ProTen

Euroley Poultry Production Complex

(SSD 6882)

RESPONSE TO SUBMISSIONS



Prepared by:

SLR

Euroley Poultry Production Complex, SSD 6882

Response of Submissions

1 September 2015

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1 INTRODUCTION

1.1 Background

ProTen Holdings Pty Limited (ProTen) is seeking development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to develop an intensive poultry broiler production farm, known as the Euroley Poultry Production Complex, within a rural property approximately 26 kilometres west of Narrandera in south western New South Wales (NSW).

The Euroley Poultry Production Complex (herein referred to as "the Project") comprises the development of five poultry production units (PPU), where broiler birds will be grown for human consumption. Each PPU will comprise 16 tunnel-ventilated fully-enclosed climate-controlled poultry sheds, with associated support infrastructure and staff amenities. Each shed will have the capacity to house a maximum of 49,000 broilers at any one time, equating to a PPU population of up to 784,000 broilers, and a total farm population of 3,920,000 broilers. The complex will employ a total of 30 full-time equivalent employees, 10 of whom will live on site as full-time farm managers and assistant managers.

Clause 3 of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP) identifies development for the purposes of intensive livestock agriculture with a capital investment value (CIV) of more than $30 million as State significant development (SSD). Given that the Project has a CIV of approximately $63.61 million, pursuant to clause 8(1) of the SRD SEPP, the Project comprises SSD.

The assessment of environmental issues associated with the Project was multi-disciplinary and involved an environmental risk assessment and consultation with relevant State and local government agencies. SLR Consulting Australia (SLR) prepared the Environmental Impact Statement (EIS) (SLR 2015a) on behalf of ProTen, with the following specialist studies undertaken to assist in the assessment of the Project:

- *Air Quality Impact Assessment* (Pacific Environment 2015a);
- *Noise Impact Assessment* (Global Acoustics 2015);
- *Traffic Assessment* (RoadNet 2015a);
- *Aboriginal Heritage Impact Assessment* (OzArk Environmental and Heritage Management (OzArk) 2015);
- *Biodiversity Assessment* (SLR 2015b);
- *Flooding Assessment* (SLR 2015c);
- *Preliminary Risk Screening & Hazard Assessment* (SLR 2015d); and
- *Stormwater Report* (Lance Ryan Consulting Engineers (LRCE) 2015).

Key milestones in the development assessment process (to date) have been:

- 19 December 2014 - Project Briefing Paper and application for the Secretary's Environmental Assessment Requirements (SEARs) submitted to the Department of Planning and Environment (DP&E);
- 6 February 2015 - SEARs (SSD 6882) issued by the DP&E;
- 3 March 2015 - draft EIS submitted to the DP&E for Adequacy Review;
- 14 April 2015 - DP&E requests that a revised EIS be submitted that addresses the Adequacy Review comments;
- 21 May 2015 - revised EIS submitted to the DP&E for public exhibition;
- 26 May to 26 June 2015 - EIS is on public exhibition;

- 14 July 2015 – meeting with DP&E to discuss some of the submissions received from government agencies during the exhibition period and project timeline;
- 24 July 2015 – DP&E provided its "issues letter" and requested that each of the issues raised in the submissions received from the government agencies, general public and special interest group following the exhibition of the EIS be addressed in a Response to Submissions report;
- 13 August 2015 – OEH met SLR and ProTen for a site visit to discuss and clarify the issues raised by OEH in their submission in relation to biodiversity and Aboriginal heritage;
- 25 August 2015 – telecom between EPA, Pacific Environment, SLR and ProTen to discuss Pacific Environment's response to the issues raised by EPA in their submission in relation to air quality; and
- 1 September 2015 – formal Response to Submissions report (i.e. this document) submitted to the DP&E.

A total of 26 submissions were received by the DP&E following public exhibition of the EIS, comprising 11 from government agencies (including DP&E's issues letter), 14 from the general public and one from a special interest group.

1.2 Document Purpose and Structure

This Response to Submissions report has been prepared by SLR on behalf of ProTen to respond to all submissions received following public exhibition of the EIS for the proposed Euroley Poultry Production Complex (SSD 6882). This report is structured as follows:

- Section 1 - background information on the Project and a summary of the submissions.
- Section 2 - comprehensive response to the issues raised by government agencies.
- Section 3 - comprehensive response to the issues raised by the general public.
- Section 4 - comprehensive response to the issues raised by the special interest group.
- Section 5 - references.
- Appendices – additional Project documentation and specialist assessment studies.

1.3 Summary of Submissions

The submissions received in relation to the Project are summarised below, and can be viewed in full on the DP&E's website at the following address:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6882

A summary of the 26 submissions received from government agencies, the general public and community interest group is provided **Table 1**.

The majority of public submissions were received from outside of the local area, with nine submissions coming from locations including Wollongong, Wagga Wagga, areas around Sydney and Victoria. The remaining five public submissions were received from residents within the local communities of Euroley, Narrandera and Griffith.

Table 1 - Submissions Received

From	Objection / Comments
Government Agencies	
Department of Planning and Environment (DP&E)	Comments
Environment Protection Authority (EPA)	Comments
NSW Office of Water (NOW)	Comments
Office of Environment and Heritage (OEH)	Comments
Roads and Maritime Services (RMS)	Comments
Department of Primary Industries	Comments
Narrandera Shire Council (Council)	Comments
Griffith City Council	Comments
Leeton Shire Council	Comments
Murrumbidgee Shire Council	Comments
Essential Energy	Comments
Public Submissions - Local residents	
A. and M. Steiner (“Warilba”, Narrandera NSW)	Objects
Randren House Pty Ltd (“Somerset Park”, Euroley NSW)	Objects
Name withheld (East Griffith NSW)	Objects
Name withheld (Narrandera NSW)	Comment
M. Rowe (“Narimba”, Narrandera NSW)	Comment
Public Submissions - Other	
J. Craig (Wagga Wagga NSW)	Comment
J. Balfour (Wollongong NSW)	Objects
J. Prasad (Doveton VIC)	Objects
M. Kelly (Reservoir VIC)	Objects
P. Karunaharan (Rushcutters Bay NSW)	Objects
Name withheld (Carrum Downs VIC)	Objects
Name withheld (Mount Eliza VIC)	Objects
Name withheld (Leumeah NSW)	Objects
Name withheld (Georges Hall NSW)	Objects
Special Interest Group	
Voiceless – the animal protection institute	Objects

2 GOVERNMENT SUBMISSIONS

Submissions were received from 11 government agencies (see **Table 1** above) following the public exhibition of the EIS. Each of these submissions are addressed in the below sub-sections, with the issues raised presented in ***bold italics***, followed by the response in normal text.

2.1 Department of Planning and Environment

2.1.1 Project Description

Clarification of the components of the proposal for which you are seeking development consent for is required. Details of preliminary design, civil and engineering drawings for all such structures, civil works and earthworks need to be provided. All drawings should be presented at an appropriate scale and minimum A3 size.

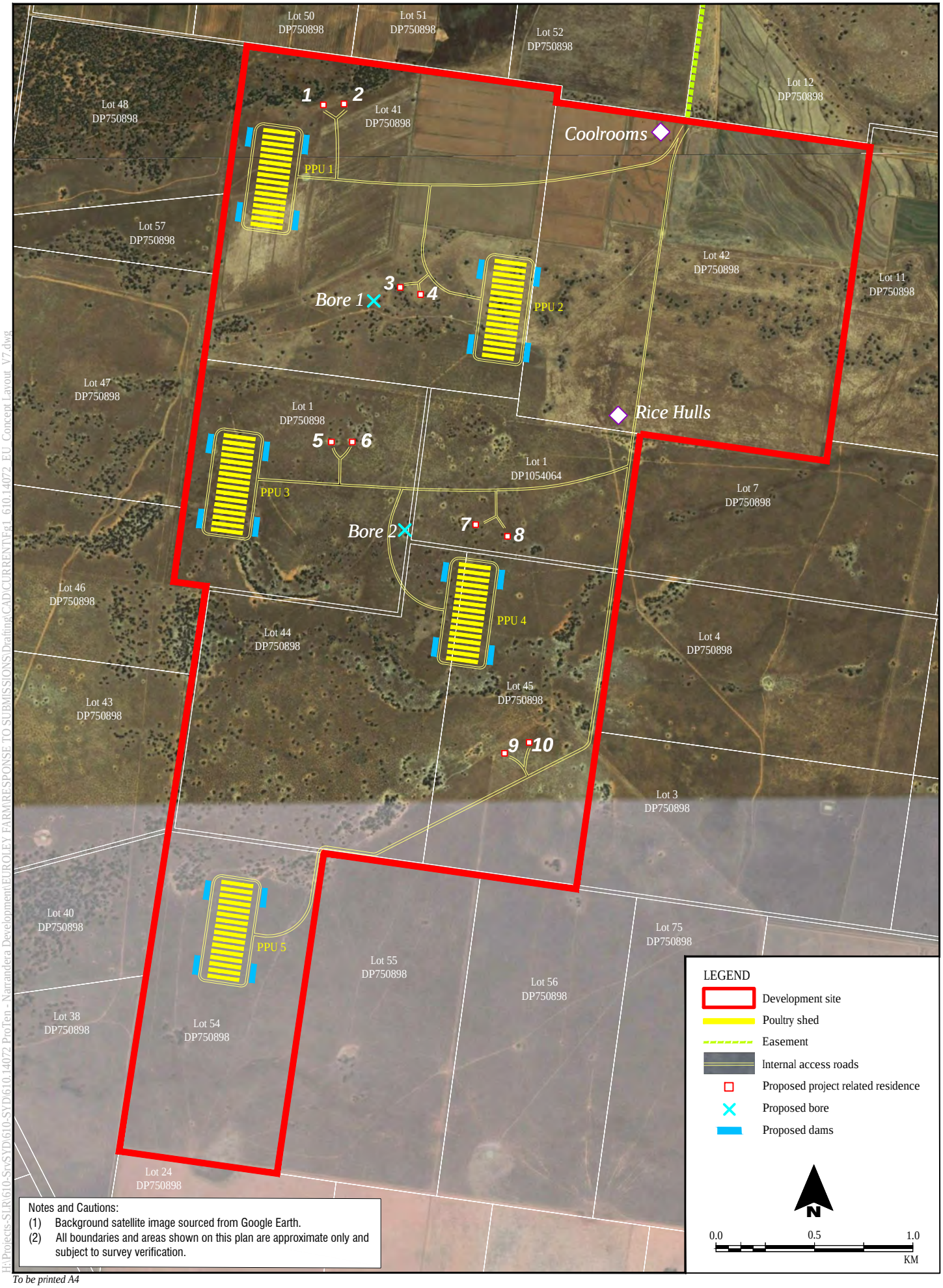
The conceptual layout of the Project is shown on **Figure 1** (revised Figure 1.3 from the EIS), and the individual components of the Project for which development consent is sought are listed and described in **Table 2**. The available preliminary civil and engineering drawings referenced in **Table 2** are contained in **Appendix A**.

Table 2 - Project Components

Component	Description	Available Plan / Design Drawing
Five Poultry Production Units (PPUs), each consisting of:		
16 poultry sheds	Each shed will: • Measure approximately 160 metres long and 17 metres wide; • Measure approximately 4.2 metres to the ridge of the roof and approximately 2.4 metres to under the eaves; • Comprise steel framework, zincalume corrugated iron roofs and coolroom sandwich panel walls; • Be constructed using a colour-bond type material in an appropriate shade such as eucalyptus green; • Have front and rear access; • Have external lighting mounted over the loading-unloading area; • Have a bird space of approximately 2,720 square metres; and • Have 12 tunnel ventilation fans mounted at one end of the shed and 3 in each side wall.	• Conceptual development layout - **Figure 1** (revised Figure 3.1 in the EIS). • Conceptual poultry shed design - **Figure 2** (Figure 3.1 from the EIS). • Poultry Production Unit Layout - **Figure 3** (Figure 3.2 form the EIS) • Civil design drawings - drawing series by B&M Slots, drawing numbers S1-S5 - **Appendix A**. • PPU layout and access road design – LRCE - **Appendix A**.
Amenities facility for staff	• The amenities facility will comprise a demountable building and will include office space, toilets and staff change rooms. • The demountable building will measure approximately 12 metres long, 3.3 metres wide and 2.4 metres high. • Adequate car parking will be provided adjacent to the amenities facility.	• Poultry Production Unit Layout - **Figure 3** (Figure 3.2 form the EIS) • Preliminary building design - **Appendix A**.
24 feed silos	• Three feed silos will be installed in between every second poultry shed within the PPUs. • Each silo will have a storage capacity of around 16.5 cubic metres and a bin diameter of 3.2 metres. They will measure approximately 8.3 metres high.	• Poultry Production Unit Layout - **Figure 3** (Figure 3.2 form the EIS) • Preliminary silo design - **Appendix A**.

Workshop	• The workshop at each PPU will measure approximately 14 metres long by 6 metres wide, and measure 3.2 metres to under the eaves and 3.8 metres to the roof peak. • It will be constructed in an appropriate shade such as eucalyptus green.	• Drawing series GRIF15712 - Fair dinkum Sheds - **Appendix A**.
Four water storage tanks	• Four water storage tanks will be placed at each PPU near the amenities facility. Water from the groundwater bores will be pumped to these tanks for storage and treatment prior to use in the poultry sheds for water supply and cleaning purposes.	• Poultry Production Unit Layout - **Figure 3** (Figure 3.2 form the EIS).
Ring roads	• Each PPU will have one-way circulation road (ring roads) around its perimeter to enable traffic to enter, exit and manoeuvre around the PPU for loading-unloading and servicing activities in a forward direction to minimise the potential for traffic conflict and noise.	• Conceptual development layout - **Figure 1** (revised Figure 3.1 in the EIS). • Poultry Production Unit Layout - **Figure 3** (Figure 3.2 form the EIS) • PPU layout and access road design – LRCE - **Appendix A**.
Eight LPG tanks	• Eight LPG tanks, each with a capacity of 7,500 litres will be installed at each PPU.	• Poultry Production Unit Layout - **Figure 3** (Figure 3.2 form the EIS).
Generators	• There will be two 390 kilovolt-amp (kVA) (standby rating) generators at each PPU positioned immediately to the west of the poultry sheds adjacent to sheds 4 and 5 and sheds 12 and 13. • There will also be two 143 kVA (standby rating) generators at each PPU positioned immediately to the east of the poultry sheds adjacent to sheds 4 and 5 and sheds 12 and 13. • All generators will have lockable acoustic enclosures with a vertical air discharge.	• Poultry Production Unit Layout - **Figure 3** (Figure 3.2 form the EIS). • Generator specifications and general arrangement drawings – **Appendix A**.
Stormwater management system	The stormwater management system at each PPU will consist of: • Dwarf concrete bund walls (0.4 metres high) around each poultry shed to prevent rainfall/runoff entering the sheds and to allow for controlled discharge of wash down water from the sheds; • Grassed swales between each shed; • Catch drain and underground pipes around the perimeter of the PPU. Excess water from the swale drains will be directed to the pipes, which will convey the water to the catch drain. The catch drain in turn will convey the water to storage dams; and • Four water storage dams, one constructed at each corner of the PPU. Each dam will have a capacity of approximately 7,000 cubic metres, totalling 28,000 cubic metres of storage at each PPU.	• Swale Drain Design - **Figure 4** (Figure 3.7 form the EIS) • PPU layout and access road design - drawing no. C02, sheet 2 - LRCE - **Appendix A** (cross-section of the swale drains, PPU ring roads and stormwater conveyance under the roads).
Two houses	• Two houses will be constructed in close proximately to each PPU to accommodate the farm manager and assistant farm manager.	• Conceptual development layout - **Figure 1** (revised Figure 3.1 in the EIS). • House design plans - Davis Sanders Homes - **Appendix A**.
Septic systems	• Aerated wastewater treatment systems will be installed at each PPU and at each residence. • Each of the systems installed will have a treatment capacity of 10 equivalent persons at 200 litres per person per day. Treated effluent from each system will be irrigated over an area of approximately 200 square metres.	• Ozzi Kleen Owner's Manual (including system drawings) – **Appendix A.** • Indicative system location at the residences - Davis Sanders Homes drawing - **Appendix A**.

Landscaping	• Suitable tree and shrub species will be strategically planted around the perimeter of each PPU to screen the poultry sheds, enhance dust deposition and odour dispersion. • The landscaping will provide a biological buffer of a minimum total width of 40 metres around each PPU.	• Proposed Landscaping - **Figure 5** (Figure 3.8 in the EIS).
Additional infrastructure		
Rice hull (bedding material) shed	• The bedding material shed will measure approximately 60 metres long by 17 metres wide, and measure a nominal 5.2 metres to under the eaves and 7.5 metres to the roof peak. • It will be constructed in an appropriate shade such as eucalyptus green.	• Conceptual development layout - **Figure 1** (revised Figure 3.1 in the EIS). • Drawing series GRIF15831 - Fair dinkum Sheds - **Appendix A**.
Coolroom / chiller	• The coolroom/chiller will service all five PPUs and will be used for the storage of dead birds prior to their removal off site for disposal. • The coolroom will comprise a shed approximately 20 metres long, 4 metres wide and 2.5 metres high, and will be constructed with 100 mm thick insulated sandwich panels.	• Conceptual development layout - **Figure 1** (revised Figure 3.1 in the EIS).
Groundwater bores	• A total of four groundwater production bores will be installed – a production bore and backup production bore within Lot 41 in DP 750898 and a production bore and backup production bore in Lot 1 DP 750898.	• Conceptual development layout - **Figure 1** (revised Figure 3.1 in the EIS).
Sturt Highway - site access road intersection	• An intersection consisting of a basic right turn treatment (BAR) and basic left turn treatment (BAL) will be constructed at the intersection of the Sturt Highway and the site access road. It will be designed in accordance with *Austroads Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections*.	• Proposed Access Road Route - **Figure 6** (Figure 3.3 in the EIS).
Site access roads	• An access road will be constructed from the Sturt Highway to the development site. This access road will be sealed for a minimum of 50 metres from the Sturt Highway intersection and will be approximately 6.5 metres wide. An appropriate easement will be created to enable the access road to traverse privately-owned land between the Sturt Highway and development site. • Internal access within the development site will be provided via the construction of rural-type all-weather property access roads. These internal roads will meet the minimum requirements of *AS 2890.2* to accommodate the turning movements of the largest vehicles generated by the poultry development, which will initially be semi-trailers however may include B-doubles in the future.	• Conceptual development layout - **Figure 1** (revised Figure 3.1 in the EIS). • Proposed Access Road Route - **Figure 6** (Figure 3.3 in the EIS). • PPU layout and access road design – LRCE - **Appendix A**.



Notes and Cautions:
(1) Background satellite image sourced from Google Earth.
(2) All boundaries and areas shown on this plan are approximate only and subject to survey verification.

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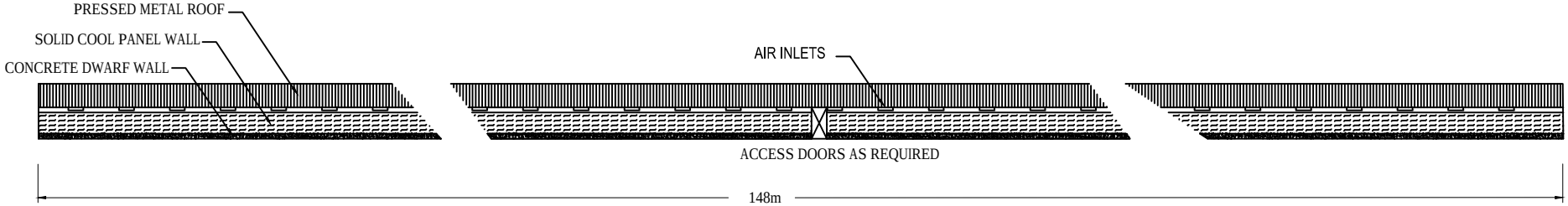
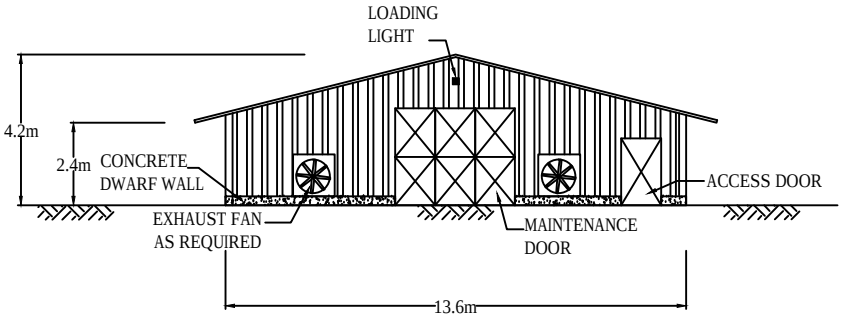
Conceptual Layout

FIGURE 1



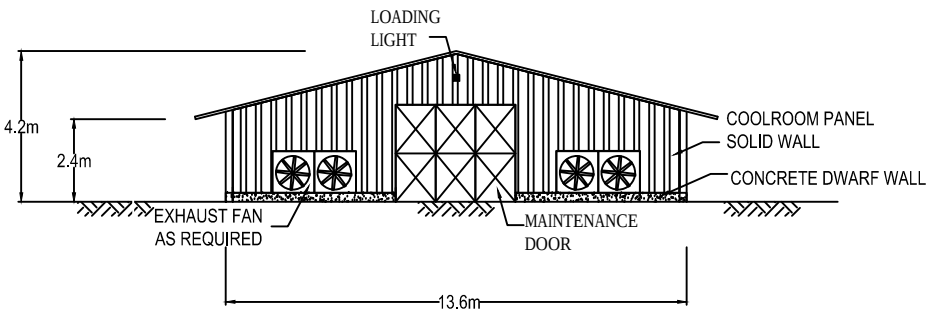
SIDE ELEVATION

Not to Scale



FRONT ELEVATION

Not to Scale



BACK ELEVATION

Not to Scale

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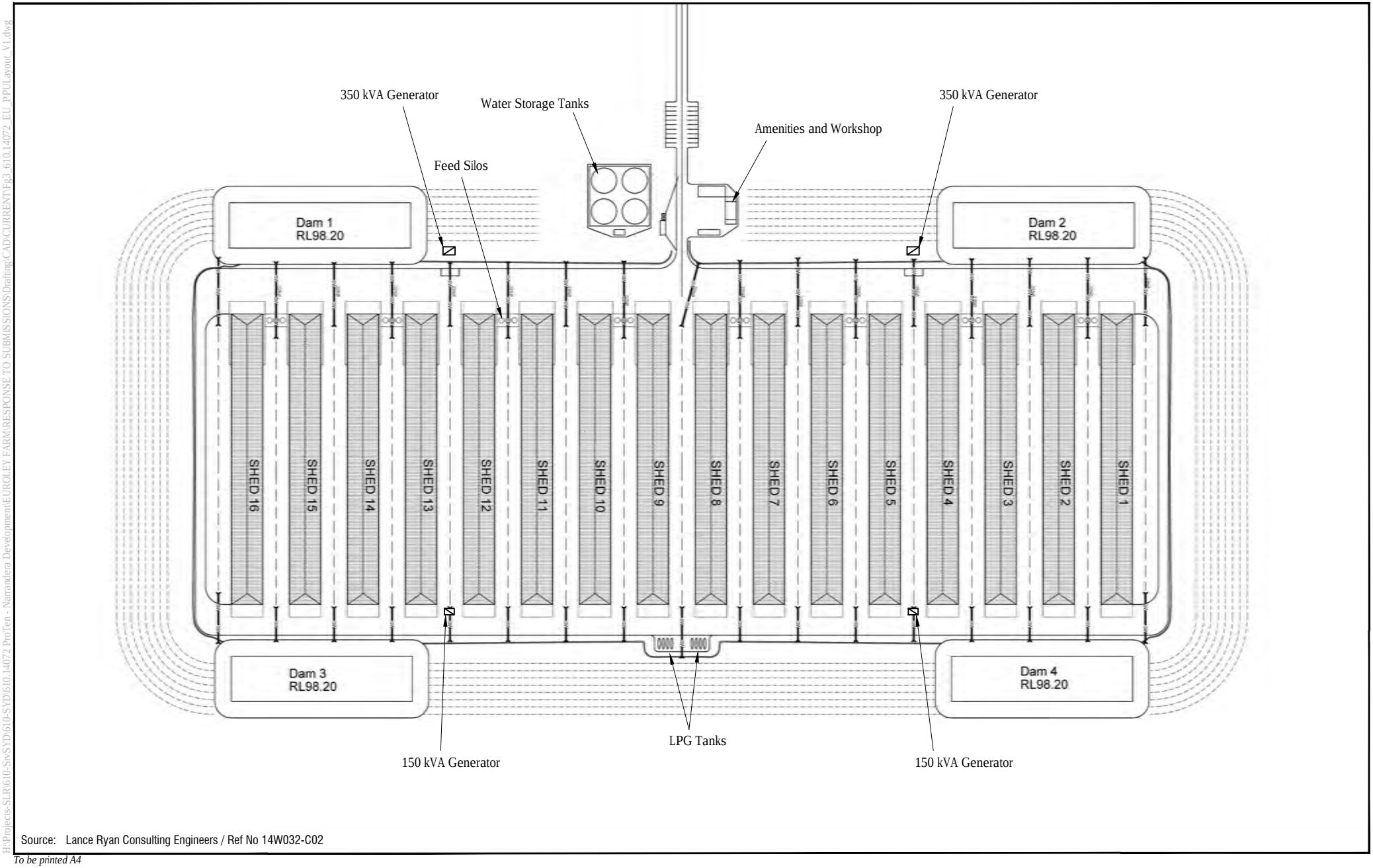
Conceptual Poultry Shed Design

FIGURE 2



Source: Lance Ryan Consulting Engineers / Ref No 14W032-C02

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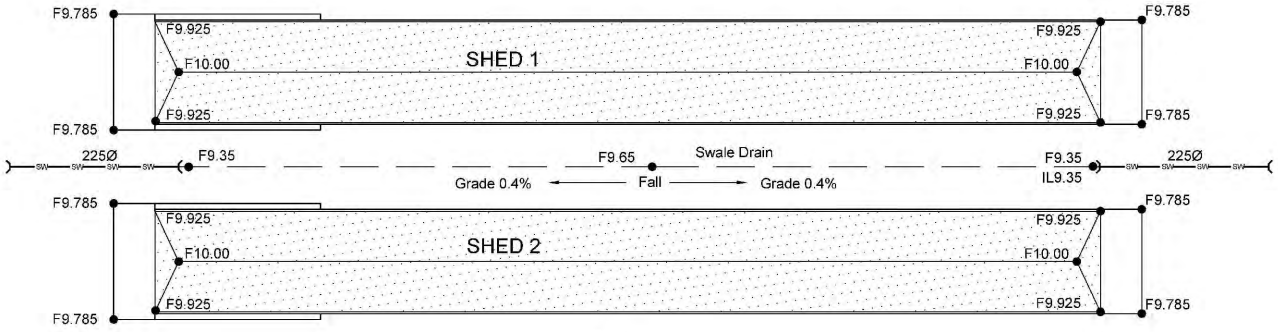
Poultry Production Unit Layout

FIGURE 3



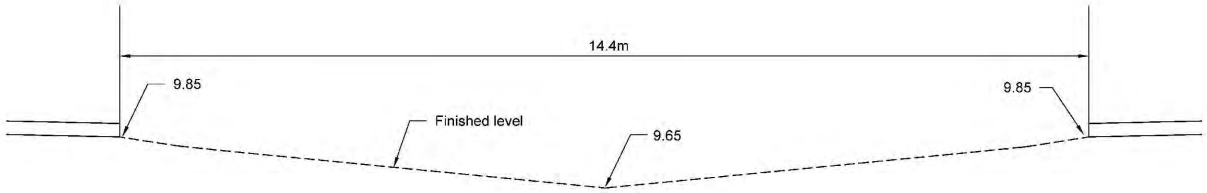
Plan

Chezy ch	Mannings Roughness n	Area Inv-HFL A (m2)	Wetted Perimeter WP (m)	Slope Decimal So	Hydraulic Radius R	Velocity V (m/sec)	Discharge Q (m3/sec)
19.46	0.035	1.44	14.41	0.004	0.10	0.39	0.56

Swale Drain Capacity at Level 9.65
(0.56m³/s)

Chezy ch	Mannings Roughness n	Area Inv-HFL A (m2)	Wetted Perimeter WP (m)	Slope Decimal So	Hydraulic Radius R	Velocity V (m/sec)	Discharge Q (m3/sec)
22.67	0.035	3.60	14.43	0.004	0.25	0.72	2.58

Swale Drain Capacity at Level 9.35
(2.58m³/s)



SWALE DRAIN
Section 1-1

Total catchment Area (A) for the swale drains = 2560m²
This comprises 1464m² of hardstand area and 1096m² of landscaped area.
Fraction Impervious for hardstand area = 0.95 and landscaped areas 0.2
Runoff Coefficients (C) are 1.0 for hardstand areas and 0.41 for landscaped areas
Time of concentration = 12minutes
Rainfall Intensity (I) = 132mm/hr
Discharge = CAI / 360 = (1 x 0.1464 + 0.41 x 0.1096) x 132 / 360) = 0.07m³/s

Therefore the swale drains are capable of handling over the 1 in 100 year rainfall event.

At the end of each swale drain is a 225Ø pipe graded at a minimum 1%. This pipe has a capacity of 70L/s which is also capable of handling the 1 in 100 year storm event.

