minerals, land for public ways, and rights and powers in respect thereof and the provision for forfeiture as more fully set out in memorandum filed as No. Q400000.

2. The provisions of the Crown Lands Acts and Regulations thereunder in respect of Conditional Leases and in particular that the Grantee and his Assigns shall pay for the said land an annual rent of forty six dollars twenty cents as determined in due course of law or such other rent as may from time to time be so determined (provided always that such rent shall not be less than the minimum for the time being provided under the said Acts) to our Treasurer or such other officer in Our said State as may from time to time be appointed for that purpose on such day or days in each year as may from time to time be determined in due course of law.

RX 3. Q1P Caveat by the Registrar General. Mortgage dated 16-3-1973: mortgagors John Douglas Moy and Helen Frances Moy.

AA 4. Perpetual Lease Grant (C.L. 1924/5 Tamworth) - Crown dues payable, reservations, conditions and restrictions as herein set out and in the Crown Lands Consolidation Act, 1913, particularly sections 257 and 272.

KY

RG 2/120

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

a7 22.3.83
T873028 Plex R
V109124 w/a R
C.T. 8/5/84.
GT 3 FEB 1985
V715062 R

(Page 2 of 2 pages)

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
CANCELLED				
SEE AUTO FOLIO				

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	~~Signature of~~ Registrar General	CANCELLATION	
~~T873028~~		~~Caveat by State Bank of New South Wales. Registered 6-12-1983.~~			Withdrawn	V109124
V715062		Caveat by Rural Assistance Board Registered 13-5-1985				

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol. 14497 Fol. 118

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
11/10/2016 8:39AM

FOLIO: 143/752189

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 14497 FOL 118

Recorded	Number	Type of Instrument	C.T. Issue
12/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
1/2/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
5/2/1991	Z480021	WITHDRAWAL OF CAVEAT	
5/2/1991	Z480022	TRANSFER	
5/2/1991	Z480023	TRANSFER	EDITION 1
18/3/1991		AMENDMENT: TITLE DIAGRAM	
13/2/1995	U989957	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	EDITION 2
19/6/1995	O312732	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	EDITION 3
10/1/1998	3721792	DEPARTMENTAL DEALING	
19/10/2001	8040023	DEPARTMENTAL DEALING	
2/12/2004	AB134442	TRANSFER	EDITION 4
22/12/2006	AC827228	DEPARTMENTAL DEALING	
20/1/2009	AE446555	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

Ref:rushes creek /Src:M

1985 STAMP DUTY [redacted]

Z 480022F

THIS TRANSFER IS BY WA
OF RELEASE OF MORTGAGE ONLY
TO THE ORIGINAL MORTGAGOR

MANAGER, LEGAL
NEW SOUTH WALES DIVISION
Westpac Banking Corporation

TRANSFER

REAL PROPERTY ACT, 1900

T

3 | 2 of 3 | X | R 2/3

$47

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
Vol. 14497 Fol. 118 NOW BEING [illegible] OF LAND COMPRISED IN FOLIO 143/752189	WHOLE	Shire Gunnedah Parish Keepit County Darling

DESCRIPTION OF LAND
Note (a)

TRANSFEROR
Note (b)

WESTPAC BANKING CORPORATION
60 Martin Place
SYDNEY

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $1-00
and transfers an estate in fee simple
in the land above described to the TRANSFEREE

ESTATE
Note (c)

TRANSFEREE
Note (d)

JOHN DOUGLAS MOY and HELEN FRANCES MOY

OFFICE USE ONLY
HIST

TENANCY
Note (e)

as joint tenants/~~tenants in common~~

PRIOR ENCUMBRANCES
Note (f)

subject to the following PRIOR ENCUMBRANCES 1. .....
2. ..... 3. .....

DATE 26th November 1990

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION
Note (g)

Signed in my presence by the transferor who is personally known to me

[signature] Signature of Witness

JENNIFER DALY Name of Witness (BLOCK LETTERS)

Bank Officer
228 Pitt Street
Sydney Address and occupation of Witness

Signed Sealed and Delivered for and on behalf of WESTPAC BANKING CORPORATION by Roderick Thomas Williams its duly constituted Attorney who is personally known to me

WESTPAC BANKING CORPORATION
by its Attorney
who hereby states at the time of his executing this instrument he has no notice of the revocation of the Power of Attorney registered in the office of the Registrar General No. 274 Book 6733 under the authority of which he has executed this instrument.

[signature]
ACTING ASSISTANT TO Manager, Legal, New South Wales Division

Note (g)

Signed in my presence by the transferee who is personally known to me

C.N. Payne
Signature of Witness

C.N. PAYNE
Name of Witness (BLOCK LETTERS)

MANILLA CLERK
Address and occupation of Witness

J.D. Moy
H.F. Moy
Signature of Transferee

TO BE COMPLETED BY LODGING PARTY
Notes (h) and (i)

LODGED BY
THOMAS KENYON & SON,
LAW STATIONERS,
FIRST FLOOR, THE CENTREPOINT,
SYDNEY.
Delivery Box Number D.X. 435 PHONE 231 5733
33H

LOCATION OF DOCUMENTS	CT	OTHER
Herewith.		
In L.T.O. with		
Produced by		

OFFICE USE ONLY

Checked	Passed	REGISTERED - -19
EC'd		
Signed	Extra Fee	5 FEB 1991

Secondary Directions	OFF	Rx	Q1
Delivery Directions			

Ref:rushes creek /Src:M

STAMP DUTY (1) [redacted]

OFFICE USE ONLY

Z 480023 D

TRANSFER

REAL PROPERTY ACT, 1900

T | 3 | 3 of 3 | X | R3/3

$ 47

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
C.T. Volume 14497 Folio 118 NOW BEING WHOLE OF LAND COMPRISED IN FOLIO 12/752189	WHOLE	Manilla

DESCRIPTION OF LAND Note (a)

TRANSFEROR Note (b)

JOHN DOUGLAS MOY and HELEN FRANCES MOY

ESTATE Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 145,000.00 and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE Note (d)

RAYMOND JOHN DOYLE of "Bundah", Manilla, Farmer and Grazier

OFFICE USE ONLY S

TENANCY Note (e)

as joint tenants/tenants in common

PRIOR ENCUMBRANCES Note (f)

subject to the following PRIOR ENCUMBRANCES 1. Nil 2. 3.

DATE 21 December 1990

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION Note (g)

Signed in my presence by the transferor who is personally known to me

Signature of Witness

EDWARD MARK LEYDEN

Name of Witness (BLOCK LETTERS)

SOLICITOR

97 ROWAN STREET,

MANILLA NSW 2346

Address and occupation of Witness

J.D. Moy

H.F. Moy

Signature of Transferor

Signed in my presence by the transferee who is personally known to me

Note (g)

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address and occupation of Witness

Signature of Transferee

Edward Mark Leyden
Solicitor for Transferee

TO BE COMPLETED BY LODGING PARTY Notes (h) and (i)

LODGED BY THOMAS KENYON & SON, LAW STATIONERS, FIRST FLOOR, THE CENTREPOINT, SYDNEY.

Ref:

Delivery Box Number D.X. 435 PHONE 231 5733 33H

LOCATION OF DOCUMENTS	CT	OTHER
Herewith		
In L.T.O. with		
Produced by		

OFFICE USE ONLY

Checked	Passed	REGISTERED - -19
Signed	Extra Fee	5 FEB 1991

Secondary Directions		
Delivery Directions	CT - 33H	

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 143/752189

SEARCH DATE	TIME	EDITION NO	DATE
11/10/2016	8:40 AM	4	2/12/2004

LAND

LOT 143 IN DEPOSITED PLAN 752189
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF KEEPIT COUNTY OF DARLING
(FORMERLY KNOWN AS PORTION 143)
TITLE DIAGRAM CROWN PLAN 1163.1808

FIRST SCHEDULE

RAYMOND ANDREW DOYLE (T AB134442)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

STATE OF NEW SOUTH WALES

CROWN GRANT

14497117

No. 88002

Vol 14497 Fol 117
Registered 24-8-1981

Registrar General

(Page 1) Vol. 14497 Fol. 117

We, Elizabeth the Second, by the Grace of God Queen of Australia and Her other Realms and Territories, Head of the Commonwealth, do hereby grant to the person described in the First Schedule a Lease in Perpetuity in the land within described, subject nevertheless to such reservations, conditions and other provisions as are shown in the Second Schedule. In testimony whereof We have caused this Our Grant to be sealed with the seal of Our said State

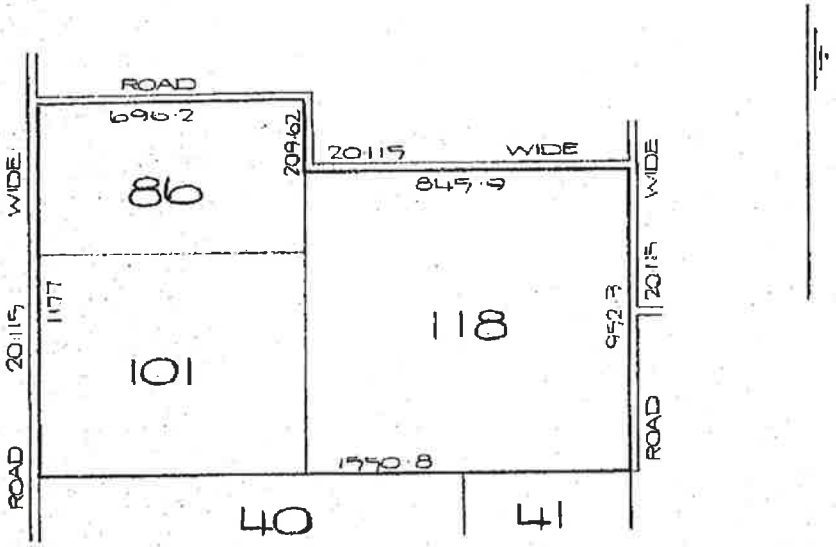
Witness Our Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this fourteenth day of August in the Thirtieth year of Our Reign and in the year of Our Lord one thousand nine hundred and eighty one.

Governor

CANCELLED
86, 101, 118/752169
SEE AUTO FOLIO

PLAN SHOWING LOCATION OF LAND
LENGTHS ARE IN METRES

AREA: 163.1 ha



LAND REFERRED TO

Portions 86, 101 and 118 in the Shire of Manilla Parish of Baldwin and County of Darling.

FIRST SCHEDULE

BANK OF NEW SOUTH WALES. Mortgagee

SECOND SCHEDULE

1. The reservation and exception unto Us, Our Heirs and Successors of all minerals, land for public ways, and rights and powers in respect thereof and the provision for forfeiture as more fully set out in memorandum filed as No.Q400000.

2. The provisions of the Crown Lands Acts and Regulations thereunder in respect of Conditional Leases and in particular that the Grantee and his Assigns shall pay for the said land an annual rent of thirty five dollars twenty seven cents as determined in due course of law or such other rent as may from time to time be so determined (provided always that such rent shall not be less than the minimum for the time being provided under the said Acts) to our Treasurer or such other officer in Our said State as may from time to time be appointed for that purpose on such day or days in each year as may from time to time be determined in due course of law.

3. Q1 Caveat by the Registrar General. Mortgage dated 19-4-1967: mortgagors John Douglas Moy and Helen Frances Moy.

4. Perpetual Lease Grant (C.L. 1910/40 Tamworth) - Crown dues payable, reservations, conditions and restrictions as herein set out and in the Crown Lands Consolidation Act, 1913, particularly sections 257 and 272.

Vol. 14497 Fol. 117

CT 22.3.83 T873028 Rex R
V109124 w/x R
C.T. 8/5/84.
CT 13 FEB 1992
V715062 x R

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
86, 101, 118/752/69 COMPUTER FOLIO / NO FURTHER DEALINGS TO BE REGISTERED.				

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
~~T873028~~		~~Caveat by State Bank of New South Wales. Registered 6-12-1983.~~			Withdrawn	V109124
V715062		Caveat by Rural Assistance Board Registered 13-5-1985				

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/10/2016 4:03PM

FOLIO: 86/752169

First Title(s): VOL 14497 FOL 117
Prior Title(s): VOL 14497 FOL 117

Recorded	Number	Type of Instrument	C.T. Issue
12/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
17/10/1990	DP752169	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
28/2/1991	Z514057	WITHDRAWAL OF CAVEAT	
28/2/1991	Z514058	TRANSFER	
28/2/1991	Z514059	MORTGAGE	EDITION 1
20/5/1991	Z655748	MORTGAGE	EDITION 2
10/2/1992	E246943	DISCHARGE OF MORTGAGE	
10/2/1992	E246945	DISCHARGE OF MORTGAGE	
10/2/1992	E246946	TRANSFER	EDITION 3
23/7/1992	E540207	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	EDITION 4
10/1/1998	3721792	DEPARTMENTAL DEALING	
26/7/1999	6019144	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	
8/7/2002	8750997	MORTGAGE	EDITION 5
27/3/2006	AC201708	DISCHARGE OF MORTGAGE	
27/3/2006	AC201709	TRANSFER	EDITION 6
27/4/2006	AC260145	MORTGAGE	EDITION 7
22/12/2006	AC827228	DEPARTMENTAL DEALING	
7/4/2010	AF411437	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

Ref:rushes creek /Src:M

RP 13 1985

STAMP DUTY

[redacted]

Z 514058 Y

THIS TRANSFER IS BY WAY OF RELEASE OF MORTGAGE ONLY TO THE ORIGINAL MORTGAGOR

OFFICE OF STATE REVENUE (N.S.W. TREASURY) 1990/91 S8 NO STAMP DUTY IS PAYABLE ON THIS INSTRUMENT

TRANSFER

REAL PROPERTY ACT, 1900

T | 1 | 2 of 3 | X | R 2/3

$ 47

acting Assistant to MANAGER, LEGAL, NEW SOUTH WALES DIVISION

Westpac Banking Corporation

Torrens Title Reference

	If Part Only, Delete Whole and Give Details	Location
DESCRIPTION OF LAND Note (a)	WHOLE Volume 14497 Folio 117 Now being { 86/752169 101/752169 118/752169	Shire of Manilla Parish of Baldwin County of Darling

TRANSFEROR Note (b)

Westpac Banking Corporation
60 Martin Place
Sydney
Bankers

ESTATE Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 1-00 (one dollar) and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE Note (d)

John Douglas Moy and Helen Frances Moy

OFFICE USE ONLY

JT2

TENANCY Note (e)

as joint tenants/~~tenants in common~~

PRIOR ENCUMBRANCES Note (f)

subject to the following PRIOR ENCUMBRANCES 1. .....