Source: Lance Ryan Consulting Engineers

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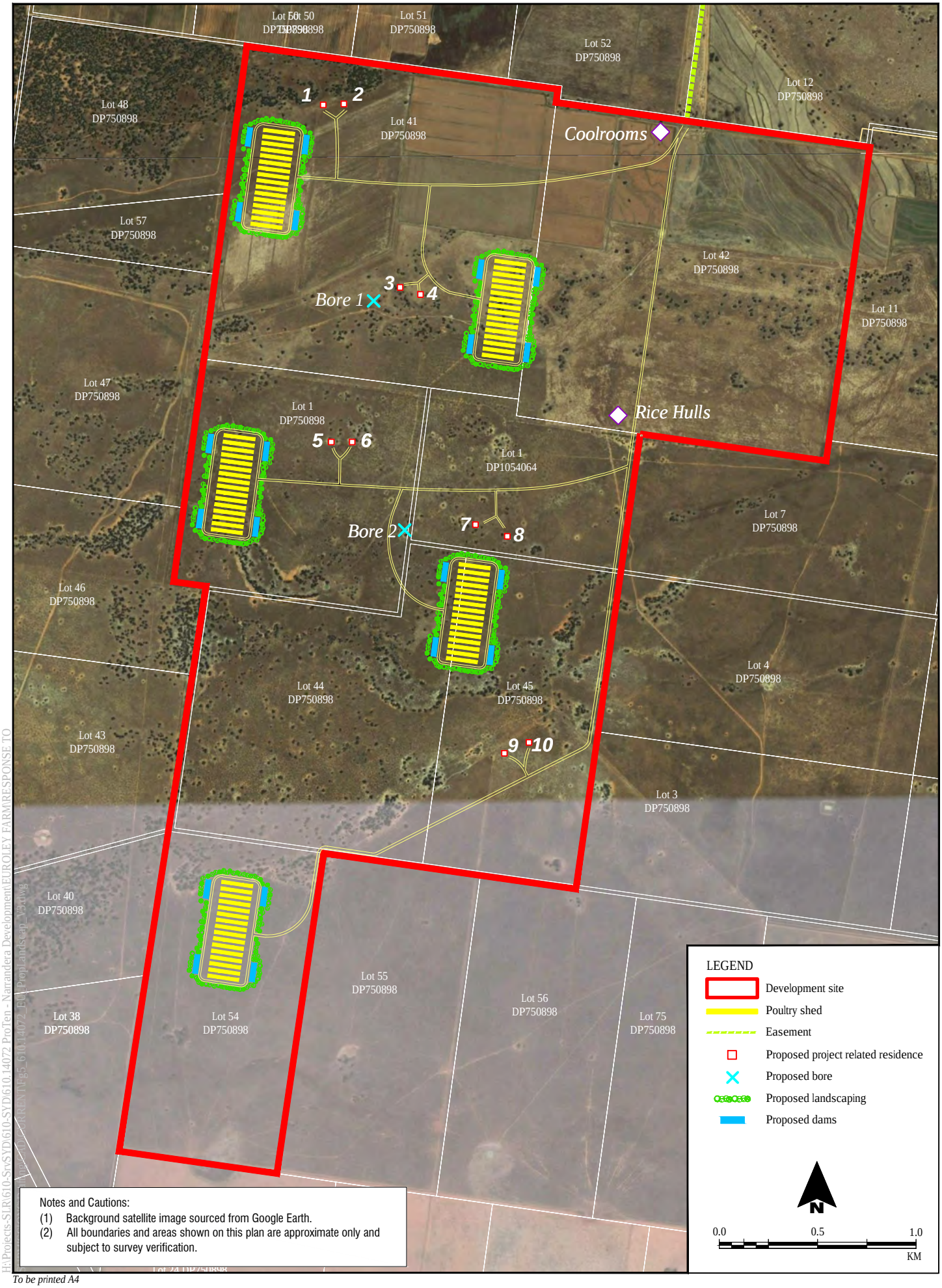
Swale Drain Design

FIGURE 4



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Proposed Landscaping

FIGURE 5

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Proposed Access Road Route

FIGURE 6

The cut and fill volumes required to construct the development should be quantified.

Cut and fill quantities required to construct the Project have been calculated by LRCE, and are presented on the plans provided in **Appendix A** for each PPU (refer LRCE drawing numbers C03 (PPU5), C04 (PPU 4), C05 (PPU 3), C06 (PPU 2) and C07 (PPU 1)).

Additional details regarding the relationship between farm managers' accommodation and each PPU is required, including proximity of the dwellings to each PPU and the management of the dwellings at the conclusion of farm operations.

As shown on **Figure 1**, two houses will be constructed in close proximity to each PPU to accommodate the farm manager and assistant farm manager. The distance from each house to the nearest poultry shed is provided in **Table 3**.

Table 3 - Proximity of houses to each PPU

PPU	House	Distance to nearest poultry shed
1	1	200 metres
	2	286 metres
2	3	450 metres
	4	345 metres
3	5	385 metres
	6	488 metres
4	7	197 metres
	8	175 metres
5	9	471 metres from PPU 4 1,450 metres from PPU 5
	10	481 metres from PPU 4 1,570 metres from PPU 5

The 10 houses to be constructed as part of Project will be owned at all times by ProTen Holdings Pty Ltd. The managers will reside in the houses, and this will form part of the manager's remuneration package under a normal tenancy type arrangement. The houses will be inspected periodically by ProTen's regional management.

As advised in Section 3.4.1 of the EIS (SLR 2015a), the use of the houses will be limited to the life of the Project. At the conclusion of farm operations the management of the houses will be determined in consultation with all relevant stakeholders and will depend on the future land use of the property (which will be subject to the appropriate planning approvals at the time).

Provide evidence of consultation with and support from Crown Lands regarding the proposed closure and purchase of Crown land within the site.

Consultation with Crown Lands regarding the management of Crown land within the development site occurred in February 2015, as documented in Table 5.1 of the EIS (SLR 2015a). During this process Crown Lands advised ProTen to apply to close and purchase the Crown roads within the development site. In addition, due to the lengthy timeframes involved in processing closure applications, Crown Lands advised ProTen to simultaneously apply for a licence under Section 34 of the *Crown Lands Act 1989* to allow access across the Crown roads so that, pending development consent from the DP&E, works could commence across the Crown roads as required by the development whilst the close and purchase application is being processed.

Both of these applications were subsequently lodged by ProTen, with Crown Lands issuing a licence on 15 July 2015 to access the Crown roads in the development site, pursuant to Section 34 of the Act. This licence is attached in **Appendix B**.

2.1.2 Contamination

A stage 1 preliminary investigation should be undertaken in accordance with State Environmental Planning Policy no. 55 - Remediation of Land.

The DP&E's provided further clarification on this matter in an email to SLR on 29 July 2015 advising – "…we require further information from a desktop analysis to confirm there have been no cattle dips, chemical storage or similar uses within and adjoining the site".

A stage 1 preliminary site investigation has been undertaken to address the contamination potential and site suitability in accordance with *State Environmental Planning Policy No. 55 - Remediation of Land* (SEPP 55). The *Stage 1 Preliminary Site Investigation* report (SLR 2015e) detailing the methodology and results of the investigation is provided in **Appendix C**.

In summary, based on a review of the available site history data, SLR (2015e) concluded the following:

- The potential for significant widespread contamination to be present on the site, as a result of past and present land use activities, is considered to be low;
- The site is suitable, from a contamination perspective, for the proposed poultry broiler production farm and associated residences; and
- No further assessment is considered necessary.

2.1.3 Flooding

A site constraints plan should be provided that shows all relevant external and internal features of the site (e.g. Dry lake, topographical features, waterways).

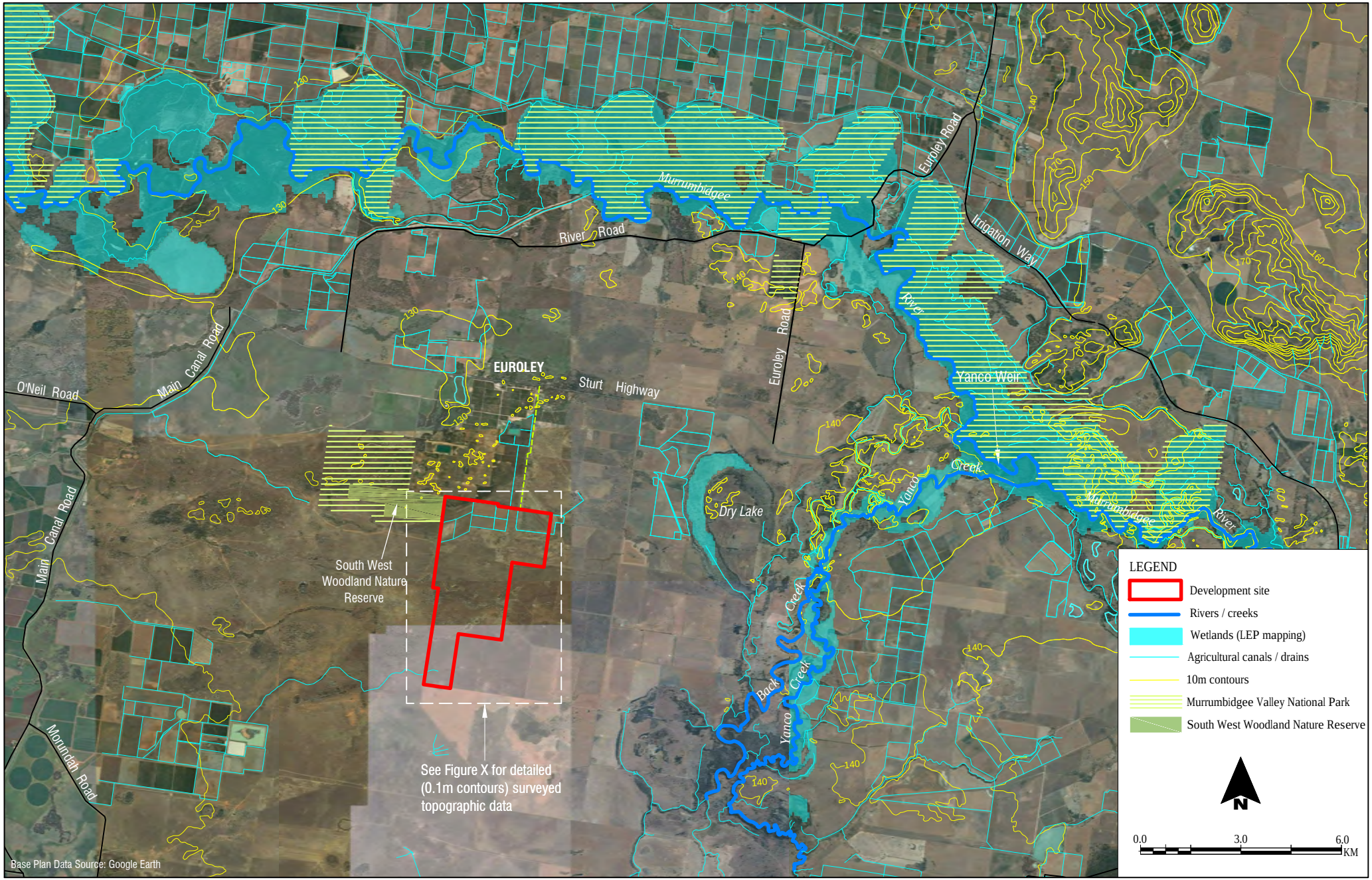
A site constraints plan showing relevant external and internal features, including Dry Lake, topographical features and waterways, is provided as **Figure 7**. An additional figure showing the recently surveyed topography (0.1 metre contours) within the development site is provided as **Figure 8.**

As evident, very limited constraints occur within the development site in relation to water resources and flooding. The topography is relatively very flat and the nearest waterway (apart from irrigation channels/agricultural drains) appears to be located approximately 8 kilometres away. The site is also well removed from any wetland areas. Two minor depressions, which act as minor drainage features, traverse the site. These features do not have any formed banks and are only distinguishable as drainage features by their location topographically.

The *Flooding Assessment* (SLR 2015c) undertaken as part of the EIS (SLR 2015a) advised that the development site is unlikely to be flood affected during mainstream flood events up to and including the 1 in 100 year annual recurrent interval (ARI) event. SLR (2015c) also advised that it is unlikely that the site will be flood affected by Murrumbidgee River or Yanco Creek out of bank flows during an extreme flood event such as the probable maximum flood (PMF).

Figure 6.8 should show the route for Option 6 for the off-site transportation of birds.

Please see **Figure 9** (revised Figure 6.8 in the EIS), which has been amended to show the route for Option 6.



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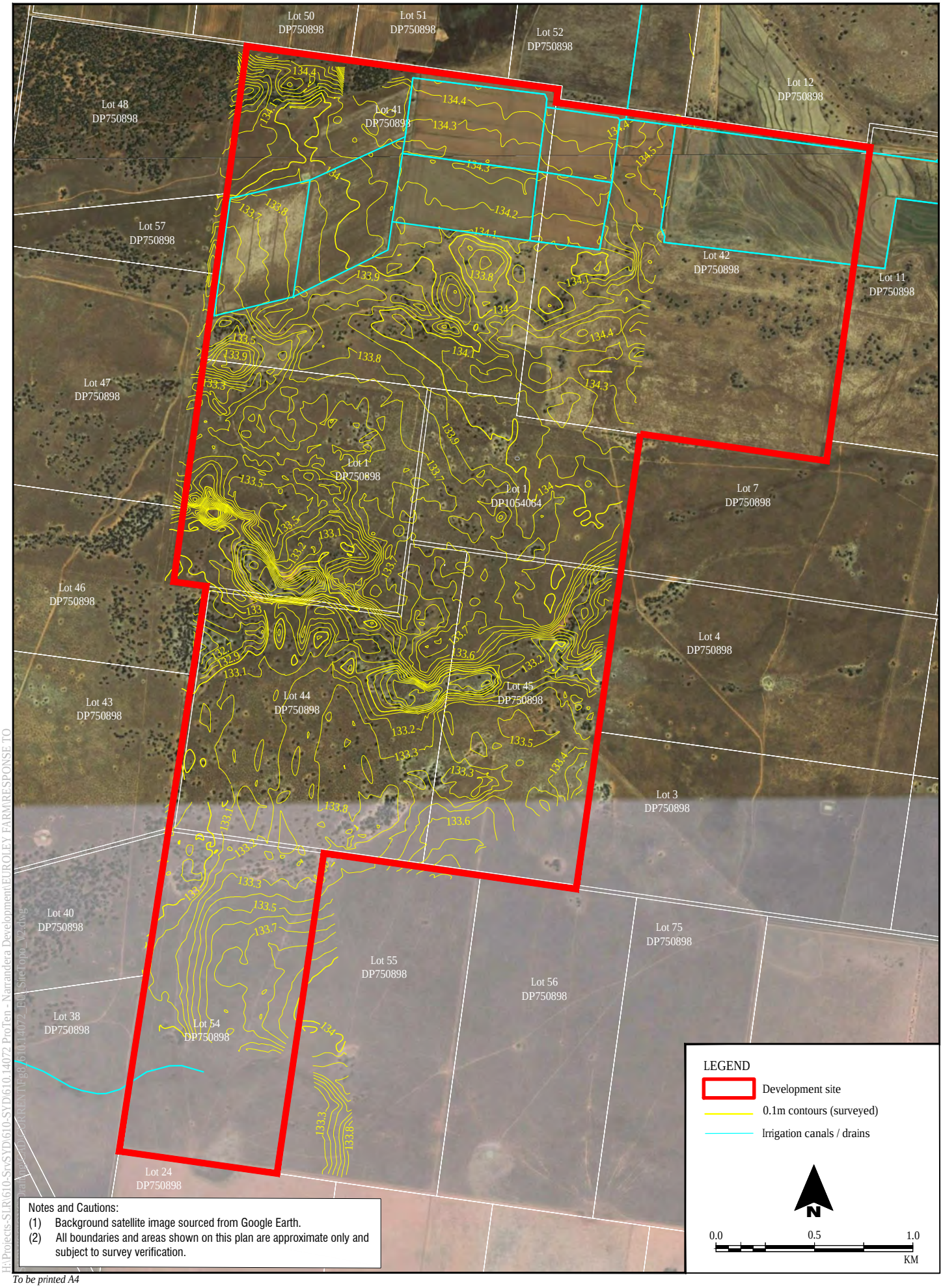
Site Constraints Plan (Flooding)

FIGURE 7



Notes and Cautions:
(1) Background satellite image sourced from Google Earth.
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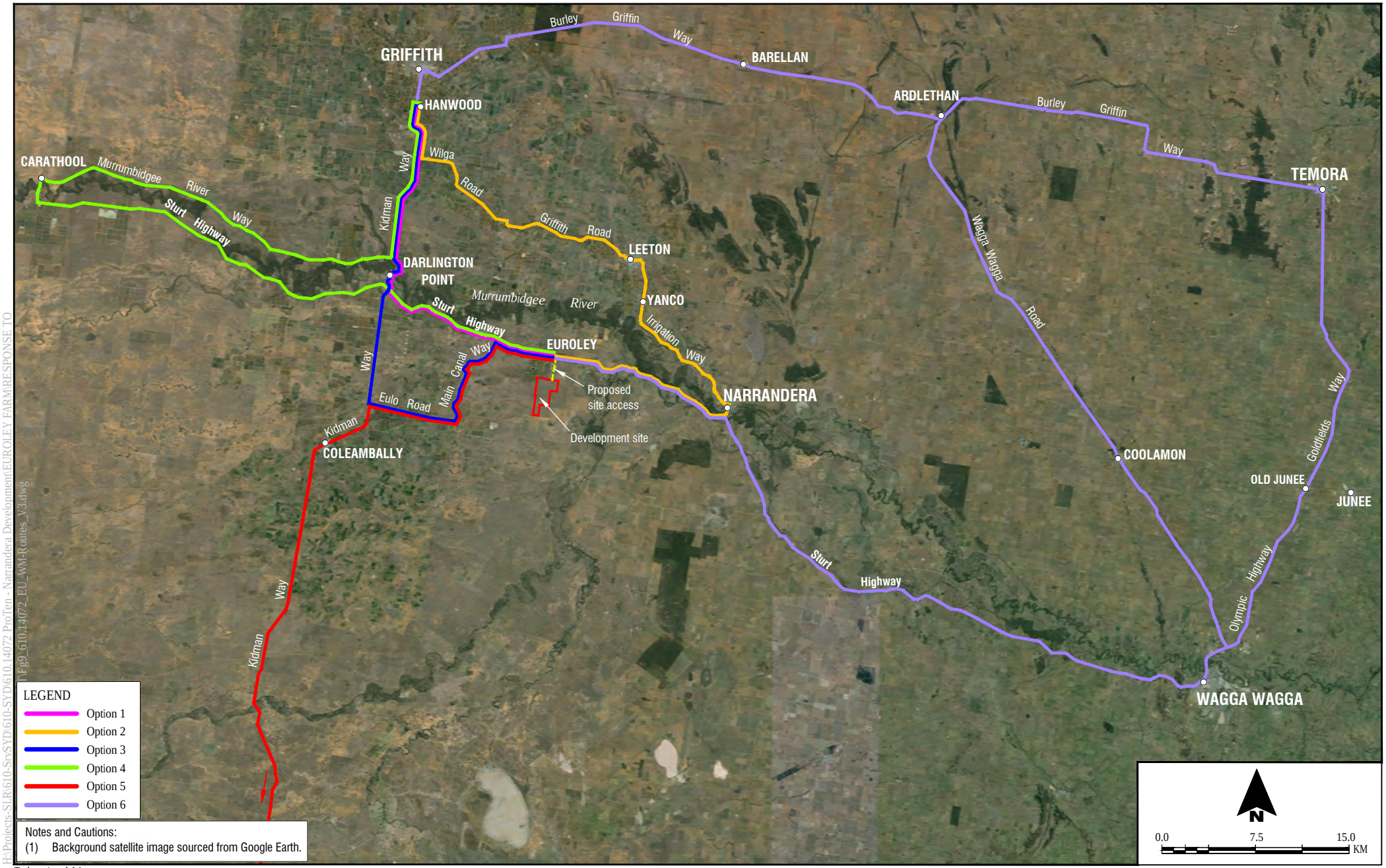
Development Site Existing Topography

FIGURE 8



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Transport Options During a Flood Event

FIGURE 9

Internal roads should be constructed to the 1 in 100 year flood level for access/egress for farm employees and manager accommodation to the Sturt Highway.

To address the flooding issues raised by NOW (see **Section 2.3.1**) and OEH (see **Section 2.4.3**), SLR undertook additional flood modelling and prepared an addendum to the *Flooding Assessment* (SLR 2015c) that was appended to the EIS (SLR 2015a). A copy of the *Flooding Addendum* (SLR 2015f) is contained in **Appendix D**.

SLR (2015f) advises that constructing the internal roads to the 100 year ARI flood level is inappropriate on the following grounds:

- The development site is affected by overland flooding;
- Overland flooding is likely to have also impacted the Sturt Highway;
- The worst-case overland flooding relates to short duration storms and, therefore, it will be safer for farm employees to remain on site during significant rainfall events until flood waters have resided;
- Floodwaters are unlikely to take more than a few hours to reside with the exception of the two topographical depressions and ephemeral flow paths; and
- Significant raising of ground levels along roadways may impede floodwaters and further alter flood behaviour.

SLR (2015f) recommends that the internal roads be raised by a minimal amount (up to 0.3 metres) above adjacent ground level to prevent farm traffic disruption during the majority of rainfall events.

As recommended by the OEH, an Emergency and Evacuation Plan will be developed to outline a strategy for responding to local food events. This will be developed for approval prior to commencement of operations.

Details should be provided regarding the potential impacts to flood behaviour, extents and flows from on-site structures to neighbouring properties for the 1 in 100 year and PMF events.

The *Flooding Addendum* (SLR 2015f), which is contained in **Appendix D** and summarised in **Sections 2.3.1** and **2.4.3**, concludes that the maximum flood afflux as a result of the development is predicted to be experienced upstream of PPU 2 at 90 millimetres for the 100 year ARI flood event and 110 millimetres for the PMF event. The flood afflux impacts upstream of the development at the site's eastern boundary are predicted to be less than 50 millimetres for a 100 year ARI event and 80 millimetres during a PMF event. No flood afflux impacts are predicted to occur downstream of the development towards the site's western boundary. The maximum average flood flow velocity increase is predicted to be 0.08 metres per second during a 100 year ARI event and 0.11 metres per second during a PMF event.

SLR (2015f) concludes that there are no existing buildings or infrastructure items on properties surrounding the development site that will to be adversely affected by the construction of the proposed development buildings, residences or associated infilling earthworks in terms of flooding. As the flood afflux is predicted to be relatively minor within the development site and at the site boundaries and flood velocities did not increase significantly within the development site or at the site boundaries, SLR (2015f) advises that agricultural practices in neighbouring properties are also unlikely to be affected by the flood impacts associated with the proposed development.

2.1.4 Stormwater and Wastewater

A plan showing each component of the stormwater treatment train is required, including a description and sizing of each component.

The civil design drawings prepared by LRCE (see **Appendix A**) provide details of the proposed stormwater treatment system. Refer to drawing number C02, which presents a cross-section of the swale drains, ring roads around the PPUs and stormwater conveyance under the roads. Further details for the swale drains are provided on **Figure 4**.

Quantify the volume of water used in the wash-down process for each production cycle.

Approximately 12 kilolitres of water will used be in the wash-down process for each poultry shed at the end of each production cycle. This amounts to a total volume of 192 kilolitres per PPU per production cycle for wash-down.

This volume was calculated by ProTen based on the volume of water used at their other operational poultry production complexes within NSW that have similarly sized poultry sheds and production cycles.

Additional details regarding the proposed wastewater system to treat and dispose of wastewater from the proposed dwellings is required, including its location, components, land area proposed for irrigation and design drawings.

Aerated wastewater treatment systems will be installed at each PPU and at each residence. Each of the systems will have a treatment capacity of 10 equivalent persons at 200 litres per person per day. Treated effluent from each of the systems will be irrigated over an area of approximately 200 square metres.

The main components of the aerated wastewater treatment systems are listed in **Table 4** and illustrated in **Appendix A** (Ozzi Kleen Owner's Manual).

Table 4 - Septic system components

Component	Details
Aeration Tank	Operating volume of 4.1 cubic metres and tank volume of 5.6 cubic metres. The tank will have a residence time of 46 hours and will be constructed of medium-density polyethylene (MDPE). All pipe work will be polyvinyl chloride (PVC).
Disinfection equipment	Chlorinator tablet dispenser cassette.
Alarm system	Comprising both audio and visual alarms.
Effluent pump	Submersible effluent pump, with a pump capacity of 100 litres per minute.

The figure at Appendix A within Appendix B should be provided at the correct size.

The figure from Appendix A (Catchment Area Plan) within Appendix B of the EIS (SLR 2015a) is contained in **Appendix E**.

2.1.5 Groundwater

Confirmation of the rate of groundwater drawdown is required for the grassed swales (for the disposal of wash down water) and chemical storage areas.

Consider the potential impacts of groundwater drawdown in areas of chemical storage, staff amenities and dwellings.

DP&E's email to SLR on 29 July 2015 clarified this two issues - "…should be read to refer to the potential for infiltration into the groundwater table at the proposed grassed swales and chemical storage areas".

SLR was engaged by ProTen to undertake additional hydrogeological assessment to address the groundwater issues raised by the NOW (see **Section 2.3.2**). SLR's letter report (2015g) in **Appendix F** advises that the Calivil Formation aquifer (i.e. deep aquifer source) lies beneath around 50 metres of the Shepparton Formation at the development site. The Shepparton Formation in turn is overlain by 4 to 5 metres of topsoil and weathered silty clay, which provides low permeability cover to the Shepparton Formation. SLR (2015g) further advises that the 4 to 5 metres of surficial topsoil and silty clay will provide a significant attenuation barrier to any migration of water from surface operations to both the clayey Shepparton Formation and the deeper Calivil Formation.

As outlined in the EIS (SLR 2015a), an engineered surface water drainage system will be implemented to provide long-term structural controls and management measures to mitigate the impact of surface water runoff throughout the life of the operation. The swale drains between the poultry sheds will be designed to allow infiltration of the water into the topsoil for nutrient uptake by the grass, which will be regularly slashed. During heavy rainfall events, excess water from the grassed swales will be directed to underground pipes and into a catch drain that will be installed around the perimeter of the poultry sheds. The construction of the perimeter catch drain will ensure that all rainfall runoff from the ground surfaces surrounding the sheds is contained within the controlled storm water management system.

The perimeter catch drain will convey the water to the four small storage dams (see **Figures 1** and **3**). These dams will each have a capacity of approximately 7 megalitres, which is equivalent to 170 percent of the capacity required to prevent runoff escaping the dams from a 1 in 100 year ARI, 72 hour event. The runoff to be captured in these dams will predominantly be clean runoff. While the water captured in the detention basins will have some level of nutrients, the levels are predicted to be low given that the poultry sheds will be thoroughly blown and swept prior to being washed and the grassed swales will provide a very effective means of nutrient removal. An analysis of the nutrient load in the wash down water was undertaken by GHD (2007) for one of ProTen's operating poultry farms, where litter is managed in the same way as proposed for the Euroley development. This analysis determined the typical nutrient concentration of wash down water to be:

- Total Suspended Solids - 2,500 milligrams per litre;
- Total Nitrogen - 65 milligrams per litre; and
- Total Phosphorus: 45 milligrams per litre.

The typical annual pollutant load removal efficiencies for vegetated swales according to *Australian Runoff Quality* (Engineers Australia 2006) are presented in **Table 5**.

Table 5 - Typical Annual Pollutant Load Removal Efficiencies for Vegetated Swales

Pollutant	Typical Removal
Total Suspended Solids	60-80 %
Total Nitrogen	25-40 %
Total Phosphorus	30-50 %

The nature of the strata, the surface water drainage system and mitigation measures to be employed at the development site will provide an adequate buffer against infiltration of wash down water and any potential pollutants to the shallow groundwater source. No detectable impacts to groundwater levels, yields or quality are expected in the Shepparton Formation aquifer.

To reiterate SLR's (2015g) advice following the additional hydrogeological assessment, the 4 to 5 metres of surficial topsoil and silty clay will provide a significant attenuation barrier to any migration of water from surface operations to both the clayey Shepparton Formation and the deeper Calivil Formation.

In addition to the strata barrier, the following best management practices and mitigation measures will be implemented to safeguard water resources and/or minimise the potential adverse impacts:

Development Design

- Each poultry shed will be fully enclosed and have concrete flooring.
- Each poultry shed will be surrounded by a dwarf concrete bund wall (0.4 metres high) to prevent rainwater and runoff entering the sheds and to allow for the controlled discharge of wash down water from the sheds.
- The engineered surface water drainage system described above will be implemented to provide long-term structural controls to manage surface water runoff and ensure no off-site impacts.
- On-site aerated wastewater management systems will be installed to manage the sewage generated by on-site staff amenities and dwellings in accordance with the manufacturer's specifications and Council requirements.

Operation

- The surface water management system will be visually inspected on a monthly basis and following significant rainfall events. Any required maintenance work (desilting, regrading and/or reshaping) will be promptly undertaken to ensure the system's design capacity is maintained.
- The grassed swale drains between the poultry sheds will be carefully managed to minimise soil disturbance and maximise infiltration of runoff, as well as regularly slashed to encourage continual grass growth and associated nutrient up-take.
- Dry-cleaning practices at the end of each production cycle will be maximised within the poultry sheds prior to washing with water to minimise the volume of wash water, along with the amount of poultry litter (and associated sediments and nutrients) washed out of the sheds.
- The waste management systems described in the EIS (SLR 2015a) will be implemented to ensure that each waste stream generated by the development is effectively managed and disposed of off site. There will not be any on-site stockpiling or disposal of waste materials.
- The best management practices and mitigation measures described in the EIS (2015a) for chemical use and storage will be implemented.
- The limited volumes of chemicals on site will be stored in appropriately sealed and bunded storage containers/sheds.
- Diesel and petrol will be stored in bunded tanks with overflow containers. These overflow containers will be regularly inspected and, when required, removed by a licensed contractor to prevent overflow and replaced. Any excess water collected in the bunded areas will also be removed by the contractor.

Confirm that the groundwater sourced for the development is suitable for staff requirements, including for drinking water, or if treatment will be necessary.

Potable water for staff will not be sourced from the groundwater bores. Rather, potable water supply for the staff amenities at each PPU and the 10 houses will be via rainwater collection in tanks from the roofs of the amenities buildings and houses. If water levels in the tanks become low due to an extended dry period, potable water will be trucked in as required.

Refer to the submission from DPI for additional information required to assess groundwater impacts.

The groundwater issues raised by the DPI (NOW) are addressed below in **Section 2.3.2**.

2.1.6 Air Quality

Refer to the submission from the EPA for additional information required to assess air quality impacts.

The air quality issues raised by the EPA are addressed below in **Section 2.2**.

2.1.7 Traffic

RoadNet was engaged to undertake the appropriate assessment and reporting of traffic and transport-related issues associated with the Project. The assessment was prepared in accordance with relevant Council and RMS standards. A copy of RoadNet's *Traffic Impact Assessment* (2015a) was appended to the EIS and summarised within the EIS.

Key conclusions of RoadNet's (2015a) assessment included:

- Existing and future background traffic volumes on the Sturt Highway are relatively low and additional traffic from the Project can be easily accommodated; and

- Provided the recommendations made by RoadNet (2015a) are met, the Project is not expected to cause any significant impacts in terms of road safety or operation.

To address the traffic-related issues raised by the DP&E (and also a public submission, see **Section 3**), RoadNet prepared the letter report (2015b) contained in **Appendix G**. A summary of RoadNet's responses to each of the issues is provided below.

Provide details of the basis and source(s) of traffic data used in the Traffic Impact Assessment (TIA).