2. ..... 3. .....

DATE 9th JANUARY 1991

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION Note (g)

Signed in my presence by the transferor who is personally known to me

Signed Sealed and Delivered for and on behalf of WESTPAC BANKING CORPORATION by its duly constituted Attorney who is personally known to me

Signature of Witness

Name of Witness (BLOCK LETTERS) Robert James Elliot

Address and occupation of Witness

WESTPAC BANKING CORPORATION
by its Attorney

who hereby states at the time of his executing this instrument he has no notice of the revocation of the Power of Attorney registered in the office of the Registrar General No. 274 Book 3733 under the authority of which he has executed this instrument.

acting Assistant to Manager Legal, New South Wales Division

Note (g)

Signed in my presence by the transferee who is personally known to me

Leanne Helm Leanne Helm
Bank Officer
228 Pitt Street Sydney

Signature of Witness

IAN CLYDE COLLEY

Name of Witness (BLOCK LETTERS)

147 MANILLA ST. MANILLA. BANK MANAGER

Address and occupation of Witness

X J. D. Moy.

X H F Moy

Signature of Transferee

TO BE COMPLETED BY LODGING PARTY Notes (h) and (i)

LODGED BY

TRAVERS + CO

Delivery Box Number 411B

LOCATION OF DOCUMENTS	CT	OTHER
Herewith.		
In L.T.O. with		
Produced by		

OFFICE USE ONLY

Checked	Passed	REGISTERED - -19	Secondary Directions	DFF	RX	Q1
Signed	Extra Fee	28 FEB 1991	Delivery Directions			

RP 13
1985

INSTRUCTIONS FOR COMPLETION

This dealing should be marked by the Commissioner of Stamp Duties before lodgment by hand at the Land Titles Office.

Typewriting and handwriting should be clear, legible and in permanent dense black or dark blue non-copying ink.

Alterations are not to be made by erasure; the words rejected are to be ruled through and initialled by the parties to the dealing in the left hand margin.

If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the parties and the attesting witnesses.

If it is intended to create easements, covenants, &c., use forms RP13A, RP13B, RP13C as appropriate.

Rule up all blanks.

The following instructions relate to the SIDE NOTES on the form.

(a) Description of land.

(i) TORRENS TITLE REFERENCE.—For a manual reference insert the Volume and Folio (e.g., Vol. 8514 Fol. 126)—For a computer folio insert the folio identifier (e.g., 12/701924).

(ii) PART/WHOLE.—If part only of the land in the folio of the Register is being transferred, delete the word "WHOLE" and insert the lot and plan number, portion, &c. See also sections 327 and 327AA of the Local Government Act, 1919.

(iii) LOCATION.—Insert the locality shown on the Certificate of Title/Crown Grant, e.g., at Chullora. If the locality is not shown, insert the Parish and County, e.g., Ph. Lismore Co. Rous.

(b) Show the full name of the transferor(s).

(c) If the estate being transferred is a lesser estate than an estate in fee simple, delete "fee simple" and insert appropriate estate.

(d) Show the full name, address and occupation or description of the transferee(s).

(e) Delete if only one transferee. If more than one transferee, delete either "joint tenants" or "tenants in common", and, if the transferees hold as tenants in common, state the shares in which they hold.

(f) In the memorandum of prior encumbrances, state only the registered number of any mortgage, lease, charge or writ to which this dealing is subject.

(g) Execution.

GENERALLY
(i) Should there be insufficient space for the execution of this dealing, use an annexure sheet.
(ii) The certificate of correctness under the Real Property Act, 1900, must be signed by all parties to the transfer, each party to execute the dealing in the presence of an adult witness, not being a party to the dealing, to whom he/she is personally known.
The solicitor for the transferee may sign the certificate on behalf of the transferee, the solicitor's name (not that of his/her firm), to be typewritten or printed adjacent to the signature. Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.

ATTORNEY
(iii) If the transfer is executed by an attorney for the transferor/transferee pursuant to a registered power of attorney, the form of attestation must set out the full name of the attorney, and the form of execution must indicate the source of his/her authority, e.g., "AB by his attorney (or receiver or delegate, as the case may be) XY pursuant to power of attorney registered Book No."

AUTHORITY
(iv) If the transfer is executed pursuant to an authority (other than specified in (iii)), the form of execution must indicate the statutory, judicial or other authority pursuant to which the transfer has been executed.

CORPORATION
(v) If the transfer is executed by a corporation under seal, the form of execution should include a statement that the seal has been properly affixed, e.g., in accordance with the Articles of Association of the corporation. Each person attesting the affixing of the seal must state his/her position (e.g., director, secretary) in the corporation.

(h) Insert the name, postal address, Document Exchange reference, telephone number, and delivery box number of the lodging party.

(i) The lodging party is to complete the LOCATION OF DOCUMENTS panel. Place a tick in the appropriate box to indicate the whereabouts of the Certificate of Title. List, in an abbreviated form, other documents lodged, e.g., stat. dec. for statutory declaration, pbte for probate, L/A for letters of administration, &c.

OFFICE USE ONLY

L.O. 1341

FIRST SCHEDULE DIRECTIONS

(A) FOLIO IDENTIFIER	(B) DIRECTION	(C) NAME

SECOND SCHEDULE AND OTHER DIRECTIONS

(D) FOLIO IDENTIFIER	(E) DIRECTION	(F) NOTFN TYPE	(G) DEALING NUMBER	(H) DETAILS

Copy

RP13

[redacted]

(4)

TRANSFER

Real Property Act, 1900

E 246946 K

Office of State Revenue use only

OFFICE OF STATE REVENUE N15
STAMP DUTY [illegible]
DUTY $ 200 1ST [illegible] 8001757 10

B

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

Identifier 86/752169 Identifier 118/752169
Identifier 101/752169 Identifier 166/752169

(B) **LODGED BY**

L.T.O. Box

38W

Name, Address or DX and Telephone RALPH & CO.
LAW STATIONERS
LEVEL 19, M.L.C. CENTRE
MARTIN PLACE, SYDNEY
DX 347 SYDNEY
REFERENCE (max. 20 characters) 8645 PH: 233 8088
38W

(C) **TRANSFEROR** JOHN DOUGLAS MOY and HELEN FRANCES MOY

(D) acknowledges receipt of the consideration of $280,000.00

and as regards the land specified above transfers to the transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T

(G)

STEPHEN DOUGLAS WOODS of R.M.B. 775 Willans Lane, Tamworth and LEAH WOODS of the same address, his wife

as joint tenants/tenants in common

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATE OF EXECUTION** 3RD FEBRUARY 1992

Signed in my presence by the transferor who is personally known to me.

S. M. Leyden
Signature of Witness

EDWARD MARK LEYDEN
Name of Witness (BLOCK LETTERS)

SOLICITOR
97 ROWAN STREET,
MANILLA N.S.W. 2346
Address of Witness

J. D. Moy.
H. F. Moy.
Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Solicitor for Signature of Transferee
W.V. THIBAULT

CHECKED BY (office use only)

☞ **INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE**

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 86/752169

SEARCH DATE	TIME	EDITION NO	DATE
11/10/2016	9:49 AM	7	27/4/2006

LAND

LOT 86 IN DEPOSITED PLAN 752169
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
(FORMERLY KNOWN AS PORTION 86)
TITLE DIAGRAM CROWN PLAN 2203.1808

FIRST SCHEDULE

STEPHEN CHARLES MCCRAE
MARGARET JOY MCCRAE
AS JOINT TENANTS (T AC201709)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
2 AC260145 MORTGAGE TO WESTPAC BANKING CORPORATION

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/10/2016 4:05PM

FOLIO: 101/752169

First Title(s): VOL 14497 FOL 117
Prior Title(s): VOL 14497 FOL 117

Recorded	Number	Type of Instrument	C.T. Issue
12/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
17/10/1990	DP752169	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
28/2/1991	Z514057	WITHDRAWAL OF CAVEAT	
28/2/1991	Z514058	TRANSFER	
28/2/1991	Z514059	MORTGAGE	EDITION 1
10/2/1992	E246945	DISCHARGE OF MORTGAGE	
10/2/1992	E246946	TRANSFER	EDITION 2
23/7/1992	E540207	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	EDITION 3
10/1/1998	3721792	DEPARTMENTAL DEALING	
26/7/1999	6019144	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	
8/7/2002	8750997	MORTGAGE	EDITION 4
27/3/2006	AC201708	DISCHARGE OF MORTGAGE	
27/3/2006	AC201709	TRANSFER	EDITION 5
27/4/2006	AC260145	MORTGAGE	EDITION 6

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 101/752169

SEARCH DATE	TIME	EDITION NO	DATE
11/10/2016	9:49 AM	6	27/4/2006

LAND

LOT 101 IN DEPOSITED PLAN 752169
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
(FORMERLY KNOWN AS PORTION 101)
TITLE DIAGRAM CROWN PLAN 840.1808

FIRST SCHEDULE

STEPHEN CHARLES MCCRAE
MARGARET JOY MCCRAE
AS JOINT TENANTS (T AC201709)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
2 AC260145 MORTGAGE TO WESTPAC BANKING CORPORATION

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/10/2016 4:05PM

FOLIO: 118/752169

First Title(s): VOL 14497 FOL 117
Prior Title(s): VOL 14497 FOL 117

Recorded	Number	Type of Instrument	C.T. Issue
12/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
17/10/1990	DP752169	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
28/2/1991	Z514057	WITHDRAWAL OF CAVEAT	
28/2/1991	Z514058	TRANSFER	
28/2/1991	Z514059	MORTGAGE	EDITION 1
10/2/1992	E246945	DISCHARGE OF MORTGAGE	
10/2/1992	E246946	TRANSFER	EDITION 2
23/7/1992	E540207	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	EDITION 3
10/1/1998	3721792	DEPARTMENTAL DEALING	
26/7/1999	6019144	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	
8/7/2002	8750997	MORTGAGE	EDITION 4
27/3/2006	AC201708	DISCHARGE OF MORTGAGE	
27/3/2006	AC201709	TRANSFER	EDITION 5
27/4/2006	AC260145	MORTGAGE	EDITION 6
22/12/2006	AC827228	DEPARTMENTAL DEALING	
7/4/2010	AF411437	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 118/752169

SEARCH DATE	TIME	EDITION NO	DATE
11/10/2016	9:49 AM	6	27/4/2006

LAND

LOT 118 IN DEPOSITED PLAN 752169
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
(FORMERLY KNOWN AS PORTION 118)
TITLE DIAGRAM CROWN PLAN 971.1808

FIRST SCHEDULE

STEPHEN CHARLES MCCRAE
MARGARET JOY MCCRAE
AS JOINT TENANTS (T AC201709)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
2 AC260145 MORTGAGE TO WESTPAC BANKING CORPORATION

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

15366003

CERTIFICATE OF TITLE

NEW SOUTH WALES — REAL PROPERTY ACT, 1900

Vol 15366 Fol 3

First Title Vol. 5225 Fol. 150

Prior Title Vol. 5225 Fol. 150

EDITION ISSUED 9 8 1985

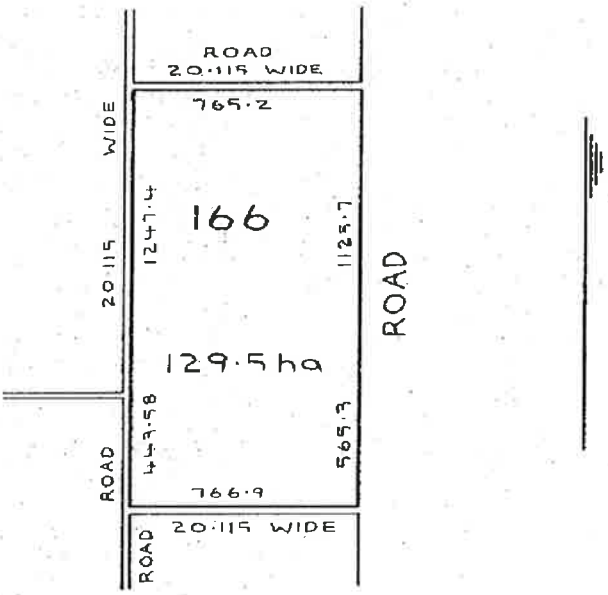
I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

CANCELLED

Registrar General.

PLAN SHOWING LOCATION OF LAND SEE AUTO FOLIO

LENGTHS ARE IN METRES



LAND REFERRED TO

Portion 166 in the Shire of Manilla Parish of Baldwin County of Darling.

FIRST SCHEDULE

JOHN DOUGLAS MOY and HELEN FRANCES MOY, as Tenants in Common in equal shares. K657955

SECOND SCHEDULE

GRM 1. Land excludes minerals and is subject to reservations and conditions in favour of the Crown - see Crown grant.

AA 2. Restrictions on dealings - see s.272 Crown Lands Consolidation Act, 1913 (Conditional Purchase 1910/219 Tamworth). Area affected 129·5 hectares

MX 3. K657956 Mortgage to Westpac Banking Corporation.

XS 4. T204279 Caveat by State Bank of New South Wales.

MR 5. V715061 Mortgage to Rural Assistance Board.

RG 2/64

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON (Page 1) Vol 15366 Fol 3

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol 15366 Fol 3

40828–4036

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

CANCELLED

SEE AUTO FOLIO

SECOND SCHEDULE (continued)

PARTICULARS | Registrar General | CANCELLATION

NOTATIONS AND UNREGISTERED DEALINGS

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 8:38AM

FOLIO: 166/752169

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 15366 FOL 3

Recorded	Number	Type of Instrument	C.T. Issue
14/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
9/2/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
26/2/1991	Z514060	WITHDRAWAL OF CAVEAT	
26/2/1991	Z514061	DISCHARGE OF MORTGAGE	EDITION 1
18/3/1991		AMENDMENT: TITLE DIAGRAM	
20/5/1991	Z655748	MORTGAGE	EDITION 2
10/2/1992	E246943	DISCHARGE OF MORTGAGE	
10/2/1992	E246944	DISCHARGE OF MORTGAGE	
10/2/1992	E246946	TRANSFER	EDITION 3
24/11/1998	5417156	DEPARTMENTAL DEALING	
8/7/2002	8750997	MORTGAGE	EDITION 4
27/3/2006	AC201708	DISCHARGE OF MORTGAGE	
27/3/2006	AC201709	TRANSFER	EDITION 5
27/4/2006	AC260145	MORTGAGE	EDITION 6
22/12/2006	AC827228	DEPARTMENTAL DEALING	
7/4/2010	AF411437	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 166/752169

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	8:39 AM	6	27/4/2006

LAND

LOT 166 IN DEPOSITED PLAN 752169
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
(FORMERLY KNOWN AS PORTION 166)
TITLE DIAGRAM CROWN PLAN 2625.1808

FIRST SCHEDULE

STEPHEN CHARLES MCCRAE
MARGARET JOY MCCRAE
AS JOINT TENANTS (T AC201709)

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 AC260145 MORTGAGE TO WESTPAC BANKING CORPORATION

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

09747003

C.

TIFICATE OF TITLE

NEW SOUTH WALES — PERTY ACT, 1900, as amended.

Crown Grant (Prior Title)
Volume 5896 Folio 238.

Vol. 9747 Fol. 3

1st Edition issued 14-7-1964

ML J610588

Fol. 3

9747

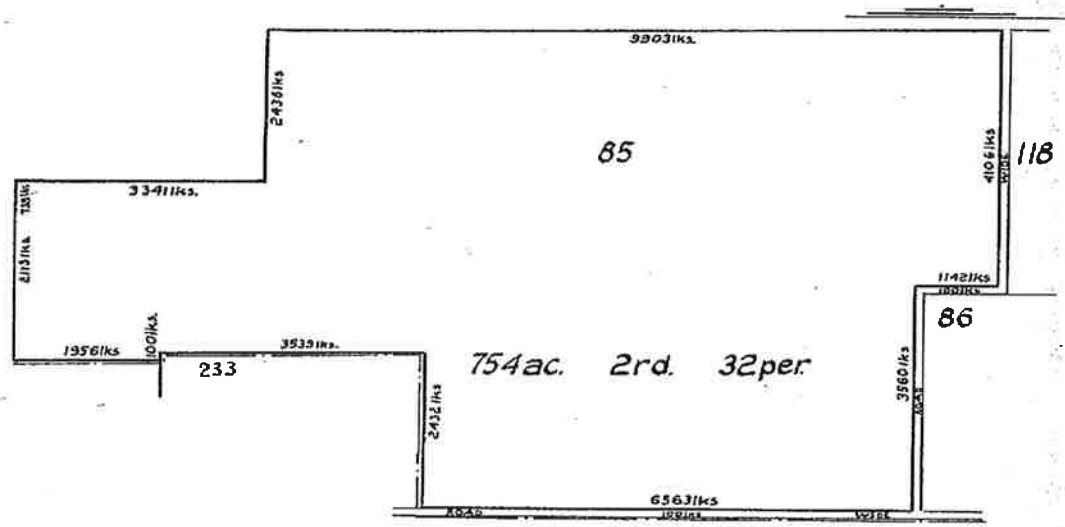
(Page 1) Vol.

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness S Maclennan

CANCELLED
Registrar-General.
SEE AUTO FOLIO

PLAN SHOWING LOCATION OF LAND



J610588 98
5

Scale: 20 chains to one inch

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Portion 85 Shire of Manilla, Parish of Baldwin and County of Darling. Excepting thereout the minerals reserved by the Crown Grant.

Registrar General.

FIRST SCHEDULE (Continued overleaf)

~~RAYMOND JOHN DOYLE, of McCully's Gap via Musvellbrook, Farmer.~~

Registrar General.

GRM

SECOND SCHEDULE (Continued overleaf)

1. Reservations and conditions, if any, contained in the Crown Grant(s) above referred to.

Registrar General.

J61?858
L765191
T981029?
W539691T
W539692M

Vol. 9747 Fol 3

BY 1609 V. C. N. BLIGHT, GOVERNMENT PRINTER

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
~~Raymond Andrew Doyle by Transfer T981029. Registered 13-3-1984~~					[signature]
Raymond John Doyle by Transfer W539691. Registered 25·11·1986					

CANCELLED

SEE AUTO FOLIO

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
~~Mortgage~~	~~?610589~~	~~14-2-1964~~	~~Theodore George [illegible] Fannie [illegible]~~	~~7-5-1964~~	[signature]	Discharged	K612166	[signature]
~~Caveat~~	~~K196896~~	~~13-12-1965~~		~~11-1-1966~~	[signature]	Withdrawn	L765119	[signature]
~~T983943 Caveat by Dell Alexia Cornwell. Registered 13-3-1984~~								
W539692	Mortgage		to National Australia Bank Limited. Registered 25-11-1986.					

REG GEN 13-3-1984
MM

FORM No. 183A

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 8:57AM

FOLIO: 85/752169

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 9747 FOL 3

Recorded	Number	Type of Instrument	C.T. Issue
3/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
6/1/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
18/3/1991		AMENDMENT: TITLE DIAGRAM	
28/6/2005	AB570014	DISCHARGE OF MORTGAGE	EDITION 1

*** END OF SEARCH ***

rushes creek PRINTED ON 12/10/2016

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 85/752169

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	8:58 AM	1	28/6/2005

LAND

LOT 85 IN DEPOSITED PLAN 752169
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
(FORMERLY KNOWN AS PORTION 85)
TITLE DIAGRAM CROWN PLAN 2202.1808

FIRST SCHEDULE

RAYMOND JOHN DOYLE (T W539691)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

G.

NEW SOUTH WALES

Crown Grant (Prior Title)
Volume 5831 Folio 175.

CERTIFICATE OF TITLE

REAL PROPERTY ACT, 1900, as amended.

TORRENS TITLE
Register Book

Vol. 9747 Fol. 4

1st Edition issued 14-7-1964

ML J610588

CANCELLED R

Fol. 4
Vol. 9747
(Page 1)

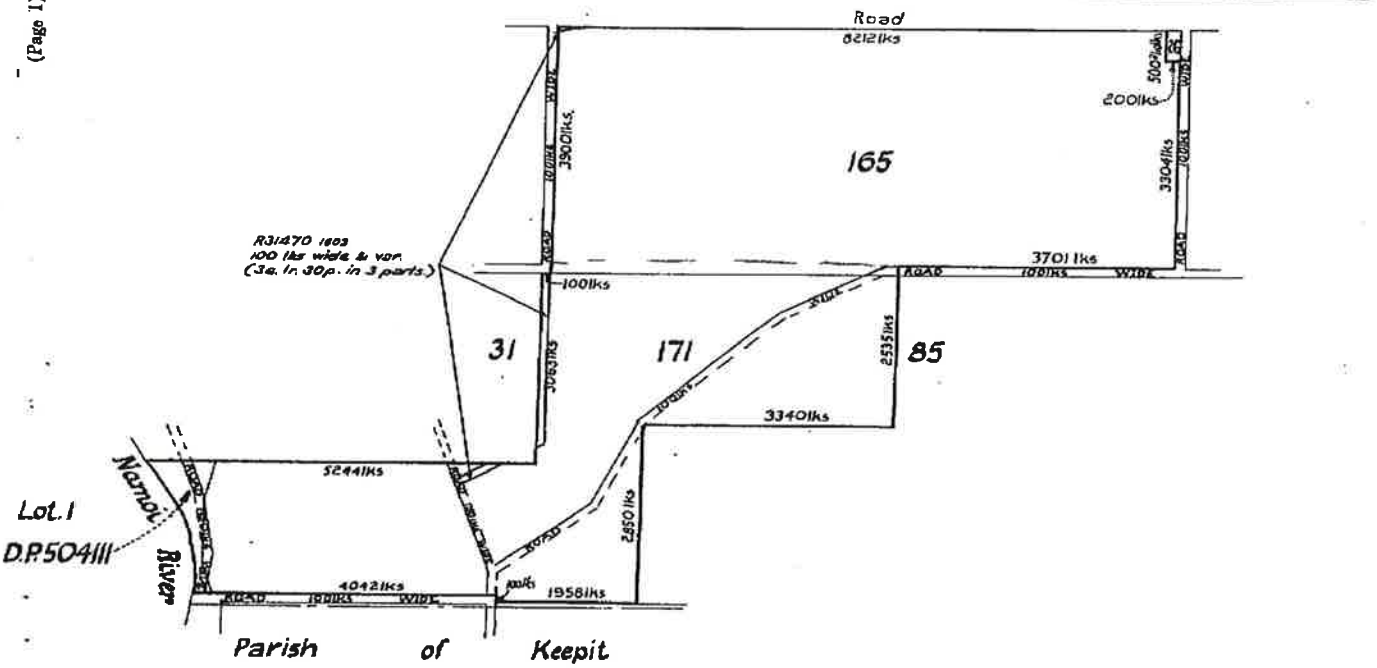
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness S Maclennan

SEE AUTO FOLIO

Registrar-General.

PLAN SHOWING LOCATION OF LAND



Total Area: 573ac. 1rd. This area does not include the area of the roads 100lks wide but does include the area of Lot 1 in D.P.504111

J610588

Scale: 20 chains to one inch

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Portions 165 and 171, Shire of Manilla, Parish of Baldwin and County of Darling. Excepting thereout Lot 1 in Deposited Plan 504111(but not the mines and deposits specified in Section 141 Public Works Act, 1912 thereunder) the roads 100 links wide shown in the plan hereon and the minerals reserved by the Crown Grant.

FIRST SCHEDULE (Continued overleaf)

~~RAYMOND [redacted] DOYLE, of McSully's Gap via Muswellbrook, Farmer.~~

Registrar General.

SECOND SCHEDULE (Continued overleaf)

1. Reservations and conditions, if any, contained in the Crown Grant(s) above referred to.

AB 2. Restrictions on transfer – See Section 272 Crown Lands Consolidation Act, 1913. (Conditional Purchase 1911/4 Tamworth.)

Regi[redacted]

09747004

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

ST 1909 V. C. W. BLIGHT, GOVERNMENT PRINTER

Vol. 9747 Fol. 4

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
~~Raymond Andrew Doyle by Transfer T981029. Registered 13-3-1984~~ Raymond John Doyle by Transfer W539691. Registered 25-11-1986.					

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
~~Mortgage~~	~~J610559~~	~~14-3-1964~~	~~Westpac Savings Bank Corporation of New South Wales~~	~~7-8-1964~~		~~Discharged~~	~~K612106~~	
~~Caveat~~	~~K196896~~	~~13-12-1965~~		~~4-1-1966~~		~~Withdrawn~~	~~L765119~~	
Resumption	L638704		the land shown by pink lines and 100 links wide (in 3 parts) in the plan hereon is public road	11-12-1969				
~~T98394 Caveat by Dell Alexia Cornwell. Registered 13-3-1984~~								
W539692 Mortgage to National Australia Bank Limited. Registered				25-11-1986				

CANCELLED

SEE AUTO FOLIO

FORM No. 183A

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

J610559
K196896
N/R
L638704
L765119 ent
T981029 Te.
W539691T
W539692M

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 8:55AM

FOLIO: AUTO CONSOL 9747-4

Recorded	Number	Type of Instrument	C.T. Issue
28/8/1991		CONSOL HISTORY RECORD CREATED FOR AUTO CONSOL 9747-4	
		PARCELS IN CONSOL ARE: 165/752169, 171/752169.	
8/4/1998	3907985	DEPARTMENTAL DEALING	
28/6/2005	AB570014	DISCHARGE OF MORTGAGE	EDITION 1
20/1/2014	AI314653	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: AUTO CONSOL 9747-4

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	8:56 AM	1	28/6/2005

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

RAYMOND JOHN DOYLE (T W539691)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 LAND EXCLUDES THE ROAD(S) WITHIN LOT 171 SHOWN IN THE TITLE DIAGRAM & IN CROWN PLAN 31470.1603
* 3 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912)

Lot 1 DP 504111 but includes minerals - See Vol 9747 Fol 4

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT 165 IN DP752169	CROWN PLAN 2622.1808
LOT 171 IN DP752169	CROWN PLAN 2994.1808.

*** END OF SEARCH ***

rushes creek PRINTED ON 12/10/2016

STATE OF NEW SOUTH WALES

CROWN GRANT

13963204

No. 50866

CANCELLED

Vol 13963 Fol 204
Registered 22-10-1979

SEE AUTO FOLIO

Registrar General

We, Elizabeth the Second, by the Grace of God Queen of Australia and Her other Realms and Territories, Head of the Commonwealth, do hereby grant to the person described in the First Schedule an Estate in Fee Simple in the land within described, subject nevertheless to such reservations, conditions and other provisions as are shown in the Second Schedule. In testimony whereof We have caused this Our Grant to be sealed with the seal of Our said State

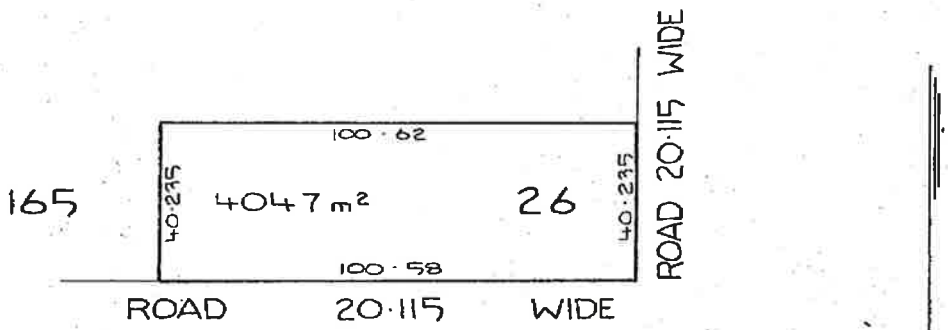
Witness Our Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this eleventh day of October in the twenty eighth year of Our Reign and in the year of Our Lord one thousand nine hundred and seventy nine.

A. R. Cutler

Governor

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



REDUCTION RATIO 1:1250

P

LAND REFERRED TO

Portion 26 in the Shire of Manilla Parish of Baldwin and County of Darling.

FIRST SCHEDULE

HAROLD PAUL JACKSON of West Tamworth.

GRM

SECOND SCHEDULE

1. The reservation and exception unto Us Our Heirs and Successors of:—
   (a) all minerals which the said land contains with full power and authority for Us Our Heirs and Successors and such person or persons as shall from time to time be authorised by Us or Them to enter upon the said land and to search for mine dig and remove the said minerals;
   (b) all such parts and so much of the said land as may hereafter be required for public ways in over and through the same to be set out by Our Governor for the time being of Our said State or some person by him authorised in that respect with full power for Us Our Heirs and Successors and for Our Governor as aforesaid by such person or persons as shall be by Us Them or him authorised in that behalf to make and conduct all such public ways; and
   (c) the right of full and free ingress egress and regress into out of and upon the said land for the several purposes aforesaid or any of them.