Existing (background) traffic volumes were obtained via hourly data provided by RMS from an Infra-Red Traffic Logger (TIRTL) located just east of the development site on the Sturt Highway for the period 1 January 2011 to 9 June 2012. A separate manual traffic count was conducted by RoadNet on the Sturt Highway at the location of the proposed site access on Friday 25 July 2014. This data was analysed and compared to provide a suitable baseline (i.e. without development) scenario against which the impacts of the additional traffic generated by the Project could be assessed.

The traffic generation associated with the Project was calculated and provided by ProTen from first principles based on their extensive experience in the poultry industry. ProTen currently own and operate eight poultry production complexes within Australia similar to the proposed Project. The traffic generation volumes for the Project were provided by identifying all of the key activities that arise during a typical nine week production cycle and calculating the number of trips required to complete each activity based on the type of vehicle to be used and the number of birds or amount of product (bedding material, feed, fuel, gas, shed litter material, etc.) that needs to be transported during each production cycle. The volume of traffic generated during each cycle was then extrapolated to generate annual figures for each activity based on approximately 5.7 production cycles per year.

RoadNet (2015b) note it is important to recognise that the method used to assess the traffic generation is not only comprehensive, but also necessary in the absence of any specific data being available for this type of development in the *RMS Guide to Traffic Generating Developments* (Roads and Traffic Authority 2002) and its supplements. The same assessment methodology has previously been used successfully for other poultry developments in the region, including Rothdene Poultry Production Complex, which ProTen has been operating since 2012, and Jeanella Poultry Production Complex, which ProTen has been operating since 2013.

Provide additional detail on the potential impacts and potential road treatment for the intersection upgrades for the existing driveway to Lot 30 DP 7500876. Management measures for potential traffic impacts on the driveway during construction and operation are required.

A new intersection between the Sturt Highway and the access driveway to the development site is proposed on the southern side of the Sturt Highway opposite the existing access driveway to Lot 30 in DP 7500876. In accordance with *Austroads Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections*, the new intersection requires a basic left turn treatment (BAL) to be provided for westbound traffic turning left into the development site's access driveway and a basic right turn treatment (BAR) for eastbound traffic to pass a vehicle waiting to turn right into the driveway.

The existing access to Lot 30 will be retained at its existing location along the Sturt Highway. In addition, the new intersection will retain the lane widths currently provided for through traffic on the Sturt Highway in each direction commensurate with its designation as both a B-double route and an approved road train route. The intersection will also be designed to allow vehicles up to the size of B-doubles to turn in and out of the proposed access driveway simultaneously without impacting on the safety of other road users.

The proposed location of the intersection in relation to the existing access to Lot 30 was discussed with RMS during a site inspection in February 2015 and agreed to in-principle. The proposed intersection will be designed and constructed to Austroads standards and will need to be approved by RMS. This design will include any modifications to the existing access driveway to Lot 30 that are required to accommodate the wider sealed shoulder on the northern side of the Sturt Highway associated with the BAR treatment for the access driveway to the development site.

The existing driveway serving Lot 30 does not currently include any turn bays or widening on the Sturt Highway approaches and takes the form of an unsealed road up to the edge of seal on the Sturt Highway. These features will not change as a result of the new intersection construction, and the driveway will still be able to service the same types and sizes of vehicles that it currently accommodates. The only change will be that the existing access driveway will need to be upgraded as part of the works for the Project to tie into the more northerly edge of seal arising from the wider sealed shoulder. It is noted that this wider sealed shoulder will also be beneficial for traffic turning left into the existing access driveway.

A Construction Traffic Management Plan and associated Traffic Control Plan satisfying the requirements of *AS1742.3* will be developed prior to undertaking works on the Sturt Highway. These plans will set out the requirements to manage any impacts on existing road users during the construction of the new intersection. Short term shoulder and lane closures may be required at times. This will be undertaken in accordance with the appropriate traffic control guidelines and by approved traffic control contractors. The impact of this traffic control, in terms of delays and queuing, is expected to be minimal due to the relatively low existing traffic volumes on this section of the Sturt Highway. Importantly, access to Lot 30 will be maintained at all times to minimise any adverse impacts to the affected landowner. For the scale of works required at the intersection it is envisaged that only a couple of weeks would be required to complete the construction activities (weather permitting).

As advised in the EIS (SLR 2015a), an Operational Environmental Management Plan (OEMP) will be developed for approval by the DP&E prior to commencing operations at the site. This OEMP will include management strategies and mitigation measures for any operational traffic-related issues.

Provide an estimate of traffic volumes during construction and potential construction traffic routes.

The anticipated construction traffic volumes was presented in Table 3.4 of the EIS (SLR 2015a), which is reproduced in **Table 6** below.

Table 6 - Estimated Construction Traffic Volumes

	Daily (two way trips)	Weekly (two way trips)
Light Vehicles		
ProTen Staff	3 (6)	15 (30)
Tradespeople	15 (30)	75 (150)
Sub-total light vehicles	**18 (36)**	**90 (180)**
Heavy Vehicles		
Tradespeople – trucks	-	3 (6)
Construction material delivery	-	3 (6)
Equipment delivery	-	2 (4)
Road material	12 (24)	60 (120)
Concrete materials	2 (4)	10 (20)
Other	2 (4)	10 (20)
Sub-total heavy vehicles	**16 (32)**	**88 (176)**
Total	**34 (68)**	**178 (356)**

The majority of the construction trips are expected to have an origin/destination from/to Griffith in the west and Narrandera in the east, and will follow the Sturt Highway to the development site. Volumes along this route are low (RoadNet 2015a and 2015b), and the highway alignment has the capacity to accommodate the anticipated construction traffic (RoadNet 2015b).

The sight line diagram at Appendix B of the TIA should be provided at A3 size for legibility.

The sight line diagram from the *Traffic Impact* Assessment (RoadNet 2015a) is reproduced in A3 size in Attachment A to RoadNet's letter report (2015b) in **Appendix G**.

2.1.8 Biodiversity

Refer to the submission from the OEH for additional information required for the assessment of biodiversity impacts.

The biodiversity issues raised by the OEH are addressed below in **Section 2.4.1**.

2.1.9 Aboriginal Heritage

A ground survey of the revised location of PPU 5 should be undertaken prior to construction to confirm that no items of Aboriginal significance will be impacted by construction of the PPU.

ProTen has engaged OzArk to undertake the additional field survey requested by OEH and this survey is scheduled for mid-September 2015 (pending weather and site access). OzArk's proposed survey methodology comprises the complete pedestrian survey of the relocated PPU 5 and relocated residences, and sampled survey (dictated by a set methodology) of the internal roads.

Refer to **Section 2.4.2** for further details.

2.1.10 Other Issues

Provide additional detail regarding the capacity of the existing rendering facility at Hanwood to handle the influx of birds in the event of a mass mortality event.

In the unlikely event of an emergency animal disease (EAD) outbreak and slaughter of farm stock is necessary, the ability of Baiada's facility at Hanwood to process the birds will depend on a number of factors at the time of the outbreak. These factors include the scale of the mass mortality and the capacity at which the facility is operating at the time. The EIS (SLR 2015a) presented a number of options for the large scale disposal of birds to cater for the scenario where the facility at Hanwood cannot process the number of birds.

As described in Section 6.12.2 of the EIS (SLR 2015a), pending advice from the DPI and EPA at the time of a mass mortality, the following options in order of preference will be implemented for the disposal of bird carcasses and fomites in the event of an EAD outbreak:

1. Rendering at Baiada's Hanwood protein recovery plant; or
2. In-shed composting; or
3. Off-site burial at ProTen's Jeanella property near Goolgowi within the Carrathool Shire local government area (LGA).

Carrathool Shire Council has recently advised ProTen that a fourth disposal option is also available when the scale of the outbreak is such that Baiada's Hanwood facility (i.e. option 1) is unable to manage the volume of birds affected. Council, in conjunction with Baiada, has recently designated a portion of Council's landfill for the mass disposal of chickens from the various contract production farms in the LGA. Council has advised that this area of the landfill has been appropriately sectioned and quarantined, providing a means of safely disposing of birds in a mass mortality event.

Landfilling would be carried out under appropriately qualified supervision from the DPI, EPA and Council to ensure appropriate quarantine control and standard operating procedures are implemented in line with the relevant AUSVETPLAN disease strategy. Carcasses and formites would be loaded in to leak-proof containers within the sheds and these containers would be transported in appropriate trucks disinfected on exit from the development site. The truck and operator would be independent from normal ProTen and Baiada operations in order to minimise the risk of disease transfer to other poultry operations. All vehicles would be thoroughly cleaned and disinfected after unloading.

Baiada and Council have entered into a 2 year agreement for this quarantined portion of the landfill from mid-2015 to mid-2017. During this time Baiada has committed to investigating other long term disposal options for their contract growers (including ProTen) in the event of a mass mortality.

2.2 Environment Protection Authority

Pacific Environment was engaged to undertake the appropriate assessment and reporting of air quality issues associated with the Project. The assessment was undertaken in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (Approved Methods) (Department of Environment and Conservation (DEC) 2005) and *Assessment and Management of Odours from Stationary Sources in NSW* (DEC 2006). A copy of Pacific Environment's *Air Quality Impact Assessment* (2015a) was appended to the EIS and summarised within the EIS.

In summary, Pacific Environment (2015a) concluded the following:

- Odour concentrations at all of the nearest receptors are predicted to be at or below 5 odour units (OU); and
- Maximum 24 hour and annual average PM_{10} levels are predicted to be below the respective assessment criterion at all of the sensitive receptors.

The EPA's submission dated 8 July 2015 identified 11 issues in relation to the air quality assessment undertaken for the Project. Each of these issues has been addressed by Pacific Environment in the letter report (2015b) contained in **Appendix H**, and a summary of the responses is provided below. The issues raised by the EPA and requests for additional information are identified in ***bold italic text***, followed by the response in normal text.

Staff members from the EPA, Pacific Environment, SLR and ProTen joined in on a teleconference on Tuesday 25 August 2015 to discuss the EPA's issues and Pacific Environment's responses prior to lodging this Response to Submissions to the DP&E. In summary, all issues seemed to be resolved with the exception of additional quantitative analysis requested by the EPA to address emergency standby diesel generators (issue 1) and batch length and staging (issue 2). This additional analysis was undertaken by Pacific Environment and has been detailed in their letter report in **Appendix H** and summarised in the relevant sub-sections below.

2.2.1 Emergency Diesel Generators

1. No information provided regarding emergency standby diesel generators.

The EPA requests the following information regarding the proposed emergency standby diesel generators.

- ***Capacity and location of diesel generators;***
- ***Expected frequency of use, including regular testing for maintenance; and***
- ***Assessment of compliance with the relevant emission standards in the POEO (Clean Air) Regulation.***

As advised in the EIS (SLR 2015a), the proposed diesel generators will only be used in emergency situations when mains power supply from the electricity grid is interrupted or lost to the Development Site. Based on experience at their other eight poultry production complexes within Australia, ProTen has advised that the generators are only typically required a couple of days per year. They will be tested on a regular basis as per the manufacturer's recommendations.

The Project includes two 350 kilovolt-amp (kVA) (Prime Power 315 kW) generators at each PPU, which will be positioned immediately to the west of the poultry sheds adjacent to sheds 4 and 5 and sheds 12 and 13 (see **Figure 3**). The Project also includes two 150 kVA (Prime Power 119 kW) generators at each PPU, which will be positioned immediately to the east of the poultry sheds adjacent to sheds 4 and 5 and sheds 12 and 13 (see **Figure 3**). Each of these generators will be housed in a lockable acoustic enclosure with a vertical air discharge and, as listed in **Table 7**, will meet the relevant emission standards in Schedule 4 of the *Protection of the Environment Operations (Clean Air) Regulation 2010* (Clean Air Regulation).

Table 7 - Backup Generator Parameters

Pollutant	Emission Rate (mg/m^3)		Clean Air Regulation Limit
	119 kW	315 kW	
Nitrogen oxides (NOx)	441	401	450
Solid particles	11	5	50

Source: Pacific Environment (2015b)

Considering the size of the generators, the low level of usage and the location of the generators with regard to nearby sensitive locations, the generators are not expected to exceed the relevant air quality criteria at nearby sensitive locations.

In order to confirm this, Pacific Environment (2015b) completed a dispersion modelling exercise using AUSPLUME to predict ground-level concentrations at surrounding receptors. For the purposes of the assessment, Pacific Environment (2015b) conservatively assumed that 100 percent of the nitrogen oxides (NOx) is converted to nitrogen dioxide (NO_2), when in reality only a fraction will be, and that the particulate matter are PM_{10}. It was also conservatively assumed that all 20 generators were operating simultaneously and continuously.

As listed in **Table 8**, the predicted concentrations are the surrounding receptors are all well below the relevant assessment criteria.

Table 8 - Predicted Concentrations from Backup Generator Parameters

	Carbon Monoxide (CO)		Nitrogen Dioxide (NO_2)		PM_{10}	
Averaging Period	1-hour	8-hour	1-hour	Annual	24-hour	Annual
Criteria	30 mg/m^3	10 mg/m^3	246 $\mu g/m^3$	62 $\mu g/m^3$	50 $\mu g/m^3$	30 $\mu g/m^3$
R1	0.006	0.001	71.5	0.74	0.107	0.011
R2	0.007	0.002	80.1	0.83	0.174	0.013
R3	0.008	0.002	102.5	0.85	0.175	0.013
R4	0.009	0.002	105.2	1.07	0.215	0.016
R5	0.009	0.002	105.5	1.16	0.227	0.017
R6	0.006	0.002	66.7	1.37	0.144	0.020
R7	0.007	0.003	89.6	1.52	0.226	0.023
R8	0.005	0.002	66.3	0.78	0.126	0.011
R9	0.006	0.001	75.1	0.86	0.097	0.012
R10	0.004	0.001	51.2	0.76	0.112	0.011
R11	0.004	0.001	49.8	0.65	0.093	0.009

Pacific Environment (2015b) advises that the predicted concentrations of CO and PM_{10} are so low (ranging between 0.01 and 0.45 percent of the relevant criterion) that cumulative concentrations have not been considered.

The closest EPA monitoring station that records NO_2 concentrations (and has publically available data for 1-hour averages) is Wollongong, located approximately 420 kilometres east of the development site. Given the industrial/residential nature of the Wollongong area, compared with the rural setting of the development site, the NO_2 concentrations measured at Wollongong are considered to be conservative. As reported in the *NSW NEPM Annual Review* for 2010 (OEH 2010, cited in Pacific Environment 2015b), the maximum 12-hour average NO_2 concentration measured in 2010 was 106.8 $\mu g/m^3$, giving a resultant maximum NO^2 concentration of 212.3 $\mu g/m^3$ at R5, which is below the assessment criterion of 246 $\mu g/m^3$.

Based on the conservative approach taken, Pacific Environment (2015b) concludes that no air quality criteria will be exceeded as a result of the operation of the backup generators.

2.2.2 Worst Case Odour Emissions

2. Worst case odour emissions have not been estimated.

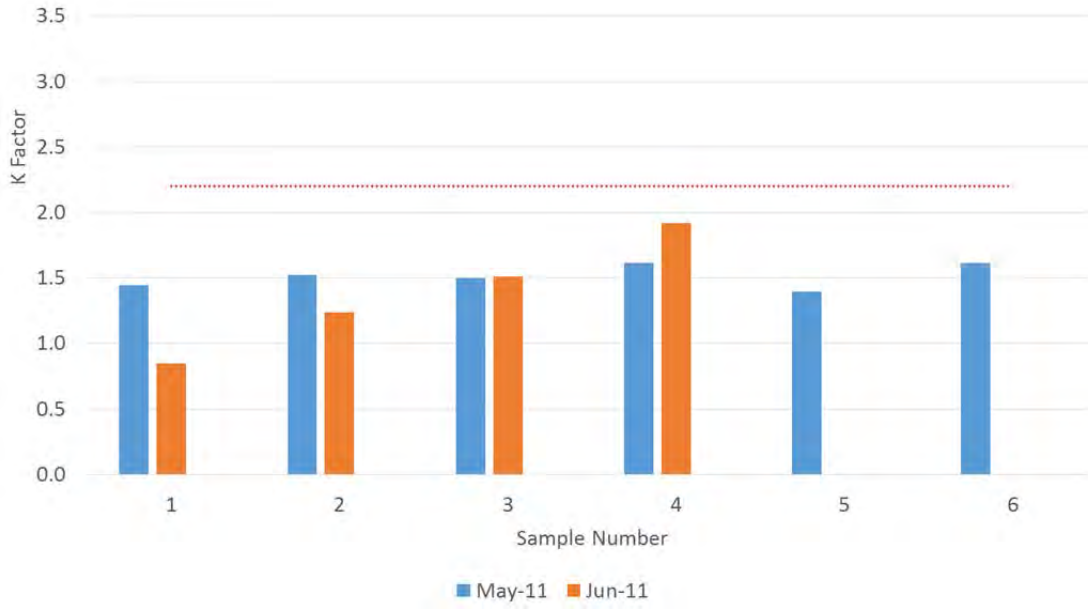
The EPA requests a sensitivity analysis to determine the impact on the odour assessment results of assuming a K factor of 2.0, 2.5 and 3.0. Further, information on the different shed management practices that correspond to a K factor of 2.0, 2.5 and 3.0 must also be provided. This information will contribute to determining the odour risk to the project (see issue 11).

Pacific Environment (2015a) adopted a modelling methodology development by Ormerod & Holmes (2005), which is based on odour emission rate data collected at a number of meat chicken farms over time. This method was recently adopted as the base model for use in Queensland as detailed in *Queensland Guidelines Meat Chicken Farms* (Department of Agriculture, Fisheries and Forestry (DAFF) 2012). It has also been used in regulatory matters in NSW, along with Victoria and South Australia.

The use of a K factor of 2 was historically based on test data collected at a number of poultry farms in Queensland and NSW over time. While older poorly managed farms typically had K factors of above 2, experience showed that all new farms typically operate with a K factor of 2 or less. Pacific Environment (2015b) advises that the majority of poultry farms approved in Queensland over the past 10 years were modelled using a K factor of 2 and have since operated without complaint.

With the adoption of the *Queensland Guidelines Meat Chicken Farms* (DAFF 2012) a 10 percent increase in K factor was used by Pacific Environment (2015a) to incorporate the potential for variation in emissions. Analysis of randomised emission rates showed that a 10 percent increase in K factor would encompass the majority of potential emission variation on farm. This did not mean that farms are expected to have a K factor of 2.2, but that the maximum K factor they are assessed against is 2.2.

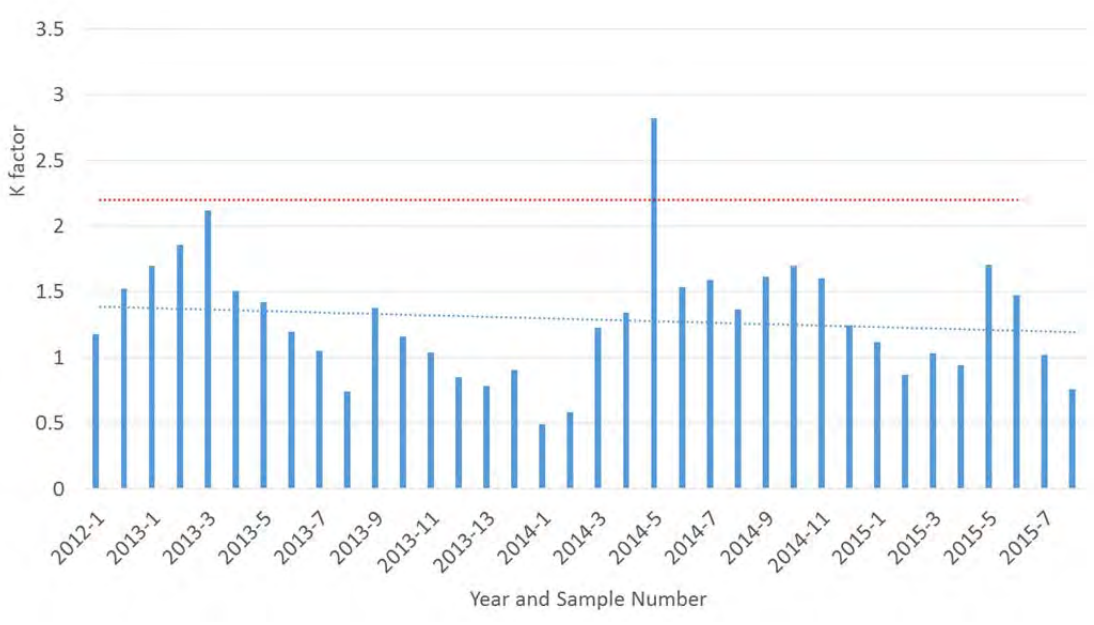
Pacific Environment reviewed the results of 10 samples collected at a ProTen farm near Tamworth in 2011 by The Odour Unit. The first six samples (in three sheds) were collected in the week leading up to first pickup (days 27 and 28) and the remaining samples were collected at day 41. This data is summarised in **Figure 10**, with the red line representing a K factor of 2.2. The average K factor for this period was 1.5.



Source: Pacific Environment (2015b)

Figure 10 - K Factors – ProTen Tamworth (2011)

The data shown in **Figure 10** is consistent with sample data held by Pacific Environment for other sites in Queensland and NSW collected between 2012 and 2015 for bird aged between 26 and 38 days. This data is summarised in **Figure 11**, with the red line representing a K factor of 2.2 and the blue line being a trend line showing K factors reducing over time.



Source: Pacific Environment (2015b)

Figure 11 - K Factors - Other Farms (2012 to 2015)

It is important to note that the highest K factor value shown in **Figure 11** was one sample from two sets of paired samples collected at the same farm in different sheds and is considered an outlier. Irrespective of this, the average K factor is well below 2. The average K factors by year are listed in **Table 9**.

Table 9 - Average K Factors – Other Farms (2012 to 2015)

Year	Average K factor
2012	1.4
2013	1.3
2014	1.4
2015	1.1

Source: Pacific Environment (2015b)

Based on this above data, Pacific Environment (2015b) concludes that there is a downward trend in emissions and a K factor of 2.2 is likely representative of worst-case (rather than average emission rates). Pacific Environment (2015b) also notes that, in their experience, the majority of modern farms comply with the best practice management requirements detailed in *Best Practice Management for Meat Chicken Production in NSW - Manual 2 Meat Chicken Growing Management* (Department of Primary Industries (DPI) 2012), and, as such, lower K factors are expected.

In terms of the EPA requesting a sensitivity analysis using K factors up to 3, there is nothing to suggest that any modern farm will be represented by a K factor of 3. The data Pacific Environment (2015b) has presented shows the industry on average (from paired samples) is currently around 1.5, with a long-term (~10 years) maximum average of 2. To say the K factor will sit long-term at 3 is unrealistic and would indicate that the farm was not being well managed in accordance with industry standards and not operating as profitably as it should or could be. The emissions adopted by Pacific Environment in their *Air Quality Impact* Assessment (2015a) are considered conservative and further analysis of the K factor is not warranted.

Other related factors discussed by Pacific Environment (2015b) in addressing the EPA's belief that worst case odour emissions were not modelled are:

Minimum Ventilation Rates

The minimum ventilation rates used by Pacific Environment (2015a) in the modelling are roughly a factor of two higher than the minimum rates detailed in *Poultry Housing Tips – Minimum Ventilation Rates* (University of Georgia 2007). This combined with the fact that Pacific Environment (2015a) calculated the minimum ventilation after week 5 of the production cycle based on "birds placed" (not "birds present") means that for minimum ventilation conditions the emissions were overestimated, especially for emissions after the first thin-out, which is typically when emissions are highest.

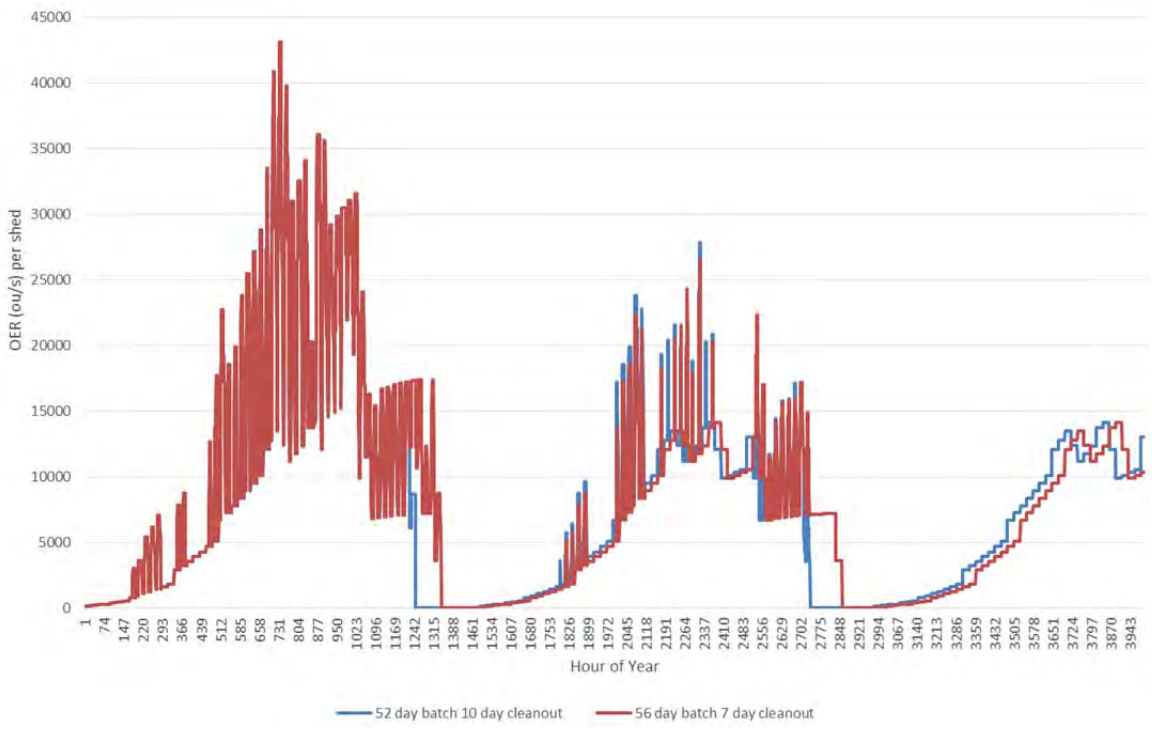
Finisher Feed

Pacific Environment's (2015a) model did not account for finisher feed, which is typically introduced around day 37 of the batch. Finisher feed is a lower value feed ration given to the birds after peak density to slow their growth down compared to the higher value feed earlier in the batch. It results in less waste and therefore lower emissions per bird towards the end of the batch.

Therefore, again, the emissions used by Pacific Environment (2015a) are conservative.

A revision of the odour assessment to assume a 56 day batch and 7 day cleanout.

Pacific Environment (2015b) undertook a comparison of emissions for 52 and 56 day batches for a summer, autumn and winter batch, with the results shown in **Figure 12**.



Source: Pacific Environment (2015)

Figure 12 - Odour Emissions for 52 and 56 Day Batches

Figure 12 shows little difference between the two scenarios. On this basis, a revision of the odour assessment to assume a 56 day batch and 7 day clean out, as requested by the EPA, was not considered warranted. When consideration is given to the over-prediction of the minimum emissions and over-prediction of the peak emissions (considering the K factor) and the minimum ventilation requirements, Pacific Environment (2015b) reaffirm that the predicted impacts are conservative.

Regardless, the EPA insisted on a quantitative analysis to address batch length and staging. On this basis, Pacific Environment (2015b) assessed another three scenarios based on the following shed placements:

- PPU 1 - birds placed first, on day 1;
- PPU 2 - birds placed on day 3;
- PPU 3 - birds placed on day 5;
- PPU 4 - birds placed on day 8; and
- PPU 5 - birds placed on day 10.

The above placements were modelled assuming starting on day 1 (Run 1), day 14 (Run 2) and day 28 (Run 3) of the year. The emission profiles are shown in Figures 3 to 5 in Pacific Environment's letter report (2015b) in **Appendix H**.

Re-running the odour model with gridded receptors for the three scenarios would take an extended period. To reduce model run time a selected number of discrete receptors were modelled. The receptors were selected by Pacific Environment (2015b) as being both the closest to the site (Receptors 5-7) or representative of areas not covered by the aforementioned receptors (Receptors 8 and 11).

The modelling results for the three scenarios, along with the original scenario, are summarised in **Table 10**.

Table 10 - Batch Staging Analysis – Odour Concentrations

Receptor	Original Run	Run 1	Run 2	Run 3	Maximum	Compliance
R5	4.7	4.5	3.6	3.9	4.5	Yes
R6	4.4	4.1	3.8	4.6	4.6	Yes
R7	2.1	2.4	2.3	2.3	2.4	Yes
R8	3.8	2.4	2.0	3.2	3.8	Yes
R11	2.8	2.2	2.2	2.8	2.8	Yes

As evident in **Table 10**, each of the receptors comply with the 5 OU criterion even with the K factor of 2.2. A lower K factor would see lower predicted odour concentrations. For example a K factor of 2 would see the maximum predicted concentrations at R5 and R6 being 4.1 OU and 4.2 OU, respectively (Pacific Environment 2015b).

Additional odour modelling with the start date of day 1 of placement offset by 2 weeks and then a further 2 weeks to determine the worst case odour impacts for the project.

Pacific Environment (2015a) modelled the sheds based on placement starting on day 1 of the year. Pacific Environment (2015b) advises that, based on their experience in modelling numerous poultry farms over time, this method typically picks up worst case impacts as it assumed that all sheds across all PPUs will have peak emissions at the same time.

This assumption is of course unrealistic as each PPU will be placed over a period of roughly one week (outlined above). As a result, the proposed development, which comprises five PPUs, will be placed across a period of up to 5 weeks. Pacific Environment (2015b) has previously examined the "all in" assumption and batch placement assumption (by week) at a similar sized farm elsewhere and found the "all in" assumption more conservative. Pacific Environment (205b) further advises that staging each farm by two weeks (as requested) and also staging by placement at the same time does not significantly change the modelled concentrations.

Considering the conservatism in the emissions (as a function of the K factor) and that the development complies with the 5 OU contour, Pacific Environment (2015b) considers that the modelling is representative of potential impacts and additional modelling is not warranted.

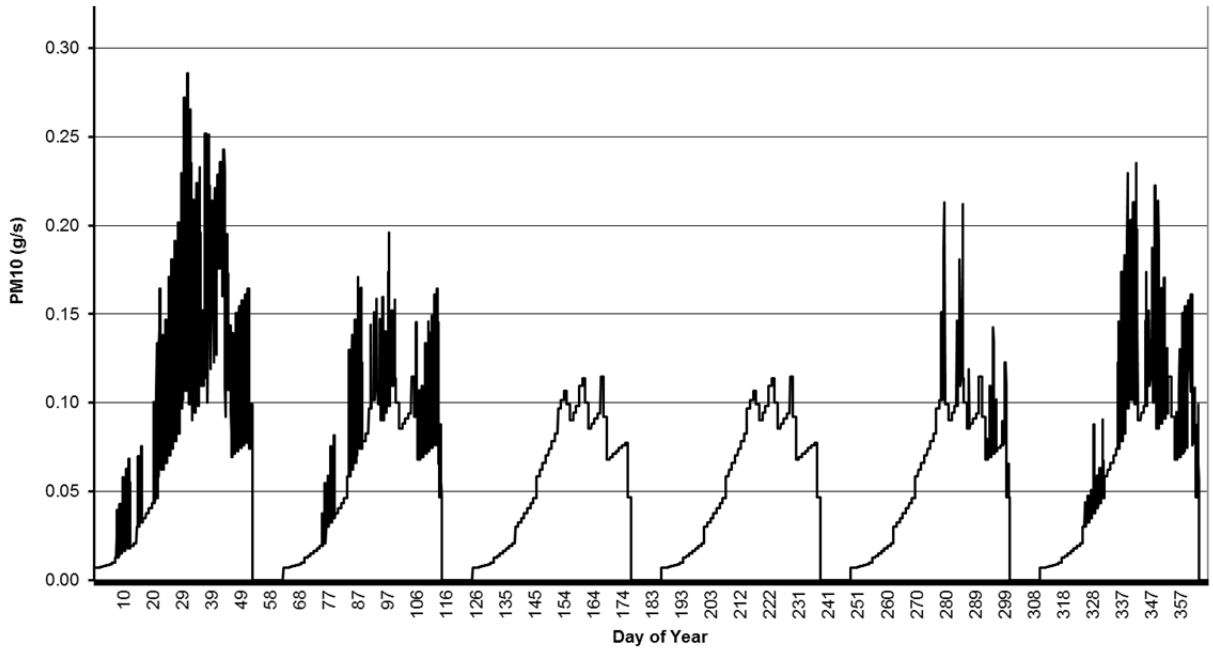
2.2.3 Particulate Emissions

3. Modelled shed particulate emission rates have not been provided.

The EPA requests clarification on how design and management practices are incorporated into the estimation of hourly particulate emission rates.

The EPA requests a presentation of the modelled hourly varying shed particulate emission rates for a grow out cycle.

Pacific Environment's (2015a) modelled PM_{10} emissions rates on a per shed basis are shown in **Figure 13**.



Source: Pacific Environment (2015b)

Figure 13 - Modelled PM_{10} Emissions

Dust emissions from modern poultry farms are typically low. Pacific Environment (2015b) advises that by adopting a conservative dust emission profile it has been found, provided the odour buffer is suitable (which in this case it is), that dust impacts will not occur even with the conservative emissions. On this basis, scaling of dust emissions based on farm management is not undertaken.

4. Sources of particulate matter were excluded from the assessment.

The EPA requests a revision of the dispersion modelling to include the internal roads as a source of particulate emissions and identify the management measures that will be applied to control particulate emissions from the internal roads.

While Pacific Environment (2015a) did consider the potential for wheel generated dust from the internal roads in the air quality impact assessment, it was concluded that the potential for emissions will be low given the constructed nature of the roads and subsequent lower silt loading (compared to using unformed tracks). As advised in the EIS (SLR 2015a), the internal roads will be 7 metres wide and will be constructed with a compacted clay base to 98 percent and 200 millimetres (mm) of road base (120 mm of 80 mm "Jawbone" rock and 80 mm of 40 mm "DGS" gravel on top).

Pacific Environment (2015b) advises that they have assessed multiple poultry operations and found internal roadways not to be a significant source of dust emissions. This is because the roads can be constructed in a way to minimise dust (as proposed) and can also be managed to minimise emissions.

Moreover, in this case, the distances from the internal roads to nearby sensitive locations are suitably significant (Pacific Environment 2015b).

On this basis, Pacific Environment (2015b) advises that modelling of dust emissions from the internal roads is not warranted.

Dust emissions from the internal roads will be managed during both the construction and operational phases through the Construction Environmental Management Plan (CEMP) and OEMP, respectively. The following mitigation measures will be implemented to minimise the potential for dust emissions from the internal roads:

- Internal roads will be appropriately constructed (including a compacted clay base) and maintained;
- The proposed access road from the Sturt Highway will be bitumen sealed for a distance of 50 metres from the carriageway of the highway;
- A 40 kilometre per hour speed limit will be adopted on the access road between the Development Site and the Sturt Highway;
- A 40 kilometre per hour speed limit will be adopted within the development site; and
- If necessary, a water truck will be used to reduce dust emissions during dry periods.

2.2.4 Meteorological Data

5. Representativeness of year 2010 meteorological data is not demonstrated.

The EPA requests provision of the results of the analysis demonstrating year 2010 is a representative year.

The year 2010 was evaluated by Pacific Environment by comparing the long-term averages up to 2015 (based on available data) against a number of years. It was found that 2010 correlated well with the long-term averages with regard to minimum and maximum temperatures, 9.00 am wind speed and humidity. A check of the weather data for the area also confirmed that the average wind speed for 2010 of 3.4 metres per second was consistent with other recent years, and that the frequency of calm winds, which are critical in terms of odour, at 12.7 percent was consistent with other years, albeit slightly higher (~1%) than 2007 to 2009.

Please refer to Pacific Environment's (2015b) letter report in **Appendix H** for graphs comparing 2010 meteorological data against long-term averages.

6. Modelled meteorological data input parameters are not presented for verification.

The EPA requests the proponent provide and justify the values assumed for these seven critical parameters (TERRAD, RMAX1, RMAX2, R1, R2, IEXTRP and BIAS).

After selecting 2010 at the representative year, Pacific Environment compared observations at the Bureau of Meteorology's (BoM) weather stations at Yanco and Narrandera with TAPM generated data. This comparison, which was illustrated in Pacific Environment's *Air Quality Impact Assessment* (2015a) and reproduced in the appended letter report (2015b), shows that the data does not compare well, with TAPM predicting less south-easterly and easterly winds. Overall, the Yanco and Narrandera sites were similar with the exception of some terrain blocking at Yanco, which resulted in a high proportion of winds from the north.

In line with good practice, Pacific Environment selected the Narrandera data to drive the model, with some data gaps filled by Yanco data. TAPM data was not considered representative of the area, particularly as it had zero calms, which are critical for odour impacts. The lack of large terrain elements in the area led Pacific Environment to conclude that the "observation only" approach was suitable for the Project.

The seven parameters used by Pacific Environment for the modelling are:

- RMAX1 = 0.1;
- RMAX2 = 0.1;
- R1 = 0.1;
- R2 = 0.1;
- TERRAD = 2;
- IEXTRP = - 4; and
- BIAS = -1, - 0.75, - 0.5, 0, 1, 1, 1, 1, 1.

Pacific Environment (2015b) advised in the following in relation to these parameters:

- IEXTRP is the extrapolation of surface wind to the upper layers. Pacific Environment (2015a) used the default of minus (-) 4, which allows extrapolation through similarity theory.
- RMAX is the maximum radius of influence the surface station will exert on the final guess field. As required, Pacific Environment (2015a) used professional judgement to select a value on the basis of the geography of the region. CALMET was run with both RMAX values at 0.1 as the method is "observation only" (see discussion below)
- R1 is the radius that yields equal weighting to the first guess and surface station winds. This is usually the same as RMAX as there is only the single meteorological station (see discussion below).
- RMAX2 and R2 for upper air. In this case the domain was small and we allowed the upper air station "observations" to influence the domain (See discussion below)
- TERRAD is a radius of influence of terrain features. As there are no significant terrain features in the area, Pacific Environment (2015a) selected a value of 2 kilometres (km).

Pacific Environment ran two scenarios with small (Run 1) and large (Run 2) RMAX and R values. Pacific Environment's letter report (2015b) in **Appendix H** contains a table summarising the parameters used for these scenarios. As there was only one observation station in the domain and the domain is flat, CALMET produced exactly the same wind field for Runs 1 and 2. Pacific Environment's model run produced wind fields which were the same as the data measured at Narrandera. This is consistent with the TAPM modelling, which produced nearly identical wind fields for spatially separated sites.

7. Modelled meteorological data is not evaluated.

The EPA requests an evaluation of the CALMET generated wind speed and wind direction data to demonstrate it is suitable for use in CALPUFF.

As advised above, Pacific Environment performed two runs to test the sensitivity of the model. Given that the terrain is flat and driven by observation data at Narrandera, the model produced a similar wind field at the Development Site as at Narrandera, which is as expected given the lack of terrain in the area which was also confirmed by the TAPM outputs.

2.2.5 Odour Criterion

8. Project odour criterion should be 5 Odour Units (OU).

The EPA considers an appropriate odour performance criterion for the project is 5 OU. The EPA notes the project, as modelled by PEL (2015) marginally complies with an odour performance criterion of 5 OU. This highlights the need for the proponent to consider feasible odour mitigation measures that will be applied should odour impacts occur once operation (see issue 10).

Pacific Environment (2015a) adopted an odour criterion of 7 OU based on discussions between ProTen and the EPA's Griffith office. The Australian Bureau of Statistics (ABS) 2011 census data for rural communities in NSW gave an average population per house of 2.4 people, which is consistent with the EPA's 2.8 people per house value.

The population density around the development site is variable and on a per square kilometre basis is quite low at approximately 29 people over an area of around 110 square kilometres (km^2) (Pacific Environment 2015b). There are three single residences around the development site, these being:

- R7 - approximately 2.7 km to the southeast of the development site (approximately 3.9 km to the nearest PPU);
- R6 (proposed) - approximately 300 metres to the east of the development site (approximately 1.8 km to the nearest PPU); and
- R11 - approximately 2.8 km to the east-northeast of the development site (approximately 4.7 km to the nearest PPU).

These are discrete dwellings rather than forming part of a cluster of dwellings.

There is a cluster of eight dwellings to the north, over an area of approximately 8 km^2, with the nearest (R5) being located approximately 1.7 km from the development site (approximately 2.1 km to the nearest PPU).

While the population (approximately 31 people, based on 11 residences with an average of 2.8 people per residence) indicates an odour criterion of 5 OU, when the area (greater than 100 km^2) and distances between the residences are considered, a higher criterion of 6 OU is considered appropriate by Pacific Environment (2015b) to protect against amenity impacts at the single rural residences.

On this basis, in addressing the EPA's request for a higher odour performance criterion, 6 OU is considered appropriate.

2.2.6 Cumulative Assessment

9. Assessment of cumulative particulate impacts not in accordance with the Approved Methods.

The EPA requests a revision of the cumulative assessment of 24 hour average PM^{10} concentrations in accordance with the methodologies listed in the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW or provide justification for adopting an alternate method.

Pacific Environment (2015a) assessed cumulative 24-hour PM_{10} impacts using Monte Carlo simulations, which provide results in terms of the statistical probability that an event may occur. This methodology has been used and accepted in numerous significant extractive industry dust assessments as an alternative to the Level 2 approach in the Approved Methods (DEC 2005) when site-specific monitoring data is unavailable.

The Monte Carlo simulation is a statistical approach that combines the frequency distribution of one data set (in this case, measured 24-hour average PM_{10} concentrations representative of the development site) with the frequency distribution of another data set (modelled concentrations at a given receptor). This is achieved by randomly and repeatedly sampling and combining values within the two data sets to create a third "cumulative" data set and associated frequency distribution. To generate greater confidence in the statistical robustness of the results, Pacific Environment (2015a) repeated the Monte Carlo simulation 250,000 times for each of the chosen receptors.

Pacific Environment (2015b) advises that, in their experience, this dust emissions method over predicts emissions by a factor (depending on bird numbers, etc.) anywhere between a factor of two and four. On this basis, based on the modelling to date, the maximum PM_{10} concentration that could actually occur at the most exposed receptors is in the order of 5 $\mu g/m^3$ (Pacific Environment 2015b). In other words, the predicted impact of the proposed development at the nearest receptors is very low. This is also based on all PPUs peaking at the same time, which is unrealistic (as discussed above) and adds to the conservatism.

In summary, Pacific Environment (2015b) considers the use of the Monte Carlo method appropriate for the assessment of cumulative impacts associated with the proposed poultry development and advises that dust impacts from the proposed development are unlikely to occur.

2.2.7 Mitigation Measures

10. No feasible mitigation measures that could be implemented should odour impacts occur once operational have been provided.

The EPA requests the proponent to investigate additional odour control options that could be implemented should odour impacts occur once operational.

As discussed above, emissions from the poultry industry have been decreasing over past years. Pacific Environment (2015b) links this to improved feed conversion and better overall shed management. The use of a K factor of 2.2, when the average K factor at present is well below this represents (as also discussed above) means Pacific Environment's (2015a) assessment is conservative. Moreover, by complying with the best practice management requirements detailed in *Best Practice Management for Meat Chicken Production in NSW - Manual 2 Meat Chicken Growing Management* (DPI 2012), the risk of elevated emissions is low due to the high standard of shed management (Pacific Environment 2015b).

As noted by the EPA, the industry literature does not support the use of windbreak walls or stacks. While there are other technology options for odour control, it is accepted that the potential benefits are outweighed by issues associated with cost and management.

Research has shown that vegetative buffers can reduce the impact of odour and dust emissions from agricultural operations (Laird 1997 and Thernelius 1997, cited in Pacific Environment 2015b). Other more recent publications have reported that vegetation can assist in odour management from livestock buildings by increasing dilution and acting as a sink for the chemical compounds responsible for odour (Patterson & Adrizal 2005, Tyndall & Colletti 2000, Tyndall & Colletti 2007 and Parker et. al. 2012, cited in Pacific Environment 2015b). Other publications, such as Karmaker et. al. (2006, cited in Pacific Environment 2015b), have highlighted how in other areas, such as Canada, vegetative buffers are a primary consideration for odour control on intensive livestock operations.

Pacific Environment (2015b) concludes that a combination of suitable separation distances and vegetation buffers represents the current best practice for poultry site management.

<u>Independent Environmental Audit at ProTen's Murrami Poultry Production Complex</u>

In 2013 GHD undertook an independent environment audit at ProTen's Murrami Complex near Tamworth NSW in response to a variation to the site's environment protection licence imposed by the EPA. The scope of this audit included (but was not limited) the following:

(a) Examine the systems and procedures that the Licensee has in place to ensure that any activities performed at the site are undertaken in accordance with current best practice and in accordance with the regulatory requirements;

(b) Examine the systems, procedures and control measures that the Licensee has in place to ensure it can reliably and robustly comply with section 129 of the Protection of the Environment Operations Act 1997 ("the Act");

(g) Recommend improvements, so far as reasonably practicable, to the systems referred to at a) and b) above to ensure they achieve current best practice for meat chicken farms and comply with Section 129 of the Act at all times; and

(h) Identify measures that, so far as reasonably practicable, to the systems referred to at a) and b) above to ensure compliance with Section 129 of the Act. This must include appropriate potential implementation time fame for each measure identified.

GHD's (2013) audit found that the Murrami Complex is being managed broadly in accordance with the *Best Practice Management for Meat Chicken Production in NSW - Manual 2 Meat Chicken Growing Management* (DPI 2012), its development consent and environment protection licence requirements. No material deficiencies in systems, procedures or controls were identified.

Given that the audit established that industry best practice is being adopted at the Murrami Complex for the protection of bird health and odour control from shed litter, GHD (2013) advised that there are few options to further reduce shed odour emission rates. A summary of GHD's (2013) analysis of odour control options is provided below.

Release of Shed Exhaust – Stub Stacks or End Bay Deflectors

A reduction in predicted odour levels at receptors as a result of introducing stub stacks or end bay deflectors would need to be significant (50 percent reduction or better) before these measures could be recommended on the basis that a perceived decrease in odour intensity is typically only registered where the reduction is 2:1 or greater. These options are only effective at short (~100s of metres) distances where there is a lower odour level at ground level compared to that at the elevated plume centreline.

Options to Reduce Shed Odour Emission Rates

By-pass cooling arrangements are a possible option to reduce odour emission rates as long as the oxygen levels within the poultry sheds are maintained for bird health. Shed insulation is also a possible option to reduce fan use. However, these options are subject to further and extensive investigation inclusive of cost/benefit analysis.

While scrubbing techniques of the exiting ventilated air have been trialled within the industry, these are yet to be established as part of "best practice". The European Union guidance on best practice for intensive rearing of poultry and pigs includes a section on a chemical wet scrubber for "end-of-pipe techniques for the reduction of air emissions from poultry housing", however the benefits were found to be outweighed by costs and other issues.

Vegetative and Other Screens

Increasing the "surface roughness" and providing some filtering effect via vegetation screening is sure to assist in reducing dust and odour levels crossing the site boundary. Options include a commercial tree plantation and cropping rather than grazing on the remnant site open space. Some measures and vegetative treatments can occur in the short-term while it is acknowledged that trees in particular take time to establish.

Vegetative screens and fixed barrier systems (fence with shade-cloth) set downwind of the farm in the directions of exposed receptors will induce additional turbulence as the odour plumes pass through this permeable barrier, though this will be muted when the stability is high (E or F conditions). Vegetative screens however also act to partially remove fine dust particles in the odour plumes. To the extent that a fraction of the odorant blend in a broiler shed exhaust is adsorbed to fine particles, then the action of dust removal by the screen will also reduce the odour level in the plumes, and will give a corresponding percentage reduction in the odour level as the plumes pass receptors further downwind.

Efforts have been made to determine the fraction of broiler odour adsorbed to particles by placing samples of the shed exhaust, both filtered and unfiltered to dynamic olfactometry. Recent research by the Queensland government has shown that dust particles in broiler exhaust are rapidly removed from the sample and adsorbed onto the sample bag wall. Further, it was realised that those particles not removed when in the sample bag will be highly likely to adsorb onto the internal surfaces of the olfactometer tubing which have much smaller dimensions. These two findings suggest that vegetative screens may be more effective to remove odour than first expected.

Proposed Landscaping and Other Odour Mitigation Measures

As outlined in the EIS (SLR 2015a), suitable tree and shrub species will be strategically planted around the perimeter of each PPU. The proposed plantings will be based on the relevant recommendations outlined in *Planning Guidelines Separating Agricultural and Residential Land Uses* (Queensland Department of Natural Resources 1997), as follows:

- Provide a biological buffer of a minimum total width of around 40 metres;
- Contain consistent, yet random, plantings of a variety of tree and shrub species of differing growth habits, at spacing's of around four to seven metres;
- Include species with long, thin and rough foliage to facilitate the capture of spray droplets and dust particles;
- Provide a permeable barrier that allows air to pass through the buffer. The plantings will aim to achieve a porosity of around 0.5 (i.e. around 50 percent of the screen will be air space);
- Include species that are hardy and fast growing; and
- Foliage from base to crown (i.e. lower and upper storey vegetation) to ensure that the buffer is effective in slowing and filtering air movement at all levels.

ProTen will progressively establish the landscape plantings, as soon as practically possible, following bulk earthworks and construction of development infrastructure.

ProTen understands that odour issues are directly related to farm operation, with good management practices playing a significant role in reducing the potential for emissions. On this basis, and as advised in the EIS (SLR 2015a), the following additional design features, best management practices and mitigation measures will be implemented to minimise the potential for odour impacts:

- The poultry sheds will be fully enclosed and have adequate roof overhang (wide eaves) and be surrounded by dwarf concrete bund walls to reduce moisture in the sheds and thereby reduce odour emissions.
- 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 (NSW Agriculture 2004).
- The poultry sheds will be fitted with nipple drinkers and drip cups to minimise water spillage and shed moisture.
- Regular monitoring and maintenance of the tunnel ventilation systems and bird drinkers will be undertaken to avoid spillages, leaks and uneven distribution.
- Stocking densities and bird health within the poultry sheds will be regularly checked and, if necessary, appropriate corrective measures will be implemented.
- Daily monitoring and maintenance of the bedding material 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. Where possible, litter handling 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 litter removal.
- Dead birds will be collected from the sheds on a daily basis and stored in the on-site chiller prior to removal from site.
- During sanitisation of the poultry sheds, 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.

2.2.8 Odour Risk

11. The proponent has not assessed the odour risk of their project.

The EPA recommends the proponent evaluate the odour risk level of their project. The evaluation of odour risk must, as a minimum, consider the additional information example listed above. This information is important as it will demonstrate to the EPA the proponent's level of understanding regarding the odour risk of their facility and their obligation to comply with Section 129 of the POEO Act.

Firstly, the odour risk of the poultry development has been assessed in Pacific Environment's *Air Quality Impact* Assessment (2015a), which was undertaken in accordance with accepted methodologies and considered local land use, terrain and meteorology. An air quality impact assessment, by its very nature, is an odour risk assessment. Based on the air quality impact assessment (2015a), which is considered conservative, field experience and the additional information in the letter report (2015b) contained in **Appendix H,** Pacific Environment (2015b) concludes that the modelling has produced a representative summary of potential impacts, which, in summary, are:

- Odour concentrations at all of the nearest receptors are predicted to be at or below 5 OU; and
- Maximum 24 hour and annual average PM_{10} levels are predicted to be below the respective assessment criterion at all of the sensitive receptors.

The project did not use site-specific meteorology and emissions, and only used average emission rate data.

Yes, Pacific Environment (2015a) did not use site-specific meteorology or emissions given that no such data is available. It is considered good practice and standard practice to use the methodology adopted by Pacific Environment (2015a) when site-specific data is not available. If significant terrain was present in the region reliance on prognostic model output data, including that from TAPM, would be appropriate, however, given that the area is flat and that TAPM does not compare well with the observed data, the meteorology used is likely to be consistent with that expected on the site (Pacific Environment 2015b).

While the emissions estimation method was not based on test data from the site (given there are currently no poultry sheds on site), it is based on over 10 years of experience and data collected from other poultry farms. The data makes use of local temperatures over a full year, which is firstly used to predict the shed ventilation rate, which is then used to predict an odour emission rate. As discussed above, the adopted K factor of 2.2 is conservative and is not expected to be exceeded (Pacific Environment 2015b). The data collected at a ProTen farm near Tamworth in 2011 shown above in **Figure 10**, along with the data shown in **Figure 11**, clearly shows that the K factor of 2.2 is likely to be about 50 percent higher than what is typical of similar farms elsewhere.

There was a higher risk of unacceptable odour impacts if there were small changes in the assumptions.

It is true that the assumptions can be critical, however (as discussed above) Pacific Environment (2015a) assumed all birds will be placed on the same day and used the recommended K factor for new farms, which is higher than what is measured at operational farms over the last four years. The assessment has been made based on a number of assumptions, which, through experience, Pacific Environment has found to be appropriate and conservative for poultry odour assessments.

Throughout its history in the Australian poultry industry, ProTen has proven its commitment to best management practice at its numerous poultry production operations. This is demonstrated by the independent environment audit undertaken in 2013 by GHD at ProTen's Murrami Complex (discussed above). Farm management and profitability go hand in hand. The grower (i.e. ProTen) is paid less if the farm performs poorly. Therefore, the better managed the farm, the lower the emissions, and the lower risk of odour impacts.

Further statistical analysis was required which could include maximum, minimum, 99.9th, 95th percentile values.

The Approved Methods uses the 99th percentile nose response. It is unclear as to why the EPA wishes further percentiles to be examined, or what to compare these against. Pacific Environment (2015b) advises that while different percentiles can be used there needs to be careful consideration of associated odour criteria and averaging times (odour criterion must vary with the percentile and averaging time). The use of maximum values will give a higher concentration. However, Pacific Environment (2015b) points out that odour criteria are based on the relationship between percentiles, averaging times and concentrations – if one changes, the others also need to very in order to maintain an equivalent statistical outcome. Suitable adjustments to criteria have not been developed, and the current use of a single percentile-concentration-averaging time combination is a widely accepted approach. It is an indicator of the critical upper part of the predicted odour concentration distribution.

Unreliable and poorly performing mitigation measures presented a higher risk.

The facility posed an additional risk if there were no feasible mitigation measures that could be implemented if the facility emitted more odour that assumed.

As noted above, farm management and profitability go hand-in-hand and ProTen has proven its commitment to best management practice at its numerous poultry production operations. Based on the air quality impact assessment (2015a), which is considered conservative, field experience and the additional information in the letter report (2015b) contained in **Appendix H,** Pacific Environment (2015b) does not expect farm management standards to reduce over time or the emissions to be higher than what was modelled.

As discussed above to address the EPA's issue number 10, emissions from the poultry industry have been decreasing over past years. Pacific Environment (2015b) links this to improved feed conversion and better overall shed management. The use of a K factor of 2.2, when the average K factor at present is well below this represents (as also discussed above) means Pacific Environment's (2015a) assessment is conservative. Moreover, by complying with the best practice management requirements detailed in *Best Practice Management for Meat Chicken Production in NSW - Manual 2 Meat Chicken Growing Management* (DPI 2012), the risk of elevated emissions is low due to the high standard of shed management (Pacific Environment 2015b).

As noted by the EPA, the industry literature does not support the use of windbreak walls or stacks. While there are other technology options for odour control, it is accepted that the potential benefits are outweighed by issues associated with cost and management.

Pacific Environment (2015b) concludes that a combination of suitable separation distances and vegetation buffers represents the current best practice for poultry site management. This is backed-up by GHD's audit of ProTen's Murrami Complex in 2013 (discussed above) which, in summary, concluded the following:

- The Murrami Complex is being managed broadly in accordance with the *Best Practice Management for Meat Chicken Production in NSW - Manual 2 Meat Chicken Growing Management* (DPI 2012), its development consent and environment protection licence requirements.
- Given that the audit established that industry best practice is being adopted, there are few options to further reduce shed odour emission rates.
- A reduction in predicted odour levels at receptors as a result of introducing stub stacks or end bay deflectors would need to be significant before such measures could be recommended. These options are only effective at short distances where there is a lower odour level at ground level compared to that at the elevated plume centreline.
- By-pass cooling arrangements and shed insulation options are subject to further and extensive investigation inclusive of cost/benefit analysis.
- While scrubbing techniques have been trialled within the industry, these are yet to be established as part of "best practice", with benefits being outweighed by costs and other issues.
- Increasing the "surface roughness" and providing some filtering effect via vegetation screening is sure to assist in reducing dust and odour levels crossing the site boundary. Vegetative screens will induce additional turbulence as the odour plumes pass through this permeable barrier, though this will be muted when the stability is high (E or F conditions). Vegetative screens however also act to partially remove fine dust particles in the odour plumes.

ProTen has committed to establishing vegetation screens around each PPU in accordance with the relevant recommendations outlined in *Planning Guidelines Separating Agricultural and Residential Land Uses* (Department of Natural Resources 1997) (listed above). ProTen has also committed to the range of design features, best management practices and mitigation measures listed above to minimise the potential for odour impacts.

2.3 NSW Office of Water

Water resources were assessed in the EIS (SLR 2015a) as follows:

- SLR undertook an assessment of potential surface water issues associated with the Project, including a flooding assessment to define pre-development flooding behaviour and inform any building design, transport and safety provisions necessary during flooding events. A copy of SLR's *Flooding Assessment* (2015c) was appended to the EIS and summarised within the EIS. Conclusions of the flooding assessment included:
  - The development site is unlikely to be flood affected during mainstream flood events up to and including the 1 in 100 year annual recurrence interval (ARI) event. In addition, it is considered unlikely that the site will be flood affected by Murrumbidgee River or Yanco Creek out of bank flows during an extreme flood event such as the probable maximum flood (PMF).
  - Flood warnings are likely to be available via the NSW State Emergency Service (SES) at least several days prior to a mainstream flood occurring. Where a flood warning is issued, the flood management plan documented in the EIS (SLR 2015a) will be implemented to effectively manage the flood risk to the development.
  - All PPUs will be constructed above the predicted 1 in 100 year ARI flood depth. Concrete bund walls will be constructed around each of the poultry sheds and swale drains between the sheds have been designed to safely convey flood flows.
  - The stormwater management system has been designed with the total storage on site equivalent to 170 percent of the storage capacity required to contain runoff from a 1 in 100 year ARI, 72 hour flood event.
- SLR undertook an assessment of potential groundwater issues associated with the Project, including a conceptual hydrogeological model. This assessment was detailed in the EIS (SLR 2015a). Conclusions of the groundwater assessment included:
  - The proposed extraction of groundwater to service the development's water supply requirements of 460 megalitres per year (1.26 megalitres per day averaged over a year), which will be serviced via the transfer of an existing water access licence (WAL) from a bore located approximately 5 km to the east of the development site, will not create any additional impact on the sustainable yield of the deep aquifer source (Calivil Formation).
  - The proposed extraction will also meet the NSW Aquifer Interference Policy (NOW 2012) minimal impact considerations for a "highly productive groundwater source", with the associated drawdown not exceeding 2 metres at any nearby extraction well.

The NOW's submission dated 7 July 2015 included nine recommendations (including requests for additional information) in relation to the assessment of flooding and groundwater undertaken for the Project. The recommendations made by the NOW and requests for additional information are identified below in ***bold italic text***, followed by the response in normal text.

2.3.1 Flooding

1. Clarification is included in the flooding assessment of potential impacts on-site and to the neighbouring properties in terms of food extent, food depth and flood velocities for the 1 in 100yr ARI event and the PMF. Impacts on neighbouring properties need to be considered in terms of land management practices as well as infrastructure.

To address this issue, SLR undertook additional flood modelling and prepared an addendum to the *Flooding Assessment* (SLR 2015c) that was appended to the EIS (SLR 2015a). The scope of this additional work comprised:

- One dimensional hydraulic modelling of local overland flood flows for the post-development scenario (the pre-development scenario was modelled previously by SLR (2015c)); and
- Comparison of flooding behaviour between pre-development and post-development scenarios to identify the impact of the proposed development.

A copy of the *Flooding Addendum* (SLR 2015f) is contained in **Appendix D** and the key outcomes are summarised below.

SLR (2015c) developed two hydraulic models for the pre-development scenario to simulate the northern ephemeral flow path through the development site and both the combined southern and northern ephemeral flow paths (with the worst-case flood level for the northern ephemeral flow path selected). SLR (2015f) modified these models to account for the construction of the five PPUs (i.e. the post-development scenario). Additional cross-sections were added to both the pre-development and post-development hydraulic models to enable the change in hydraulic conditions between the two scenarios to be identified and assessed. In the post-development scenario, each PPU was assumed to be a solid structure with no allowance for flow in between the poultry sheds to conservatively assess flood afflux.