~~2. Restrictions Covenants see section~~

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

T192608M

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General

CANCELLED

SEE AUTO FOLIO

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
M T192608	Mortgage to The	Commercial Banking Company of Sydney Limited. Registered 19-8-1982				

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol. 13963 Fol. 204

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 9:35AM

FOLIO: 26/752169

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 13963 FOL 204

Recorded	Number	Type of Instrument	C.T. Issue
12/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
27/1/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
18/3/1991		AMENDMENT: TITLE DIAGRAM	
15/11/2003	AA161157	DISCHARGE OF MORTGAGE	
15/11/2003	AA161158	TRANSFER	EDITION 1
14/7/2006	AC455068	TRANSFER	EDITION 2

*** END OF SEARCH ***

Ref:rushes creek /Src:M
Form: 01T
Licence: 01-08-067
Licensee: Midware Systems
Lyons Barnett Kennedy

TRANSFER

New South Wales
Real Property Act 1900

AA161158J

PRIVACY NOTE: this information is legally required and will bec

STAMP DUTY

Office of State Revenue use only

OFFICE OF STATE REVENUE (N.S.W. TREASURY)
CLIENT No. 3828528 $2-00
STAMP DUTY..... EXEMPT
TRANSACTION No. 1697647
STAMP No. 210
SIGNATURE..... Kearney
DATE..... 10/11/2003
ASSESSMENT DETAILS:

(A) TORRENS TITLE

If appropriate, specify the part transferred
Certificate of Title 13963 Folio 204

(B) LODGED BY

Delivery Box	Name, Address or DX and Telephone	CODE
33[illegible]	33[illegible] legal services Reference (optional): 1011 Fax: (02) 9232 6491	T TW (Sheriff)

(C) TRANSFEROR

HAROLD PAUL JACKSON

(D) CONSIDERATION The transferor acknowledges receipt of the consideration of $ 5,500.00 and as regards

(E) ESTATE the land specified above transfers to the transferee an estate in fee simple.

(F) SHARE TRANSFERRED

(G) Encumbrances (if applicable):

(H) TRANSFEREE

ISTVAN OLAH and STEPHEN OLAH

(I) TENANCY: Joint Tenants

(J) DATE 10 / 11 / 03

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: EDWARD MARK LEYDEN

Address of witness: SOLICITOR
MANILLA NSW 2346

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature

Signatory's name: EDWARD LEYDEN
Signatory's capacity: Solicitor for the transferee

All handwriting must be in block capitals.

Number additional pages sequentially

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 26/752169

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	9:35 AM	2	14/7/2006

LAND

LOT 26 IN DEPOSITED PLAN 752169
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
(FORMERLY KNOWN AS PORTION 26)
TITLE DIAGRAM CROWN PLAN 3849.1808

FIRST SCHEDULE

ISTVAN OLAH (T AC455068)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 2:04PM

FOLIO: 1/1085455

First Title(s): VOL 3539 FOL 219
Prior Title(s): VOL 8466 FOL 235

Recorded	Number	Type of Instrument	C.T. Issue
5/7/2005	DP1085455	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
5/7/2005	AB601769	DEPARTMENTAL DEALING	EDITION 1

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/1085455

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	2:05 PM	1	5/7/2005

LAND

LOT 1 IN DEPOSITED PLAN 1085455
AT RUSHES CREEK
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF KEEPIT COUNTY OF DARLING
TITLE DIAGRAM DP1085455

FIRST SCHEDULE

RAYMOND JOHN DOYLE

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 LAND EXCLUDES THE ROAD(S) SHOWN IN THE TITLE DIAGRAM

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 2:38PM

FOLIO: 39/752189

First Title(s): VOL 3917 FOL 227
Prior Title(s): VOL 5857 FOL 223

Recorded	Number	Type of Instrument	C.T. Issue
9/12/1986	DP752189	DEPOSITED PLAN	FOLIO CREATED EDITION 1
19/2/1991		AMENDMENT: VOL FOL INDEX	
23/5/1995	O251158	DISCHARGE OF MORTGAGE	
1/6/1995	DP849741	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

G[redacted]ulla

No.

REGISTRAR GENERAL NEW SOUTH WALES

'76 SEP 7 AM [redacted]

STAMP DUTY ... 3.11.67

P 888295 Lodgment Endorsement

R.P. 13

FEES:— (1)

A — X

$18-00

10-10

New South Wales

MEMORANDUM OF TRANSFER

(REAL PROPERTY ACT, 1900)

(Trusts must not be disclosed in the transfer.)

Typing or handwriting in this instrument should not extend into any margin. Handwriting should be clear and legible and in permanent black non-copying ink.

I, BANK OF NEW SOUTH WALES

(herein called transferor)

being registered as the proprietor of an estate in *fee simple*[a] in the land hereinafter described, subject, however, to such encumbrances, liens and interests as are notified hereunder, in consideration of ONE DOLLAR ($1.00) (the receipt whereof is hereby acknowledged) paid to it by[b] LILLIAN MAY JOHNSTON and WINNIFRED ELIZABETH GARDNER

do hereby transfer to

[c] LILLIAN MAY JOHNSTON of 22 Rowan Street, Manilla Widow and WINNIFRED ELIZABETH GARDNER Wife of Civil Clifford Gardner of Southbrook Manilla, Carrier, ~~Executices of the~~ Will of the late Charles Greer JOHNSTON (herein called transferee)[d] Joint TENANTS

ALL such its Estate and Interest in ALL THE land mentioned in the schedule following:—

County	Parish	Reference to Title			Description of Land (if part only)[e]
		Whole or Part	Vol.	Fol.	
Darling	~~Manilla~~ Keepit	Whole	8406	64	Crown Lease CP1910/158 Tamworth

STAMP DUTY REGISTRATION NOT OPPOSED

22 OCT 1976

ENCUMBRANCES, &c., REFERRED TO[f]

Executed ~~Signed~~ at SYDNEY the twenty sixth ~~twenty fifth~~ day of September, 19 73 ~~67~~

[g] ~~Signed in my presence by the transferor~~ ~~WHO IS PERSONALLY KNOWN TO ME~~

Signed sealed and delivered for and on behalf of BANK OF NEW SOUTH WALES by RONALD BERTRAM GREENWOOD and ALAN ERNEST THOMAS its duly constituted Attorneys in the presence of:

[h] Signed

J. Meacher J.P.
W. C. R. THRESHER

BANK OF NEW SOUTH WALES by its Attorneys who hereby respectively state that at the time of executing this instrument they have no notice of the revocation of the Power of Attorney Registered No. 64793 Miscellaneous Register under the authority of which they have executed this deed.

Transferor[*]

R.B. Greenwood
Acting Assistant Chief Security Officer, and
Alan Thomas
Joint State Manager, New South Wales

† Accepted, and I hereby certify this Transfer to be correct for the purposes of the Real Property Act.

Signed in my presence by the transferees are ~~WHO IS PERSONALLY KNOWN TO ME~~

[signature]
Solicitor Manilla
Transferee(s)
Solicitor for whose signatures cannot be obtained without difficulty and delay
25th October 1967

a If a less estate, strike out "in *fee simple*" and interline the required alteration.

b State in full the name of the person who furnished the consideration monies.

c Show in BLOCK LETTERS the full name, postal address and description of the persons taking.

d If more than one person is taking state whether they hold as joint tenants or tenants in common.

e The description may refer to the defined residue of the land in a certificate or grant (e.g., "and being residue after Transfer No. ") or may refer to parcels shown in Town or Parish Maps issued by the Dept. of Lands or shown in plans filed in the Office of the Registrar General (e.g., "and being lot sec. D.P. "). Unless authorised by ... of the Conveyancing Act Regulations, 1961, a plan may not be annexed to or endorsed on this transfer form.

f A very short note will suffice.

g Execution in New South Wales may be proved if this instrument is signed or acknowledged before the Registrar General, or Deputy Registrar General, or a Notary Public, a J.P., or Commissioner for Affidavits, to whom the Transferor is known, otherwise the attesting witness should appear before one of the above functionaries who having questioned the witness should sign the certificate on the back of this form.

As to instruments executed elsewhere, see Section 107 of the Real Property Act, 1900, Section 168 of the ... Conveyancing Act, 1919, and Section 52A of the Evidence Act, 1898.

h Repeat attestation if necessary.

If the Transferor or Transferee signs by a mark, the attestation must state "that the instrument was read over and explained to him, and that he appeared fully to understand the same."

THIS SPACE TO BE LEFT FREE FROM NOTATION

NOT TO BE ALTERED BY ERASURE—See Foot Note

* If signed by virtue of any power of attorney, the original power must be registered in the Miscellaneous Register, and produced with each dealing, and the memorandum of non-revocation on back of form signed by the attorney before a witness.

† N.B.—Section 117 requires that the above Certificate be signed by each Transferee or his Solicitor or Conveyancer, and renders any person falsely or negligently certifying liable to a penalty; also to damages recoverable by parties injured. Acceptance by the Solicitor or Conveyancer (who must sign his own name, and not that of his firm) is permitted only when the signature of the Transferee cannot be obtained without difficulty, and when the instrument does not impose a liability on the party taking under it. When the instrument contains some special covenant by the Transferee or is subject to a mortgage, encumbrance or lease, the Transferee must accept personally.

No alterations should be made by erasure. The words rejected should be scored through with the pen, and those substituted written over them, the alteration being verified by signature or initials in the margin, or noticed in the attestation.

St 437—W K 1165 V. C. N. Blight, Government Printer

No. P 888295

PARTIAL DISCHARGE OF MORTGAGE[i]
(N.B.—Before execution read marginal note)

Lodged by
Address:
Phone No.:

I, *mortgagee under Mortgage No.* *release and discharge the land comprised in the within transfer from such mortgage and all claims thereunder but without prejudice to my rights and remedies as regards the balance of the land compised in such mortgage.*

i This discharge is appropriate to a transfer of part of the land in the Mortgage. The mortgagee should execute a formal discharge where the land transferred is the whole of or the residue of the land in the Certificate of Title or Crown Grant or is the whole of the land in the mortgage.

Dated at *this* *day of* 19 .

Signed in my presence by

who is personally known to me. *Mortgagee.*

MEMORANDUM AS TO NON-REVOCATION OF POWER OF ATTORNEY

(To be signed at the time of executing the within instrument)

Memorandum whereby the undersigned states that he has no notice of the revocation of the Power of Attorney registered No. *Miscellaneous Register under the authority of which he has just executed the within tranfer.*[j]

j Strike out unnecessary words. Add any other matter necessary to show that the power is effective.

Signed at *the* *day of* , 19 .

Signed in the presence of—

CERTIFICATE OF J.P., &c., TAKING DECLARATION OF ATTESTING WITNESS[k]

Appeared before me at *, the* *day of* *, one thousand nine hundred and* *the attesting witness to this instrument and declared that he personally knew* *the person signing the same, and whose signature thereto he has attested; and that the name purporting to be such signature of the said* *is* *own handwriting, and that* *he was of sound mind and freely and voluntarily signed the same*

k To be signed by Registrar General, Deputy Registrar General, a Notary Public, J.P., Commissioner for Affidavits, or other functionary before whom the attesting witness appears. Not required if the instrument itself be signed or acknowledged before one of these parties.

LEAVE THESE SPACES FOR DEPARTMENTAL USE

INDEXED	MEMORANDUM OF TRANSFER
Checked by 27 SH KIJ	Particulars entered in Register Book, 26-11-1926
Passed (in S.D.B.) by	
Signed by	Registrar General

DOCUMENTS LODGED HEREWITH
To be filled in by person lodging dealing

1. Pbte prod B.N.L.Co. [illegible] 30-11-26
2.
3.
4.
5.
6.
7.

Received Docs.
Nos.
Receiving Clerk

PROGRESS RECORD

	Initials	Date
Sent to Survey Branch		
Received from Records		
Draft written		
Draft examined		
Diagram prepared		
Diagram examined		
Draft forwarded		
Supt. of Engrossers		
Cancellation Clerk		
Vol.	Fol.	

Withdraw

RGX. J192865

~~Free from~~

Deliver P.Bate 634382

K 1163 Sc 437—W

M.P.D.

Ref:rushes creek /Src:M

Req:R554915 /Doc:DL P888295 /Rev:24-Aug-2011 /Sts:OK.SC /Pgs:ALL /Prt:11-Oct-2016 11:53 /Seq:2 of 2

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 3:01PM

FOLIO: 98/752189

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 8406 FOL 64

Recorded	Number	Type of Instrument	C.T. Issue
1/3/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
8/6/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
9/8/1994	U504018	TRANSMISSION APPLICATION	EDITION 1
1/11/1994	U740506	TRANSFER	EDITION 2
1/6/1995	DP849741	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

RP3

[redacted]

B TRANSMISSION APPLICATION

Section 93 Real Property Act 1900

U 504018 T

Office of State Revenue use only

① A/26081 ② 4/4/8900 ③ B/26081 ④ 98/752189 ⑤ 1/128144

(A) LAND
Show no more than 20 References to Title.

F/I B/26081, ① Vol. 7066 Fol.218 Vol.2023 Fol.126
F/I 2/619296 Vol.14809 Fol. 38 ② Vol.6392 Fol.114
③ Vol. 7066 Fol.220 ④ Vol. 8406 Fol. 64
⑤ Vol.10832 Fol.185

(B) REGISTERED DEALING
If applicable.

(C) LODGED BY

L.T.O. Box

Name, Address or DX and Telephone
THOMAS KENYON & S
LAW STATIONERS,
SUITE 503, 49 MARKET STRE
SYDNEY, N.S.W. 2000
D.X. 435 PHONE: (02) 283 1766
REFERENCE (max. 15 characters): 33H LBK-GARDNER

(D) DECEASED REGISTERED PROPRIETOR
WINNIFRED ELIZABETH GARDNER

(E) APPLICANT

TA
EDWARD MARK LEYDEN,
SCOTT CIVIL GARDNER and
GREER ELIZABETH RUSHBY
as Joint Tenants

(F) I, the Applicant, being entitled as Executors of the will/~~estate~~ of the Deceased Registered Proprietor (who died on 13th April, 1994) pursuant to Probate/~~Letters of Administration~~ No. 109329/94 granted on 5th July, 1994 to EDWARD MARK LEYDEN, SCOTT CIVIL GARDNER and GREER ELIZABETH RUSHBY, apply to be registered as proprietor of the estate or interest of the Deceased Registered Proprietor in the Land/~~Registered Dealing~~ specified above.