A schematic of the hydraulic models, including cross-section locations, is provided in **Figure 14**.

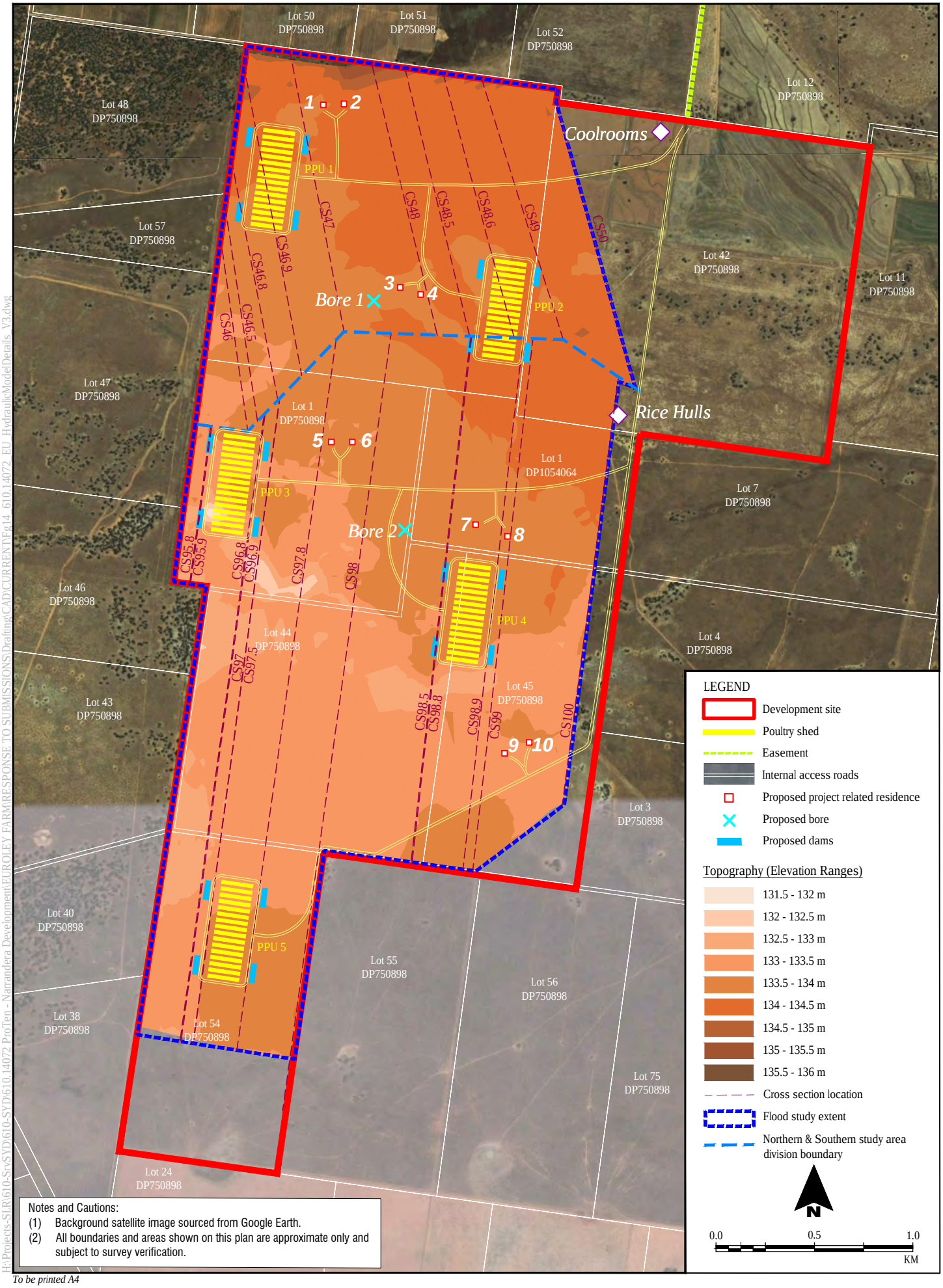
The flooding afflux impacts for the 1 in 100 year ARI event and PMF event are shown in the long-sections provided in **Figures 15** and **16** for the northern and southern ephemeral flow paths, respectively. Flood mapping showing the 1 in 100 year ARI event flooding depths for the pre-development and post-development scenarios are also shown on **Figures 17** and **18**, respectively.

The hydraulic modelling indicates that the maximum flood afflux as a result of the development is predicted to be experienced upstream of PPU 2 at 90 millimetres for the 100 year ARI flood event and 110 millimetres for the PMF event. The flood afflux impacts upstream of the development at the site's eastern boundary are predicted to be less than 50 millimetres for a 100 year ARI event and 80 millimetres during a PMF event. No flood afflux impacts are predicted to occur downstream of the development towards the site's western boundary.

The maximum average flood flow velocity increase is predicted to be 0.08 metres per second during a 100 year ARI event and 0.11 metres per second during a PMF event.

SLR (2015f) concludes that there are no existing buildings or infrastructure items on properties surrounding the development site that will to be adversely affected by the construction of the proposed development buildings, residences or associated infilling earthworks in terms of flooding. As the flood afflux is predicted to be relatively minor within the development site and at the site boundaries and flood velocities did not increase significantly within the development site or at the site boundaries, agricultural practices in neighbouring properties are also unlikely to be affected by the flood impacts associated with the proposed development.

It is also worth noting, as detailed in Section 6.5.2 of the EIS (SLR 2015a), mainstream flooding is not considered to pose a significant risk to the development site. Notably, aerial photography of the 1974 flood event, which was estimated to be a 1 in 99 year ARI event (SKM 2000), taken within hours of the flood peak do not appear to show the development site to be flood affected.



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Hydraulic Model Details

FIGURE 14

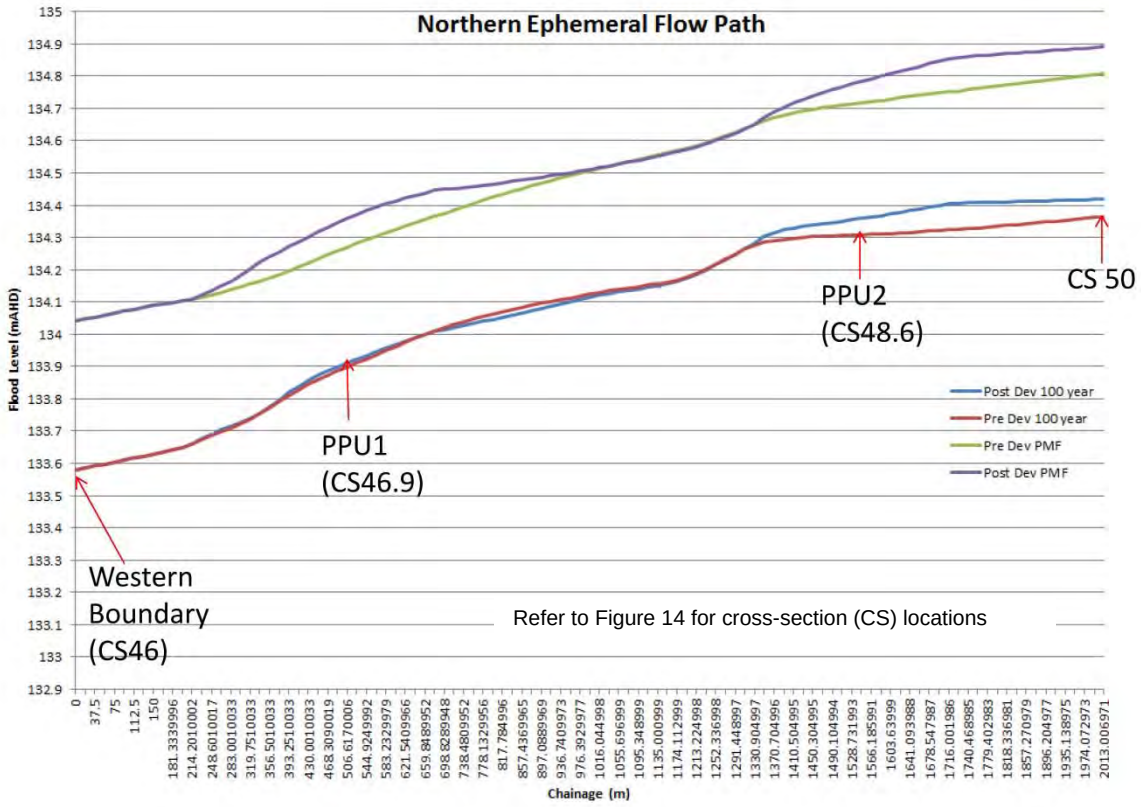


Figure 15 - Flood Afflux Impact – Northern Ephemeral Flow Path

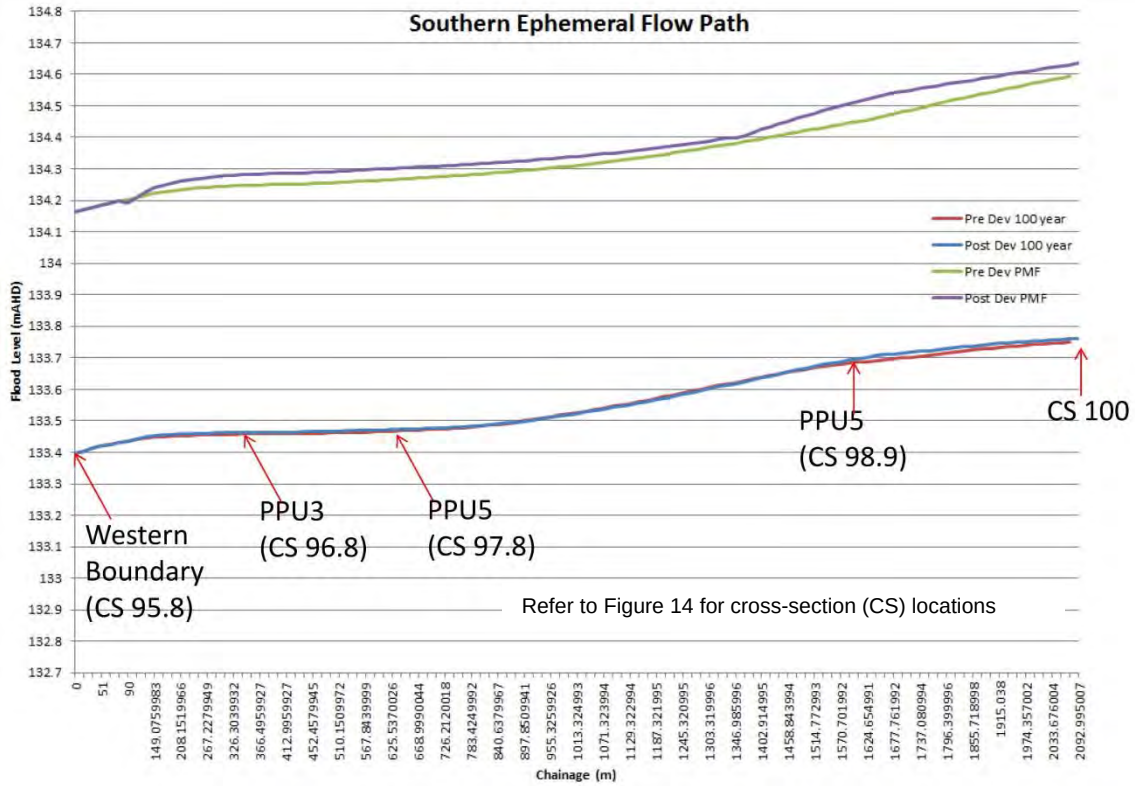
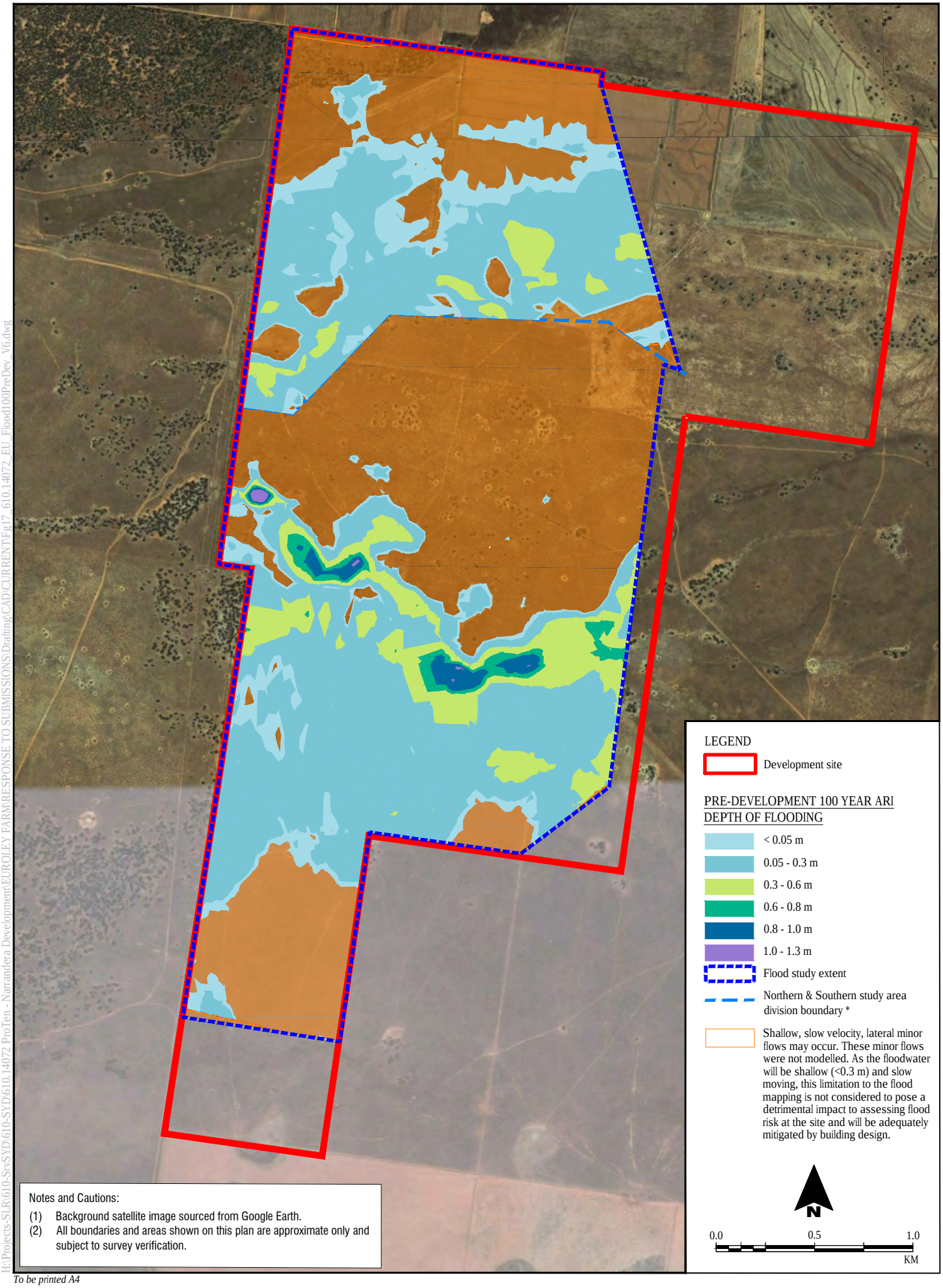


Figure 16 - Flood Afflux Impact – Southern Ephemeral Flow Path



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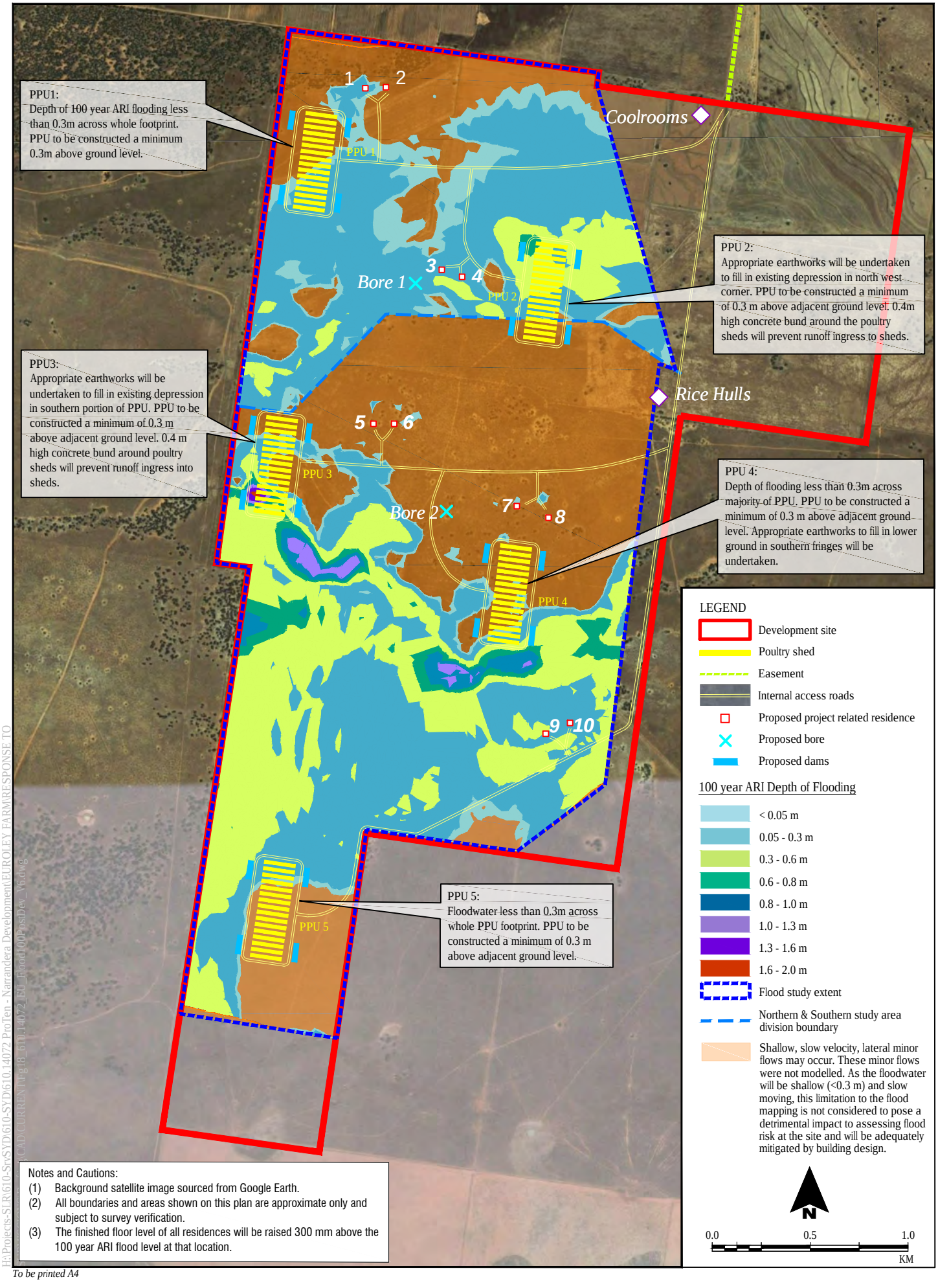
100 Year ARI Pre-Development Flood Depths

FIGURE 17



Notes and Cautions:

(1) Background satellite image sourced from Google Earth.
(2) All boundaries and areas shown on this plan are approximate only and subject to survey verification.
(3) The finished floor level of all residences will be raised 300 mm above the 100 year ARI flood level at that location.

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100 Year ARI Post-Development Flood Depths

FIGURE 18

2.3.2 Groundwater

2. The EIS be amended to clarify the exact locations of proposed bores (correct Lots/DP numbers)

The exact locations of the proposed bores within the development are shown on **Figure 1** (revised Figure 1.3 from the EIS). As evident, the proposed bores will be located within Lot 41 in DP 750898 and Lot 1 in DP 750898. Both of these bore locations will include one production bore and one backup bore in case of pump failure.

3. It is recommended that proper pump testing be carried out to confirm bore yields at the proposed sites to confirm water supply security.

ProTen engaged Watson Drilling of Deniliquin to undertake bore drilling and construction, Wayne Kempton Bore Pumps of Deniliquin to undertake a bore pump testing program and SLR to provide hydrogeological support and analysis. SLR's letter report (2015g) in **Appendix D** presents the results of the bore drilling and pump testing program for the two proposed groundwater production bores, and a summary of the pump testing results is provided below.

The drilling program targeted the Calivil Formation aquifer (i.e. the deep source), which lies beneath approximately 50 metres of the Shepparton Formation at the development site. The Shepparton Formation in turn is overlain by 4 to 5 metres of topsoil and weathered silty clay, which provides low permeability cover to the Shepparton Formation aquifer (i.e. the shallow source).

Lithological drilling logs are appended to SLR's letter report in **Appendix D**, and a summary of the bore construction information is provided below in **Table 11**.

The target Calivil Formation was intersected at 54 metres below ground level (BGL) at both of the proposed groundwater production bore locations lying immediately below the Shepparton Formation. It was noted to be 24 metres thick at Bore 1 and 46 metres thick at Bore 2, although its entire thickness was not drilled in Bore 1. The Renmark Group was intersected at Bore 2 below the Calivil Formation at 100 metres depth, giving a total formation thickness of 46 metres. In the two drilling locations, the Calivil Formation consisted of medium to coarse grained clean white quartzose sands, interbedded with thin clayey horizons.

Table 11 - Bore Drilling and Construction Information

Bore ID	Total Drilled Depth (mBGL)	Top of Calivil Formation (mBGL)	Base of Calivil Formation (mBGL)	Well Screens (ss wire-wound)		Standing Water Level (mBGL)
				Aperture	Setting (mBGL)	
Bore 1	78	54	not drilled	0.050” 0.060” 0.040” 0.050” 0.060” 0.070”	57-79 59-60 64-65 65-66 66-71 71-73	24.48
Bore 2	107	54	100	0.060” 0.070” 0.040” 0.050”	73-75 75-77 85-91 91-93	24.22

The bore pump testing was undertaken according to *AS 2368-1990 Test Pumping of Water Wells* and comprised:

- A single constant rate test on Bore 1 at a rate of 45 litres per second (i.e. well in excess of the long-term forecast water demand of the development) for 48 hours, with drawdown monitored in both Bore 1 and Bore 2 using electronic data loggers and e-tapes. The constant rate test was undertaken with the objective of obtaining reliable site-specific estimates of the aquifer hydraulic properties of transmissivity and storativity for groundwater drawdown modelling (see issue 5 below).
- A short monitored recovery test, with recovery monitored in Bore 1 using an electronic data logger and an e-tape. The recovery test was undertaken with the objective of obtaining additional data on aquifer hydraulic properties.

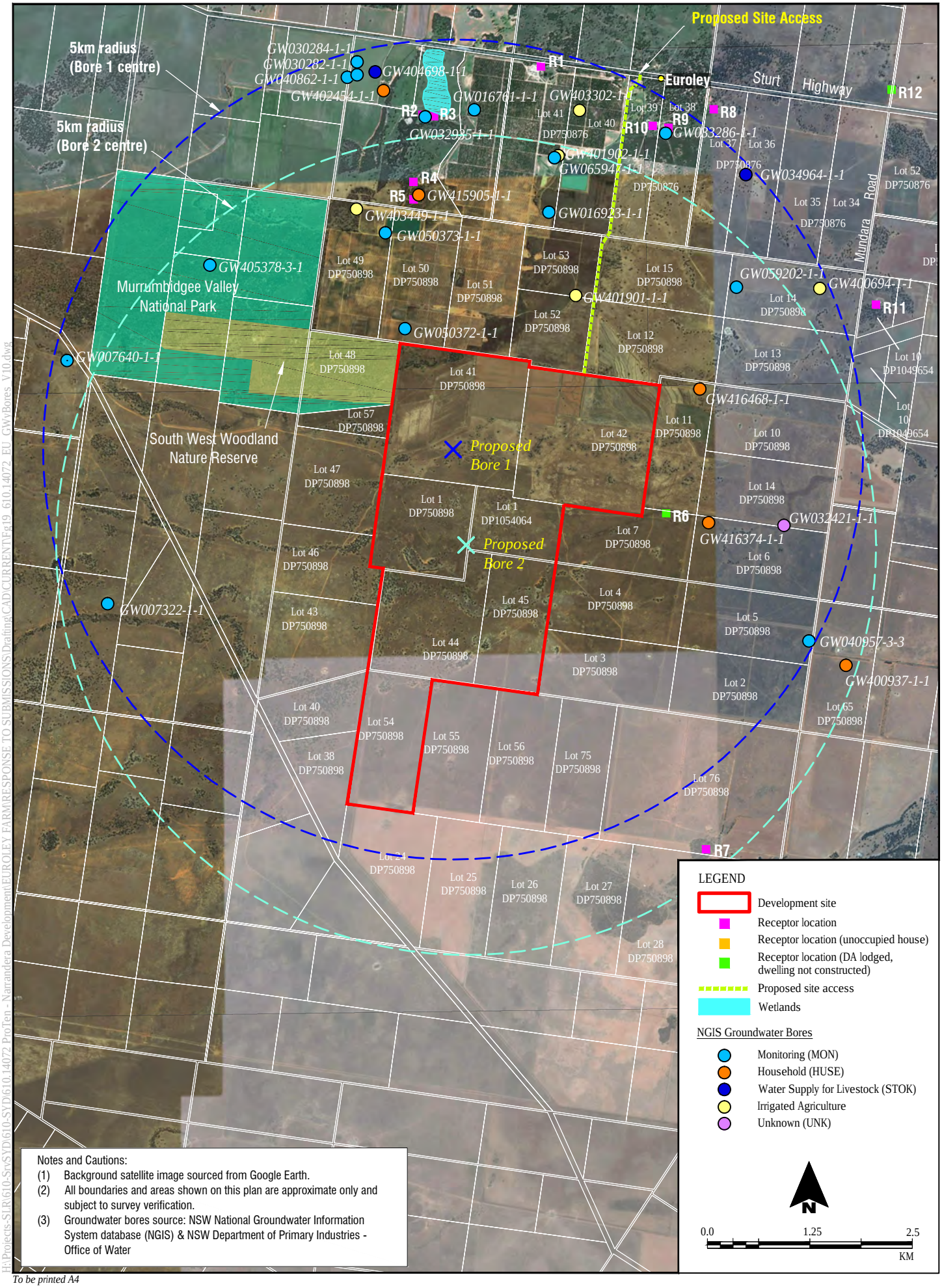
The results of the pumping test indicate that the Calivil Formation aquifer has sufficient capacity to support the development's long-term water supply requirements of approximately 1.26 megalitres per day and can support significantly higher rates of extraction. The pumped bore recorded a maximum drawdown of only 4.18 metres after 2 days of pumping at 45 litres per second (3.89 megalitres per day), with the observation bore located almost 1.2 kilometres away recording a maximum of 0.44 metres drawdown.

The achieved yields demonstrate appropriate water supply security for the development.

4. The locations of all existing bores within 5km including their depths and distances from ProTen's proposed extraction sites are provided.

The locations of all existing bores within 5 km of the proposed bores within the development site are shown on **Figure 19**. As evident a total of 28 bores have been identified within this area, including 15 monitoring bores, five bores used for household purposes, two bores used for livestock watering, five bores used for irrigation purposes and one bore with an unknown purpose.

This information was sourced from the National Groundwater Information System (NGIS) on-line database and NOW's on-line database.



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Groundwater Bores

FIGURE 19

5. The assessment of potential impacts of 460 ML extraction on nearby bores is considered inadequate and it is recommended that the analytical model be re-run to assess the impact of extraction using modified aquifer parameters and a longer pumping period (i.e. 2,000 days).

As outlined above (see issue 3), ProTen engaged Watson Drilling of Deniliquin to undertake bore drilling and construction, Wayne Kempton Bore Pumps of Deniliquin to undertake a bore pump testing program and SLR to provide hydrogeological support and analysis. SLR's letter report (2015g) in **Appendix D** presents the results of the bore drilling and pump testing program for the two proposed groundwater production bores, and a summary of the modelling results is provided below.

Analysis of the bore pumping test was undertaken by SLR (2015g) using the following published solutions (Kruseman & de Ridder 1994):

- Cooper-Jacob straight-line method (pumping data, pumping bore and observation bore); and
- Theis recovery straight-line method (recovery data, pumping bore only).

These analyses are appended to SLR's letter report (2015g) in **Appendix D** and a summary of the results from the pumping test analysis is provided below in **Table 12**.

Table 12 - Aquifer Testing Analysis Results

Pumped Bore ID	Observation Bore	Transmissivity (m^2/d)	Storativity
Bore 1	Bore 1	3,389 (pumping, Cooper-Jacob) 3,953 (Theis recovery)	n/a n/a
	Bore 2	3,389 (pumping, Cooper-Jacob) 3,350 (pumping, Theis curve fitting)	3.45×10^{-4} 3.30×10^{-4}
	Geometric mean	**3,512**	**3.4×10^{-4}**

The aquifer test analysis indicates that the transmissivity of the Calivil Formation aquifer is about 3,400 square metres per day in the development area and storativity is around 3.4×10^{-4}.

The aquifer parameters obtained from the testing program were input to an analytical model using the Theis distance-drawdown equation to determine likely groundwater drawdown resulting from operation of the development. The model adopted the following assumptions:

- Pumping rate of 1.26 megalitres per day, equivalent to the development's proposed extraction of approximately 460 megalitres per year;
- Pumping from only Bore 1 (rather than splitting the extraction over two bores) to provide the most conservative estimate of groundwater drawdown;
- Transmissivity of 3,512 square metres per day and storativity of 3.37 x 10-4 as per the results of the aquifer testing program (see **Table 12**); and
- Pumping duration of 2,000 days (as requested by NOW) to provide an indication of the long-term groundwater drawdown impacts.

The results of the analytical model, which are presented in **Figure 20** below, show a predicted maximum long-term drawdown of 0.8 metres in the immediate vicinity of the pumping bore, with the 0.5 metre drawdown radius extending only around 110 metres from the pumping bore.