(G) Certified correct for the purposes of the Real property Act 1900.
Signed in my presence by the Applicant who is personally known to me.

DATE 18th July 1994

M. C. Thrift
Signature of Witness

MARGARET C. THRIFT
Name of Witness (BLOCK LETTERS)

174 MANILLA ST, MANILLA.
Address of Witness

S.C. [signature]
Greer Rushby
[signature]
Signature of Applicant

EVIDENCE SIGHTED & RETURNED (office use only) Prob S&R

CHECKED BY (office use only)

AUTO RECORDED 9/8 MIN. CON. S&R 33H

Ausdoc Commercial and Law Stationers

(H)

CONSENT OF EXECUTOR OR ADMINISTRATOR

I, ... **Executor of the will /Administrator of the estate** of the Deceased Registered Proprietor, hereby consent to this application.

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

.....
Signature of Executor/Administrator

INSTRUCTIONS FOR COMPLETION

STAMP DUTY: If the Applicant is a devisee, beneficiary, next-of-kin or otherwise beneficially entitled or if the Deceased Registered Proprietor died prior to 31 December 1981 the application must be presented to the Office of State Revenue prior to lodgment at the Land Titles Office.

1. The Application must be completed clearly and legibly in permanent, dense, black or dark blue non-copying ink. If using a dot-matrix printer the print must be letter-quality.
2. Do not use an eraser or correction fluid to make alterations: rule through rejected material. Initial each alteration in the lefthand margin.
3. If the space provided at any point is insufficient, you may annex additional pages. These must be the same size as the form; paper quality, colour. etc, must conform to the requirements set out in Land Titles Office Information Bulletin No. 19. All pages of any annexure must be signed by the person executing the Application and any attesting witness.
4. The following instructions relate to the marginal letters on the application.

(A) LAND
Show the relevant Reference to Title. If there are more than 20 show none in this panel. Place ALL of them on an annexure (see 3 above) with 20 per sheet.

(B) REGISTERED DEALING
Show the registration number of any lease, mortgage or charge in regard to which the Applicant is applying to be registered as a proprietor.

(C) LODGED BY
This section relates to the person or firm lodging the Application at the Land Titles Office.
Reference (max. 15 characters) This is optional. Any slashes, dots, blank spaces, etc, will be counted as characters.

(D) DECEASED REGISTERED PROPRIETOR
Show the name in full. Address and occupation need not be shown.

(E) APPLICANT
Show the name in full. Address and occupation need not be shown.

(F) WILL/ESTATE, etc
Amend "will/estate", "Probate/Letters of Administation" and "Land/Registered Dealing" as appropriate.
In the relevant spaces show the capacity (executor, devisee, etc) in which the Applicant is entitled to apply, the number and date of grant of the Probate or Letters of Administration pursuant to which the application is made, and the name of the person to whom the grant was made.

(G) EXECUTION
General The application must be executed by or on behalf of the Applicant.
By the Applicant Personally The application must be signed in the presence of an adult witness who is not an Applicant and who knows the party executing personally. The witness should complete the appropriate section of the application.
By the Applicant's Attorney The Power of Attorney must be registered in the General Register of Deeds at the Land Titles Office. The execution should take the form, "AB by her attorney XY *[full name]* pursuant to Power of Attorney Book 1234 Number 567".
Under Authority If the application is made pursuant to any statutory, judicial or other authority, except a Power of Attorney (see above), the nature of the authority should be disclosed.
By a Corporation under Seal The execution should include a statement that the seal has been properly affixed, for example, "... pursuant to a resolution of the board of directors ...". Alternatively, all those attesting the affixing of the seal must state their position in the corporation.

(H) CONSENT OF EXECUTOR OR ADMINISTRATOR
This is required only where the Applicant claims to be entitled other than as executor, administrator or trustee.

The completed Application must be lodged by hand at the LAND TITLES OFFICE, Queen's Square, Sydney, together with the Certificate of Title, the probate or letters of administration (or a copy thereof certified by a solicitor to be a true copy) and a completed Notice of Sale.

If you have any questions about filling out the form, please call 228-6666 and ask for our Customer Services Branch.

KP13 [redacted]

TRANSFER

Real Property Act, 1900

U 740506 K

(S)

Office of State Revenue use only

... NS ... DUTY $/0-00 ... 80016540

D

(A) **LAND TRANSFERRED**
Show no more than 20 References to Title. If appropriate, specify the share transferred.

F/I 2/619296 (P)
Vol. 14809 Folio 38
Vol. 7066 Folio 220 — NOW IDENTIFIER 0/26081
Vol. 8406 Folio 64 — NOW IDENTIFIER 98/752189 (2/12)
Vol. 10832 Folio 185 — NOW IDENTIFIER 1/1281...

(B) **LODGED BY**

L.T.O. Box: 33H

Name, Address or DX and Telephone
THOMAS KENYON & SON
LAW STATIONERS,
SUITE 503, 49 MARKET STREET
SYDNEY, N.S.W. 2000
D.X. 435 PHONE: (02) 293 1766
REFERENCE (max. 15 characters): 211-GARDNER

(C) **TRANSFEROR** EDWARD MARK LEYDEN, SCOTT CIVIL GARDNER and GREER ELIZABETH RUSHBY

(D) ~~acknowledges receipt of the consideration of~~ Pursuant to Deed of Arrangement dated 12th August, 1994.
and as regards the land specified above transfers to the transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. .... 2. .... 3. ....

(F) **TRANSFEREE**

(G) T

SCOTT CIVIL GARDNER

as joint tenants/tenants in common

S

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATE OF EXECUTION** 12 August 1994

Signed in my presence by the transferor who is personally known to me.

Margaret C. Thrift
Signature of Witness
MARGARET C. THRIFT
Name of Witness (BLOCK LETTERS)
MANILLA CLERK
Address of Witness

S.C. ... Rushby
Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

Margaret C. Thrift
Signature of Witness
MARGARET C. THRIFT
Name of Witness (BLOCK LETTERS)
MANILLA CLERK
Address of Witness

S.C. ...
Signature of Transferee

~~CT - 3?? (?/?????)~~
CT - 33H (14809-38)

☞ INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

Ministers Consent Re 98/752189 Sighted

No. 1968/970

NEW SOUTH WALES
Seventy five cents
STAMP DUTY
SYDNEY, N.S.W.

State of New South Wales

10832185

Vol. [illegible] Fol. [illegible]
Registered 26-7-1968
Registrar General.

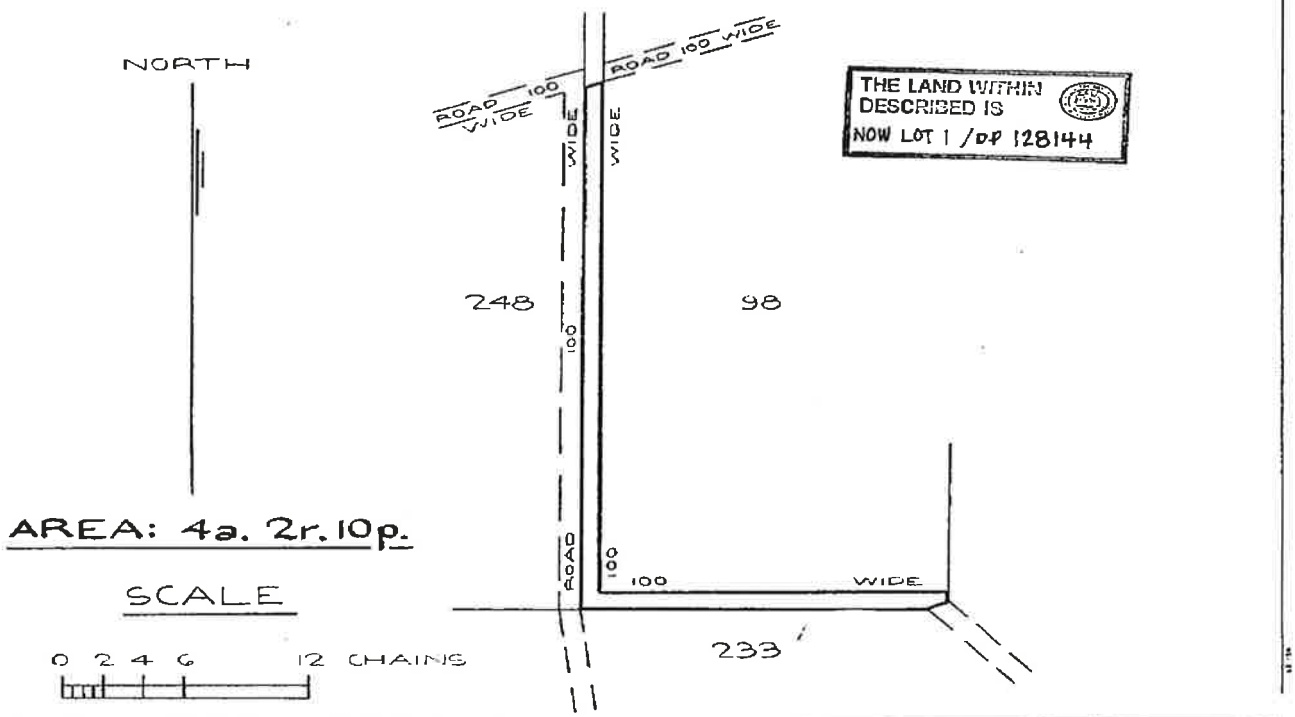
GRANT UPON PURCHASE OF UNNECESSARY ROAD

(UNDER THE PUBLIC ROADS ACT, 1902)

ELIZABETH the SECOND, by the Grace of God of the United Kingdom, Australia and her other Realms and Territories Queen, Head of the Commonwealth, Defender of the Faith—
To All to whom these Presents shall come, Greeting

CANCELLED W
ON ISSUE OF NEW FOLIO 1/128144

Whereas CHARLES GREER JOHNSTON of Manilla in Our State of New South Wales (hereinafter called the GRANTEE) being the owner of land adjoining the land hereinafter described and intended to be hereby granted (formerly a road which was duly closed in accordance with the provisions of the Public Roads Act, 1902) agreed to have such land granted to him upon payment of the sum of one hundred and seventy two dollars thirty one cents being the value thereof as determined by the Local Land Board AND WHEREAS the said sum has been duly paid and all things required by law to be done to entitle the GRANTEE to a Grant of the fee simple of the said land Subject to the Reservations and Exceptions hereinafter contained have been done and performed NOW THESE PRESENTS WITNESS That in consideration of the premises WE DO HEREBY GRANT unto the GRANTEE Subject to the Reservations and Exceptions hereinafter contained ALL THAT parcel of land containing by admeasurement four acres two roods ten perches — be the same more or less situated in the County of Darling Parish of Keepit Being the closed part of the road separating portions 248 and 233 from portion 98



As per Plan hereon TO HOLD unto the GRANTEE in fee simple PROVIDED NEVERTHELESS AND WE DO HEREBY RESERVE AND EXCEPT unto Us Our Heirs and Successors all minerals which the said Land contains with full power and authority for Us Our Heirs and Successors and such person or persons as shall from time to time be authorised by Us or Them to enter upon the said Land and to search for mine dig and remove the said minerals AND ALSO all such parts and so much of the said Land as may hereafter be required for public ways in over and through the same to be set out by Our Governor for the time being of Our said State or some person by him authorised in that respect with full power for Us Our Heirs and Successors and for Our Governor as aforesaid by such person or persons as shall be by Us Them or him authorised in that behalf to make and conduct all such public ways And the right of full and free ingress egress and regress into out of and upon the said Land for the several purposes aforesaid or any of them IN TESTIMONY WHEREOF We have caused this Our Grant to be Sealed with the Seal of Our said State

Witness Our Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this fifteenth day of July in the seventeenth year of Our Reign and in the year of Our Lord one Thousand nine hundred and sixty eight

A. R. Cutler
Governor

FOR ENDORSEMENTS SEE PAGE 2

4228279

Sc 1609 V. C. N. Blight, Government Printer

Vol. 10832 Fol 185

SCHEDULE OF REGISTERED PROPRIETORS

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
Winnifred Elizabeth Gardner by Transmission 4228279 Registered 2-8-1939					

COMPUTER FOLIO 1/1281444 NO FURTHER DEALINGS TO BE REGISTERED.

SCHEDULE OF ENCUMBRANCES ETC.

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 3:16PM

FOLIO: 1/128144

First Title(s): VOL 10832 FOL 185
Prior Title(s): VOL 10832 FOL 185

Recorded	Number	Type of Instrument	C.T. Issue
3/8/1994	DP128144	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
8/8/1994		AMENDMENT: VOL FOL INDEX	
9/8/1994	U504018	TRANSMISSION APPLICATION	EDITION 1
1/11/1994	U740506	TRANSFER	EDITION 2
1/6/1995	DP849741	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 2:38PM

FOLIO: 9/849741

First Title(s): VOL 3917 FOL 227 VOL 8406 FOL 64
1/128144
Prior Title(s): 1/128144 39/752189
98/752189

Recorded	Number	Type of Instrument	C.T. Issue
6/6/1995	DP849741	DEPOSITED PLAN	FOLIO CREATED EDITION 1
19/6/1995	O312733	TRANSFER	EDITION 2
10/1/1998	3721792	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

rushes creek PRINTED ON 12/10/2016

Ref:rushes creek /Src:M
97-01T

[redacted]

TRANSFER

Real Property Act, 1900

O
312733 M

Office of State Revenue use only

260595 220S 04 8004875Z3/01 $2.00

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

That part of Lot 9 in D.P. 849741 formerly comprised in Identifier 98/752189 and Volume 10832 Folio 185 now 1/128144

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
33H	THOMAS KENYON & SON DX 435 SYDNEY PHONE: (02) 283 1766 REFERENCE (max. 15 characters): 211-DOYLE

(C) **TRANSFEROR** SCOTT CIVIL GARDNER

(D) acknowledges receipt of the consideration of $21,500.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. .....Nil..... 2. ..... 3. .....

(F) **TRANSFEREE**

T	RAYMOND JOHN DOYLE

(G) **TENANCY:**

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATED** 14th June, 1995

Signed in my presence by the Transferor who is personally known to me.