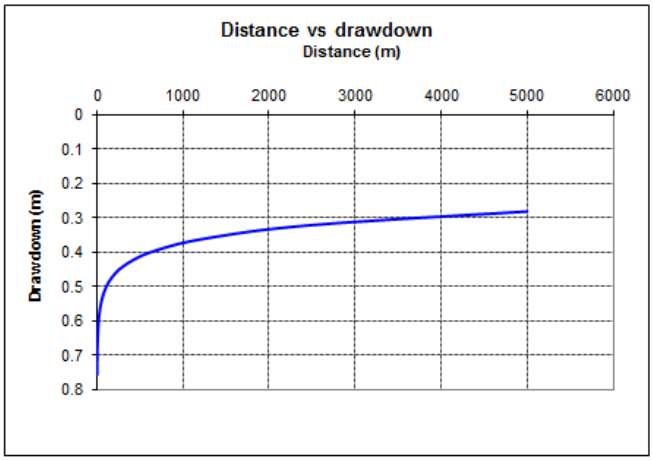
Project: ProTen

Calculate Drawdown (s) for known Discharge (Q) **THEIS Analytical Solution (Theis, 1935)**

INPUTS

Pumping rate of well:	14.58	L/s
	1260	m3/day
Storage coefficient (s) of aquifer:	3.37E-04	
Transmissivity (m2/day):	3512	
Time since pumping started (days):	20000	

Distance (m)	u	W(u)	Drawdown (m)
1.2	1.79E-12	2.65E+01	0.76
2.4	7.15E-12	2.51E+01	0.72
4.9	2.86E-11	2.37E+01	0.68
9.8	1.14E-10	2.23E+01	0.64
19.5	4.58E-10	2.09E+01	0.60
39.1	1.83E-09	1.95E+01	0.56
78.1	7.32E-09	1.82E+01	0.52
156.3	2.93E-08	1.68E+01	0.48
312.5	1.17E-07	1.54E+01	0.44
625.0	4.69E-07	1.40E+01	0.40
1250.0	1.87E-06	1.26E+01	0.36
2500.0	7.50E-06	1.12E+01	0.32
5000.0	3.00E-05	9.84E+00	0.28



Source: SLR 2015g

Figure 20 - Groundwater Analytical Model Predictions

The pump test analysis indicates that the development's proposed groundwater abstraction levels will not significantly affect surrounding bores on adjacent properties or impact groundwater levels in excess of the *NSW Aquifer Interference Policy* (NOW 2012) thresholds.

6. It is recommended that all groundwater extraction points (bores) are required to be equipped with meters as per required standards.

Noted. The proposed groundwater bores within the development site will be equipped with meters to record water extraction volumes.

7. The volume of groundwater extracted from the authorised bores be limited to 460 ML/year through the project approval.

While it has been calculated that the poultry development will require approximately 460 megalitres per annum, the volume of water extracted will be limited by the conditions on the development site's WAL. The development's water supply requirements will be serviced via the transfer of an existing WAL (No. 11788) from a bore located approximately 5 kilometres to the east of the development site. WAL 11788 permits the abstraction of 488 megalitres per year from the Lower Murrumbidgee Deep Groundwater Source under the *Water Sharing Plan for Lower Murrumbidgee Groundwater Sources 2003.* The *Statement of Conditions* for WAL 11788 includes the following relevant conditions:

Condition 5 *The licence holder must comply with the terms of the extraction component specified on this licence, including the times, rates or circumstances in which, and the areas or locations from which, water may be taken under this licence subject to any extraction restrictions in local impact areas.*

Condition 6 *This licence entitles its holder to the specified shares in the available water from the specified water source as described in this licence*

Condition 10 *The licence holder must not take more water than is allowed pursuant to an applicable AWD* (available water determination) *unless the taking is pursuant to a lawful transfer or assignment under chapter 3 part 3 of the Act.*

In addition to WAL 11788, ProTen has recently entered in to a sale and purchase agreement for an additional 225 megalitres of water per year from the same water source, being the Lower Murrumbidgee Deep Groundwater Source under the *Water Sharing Plan for Lower Murrumbidgee Groundwater Sources 2003.* This additional allocation is being transferred from WAL 11833, which has a total allocation of 925 megalitres per year and is currently associated with a property approximately 4 kilometres to the northeast of the development site.

On this basis, the development site will have a licensed allocation of 713 megalitres per year of groundwater from the Lower Murrumbidgee Deep Groundwater Source (i.e. Calivil Formation aquifer).

In response to the NOW's request, the volume of water extracted will be limited by the development site's licensed water allocation and conditions on the WAL, not the development consent.

8. As part of the condition of consent all production bores are required to be constructed in accordance with the "Minimum Construction Requirements for Water Bores in Australia, Third Edition, February 2012".

Noted. The proposed groundwater bores within the development site will be constructed in accordance with the *Minimum Construction Requirements for Water Bores in Australia, Third Edition* (February 2012).

9. The EIS establish pre-development depth to water table and groundwater quality of the shallow groundwater source in areas targeted for shed wash and stormwater disposal and in the vicinity of on-site staff amenities and residences as well as chemical storage facility. Shallow piezometers are recommended with regular monitoring for water table depth and quality.

SLR (2015g) advises that the Calivil Formation aquifer (i.e. deep aquifer source) lies beneath around 50 metres of the Shepparton Formation at the development site. The Shepparton Formation in turn is overlain by 4 to 5 metres of topsoil and weathered silty clay, which provides low permeability cover to the Shepparton Formation. SLR (2015g) advises that the 4 to 5 metres of surficial topsoil and silty clay will provide a significant attenuation barrier to any migration of water from surface operations to both the clayey Shepparton Formation and the deeper Calivil Formation.

As outlined in the EIS (SLR 2015a), an engineered surface water drainage system will be implemented to provide long-term structural controls and management measures to mitigate the impact of surface water runoff throughout the life of the operation. The swale drains between the poultry sheds will be designed to allow infiltration of the water into the topsoil for nutrient uptake by the grass, which will be regularly slashed. During heavy rainfall events, excess water from the grassed swales will be directed to underground pipes and into a catch drain that will be installed around the perimeter of the poultry sheds. The construction of the perimeter catch drain will ensure that all rainfall runoff from the ground surfaces surrounding the sheds is contained within the controlled storm water management system.

The perimeter catch drain will convey the water to the four small storage dams (see **Figures 1** and **3**). These dams will each have a capacity of approximately 7 megalitres, which is equivalent to 170 percent of the capacity required to prevent runoff escaping the dams from a 1 in 100 year ARI, 72 hour event. The runoff to be captured in these dams will predominantly be clean runoff. While the water captured in the detention basins will have some level of nutrients, the levels are predicted to be low given that the poultry sheds will be thoroughly blown and swept prior to being washed and the grassed swales will provide a very effective means of nutrient removal. An analysis of the nutrient load in the wash down water was undertaken by GHD (2007) for one of ProTen's operating poultry farms, where litter is managed in the same way as proposed for the Euroley development. This analysis determined the typical nutrient concentration of wash down water to be:

- Total Suspended Solids - 2,500 milligrams per litre;
- Total Nitrogen - 65 milligrams per litre; and
- Total Phosphorus: 45 milligrams per litre.

The typical annual pollutant load removal efficiencies for vegetated swales according to *Australian Runoff Quality* (Engineers Australia 2006) are presented in **Table 13**.

Table 13 - Typical Annual Pollutant Load Removal Efficiencies for Vegetated Swales

Pollutant	Typical Removal
Total Suspended Solids	60-80 %
Total Nitrogen	25-40 %
Total Phosphorus	30-50 %

The nature of the strata, the surface water drainage system and mitigation measures to be employed at the development site will provide an adequate buffer against infiltration of wash down water and any potential pollutants to the shallow groundwater source. No detectable impacts to groundwater levels, yields or quality are expected in the Shepparton Formation aquifer.

To reiterate SLR's (2015g) advice following the groundwater bore drilling and pump testing analysis, the 4 to 5 metres of surficial topsoil and silty clay will provide a significant attenuation barrier to any migration of water from surface operations to both the clayey Shepparton Formation and the deeper Calivil Formation.

On this basis, the installation of piezometers to monitor the water table depth and quality within the shallow aquifer is not considered warranted.

In addition to the strata barrier, the following best management practices and mitigation measures will be implemented to safeguard water resources and/or minimise the potential adverse impacts:

Development Design

- Each poultry shed will be fully enclosed and have concrete flooring.
- Each poultry shed will be surrounded by a dwarf concrete bund wall to prevent rainwater and runoff entering the sheds and to allow for the controlled discharge of wash down water from the sheds.
- The engineered surface water drainage system described above will be implemented to provide long-term structural controls to manage surface water runoff and ensure no off-site impacts.
- On-site aerated wastewater management systems will be installed to manage the sewage generated by on-site staff amenities and dwellings in accordance with the manufacturer's specifications and Council requirements.

Operation

- The surface water management system will be visually inspected on a monthly basis and following significant rainfall events. Any required maintenance work (desilting, regrading and/or reshaping) will be promptly undertaken to ensure the system's design capacity is maintained.

- The grassed swale drains between the poultry sheds will be carefully managed to minimise soil disturbance and maximise infiltration of runoff, as well as regularly slashed to encourage continual grass growth and associated nutrient up-take.
- Dry-cleaning practices at the end of each production cycle will be maximised within the poultry sheds prior to washing with water to minimise the volume of wash water, along with the amount of poultry litter (and associated sediments and nutrients) washed out of the sheds.
- The waste management systems described in the EIS (SLR 2015a) will be implemented to ensure that each waste stream generated by the development is effectively managed and disposed of off site. There will not be any on-site stockpiling or disposal of waste materials.
- The best management practices and mitigation measures described in the EIS (2015a) for chemical use and storage will be implemented.
- The limited volumes of chemicals on site will be stored in appropriately sealed and bunded storage containers/sheds.
- Diesel and petrol will be stored in bunded tanks with overflow containers. These overflow containers will be regularly inspected and, when required, removed by a licensed contractor to prevent overflow and replaced. Any excess water collected in the bunded areas will also be removed by the contractor.

Groundwater Quality within the Shallow Aquifer

A water sample taken from the shallow aquifer source during the recent bore drilling and pump testing (see issues 3 and 5 above) has been tested by a NATA accredited laboratory. The laboratory analysis report is contained in **Appendix I** and the results are listed in **Table 14**.

Table 14 - Groundwater Quality in the Shallow Aquifer

Parameter	Result
pH	6.6
Conductivity	685 µS/cm
Total Organic Carbon	<0.5 mg/L
Ammonia as N	<0.2 mg/L
Nitrate as N	<0.5 mg/L
Phosphorus	0.04 mg/L
Sodium (dissolved)	84.3 mg/L
Potassium (dissolved)	1.89 mg/L
Sulphate	18.9 mg/L
Calcium (dissolved)	29.7 mg/L
Chloride	144 mg/L
Magnesium (acid extractable)	22 mg/L

2.4 Office of Environment and Heritage

2.4.1 Biodiversity

SLR undertook an assessment of the biodiversity issues associated with the Project in accordance with the requirements of the *Framework for Biodiversity Assessment* (FBA) (OEH 2014). Field survey and assessment of native vegetation and threatened species was conducted in January and February 2015. A copy of SLR's (2015b) *Biodiversity Assessment Report* was appended to the EIS and summarised within the EIS.

As described in the EIS (SLR 2015a) the development site contains a large expanse of cleared land and it represented the preferred option of several sites considered based on a range of economic, social and environmental criteria, including biodiversity. SLR (2015b) advises that unavoidable impacts on native vegetation within the development site are minor and include impacting a small area of Sandhill Pine EEC (endangered ecologically community) to allow construction of the internal access road and a small area of low condition Black Box Grassy Open Woodland in the south of the development site. SLR (2015b) determined appropriate biodiversity credits and offsetting to compensate for vegetation and habitat loss, comprising a small requirement of 16 ecosystem credits.

The OEH's submission dated 26 June 2015 recommends that the development consent be conditioned to avoid impacts to biodiversity. Following this submission, representatives of ProTen, OEH and SLR conducted a site meeting on 13 August 2015 to discuss and verify some of the issues raised by OEH. Subsequently, OEH revised their requirements in relation to biodiversity in an email on the 24 August 2015 (see **Appendix J**). The OEH's revised requirements and recommended conditions are identified below in ***bold italic text***, followed by the response in normal text.

It is now our understanding that the siting of residences and their access tracks, roads, and other project-related infrastructure will avoid disturbing or clearing individual trees and patches of open-woodland… SLR have agreed to use the 'Central Southern NSW' vegetation mapping to guide location of infrastructure to avoid biodiversity impacts.

The current biodiversity credit requirement to offset impacts of the proposal is 16 ecosystem credits…. there are no available like-for-like credits available to the proponent. The small credit requirement, the cost of establishing a BioBanking site for such as small area and lack of available matched ecosystem credits means that, the most appropriate option in this case would be use of the offset fund if it is available…

There is a patch of remnant vegetation in the north-west corner of Lot 41/750898 that is likely to represent Sandhill Pine Woodland EEC… we consider that the protection and improvement in condition of this area (approximately 18 ha) could provide a long-term contribution to regional biodiversity values.

We consider that the following actions would provide an acceptable outcome for loss of biodiversity values if Option 2 (as described in Section 7.4 of the BAR) does not result in the purchase and retirement of the 16 credits.

Suggested Biodiversity Offset Strategy Actions:

- ***A contribution is made to the offset fund when it is available, and credits are retired.***
- ***In the meantime, and to provide a short-term option in the event that the offset fund is delayed or it's development ceases:***
  - ***ProTen/SLR confirm that the patch of vegetation in north-west corner of Lot 41/750898 is Sandhill Pine Woodland EEC and undertake a BioBanking plot(s) to determine its condition and to identify appropriate management actions.***
  - ***ProTen erect a temporary fence to exclude stock and rabbits from the patch of Sandhill Pine Woodland EEC. Any site management actions undertaken by ProTen that benefit biodiversity after fencing will be considered when the offset strategy is finalised.***

- ***SLR/ProTen will contact NPWS to discuss the possibility of adding the vegetated north-west corner of Lot 41/750898 into the national park reserve system.***

Following the site visit with OEH on the 13 August 2015 and receipt of OEH's revised requirements (see **Appendix J**), SLR amended the biodiversity offset strategy presented in the EIS (SLR 2015a) and the revised version (2015h) is provided in **Appendix K.** In summary, ProTen's preferred approach to biodiversity offsetting for the Project is:

- Temporary fencing (to exclude sheep and other relevant stock animals) of the area mapped by OEH (2011) as White Cypress Pine Open Woodland (equivalent to Sandhill Pine Woodland EEC) within the northwestern corner of the development site (see **Figure 21**); plus
- Purchase and retirement of the 16 credits (or equivalent as permitted as the Variation Rules) should they become available over a 5 year period; or
- If the ecosystem credits do not become available, make a monetary contribution equivalent to the cost of the credits. The amount calculated will be deposited into a NSW Government fund or invested in another approved conservation fund.

The temporary offset area shown on **Figure 21** is currently subject to sheep grazing, which is likely to be having a debilitating effect on any native vegetation present through soil compaction, suppression of native seed germination, suppression of native seedling growth (through herbivory) and the spread of exotic grasses and herbaceous weeds. As such, the removal of grazing stock from this area, as proposed, will no doubt result in a substantial improvement in the condition of the native vegetation during the proposed temporary stock exclusion period (SLR 2015h).

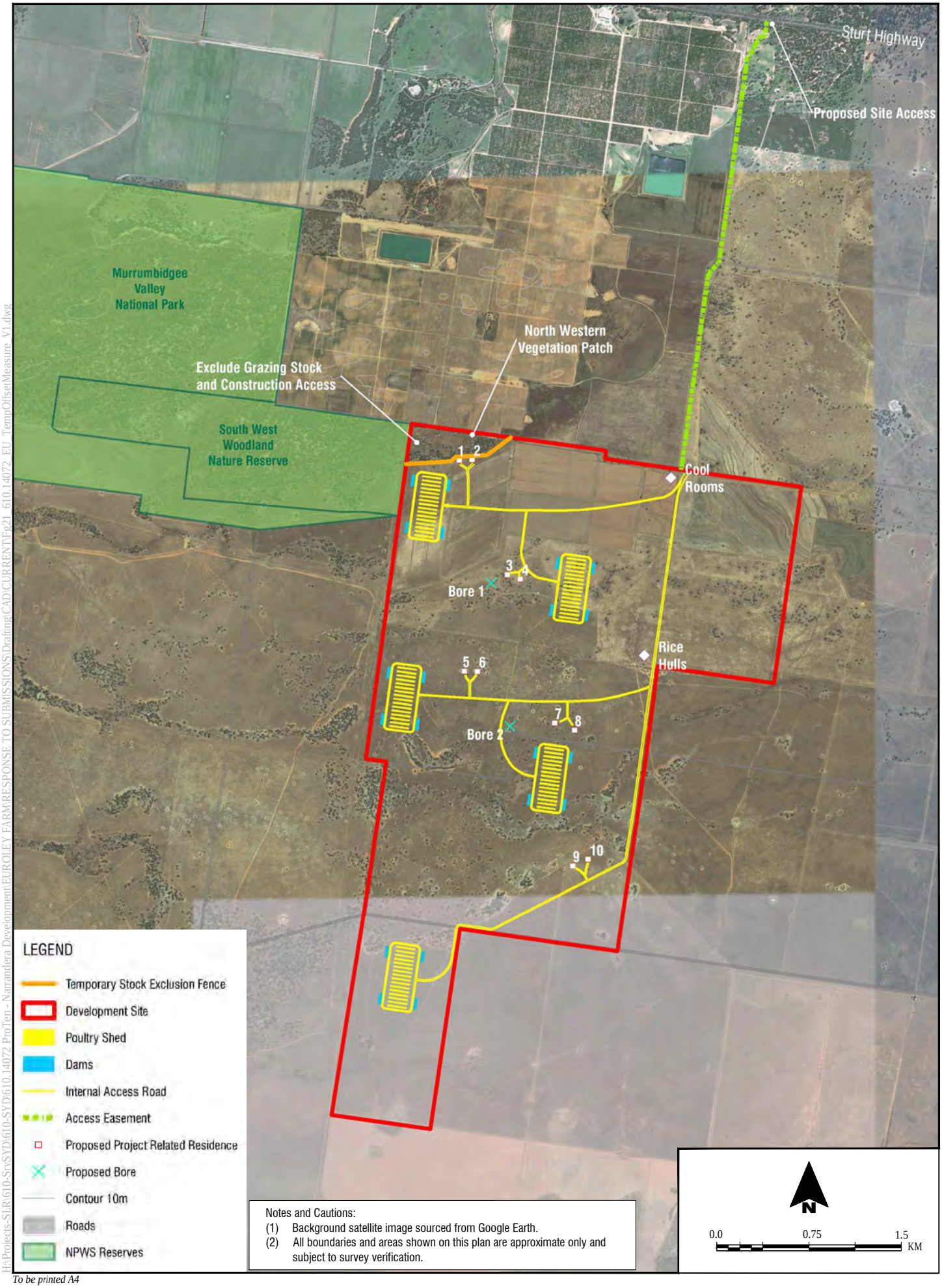
If no suitable credits are available after the end of the 5 year advertisement period, undertake the following actions:

- Survey the vegetation in the northwestern corner (including establishment of one Biobanking plot), as necessary, to confirm that the vegetation is Sandhill Pine Woodland EEC;
- Identify appropriate management actions (in consultation with OEH) for the northwestern vegetation patch, mainly stock exclusion and weed control; and
- Implement one of the two following options:
  - Consult National Parks and Wildlife Service (NPWS) on whether the land could be dedicated to the national park estate (i.e. added to the South West Woodland Nature Reserve); or
  - Make a monetary contribution equivalent to the cost of the credits. The total amount calculated would be the total credit value (as agreed with OEH) less any moneys expended by ProTen in implementing temporary offsetting measures. The agreed value will be deposited into a NSW Government fund.

Actions proposed to fulfil this preferred offset strategy will involve:

- Uploading an expression of interest (EOI) for the required ecosystem credits on the "Credit Wanted" register of the Biobanking Credit Register;
- Monitor the availability of matching ecosystem credits during the advertisement period (as required by OEH), including regularly checking the credit register for ecosystem credits that match the required type and number (including "variation credits" from the same vegetation formations);
- Consult regularly with the OEH Biobanking Team and the Albury office of OEH during the EOI period in relation to the availability of suitable credits or offset sites;
- During, or at the end of, the advertisement period, either:
  - Purchase like-for-like credits, or, if not available, purchase variation credits; or if both credit types not available, then:
  - Survey the vegetation in the northwestern corner (including establishment of one Biobanking plot), as necessary, to confirm that the vegetation is Sandhill Pine Woodland EEC; and

- Identify appropriate management actions (in consultation with OEH) for the northwestern vegetation patch, mainly stock exclusion and weed control; and
- Apply supplementary measures and calculate suitable monetary fund deposit; or
- Consult with NPWS on whether the land could be dedicated to the national park estate (i.e. potentially added to the South West Woodland Nature Reserve).



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Temporary Offset Measures

FIGURE 21

Areas dominated by Weeping Myall (Acacia pendula) in the vicinity of the proposed vehicle track between the eastern boundary of Lot 1 DP 1045064 and PPU 3 should be mapped and avoided during construction.

There are two small patches of Weeping Myall Woodland mapped by OEH (2011) within the development site. SLR's ecology field team inspected these areas during field surveys and noted that these patches comprise a monoculture of scattered Weeping Myall Acacia pendula, with a complete absence of native understorey or groundcover.

Regardless of the identity and conservation status of these patches of vegetation, they lie outside of the development footprint and will not be impacted by construction or operation of the development.

Revegetation works within 100 metres of threatened ecological communities and remnant native vegetation identified in the BAR or mapped in the 'Central-southern NSW' vegetation dataset (OEH 2011) should be with species that naturally occur within the relevant community. Pasture species, weed seeds from hay bales and non-local native plants should not be introduced into native remnant vegetation.

Noted. All revegetation works and landscaping undertaken within 100 metres of mapped threatened ecological communities and remnant native vegetation will be undertaken with species that are naturally occurring within the area.

Revegetation works and landscape plantings will be undertaken and managed during both the construction and operational phases through the CEMP and OEMP, respectively. The revegetation works and landscape plantings will be regularly inspected and assessed for maintenance requirements, including any necessary weed control practices.

A minimum 100 metre buffer should be maintained between the construction footprint (including revegetation sites and vehicle access tracks) and the boundary of areas of remnant vegetation and the South West Woodland Nature Reserve.

Noted. The proposed development layout, as shown on **Figure 1**, includes a minimum 100 metre buffer between the disturbance footprint and remnant vegetation and the South West Woodland Nature Reserve. These buffers will be ensured when the development is physically set-out by surveyors.

The development disturbance footprint, buffer requirements and vegetation management requirements will be detailed in the CEMP to be prepared for approval prior to commencement of construction works.

Develop a construction protocol for identification and management of rescued fauna that includes pre-construction liaison with animal welfare organisations to enable support if required.

The CEMP will include a construction protocol for the identification and management of rescued fauna. ProTen will liaise with the NSW Wildlife Information, Rescue and Education Service Inc. (WIRES) (or similar) during the development of the CEMP to seek their input in to the protocol and confirm their availability and resources for assistance during construction (if required).

2.4.2 Aboriginal Cultural Heritage

OzArk was engaged to undertake the appropriate assessment and reporting of Aboriginal heritage issues associated with the Project. The assessment was undertaken in accordance with the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water (DECCW) 2010) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (ACHCRs) (DECCW 2010). A copy of OzArk's (2015) *Aboriginal Heritage Impact Assessment* was appended to the EIS and summarised within the EIS.

OzArk (2015) surveyed the proposed development disturbance areas using a combination of vehicle and pedestrian survey methods. The more archaeologically sensitive landscape features, such as the fringes of ephemeral waterways and areas of lower disturbance, were surveyed on foot. Slow vehicle survey was considered appropriate in other area due to good ground surface visibility and an almost complete absence of nonartefactual material.

In consultation with the OEH, the location of the PPU 5 and alignment of the associated access road were moved following OzArk's field survey to avoid vegetation clearing. While the new locations were not directly surveyed by OzArk, they were witnessed by OzArk from the north during the survey and consultation was undertaken with the registered Aboriginal party, being the Leeton and District Local Aboriginal Land Council (LALC).

The OEH's submission dated 26 June 2015 recommends that the development consent be conditioned to avoid impacts to Aboriginal cultural heritage. Following this submission, representatives of ProTen, OEH and SLR conducted a site meeting on 13 August 2015 to discuss and verify some of the issues raised by OEH. Subsequently, OEH clarified their requirements in relation to Aboriginal heritage in an email on the 24 August 2015 (see **Appendix J**). The OEH's requirements/recommended conditions are identified below in ***bold italic text***, followed by the response in normal text.

A pre-clearance pedestrian archaeological survey should be undertaken for linear alignments. Representatives from relevant Registered Aboriginal Parties are to be included in this assessment.

The internal road alignment and impact area of PPU5, which was not assessed as part of the original survey, should be subject to a pre clearance archaeological survey. Representatives from relevant Registered Aboriginal Parties are to be included in this assessment.

There is a requirement to undertake further pedestrian archaeological survey, particularly associated with road works and PPU 5. The site inspection has confirmed that survey will not be necessary prior to development approval, but will be required before clearing occurs. The results of this survey will then need to be incorporated into any required management plans.

ProTen has engaged OzArk to undertake the additional field survey requested by OEH and this survey is scheduled for mid-September 2015 (pending weather and site access). OzArk's proposed survey methodology comprises the complete pedestrian survey of the relocated PPU 5 and relocated residences, and sampled survey (dictated by a set methodology) of the internal roads. The pedestrian survey sample of the internal access roads will take the form of eight 500 metre long sections designed to capture the most archaeologically sensitive landforms, as well as the range of landforms present within the development site. These eight sections will be walked and will include a nominal 100 metre wide assessment area. All internal roads will also be driven and spot checks made at the discretion of the archaeologist and/or Aboriginal community members. This survey methodology will enable the landforms traversed by the access roads to be characterised, as well as fully surveying all archaeologically sensitive landforms.

The site management plan for operation of the facility should include a section on ACH site management. The section is to describe management actions for the three known sites (EPPC-ST1, EPPC-ST2 and EPPC-H1) that are currently outside the disturbance footprint according to Appendix J, Section 6.2. Any sites found during pre-clearance assessments of linear infrastructure alignment and PPU 5 should be incorporated into this plan.

The site-specific OEMP to be prepared for approval prior to commencement of operations will include a section on Aboriginal cultural heritage that prescribes the management measures for all known sites and any additional sites identified during the pre-construction surveys.

Any subsequent alterations to the development footprint that are outside the study areas of the ACH assessment and pre-clearance surveys should be assessed in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.

Noted. Any proposed development modification will be assessed in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DEWWC 2010).

2.4.3 Flooding

SLR undertook an assessment of potential surface water issues associated with the Project, including a flooding assessment to define pre-development flooding behaviour and inform any building design, transport and safety provisions necessary during flooding events. A copy of SLR's *Flooding Assessment* (2015c) was appended to the EIS and summarised within the EIS. Conclusions of the flooding assessment included:

- The development site is unlikely to be flood affected during mainstream flood events up to and including the 1 in 100 year ARI event. In addition, it is considered unlikely that the site will be flood affected by Murrumbidgee River or Yanco Creek out of bank flows during an extreme flood event such as the probable maximum flood (PMF).
- Flood warnings are likely to be available via the SES at least several days prior to a mainstream flood occurring. Where a flood warning is issued, the flood management plan documented in the EIS (SLR 2015a) will be implemented to effectively manage the flood risk to the development.
- All PPUs will be constructed above the predicted 1 in 100 year ARI flood depth. Concrete bund walls will be constructed around each of the poultry sheds and swale drains between the sheds have been designed to safely convey flood flows.
- The stormwater management system has been designed with the total storage on site equivalent to 170 percent of the storage capacity required to contain runoff from a 1 in 100 year ARI, 72 hour flood event.

The OEH's submission dated 26 June 2015 advises that the assessment of flooding provided in the EIS (SLR 2015a) had been extensively revised following consultation with OEH and provided an adequate model of the potential impacts due to mainstream and local overland flooding. However OEH noted that some flood impacts on the development site during the 100 year ARI and PMF events had not been fully considered.

In response, SLR undertook additional flood modelling and this work is detailed in the *Flooding Addendum* (SLR 2015f) contained in **Appendix D**. The scope of this additional work comprised:

- One dimensional hydraulic modelling of local overland flood flows for the post-development scenario (the pre-development scenario was modelled previously by SLR (2015c)); and
- Comparison of flooding behaviour between pre-development and post-development scenarios to identify the impact of the proposed development.

The key outcomes from the *Flooding Addendum* (SLR 2015f) are outlined and illustrated above in **Section 2.3.1** (in response to NOW's submission) and below. The issues raised by OEH are identified below in ***bold italic text***, followed by the response in normal text.

The flooding assessment provides justification of the existing planned location of the PPUs based on the assumption that construction of raised floor levels (0.3m above ground level) will provide flood immunity in the 100 year ARI event. However, Figure 8 shows the current site conditions without the presence of PPUs. There are likely to be hydraulic impacts that have not been considered if PPUs are constructed in the proposed locations. Section 4.4 of the flooding assessment (page 19), states that hydraulic impact modelling was completed and that the afflux due to the PPUs was "less than 150mm" in the 100 year ARI event. The assessment does not address the potential for inundation of PPU floors due to these results….

OEH understands that the proposed site layout includes a minimum distance of 1000 metres between PPUs to reduce the risk of disease transmission between units (EIS Section 3.2, page 23). This design constraint appears to be restricting the ability of the proponent to consider the flooding impacts when locating the PPUs and to select more appropriate locations away from natural drainage lines. PPUs 1 and 3 would be less susceptible to potential flooding impacts if located to the east of their proposed location, PPU 4 to the north and PPU 2 to the south.

Altering the proposed location of PPU 5 has reduced the threat from flooding to that unit, however the proposed access road. Greater consideration of flooding impacts could also be applied to the location of residences, particularly 4, 7 and 8 (shown on EIS Figure 6.7, page 96), which are proposed in areas prone to flooding.

As outlined above in **Section 2.3.1**, the *Flooding Addendum* (SLR 2015f) contained in **Appendix D** concluded the following in terms of the impact of the proposed development on flooding behaviour:

- The maximum flood afflux as a result of the development is predicted to be experienced upstream of PPU 2 at 90 millimetres for the 100 year ARI flood event and 110 millimetres for the PMF event;
- The flood afflux impacts upstream of the development at the site's eastern boundary are predicted to be less than 50 millimetres for a 100 year ARI event and 80 millimetres during a PMF event;
- No flood afflux impacts are predicted to occur downstream of the development towards the site's western boundary; and
- The maximum average flood flow velocity increase is predicted to be 0.08 metres per second during a 100 year ARI event and 0.11 metres per second during a PMF event.
- There are no existing buildings or infrastructure items on neighbouring properties that are likely to be affected by the construction of the proposed development buildings, residences or associated infilling earthworks in terms of flooding.
- As the flood afflux is predicted to be relatively minor and flood velocities did not increase significantly, agricultural practices in neighbouring properties are unlikely to be affected by the flood impacts associated with the proposed development.