.....
Signature of Witness

EDWARD MARK LEYDEN
Name of Witness (BLOCK LETTERS)

SOLICITOR MANILLA
Address of Witness

S.C.
Signature of Transferor

Signed in my presence by the Transferee who is personally known to

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

Edward Mark Leyden
Signature of Transferee
Solicitor for Transferees

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

ADMINISTRATOR'S CONSENT SIGNED.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 9/849741

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	2:39 PM	2	19/6/1995

LAND

LOT 9 IN DEPOSITED PLAN 849741
AT RIVERLEA
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF KEEPIT COUNTY OF DARLING
TITLE DIAGRAM DP849741

FIRST SCHEDULE

RAYMOND JOHN DOYLE (T 0312733)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

NOTATIONS

NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND COMPRISED IN THIS FOLIO.
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

[redacted]FICATE OF TITLE

15183173

NEW SOUTH WALES [redacted]L PROPERTY ACT, 1900

Vol. 15183 Fol. 173

First Title This Folio

Prior Title Crown Land (FI 67429)

EDITION ISSUED

19 1 1984

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

CANCELLED

Registrar General.

SEE AUTO FOLIO

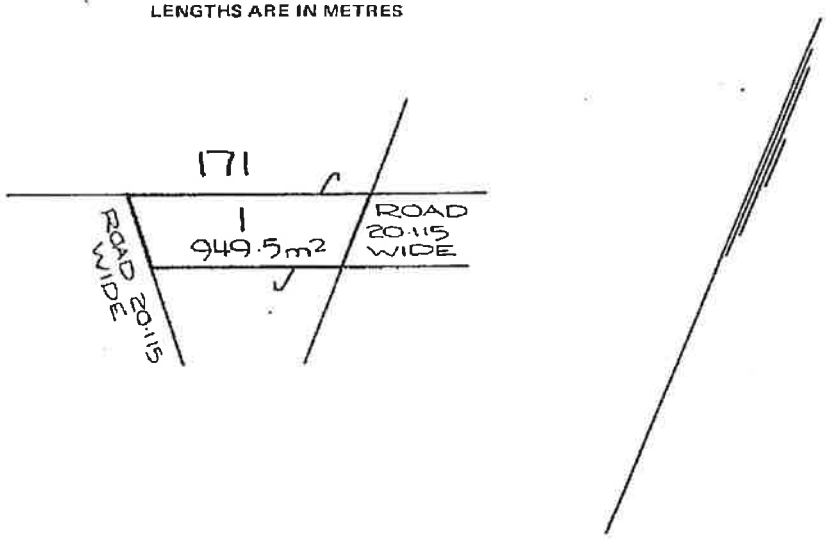
15183 Fol. 173 (Page 1) Vol.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



LAND REFERRED TO

Lot 1 in Deposited Plan 44215 in the Shire of Manilla Parish of Baldwin County of Darling.

FIRST SCHEDULE

RAYMOND JOHN DOYLE.

SECOND SCHEDULE

1. Land excludes minerals and is subject to reservations and conditions in favour of the Crown - see Memorandum S700000A.

RG 2/64

Vol. 15183 Fol. 173

L.O. 1066 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	Registrar General
CANCELLED SEE AUTO FOLIO	

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
~~T983943 Caveat by Dell Alexia Cornwell Registered 1-5-1984.~~		W422726

NOTATIONS AND UNREGISTERED DEALINGS

W432736 AJX R.		T983943

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/44215

SEARCH DATE	TIME	EDITION NO	DATE
13/10/2016	8:29 AM	-	-

VOL 15183 FOL 173 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LOT 1 IN DEPOSITED PLAN 44215
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
TITLE DIAGRAM DP44215

FIRST SCHEDULE

RAYMOND JOHN DOYLE

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE MEMORANDUM S700000A

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
13/10/2016 8:39AM

FOLIO: 1/1108119

First Title(s): THIS FOLIO
Prior Title(s): CROWN LAND

Recorded	Number	Type of Instrument	C.T. Issue
26/2/2007	DP1108119	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
28/5/2007	AD147967	DEPARTMENTAL DEALING	
23/7/2007	AD222977	TRANSFER AND ROAD CLOSURE	EDITION 1

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/1108119

SEARCH DATE	TIME	EDITION NO	DATE
13/10/2016	8:38 AM	1	23/7/2007

LAND

LOT 1 IN DEPOSITED PLAN 1108119
AT RUSHES CREEK
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
PARISH OF KEEPIT COUNTY OF DARLING
TITLE DIAGRAM DP1108119

FIRST SCHEDULE

RAYMOND JOHN DOYLE (TX AD222977)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
13/10/2016 8:51AM

FOLIO: 1/1132298

First Title(s): THIS FOLIO
Prior Title(s): CROWN LAND

Recorded	Number	Type of Instrument	C.T. Issue
6/11/2008	DP1132298	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
23/12/2008	AE412099	DEPARTMENTAL DEALING	
19/1/2009	AE446870	TRANSFER AND ROAD CLOSURE	EDITION 1
12/2/2009	AE493102	DEPARTMENTAL DEALING	EDITION 2

*** END OF SEARCH ***

Form: 01TX
Release: 1.3
www.lands.nsw.gov.au

TRANSFER and ROAD CLOSURE

New South Wales
Real Property Act 1900, section 42 Roads Act

AE446870C

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

NEW SOUTH WALES DUTY
28-11-2008 0005227606-001
TRANSFER- TRANSFER
DUTIABLE AMOUNT $ **********2,834.00
DUTY $ **********36.25

(A) **TORRENS TITLE** 1/1132298

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and LLPN if any	CODE
469S	Dept of Lands P O Box 535 TAMWORTH NSW 2340 PH: (02) 6764 5118 Fax: (02) 6766 3805 LLPN: 123334F Reference: TH05H26	TX

(C) **TRANSFEROR** THE STATE OF NEW SOUTH WALES

(D) The transferor acknowledges receipt of the consideration of $ 2,834.00 and as regards the land specified above transfers to the transferee an estate in fee simple and requests the Registrar General to endorse on the above folio of the Register a notification of the road closure referred to in Government Gazette

(E) No. 157 dated 12 / 12 / 2008 folio 11937 a copy of which is annexed hereto and marked "A".

(F) The transferor states that purchase monies HAVE BEEN PAID.

(G) **TRANSFEREE** Raymond Andrew Doyle

(H) **TENANCY:**

DATE 12.1.09

(I) Signed on behalf of the State of New South Wales by the delegate named below who certifies this dealing to be correct for the purposes of the Real Property Act 1900.

Signature of witness: Kerrie Brooks
Name of witness: Kerrie Brooks
25-27 Fitzroy St
TAMWORTH NSW 2340

Signature of delegate: BKelly
Name of delegate: BELINDA KELLY

By delegation pursuant to section 100 of the Crown Lands Act 1989 for the purposes of section 42 of the Real Property Act 1900 on behalf of the Crown Lands Minister on behalf of the State of New South Wales

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness: Grady TP 166350
Name of witness: BARRY CLARKE GRADY
Address of witness: 8 Ratcliffe Court DUBBO 2830

Certified correct for the purposes of the Real Property Act 1900 by the transferee.

Signature of transferee:

Annexure "A" to TRANSFER AND ROAD CLOSURE

Parties:

Dated 30/10/2008

12 December 2008 OFFICIAL NOTICES 11937
NEW SOUTH WALES GOVERNMENT GAZETTE No. 157

TAMWORTH OFFICE
25-27 Fitzroy Street (PO Box 535), Tamworth NSW 2340
Phone: (02) 6764 5100 Fax: (02) 6766 3805

NOTIFICATION OF CLOSING OF A ROAD

IN pursuance to the provisions of the Roads Act 1993, the road hereunder specified is closed and the land comprised therein ceases to be a public road and the rights of passage and access that previously existed in relation to the road are extinguished.
TONY KELLY, M.L.C.,
Minister for Lands

Description
Locality – Rushes Creek; Land District – Tamworth;
L.G.A. – Tamworth Regional
Road Closed: Lot 1 in Deposited Plan 1132298, Parish Baldwin, County Darling.
File No.: TH05 H 26.

Note: On closing, title to the land comprised in Lot 1 will remain vested in the State of New South Wales as Crown Land.

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/1132298

SEARCH DATE	TIME	EDITION NO	DATE
13/10/2016	8:49 AM	2	12/2/2009

LAND

LOT 1 IN DEPOSITED PLAN 1132298
AT RUSHES CREEK
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
TITLE DIAGRAM DP1132298

FIRST SCHEDULE

RAYMOND ANDREW DOYLE (TX AE446870)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Form: 01TX
Release: 1.3
www.lands.nsw.gov.au

TRANSFER and ROAD CLOSURE

New South Wales
Real Property Act 1900, section 42 Ro...

AE447630T

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

NEW SOUTH WALES DUTY
28-10-2008 0005187873-001
TRANSFER- TRANSFER
DUTIABLE AMOUNT $ **********386.00
DUTY $ **********5.00

(A) **TORRENS TITLE** 1/1132078

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and LLPN if any	CODE
469S	DEPT OF LANDS, P O BOX 535, TAMWORTH NSW 2340 PH: (02) 6764 5113 LLPN: 123334F Reference: 08/6102	TX

(C) **TRANSFEROR** THE STATE OF NEW SOUTH WALES

(D) The transferor acknowledges receipt of the consideration of $ 386.00 and as regards the land specified above transfers to the transferee an estate in fee simple and requests the Registrar General to endorse on the above folio of the Register a notification of the road closure referred to in Government Gazette

(E) No. 155 dated 5/12/08 folio 11746 a copy of which is annexed hereto and marked "A".

(F) The transferor states that purchase monies HAVE BEEN PAID.

(G) **TRANSFEREE** Istvan OLAH

(H) **TENANCY:**

DATE 17.12.08

(I) Signed on behalf of the State of New South Wales by the delegate named below who certifies this dealing to be correct for the purposes of the Real Property Act 1900.

Signature of witness: Michelle Read
Name of witness: MICHELLE READ

Signature of delegate: B Kelly
Name of delegate: BELINDA KELLY

By delegation pursuant to section 180 of the Crown Lands Act 1989 and with authority under section 13L of the Real Property Act 1900 from the Minister administering the Crown Lands Act 1989 on behalf of the State of New South Wales

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness: SOH
Name of witness: STEPHEN OLAH
Address of witness: 1648 RUSHES CREEK Rd. MANILLA.

Certified correct for the purposes of the Real Property Act 1900 by the transferee.

Signature of transferee: Istvan Olah

Annexure "A" to TRANSFER and ROAD CLOSURE

Parties:

BKeery

Dated 23.10.08

11746 OFFICIAL NOTICES 5 December 2008

NOTIFICATION OF CLOSING OF A ROAD

IN pursuance to the provisions of the Roads Act 1993, the road hereunder specified is closed and the land comprised therein ceases to be a public road and the rights of passage and access that previously existed in relation to the road are extinguished.

TONY KELLY, M.L.C.,
Minister for Lands

Description
Locality – Rushes Creek;
Land District – Tamworth;
L.G.A. – Tamworth Regional
Road Closed: Lot 1 in Deposited Plan 1132078, Parish Baldwin, County Darling. File No.: 07/6102.

Note: On closing, title to the land comprised in Lots 1 and 2 will remain vested in the State of New South Wales as Crown Land

NEW SOUTH WALES GOVERNMENT GAZETTE No. 155

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/1132078

SEARCH DATE	TIME	EDITION NO	DATE
13/10/2016	8:53 AM	1	20/1/2009

LAND

LOT 1 IN DEPOSITED PLAN 1132078
AT RUSHES CREEK
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
TITLE DIAGRAM DP1132078

FIRST SCHEDULE

ISTVAN OLAH (TX AE447630)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/1141148

SEARCH DATE	TIME	EDITION NO	DATE
13/10/2016	9:05 AM	1	12/5/2010

LAND

LOT 1 IN DEPOSITED PLAN 1141148
AT RUSHES CREEK
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF BALDWIN COUNTY OF DARLING
TITLE DIAGRAM DP1141148

FIRST SCHEDULE

STEPHEN CHARLES MCCRAE
MARGARET JOY MCCRAE
AS JOINT TENANTS (TX AF486842)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

APPENDIX D

NSW EPA

Healthy Environment, Healthy Community, Healthy Business

Home Contaminated land Record of notices

Search results

Your search for:Suburb: RUSHES CREEK

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

10 October 2016

Healthy Environment, Healthy Community, Healthy Business

Search results

Your search for: **General Search** with the following criteria

Suburb - rushes creek

returned 0 result

Search Again

APPENDIX E

Planning Certificates

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Certificate No: *PC2016/1364*
Receipt No:
Date: *21 January 2016*
Applicants Ref: *56447*

PLANNING CERTIFICATE
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Applicant:

Leyden Legal
180 Manilla Street
MANILLA NSW 2346

Owner (as recorded by Council):

Mr RJ Doyle
Bundah
1582 Rushes Creek Road
MANILLA NSW 2346

Land: 1582 Rushes Creek Road RUSHES CREEK NSW 2346
Lot 165 DP 752169
Lot 171 DP 752169
Lot 85 DP 752169
Lot 9 DP 849741
Lot 1 DP 1085455
Lot 1 DP 44215
Lot 1 DP 1108119

This certificate is provided pursuant to Section 149(2) of the Act. At the date of this certificate, the subject land is affected by the following matters.

Names of relevant planning instruments and development control plans

Note: Current environmental planning instruments (State environmental planning policies, regional environmental plans and local environmental plans) may be viewed at the NSW Government legislation web-site – www.legislation.nsw.gov.au.

Names of relevant State Environmental Planning Policies

1. State Environmental Planning Policy No. 15 – Rural Landsharing Communities
2. State Environmental Planning Policy No. 21 – Caravan Parks
3. State Environmental Planning Policy No. 30 – Intensive Agriculture
4. State Environmental Planning Policy No. 32 – Urban Consolidation (Redevelopment of Urban Land)
5. State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
6. State Environmental Planning Policy No. 36 – Manufactured Home Estates
7. State Environmental Planning Policy No. 44 – Koala Habitat Protection
8. State Environmental Planning Policy No. 50 – Canal Estate Development
9. State Environmental Planning Policy No. 55 – Remediation of Land
10. State Environmental Planning Policy No. 62 – Sustainable Aquaculture
11. State Environmental Planning Policy No. 64 – Advertising and Signage
12. State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development
13. State Environmental Planning Policy (Affordable Rental Housing) 2009
14. State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
15. State Environmental Planning Policy (Exempt and Complying Development) 2008
16. State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
17. State Environmental Planning Policy (Infrastructure) 2007
18. State Environmental Planning Policy (Major Development) 2005
19. State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
20. State Environmental Planning Policy (Rural Lands) 2008
21. State Environmental Planning Policy (Temporary Structures) 2007
22. State Environmental Planning Policy (State and Regional Development) 2011

Development Control Plans

23. Tamworth Regional Development Control Plan 2010.

Zoning and land use under relevant LEPs

24. The subject land is affected by the Tamworth Regional Local Environmental Plan 2010. Under this plan, the land is zoned -

RU1 Primary Production

1. **Objectives of zone**
   - To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
   - To encourage diversity in primary industry enterprises and systems appropriate for the area.
   - To minimise the fragmentation and alienation of resource lands.
   - To minimise conflict between land uses within the zone and land uses within adjoining zones.
   - To permit subdivision only where it is considered by the Council to be necessary to maintain or increase agricultural production.
   - To restrict the establishment of inappropriate traffic generating uses along main road frontages.
   - To ensure sound management of land which has an extractive or mining industry potential and to ensure that development does not adversely affect the extractive industry.
   - To permit development for purposes where it can be demonstrated that suitable land or premises are not available elsewhere.

2. **Permitted without consent**
   Environmental protection works; Extensive agriculture; Forestry; Home-based child care; Home occupations; Moorings; Roads

3. **Permitted with consent**
   Cellar door premises; Dual occupancy (attached); Dwelling houses; Extractive industries; Farm buildings; Intensive livestock agriculture; Intensive plant agriculture; Kiosks, Landscaping material supplies; Mining; Plant nurseries; Roadside stalls; Rural workers' dwellings; Any other development not specified in item 2 or 4

4. **Prohibited**
   Amusement centres; Cemeteries; Child care centres; Commercial premises; Crematoria; Depots; Eco-tourist facilities; Educational establishments; Entertainment facilities; Exhibition homes; Exhibition villages; Function centres; Health services facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Mortuaries; Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Service stations; Serviced apartments; Sex services premises; Storage premises; Vehicle body repair workshops; Vehicle repair stations; Wharf or boating facilities; Wholesale supplies

25. The Tamworth Regional Local Environmental Plan 2010 contains a development standard in relation to the erection of a dwelling-house on the subject land being either:

- A minimum lot size of 400 hectares as specified by the Lot Size Map pursuant to clause 4.2B(3)(a); or

- A minimum lot or holding size of 200 hectares pursuant to clause 4.2B(3)(b) or 4.2B(3)(f).

For further information, see clause 4.2B of the Plan.

Complying Development

General Housing Code

26. Development specified as Complying Development for the General Housing Code in Part 3 of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

Rural Housing Code

27. Development specified as Complying Development for the Rural Housing Code in Part 3A of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

Housing Alterations Code

28. Development specified as Complying Development for the Housing Alterations Code in Part 4 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

General Development Code

29. Development specified as Complying Development for the General Development Code in Part 4A of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Commercial and Industrial Code Alterations Code

30. Development specified as Complying Development for the Commercial and Industrial Alterations Code in Part 5 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code

31. Development specified as Complying Development for the Commercial and Industrial (New Buildings and Additions) Code in Part 5A of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Subdivisions Code

32. Development specified as Complying Development for the Subdivisions Code in Part 6 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Demolition Code

33. Development specified as Complying Development for the Demolition Code in Part 7 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Fire Safety Code

34. Development specified as Complying Development for the Fire Safety Code in Part 8 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Coastal Protection

35. The land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act.

Mine subsidence

36. The land has not been proclaimed to be a mine subsidence district within the meaning of Section 15 of the Mine Subsidence Compensation Act 1961.

Road widening and road realignment

37. The land is not affected by any road widening or road realignment proposal under:-
(1) section 262 of the Local Government Act, 1919;
(2) an environmental planning instrument; or
(3) any resolution of Council.

Council and other public authority policies on hazard risk restrictions

38. The land is not affected by a policy adopted by any other public authority that has been notified to Council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

39. The land is not affected by a policy adopted by Council that restricts the development of the land because of the likelihood of landslip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Flood related development control information

40. Council is unable to confirm whether or not development on the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.
Note: Clause 7.2 of the Tamworth Regional Local Environmental Plan 2010 defines the flood planning level as *the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metres freeboard.* This Clause was inserted into the Tamworth Regional Local Environmental Plan 2010 by the Minister for Planning after the Council had submitted it to the Minister for approval. The flood planning level is not known by the Council. Consequently the Council has been unable to map the extent of land affected by the flood planning level.
You should conduct studies necessary for determining flood levels in relation to the land if you consider the land may be at or below the flood planning level.

41. Council is unable to confirm whether or not development on the land or part of the land for any other purpose is subject to flood related development controls.
Note: Clause 7.2 of the Tamworth Regional Local Environmental Plan 2010 defines the flood planning level as *the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metres freeboard.* This Clause was inserted into the Tamworth Regional Local Environmental Plan 2010 by the Minister for Planning after the Council had submitted it to the Minister for approval. The flood planning level is not known by the Council. Consequently the Council has been unable to map the extent of land affected by the flood planning level.
You should conduct studies necessary for determining flood levels in relation to the land if you consider the land may be at or below the flood planning level.

Land reserved for acquisition

42. There are no environmental planning instruments applying to the land which provide for the acquisition of the land by a public authority, as referred to in Section 27 of the Act.

Contributions plans

43. Tamworth Regional Council Section 94 (Direct) Development Contributions Plan 2013 applies to the land.

44. Tamworth Regional Council Section 94 (Indirect) Development Contributions Plan 2013 applies to the land.

Bushfire Prone Land

45. The subject land is not identified as being "bushfire prone land" on the Bushfire Prone Land Map, certified by the NSW Rural Fire Service.

Contaminated Land Management Act 1997

46. The land to which this certificate relates is not subject to the matters identified by Section 59(2) of the Contaminated Land Management Act 1997.

Site Compatibility Certificates for Infrastructure

47. Council is not aware of a valid site compatibility certificate (infrastructure) in respect of proposed development on the land.

Site Compatibility Certificates and Conditions for Affordable Rental Housing

48. Council is not aware of a current site compatibility certificate (affordable rental housing) in respect of proposed development on the land.

Development & Approvals
Tamworth Regional Council
21 January 2016

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Certificate No: *PC2016/1331*
Receipt No:
Date: *12 January 2016*
Applicants Ref: *56448*

PLANNING CERTIFICATE
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Applicant:

Leyden Legal
180 Manilla Street
MANILLA NSW 2346

Owner (as recorded by Council):

Mr RA Doyle
7 Coonawillin Close
DUBBO NSW 2830

Land: Rushes Creek Road RUSHES CREEK NSW 2346
Lot 143 DP 752189
Lot 1 DP 1132298

This certificate is provided pursuant to Section 149(2) of the Act. At the date of this certificate, the subject land is affected by the following matters.

Names of relevant planning instruments and development control plans

Note: Current environmental planning instruments (State environmental planning policies, regional environmental plans and local environmental plans) may be viewed at the NSW Government legislation web-site – www.legislation.nsw.gov.au.

Names of relevant State Environmental Planning Policies

1. State Environmental Planning Policy No. 15 – Rural Landsharing Communities
2. State Environmental Planning Policy No. 21 – Caravan Parks
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4. State Environmental Planning Policy No. 32 – Urban Consolidation (Redevelopment of Urban Land)
5. State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
6. State Environmental Planning Policy No. 36 – Manufactured Home Estates
7. State Environmental Planning Policy No. 44 – Koala Habitat Protection
8. State Environmental Planning Policy No. 50 – Canal Estate Development
9. State Environmental Planning Policy No. 55 – Remediation of Land
10. State Environmental Planning Policy No. 62 – Sustainable Aquaculture
11. State Environmental Planning Policy No. 64 – Advertising and Signage
12. State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development
13. State Environmental Planning Policy (Affordable Rental Housing) 2009
14. State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
15. State Environmental Planning Policy (Exempt and Complying Development) 2008
16. State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
17. State Environmental Planning Policy (Infrastructure) 2007
18. State Environmental Planning Policy (Major Development) 2005
19. State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
20. State Environmental Planning Policy (Rural Lands) 2008
21. State Environmental Planning Policy (Temporary Structures) 2007
22. State Environmental Planning Policy (State and Regional Development) 2011

Development Control Plans

23. Tamworth Regional Development Control Plan 2010.

Zoning and land use under relevant LEPs

24. The subject land is affected by the Tamworth Regional Local Environmental Plan 2010. Under this plan, the land is zoned -

RU1 Primary Production

1. Objectives of zone

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within the zone and land uses within adjoining zones.
- To permit subdivision only where it is considered by the Council to be necessary to maintain or increase agricultural production.
- To restrict the establishment of inappropriate traffic generating uses along main road frontages.
- To ensure sound management of land which has an extractive or mining industry potential and to ensure that development does not adversely affect the extractive industry.
- To permit development for purposes where it can be demonstrated that suitable land or premises are not available elsewhere.

2. Permitted without consent

Environmental protection works; Extensive agriculture; Forestry; Home-based child care; Home occupations; Moorings; Roads

3. Permitted with consent

Cellar door premises; Dual occupancy (attached); Dwelling houses; Extractive industries; Farm buildings; Intensive livestock agriculture; Intensive plant agriculture; Kiosks, Landscaping material supplies; Mining; Plant nurseries; Roadside stalls; Rural workers' dwellings; Any other development not specified in item 2 or 4

4. Prohibited

Amusement centres; Cemeteries; Child care centres; Commercial premises; Crematoria; Depots; Eco-tourist facilities; Educational establishments; Entertainment facilities; Exhibition homes; Exhibition villages; Function centres; Health services facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Mortuaries; Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Service stations; Serviced apartments; Sex services premises; Storage premises; Vehicle body repair workshops; Vehicle repair stations; Wharf or boating facilities; Wholesale supplies

25. The Tamworth Regional Local Environmental Plan 2010 contains a development standard in relation to the erection of a dwelling-house on the subject land being either:

- A minimum lot size of 400 hectares as specified by the Lot Size Map pursuant to clause 4.2B(3)(a); or

- A minimum lot or holding size of 200 hectares pursuant to clause 4.2B(3)(b) or 4.2B(3)(f).

For further information, see clause 4.2B of the Plan.

Complying Development

General Housing Code

26. Development specified as Complying Development for the General Housing Code in Part 3 of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

Rural Housing Code

27. Development specified as Complying Development for the Rural Housing Code in Part 3A of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

Housing Alterations Code

28. Development specified as Complying Development for the Housing Alterations Code in Part 4 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

General Development Code

29. Development specified as Complying Development for the General Development Code in Part 4A of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Commercial and Industrial Code Alterations Code

30. Development specified as Complying Development for the Commercial and Industrial Alterations Code in Part 5 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code

31. Development specified as Complying Development for the Commercial and Industrial (New Buildings and Additions) Code in Part 5A of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Subdivisions Code

32. Development specified as Complying Development for the Subdivisions Code in Part 6 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Demolition Code

33. Development specified as Complying Development for the Demolition Code in Part 7 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Fire Safety Code

34. Development specified as Complying Development for the Fire Safety Code in Part 8 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Coastal Protection

35. The land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act.

Mine subsidence

36. The land has not been proclaimed to be a mine subsidence district within the meaning of Section 15 of the Mine Subsidence Compensation Act 1961.

Road widening and road realignment

37. The land is not affected by any road widening or road realignment proposal under:-
(1) section 262 of the Local Government Act, 1919;
(2) an environmental planning instrument; or
(3) any resolution of Council.

Council and other public authority policies on hazard risk restrictions

38. The land is not affected by a policy adopted by any other public authority that has been notified to Council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

39. The land is not affected by a policy adopted by Council that restricts the development of the land because of the likelihood of landslip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Flood related development control information

40. Council is unable to confirm whether or not development on the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.
Note: Clause 7.2 of the Tamworth Regional Local Environmental Plan 2010 defines the flood planning level as *the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metres freeboard.* This Clause was inserted into the Tamworth Regional Local Environmental Plan 2010 by the Minister for Planning after the Council had submitted it to the Minister for approval. The flood planning level is not known by the Council. Consequently the Council has been unable to map the extent of land affected by the flood planning level.
You should conduct studies necessary for determining flood levels in relation to the land if you consider the land may be at or below the flood planning level.

41. Council is unable to confirm whether or not development on the land or part of the land for any other purpose is subject to flood related development controls.
Note: Clause 7.2 of the Tamworth Regional Local Environmental Plan 2010 defines the flood planning level as *the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metres freeboard.* This Clause was inserted into the Tamworth Regional Local Environmental Plan 2010 by the Minister for Planning after the Council had submitted it to the Minister for approval. The flood planning level is not known by the Council. Consequently the Council has been unable to map the extent of land affected by the flood planning level.
You should conduct studies necessary for determining flood levels in relation to the land if you consider the land may be at or below the flood planning level.

Land reserved for acquisition

42. There are no environmental planning instruments applying to the land which provide for the acquisition of the land by a public authority, as referred to in Section 27 of the Act.

Contributions plans

43. Tamworth Regional Council Section 94 (Direct) Development Contributions Plan 2013 applies to the land.

44. Tamworth Regional Council Section 94 (Indirect) Development Contributions Plan 2013 applies to the land.

Bushfire Prone Land

45. The subject land is not identified as being "bushfire prone land" on the Bushfire Prone Land Map, certified by the NSW Rural Fire Service.

Contaminated Land Management Act 1997

46. The land to which this certificate relates is not subject to the matters identified by Section 59(2) of the Contaminated Land Management Act 1997.

Site Compatibility Certificates for Infrastructure

47. Council is not aware of a valid site compatibility certificate (infrastructure) in respect of proposed development on the land.

Site Compatibility Certificates and Conditions for Affordable Rental Housing

48. Council is not aware of a current site compatibility certificate (affordable rental housing) in respect of proposed development on the land.

Development & Approvals
Tamworth Regional Council
12 January 2016

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Certificate No: *PC2016/1370*
Receipt No:
Date: *18 January 2016*
Applicants Ref: *PMF: 10347*

PLANNING CERTIFICATE
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Applicant:

Furlong Legal
PO Box 142
QUIRINDI NSW 2343

Owner (as recorded by Council):

Mr SC McCrae & Mrs MJ McCrae
Happy Hills
1788 Rushes Creek Road
RUSHES CREEK VIA MANILLA NSW 2346

Land: Happy Hills 1788 Rushes Creek Road RUSHES CREEK NSW 2346
Lot 101 DP 752169
Lot 118 DP 752169
Lot 166 DP 752169
Lot 86 DP 752169
Lot 1 DP 1141148

This certificate is provided pursuant to Section 149(2) of the Act. At the date of this certificate, the subject land is affected by the following matters.