As outlined in the EIS (2015a), consideration of alternative PPU locations within the development site is dependent upon a number of factors, including environmental impact considerations and engineering design requirements. While other locations were considered, the proposed layout is considered optimal in terms of minimising the potential for adverse impact and required earthworks. In particular the proposed PPU locations ensure that tree clearing is minimised, whilst ensuring the required buffer distances between PPUs is maintained for biosecurity.

These considerations/design constraints have prevented the location of the PPUs from being relocated to less flood impacted areas as recommended by OEH. However, as detailed in Section 6.5.2 of the EIS (SLR 2015a), mainstream flooding is not considered to pose a significant risk to the development site. Notably, aerial photography of the 1974 flood event, which was estimated to be a 1 in 99 year ARI event (SKM 2000), taken within hours of the flood peak do not appear to show the development site to be flood affected.

The PPUs will all be constructed above the 100 year ARI event flood depth, at a minimum of 0.3 metres above the existing surface, and the poultry sheds will be constructed with concrete perimeter bund walls 0.4 metres high and swale drains between the sheds. On this basis, the ingress of floodwaters in to the poultry sheds during a 100 year ARI event is not anticipated. Whilst topographical depressions exist in the northern corner of the PPU 2, the southern corner of PPU 3 and the southern fringe of PPU 4, appropriate earthworks will be undertaken to fill in these depressions during site establishment works to ensure the risk of floodwater ingress is minimised.

The predicted 100 year ARI flood levels for the PPUs from the additional hydraulic modelling undertaken by SLR (2015f) are shown on **Figure 18** (above in **Section 2.3.1**) and listed in **Table 15.**

Table 15 - 100 Year ARI Flood Levels at the PPUs

PPU	100 Year ARI Flood Level (metres AHD)	Construction Details
PPU 1	133.98	Depth of 100 year ARI flooding less than 0.3 metres across the PPU. The PPU will be constructed a minimum of 0.3 metres above ground level.
PPU 2	134.39	Appropriate earthworks will be undertaken to fill in a depression in northwest corner of the PPU. The PPU will be constructed a minimum of 0.3 metres above adjacent ground level.
PPU 3	133.46	Appropriate earthworks will be undertaken to fill in a depression in southern portion of the PPU. The PPU will be constructed a minimum of 0.3 metres above adjacent ground level.
PPU 4	133.69	Depth of 100 year ARI flooding less than 0.3 metres across majority of the PPU. The PPU will be constructed a minimum of 0.3 metres above adjacent ground level. Appropriate earthworks will be undertaken to fill in lower ground in the southern fringe of the PPU location.
PPU 5	133.47	Depth of 100 year ARI flooding less than 0.3 metres across the PPU. The PPU will be constructed a minimum of 0.3 metres above adjacent ground level.

SLR (2015f) advises that the raising of the PPU pad level a minimum of 0.3 metres above adjacent ground level, infilling works at PPU 2, PPU 3 and PPU 4 and the 0.4 metre high concrete bund around the poultry sheds will adequately protect the sheds from flooding during a 100 year ARI event.

SLR's (2015f) predicted 100 year ARI flood levels for the proposed farm residences and proposed finished floor levels of these residences are listed in **Table 16.**

Table 16 - 100 Year ARI Flood Levels at the Farm Residences

Residence	100 Year ARI Flood Level (metres AHD)	Finished Floor Level (metres AHD)
1	134.05	134.35[1]
2	134.09	134.39[1]
3	134.11	134.41[1]
4	134.14	134.44[1]
5	133.48	133.89[2]
6	133.49	133.83[2]
7	133.66	133.96[2]
8	133.71	134.12[2]
9	133.72	134.02[1]
10	133.74	134.04[1]

1 – finished flow level set as 0.3 metres above the modelled ephemeral flow path 100 year ARI flood level.

2 – residence located outside ephemeral flow path 100 year ARI flood extent. Finished flow level set at 0.3 metres above adjacent ground level.

As recommended by OEH, residences 4, 7 and 8 have been relocated to reduce the flood risk. Residences 5, 6, 7 and 8 are located outside of the ephemeral flow path 100 year ARI flood extent, while the remaining residences are located in shallow flood depth zones (100 year ARI event) and will be constructed with finished floor levels 0.3 metres above the modelled flood level.

The implications of the flooding assessment should be considered in an Emergency and Evacuation Plan. Access to PPU 5 is likely to be restricted during local overland flooding events.

As recommended by the OEH, an Emergency and Evacuation Plan will be developed to outline a strategy for responding to local food events. This will be developed for approval prior to commencement of operations.

2.5 Roads and Maritime Services

RoadNet was engaged to undertake the appropriate assessment and reporting of traffic and transport-related issues associated with the Project. The assessment was prepared in accordance with relevant Council and RMS standards. A copy of RoadNet's *Traffic Impact Assessment* (2015a) was appended to the EIS and summarised within the EIS.

Key conclusions of RoadNet's (2015a) assessment included:

- Existing and future background traffic volumes on the Sturt Highway are relatively low and additional traffic from the Project can be easily accommodated; and
- Provided the recommendations made by RoadNet (2015a) are met, the Project is not expected to cause any significant impacts in terms of road safety or operation.

The RMS' submission dated 26 June 2015 advises that it raises no objection to the development proposal subject to the consent authority ensuring that the development is undertaken in accordance with the information submitted and with the inclusion of a number of consent conditions.

ProTen commits to implementing the RMS' recommended consent conditions. On this basis, no further response is required.

2.6 Department of Primary Industries

The DPI's submission dated 25 March 2015 advised that the development meets the requirements of the *Best Practice Management for Meat Chicken Production in NSW Guidelines – Manuals 1* and *2* (DPI 2012), with the exception of water treatment. The issue raised by DPI is identified below in ***bold italic text***, followed by the response in normal text.

The developer will need to ensure that the bore water for poultry is treated to drinking water standards in accordance with the recommendation by the National Water Biosecurity Manual – Poultry Production (DAFF 2009).

Section 3.8.3 of the EIS (SLR 2015a) advises the following:

> *Water extracted from the bores will be treated as per the recommendations by the National Water Biosecurity Manual – Poultry Production (DAFF 2009). Water will pumped from the bore and filtered through sand media. The water pH is monitored and if it is found to be high, citric acid will be added to maintain pH at approximately 7.0. The water will then be chlorinated to deliver approximately 3 ppm* (parts per million total dissolved solids) *into storage tanks. Finally, chlorine dioxide will be dosed into the water delivery system supplying the sheds at between 0.5 – 0.1 ppm.*

2.7 Narrandera Shire Council

Council's submission dated 26 June 2015 provided draft consent conditions for the Project. While the consent conditions will be provided by the DP&E as the consent authority for the Project, responses to selected conditions proposed by Council are provided in **Table 17**.

Table 17 - Comments on Consent Conditions Provided by Council

Proposed Consent Conditions		Comment / Amendment
Number	**Detail**	
A6 (a)	In accordance with Division 6 of Part 4 of the Act, the applicant shall pay the following section 94A monetary contribution: a) Amount of Contribution $680,000 (1% of construction cost)	**Calculation Error** The development's CIV, which has been confirmed by an independent cost review (Rider Levett Bucknall 2014) is $63,610,000. On this basis, a 1% contribution would actually be $636,100 (i.e. $43,900 less than what Council proposes in its submission). **Application for S94A Contribution Reduction** Council advised in an email from the Deputy General Manager Infrastructure (Mr Frank Dyrssen) on 27 July 2015 that ProTen's application to vary the S94A contribution for the Project to 0.5% (i.e. 318,050) had been approved.
A7 (a)	Prior to the issue of a Construction Certificate the Applicant shall submit to the satisfaction of the Principal Certifying Authority the following: a) An Environmental Management Plan (EMP), including a Construction Environmental Management Plan (CEMP) and an Operational Environmental Management Plan (OEMP) prepared in accordance with…	A CEMP will be prepared for approval by the DP&E prior to the commencement of construction works. An OEMP will be prepared for approval by the DP7E prior to the commencement of operation.
A7 (a) (ii)	Flood Management Plan - The Flood Management Plan shall show the proposed location and minimum floor level of the proposed structures in relation to the 1 in 100 year flood event. Habitable dwellings shall be protected against the 1 in 100 year flood event plus 500mm freeboard in accordance with the policy of Narrandera Shire Council.	As outlined in **Section 2.4.3**, residences 5, 6, 7 and 8 are located outside of the ephemeral flow path 100 year ARI flood extent and will have finished flow levels set at 0.3 metres above adjacent ground level. The remaining residences are located in shallow flood depth zones (100 year ARI event) and will be constructed with finished floor levels 0.3 metres above the modelled flood level.
A7 (f)	Prior to the issue of a Construction Certificate for a dwelling, the applicant shall submit a Land Contamination Report verifying that the land is appropriate for its proposed residential use.	The S*tage 1 Preliminary Site Investigation* (SLR 2015e) contained in **Appendix C** concludes: • The potential for significant widespread contamination to be present on the site, as a result of past and present land use activities, is considered to be low; and • The site is suitable, from a contamination perspective, for the proposed poultry broiler production farm and associated residences.

Proposed Consent Conditions		Comment / Amendment
Number	**Detail**	
A7 (g)	The applicant is required to consolidate all separate parcels - being lots 1, 41, 42, 44, 45 and 54 DP 750898; and lot 1 DP 1054064 into one allotment under one title in order to prevent future dealings in separately titled land.	Clause 4.2C of the *Narrandera Local Environmental Plan 2013* (LEP) contains development standards relating to the erection of dwelling houses in the RU1 Primary Production zone, one of which (clause 3a) states that consent must not be granted for the erection of a dwelling unless the land is a lot that is at least the minimum lot size shown on the Lot Size Map. The applicable minimum lot size for the development site is 400 hectares, which is greater than the individual lot sizes within the site on which the farm managers' houses are proposed to be constructed. ProTen sought legal advice on this issue from Gilbert and Tobin Lawyers, specifically whether there is a legal requirement to consolidate the lots within the development site to achieve the minimum lot size specified in the LEP. This advice, which was provided to the DP&E, concluded that the development controls in clause 4.2C of the LEP are not a relevant consideration to the Project. The objectives of clause 4.2C are "to minimise unplanned rural residential development, and to enable the replacement of lawfully erected dwelling houses in rural and environment protection zones". Clause 4.2C would therefore be a relevant matter for consideration if the application involved rural residential development or the erection of dwellings to replace lawfully erected dwellings. The Project is not a rural residential development, nor are dwelling houses being replaced. The houses proposed are ancillary to the operation of the PPUs and a necessary component given the 24 hour nature of the operation. Gilbert and Tobin Lawyers therefore conclude that clause 4.2C is not a relevant consideration for this project. No consolidation of lots is required.
B1 and B2	The applicant shall implement an environmental management system to ensure compliance with all conditions and take reasonable steps to ensure…	As advised in the EIS (SLR 2015a) a site-specific OEMP will be prepared for approval by the DP&E prior to commencing operations.
C18	The Applicant must design, construct, operate and maintain all stormwater and water storage facilities on site with the internal surfaces equivalent to, or better than, a clay liner of permeability 1 x 10^{-9} ms^{-1} or less and a thickness of no less than 900mm.	Subject to soil sampling and final engineering design, if necessary, the stormwater and water storage facilities will be compacted or lined to achieve a permeability of 10^{-9} metres per second. The requirement for a thickness of "no less than 900 mm" is not necessary.
C20	Stormwater management facilities must be designed to a standard so that in the event of a 1 in 100 ARI storm event there is no discharge from the development site.	The stormwater management system will be designed to cater for the design event, being a 20 year ARI, 24 hour event. The combined capacity of the four retention dams at each PPU is approximately 28,000 cubic metres, which is approximately 170 percent of the storage required to capture the predicted runoff volume for a 100 year ARI, 72 hour storm event. The proposed retention storage is therefore of sufficient capacity to prevent overflows for events up to and including the 100 year ARI event.

Proposed Consent Conditions		Comment / Amendment
Number	**Detail**	
C32	As a minimum the private access road is to be line marked to separate the sweep path of vehicles entering and exiting the site. Associated directional marking and signage is to be installed and maintained in accordance with Australian Standards.	The sealed 50 metre section of the site access road will be line marked.
C38	The internal road network and parking on site is to comply with Austroads Guidelines and Australian Standards AS 2890:1:23004 and AS 2890.2:2002.	Internal roads will be constructed as rural-type all-weather property internal roads able to carry the anticipated heavy vehicle movements. They will meet the minimum requirements of AS 2890.2 to accommodate the turning movements of the largest vehicles generated by the Project, which will initially be semi-trailers however may include B-doubles in the future.
C43	Heavy vehicle traffic routes associated with the development shall be limited to the existing classified road (Highway) system and the approved private access road.	Under normal operating conditions heavy vehicles will be limited to the Sturt Highway and the private access road. However, Section 6.5.6 of the EIS (SLR 2015a) describes the flood management plan, which includes the identification of alternate access routes in the event that the Sturt Highway is non-trafficable as a result of flooding. These alternate routes include roads other than the highway and the private access road, as shown on **Figure 9**. A condition of consent such as this would therefore not allow the flood management plan to be implemented.
C52	The development shall be protected from the 1 in 100 year flood event including the proposed access road between the development site and the Sturt Highway to facilitate safe egress during a flood event.	This is considered is inappropriate on the following grounds: • The development site is affected by overland flooding; • Overland flooding is likely to have also impacted the Sturt Highway; • The worst-case overland flooding relates to short duration storms and, therefore, it will be safer for farm employees to remain on site during significant rainfall events until flood waters have resided; • Floodwaters are unlikely to take more than a few hours to reside with the exception of the two topographical depressions and ephemeral flow paths; and • Significant raising of ground levels for flood protection works would impede floodwaters and further alter downstream flood behaviour. As recommended by the OEH, an Emergency and Evacuation Plan will be developed to outline a strategy for responding to local food events.
C53	Minimum floor levels for habitable buildings should be based on protection from the 1 in 100 year flood event plus 500mm freeboard.	As outlined in **Section 2.4.3**, residences 5, 6, 7 and 8 are located outside of the ephemeral flow path 100 year ARI flood extent and will have finished flow levels set at 0.3 metres above adjacent ground level. The remaining residences are located in shallow flood depth zones (100 year ARI event) and will be constructed with finished floor levels 0.3 metres above the modelled flood level.

2.8 Other

2.8.1 Griffith City Council

In its submission dated 16 July 2015, Griffith City Council advised:

> *it was deemed that the proposed development would not have any significant environmental impact on the Griffith Local Government Area.*

On this basis, no response is necessary.

2.8.2 Leeton Shire Council

In its submission dated 16 July 2015, Leeton Shire Council advised:

> *Council raises no objections to the proposed development, provided that:*
>
> 1. *The transport routes associated with the proposal are restricted to the classified road network as indicated by the Traffic Impact Statement, and*
> 2. *Conditions are imposed to regulate the environmental impacts of the proposal so that there are no adverse impacts to residents in the locality and the receiving environment.*

The transport routes to be utilised by the Project will utilised the classified road network as described in the EIS (SLR 2015a) and the *Traffic Impact Assessment* (RoadNet 2015a).

ProTen will prepare and implement a site-specific OEMP for the Project to ensure that the commitments made within the EIS (SLR 2015a), along with the conditions of development consent and environment protection licence, are fully implemented and complied with.

2.8.3 Murrumbidgee Shire Council

In its submission dated 17 July 2015, Murrumbidgee Shire Council advised:

> *…the DA and EIS for the proposal were on public exhibition from 26th May 2015 to 26th June 2015 in both the Murrumbidgee Shire's Darlington Point office and Coleambally branch office and received no public comment.*

On this basis, no response is necessary.

2.8.4 Essential Energy

In its submission dated 30 June 2015, Essential Energy advised:

> *… Essential Energy's Senior Environmental Engineer has reviewed the EIS and has no additional comment.*

On this basis, no response is necessary.

3 PUBLIC SUBMISSIONS

As listed in **Table 1**, a total of 14 public submissions were received following the exhibition of the EIS. Eleven of these submissions objected to the Project, while the remaining three provided comment. Only three of the objections received were from residents within the local area.

A summary of the issues raised in the public submissions and responses (grouped by issue) is provided below in **Table 18**.

Table 18 - Issues Raised in the Public Submissions

Issue	Raised by	Response
Water resources		
1. Contamination of groundwater, including from the operation of plant, mass burial and chemical runoff	• A. & M. Steiner (Narrandera NSW) • Randren House (Euroley NSW)	Mass Burial As advised in the mass mortality disposal strategy in the EIS (SLR 2015a), bird carcasses will not be buried on site in the event of an emergency animal disease (EAD) outbreak (unless directed to do so by the DPI) due to the relative proximity of the site to the Murrumbidgee River and Yanco Creek. This removes the risk to groundwater as a result of an EAD outbreak. In the unlikely event of an EAD outbreak and slaughter of farm stock is necessary, pending advice from the DPI and EPA at the time of a mass mortality, the following options will be available for the disposal of bird carcasses and fomites: • Rendering at Baiada's Hanwood protein recovery plant; or • In-shed composting; or • Off-site burial at ProTen's Jeanella property near Goolgowi within the Carrathool Shire LGA; or • Disposal at Carrathool Council's landfill in an appropriately quarantined area (see **Section 2.1.10**). Chemical Runoff The only chemicals that will be used at the site will be for sanitisation and disinfection purposes, along with pest, vermin and weed control. Chemicals will generally only be delivered to site a few days prior to the commencement of the cleaning phase in order to minimise on-site storage requirements. During this time chemicals will be stored in appropriately bunded areas or specifically-purchased chemical sheds, removing the potential risk of groundwater contamination from stored chemicals. As outlined in the EIS (SLR 2015a) and above in **Section 2.1.5**, an engineered surface water drainage system will be implemented to provide long-term structural controls and management measures to mitigate the impact of surface water runoff throughout the life of the operation. Potential for Groundwater Infiltration As outlined in **Section 2.3.2**, the additional hydrogeological assessment (SLR 2015g) advises that the Calivil Formation aquifer (i.e. deep aquifer source) lies beneath around 50 metres of the Shepparton Formation at the development site. The Shepparton Formation in turn is overlain by 4 to 5 metres of topsoil and weathered silty clay, which provides low permeability cover to the Shepparton Formation. SLR (2015g) further advises that the 4 to 5 metres of surficial topsoil and silty clay will provide a significant attenuation barrier to any migration of water from surface operations to both the clayey Shepparton Formation and the deeper Calivil Formation. The nature of the strata, the surface water drainage system and mitigation measures (see **Section 2.3.2**) to be employed will provide an adequate buffer against infiltration of wash down water and any potential pollutants to groundwater.

Issue	Raised by	Response
2. Excessive use of water resources by agricultural activities 3. Impacts on existing bores and water users in the area	• M. Kelly (Reservoir VIC) • Name withheld (Narrandera NSW)	The proposed extraction of groundwater to service the development's water supply requirements of approximately 460 megalitres per year (average 1.25 megalitres per day), will be serviced via the transfer of an existing water access licence (WAL 11788) from a bore located approximately 5 kilometres to the east of the development site. In addition, ProTen has recently entered in to a sale and purchase agreement for an additional 225 megalitres of water per year from the same water source from a property approximately 4 kilometres to the northeast of the development site. On this basis, the development will be using water that is already allocated under the *Water Sharing Plan for Lower Murrumbidgee Groundwater Sources 2003* (not additional water). As outlined in **Section 2.3.2**, the results of the groundwater pumping test indicate that the Calivil Formation aquifer has sufficient capacity to support the development's long-term water supply requirements and can support significantly higher rates of extraction. The pumped bore recorded a maximum drawdown of only 4.18 metres after 2 days of pumping at 45 litres per second (3.89 megalitres per day), with the observation bore located almost 1.2 kilometres away recording a maximum of 0.44 metres drawdown. The pump test analysis (SLR 2015g) indicates that the development's proposed groundwater abstraction levels will not significantly affect surrounding bores on adjacent properties or impact groundwater levels in excess of the *NSW Aquifer Interference Policy* (NOW 2012) thresholds.
Flooding		
4. Site access cut off as a result of flooding 5. Isolation and resulting issues in removing birds from the site and transporting feed to the site	• A. & M. Steiner (Narrandera NSW) • Name withheld (Narrandera NSW)	The flood management plan presented in the EIS (SLR 2015a) identifies six different transport options for gaining access to and from the site during a flood event (see **Figure 9**). The flood management plan also identifies processes for the collection and storage of surplus food for birds and workers where a flood event is anticipated, noting there will be capacity on site to store at least eight days of feed. The *Flooding Assessment* (SLR 2015c) appended to the EIS (SLR 2015a) advised: • The development site is unlikely to be flood affected during mainstream events up to and including the 100 year ARI event. In addition, it is considered unlikely that the site will be flood affected by Murrumbidgee River or Yanco Creek out of bank flows during an extreme flood event. • Flood warnings are likely to be available via the SES at least several days prior to a mainstream flood occurring. Where a flood warning is issued, the flood management plan documented in the EIS (SLR 2015a) will be implemented to effectively manage the flood risk to the development. The *Flooding Addendum* (SLR 2015f) contained in **Appendix D** advises the following relevant points: • The site is affected by overland flooding, and overland flooding is likely to have also impacted the Sturt Highway; • The worst-case overland flooding relates to short duration storms and, therefore, it will be safer for farm employees to remain on site during significant rainfall events until flood waters have resided; • Floodwaters are unlikely to take more than a few hours to reside with the exception of the two topographical depressions and ephemeral flow paths; and • Significant raising of ground levels for access or flood protection works may impede floodwaters and further alter flood behaviour.

Issue	Raised by	Response
Air quality and odour		
6. Dust contaminating surrounding farms	• A. & M. Steiner (Narrandera NSW)	Particulate matter (dust) is typically not an issue for a well-run poultry broiler production farm. ProTen does not have any issues or receive complaints at its other poultry production complexes in relation to dust. Notwithstanding, the potential for dust impacts as a result of the poultry sheds was addressed in the *Air Quality Impact Assessment* (Pacific Environment 2015a) prepared as part of the EIS (SLR 2015a). The modelling assessment predicted that 24-hour maximum and annual average PM_{10} levels will be well below the applicable criteria at all of the surrounding receptors. In terms of wheel-generated dust from the internal road, Pacific Environment (2015a and 2015b) concluded that the potential for emissions will be low given the constructed nature of the roads and subsequent lower silt loading (compared to using unformed tracks). The internal roads will be constructed with a compacted clay base to 98 percent and 200 mm of road base. Pacific Environment (2015b) has assessed multiple poultry operations and found internal roadways are not a significant source of dust emissions. The emissions from roads will be managed though the CEMP and OEMP.
7. Odour levels affecting surrounding properties 8. Wind direction and distance from nearest dwellings	• A. & M. Steiner (Narrandera NSW) • Randren House (Euroley NSW) • P. Karunaharan (Rushcutters Bay NSW) • Name withheld (Narrandera NSW)	The *Air Quality Impact Assessment* (Pacific Environment 2015a) analysed meteorological data from the Bureau of Meteorology weather station at Narrandera Airport, selecting the year 2010 for use in the air quality model based on long term averages. Pacific Environment (2015a) generated wind roses, which show that wind commonly blows from all directions, although with a low frequency of southerly and south-easterly winds. The varying meteorological conditions were used by Pacific Environment (2015a) in the odour dispersion modelling to predict the worst case odour concentrations at surrounding receptors. The odour modelling was conservative (see **Section 2.2.2**) and predicted that the odour concentrations at all of the nearest receptors will be below 5 OU, which is below the adopted criteria. Pacific Environment (2015b) concludes that a combination of suitable separation distances and vegetation buffers represents the current best practice for poultry site management in terms of odour emissions. The nearest privately-owned residence is located over 2 kilometres from the nearest PPU and, as outlined in the (SLR 2015a), suitable tree and shrub species will be strategically planted around the perimeter of each PPU to provide a biological buffer of a minimum total width of 40 metres.
Noise		
9. Noise levels affecting surrounding properties	• A. & M. Steiner (Narrandera NSW) • Randren House (Euroley NSW) • P. Karunaharan (Rushcutters Bay NSW)	Noise is typically not an issue for a well-run poultry broiler production farm. ProTen does not have any issues or receive complaints at its other poultry production complexes in relation to noise. Notwithstanding, the potential for noise impacts as a result of the Project was addressed in the *Noise Impact Assessment* (Global Acoustics 2015) prepared as part of the EIS (SLR 2015a). This assessment considered three operational scenarios to assess various combinations of noise sources, including a worst case continuous operation scenario where all 18 ventilation fans were assumed to be operating on all poultry sheds and with feed silo re-filling taking place. In reality, it is highly unlikely that all fans will be running on all sheds at the same time, due to the staggering of the production cycle, however this was modelled as a conservative worst case. Global Acoustics (2015) concluded that construction, operational and sleep disturbance noise levels will comply with project-specific noise levels at all surrounding receptors for all scenarios. Furthermore, an assessment of road traffic noise showed no discernible impact.

Issue	Raised by	Response
Traffic		
10. Excessive traffic affecting surrounding properties	• A. & M. Steiner (Narrandera NSW)	RoadNet was engaged to undertake the appropriate assessment and reporting of traffic issues associated with the Project. Key conclusions of RoadNet's (2015a) assessment included: • Existing and future background traffic volumes on the Sturt Highway are relatively low and additional traffic from the Project can be easily accommodated; and • Provided the recommendations made by RoadNet (2015a) are met, the Project is not expected to cause any significant impacts in terms of road safety or operation. In terms of road traffic noise, given the proximity to a privately owned residence (R10), the largest potential impact from traffic in terms of noise would be road traffic on the site access road from the Sturt Highway. The *Noise Impact* Assessment (Global Acoustics 2015) concluded that no discernible noise impact will occur if a 60 kilometre per hour speed limit is adopted on this site access road. ProTen has committed to a 40 kilometre per hour speed limit on the access road and within the development site. In terms of wheel-generated dust from the internal road, Pacific Environment (2015a and 2015b) concluded that the potential for emissions will be low given the constructed nature of the roads and subsequent lower silt loading (compared to using unformed tracks). The internal roads will be constructed with a compacted clay base to 98 percent and 200 mm of road base. Pacific Environment (2015b) has assessed multiple poultry operations and found internal roadways are not a significant source of dust emissions. The emissions from roads will be managed though the CEMP and OEMP.
11. Visibility at the proposed intersection location on the Sturt Highway	• A. & M. Steiner (Narrandera NSW) • M. Rowe (Narrandera NSW)	RoadNet's (2015a) assessment included a site visit and inspection of the proposed intersection location along the Sturt Highway with representatives from RMS. RoadNet (2015a) recommended the proposed intersection location based on a Safe Intersection Sight Distance (SISD) which was calculated in accordance with the *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections,* and Stopping Sight Distance (SSD), which was calculated in accordance with *Ausroads Guide to Road Design Part 3: Geometric Design, Table 5.4* . The approaches from both the direction along the Sturt Highway exceed the SISD and SSD requirements.
12. Presence of an existing driveway opposite the proposed site entrance, including concerns over: a. Ability of the proposed intersection design to accommodate road train manoeuvres at the intersection b. Ability of the proposed intersection design to cater for the additional drainage and runoff requirements created by the larger road	• Name withheld (East Griffith, NSW)	To address these traffic-related issues, RoadNet prepared the letter report (2015b) contained in **Appendix G**. A summary of RoadNet's responses to each of the issues is provided below. a. As noted in EIS (SLR 2015a), the Sturt Highway is an approved road train route and the new intersection will not affect the use of the Highway by road trains in any way. The proposed intersection layout will retain the lane widths currently provided in each direction along the Sturt Highway for through traffic commensurate with its designation as both a B-double route and an approved road train route. The intersection will also be designed to allow vehicles up to the size of B-doubles to turn in and out of the proposed access simultaneously without impacting on the safety of other road users. The design features of the existing access driveway for Lot 30 will also be retained as part of any modifications required to accommodate the new intersection layout, such that the existing driveway will continue to be able to service the same types and sizes of vehicles that it currently accommodates. b. The proposed intersection will be designed and constructed to Austroads standards and will need to be approved by RMS. The need to cater for additional drainage and runoff requirements will be considered as part of the design process and appropriate provisions will be incorporated into the

Issue	Raised by	Response
surface area c. Impacts of road works during construction phase on operation of nearby properties/businesses d. Biosecurity measures, ensuring that weeds do not enter nearby properties via drainage runoff at the intersection e. Ability of the new intersection to manage vehicles entering from both access roads north and south of the Sturt Highway, and associated impacts on road safety for the driving public (i.e. general traffic) f. Visibility of the intersection due to its presence in a depression and occurrence of fog.		design as required. c. A Construction Traffic Management Plan and associated Traffic Control Plan satisfying the requirements of AS1742.3 will be developed prior to undertaking works on the Sturt Highway. These plans will set out the requirements to manage any impacts on existing road users during the construction of the new intersection. Short term shoulder and lane closures may be required at times. This will be undertaken in accordance with the appropriate traffic control guidelines and by approved traffic control contractors. The impact of this traffic control, in terms of delays and queuing, is expected to be minimal due to the relatively low existing traffic volumes on this section of the Sturt Highway. Importantly, access to Lot 30 will be maintained at all times to minimise any adverse impacts to the affected landowner. For the scale of works required at the intersection it is envisaged that only a couple of weeks would be required to complete the construction activities (weather permitting). d. As described in point b, the need to appropriately manage drainage and runoff will be considered as part of the design process and appropriate provisions will be incorporated in to the design as required. Weed control practices will be included in the CEMP and OEMP. e. RoadNet (2015b) note that the intersection between the proposed and existing access driveways and the Sturt Highway is not a cross-roads intersection. The two side-roads are private access driveways serving independent sites, with no cross-movements between the two access roads needing to be catered for. For traffic exiting from either of the access driveways, normal road rules will apply in the event that traffic arrives at the same time on each of the approaches. For traffic entering the access driveways from the Sturt Highway, in addition to the BAL and BAR treatments proposed as part of the new access driveway, the intersection will be designed to allow for right turning movements to occur simultaneously from either approach of the Sturt Highway should the need arise. Traffic turning left from the Sturt Highway into the existing access to Lot 30 will most of the time benefit from being able to use the wider sealed shoulder, constructed as part of the BAR treatment, to decelerate out of the path of eastbound through traffic. On those occasions when the BAR treatment is being used by through traffic; the situation will be similar to what it is at present. f. The proposed site access has been optimally located between the vertical crest curves that exist on each of the Sturt Highway approaches in order to maximise the available sight distance. As illustrated in the sight line diagram in RoadNet's letter report (2015b) in **Appendix G**, the minimum requirements for Stopping Sight Distance and Safe Intersection Sight Distance at the proposed intersection location are exceeded. With respect to the occurrence of fog, there are no specific design requirements to be addressed, however, motorists are generally expected to modify their driving behaviour to suit the conditions and this would equally apply at the subject location.
Other Issues		
13. Disposal of birds following a mass morality event. Disposal of birds during a flood event where site access is cut off.	• M. Rowe (Narrandera NSW) • J. Craig (Wagga Wagga NSW)	See response to point 1 above (under water resources).