Names of relevant planning instruments and development control plans

Note: Current environmental planning instruments (State environmental planning policies, regional environmental plans and local environmental plans) may be viewed at the NSW Government legislation web-site – www.legislation.nsw.gov.au.

Names of relevant State Environmental Planning Policies

1. State Environmental Planning Policy No. 15 – Rural Landsharing Communities
2. State Environmental Planning Policy No. 21 – Caravan Parks
3. State Environmental Planning Policy No. 30 – Intensive Agriculture
4. State Environmental Planning Policy No. 32 – Urban Consolidation (Redevelopment of Urban Land)
5. State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
6. State Environmental Planning Policy No. 36 – Manufactured Home Estates
7. State Environmental Planning Policy No. 44 – Koala Habitat Protection
8. State Environmental Planning Policy No. 50 – Canal Estate Development
9. State Environmental Planning Policy No. 55 – Remediation of Land
10. State Environmental Planning Policy No. 62 – Sustainable Aquaculture
11. State Environmental Planning Policy No. 64 – Advertising and Signage
12. State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development
13. State Environmental Planning Policy (Affordable Rental Housing) 2009
14. State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
15. State Environmental Planning Policy (Exempt and Complying Development) 2008
16. State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
17. State Environmental Planning Policy (Infrastructure) 2007
18. State Environmental Planning Policy (Major Development) 2005
19. State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
20. State Environmental Planning Policy (Rural Lands) 2008
21. State Environmental Planning Policy (Temporary Structures) 2007
22. State Environmental Planning Policy (State and Regional Development) 2011

Development Control Plans

23. Tamworth Regional Development Control Plan 2010.

Zoning and land use under relevant LEPs

24. The subject land is affected by the Tamworth Regional Local Environmental Plan 2010. Under this plan, the land is zoned -

RU1 Primary Production

1. Objectives of zone

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within the zone and land uses within adjoining zones.
- To permit subdivision only where it is considered by the Council to be necessary to maintain or increase agricultural production.
- To restrict the establishment of inappropriate traffic generating uses along main road frontages.
- To ensure sound management of land which has an extractive or mining industry potential and to ensure that development does not adversely affect the extractive industry.
- To permit development for purposes where it can be demonstrated that suitable land or premises are not available elsewhere.

2. Permitted without consent

Environmental protection works; Extensive agriculture; Forestry; Home-based child care; Home occupations; Moorings; Roads

3. Permitted with consent

Cellar door premises; Dual occupancy (attached); Dwelling houses; Extractive industries; Farm buildings; Intensive livestock agriculture; Intensive plant agriculture; Kiosks, Landscaping material supplies; Mining; Plant nurseries; Roadside stalls; Rural workers' dwellings; Any other development not specified in item 2 or 4

4. Prohibited

Amusement centres; Cemeteries; Child care centres; Commercial premises; Crematoria; Depots; Eco-tourist facilities; Educational establishments; Entertainment facilities; Exhibition homes; Exhibition villages; Function centres; Health services facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Mortuaries; Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Service stations; Serviced apartments; Sex services premises; Storage premises; Vehicle body repair workshops; Vehicle repair stations; Wharf or boating facilities; Wholesale supplies

25. The Tamworth Regional Local Environmental Plan 2010 contains a development standard in relation to the erection of a dwelling-house on the subject land being either:

- A minimum lot size of 400 hectares as specified by the Lot Size Map pursuant to clause 4.2B(3)(a); or

- A minimum lot or holding size of 400 hectares pursuant to clause 4.2B(3)(b) or 4.2B(3)(f).

For further information, see clause 4.2B of the Plan.

Complying Development

General Housing Code

26. Development specified as Complying Development for the General Housing Code in Part 3 of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

Rural Housing Code

27. Development specified as Complying Development for the Rural Housing Code in Part 3A of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

Housing Alterations Code

28. Development specified as Complying Development for the Housing Alterations Code in Part 4 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

General Development Code

29. Development specified as Complying Development for the General Development Code in Part 4A of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Commercial and Industrial Code Alterations Code

30. Development specified as Complying Development for the Commercial and Industrial Alterations Code in Part 5 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code

31. Development specified as Complying Development for the Commercial and Industrial (New Buildings and Additions) Code in Part 5A of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Subdivisions Code

32. Development specified as Complying Development for the Subdivisions Code in Part 6 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Demolition Code

33. Development specified as Complying Development for the Demolition Code in Part 7 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Fire Safety Code

34. Development specified as Complying Development for the Fire Safety Code in Part 8 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Coastal Protection

35. The land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act.

Mine subsidence

36. The land has not been proclaimed to be a mine subsidence district within the meaning of Section 15 of the Mine Subsidence Compensation Act 1961.

Road widening and road realignment

37. The land is not affected by any road widening or road realignment proposal under:-
(1) section 262 of the Local Government Act, 1919;
(2) an environmental planning instrument; or
(3) any resolution of Council.

Council and other public authority policies on hazard risk restrictions

38. The land is not affected by a policy adopted by any other public authority that has been notified to Council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

39. The land is not affected by a policy adopted by Council that restricts the development of the land because of the likelihood of landslip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Flood related development control information

40. Council is unable to confirm whether or not development on the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.
Note: Clause 7.2 of the Tamworth Regional Local Environmental Plan 2010 defines the flood planning level as *the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metres freeboard.* This Clause was inserted into the Tamworth Regional Local Environmental Plan 2010 by the Minister for Planning after the Council had submitted it to the Minister for approval. The flood planning level is not known by the Council. Consequently the Council has been unable to map the extent of land affected by the flood planning level.
You should conduct studies necessary for determining flood levels in relation to the land if you consider the land may be at or below the flood planning level.

41. Council is unable to confirm whether or not development on the land or part of the land for any other purpose is subject to flood related development controls.
Note: Clause 7.2 of the Tamworth Regional Local Environmental Plan 2010 defines the flood planning level as *the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metres freeboard.* This Clause was inserted into the Tamworth Regional Local Environmental Plan 2010 by the Minister for Planning after the Council had submitted it to the Minister for approval. The flood planning level is not known by the Council. Consequently the Council has been unable to map the extent of land affected by the flood planning level.
You should conduct studies necessary for determining flood levels in relation to the land if you consider the land may be at or below the flood planning level.

Land reserved for acquisition

42. There are no environmental planning instruments applying to the land which provide for the acquisition of the land by a public authority, as referred to in Section 27 of the Act.

Contributions plans

43. Tamworth Regional Council Section 94 (Direct) Development Contributions Plan 2013 applies to the land.

44. Tamworth Regional Council Section 94 (Indirect) Development Contributions Plan 2013 applies to the land.

Bushfire Prone Land

45. The subject land is not identified as being "bushfire prone land" on the Bushfire Prone Land Map, certified by the NSW Rural Fire Service.

Contaminated Land Management Act 1997

46. The land to which this certificate relates is not subject to the matters identified by Section 59(2) of the Contaminated Land Management Act 1997.

Site Compatibility Certificates for Infrastructure

47. Council is not aware of a valid site compatibility certificate (infrastructure) in respect of proposed development on the land.

Site Compatibility Certificates and Conditions for Affordable Rental Housing

48. Council is not aware of a current site compatibility certificate (affordable rental housing) in respect of proposed development on the land.

Development & Approvals
Tamworth Regional Council
18 January 2016

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Furlong Legal
PO Box 142
QUIRINDI NSW 2343

Dear Sir/Madam

APPLICATION FOR DRAINAGE DIAGRAM

Application No.	PC2016/1370
Your Reference.	PMF: 10347
Location:	Lot 101 DP 752169 Lot 118 DP 752169 Lot 166 DP 752169 Lot 86 DP 752169 Lot 1 DP 1141148 Happy Hills 1788 Rushes Creek Road RUSHES CREEK NSW 2346

It is advised that this property is serviced by an on-site sewage management system, however, a diagram of the installation is not available.

For your information, it should be noted that:-

1. The owner of property serviced by an on-site sewerage management system must obtain Council's approval to operate the system and ensure that all specified performance standards are maintained.

2. If ownership of the property changes, the new owner must obtain Council's approval to operate the system within three (3) months of transfer.

3. Intending purchasers are advised to verify the current status of the system and the date of the last inspection by contacting Council.

4. If requested, Council will undertake a pre-sale inspection of the system to determine that it is operating as approved. Council's current fee will apply, however, if the system has been checked recently, a further inspection may not be necessary.

Development & Approvals
Tamworth Regional Council

18 January 2016

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Certificate No: *PC2017/0041*
Receipt No:
Date: *07 July 2016*
Applicants Ref: *56578*

PLANNING CERTIFICATE
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Applicant:

Leyden Legal
180 Manilla Street
MANILLA NSW 2346

Owner (as recorded by Council):

Mr I Olah
1648 Rushes Creek Road
MANILLA NSW 2346

Land: 1648 Rushes Creek Road RUSHES CREEK NSW 2346
Lot 26 DP 752169
Lot 1 DP 1132078

This certificate is provided pursuant to Section 149(2) of the Act. At the date of this certificate, the subject land is affected by the following matters.

Names of relevant planning instruments and development control plans

Note: Current environmental planning instruments (State environmental planning policies, regional environmental plans and local environmental plans) may be viewed at the NSW Government legislation web-site – www.legislation.nsw.gov.au.

Names of relevant State Environmental Planning Policies

1. State Environmental Planning Policy No. 15 – Rural Landsharing Communities
2. State Environmental Planning Policy No. 21 – Caravan Parks
3. State Environmental Planning Policy No. 30 – Intensive Agriculture
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6. State Environmental Planning Policy No. 36 – Manufactured Home Estates
7. State Environmental Planning Policy No. 44 – Koala Habitat Protection
8. State Environmental Planning Policy No. 50 – Canal Estate Development
9. State Environmental Planning Policy No. 55 – Remediation of Land
10. State Environmental Planning Policy No. 62 – Sustainable Aquaculture
11. State Environmental Planning Policy No. 64 – Advertising and Signage
12. State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development
13. State Environmental Planning Policy (Affordable Rental Housing) 2009
14. State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
15. State Environmental Planning Policy (Exempt and Complying Development) 2008
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20. State Environmental Planning Policy (Rural Lands) 2008
21. State Environmental Planning Policy (Temporary Structures) 2007
22. State Environmental Planning Policy (State and Regional Development) 2011

Development Control Plans

23. Tamworth Regional Development Control Plan 2010.

Zoning and land use under relevant LEPs

24. The subject land is affected by the Tamworth Regional Local Environmental Plan 2010. Under this plan, the land is zoned -

RU1 Primary Production

1. Objectives of zone

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within the zone and land uses within adjoining zones.
- To permit subdivision only where it is considered by the Council to be necessary to maintain or increase agricultural production.
- To restrict the establishment of inappropriate traffic generating uses along main road frontages.
- To ensure sound management of land which has an extractive or mining industry potential and to ensure that development does not adversely affect the extractive industry.
- To permit development for purposes where it can be demonstrated that suitable land or premises are not available elsewhere.

2. Permitted without consent

Environmental protection works; Extensive agriculture; Forestry; Home-based child care; Home occupations; Moorings; Roads

3. Permitted with consent

Cellar door premises; Dual occupancy (attached); Dwelling houses; Extractive industries; Farm buildings; Intensive livestock agriculture; Intensive plant agriculture; Kiosks, Landscaping material supplies; Mining; Plant nurseries; Roadside stalls; Rural workers' dwellings; Any other development not specified in item 2 or 4

4. Prohibited

Amusement centres; Cemeteries; Child care centres; Commercial premises; Crematoria; Depots; Eco-tourist facilities; Educational establishments; Entertainment facilities; Exhibition homes; Exhibition villages; Function centres; Health services facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Mortuaries; Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Service stations; Serviced apartments; Sex services premises; Storage premises; Vehicle body repair workshops; Vehicle repair stations; Wharf or boating facilities; Wholesale supplies

25. The Tamworth Regional Local Environmental Plan 2010 contains a development standard in relation to the erection of a dwelling-house on the subject land being either:

- A minimum lot size of 400 hectares as specified by the Lot Size Map pursuant to clause 4.2B(3)(a); or

- A minimum lot or holding size of 200 hectares pursuant to clause 4.2B(3)(b) or 4.2B(3)(f).

For further information, see clause 4.2B of the Plan.

Complying Development

General Housing Code

26. Development specified as Complying Development for the General Housing Code in Part 3 of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

Rural Housing Code

27. Development specified as Complying Development for the Rural Housing Code in Part 3A of the State Environmental Planning Policy (Exempt and Complying Development Code) 2008 may be carried out on the land.

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Subdivisions Code

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Fire Safety Code

34. Development specified as Complying Development for the Fire Safety Code in Part 8 of the State Environmental Planning Policy (Exempt & Complying Development Code) 2008 may be carried out on the land.

Coastal Protection

35. The land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act.

Mine subsidence

36. The land has not been proclaimed to be a mine subsidence district within the meaning of Section 15 of the Mine Subsidence Compensation Act 1961.

Road widening and road realignment

37. The land is not affected by any road widening or road realignment proposal under:-
(1) section 262 of the Local Government Act, 1919;
(2) an environmental planning instrument; or
(3) any resolution of Council.

Council and other public authority policies on hazard risk restrictions

38. The land is not affected by a policy adopted by any other public authority that has been notified to Council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

39. The land is not affected by a policy adopted by Council that restricts the development of the land because of the likelihood of landslip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Flood related development control information

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42. There are no environmental planning instruments applying to the land which provide for the acquisition of the land by a public authority, as referred to in Section 27 of the Act.

Contributions plans

43. Tamworth Regional Council Section 94 (Direct) Development Contributions Plan 2013 applies to the land.

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Bushfire Prone Land

45. The subject land is not identified as being "bushfire prone land" on the Bushfire Prone Land Map, certified by the NSW Rural Fire Service.

Contaminated Land Management Act 1997

46. The land to which this certificate relates is not subject to the matters identified by Section 59(2) of the Contaminated Land Management Act 1997.

Site Compatibility Certificates for Infrastructure

47. Council is not aware of a valid site compatibility certificate (infrastructure) in respect of proposed development on the land.

Site Compatibility Certificates and Conditions for Affordable Rental Housing

48. Council is not aware of a current site compatibility certificate (affordable rental housing) in respect of proposed development on the land.

Development & Approvals
Tamworth Regional Council
07 July 2016

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