Issue	Raised by	Response
14. Health issues associated with meat consumption	• M. Kelly (Reservoir VIC)	This is not an issue that is relevant to a planning application. The proposed development is permissible with development consent under the provisions of the *Narrandera Local Environmental Plan 2013*.
15. Devaluation of neighbouring properties	• A. & M. Steiner (Narrandera NSW) • J. Balfour (Wollongong NSW) • Name withheld (Narrandera, NSW)	Intensive livestock agriculture is permissible with consent in the RU1 Primary Production Zone, and is therefore permissible with consent in the development site. With the exception of the small area to the west comprising the Murrumbidgee National Park and South West Woodland Nature Reserve, all land surrounding the development site is also zoned RU1 Primary Production, indicating compatibility with surrounding lands. In addition, the various environmental impact assessments have concluded no significant adverse impact on surrounding properties. While intensive agricultural operations may have the potential to devalue properties when developed in close proximity to higher density living areas, such as residential and rural-residential developments, there is no evidence to suggest that they devalue agricultural properties. Throughout its history in the Australian poultry industry, ProTen has proven its commitment to best management practice at its numerous poultry production operations.
16. Animal welfare	• J. Balfour (Wollongong NSW) • M. Kelly (Reservoir VIC) • Name withheld (Mount Eliza VIC) • Name withheld (Leumeah NSW) • Name withheld (Georges Hall NSW) • Name withheld (Carrum Downs VIC)	The conditions under which broiler poultry are housed and the way that they are managed during their growing phase, transportation and processing are prescribed in several government and industry endorsed Codes of Practice designed to safeguard their health and welfare. ProTen has proven its commitment to high standards of bird welfare throughout its history within the poultry industry. The company understands that bird welfare, flock performance and economic functioning go hand-in-hand. ProTen has advised that it is committed to the standards of care and management detailed in the *National Animal Welfare Standards for the Chicken Meat Industry* (Australian Poultry CRC 2008), which is based on the Model Codes of Practice for poultry production and Australian Standards, along with international and national guidelines for animal welfare. Key features of this commitment are advised in Section 3.16 of the EIS (SLR 2015a).
17. Impacts on existing servicing infrastructure resulting in shortages of power and other services	• Randren House (Euroley NSW)	ProTen has conducted extensive consultation with Essential Energy regarding the power requirements of the development to ensure that appropriate infrastructure is put in place to service the needs of the development without affecting other users. New power supply infrastructure is proposed to be installed from the existing Coleambally sub-station to the development site. The Review of Environmental Factors (REF) (SLR 2015i) prepared for this new power supply infrastructure has been accepted by Essential Energy and SLR's understands that approval will be issued in the near future. In relation to water supply, as outlined above for issues 2 and 3, the proposed extraction of groundwater to service the development's water supply requirements will be serviced via the transfer of existing water access licences from bores located within the nearby area. On this basis, the development will be using water that is already allocated under the *Water Sharing Plan for Lower Murrumbidgee Groundwater Sources 2003* (not additional water). As outlined in **Section 2.3.2**, the results of the groundwater pumping test indicate that the development's proposed groundwater extraction will not significantly affect surrounding bores on adjacent properties or impact groundwater levels in excess of the *NSW Aquifer Interference Policy* (NOW 2012) thresholds.

Issue	Raised by	Response
18. Biosecurity – outbreaks of disease requiring culling of the bird population	• Randren House (Euroley NSW)	Biosecurity is in integral part of any successful poultry operation, and ProTen has demonstrated strict biosecurity commitment over the years. A copy of the *National Farm Biosecurity Manual for Chicken Growers* (Australian Chicken Meat Federation 2010) will be kept at the development site and all staff will be provided with training in the relevant parts of the Manual and site-specific biosecurity measures. The key biosecurity measures that will be implemented are advised in Section 3.18 of the EIS (SLR 2015a), and a mass mortality disposal strategy (in the unlikely event of an emergency disease outbreak) is outlined in Section 6.12.2 of the EIS (SLR 2015a).
19. Greenhouse gas emissions and the contribution to climate change	• M. Kelly (Reservoir VIC) • Randren House (Euroley NSW)	As advised in Section 6.11 of the EIS (SLR 2015a), the following best management practices and mitigation measures will be implemented to improve energy efficiency and minimise greenhouse gas emissions: • Low lux internal shed lighting, which has a significantly reduced power demand compared to past lighting practices, will be installed within the poultry sheds. • External lighting will only be used when necessary during times of low light and/or heavy fog. • Lighting, temperature, humidity and static pressure within the poultry sheds will be continuously monitored and automatically adjusted to suit conditions. This will avoid unnecessary electricity and LPG usage. • Equipment such as ventilation fans and heaters will be regularly maintained and serviced to ensure optimal performance and efficiency.
20. Adverse visual amenity impacts from the construction of a poultry processing plant	• Randren House (Euroley NSW)	The Project does not involve the construction of a poultry processing plant. Rather, the Project involves the construction of a poultry broiler farm where chickens will be grown for processing off site. Five PPUs are proposed, each consisting of 16 poultry sheds and ancillary infrastructure. The nearest privately-owned residences, being R4 and R5, are located over 2 kilometres from the nearest PPU (PPU 1). There is also a slight change in topography between these residences and PPU1, which is likely to shield the view from these residences. Adverse visual impacts are therefore not anticipated due to the local topography combined with the distance to the nearest receptors.
21. Storage and disposal of waste materials will result in environmental risks and damage due to foul odours and atmospheric fall out	• Randren House (Euroley NSW)	In their submission Randren house refer to waste and odour generated by “plant operation”. The Project is a poultry farm, not a poultry processing facility. No processing of chickens or rendering will take place on site, and there will not be any on-site stockpiling or disposal of waste materials. As outlined in Section 3.10 of the EIS (SLR 2015a), appropriate systems will be implemented to ensure that all waste streams generated by the Project are effectively managed and/or disposed of off site.
22. The applicant and associated entities are under investigation by Fair Work Australia, the Ombudsman and the Australian Securities and Investment Commission	• Randren House (Euroley NSW)	The Applicant for the Euroley Poultry Production Complex is ProTen Holdings Pty Ltd. ProTen is not under investigation by Fair Work Australia, the Ombudsman, or the Australian Securities and Investment Commission.

Issue	Raised by	Response
23. Roads and enclosure permits – changes to Crown lands within the area and possible detrimental impacts to neighbouring properties	• Name withheld (Narrandera NSW)	Consultation with Crown Lands regarding the management of Crown land within the development site occurred in February 2015, as documented in Table 5.1 of the EIS (SLR 2015a). During this process Crown Lands advised ProTen to apply to close and purchase the Crown roads within the development site. In addition, due to the lengthy timeframes involved in processing closure applications, Crown Lands advised ProTen to simultaneously apply for a licence under Section 34 of the Crown Lands Act 1989 to allow access across the Crown roads so that, pending development consent from the DP&E, works could commence across the Crown roads as required by the development whilst the close and purchase application is being processed. Both of these applications were subsequently lodged by ProTen, with Crown Lands issuing a licence on 15 July 2015 to access the Crown roads in the development site, pursuant to Section 34 of the Act. This licence is attached in **Appendix B**.

4 SPECIALIST INTEREST GROUP SUBMISSION

The submission lodged by the specialist interest group "Voiceless - the animal protection institute" raised various issues associated with animal welfare, environmental impacts and socio-economic impacts. The issues are identified below in ***bold italic text***, followed by the response in normal text.

4.1 Animal welfare

The conditions under which broiler poultry are housed and the way that they are managed during their growing phase, transportation and processing are prescribed in several government and industry endorsed Codes of Practice designed to safeguard their health and welfare. ProTen has proven its commitment to high standards of bird welfare throughout its history within the poultry industry. The company understands that bird welfare, flock performance and economic functioning go hand-in-hand.

ProTen has advised that it is committed to the standards of care and management detailed in the *National Animal Welfare Standards for the Chicken Meat Industry* (the Standards) (Australian Poultry CRC 2008). The Standards were developed to help fulfil both the chicken meat industry's and the community's expectations of the high levels of quality assurance associated with chicken meat production, and have been based on the Model Codes of Practice for poultry production and Australian Standards, along with international and national guidelines for animal welfare. Key features of this commitment are advised in Section 3.16 of the EIS (SLR 2015a).

Denial of natural behaviours due to close confinement and stocking densities

Broiler birds are run in large open poultry sheds on bedding material. They are not kept in cages.

Stocking Density

The Standards (Australian Poultry CRC 2008) recommend a maximum stocking density target for tunnel-ventilated sheds with evaporative cooling and one air exchange per minute of 40 kilograms per square metre. ProTen's broiler "pick-ups" (shed thinning) are governed by customer bird weight specifications and maintaining a maximum stocking density of 40 kilograms per square metre in line with the Standards.

Feed and Water

Feed and water lines will run the length of each poultry shed and will be automatically supplied by external silos and water storage tanks. Feed pans and water nipple drinkers (with drip cups) will be spaced along these lines at regular intervals so that the birds are never more than a few metres from food and water.

Lighting

Uniform lighting will be provided within the poultry sheds to enable the birds to see the feed pans and water drinkers, with dark periods provided each day to allow the birds to rest. Reduced light has been found to minimise livestock stress and, as such, low lux internal lighting will be provided to promote calm. Control of light intensities will be via dimmer controls.

Ventilation

The sheds will be fully-enclosed climate-controlled and tunnel-ventilated. The use of tunnel-ventilated sheds has grown to steadily replace poultry housing that conventionally relied on natural ventilation. Tunnel ventilation is easier to manage then natural ventilation and enables the grower to provide close to optimum conditions for bird health, growth and performance throughout the year. Additional benefits include better control over shed moisture levels, which is directly related to odour production, and reduced consumption of power and water.

Disease – Antibiotic Use

Antibiotic use is important in chicken meat production to ensure the overall health and wellbeing of the flock. The Australian Chicken Meat Federation (http://www.chicken.org.au/page.php?id=6) recommends the use of antibiotics in farm animals in two important ways:

- Therapeutic agents - used to treat the symptoms of a bacterial infection; and
- Prophylactic (preventative) agents - used to prevent disease occurring in healthy animals.

Only antibiotics approved by Australia's regulatory authorities will be used and they will be administered in accordance with strict regulatory guidelines. Antibiotics are usually delivered via drinking water (not in feed) and only a veterinarian can authorise and supervise these treatments.

If antibiotics are required to be used, such use will be undertaken in accordance with the antibiotic policy of the Australian Chicken Meat Federation, which states that:

- Antibiotics must not be used to promote growth in chickens;
- Antibiotics are only to be used for therapeutic or preventative treatments against serious diseases such as necrotic enteritis;
- Antibiotics that are considered important for human use are not to be used in preventative treatments of chickens;
- Antibiotics must be used under veterinary supervision and according to good veterinary practice;
- At all times withholding periods set by regulatory authorities must be observed.

The Australian Chicken Meat Federation also supports the Australian Government's *National Residue Survey*, which conducts regular independent checks of residues of antibiotics in chicken meat and consistently shows that Australian chicken meat does not contain residues of antibiotics. The results from the latest animal product monitoring conducted in 2013-14 found that out of 300 samples collected, none contained levels of antibiotics above the maximum residue limit. In fact, no samples contained antibiotics levels above the limit of reporting. The results are published on the Australian Government's Department of Agriculture website at:
http://www.agriculture.gov.au/ag-farm-food/food/nrs/nrs-results-publications/animal-product-monitoring-2013-14.

Disease – Depopulation

Whilst robust biosecurity measures will be in place to ensure the risk of a disease outbreak is minimal, in the unlikely event of a major disease outbreak and depopulation was necessary, the site would be managed by the DPI in co-ordination with the EPA and technical service units of the poultry industry.

Depopulation would be undertaken in accordance with Standard 5 of the Standards (Australian Poultry CRC 2008) to ensure it occurs in a humane manner and using the most appropriate equipment and method according to the class/condition of the bird.

Growth and Mortality Rates

Chickens are not genetically engineered or modified. Around 50 to 60 percent of the improvement in broiler growth rates over the last 50 years is due to improved breeds of chicken. A further 20 to 25 percent is due to improved nutrition, with feed being specifically formulated to match the chicken's precise nutritional requirements throughout its lifecycle, thereby optimising growth. Other gains made in meat chicken growth and performance are due to better husbandry techniques and health management.

Hormones are not added to chicken feed or administered to commercial meat chickens in Australia. Hormone supplementation is a practice that has been banned internationally for over 40 years.

The cycle of a broiler production complex typically lasts about nine weeks, with a bird occupation of around eight weeks and a down-time of close to one week for cleaning in preparation for the next batch of birds. This cycle, which is typically standard across the broiler chicken industry, will be adopted at the Euroley Poultry Production Complex.

The Standards (Australian Poultry CRC 2008) do not set targets for bird mortality rates, rather stating that they are provided by the owner of the birds, which, in this case, is Baiada. As stated in the EIS the average mortality rates for broiler poultry housed within tunnel-ventilated sheds is:

- Week 1 of cycle (1 to 7 days of age) – 1 percent of population; and
- Weeks 2 to 8 of cycle (7 to 56 days of age) - 0.6 percent of the population per week.

The Standards (Australian Poultry CRC 2008) state, as a guide, that weak, ill or injured birds should not exceed 1 percent of the flock, which is consistent with the average mortality rates listed above. Maintaining a low mortality rate is obviously in the best interests of both the chickens and the growers. On this basis, both ProTen and Baiada monitor mortality rates very carefully to identify and eliminate any issues in the management of their flocks to ensure morality rates are kept as low as possible.

4.2 Environmental impact

A comprehensive environmental assessment of the Project has been carried out in accordance with the EP&A Act and its regulation, the SEARs and input received from other government agencies.

The potential for adverse impact on the local environment and surrounding populace has been minimised by selective siting of the PPUs and adoption of various development design features, best management practices and mitigation measures. While the Project may result in some externalised impacts associated with air quality, noise emissions and traffic generation, the specialist impact assessments predict that the Project will comply with all relevant impact assessment criteria and can co-exist with the surrounding land uses.

The EIS (SLR 2015a) concludes that the Project can proceed without resulting in significant or long-term adverse impacts to the local environment and surrounding populace. It will be managed on a day-to-day basis in accordance with a site-specific OEMP, which will ensure that the commitments made in the EIS (SLR 2015a), along with relevant statutory obligations and conditions of development consent (including environmental licensing requirements), are fully implemented and complied with.

It is relevant to note that ProTen has been operating in the Australian poultry industry, and specifically in the Griffith region, since 2002. They therefore have gained an extensive understanding of the environment in which they operate and of the potential impacts of their operations, as well as the suitable measures by which to eliminate or appropriately manage them.

Throughout its history in the Australian poultry industry, ProTen has proven its commitment to best management practice at its numerous poultry production operations.

4.3 Other Issues

Inconsistency with the aims of the Narrandera LEP and the objectives of Zone RU1

The proposal will increase impermeable surfaces on the land and diminish the area available for sustainable agricultural production.

The applicable aim of the *Narrandera Local Environmental Plan 2013* (Narrandera LEP), as listed in clause 1.2(2)(a) of the LEP, is *to protect, enhance and conserve agricultural land through the proper management, development and conservation of natural and man-made resources.*

As advised in the EIS (SLR 2015a), the footprint of the proposed development will be relatively small, comprising around 8 percent of the entire development site. The vast majority of the development site will therefore remain available for other agricultural activities as it is now under a lease or share farming arrangement. On this basis, the Project will not deny access to large areas of viable agricultural land, and will not significantly reduce the land area available for agricultural production.

Intensive livestock agriculture, such as that proposed, is permissible with development consent within the RU1 Primary Production Zone. The objectives of the RU1 Zone, and a comment on the consistency of the Project with these objectives, follows:

To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.

The use of natural resources as part of the Project has been carefully considered in the project design to ensure the use of natural resources is minimised through efficient use. Water supply for the 10 houses and staff amenities will be sourced via rainwater tanks and will therefore not place any demand on surface water or groundwater resources. Water required to service the poultry operation will be sourced via the transfer of an existing water access licence (WAL 11788) from a bore located approximately 5 kilometres to the east of the development site. In addition, ProTen has recently entered in to a sale and purchase agreement for an additional 225 megalitres of water per year from the same water source from a property approximately 4 kilometres to the northeast of the development site. On this basis, the Project will be using water that is already allocated under the *Water Sharing Plan for Lower Murrumbidgee Groundwater Sources 2003* (not additional water). As outlined in **Section 2.3.2**, the results of the groundwater pumping test indicate that the Calivil Formation aquifer has sufficient capacity to support the development's long-term water supply requirements and can support significantly higher rates of extraction. The pump test analysis also indicates that the development's proposed groundwater abstraction levels will not significantly affect surrounding bores on adjacent properties or impact groundwater levels in excess of the *NSW Aquifer Interference Policy* (NOW 2012) thresholds.

A number of best practice measures have also been incorporated in the design of the proposed development to ensure a high level of energy efficiency. Low lux internal shed lighting, which has a significantly reduced power demand compared to past lighting practices, will be installed within the poultry sheds. In addition, lighting, temperature, humidity and static pressure within the poultry sheds will be continuously monitored and automatically adjusted to suit conditions. This will avoid unnecessary electricity and LPG usage.

To encourage diversity in primary industry enterprises and systems appropriate for the area.

Whilst a significant poultry industry exists in the nearby Griffith LGA, limited poultry production is undertaken in the Narrandera LGA. The introduction of a broiler farm to the Euroley/Narrandera area will therefore increase the diversity in the primary industries in the area.

The poultry industry within the wider Griffith region is a perfect example of vertical integration where a number of related operations (chicken hatchery, poultry feedmill, poultry processing plant and grower farms) produce a different product or service that combine to satisfy a common need. It is widely appreciated that the industry has a good strategic in the area. The proposed broiler farm at Euroley will form another important part of the industry that is already well-established in the wider region.

To minimise the fragmentation and alienation of resource lands.

As advised in the EIS (SLR 2015a), the footprint of the proposed development will be relatively small, comprising around 8 percent of the entire development site. The vast majority of the development site will therefore remain available for other agricultural activities as it is now under a lease or share farming arrangement. On this basis, the Project will not deny access to large areas of viable agricultural land, and will not significantly reduce the land area available for agricultural production.

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

Land use conflict is discussed in detail in Section 6.1 of the EIS (SLR 2015a). The primary surrounding land use is agriculture, consistent with the dominant land use across the region. The potential for conflict between the Project and the existing surrounding agricultural production activities is considered low. The footprint of the five proposed PPU sites will be relatively small at approximately 90 hectares and the commercial activity associated with the Project will be largely confined to this area. ProTen intends to continue using the land outside of the disturbance footprint for continued agricultural production purposes under a lease or share farming arrangement.

One exception to the surrounding agricultural landuse is where the development site abuts the "Banandra" portions of the South West Woodland Nature Reserve and Murrumbidgee Valley National Park. The nearest PPU will be located 100 metres from the development site boundary that abuts the National Park. All other project-related development will be considerably further away from the site boundary. Table 6.1 in the EIS (SLR 2015a) addresses the relevant issues in consideration of *Guidelines for developments adjoining land and water managed by the Department of Environment Climate Change and Water (DECC 2010*). This consideration did not identify any issues in terms of potential land use conflict between the Project and the adjoining nature reserve/national park.

No detailed economic impact assessment

Section 6.14.2 of the EIS (SLR 2015a) provides an overview of economic activity associated with the Project. As summarised in this section, the Project will result in the creation of 30 full-time equivalent jobs and numerous and significant flow-on benefits to the wider community. The development will also consume around 105,000 tonnes of poultry feed per annum, which represents a yearly recurrent spend of approximately $33 million (based on the average price of feed at the time the EIS was prepared). The economic benefits to the local community will therefore be significant.

The Project will put downward cost pressures on other local chicken farmers.

The development will drive out competition for local free range or organic farms.

Firstly, it is important to note that all intensive poultry growers in the region produce chickens for the same company, this being Baiada. The chickens are grown for Baiada and are ultimately processed by Baiada. Secondly, a downward cost pressure can result from an oversupply of a particular product and this assertion therefore assumes that the additional supply of chickens from the Project will be in excess of projected demand. Contrary to this, the increasing demand for chicken meat in Australia is well documented.

According to statistics published by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES 2015), the popularity of chicken meat has grown enormously over the last 30 years to the extent that it is currently the most consumed meat in Australia. Chicken meat production in Australia has increased from approximately 380,000 tonnes in 1989-90 to around 1.08 million tonnes in 2013-14, and it is expected to continue increasing to around 1.32 million tonnes in 2019-20.

In 2012-13 Australians ate an average of 44.6 kilograms of chicken meat per person, compared to 36 kilograms in 2008-09 and just 13 kilograms in 1975. ABARES (2015) estimates that chicken meat consumption in Australia will continue to rise, reaching 49.2 kilograms per person in 2019-20. Around 525 million broiler birds were processed in 2011 to satisfy domestic consumption needs, with NSW enjoying a significant portion of this production. Based on current growth projections, it is estimated that by 2019 this well need to rise to close to 650 million birds per year.

In terms of driving out competition for local free range or organic farmers, for the reasons outlined, this will not be the case. While the increasing demand for chicken meat in the Australian market can be supplemented by local free range and organic farmers, the level of the demand will require intensive poultry production operations, such as that proposed. Furthermore, free range and organic farms supply a different type of product to a different consumer compared to the product that will be produced from the proposed development.

Land use conflict

Land use conflict is discussed in detail in Section 6.1 of the EIS (SLR 2015a) and addressed above under "to minimise conflict between land uses within this zone and land uses within adjoining zones". Table 6.1 in the EIS (SLR 2015a) addresses the relevant issues in consideration of *Guidelines for developments adjoining land and water managed by the Department of Environment Climate Change and Water (DECC 2010*). This consideration did not identify any issues in terms of potential land use conflict between the Project and the adjoining nature reserve/national park.

Do not accept the proponent's argument that the remaining land beyond the PPUs can remain productive agricultural land through being leased out to the current owners for grazing or other agricultural purposes.

As advised in the EIS (SLR 2015a), the footprint of the proposed development will be relatively small, comprising around 8 percent of the entire development site. This will leave over 1,000 hectares within the development site available for continued agricultural production under a lease or share farming arrangements. Such arrangements work successfully at some of ProTen's other poultry production sites within NSW and there is no evidence to suggest that such an arrangement can't be successfully implemented at the development site, particularly given the large area of land available.

Impermissibility of the farm managers' dwellings

Clause 4.2C of the Narrandera LEP contains development standards relating to the erection of dwelling houses in the RU1 Primary Production zone, one of which (clause 3a) states that consent must not be granted for the erection of a dwelling unless the land is a lot that is at least the minimum lot size shown on the Lot Size Map. The applicable minimum lot size for the development site is 400 hectares, which is greater than the individual lot sizes within the site on which the farm managers' houses are proposed to be constructed.

ProTen sought legal advice on this issue from Gilbert and Tobin Lawyers, specifically whether there is a legal requirement to consolidate the lots within the development site to achieve the minimum lot size specified in the LEP. This advice, which was provided to the DP&E, concluded that the development controls in clause 4.2C of the LEP are not a relevant consideration to the Project. The objectives of clause 4.2C are "to minimise unplanned rural residential development, and to enable the replacement of lawfully erected dwelling houses in rural and environment protection zones". Clause 4.2C would therefore be a relevant matter for consideration if the application involved rural residential development or the erection of dwellings to replace lawfully erected dwellings. The Project is not a rural residential development, nor are dwelling houses being replaced. The houses proposed are ancillary to the operation of the PPUs and a necessary component given the 24 hour nature of the operation. Gilbert and Tobin Lawyers therefore conclude that clause 4.2C is not a relevant consideration for this project. No consolidation of lots is required and the dwellings are permissible.

Unacceptable onsite hazard due to large quantities of LPG and exceedance of SEPP 33 threshold levels

A preliminary risk screening of the Project was undertaken by SLR (2015d) in accordance with SEPP 33. This initial risk screening exercise found the development to be potentially hazardous due to the volume of LPG to be stored on site (40 x 7,500 litre tanks). In accordance with SEPP 33, a preliminary hazard analysis (PHA) was conducted by SLR to determine the level of risk to people, property and the environment at the development site and in the presence of controls. The PHA (SLR 2015d) was appended to the EIS (SLR 2015a).

Based on the Project's design features for the use, storage and transport of LPG, the PHA (SLR 2015d) concluded that while the volumes of LPG will exceed the screening thresholds in SEPP 33, with suitable engineering controls in place and in consideration of all of the factors such as separation distances, the Project does not pose a significant off site risk and is not considered to be an offensive or hazardous development.

Inappropriate consideration of noise and odour, particularly on proposed farm managers' dwellings

Pacific Environment was engaged to undertake the appropriate assessment and reporting of air quality issues associated with the Project. The assessment was undertaken in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (Approved Methods) (Department of Environment and Conservation (DEC) 2005) and *Assessment and Management of Odours from Stationary Sources in NSW* (DEC 2006). A copy of Pacific Environment's *Air Quality Impact Assessment* (2015a) was appended to the EIS and summarised within the EIS.

In summary, Pacific Environment (2015a) concluded the following:

- Odour concentrations at all of the nearest receptors are predicted to be at or below 5 OU; and
- Maximum 24 hour and annual average PM_{10} levels are predicted to be below the respective assessment criterion at all of the sensitive receptors.

Global Acoustics was engaged to undertake the appropriate assessment and reporting of noise issues associated with the Project. This assessment was undertaken in accordance with the *Interim Construction Noise Guideline* (DECC 2009), *Industrial Noise Policy* (EPA 2000) and the NSW *Road Noise Policy* (DECCW 2011). A copy of Global Acoustics *Noise Impact Assessment* (2015) was appended to the EIS and summarised within the EIS.

In summary, Global Acoustics (2015) concluded the following:

- The construction, operational and sleep disturbance noise levels will comply with project-specific noise levels at all surrounding receptors for all scenarios; and
- No discernible noise impact will occur if a 60 kilometre per hour speed limit is adopted on this site access road.

The 10 houses proposed as part of the Project will house the farm managers and assistant farm managers. The houses will therefore be project-related residences and as such are not considered sensitive receptors to be assessed in terms of odour and noise impacts. Due to the 24 hour nature of the operation, the farm managers must live in close proximity to the poultry sheds. Not only is this necessary from a logistics point of view, given the farm managers may be required to work at all hours of the day and night depending on the particular stage of the production cycle, but is also necessary to ensure animal welfare. Farm managers must live in close proximity to enable an immediate response in the event that an issue, such as failure of the shed ventilation system.

Inadequate arrangements for essential electricity services and water supply

Water Supply

As evident on **Figure 3**, four water storage tanks will be installed at each PPU for the storage of water extracted from the groundwater bores. These tanks will have a combined capacity of 1.4 megalitres, which is in excess of the 2 day's water supply for each PPU recommended in the *Best Practice Management for Meat Chicken Production in NSW* (DPI 2012).

Furthermore, measures to ensure security of water supply from the groundwater bores have also been incorporated into the Project design. Both of the proposed groundwater bore locations (see **Figure 1**) will include one production bore and one backup bore in case of pump failure.

The results of the groundwater pumping test (SLR 2015g) indicate that the Calivil Formation aquifer has sufficient capacity to support the development's long-term water supply requirements and can support significantly higher rates of extraction. The achieved yields demonstrate appropriate water supply security for the development.

Electricity Supply

Ensuring adequate electricity supply is critical to a poultry development, and is one of the key factors when undertaking a site selection process for a broiler farm.

ProTen has conducted extensive consultation with Essential Energy regarding the power requirements of the development to ensure that appropriate infrastructure is put in place to service the needs of the development without affecting other users. New power supply infrastructure is proposed to be installed from the existing Coleambally sub-station to the development site. The Review of Environmental Factors (REF) (SLR 2015i) prepared for this new power supply infrastructure has been accepted by Essential Energy and SLR's understands that approval will be issued in the near future.

Emergency standby diesel generators will be installed for when power from the electricity grid is lost.

Inadequate treatment of waste and associated contamination concerns

The proponent does not appear to have any treatment process for the wash down water from the poultry sheds.

As outlined in Section 3.10 of the EIS (SLR 2015a), appropriate systems will be implemented to ensure that all waste streams generated by the Project are effectively managed and/or disposed of off site.

As outlined in Section 3.11 of the EIS (SLR 2015a), an engineered surface water drainage system will be implemented to provide long-term structural controls and management measures to mitigate the impact of surface water runoff throughout the life of the operation.

A stage 1 preliminary site investigation has been undertaken to address the contamination potential and site suitability in accordance with *State Environmental Planning Policy No. 55 - Remediation of Land* (SEPP 55). The *Stage 1 Preliminary Site Investigation* report (SLR 2015e) detailing the methodology and results of the investigation is provided in **Appendix C**.

In summary, based on a review of the available site history data, SLR (2015e) concluded the following:

- The potential for significant widespread contamination to be present on the site, as a result of past and present land use activities, is considered to be low;
- The site is suitable, from a contamination perspective, for the proposed poultry broiler production farm and associated residences; and
- No further assessment is considered necessary.

Absence of effective monitoring and control systems

Large-scale, intensive animal facilities are at heighted risk of essential services failure. For example, during hot weather, mass bird deaths can result from small interruptions to ventilation and cooling equipment. Without appropriate monitoring and control systems, the animals within these facilities may be exposed to hazardous and potentially lethal conditions for extended periods of time.

It is for this reason that the poultry sheds at all of ProTen's farms, including the proposed sheds at Euroley, are fully computer controlled and alarm monitored, with back-up power available via emergency standby generators.

5 REFERENCES

Australian Chicken Meat Federation (2010) *National Farm Biosecurity Manual for Chicken Growers*

Australian Poultry CRC (2008) *National Animal Welfare Standards for the Chicken Meat Industry*

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Global Acoustics (2015) *ProTen Euroley Poultry Production Complex, Noise Impact Assessment*

Lance Ryan Consulting Engineers (2015) *Stormwater Report, ProTen Chicken Sheds, Euroley*

OzArk Environmental and Heritage Management (2015) *Aboriginal Heritage Impact Assessment*

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SLR Consulting Australia (2015a) *Euroley Poultry Production Complex SSD 6882, Environmental Impact Statement*

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